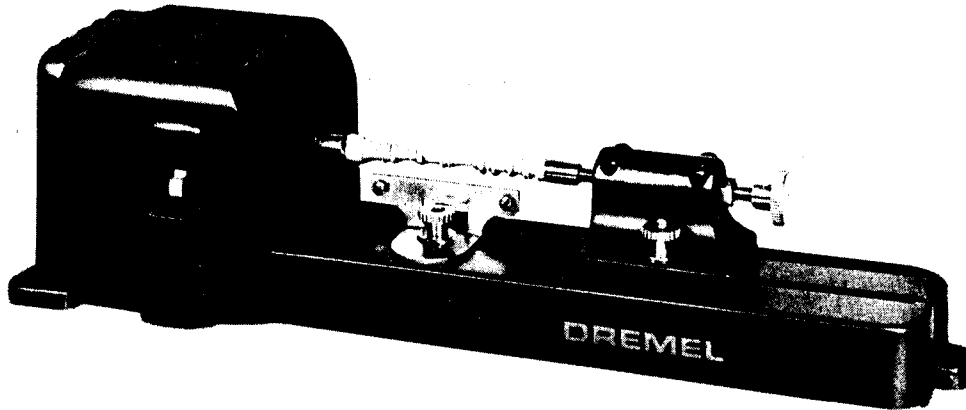


# DREMEL® MOTO-LATHE

## OPERATING AND INSTRUCTION MANUAL



- For:** *Craftworker, Artist, Hobbyist*  
**Turn:** *Wood, Plastic, Soft Metals*  
**Handle:** *Work to 6-In. Long, 1½-In. Diameter*  
**Make:** *Spindle or Bowl Shapes - for  
Models, Art Objects, Miniature Furniture*

### A SIMPLE, EASY-TO-USE FUN TOOL

With your *Dremel Moto-Lathe* you can make turned lamp stands and bases, chair and table legs, decorative trim pieces, bowls and many other similar pieces out of wood and other materials. Turning is so easy that it is fun to do; there is a fascination about shaping a workpiece to suit your plan (or your whim) that is akin to creating any art object. Best of all, *no* talent and very little experience is needed - with the step-by-step instructions given here you can quickly begin "spinning" dream pieces of your own.

• • • • •  
**DREMEL® MFG. DIVISION**

EMERSON ELECTRIC CO.

4915 21st ST., RACINE, WIS. 53406

# RULES FOR SAFE OPERATION

1. **Keep guards in place** and in working order.
2. **Remove adjusting keys and wrenches.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
3. **Keep work area clean.** Cluttered areas and benches invite accidents.
4. **Avoid dangerous environment.** Don't use power tools in damp or wet locations. Keep work area well lit.
5. **Keep children away.** All visitors should be kept safe distance from work area.
6. **Make workshop child proof** with padlocks, master switches, or by removing starter keys.
7. **Don't force tool.** It will do the job better and safer at the rate for which it was designed.
8. **Use right tool.** Don't force tool or attachment to do a job it was not designed for.
9. **Wear proper apparel.** No loose clothing or jewelry to get caught in moving parts. Rubber-soled footwear is recommended for best footing.
10. **Use safety glasses.** Also use face or dust mask if cutting operation is dusty.
11. **Secure work.** Use clamps or a vise to hold

work when practical. It's safer than using your hand and it frees both hands to operate tool.

12. **Don't overreach.** Keep proper footing and balance at all times.

13. **Maintain tools with care.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

14. **Disconnect tools** before servicing; when changing accessories such as blades, bits, cutters, etc.

15. **Avoid accidental starting.** Make sure switch is in "Off" position before plugging in.

16. **Use recommended accessories.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.

17. **Never stand on tool.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.

18. **Check damaged parts.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to assure that it will operate properly and perform its intended function — check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

The operation of any power tool can result in foreign objects being thrown into the eyes, which can result in severe eye damage. Always wear safety glasses or eye shields before commencing power tool operation.



# GROUNDING INSTRUCTIONS

This tool should be grounded while in use to protect the operator from electric shock.

## 1. Cord-Connected Tools

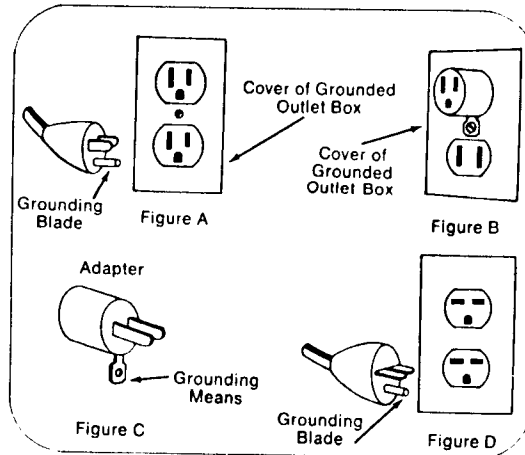
The tool is equipped with an approved three-conductor cord and a three-prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal. If your unit is for use on less than 150 volts it has a plug like that shown in Figure A. If it is for use on 150-250 volts, it has a plug like that shown in Figure D. An

(Not For Use in Canada)

adapter, Figures B and C, is available for connecting Figure "A" plugs to two-prong receptacles. The green-colored rigid ear, lug, etc., extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box. No adapter is available for a plug as shown in Figure D.

**WARNING:** Remove live center from motor when lathe is not in use! See page 6 for removal instructions.

Use of any accessories or attachments other than those supplied by Dremel may be hazardous.




## Extension Cords

Use only three-wire extension cords that have three-prong grounding type plugs and three-prong receptacles that accept the tool plug. Replace or repair damaged or worn cord immediately.

## Replacement Parts

When servicing use only identical replacement parts.

This Product is Listed by  
**UNDERWRITER'S LABORATORIES, INC.**  
 and Bears the Mark: 

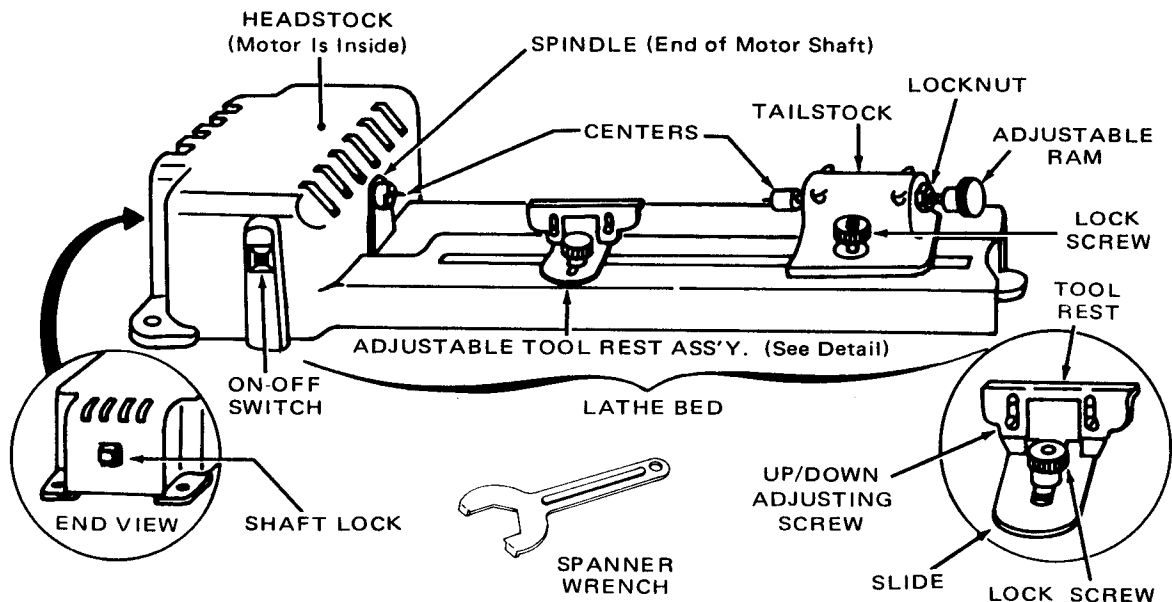
VERY I

The top  
 ating part

There is  
 side, call  
 is the el  
 motor or  
 motor sh  
 of the he  
 a workpie  
 main bod  
 headstock  
 lengthwis  
 bed, and  
 adjustable  
 into this  
 or left. V  
 part is se  
 lock scre  
 this purpo

The tailst  
 is lined  
 and can  
 rotating  
 spindle t

## THIS IS YOUR MOTO-LATHE



VIEW OF LATHE FROM FRONT (WORKING) SIDE

### VERY FEW PARTS TO OPERATE

The top illustration shows *all* of the operating parts you need to know about.

