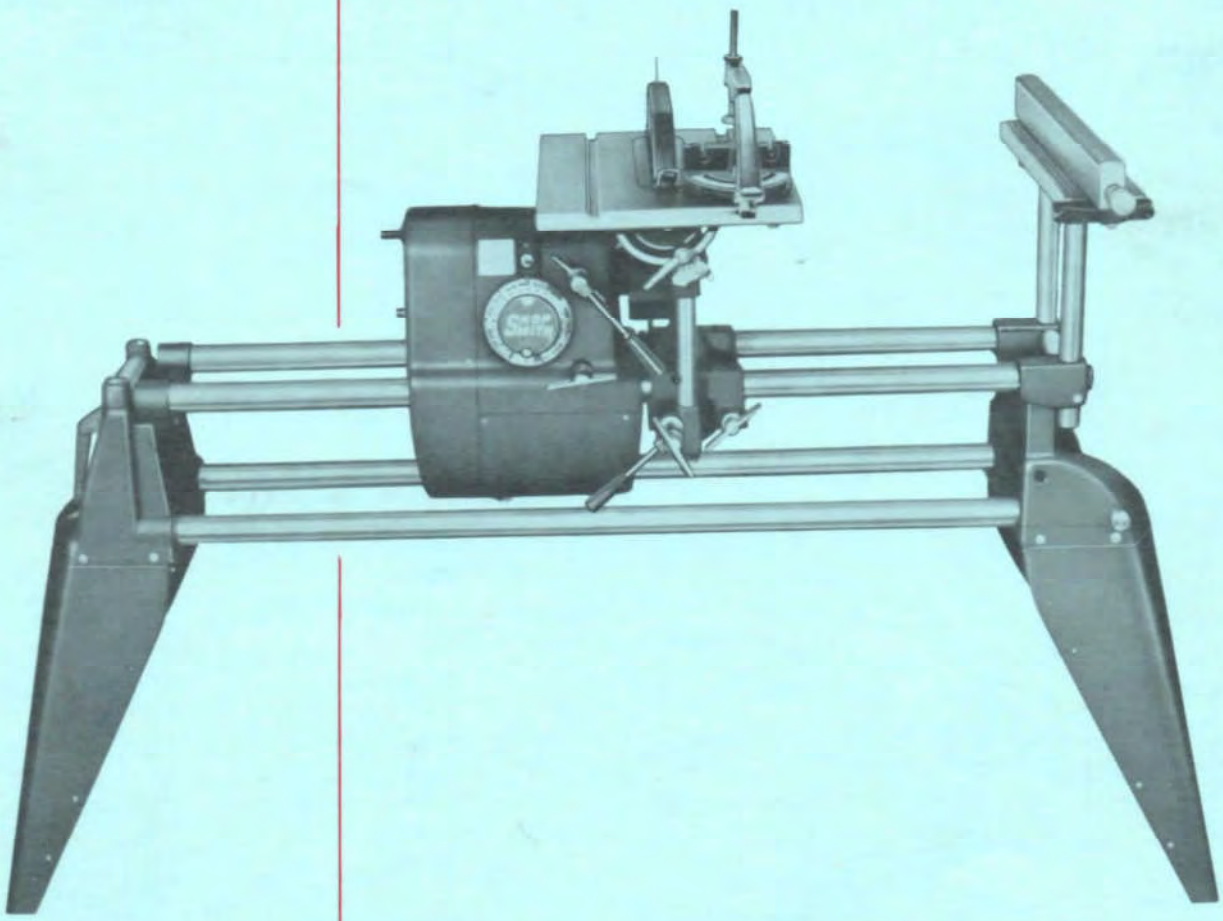
Shopsmith Mark V

Owner's Manual

price $1.50



Shopsmith Inc.
750 Center Drive, Vandalia, Ohio 45377

WE KNOW YOU ARE ANXIOUS TO USE YOUR NEW SHOPSMITH MARK V — BUT . . .

The revolutionary features incorporated in the SHOPSMITH MARK V are so unlike ordinary tools that you must learn to use them correctly for maximum utility, safety and satisfaction. Before you even turn on the switch, read at least this page and make the accuracy checks on Pages 5 and 6. At your very first opportunity, study this entire manual. It will make you a better, happier and safer craftsman.

1. Always turn the SPEED-DIAL to "slow" before changing from one operation to another. Never turn the SPEED-DIAL unless the spindle is turning under power.
2. The auxiliary spindle (Power-Mount) of the SHOPSMITH MARK V rotates in a direction opposite to the standard rotation of the main spindle. Never mount attachments on the Auxiliary Spindle unless they are designed to operate safely and hold securely in reverse rotation. Never use any flexible shaft on the Auxiliary Spindle. Never use any arbor except the special SHOPSMITH ½" (505505) and ⅝" (505506) arbors on the Auxiliary Spindle. Ordinary arbors may be safely used on the regular (main) spindle but NEVER on the Auxiliary Spindle.
3. When operating one tool on the POWER-MOUNT and another on the main spindle, never exceed the maximum safe speed for the slowest tool.
4. For the novice, we suggest the SHOPSMITH SELF-STUDY WOODWORKING COURSE (505717). Each of the 73 easy-to-follow illustrated assignments reduce even the most complicated operations to simple step-by-step procedures. It is used in conjunction with the book POWER TOOL WOODWORKING FOR EVERYONE (505507). This book has been written especially for the SHOPSMITH MARK V and is extremely comprehensive on specialized SHOPSMITH techniques and general woodworking.

PLUG-IN INSTALLATION

Your new SHOPSMITH MARK V should have been delivered with complete set-up instructions taped to the outside of the shipping carton. If, for some reason, these instructions are missing, they are repeated below. It can be quickly set up with a screw driver and crescent wrench or pair of pliers.

After removing the two bench ends and attachment box (where this manual was packed), unbolt the headrest and base castings from the bottom of the shipping carton. Then support the SHOPSMITH MARK V across two kitchen chairs, saw horse or anything that will hold it about two feet off the floor. The top end of the interchangeable bench ends are joggled to fit snugly inside the base castings. Insert the five ¼" x ⅝" screws through the mating holes in the castings and bench end. Thread the lock washers and nuts on each of the screws and finger-tighten. Then, holding the nut with a wrench or pliers and turning the head with a screw driver, lock the screws in place.

Note the pre-punched holes in each bench end. The bottom holes (two on each flange) are for mounting retractable casters (505592), an extremely useful accessory which makes your SHOPSMITH MARK V a mobile unit easily "castered" anywhere in or outside the home or shop. The upper holes (two on each flange) are there if you want to add a wood shelf to the unit.

Before starting the motor, check your line fuses. Because a powerful motor draws an initial starting load much greater than required during continuous running, it is necessary to equip the circuit supplying current to the machine with a **delayed-action fuse.** This is sometimes called a motor fuse and is available at any hardware or electrical store.

It is always preferable to be connected to an independent line without extension cords. If it is necessary to use an extension cord, it must be heavy enough to provide proper current. For up to 20 feet, use no less than 16 gauge and for longer distances, use 12 gauge.

All electrical appliances should be grounded when in use. Complete grounding instructions are provided on page 3 along with safety instructions. PLEASE READ THESE THOROUGHLY BEFORE USING YOUR SHOPSMITH MARK V.

Because of weight and design, it is not normally necessary to have the unit secured to the floor. If it is desired, this can be done by clamping the rolled edge under the four corners of the bench ends with toeclamps.

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SPEED-DIAL

SHOPSMITH MARK V SPEED-DIAL (above) makes speed selection as easy as dialing a phone. Settings for most common operations are engraved on the dial. For more detailed operational speed information, refer to the speed chart (page 21).

Turning the dial **clockwise** (with motor on), increases speed; turning **counter-clockwise** decreases speed. NEVER ATTEMPT TO CHANGE SPEEDS WHEN THE MOTOR IS TURNED OFF. MAKE IT A HABIT TO TURN SPEED-DIAL TO "SLOW" BEFORE SHUTTING OFF MOTOR FOR POSITION OR ACCESSORY CHANGE.

SHOPSMITH SAFETY RULES

The SHOPSMITH MARK V has the highest safety standards ever built into a home power tool; however, it is still a machine and it cannot think for you. Please review all these safety rules periodically and remember to follow them at all times. Take care to have an enjoyable **and** safe shop.

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 your SHOPSMITH MARK V in damp or wet locations. Keep work area well lit.
5. Make your workshop children proof with padlocks, master switches, etc.
6. Keep children away. All visitors should be kept a safe distance from the work area.
7. Never force the tool or rush a job. Correct tool speed is important and rushing the job is poor craftsmanship. It will do the job better and safer at the rate for which it was designed.
8. Use the right tool. Don't force the tool or attachment to do a job it was not designed for.
9. Wear the proper apparel. Do not wear loose clothing. Take off your tie and keep sleeves above the elbow and remove jewelry and anything else that could get caught in moving parts. Rubber-soled footwear is recommended for best footing.
10. Use safety glasses. Also use a face or dust mask if the cutting operation is dusty.
11. Secure work. Use clamps or a vise to hold your work when practical. It is safer than using your hands and it frees both hands to operate the tool.
12. Don't overreach. Keep proper footing and balance at all times.
13. Maintain tools with care. Keep all cutting tools sharp and clean for best and safest performance. Follow the instructions for periodic lubrication and how to change accessories.
14. Disconnect your SHOPSMITH MARK V before servicing and when changing accessories such as blades, bits, cutters, etc.
15. Avoid unintentional starting. Make sure the switch is in the "off" position before plugging in.
16. Use recommended accessories as described in the owner's manual or accessory catalog. The use of improper accessories may cause hazards.
17. Never stand on the SHOPSMITH MARK V. Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.
18. Check damaged parts. Before further use, a guard or other part that is damaged should be carefully checked to ensure 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.
19. Direction of feed. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
20. Do not stand in line with any cutting or abrading tool.
21. Use a push stick or hold down whenever practical.
22. Secure all machine locks before turning on the machine and particularly when going to the vertical position for drill press operation.
23. Never reach over the machine for a tool.
24. Do not try to adjust any energized power tool.
25. Never remove a cutoff from the saw while the blade is in motion.
26. When sawing, keep the blade projection just high enough to do the job — avoid the extreme.
27. Never use the rip fence as a stop for cutting off duplicate pieces.
28. When ripping, feed with the thumb; keep fingers hooked over the fence.
29. The attachments that are furnished with the SHOPSMITH MARK V and the accessories described in this manual and the SHOPSMITH Accessory Catalog are specifically designed for safe use on the SHOPSMITH MARK V. Although many other standard accessories are usable, care must be taken that they are of high quality and usable on the SHOPSMITH MARK V only in the proper and intended manner. Other accessories and attachments may be hazardous.
30. Never operate your SHOPSMITH MARK V in excess of the maximum recommended speed for the operation you are doing or the slowest attachment being used.
31. Never cut freehand on the table saw. When cross-cutting, use the miter gauge — when ripping, use the rip fence.
32. Be sure that the table inserts are flush with the top of the table. All inserts are made concave so, when inserting, tighten the front screw first and then tighten the rear screw until the insert is flush.
33. Prevent unauthorized use of your SHOPSMITH MARK V. Holes have been provided in the guard wings on either side of the on-off switch for the use of a standard padlock. When in place, the power cannot be switched on.