There is a box-like structure at the left side, called the *headstock*, inside of which is the electric motor. A *switch* turns the motor on or off. The right end of the motor shaft is threaded, and projects out of the headstock so it can hold and revolve a workpiece. It is called the *spindle*. All the main body of the lathe to the right of the headstock is called the *lathe bed*. There is a lengthwise slot in the top center of the bed, and two parts (the *tailstock* and the *adjustable tool-rest assembly*) are fitted into this slot so they will slide to the right or left. When positioned as desired each part is secured in place by tightening its *lock screw*. Use your spanner wrench for this purpose.

The tailstock holds an *adjustable ram* that is lined up with the headstock spindle — and can be moved toward the spindle by rotating it clockwise, or away from the spindle by rotating it counterclockwise.

After this ram is positioned as desired it is secured with the *locknut* (using the *wrench* furnished with your tool).

The tool-rest assembly consists of: 1) A *slide*, which can be moved in or out when the lock screw (which also holds it from sliding sideways along the lathe bed) is loosened. 2) A *tool rest*, which can be moved up or down when the two *up/down adjusting screws* are loosened.

Pieces called *centers* are screwed onto the spindle and adjustable-ram ends. Both centers can be removed by screwing them off. However, to remove the center from the spindle the *shaft lock* must be pushed in to keep the spindle from turning while the wrench (above) is used to unscrew the center. The *faceplate* (an accessory) can be put on the spindle in place of the center.

### SETTING-UP YOUR LATHE

Now you know all the important parts; next, we will tell you how to use them.

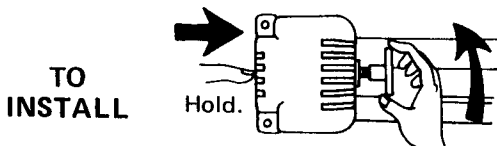
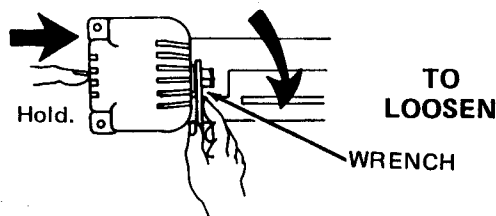
# MOUNTING WORKPIECES

First, however, you should set your lathe up on a table top or large board (a piece of 1/2-in. thick plywood 18-in. or more square, is excellent). Leave enough room in

front of the lathe to comfortably rest your hands (on the table or board). Secure the lathe with three screws or bolts through the holes provided in the three feet.

## HOW TO MOUNT A WORKPIECE FOR TURNING

### HOW TO REMOVE AND INSTALL CENTERS AND FACEPLATE



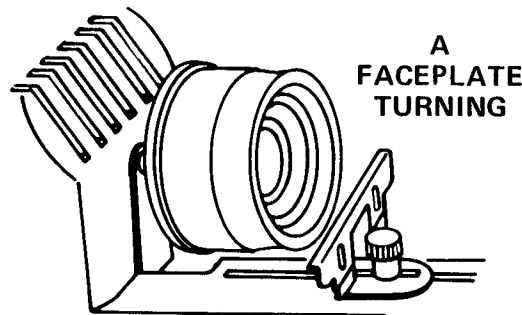
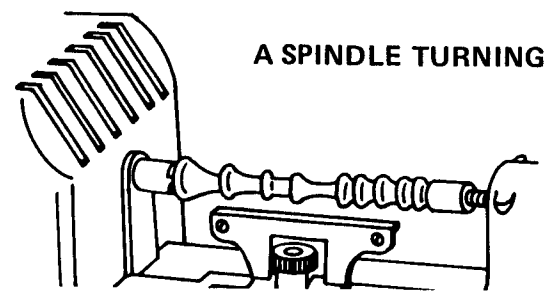
To remove (or install) the center at the left side of the lathe (on the headstock spindle) use the furnished wrench *after* engaging and holding in the shaft lock. This lock has a projection (on its inside end) that fits into a slot in the motor shaft. Hold the lock in and slowly rotate the center *by hand* (never use the motor) until the shaft is engaged and center cannot be rotated — then continue to hold the lock until the center has been removed (or installed).

To install (or remove) the faceplate, engage the lock, as above, and turn the faceplate on (or off) of the spindle by hand.

The lathe center at the right side can be removed or installed by holding the knob at the right end of the ram with one hand and screwing the center off or on with the other hand. If it is too tight to loosen with your fingers, use pliers.

### THE TWO TYPES OF WORKPIECES

Because there is a difference in the ways they are mounted and worked on, there are two types of workpieces: 1) A *spindle*



*turning* — any workpiece that must be supported *at both ends*. 2) A *faceplate turning* — a workpiece that can be supported *only at one (the left) end*. Any workpiece that will fit on the lathe (up to 6-in. long by 1-1/2-in. diameter) can be used as a spindle turning. To be used as a faceplate turning however, a workpiece must have one (the left) end about 1-1/2-in. in diameter, and must not be longer than 1-1/2-in. (preferably, shorter). A spindle turning can be worked only around its sides (like making a candlestick); but a faceplate turning can be worked both around its sides and at the unsupported end (like making a button or bowl).

### SELECTING A WORKPIECE FOR SPINDLE TURNING

For a spindle turning you can start with either a round or a square workpiece.



Manufacturers called *dot* shops and 1/8-in. dia from 1 f and brass similarly has the a work requ round thr If finishe would ha ing (not available cannot fi woods.

For many to start probably the piece lopsided in the lat difficult. rounded about 1/ your larg have squ line larg be (to all

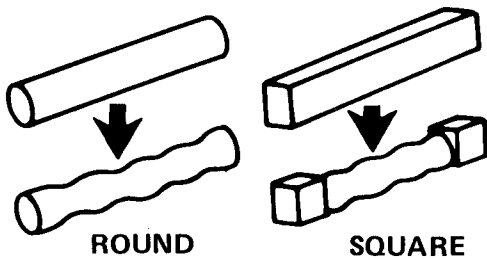
MOUN

Markin



IMP  
squa  
mou  
rotat  
sible.

# MOUNTING WORKPIECES



Manufactured pieces of round wood are called *dowels* and can be found in hobby shops and hardware stores in sizes from 1/8-in. dia. up to 1-in. or more — in lengths from 1 ft. up. Round plastic, aluminum and brass pieces are called *rods*, and are similarly available. Starting with a round has the advantage of reducing the turning work required, if the finished piece will be round throughout. Its disadvantages are: 1) If finished square areas are desired these would have to be sawed square after turning (not too easy to do). 2) Dowels are available only in common woods; you cannot find them in the better furniture woods.

For many projects you will, therefore, have to start with a square, which you will probably have to prepare for yourself. Saw the piece *as nearly square as possible* . . . a lopsided piece might vibrate while rotating in the lathe, and would make turning more difficult. If the finished turning is to be rounded end-to-end, make the square about 1/32-in. bigger than the diameter of your largest round part will be. If it is to have square areas, make the square a hair-line larger than these square sections will be (to allow for sanding, afterwards).

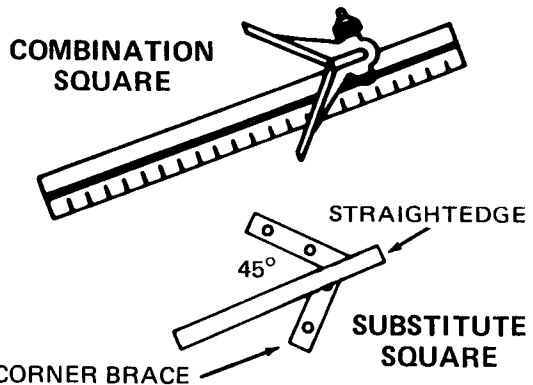
## MOUNTING A SPINDLE TURNING

### Marking the Workpiece Ends

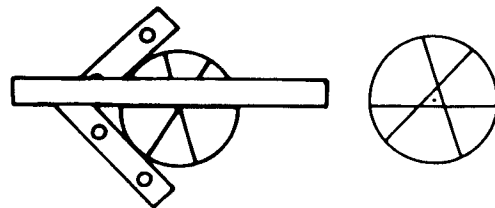


**IMPORTANT:** Whether round or square, the workpiece must be mounted (on the lathe centers) to rotate on its center, as nearly as possible. If it is off-centered, it will vi-

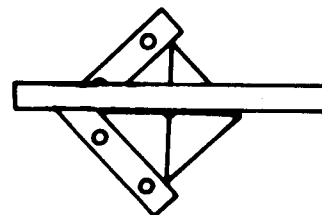
brate (more difficult to work) — and the usable portion of its diameter will be reduced as shown.



Round workpieces 1/4-in. or more in diameter can be marked for centering with a combination square and a very sharp pencil point. If you do not have a combination square (a carpenter's tool), it is easy to make a substitute. Use a corner brace (a hardware item) and a straight-edged metal piece. A brace 1- to 1-1/2-in. long on each side and a straightedge 2- to 3-in. long by 1/4-in. wide will make a tool that is easy to use. The brace should be at least 1/16-in. thick, and the straightedge as thin as practical. Use an epoxy to put the two parts permanently together, as shown. Accuracy is important.



When the combination square (or substitute) is held against a workpiece end, three lines drawn on the end will cross at the center or, as shown, close enough for you to spot the center by eye.

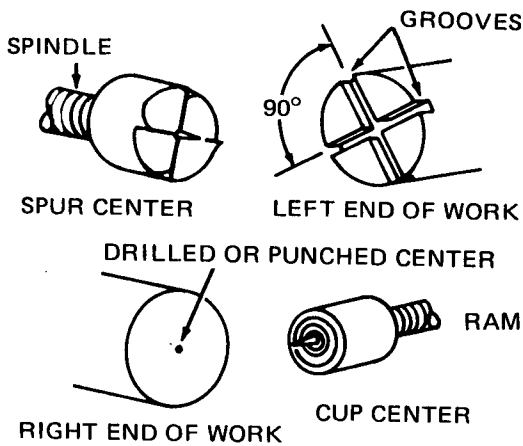


Mark a square by drawing two diagonals.

# MOUNTING WORKPIECES

**IMPORTANT:** Workpieces less than 1/4-in. (in diameter or square) cannot be mounted directly on your lathe centers without danger of splitting at the ends and coming loose while being turned. The method for handling such small workpieces is discussed later (refer to "MOUNTING SMALL SPINDLE TURNINGS").

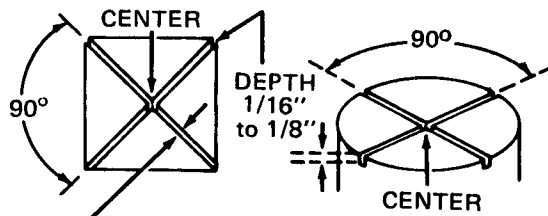
## Preparing the Workpiece Ends



The two centers on your lathe are illustrated. The one at the left side (on the headstock spindle) is a *spur center* ... the "spurs" must grip the workpiece in order to rotate it. The one at the right side (on the tailstock ram) is a *cup center* ... this center does not revolve; the workpiece must be free to spin on it.

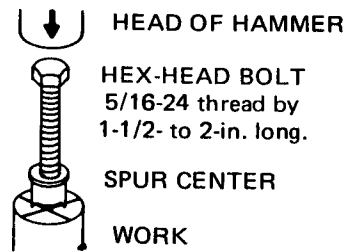
Only a small hole for the point of the cup center is needed at the right end of the workpiece — but the left end must have a hole and two grooves (to fit over the spurs), as shown. The holes can be drilled or, if workpiece is soft enough, punched (with any sharp-pointed tool like an ice pick or large safety pin). Each hole must be *just* large enough to receive the point of the center ... if too wide a hole is made the workpiece might slop around and run off center while rotating. Study your lathe centers and make the holes to fit them, or slightly smaller in diameter.

If the workpiece is soft wood the grooves can be made with a knife; otherwise, saw cuts are needed. Make the two grooves at a



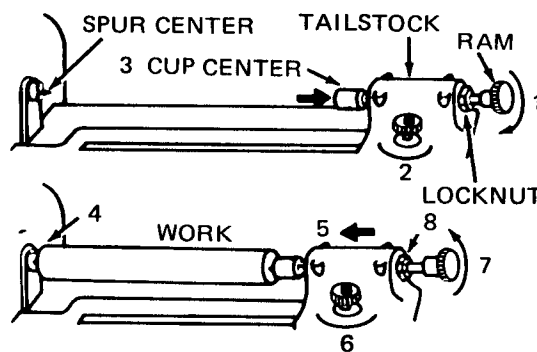
WIDTH — If work is hard must be 1/32".  
Make 2 parallel cuts, if necessary.

right angle to each other, to cross at the center hole. You can use a jig saw (like the *Dremel Moto-Saw*) or a piece of a hacksaw blade. Cut the grooves 1/16- to 1/8-in. deep and, for a plastic or metal workpiece, at least 1/32-in. wide.



If the workpiece is soft enough, an easier way to make the grooves is as shown. This requires a bolt like the one illustrated (from any hardware store). Remove the spur center from the lathe. Screw the center *all the way* onto the bolt end. Support the work and bolt upright with the point of the center in the hole in the workpiece end — then hammer until the spurs are about 1/16-in. into the workpiece. *Never* hammer directly on the center, you might damage its threads. Reinstall the center on the lathe.

## Securing the Workpiece in the Lathe



With the two centers in place on the lathe:  
1) Loosen the locknut and screw the ram

countercl  
2) Looser  
slide the t  
3) Lubric  
grease or  
the workp  
spur cent  
zontal an  
until the  
its hole.  
lock scre  
clockwise  
the two ce  
off — bu  
rotate it e

IMPOI  
the ra  
into a  
doing  
On the  
tighter  
the cu  
the wo  
the ra  
the wo  
motor  
loosen  
motor  
the lc  
right  
are w  
tion t  
plastic  
center

## MOUNT TURNII

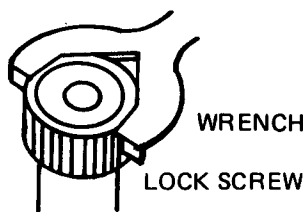
Dr  
hol

Dowel — 1



Ends of v

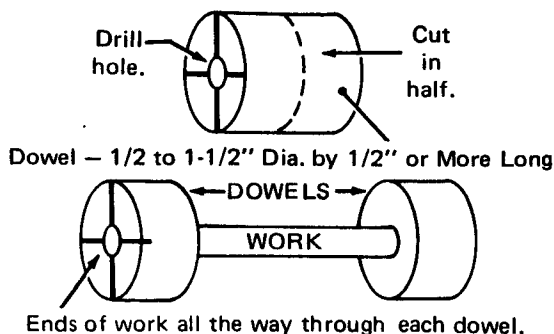
# MOUNTING WORKPIECES



counterclockwise as far as it will go. 2) Loosen the tailstock lock screw and slide the tailstock to the right, if necessary. 3) Lubricate the cup center with vaseline, grease or oil to prevent burning it. 4) Fit the workpiece left end accurately onto the spur center. 5) Hold the workpiece horizontal and slide the tailstock toward it until the cup center point is accurately in its hole. 6) Securely tighten the tailstock lock screw. 7) Carefully turn the ram clockwise until the workpiece is held by the two centers tightly enough not to come off — but not so tightly that you can't rotate it easily by hand.

**IMPORTANT:** Never attempt to use the ram to squeeze the spur center into an ungrooved workpiece end; doing so could damage your lathe. On the other hand, the ram must be tightened enough for the cup part of the cup center to enter slightly into the workpiece end. While tightening the ram turn the motor on to revolve the workpiece, and tighten until the motor slows down noticeably — then loosen the ram just enough for the motor to run freely again, and tighten the locknut (8). If a workpiece right end should loosen while you are working on it, repeat this operation to resecure it. When turning plastic or metal relubricate the cup center whenever it feels hot.