GROUNDING INSTRUCTIONS

The SHOPSMITH MARK V should be grounded while in use to protect the operator from electric shock.

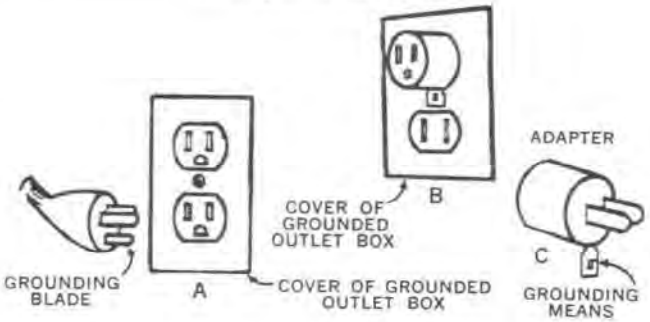
The SHOPSMITH MARK V is equipped with an approved three-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green conductor in the cord is the grounding wire. Never connect the green wire to a live terminal.

An adapter, sketches B and C, is available for connecting plugs as shown in sketch A to 2-prong receptacles. The green colored rigid ear lug, etc., extending from the adapter must be connected to a permanent ground such as to a properly grounded outlet box.

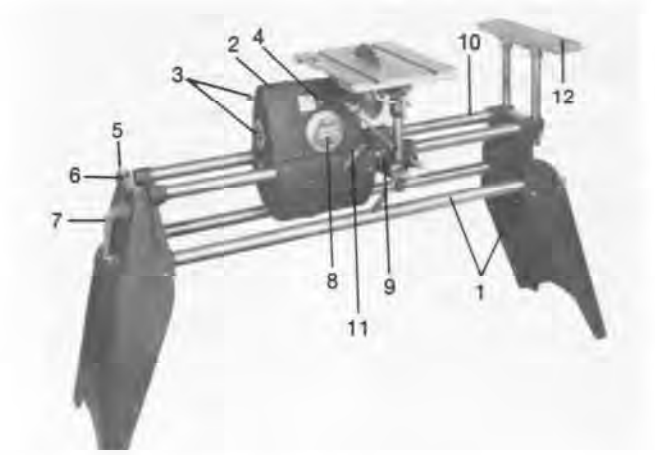
Use only three-wire extension cords which have 3-prong grounding type plugs and three-hole receptacles which accept the tool's plug.

Replace or repair damaged or worn cord immediately.

The SHOPSMITH MARK V should be connected to a grounded, metal-enclosed wiring system; or an equipment-grounding conductor should be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the SHOPSMITH MARK V.



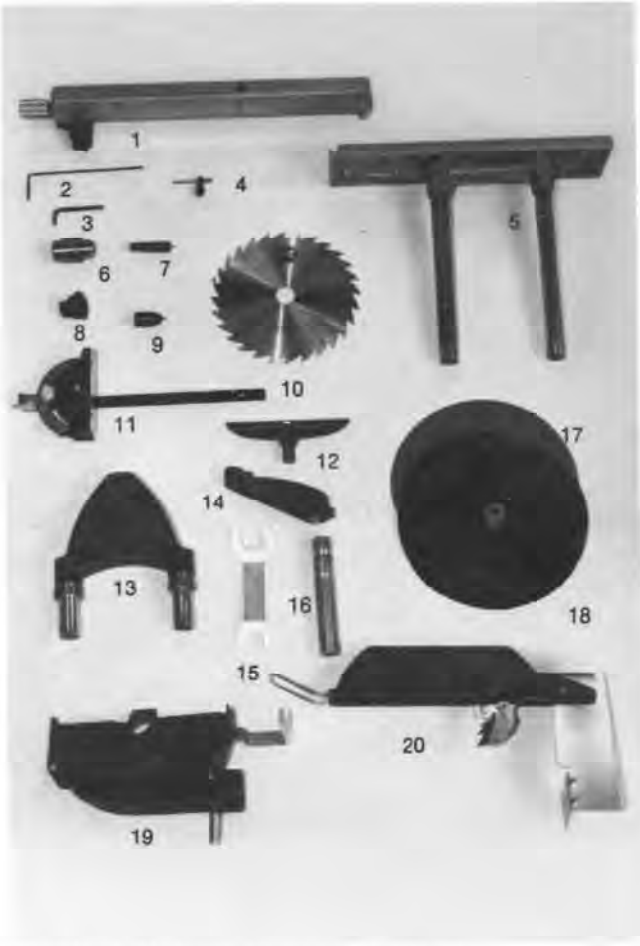
SHOPSMITH



MARK V NOMENCLATURE

1. **Bench ends and tubes** . . . Integral part of machine. Provide rigid base. Eliminate need to buy or build wood structure.
2. **Headstock** . . . Motor and all rotating parts totally enclosed in solid, pressure cast, aircraft quality aluminum alloy.
3. **Auxiliary spindles** . . . Extra safety-flat spindles for dual mounting of complementary (add-a)tools.
4. **On-off switch** . . . Set between guard wings for protection against accidentally turning on machine. Can be knocked OFF but not ON. Holes are provided in guard wings for use of a padlock to lock machine off.
5. **POWER-MOUNT** . . . For mounting extension table or the single purpose (add-a)tools such as the Jointer, Bandsaw, Jigsaw or Belt Sander.
6. **Hand grip locks** . . . One on each end — positive lock for extension table, tailstock or accessories.
7. **Headrest lock** . . . Secures SHOPSMITH MARK V in horizontal position.
8. **SPEED-DIAL** . . . Makes available the correct speed for any operation merely by turning a dial.
9. **Carriage** . . . Supports table or lathe tool rest. Slides on tubular ways.
10. **Tubular ways** . . . Centerless ground twin tubes provide extreme rigidity and accuracy. Anti-corrosion hard-chrome plated.
11. **Headstock lock** . . . Locks headstock in any position along tubular ways.
12. **Extension table** . . . Mounts at either end of machine — affords exceptional capacity for sawing, drilling, sanding, etc. Also usable as auxiliary table for upper auxiliary spindle.

STANDARD ATTACHMENTS



SHOPSMITH MARK V STANDARD ATTACHMENTS

1. **Rip fence** . . . Used for ripping cuts on table saw. Also used as guide, stop, support and jig for many other operations.
2. **Allen wrench — 5/32"** . . . Used on all attachments (the SHOPSMITH MARK V "Tool Kit").
3. **Allen wrench — 1/4"** . . . Used for internal adjustments.
4. **Chuck key** . . . For Jacobs chuck.
5. **Extension table** . . . Mounts on either end of machine.
6. **Jacobs Chuck** . . . Chuck for tools with 5/64" to 1/2" diameter shanks.
7. **Cup center** . . . For tailstock end of spindle turning. Seats in tapered hole in eccentric cup mount.
8. **1¼" saw blade arbor** . . . Special arbor for SHOPSMITH MARK V blades; attaches to main spindle and positions blade to minimize run-out and wobble.
9. **Drive center** . . . For spindle turning. Attaches to main spindle.
10. **10" saw blade** . . . SHOPSMITH MARK V all-purpose saw blade; used for both crosscutting and ripping.
11. **Miter gauge** . . . Used for crosscutting and mitering operations on table saw. Also used as stop, guide and jig for many other operations.
12. **Lathe tool rest** . . . Guide and support for lathe turning tools.
13. **Tailstock** . . . Holds eccentric cup center mount for lathe turning.
14. **Tool rest arm** . . . Used in front of table carriage to support lathe tool rest.
15. **Arbor wrench** . . . Special wrench for use with the 1¼" arbor.
16. **Tool rest post** . . . Used in front of table carriage to mount tool rest arm.
17. **Sandpaper** . . . 12" sandpaper sheet attaches to disc with adhesive (available separately).
18. **Sanding disc** . . . 12" sanding disc attaches to spindle.
19. **Lower saw guard** . . . Mounts on quill. Guards blade under the table and channels sawdust away from the operator.
20. **Upper saw guard/splitter** . . . Mounts on lower guard. Includes splitter and anti-kick back fingers.

CHECKING FOR ACCURACY

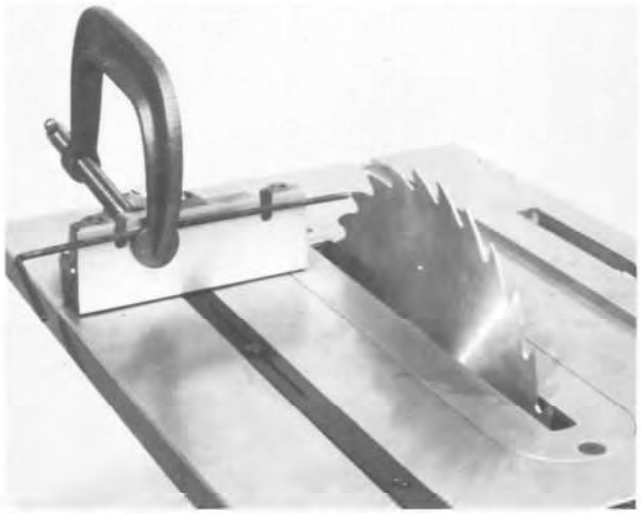
A good craftsman makes periodic checks of his machine to be sure that related parts are in correct alignment. Here is what to look for and good methods of checking.

1 . . . **AT "0" TRUNNION SETTING, THE TABLE MUST BE SQUARE TO THE SAW BLADE.** This is checked with the table as low as possible and locked in position about ⅛" away from the saw blade. Be sure the square used for checking rests flat against the blade and that it seats between the teeth.

IF TABLE WITH TRUNNION SET AT "0," IS NOT EXACTLY 90 DEGREES TO SAW BLADE

Loosen table tilt lock and pull out trunnion plunger. Set table at exactly 90 degrees and secure table tilt lock. Push in plunger and turn Nylok set screw until it just bears against plunger. Adjust trunnion vernier plate until middle calibration is lined up exactly with "0" mark on trunnion.

Tilt table until middle calibration on trunnion vernier plate lines up exactly with 45 degree mark on trunnion. Lock table. Push in plunger and adjust Nylok set screw until it just bears against plunger.



2. . . . **TABLE SLOTS MUST BE PARALLEL TO SAW BLADE.** Check by setting table as low as possible in normal sawing position. Place the miter gauge in either slot and clamp with Allen wrench to its face so that it extends just enough to touch one tooth of the blade set in the direction of the miter gauge. Mark the tooth with a pencil. The miter gauge stop rod, if available, may be used in place of the Allen wrench. Rotate the saw blade backwards by hand until that **same** tooth is at the rear of the insert slot. Move the miter gauge ahead and check to see if the Allen wrench just barely touches that same tooth.

IF TABLE SLOTS ARE NOT PARALLEL TO SAW BLADE

Loosen four hex head cap screws which secure table to trunnion and to rear bracket. Do not loosen more than one full turn. Tap the table lightly with the heel of your hand to "rotate" it into correct alignment. Lock the four cap screws, turning each one a small amount, then repeat until each is secure.