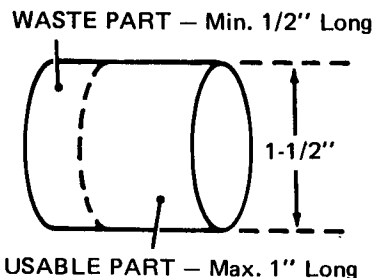
## MOUNTING SMALL SPINDLE TURNINGS



Take a piece of dowel of the size indicated in the illustration and prepare its two ends for mounting in the lathe, as told preceding. Next, drill a hole *exactly* through the dowel center in which your workpiece (round or square) will tightly fit. Cut the dowel approximately in half and glue the two parts onto your workpiece ends. Be sure to push the workpiece ends through the dowel parts so you can remark and drill (or punch) the necessary center holes in them. When the glue has hardened this assembly can be mounted in the lathe. After the turning is finished, the dowel ends are sawed off and discarded.

**NOTE:** Plastic and metal workpieces, which might be difficult to groove, can be mounted at the left (or both) end(s) in this manner.

## SELECTING A WORKPIECE FOR FACEPLATE TURNING

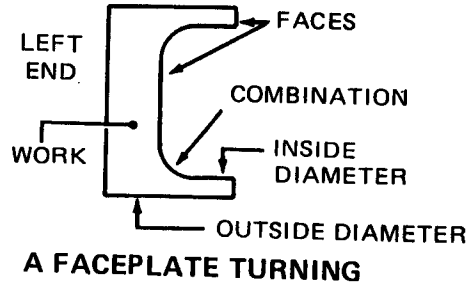
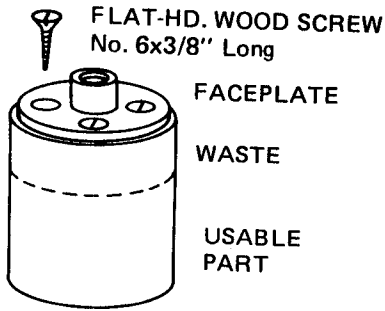


As with a spindle turning you can start with a round or square workpiece ... but, as previously mentioned, a faceplate turning must be about 1-1/2-in. (actually, 1-3/8- to 1-1/2-in.) in diameter at the left end (the 1/2-in. wide portion marked "WASTE" in the illustration). This part of the workpiece cannot be used (do *not* try to shape it); only the "USABLE" part can be shaped, and this can be any diameter desired up to 1-1/2-in. The waste and usable parts together should not exceed 1-1/2-in. length.

## MOUNTING A FACEPLATE TURNING

Place the workpiece on a table, left end up, and place the faceplate on top as nearly centered as possible. Holding these stationary, use a sharp pencil to outline the four holes in the faceplate on the work-

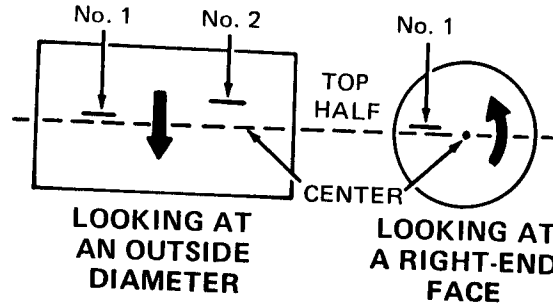
# CHISEL TECHNIQUES



piece end. Mark the centers of these four outlines then drill each with a 3/32-in. drill bit to a depth of 3/8-in. Put the faceplate back in place on the workpiece end and secure the workpiece to it with four wood screws (a hardware item), as shown. Mount the faceplate, with workpiece attached, on the headstock spindle. Move the tailstock all the way to the right and lock it (it won't be used).

surface parallel to it (like the innerside of a bowl) passes continually downward in front of you like a window shade being lowered. 2) The *face* (any surface parallel to the workpiece ends) revolves like a pin-wheel — and one half moves down while the other half moves up. As shown, some areas combine both movements.

**NOTE:** Only wood workpieces can be mounted as told. Plastic and metal workpieces must be mounted with No. 6 x 32 machine screws, and the holes must be drilled and tapped for these screws.

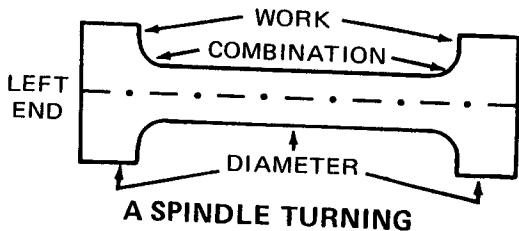


## USING THE TOOL REST AND CHISELS

**IMPORTANT:** Wood chisels of all types can be used for turning any solid wood or clear plastic. Do *not* use chisels to turn metal, plywood or other manufactured wood-type products.

Two different approaches of the chisel cutting edge to the workpiece are required. The two "Looking At" illustrations show where the cutting edge of a chisel must contact the work when turning "An Outside Diameter" and when turning "A Right-End Face". For diameter turning there are also two different heights at which the chisel edge must contact the workpiece. "No. 1" is the position for what we call a *scraping action*; "No. 2", for a *cutting action*. Note that the point of contact in all cases is *above* the center, in the *top half*. Never attempt to contact the workpiece in the bottom half . . . the chisel might split the workpiece. Note, also, that when turning a face the chisel must contact the workpiece in No. 1 position and at the *downward moving* side of center (which, for a right end, is at the left).

## TWO APPROACHES TO THE WORKPIECE



When revolving in the lathe the workpiece surfaces, against which you hold your chisel to shape the piece, move in two different ways. 1) The *diameter* (and any

## SCRAPING AND CUTTING

A *scraping action* is done with the chisel blade held *parallel to the lathe bed* so the edge digs straight into the workpiece sur-

CHISEL  
TOOL REST

VIEW

CENT

FROM

VIEW

face. Use any sliver fine saw is slow to All faces, approach practical. small (un meters, b more for to bend workpiece slower ar much easi

CHISEL

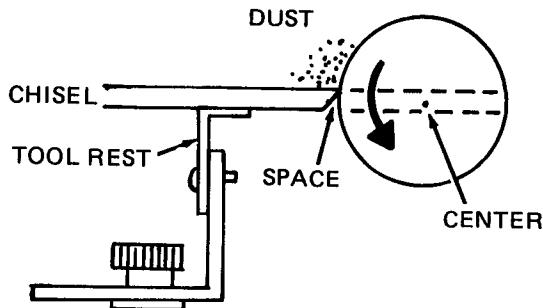
TOOL REST

VIEW

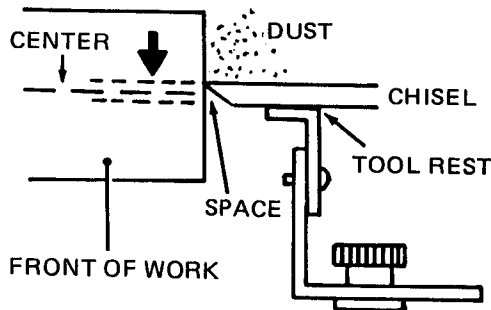
A cutting



# CHISEL TECHNIQUES

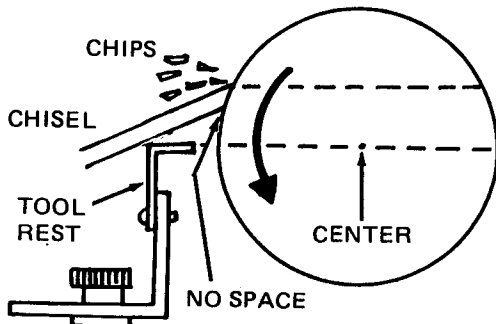


VIEW FROM RIGHT END WHEN DIAMETER SCRAPING



VIEW FROM IN FRONT WHEN FACE SCRAPING

face. Used this way the chisel doesn't peel any slivers from the workpiece — only a fine sawdust is removed, and the "action" is slow but precise and easily controlled. All faces, inside diameters and combination approaches must be scraped; cutting is *not* practical. Also, it is best to scrape most small (under 3/4-in. diameter) outside diameters, because a cutting action requires more force and, therefore, more tendency to bend and/or split a small diameter workpiece. In any event, scraping, though slower and quicker to dull the chisel, is much easier to do.