3 . . . **THE MITER GAUGE, WHEN SET AT 90 DEGREES, MUST BE AT RIGHT ANGLES TO THE TABLE SLOTS.** To check, set miter gauge in either slot and use a square as shown. Be sure that one arm of the square is held firmly against the face of the miter gauge and the other is flush against the side of the second table slot.

IF MITER GAUGE, AT 90 DEGREE SETTING, IS NOT EXACTLY SQUARE TO BLADE

Loosen lock knob and pull out miter gauge plunger. Adjust miter gauge head exactly square to blade and lock in place. Push in plunger and adjust Nylok set screw until it bears against plunger. Adjust miter gauge vernier plate until middle calibration is lined up exactly with 90 degree mark on miter gauge.

Loosen knob and turn miter gauge head until center vernier plate mark is lined up with 45 degree mark on miter gauge. Push in plunger and adjust Nylok set screw until it bears against plunger. Make a similar adjustment on the opposite 45 degree auto-stop.

4 . . . **THE RIP FENCE, WHEN LOCKED, MUST BE PARALLEL TO THE TABLE SLOTS.** Check by locking the rip fence on the table, positioned so that one side of the fence is flush with one side of either table slot.

IF RIP FENCE IS NOT EXACTLY PARALLEL TO TABLE SLOTS

Loosen the two cap screws which secure the fence to the base casting. Set the fence exactly parallel to either table slot and tighten the locking handle. Then retighten the two cap screws. If a lot of ripping is to be done, it is

advisable to adjust the rip fence so that when it is on the right side of the blade, the end of the rip fence is approximately 1/64" further from the blade than the front. This provides clearance for the wood and helps prevent kickback.

4. . . . **THE EXTENSION TABLE MUST BE PARALLEL TO THE SAW TABLE AND ALIGNED WITH IT.** Check by setting the extension table to the height of the saw table and butting them against each other. Place a straight edge across front edges.

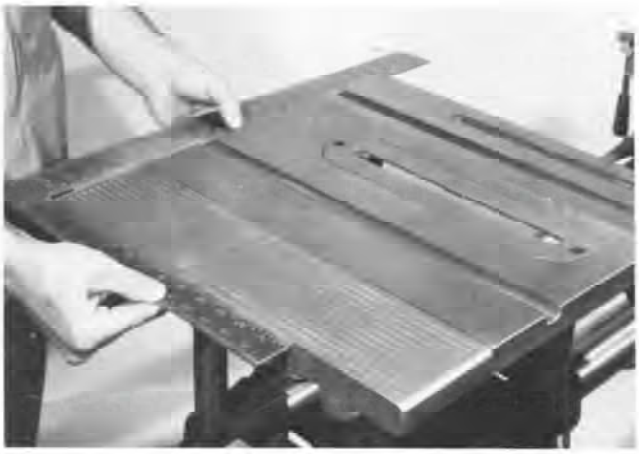
IF IT IS NOT PARALLEL TO SAW TABLE AND IN LINE ACROSS THE FRONT SURFACE

Loosen the four cap screws which secure it to its mounting bracket. Push saw table against extension table until edges are flush against each other. Tap extension table forward or back until front edge is in line with edge of saw table. Retighten four cap screws turning each a small amount until all four are secure.

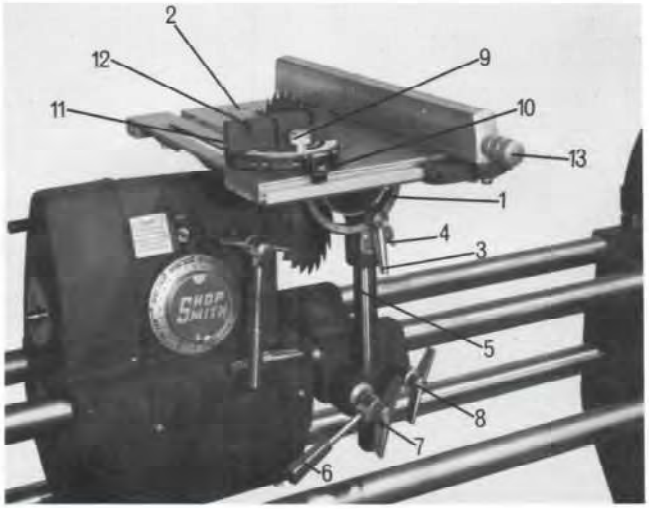
IF IT IS NOT LEVEL WITH THE SAW TABLE

Some clearance must be allowed for the tubes in the base castings. Loosen and then retighten the hand grip locks. Additional adjustment can be made by inserting thin washers between the base and extension table top.

Because of the adjustments necessary to align the SHOPSMITH MARK V, it is not always possible to have the extension table absolutely level with the table in both the right and left positions. Therefore all adjustments should be made in the right position.

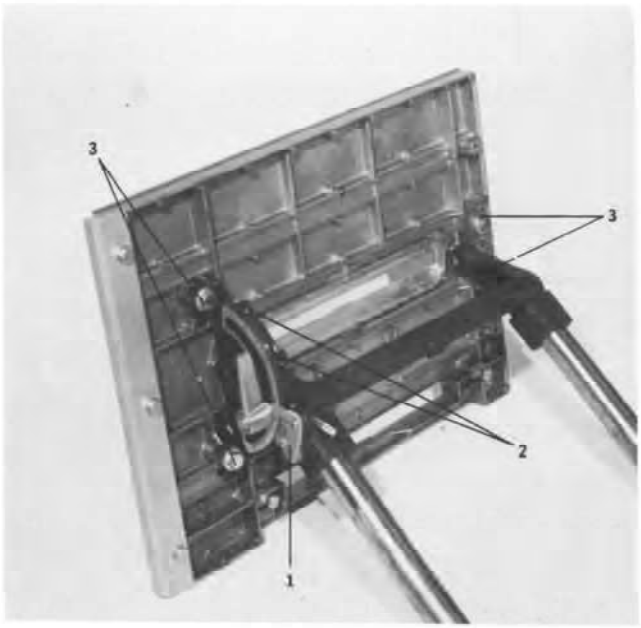


SHOPSMITH 10-INCH TABLE SAW



NOMENCLATURE

1. **Trunnion** . . . Guides table through tilt range — calibrated for angular settings.
2. **Insert** . . . Removable insert is coined and "bowed" for accurate, flush fit; integral projections prevent saw blade cutting insert.
3. **Table tilt lock** . . . Locks table at any angular setting.
4. **Trunnion plunger** . . . Pin is depressed to automatically position table at 0 to 45 degrees.
5. **Table tubes** . . . Rack cut for raising and lowering table.
6. **Table height lever** . . . Use to raise or lower table — lever is adjustable radially by unscrewing a few turns, repositioning and then locking.
7. **Table height lock** . . . Turning clockwise lock height setting obtained with height lever.
8. **Carriage lock** . . . Turning clockwise locks carriage in any position along tubes.
9. **Miter gauge knob** . . . Locks miter gauge settings.
10. **Miter gauge plunger** . . . Pin against which auto-stop set screws bear at 45, 90, and 45 degrees.
11. **Stop rod holes** . . . Permit mounting of miter gauge stop rods for duplicating cutting.
12. **Miter gauge extension slots** . . . For mounting miter gauge extensions.
13. **Rip fence lock handle** . . . Turning clockwise automatically squares fence to table and locks in front and rear.



1. **Trunnion vernier plate** . . . Adjustable, stamped plate for tilting table to exact degree.
2. **Trunnion autostop set screws** . . . Adjustable Nylok screws afford automatic settings at 45°.
3. **Cap screws** . . . Hold table to trunnion and rear bracket. Loosen for table alignment.

HOW TO USE THE TABLE SAW

Mounting the Saw Blade

The SHOPSMITH MARK V is designed to use saw blades 10 inches or less in diameter. The blade mounts on the special 1¼" saw blade arbor (505511). Remove the arbor nut by turning it clockwise (thread is left hand so nut will tend to tighten as saw turns). Hold the arbor with the flats pointing toward your left. Slip on the saw blade with the teeth pointing in your direction. Replace the nut and finger-tighten by turning counter-clockwise. Place the arbor on the spindle with the set screw positioned over the tapered flat and lock in place with the Allen wrench. Hold the arbor flats with one wrench and the arbor nut with the special wrench provided and tighten.

All spindle attachments should be positioned with the locking screw seating firmly on the tapered flat. This safety feature is provided on upper spindles as a precaution against tools flying off even if set screws are not sufficiently tightened.

When it is necessary to remove the blade from the arbor, loosen the arbor nut while the arbor is still mounted on the spindle — or — remove the arbor and grip the flats in the jaws of a vise. Actually it should not be necessary to remove a saw blade from its arbor except for sharpening. Arbors are economically priced so SHOPSMITH owners can have all their accessories pre-mounted on individual arbors ready for mounting on the spindle in seconds. Be sure to utilize this SHOPSMITH feature.

The upper and lower saw guards should be used on all sawing operations. The photographs in this section do not show the guards in place only because the operations can be seen more clearly without them.

Positioning Table

Rack the table to its highest point, lock, and slide carriage toward headstock until headstock side of carriage butts collar against headstock. Lower table and saw blade should be approximately centered in the insert slot. If necessary, further adjustments can be made by extending and locking the quill feed. The resilient collar also protects headstock and carriage from accidental damage through striking each other.

Extra Saw Slot

An extra saw slot has been provided on the left hand side of the saw table of your new SHOPSMITH MARK V. The purpose is to facilitate ripping wide boards when the operator prefers keeping the rip fence on the saw table rather than on the extension table. The length of this extra slot had to be kept short to preserve table rigidity. Therefore, **a 10" saw blade must not project above the table more than 2½".**

Blade Projection and Size

Your SHOPSMITH MARK V has a 10" blade capacity. However, it is always good shop practice to use smaller blades if they are large enough to do the job.

Avoid extremes in blade projection above work. ¼" to ½". or exposure to deepest gullet of blade (except with hollow ground blades where exposure should be at least ¾") is safe and efficient.

When saw blade, dado or other cutting tools must be set to a definite height, use the depth-of-cut scale engraved on each side of the rip fence. Bring the fence close to the blade and lock in position. Raise or lower table until cutting tool height is correct (below). This exclusive SHOPSMITH feature guarantees accurate depth of cut since it is not affected by blade sharpening, various blade sizes, etc.

USING RIP FENCE SCALE TO ADJUST BLADE HEIGHT

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Blade to Fence Settings

SHOPSMITH's quill feed makes precise blade-to-fence settings easy. Set the rip fence manually to an approximate position within ⅛" of the setting required. Lock the fence and make the final, critical adjustment by advancing the quill and locking it in position with the quill lock (below).

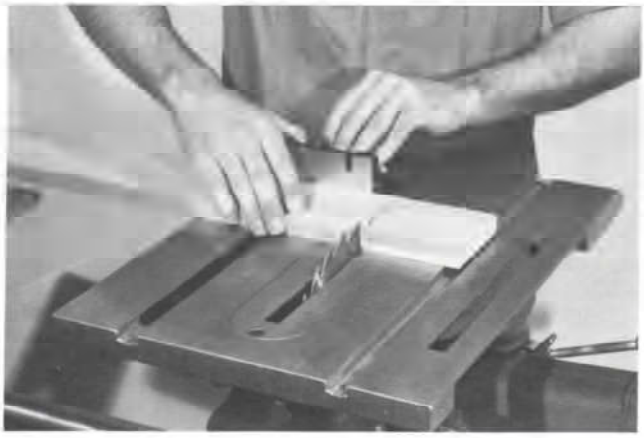
USING QUILL FEED FOR BLADE TO FENCE SETTING

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Crosscutting

The miter gauge, positioned in either of the table slots, holds the work square to the blade throughout the pass.

Hands should be placed on the miter gauge as shown (below), body positioned out of the line of cut. Use the left hand to hold the work against the face of the miter gauge and down on the table, while the right hand feeds it forward. **Never force or rush the cut.** You will always get a smoother, better cut and a minimum of blade chatter with a slower pass since you are letting more teeth pass over a given area of the wood. When the wood is cut through (thru-sawing), keep hands in same position and return work and miter gauge to the starting point. Never attempt to remove cutoff until you have switched off the machine and the blade has stopped turning. This takes but a second and will avoid accidents.



CORRECT USE OF MITER GAUGE WHEN CROSSCUTTING

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Miter Cuts

Miter cuts (next page) are made like crosscut except that the miter gauge is adjusted to the angle required. A firm grip is needed to counteract "creep" which is the pulling action of the blade on the work as the cut is made. **As always, make the pass slowly,** hands holding the work firmly and positioned on the miter gauge well away from the saw blade.

SHOPSMITH's Miter Gauge Safety Grip (505625) is especially useful on cuts of this nature to prevent "creep" and to help keep hands away from the blade.

SAFETY GRIP PROVIDES ACCURACY AS WELL AS SAFETY

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Cutting Off Duplicate Lengths

Many beginners, needing short duplicate lengths, make the mistake of using the rip fence to gauge the length of the cutoff. This is a dangerous practice and **should never be attempted.** The cutoff can jam between blade and fence, and may be thrown back with considerable force. This is known as "kickback."

Instead, clamp a stop block to the rip fence as shown below. This should be positioned forward of the saw blade. The work is butted against it and then advanced with the miter gauge to make the cut.

DUPLICATE CUTTING — STOP BLOCK CLAMPED TO FENCE

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

A SHOPSMITH accessory that is particularly convenient is the Miter Gauge Stop Rod (505629). This is a simple double-rod arrangement that fits holes in the miter gauge and serves as a jig. It adjusts to lengths up to 18" and can be used on either side of the miter gauge.

Ripping

Rip cuts are accomplished by passing the work between the saw blade and rip fence. Hand and body positions depend a great deal on the length and width of the work. The general rule is — always stand out of the line of cut; **never use hands too close to the saw blade.**

Usually, the left hand holds the work down on the table and snug against the fence (below). The right hand, with fingers hooked over the fence as shown, feeds the work forward. Always feed the work through so the overhang at the back of the table will tilt the board up where it is easily gripped with the right hand and lifted from the table.

HOOK FINGERS OVER FENCE WHEN RIPPING

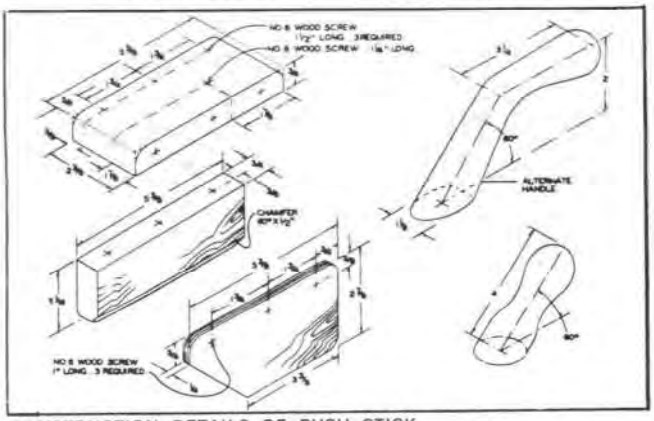
(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Care should be taken to prevent kickback. If the kerf that is already formed binds on the saw or closes, the stock is likely to shoot back with great force. The upper saw guard includes a splitter which holds the kerf open in addition to anti-kickback fingers.

Cuts which are narrower than 3 or 4 inches should **never** be pushed through by hand. Always use a push stick (below). You may, if the work is long, start the cut by hand but the last six inches should be pushed through with the stick.

USE A PUSH STICK ON NARROW CUTS

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)



CONSTRUCTION DETAILS OF PUSH STICK

Push sticks are very easy to make (above) and should be kept handy for use at all times.

Bevel Ripping

Bevel rip cuts are accomplished by tilting the table to the angle needed, locking it in place and making the pass as you would for a normal rip cut (below). The fence is always situated on the **right** side of the blade which creates a convenient V-block arrangement to support the work.

Because the pivot center of the table is below the table top, the saw slot moves in an arc as the table is tilted. This necessitates advancing the saw blade so that it may be centered in the saw slot at the angle of tilt needed. This is done by simultaneously advancing the blade as the table is tilted. An alternate method is to tilt the table, raise it, and then advance the saw blade and lower the table over the blade.

To tilt to 45 degrees, pull plunger out and tilt table to maximum setting, then push in plunger and return table until the 45 degree auto-stop set screw bears against pin. When returning to "0" setting, pull out plunger and tilt table until plunger is clear of 45 degree auto-stop. Then push in plunger and tilt until it rests against "0" setting auto-stop.

HAND AND BODY POSITION ON BEVEL RIP CUT

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Cross Beveling

Bevel cuts made across the grain also require a table tilt. The pass, however, is made with the miter gauge as in crosscutting. When the workpiece is long, lock the headstock and table at the right end of the tubes (below). Length of work is then limited only by the distance between the floor and ceiling.

CROSS BEVEL CUT — SAW AT RIGHT END OF TUBES

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

Compound Angle Cuts

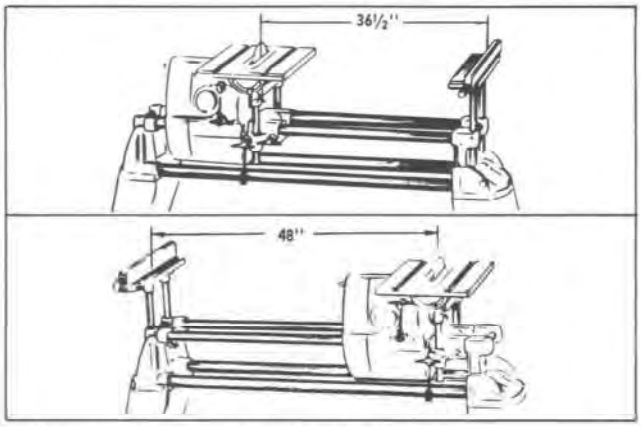
Any type of framework with slanted sides requires a combination of miter gauge settings and table tilt (next column). The settings are determined by the work angle required and must be very exact. This is one of the more difficult cuts to accomplish but only because more care is required to obtain the extreme accuracy needed.

COMPOUND ANGLE IS COMBINATION MITER AND BEVEL

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

The Extension Table

The SHOPSMITH extension table provides additional support when crosscutting long pieces and affords a maximum blade-to-fence dimension of 48" (below). Even more than 48" can be obtained by removing the insert and advancing the quill. The full 48" is obtained with the extension table mounted at the left side of the tubes and the headstock and saw table locked at the right end of the tubes.



SHOPSMITH MARK V TABLE SAW CAPACITIES

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

To set the extension table, use a long board to level it to the height of the saw table or bring the saw table close to the extension table and mate the top surfaces.

Hand grip locks at each end of SHOPSMITH are tightened by turning them upward; to release, merely turn in the opposite direction. If, for some reason you prefer a reverse action, loosen the hand grip until it may be removed from its slotted setting, reverse its position and tighten.

PLYWOOD PANELS ARE EASY TO CUT ON SHOPSMITH MARK V

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

SHOPSMITH Safety Attachments:

It cannot be stressed too heavily that the best safety feature of any power tool is the individual's personal safety habits and constant attention to the inherent danger of the tool that is being used.

The SHOPSMITH MARK V has numerous safety features designed into the various operations. As you learn to use the machine, consciously develop the habit of doing any operations the safest way. Attachments included or available to increase the safety of the table saw are:

SHOPSMITH MARK V UPPER AND LOWER SAW GUARDS:

The lower saw guard (505628) conceals the saw under the table and also provides a sawdust chute into which a standard vacuum hose fitting can be connected effectively eliminating much of the sawdust. The front plate can be easily swung aside or removed so that other accessories can be used without removing the entire guard. It can be used independently of the upper saw guard.

The upper saw guard/splitter (505627) automatically adjusts itself to the thickness of the stock being cut while the splitter keeps the kerf from closing and binding the saw blade. The anti-kickback fingers grip the stock firmly without marring the surface. The upper saw guard/splitter attaches directly to the lower saw guard so it cannot be used independently.

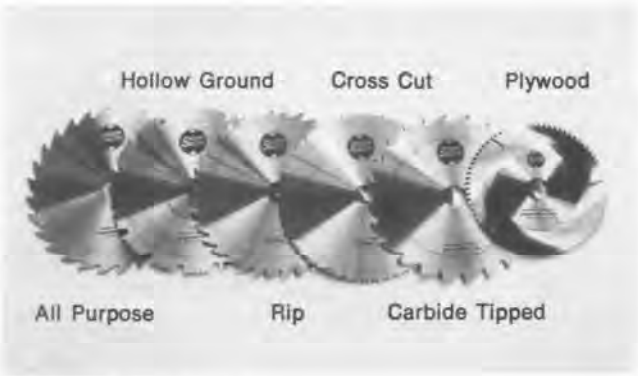
SHOPSMITH MARK V SAW GUARD

MITER GAUGE SAFETY GRIP (505625)

A SHOPSMITH exclusive, this revolutionary miter gauge hold down (illustrated on page 8) is such a useful, practical accessory that it should be a must in any craftsman's shop. All you have to do is grip the handle (which in itself facilitates handling the miter gauge) and the hold down automatically bears down on the work to keep it flat on the table and snug against the face of the miter gauge. The pressure ratio is over 20 to 1. In addition to keeping the hands safely away from the blade, you can accomplish cross-cutting, mitering, cross beveling, etc., easier, safer and with more accuracy than ever before possible. This is particularly true on cutting angles where the pulling action of the blade has a tendency to pull at the wood making it difficult to keep the angle true. Molding head operations, shaping cuts, even many sanding jobs and drill press techniques are made easier with the Miter Gauge Safety Grip. Once mounted, which is a small assembly job since the SHOPSMITH MARK V miter gauge is designed for the hold down, this accessory will prove so useful you will never remove it.

Saw Blades

Most woodworkers like to have a full assortment of blades on hand (next column), and use each for the job it was intended to do.