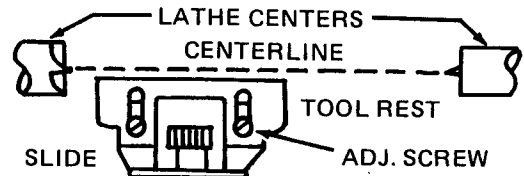
VIEW FROM RIGHT END WHEN DIAMETER CUTTING

A *cutting action* is done with the chisel

blade *tilted up* so the edge cuts into the downward moving workpiece surface to peel off chips (rather than dust). Workpieces of 3/4-in. or more diameter can be reduced in diameter more quickly by cutting; so, also, can square workpieces be more quickly and easily rounded. Cutting, however, leaves a rougher surface, and should be followed by scraping to produce a smooth finish.

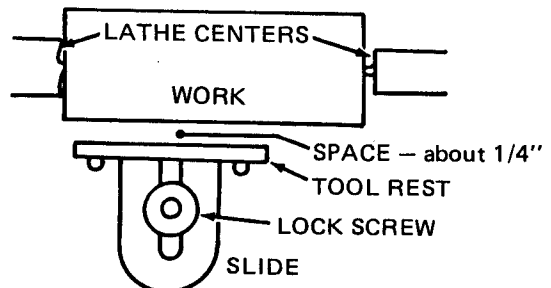
Approximately correct tool-rest height adjustments for scraping and cutting are shown in the illustration. However, the angle at which you hold the chisel makes the actual difference between the two ways in which it will remove material (dust or chips) from the workpiece.

## Positioning the Tool Rest for Turning a Diameter



VIEW STRAIGHT IN FROM IN FRONT

Use the two up/down adjusting screws to adjust and lock the tool rest at the proper height on its slide. The top of the rest should be parallel to the centerline (between the two lathe centers) — and either at the same height as the centerline or just below it, as already told. This adjustment can be made before or after the workpiece is in place.

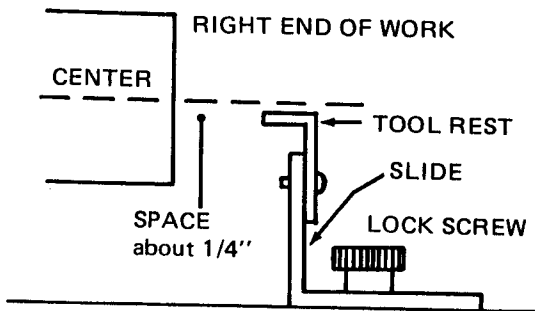


VIEW STRAIGHT DOWN FROM ON TOP

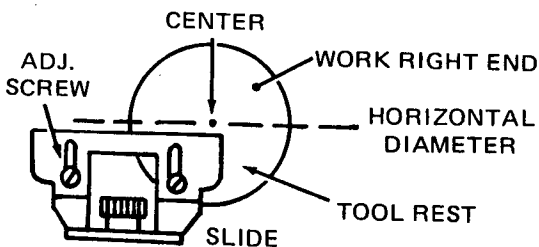
After the workpiece is in place, use the lock screw to adjust and lock the tool-rest slide. Position the slide so the tool rest is parallel to the workpiece about 1/4-in. dis-

tant. Also, if workpiece is longer than the tool rest, position it at the left end of the workpiece for starting the work; it can be moved to the right as necessary to finish working the right side of the workpiece.

## Positioning the Tool Rest for Facing a Right End



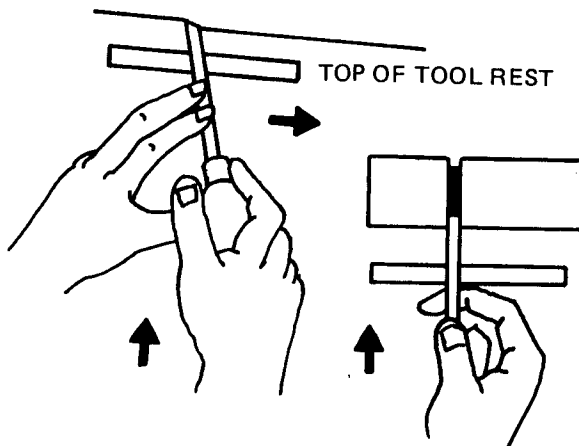
VIEW STRAIGHT IN FROM IN FRONT



VIEW STRAIGHT IN LOOKING AT RIGHT END

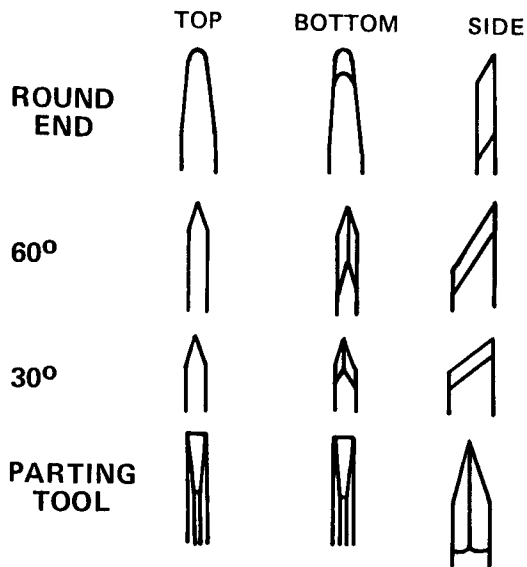
Rotate the slide 90 degrees so the tool rest is parallel to the end of the workpiece and about 1/4-in. distant, and tighten the lock screw. Adjust the tool rest to the required height and parallel to the horizontal diameter of the face.

## HOLDING A CHISEL



For delicate work *two* hands are needed. One hand — whichever you prefer — must rest on the table top and hold the tool handle near the end between the thumb (on top) and the first two fingers, in a manner that allows you to move the chisel cutting edge toward or away from the workpiece with precise and delicate control. One or two fingers of the other hand are needed to hold the chisel blade down on the tool rest and to help guide its sideways movement. The purpose is to begin a cut by feeding the chisel edge *slowly* into the workpiece until it is cutting as deeply as desired — then to control this depth-of-cut while moving the cutting edge to right or left, or as required. You *cannot* do this accurately with just one hand. One hand can be used, however, when rounding a square, making a long cut, using the parting tool, etc., as explained later. In this case the thumb holds the blade down while the forefinger, against the tool rest, holds the depth-of-cut.

## THE FOUR ACCESSORY CHISELS



The four chisels available as accessories for your lathe are illustrated. These are all you will actually need for your work. However, other-shaped chisels — for easier cutting of special shapes — are available in most hobby shops.

## KEEP YOUR CHISELS SHARP

See Page 14.

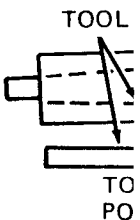
S

ROUND



Use the (in one farther (so the the wor workpie in at a that a c made. F rest to depth-o slowly t the way or the Make su the wor tool res short, a relocate whole p rounded

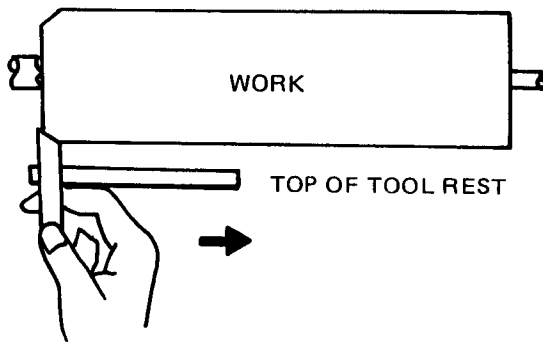
TAPER SQUA



TOOL TO PO This is cept th to the the wo when tl

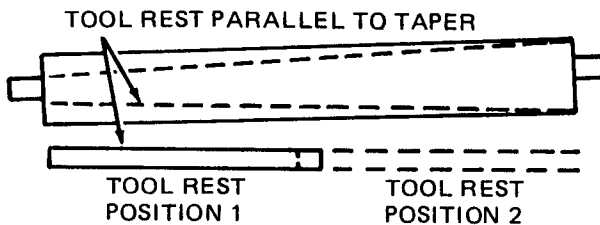
## STANDARD LATHE-TURNING OPERATIONS

### ROUNDING A SQUARE



Use the 30° or 60° chisel, held as shown (in one hand) with the handle end slightly farther to the right than the cutting edge (so the right side only of the edge contacts the workpiece). Start at the left end of the workpiece and push the chisel edge *gently in at a cutting approach* until you can see that a cut of about 1/16-in. depth is being made. Push your forefinger against the tool rest to hold the chisel edge *exactly* at this depth-of-cut ... then slide your hand *slowly* to the right to complete the cut all the way to the right end (of the workpiece, or the tool rest if workpiece is longer). Make successive cuts in this manner until the workpiece (or the portion behind the tool rest) is rounded. If tool rest is too short, after completing the first portion relocate it to the right and repeat the whole process until the entire workpiece is rounded.

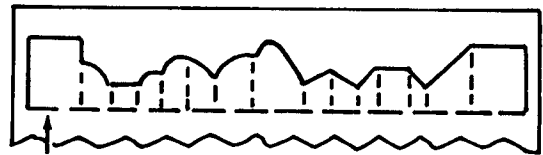
### TAPERING A ROUND OR SQUARE



This is done exactly as the preceding, except that the tool rest is positioned parallel to the desired taper instead of parallel to the workpiece side. There is no problem when the tool rest is as long as the tapered

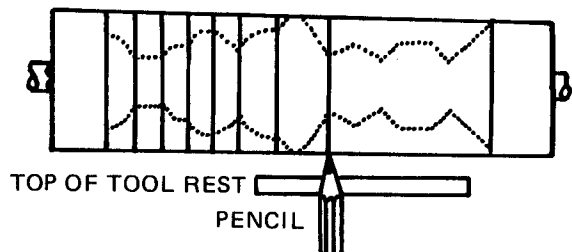
portion is to be; however, if it is shorter it must be relocated (to the right) carefully, as shown — and the final cut made in this new position must penetrate the workpiece to a depth that will keep the whole taper straight.

### MARKING A WORKPIECE FOR INTRICATE SHAPING



Fold on centerline and trace to make a full pattern.

First, make a paper pattern to exactly represent your workpiece as you want it to look when finished. Draw the vertical lines wherever the contour changes direction (up or down). If you are starting with a square and your pattern calls for leaving the ends (or any other part) square, draw pencil lines on at least two sides of the workpiece to mark off these square portions. Mount the workpiece in the lathe and round-off all except these square portions — being guided by the pencil lines which will be quite visible. If the square portions are to have straight shoulders (as illustrated) refer to “CUTTING SHOULDERS”, following.

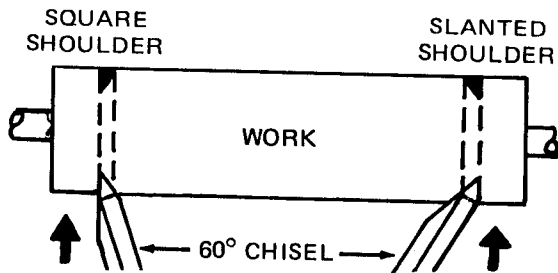


After reducing the rounded-off portion(s) to the *largest* diameter you will need, transfer the rest of the pattern vertical lines accurately to the workpiece by holding a pencil point lightly against the revolving workpiece, as shown. Save your pattern, and remark the workpiece whenever necessary.

# STANDARD OPERATIONS

## CUTTING SHOULDERS

A shoulder is the side that separates a larger diameter (round or square) portion from a smaller diameter (round) one. If it goes straight in it is a "square" shoulder . . . but it can slant in or out or be curved. All shoulders are first cut, square or slanted, with the 60° chisel — can be rounded later, if desired.

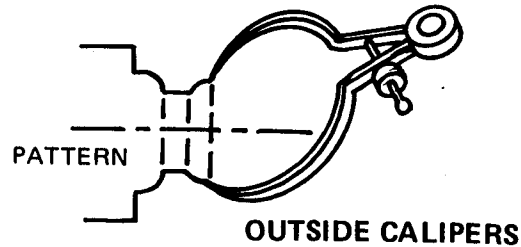


Hold the chisel for a *cutting approach*, preferably in two hands, and twisted slightly so that the sharp edge will peel chips off of the side of the shoulder as the tool digs in. For a square shoulder the chisel handle is held slightly to the right of the cutting edge, as shown; for a slanted shoulder, move the handle to the left to obtain the desired slant (or, you can move it far to the right if an undercut slant is wanted). If shoulder is to be more than 1/8-in. deep, stop at the 1/8-in. depth and reduce the diameter of the smaller portion adjacent to the shoulder (refer to "REDUCING DIAMETERS", following) — then continue to go deeper. Trying to cut deeper with wood at both sides of the chisel point may result in burning the chisel edge.

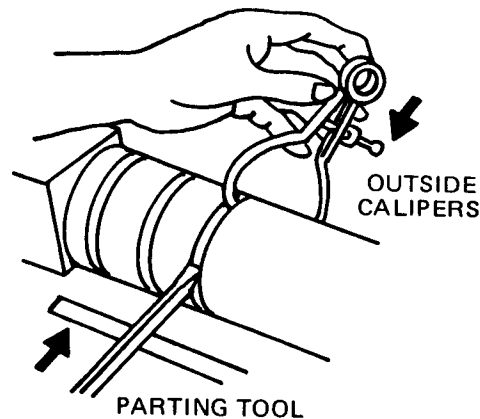
**NOTE:** Illustrations show shoulders on right side of higher portion; reverse tool position for a left-side shoulder.

## MAKING SIZING CUTS

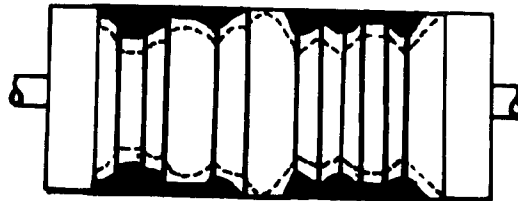
Sizing cuts are made with the parting tool (held for a *scraping approach*) and are used to groove the rounded portion of the workpiece on each of the pencil-marked contour lines. Each groove is made — either at once or eventually — to within a hairline of the depth the finished surface will be at this



contour line . . . so that during the following shaping work you will have a permanent guide as to how deep each cut is to be made. To do the job right a pair of *outside calipers* is needed.



For each sizing cut first set the calipers to just a hairline more than the finished diameter, as measured on your pattern. To make the cut, hold the calipers in one hand, as shown, and the parting tool in the other hand. Push the parting tool point straight into the workpiece (to cut a slot) until the calipers *just* slip across the workpiece in the slot — to prove that the depth of the slot has reduced the workpiece diameter as desired at this point. However, as previously cautioned, do *not* go deeper than 1/8-in. without "REDUCING DIAMETERS", as told following. Do *not* make any sizing cuts where the diameter is already as small as it should be.



When all sizing cuts (and reduced diameters, where necessary) are completed, your workpiece should look like this.

REDUCING



When necessary, some calipers are needed for the workpiece. For the workpiece of the a 30° or be used the chisel scraping workpiece desired. edge, for second row to use the grooves between

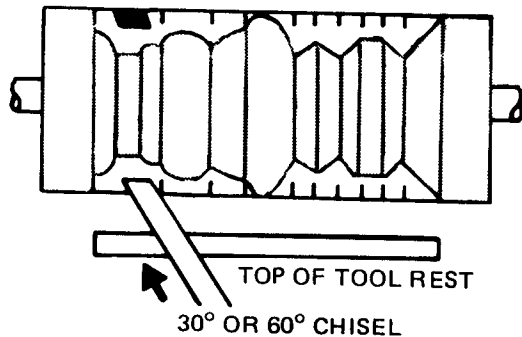
CUTTING

SCRAPING NARROW SHALL

CL

Vs are narrow

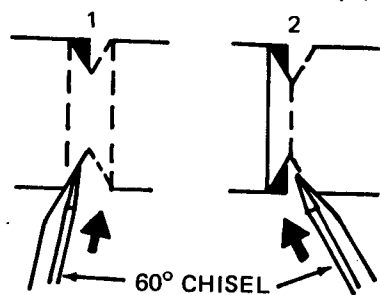
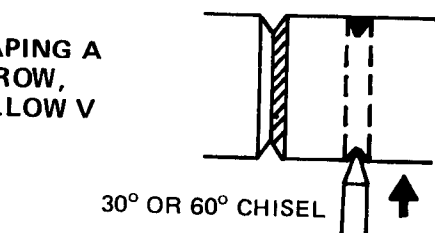
## REDUCING DIAMETERS



When making shoulders, sizing cuts and (in some cases) fancy cuts like Vs and beads, it is necessary to reduce the diameter of the workpiece at one or both sides of the cut — for the reason already given. If the width of the area to be reduced isn't too great use a 30° or 60° chisel (or, the round-end can be used if it fits the contour better). Hold the chisel, preferably in two hands, for a *scraping approach*, and cut slowly into the workpiece until the diameter is reduced as desired. If the area is wider than the chisel edge, finish the first cut then make a second (or more) alongside. If it is narrower than the edges of the above chisels, use the parting tool to make side-by-side grooves, then to clear out the ridge in between.