SHOPSMITH SAW BLADES

The blade included with the SHOPSMITH MARK V is a combination type (505544) with a special tooth design and will do a good job on all general types of cutting. This is the workhorse of the shop and with reasonable care will do a good job for a long time.

The only blade available which will produce an edge smooth enough to glue or otherwise assemble without jointing or sanding is the **hollow ground blade** (505547). This is usually the choice of a second blade. It should never be used for rough sizing cuts and should always be set so that it projects about ¾" above the work.

The **rip blade** (505546) is the best performer on ripping operations. The teeth are specially designed to act like tiny chisels, each cutting out a small amount of wood. The gullets between the teeth scoop out the waste. It does not produce a smooth cut but is excellent for production ripping and sizing cuts.

The crosscut (505545), or cutoff blade as it is sometimes called, is the best performer for cutting across the grain. The teeth are designed to provide knife-like edges to left and right that shear across the grain of the wood. This is the blade to use when you have a lot of crosscutting to do.

The plywood (505543) blade was designed and is produced exclusively for Shopsmith, Inc. to make smooth, splinter-free cuts.

The carbide tipped, all-purpose (505721) blade is a premium blade that will last much longer, stay much sharper, and cut many more kinds of materials.

Arbors

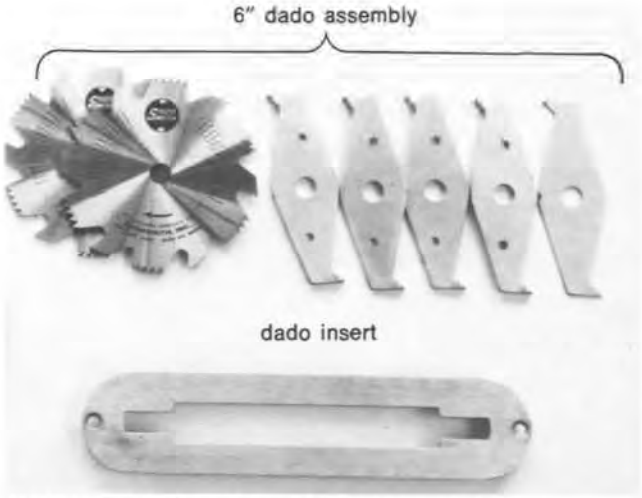
Arbors (below) are economically priced so that SHOPSMITH owners can have each saw blade and each applicable accessory ready-mounted, all set for placing on the SHOPSMITH spindle in seconds. Only with SHOPSMITH is this convenience available. The 1¼" arbor (505511) is used with saw blades. The ⅝" arbor (505506) is used for mounting other accessories with a ⅝" hole. The ½" arbor (505505) is used with accessories having a ½" arbor hole. **ON THE AUXILIARY SPINDLE USE ONLY ARBORS HAVING A KEYWAY AND TONGUED WASHER** (505505 and 505506). Ordinary arbors may be used on the main spindle but **NEVER** on the auxiliary spindle.

MOUNT EACH ACCESSORY ON ITS OWN ARBOR

Dado Tools

The 6" Dado Assembly (505548 — see illustration belw) is a standard tool which employs tow outside blades and a set of inside chippers. The size of the groove is determined by the number and size of the chippers used between the blades. This is extremely accurate and, once properly assembled, will give the exact same width indefinitely.

The dado must be used with a special Dado Insert (505621) which replaces the saw blade insert.



ACCESSORIES FOR CUTTING DADOS, GROOVES, ETC.

Miter Gauge Extension

The miter gauge extension (505630) lends much additional support and increases accuracy on such operations as crosscutting and mitering. It is made of sturdy hardwood and may be used with the miter gauge situated in either table slot. Some operators make a saw cut in the extension after it is mounted and thereafter use is as a guide for positioning work for crosscutting.

MITER GAUGE EXTENSION IN USE

(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)

SHOPSMITH Molder

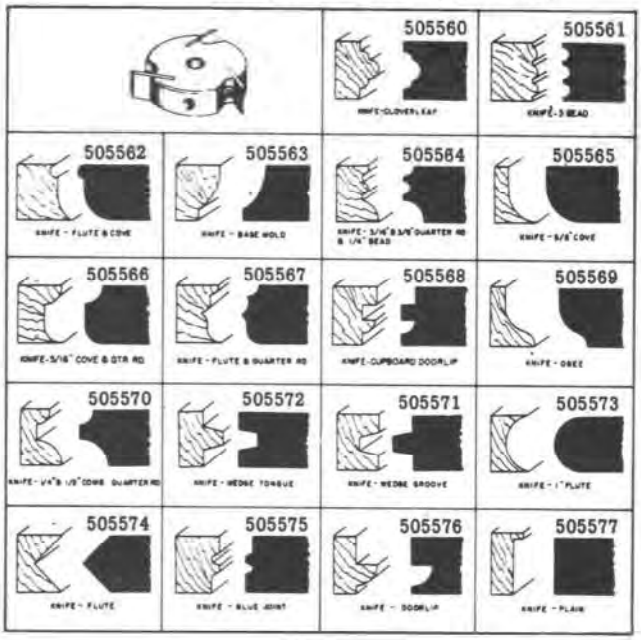
The SHOPSMITH Molder (505553 — below) makes it possible to do edges and surface molding operations on the table saw. It enables even the beginner to increase the scope of his woodworking projects and will add a professional touch to the simplest construction. The SHOPSMITH Molder mounts directly on the SHOPSMITH spindle or can be used with a 5/8" arbor.

Here are some of the jobs you can do with the SHOPSMITH Molder: — mold decorative edges, form glue joints, tongue and groove joints, make 1 3/8" sash, form countless variations of moldings, cut rabbets and grooves and many other operations which would be tedious or difficult to do otherwise.

The Molders must be used with a special Molding Insert (505622) which replaces the saw blade insert.

SURFACE CUTTING WITH SHOPSMITH MOLDER

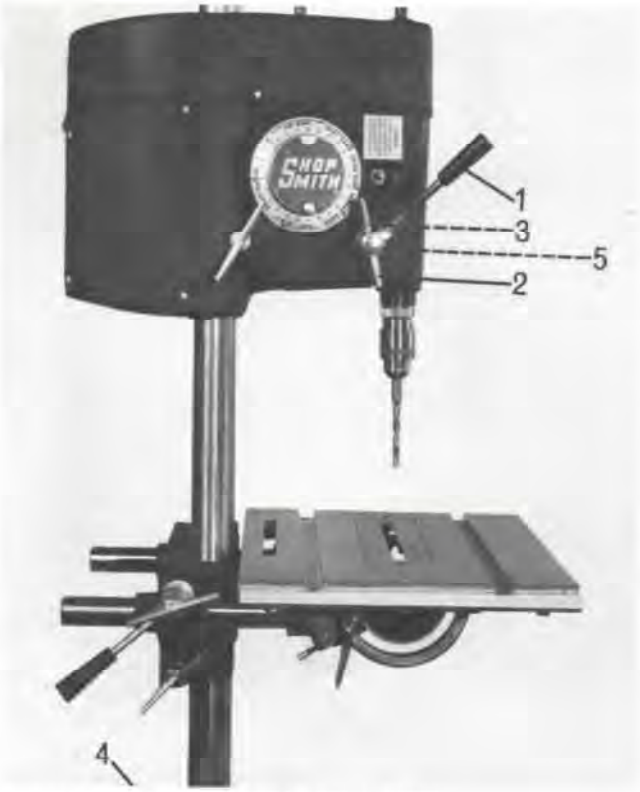
(Guards not shown in place for illustrative clarity — ALWAYS USE GUARDS IN ACTUAL PRACTICE.)



SAFETY FIRST

1. Always saw completely through the work piece.
2. Use a push stick on cuts narrower than 3 to 4 inches.
3. Never saw "freehand." When ripping, use the rip fence; when crosscutting, use the miter gauge.
4. Avoid "kickback" by not using fence to make short duplicate lengths and have the back of the fence slightly offset when ripping.
5. The saw guard has pawls to prevent "kickback." Never try to back-up the work. Always saw through. If it is necessary to interrupt the cut, turn off and then unplug the machine before removing work.
6. Periodically review all the safety rules listed on page 3.

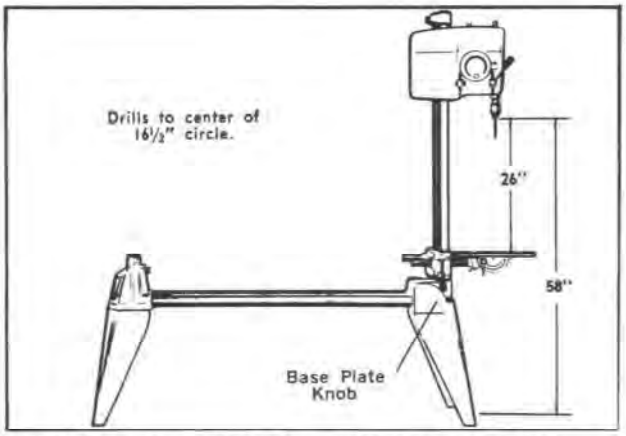
SHOPSMITH 16 ½-IN. DRILL PRESS



SHOPSMITH MARK V VERTICAL DRILL PRESS

NOMENCLATURE

1. **Quill feed lever . . .** May be used on either side of headstock. Positions radially merely by unscrewing a few turns.
2. **Quill lock . . .** Turning clockwise locks quill in any extended position for routing, shaping, and many other applications.
3. **Feed stop . . .** Turning clockwise locks setting controlled depth drilling.
4. **Base plate knob . . .** Locks SHOPSMITH in vertical drill press position. Please note that the depression in the base is offset to that the rounded end of the knob screw picks up the edge of the counter hole.
5. **Depth control dial . . .** Dial to depth setting required. Setting locked with feed stop.



SHOPSMITH MARK V VERTICAL DRILL PRESS CAPACITIES

HOW TO USE THE DRILL PRESS

Setting Up

Raise table to highest point and tilt until two cap screws underneath table rest on tubes. Secure setting with table tilt lock and use a square to check the angle of the table to the tubes. If it is not exactly 90 degrees, the two cap screws must be adjusted so they will serve as automatic stops. Thread the screws in or out until the angle is correct. This check should be made the very first time you set up SHOPSMITH MARK V in vertical drill press position.

Lock the carriage at a point about 15 inches from the base plate. Lock the headstock so that thre is about 10 inches between spindle and table. **BE SURE BOTH HEADSTOCK AND CARRIAGE ARE LOCKED SECURELY.** Lift up headrest lock lever and then, gripping tubes behind headstock, lift SHOPSMITH to vertical position. Lock base plate knob.

Position of headstock and carriage on tubes may be varied to give most convenient working level relative to operator's height.

Drilling

The SHOPSMITH MARK V is designed to use any type of drill bits ¾" or less in diameter. Drill bits should be of good quality and should always be kept sharp. Drill bits and other cutting tools (except those which require special chucks because of side thrust) are secured in the Jacobs three-jaw chuck with the chuck key. **BE SURE TO REMOVE THE KEY BEFORE TURNING ON THE MOTOR.** Before drilling, check the speed chart for correct rpm. Always use a scrap block between work and the table.