## CUTTING Vs

### SCRAPING A NARROW, SHALLOW V

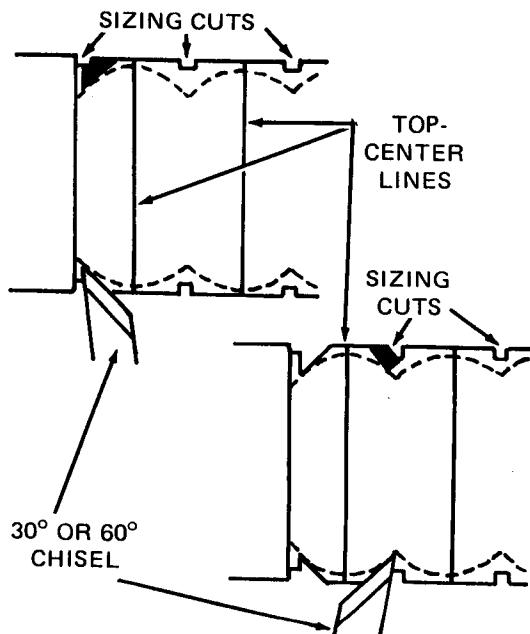


### CUTTING A DEEP OR WIDE V

Vs are cut with the 30° or 60° chisel. If narrow and shallow enough, hold the chisel

for a *scraping approach* and simply dig it straight in until the V is finished. Cut a wide or deep V like a shoulder, making: 1) A rightside slanted cut, then 2) A left-side slanted cut. Cut in at each side to the maximum 1/8-in. already explained, clean out the middle, then finish with two more cuts that will meet at the V bottom (or, if remaining portion isn't too wide, you can make one straight-in scraping cut to clean out the center and simultaneously finish the V).

## CUTTING BEADS

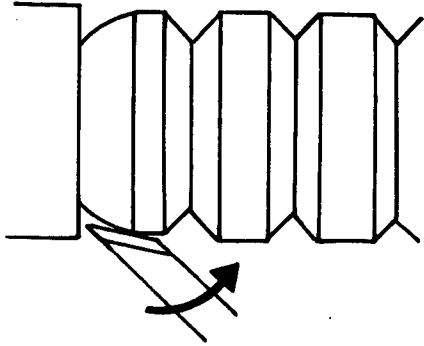


### STARTING TO SHAPE FIRST BEAD

Begin by making sizing cuts where the deepest parts of the beads will be. Also, make pencil lines to mark the top center of each bead. Start shaping each bead with the 30° or 60° chisel held for a *scraping approach*. Hold the chisel handle slightly to the right of the edge when shaping the bead left side; reverse this when shaping the right side. Slide the chisel point into the sizing-cut groove and advance the edge until it just touches the side of the proposed bead — then rotate the chisel handle as necessary while advancing the point into the deepest part at the side of the bead.

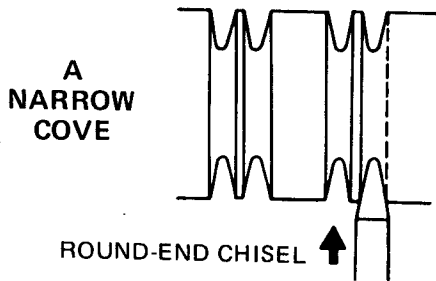
Finish each side of each bead by rotating the chisel handle (to the right for bead left

# STANDARD OPERATIONS

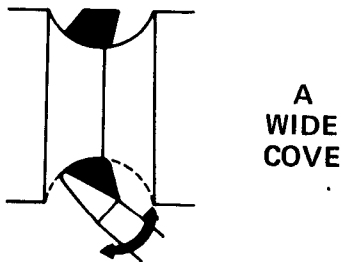


side; to the left for bead right side) while sliding the chisel on the tool rest to follow the desired bead curvature.

## CUTTING COVES

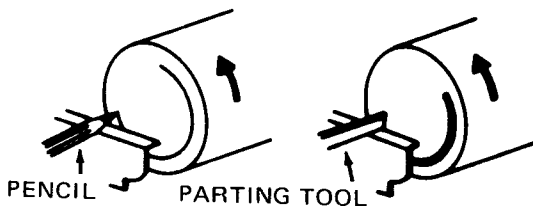


Use the round-end chisel held for a *scraping approach*. Coves the size and shape of the chisel edge are made simply by pushing the chisel straight in to the required depth.



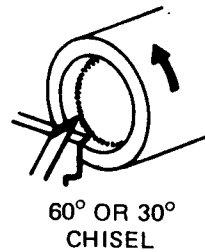
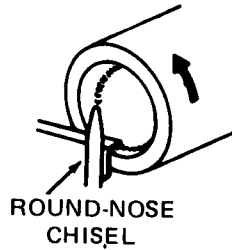
For a wider cove, after pushing the chisel in to the depth at the cove center, swing it left then right to round the cove sides.

## FACING



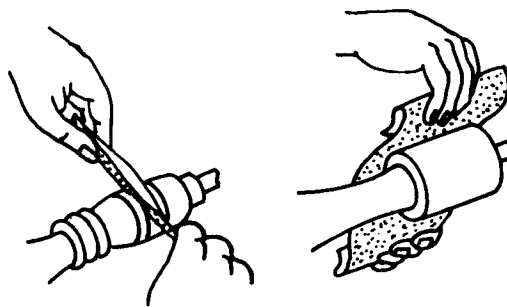
All chisels must be held for a *scraping approach*. The face can be pencil marked and

sized (with the parting tool) like a diameter, preceding.



A round-end, 30° or 60° chisel is used for hollowing, depending upon the shape of cavity desired. Inner side smoothing is best done with the 60° chisel, on its side, as shown. Vs, beads and coves can be scraped as when diameter turning.

## FINISHING WORKPIECES



Your chisels, held for a *scraping approach*, should be used to finish all surfaces insofar as possible. Final finishing is then done with sandpaper — a 3/0 grit for softwoods and a 4/0 grit for hardwoods. Two typical ways of applying the sandpaper are shown. For polishing clear plastic a lintless cloth and rouge powder must be used.

## USING FILES FOR TURNING

Soft (non-ferrous) metals, such as aluminum, brass, copper, etc., can be spindle turned by using files to do the cutting. Copper and aluminum will load a file very quickly so it will not cut any longer. Special files and rasps are made for these metals. Your regular file may be used on some alloys if it is waxed or lubricated. In addition, very small wood spindles can often be more intricately shaped with files than with chisels. A variety of small ("needle") files, in coarse-, medium- and fine-cut, is available. Choose shapes and sizes that will accomplish your purposes.