Quill feed should be steady so the drill will always be cutting (below). On very deep holes it is good practice to retract the drill frequently to clear chips from the hole.

USE SCRAP BLOCK BETWEEN WORK AND TABLE

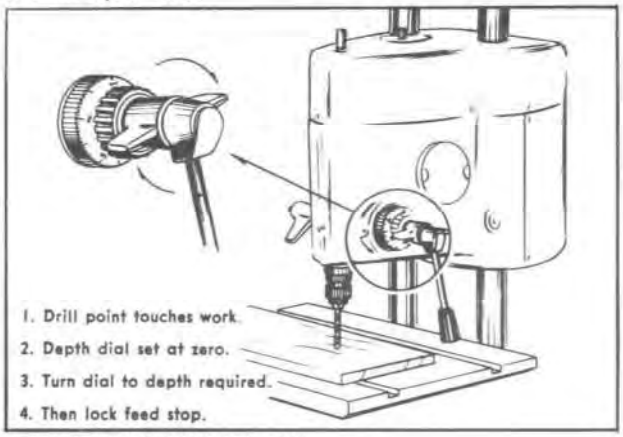
It should never be necessary to force the drill. If it isn't cutting cleanly, smoothly and easily you may be using the wrong speed or a dull drill.

When drilling metal or large holes in wood be sure to clamp the work to the table. A drill can catch in the hole, especially when breaking through, and twist the work out of your hands.

Controlled Depth Drilling

When it is necessary to control quill extension, as in drilling to predetermined depth or mortising, extend the quill until the drill point touches the work. Turn the depth control dial (next page) clockwise to the setting desired and secure with the feed stop. The quill will then extend that

further amount. To hold the quill in any extended position use the quill lock.



SETTING DEPTH CONTROL DIAL

Parallel Drilling

The rip fence is an excellent guide for maintaining edge distance on a series of equal holes. Merely lock the fence so that the distance from the side of the fence to the drill point is equal to the distance from the edge of the work to the center of the hole. On the SHOPSMITH MARK V, this is done very accurately by locking the fence in an approximate position and then using the table height lever as a forward feed mechanism to make the final critical adjustment.

USING RIP FENCE FOR PARALLEL DRILLING

V-Block Drilling

Diametrical holes are easily drilled on the SHOPSMITH MARK V merely by tilting the table to 45 degrees and setting the rip fence so that the point of the drill is exactly centered in the "V" thus created. The V-block both holds the work and positions it for accurate drilling.

V-BLOCK JIG FOR DRILLING ROUND STOCK

Jig Drilling

The rip fence and miter gauge may be utilized as jigs for duplicating drilling (below). Locate hole position on one piece of stock and set fence and miter gauge to position the work. The miter gauge is locked in place with the miter gauge bar lock screw (the tapered screw centered in the slot of the miter bar) so that no clamps are needed. Then you merely place each piece in position and drill the hole.

USING MITER GAUGE AND RIP FENCE AS A JIG

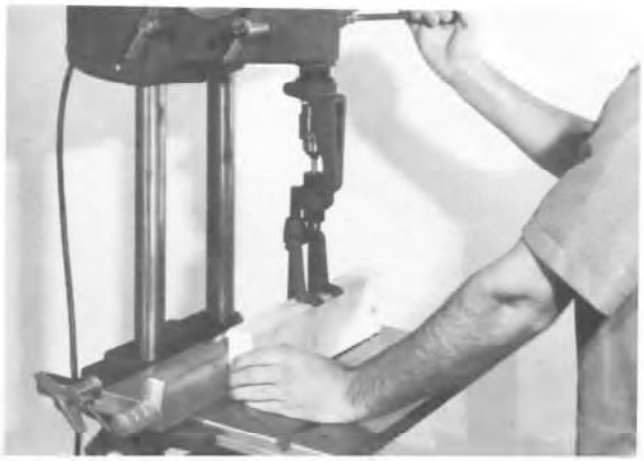
Floor Model Drill Press

The SHOPSMITH MARK V may be utilized as a floor model drill press merely by tilting the table until it is parallel to the tubes and adjusting it to gauge the position of the work. The table in this position acts as a back-up for the work. Mortising or drilling for door locks is typical of the operations conveniently handled with this setup.

Mortising

The mortise and tenon joint is very widely used in cabinet and furniture construction. The tenon, which is an integral projection cut on one of the mating pieces, is usually formed on the table saw or jointer but the mortise, the cavity which receives the tenon, must be formed with mortising bits and chisels (below). Actually, mortising attachments enable you to form square holes on the drill press, a cut which may be utilized in operations other than mortise forming.

The mortising attachment (505623) is easily attached to the quill collar and is needed to hold and position the the square mortising chisel. The hold down (505624), which locks in the hole at the top of the rip fence, prevents the work from pulling off the table when the chisel is retracted. Mortising bits and chisels are available for ¼" (505593), ⅜" (505594) and ½" (505595) holes.

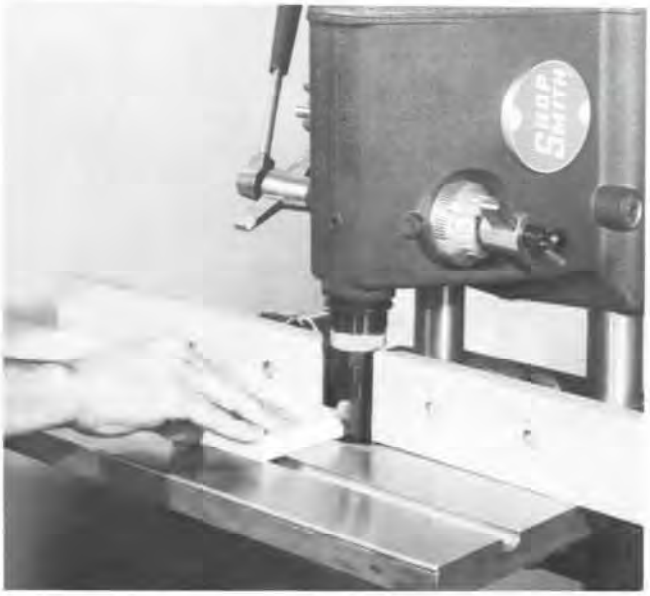


CUTTING A MORTISE

Shaping

Shaping accessories will enable you to form intricate edge designs or moldings that mean so much to the final appearance of a project.

The SHOPSMITH Shaper Fence (505508) is by far the best in the field. It is a strong unit with extra long hardwood fences and an exclusive infeed fence screw adjustment with a spring "clicker" that indicates every 1/64" of adjustment.



SHAPER FENCE IN USE

The special Shaper Insert (505509)—see next column), which is used with the fence, is actually a tool in itself since it permits freehand shaping against collars on inside or outside curves. Removable fulcrum pins are supplied to provide bearing surface at the start and end of each cut.

The Shaper Adapter (505505) is used like an arbor to mount three-lip shaper cutters on the spindle. Shaper collars (505604) are used as depth control guides when shaping freehand and also as spacers between cutters.

A good assortment of three-lip Shaper Cutters (below) is available. Some have profiles which will reproduce standard molding or joint forms. Others are combination cutters which afford a virtually unlimited variety of shapes by making several passes with the same cutter, changing depth of cut or height of cutter after each pass, or by combining partial cuts with several cutters.

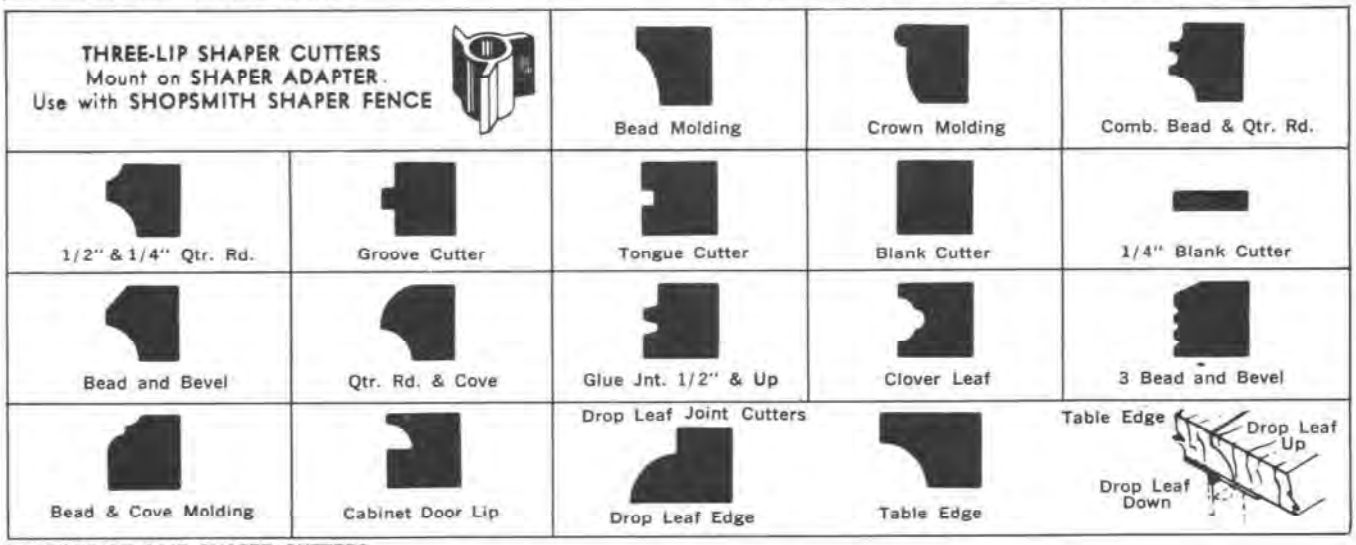
SHAPING WITH SHAPER INSERT

Routing

SHOPSMITH makes it easy to do routing operations. The table height lever when utilized as a forward feed mechanism can be used for cross-grain routing (see illustration below). SHOPSMITH's large table area affords excellent support for oversize pieces. The miter gauge can be used for routing cross-grain and it may be locked in position for stop routing. In addition, the countersunk hole at the free end of the miter gauge may be utilized for mounting a pin; thus you can do pivot routing.

Because of the side thrust which is developed, router bits should be held in a special router chuck (505597). 1/4" (505598), 3/8" (505599) and 1/2" (505600) router bits are available.

RIP FENCE AS A GUIDE FOR STRAIGHT ROUTING



PROFILES OF 3-LIP SHAPER CUTTERS

SHOPSMITH HORIZONTAL BORING MACHINE

The SHOPSMITH MARK V gives you the only adequate horizontal boring machine available in the homecraft or light industrial field. Properly utilized, it will facilitate many operations which are time-consuming, inconvenient, or actually impossible on a vertical drill press.

HOW TO USE THE HORIZONTAL BORING MACHINE

The following are but a few examples which typify operations best handled in horizontal boring position.

Drilling for Butt Dowel Joints

Drilling edge holes for a butt dowel joint is easily accomplished in wide and narrow boards with the setup shown in picture. The rip fence is locked in place to act as a backstop and as a guide to hold the work square to the drill. The feed stop is locked to control hole depth. The only dimension line needed on the board edges is distance between holes. It is not necessary to center the holes between edges if the operator makes certain to place the same side of each board down on the table.

To mark the dimension lines for distance between holes, hold the boards together and butt one end against the rip fence. The miter gauge is an excellent tool for marking the lines across the edges of the boards.

DRILLING DOWEL HOLES IN HORIZONTAL POSITION

End Drilling

Drilling end holes in long or short stock is done by locking the miter gauge in place to act as a guide for the work (below). If you position the work accurately you can drill through from each end of the piece with the assurance that the holes will have a common centerline. The extension table adds additional support for extra long work.

DRILLING END HOLE IN HORIZONTAL POSITION

Jig Drilling

The illustration below shows how easy it is to set up for drilling dowel holes in mitered pieces. Lock the miter gauge in place to act as a stop and guide for the work and clamp the work to the table before drilling. It is a good idea to set up so that aligning the front of the work with the front edge of the table positions it to maintain uniform hole depth.

LOCKED MITER GAUGE IS JIG FOR DRILLING MITER

Concentric Drilling

Concentric holes needed in lamp bases and similar projects are easily drilled as shown (below). The tailstock and cup center (see section on **THE LATHE)** are mounted in the base plate. One end of the work is positioned on the cup center and the other end centered with the drill bit. Raise the table to support the work and lock the miter gauge in place to act as a stop and guide.

HOW TO SET UP FOR CONCENTRIC DRILLING

The Horizontal Spindle

Conventional counterpart of the horizontal spindle is the polishing head which requires its own stand and motor and which is limited in function, size and capacity. With SHOPSMITH MARK V you have a double-end spindle **plus** quill action, **plus** variable speed for any tool or operation.

The double-end spindle makes possible dual mounting of many complementary tools. The traditional saw-jointer setup (illustrated on page 16) is one of the most worthwhile combinations. The single purpose (add-a)tools available are the four inch jointer (505681), eleven inch bandsaw (505641), six inch belt sander (505642), and the eighteen

inch jigsaw (505644). Mounting them on the SHOPSMITH MARK V eliminates the need for a stand, motor or pullies in addition to providing a bigger, variable speed motor. They can be conveniently stored on the wall (write for IF 257 for a free plan). These tools can also be set up on their own stands if continued use is required.

SHOPSMITH IS PERFECT SAW-JOINTER COMBINATION

When mounting accessories on the auxiliary spindle, be sure to use arbors with a keyway and tongued washer — accessory No. 505506 (⅝" arbor) and accessory No. 505505 (½" arbor). These are designed to prevent the arbor nut from loosening regardless of direction of rotation and may be used on front or rear spindles. **NEVER USE A CONVENTIONAL ARBOR HAVING A RIGHT HAND THREAD ON THE AUXILIARY SPINDLE.**

Before mounting combinations, check operational speeds of each. For example, the Rubber Bonded Abrasive Wheel (505579) mounted on the rear spindle is very useful for keeping lathe chisels sharp as you are turning **BUT BE SURE THE LATHE TURNING DOES NOT REQUIRE SPEEDS IN EXCESS OF MAXIMUM SPEED FOR THE ABRASIVE WHEEL.** Never combine any tool requiring a speed in excess of 2000 rpm with the disc sander since that is top speed for the disc.

The general rule is, **ALWAYS LET THE TOOL WITH THE LOWEST MAXIMUM SPEED GOVERN THE COMBINATION.**

You can combine disc, drum, or belt sander with buffing wheel — or buffing wheel with polishing pad — either of these combinations is excellent for polishing plastics — or a disc sander can be combined with a drum sander.

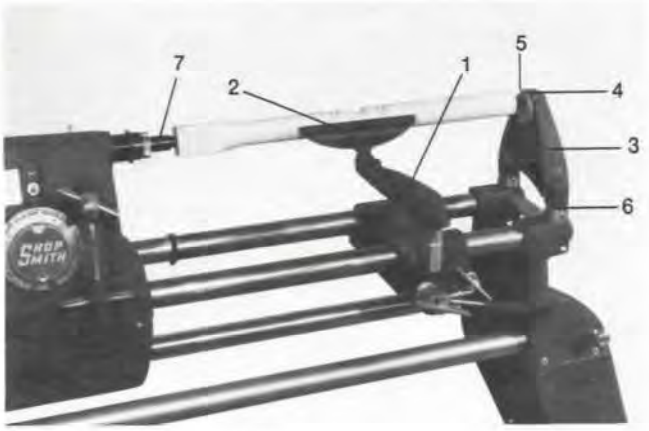
You can, for example, mount one sanding disc in its normal position and a second one with a different grit paper on the upper auxiliary spindle using the extension table to support the work.

DUAL SANDING IS POSSIBLE ON SHOPSMITH MARK V

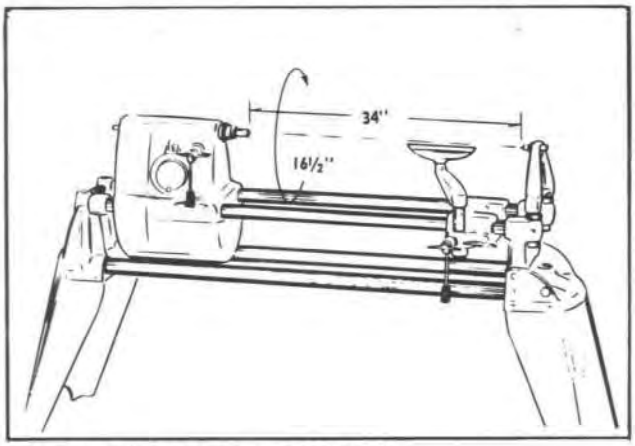
Wire Brushing

Coarse or fine wire brushes enable you to get satin finishes on various metals, do deburring jobs, clean solder joints, remove rust and do many other jobs around the home or workshop. Encrusted kitchen utensils can be cleaned by wire brushing and items like golf clubs easily refinished. Always protect way tubes with a soft cloth to avoid grit marring the chrome finish.

SHOPSMITH 16 ½-IN. BY 34-IN. LATHE



SHOPSMITH MARK V LATHE



SHOPSMITH MARK V LATHE CAPACITIES

NOMENCLATURE

1. **Tool rest arm . . .** Supports tool rest — rack adjustable up or down — swings 360 degrees.
2. **Tool rest . . .** Locks in tool rest arm — used as guide and support for lathe chisels — swings 360 degrees.
3. **Tailstock . . .** Locks securely in base plate — supports eccentric cup center mount.
4. **Eccentric cup center mount . . .** Locks in place with Allen screw — permits offset turning for tapers.
5. **Cup center . . .** No. 2 Morse Taper — supports spindle turnings at tailstock end.
6. **Height collars . . .** Correct tailstock height always maintained after initial setting.
7. **Drive center . . .** Attaches to spindle — has point for centering work; spurs for non-slip grip.

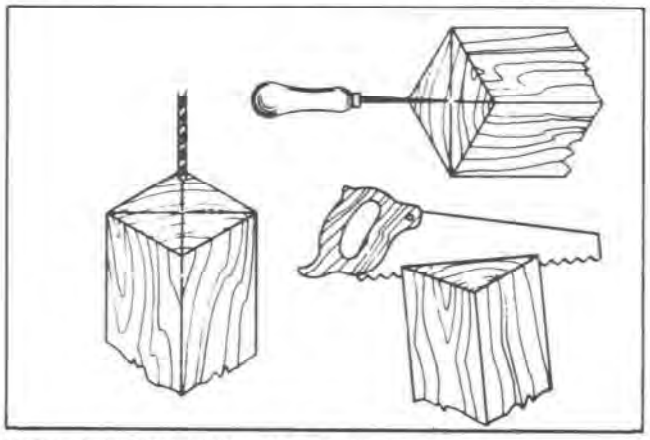
HOW TO USE THE LATHE

Points on drive and cup centers should be in perfect alignment. To check, bring headstock to right end of tubes. Extend quill until spur point almost touches cup point. Look down on the points and if they are not in perfect vertical alignment loosen cup center mount screw and turn cup center mount to bring cup point in line with drive point. Lock cup center mount and re-check.

Raise or lower the tailstock to achieve horizontal alignment. When the setting is correct, lock the height rings on the tailstock tubes.

Mounting Spindle Work

Stock or spindle turning is usually cut square before it is mounted. Next step is to draw intersecting diagonals across each end of the stock (below). Use an awl to form a small hole at each intersection. Seat the drive center



MARKING SPINDLE WORK FOR MOUNTING

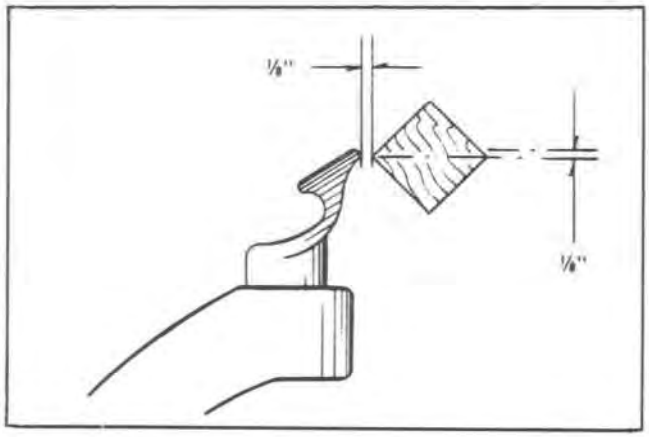
SEATING DRIVE CENTER WITH MALLET

at one end of the stock by solidly tapping it in place with a mallet (above). Place one end of the stock against the cup point and bring up the headstock so that the drive center, which you have attached to the spindle, is about ¼" away from the other end of the stock. Lock the headstock and advance the quill to engage the work (next column). Press the spur firmly in place and then retract the quill just a fraction to eliminate binding and burning the wood at the cup point end. Additional lubrication can be provided by rubbing bar soap over the hole for the cup point. **NEVER** use oil for lubrication as it will permeate the wood.

EXTENDING QUILL TO MOUNT SPINDLE WORK

Adjusting Tool Rest

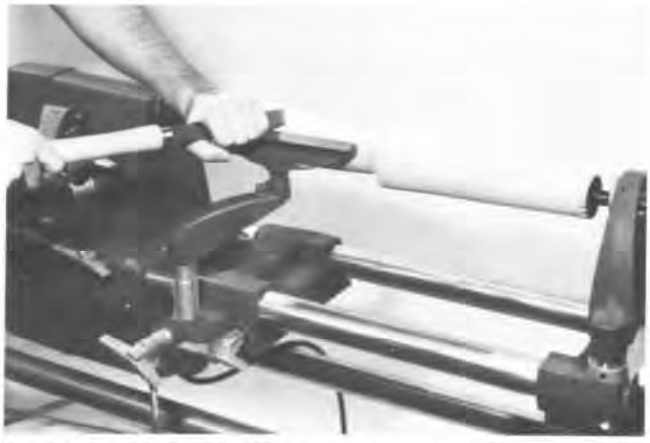
The tool rest is adjusted as shown below. This is the ideal condition and should be approximated as closely as possible at all times. Naturally, because the size of the work diminishes with successive cuts, it is impossible for the tool rest to remain in one fixed position. As turning proceeds, adjust the tool rest to give maximum support to the chisels.