TRI

FLAT

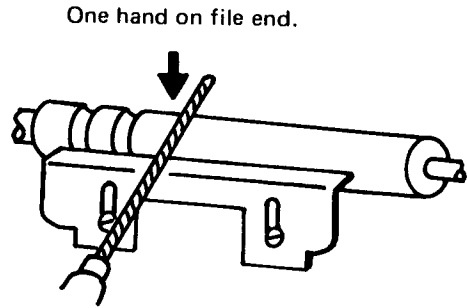
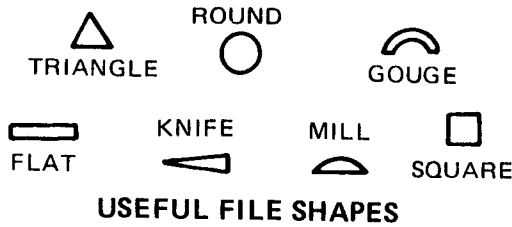
Adjust the workpiece handle, hands end ap



ROU END

A qu ho abl sid edj me the as sto sto str en

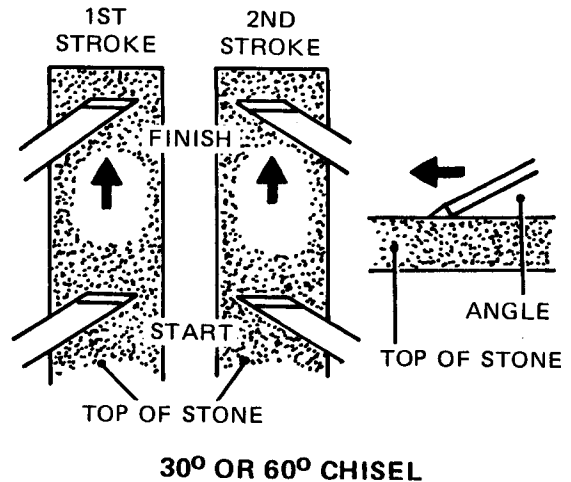
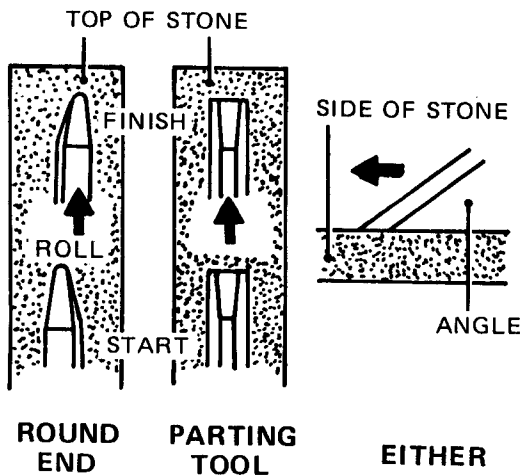
# STANDARD OPERATIONS



Adjust the tool rest so the file will contact the workpiece as close to its top as possible. Use two hands, one to hold the file handle, the other to hold the file end. Both hands guide the file and the one at the file end applies downward pressure. Use *only*

*enough* downward pressure to keep the file cutting. File should be slid across work to allow it to clear itself of chips.

## KEEP YOUR CHISELS SHARP



A dull chisel does difficult and poor-quality work. Keep your chisels honed sharp. Use an oilstone, preferably one with medium grit on one side and fine grit on the other. If an edge is slightly nicked start on the medium side — but always finish on the fine side. Always stroke the chisel — with the bevel *flat* on the stone — as if peeling a thin slice from the stone; do *not* pull it back on the stone, lift it to return for another stroke. When sharpening the round end roll it so the entire edge will con-

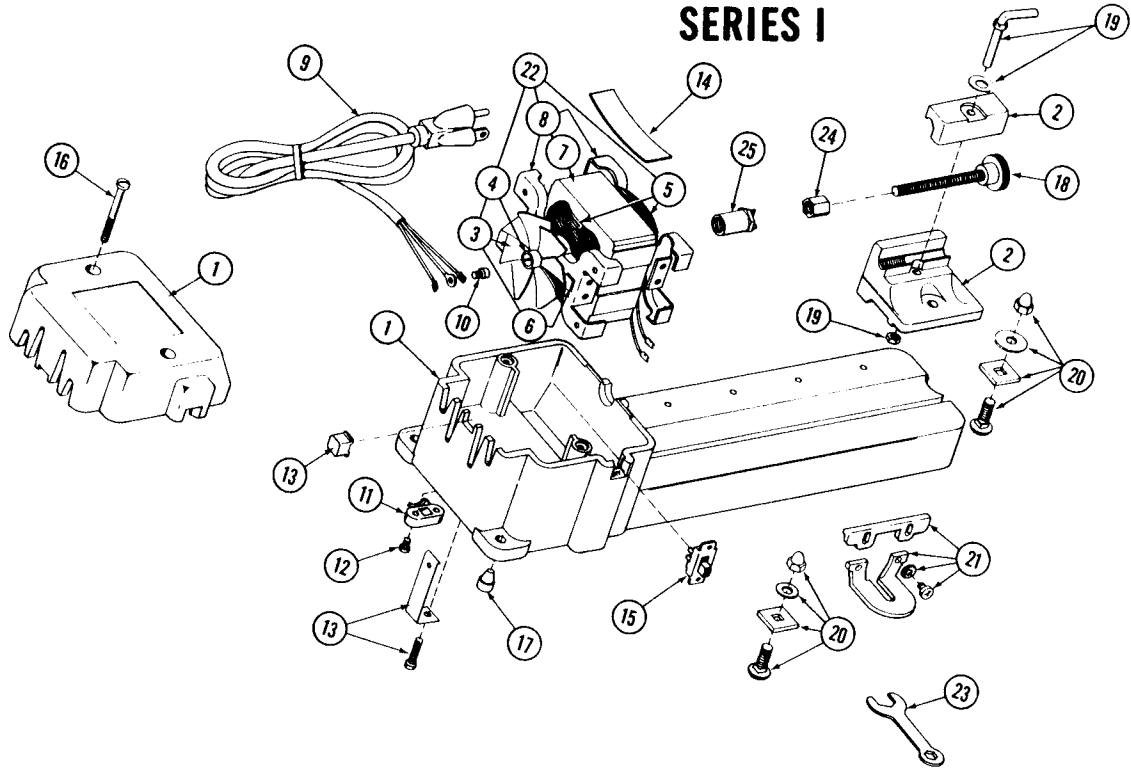
tact the stone during each stroke. In all cases, continue stroking, lessening your pressure with each stroke, until the edge is fine and sharp.

*Never* grind the edge of a woodworking tool on an electric grinder. This would remove the temper from the steel and ruin the tool. After many sharpenings, a grinder may be used to remove some excess material back away from the cutting edge. The cutting edge must be sharpened only with a honing stone.

# PARTS & ACCESSORIES

## PARTS LIST

### DREMEL® MOTO-LATHE MODEL 700 SERIES I



Code No.	Part No.	Description
1	990909	Lathe Bed & Cover
2	990910	Tailstock Base & Cap
3	403021	Fan
4	990662	Shaft & Rotor
5	990902	Rotor Shim & Spacer Set
6	990903	Field Bolt & Spacer Set & Nuts, Lock Washer
7	990661	Field
8	990663	Bearing Bracket Assembly each
9	260011	Cord Assembly
10	828038	Ground Screw
11	260009	Cord Clamp
12	990904	Cord Clamp Screws (2)
13	990911	Shaft Lock & Spring

Code No.	Part No.	Description
14	260017	Retainer Spring
15	660046	Switch
16	990912	Motor Cover Screws (2)
17	990859	Foot (4)
18	990667	Tailstock Screw Assembly
19	990913	Tailstock Lock
20	990914	Nut & Screw Assembly
21	990669	Tool Rest Assembly
22	990665	Motor Complete Incl. 3, 4, 5, 6, 7 & 8 (Less Cord)
23	260079	Wrench
24	260013	Tailstock Center
25	260016	Drive Center

SEE DREMEL CATALOG FOR ACCESSORIES.

#### DREMEL LIMITED WARRANTY

Your Dremel Moto-Lathe is warranted against defective material or workmanship for a period of one full year from date of purchase. But if for some reason trouble should develop, please do the following.

- (1) Return Tool prepaid direct to Dremel Service Center, P.O. Box 954, Racine, Wisconsin 53406.
- (2) Enclose a note telling us exactly what the problem is.

If our inspection shows that the trouble was caused by defective parts or workmanship, we will make all

repairs free of charge and return prepaid to you. Repairs made necessary by normal wear abuse, or out of warranty will be charged for at our regular low factory prices. We will try to return your repaired Moto-Lathe to you within 72 hours after we receive it at the Dremel factory.

For prices and warranty fulfillment outside the continental United States, contact your local Dremel distributor.