HOW TO ADJUST TOOL REST

Offset Turning

The SHOPSMITH MARK V eccentric cup center mount, combined with the controlled parallelism of the tool rest, makes turning tapers an almost automatic job. The cup center mount is calibrated in 16ths of an inch with a maximum offset of ½". To use it, turn the stock to full round, maximum diameter of the design. Turn the cup center mount to the offset needed. Lock in place and raise tailstock to bring points back into horizontal alignment.



ACCURATE TAPERS ARE EASY ON SHOPSMITH MARK V

Turning Tools

SHOPSMITH LATHE TURNING TOOLS

SHOPSMITH lathe chisels (505586) are high quality turning tools and are provided in an assortment that affords maximum utility and flexibility. The lathe chisels are packed in sets of five and include:

1" gouge . . . For roughing stock from square to round and for preliminary dimensional shaping. Also good for cove cutting.

⅜" gouge . . . For light roughing cuts, dimensional shaping and smaller cove cuts.

½" round nose . . . All-around tool for inside and outside contours. For hollowing, coving, circular grooving and general stock removal.

1" skew . . . For smoothing and finishing surfaces, trimming cuts on ends and shoulders and for V-cuts.

⅛" parting tool . . . Used mostly for dimensional cuts to determine cylinder diameters. Also useful for touching up and cleaning corners and shoulders.

Additional Lathe Accessories

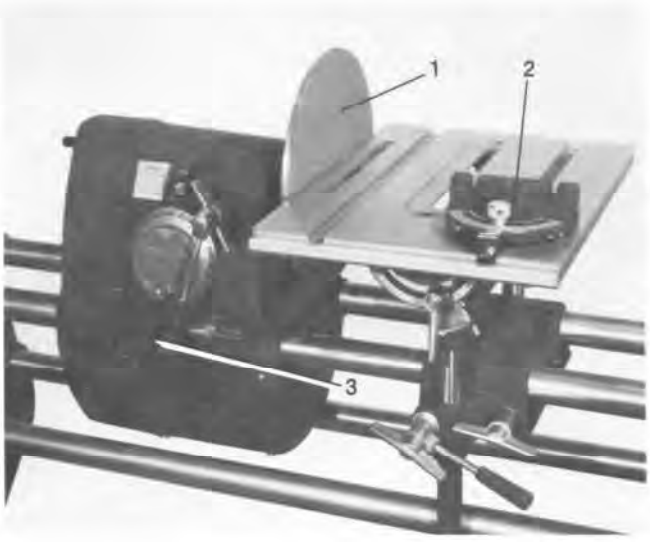
The **live center** (505602) is convenient when doing a lot of spindle turning. It has a precision ball-bearing tip to prevent burning and squeal. Necessary for any spinning operation.

The **screw center** (505601) is needed for mounting stock that is too small to be mounted between centers or on a face plate. Work is screwed on and turned like any other job.

The **tailstock chuck arbor** (505603) makes it possible to mount the Jacobs chuck in the tailstock for concentric drilling of stock which is mounted at the drive end. Good for lamp bases, candle sockets and useful for starting hollowing operations in bowls and similar projects.

SHOPSMITH **face plates** are available in 3¾" (505590) and 6" (505591) sizes. These are needed for mounting stock which is not held between centers. Bowls, bases for lamps, circular trays and similar projects are face-plate mounted for turning.

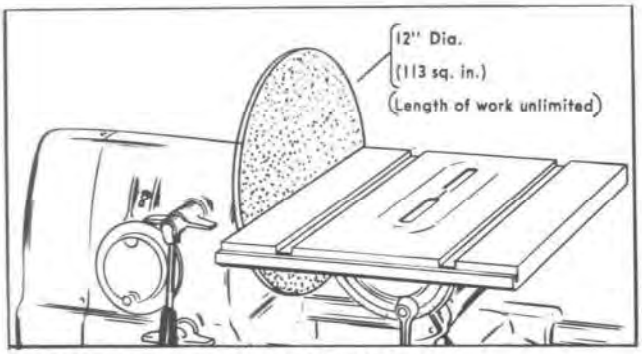
SHOPSMITH 12-IN. DISC SANDER



SHOPSMITH MARK V DISC SANDER

NOMENCLATURE

1. **12"sanding disc . . .** Affords 113 square inches of sanding area. Attaches directly to main or upper auxiliary spindle.
2. **Miter gauge . . .** Used as stop or guide for many sanding operations. Use with rip fence to create jigs for duplicate sanding and special operations.
3. **Quill feed lever . . .** Permits advancing disc into work. Unparallelled accuracy for single or duplicate parts because amount of work sanded off can be mechanically controlled with the feed stop.



SHOPSMITH MARK V DISC SANDER CAPACITIES

HOW TO USE THE DISC SANDER

Positioning

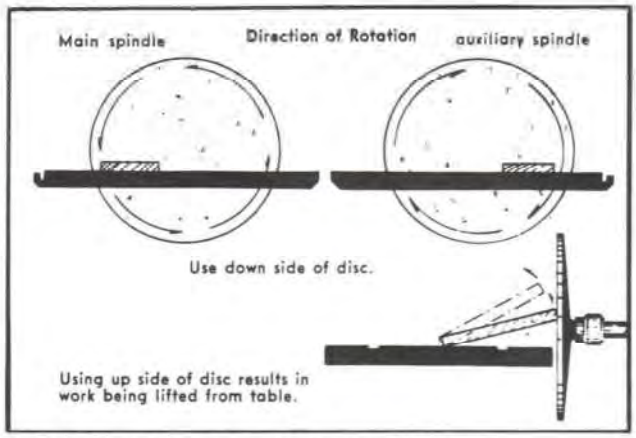
Determine the type of work to be done and lock headstock in the appropriate position. Adjust table height to about one inch below the center line of the disc and slide table over to adjust height of the extension table. Then slide table to sanding disc. **WARNING** — for your own safety — adjust the table to within ½ inch of the sanding disc and securely lock the carriage.

Attaching Sandpaper

Liquid Adhesive (505554) is applied to the disc and sandpaper sheet with an old paint brush. Spread adhesive thinly and evenly and let dry for 20 minutes or until it turns black. Press sandpaper onto disc. This is contact bond cement — sheet cannot be moved after initial contact so make sure it is correctly positioned. Adhesive can be easily removed from the disc when changing sandpaper.

Direction of Rotation

Sanding is always done on the down side of the disc (below). If it is ever necessary to use the right hand side of the table, or if you are moving a long piece across the face of the disc, be sure to hold the work firmly down on the table to prevent the disc from lifting it.



WORK PLACEMENT RELATIVE TO DISC ROTATION

Sanding

Hold the work flat on the table and move it into the turning disc, or quill-feed the disc into the work. Whenever possible use the miter gauge as a guide. Curved edges are removed in a sweeping motion. Feed should be light and smooth, even when a great deal of material must be removed. It is better to touch the work to the disc several times than it is to force it against the disc and hold it there. Burned edges, clogged paper and errors are avoided by working slowly and surely.

End Sanding

Nothing does a cross grain smoothing job like the disc sander, and the SHOPSMITH MARK V is designed to further this end. Lock the miter gauge in place and use it as a guide to square the work to the disc (below). The work may be advanced into the disc or it may be grasped firmly against the miter gauge head and the disc fed into it. The edge of the surface being sanded should not extend more than 1/16" beyond the edge of the table.

LOCKED MITER GAUGE IS GUIDE FOR END SANDING

Sanding to Length

Duplicate pieces are quickly and easily sanded to exact length by the following method (below). Lock the table about ½" away from the disc. Set the rip fence on the table or extension table, depending on length of work. Lock miter gauge in place to act as a guide for the work. Place one workpiece on the table and sand to the exact length required by feeding the disc into it. Turn off machine and extend disc to butt against sanded piece. Set depth control dial and lock the feed stop. Then sand each piece by placing in jig formed by miter gauge and rip fence and feeding disc forward. **FEED SLOWLY — NEVER FORCE THE DISC INTO THE WORK.**

QUILL FEEDING DISC FOR SANDING TO LENGTH

Angular Sanding

For bevels and cross miters, tilt the table to the angle needed and sand as you would any other piece. Always tilt the table to form an open angle with the disc. If you tilt the other way there is the possibility, especially with thin pieces, that the work will grab between the edge of the table and the disc.

To sand compound angles, set the miter gauge and table to the same angles used to cut the pieces on the saw. The table should be 1/16" from the surface of the sanding disc.

Miter Sanding

The best way to get perfect miters is to saw the pieces about 1/16" oversize and sand them to exact length (see below). Lock miter gauge in place after it has been set to the angle needed. Place and hold the work firmly against the miter gauge and feed the disc forward. The edge of the surface being sanded should not extend more than 1/16" beyond the edge of the table.

LOCKED MITER GAUGE IS GUIDE FOR MITER SANDING

EDGE SANDING PLYWOOD BETWEEN DISC AND FENCE

Jointing on Disc Sander

Long, straight edges are sanded smooth and square in an operation that combines sanding, jointing and finishing to exact width (illustrated above), a SHOPSMITH exclusive. Use the offset screw to set the rip fence at a slight angle to the disc. The distance from fence to disc should be slightly less than the width of the workpiece. Angle of the fence should be such to allow contact from outer edge of the disc to just short of the center. Work is fed through **from the back** toward the front of the table while contact is maintained with the fence throughout the pass. As always, work slowly — do not force the cut. This setup is a very practical method of joining plywood.

Drum Sander

The Drum Sander (505552) will sand inside and outside curves and internal circular cutouts with a speed and efficiency impossible to achieve with any other means. The special Shaper Insert (505509) is used with the drum sander to give support in the area immediately surrounding the drum when doing edge sanding.

Sandpaper, in disc form for the disc sander and in sleeves for the drum, is available in coarse, medium and fine grits.

NOTES

SHOPSMITH Mark V Speed Conversion Chart

SPEED (RPM)	SPEED-DIAL SETTING	SPEED (RPM)	SPEED-DIAL SETTING	SPEED (RPM)	SPEED-DIAL SETTING
700	A	2000	J	3800	S
800	B	2200	K	4000	T
900	C	2400	L	4200	U
1000	D	2600	M	4400	V
1100	E	2800	N	4600	W
1200	F	3000	O	4800	X
1400	G	3200	P	5000	Y
1600	H	3400	Q	5200	Z
1800	I	3600	R		

ALL SPEEDS ARE APPROXIMATE — SPEED VARIES SLIGHTLY WITH EACH UNIT.
The lower auxiliary shaft speed is 1.6 times the above speed for each setting.

Maintenance and Lubrication

TUBULAR WAYS: The way tubes are chrome plated and centerless ground to assure accurate, low maintenance operation. During any abrasive operation, carefully protect the way tubes with a soft rag. Metal grit or chips can damage the chrome. Hard chrome plating requires an occasional cleaning with paint thinner, followed by an application of hard paste wax rubbed to a polish. This same waxing procedure should be followed with the saw and extension table tops and tubes and the tailstock tubes.

BENCH TUBES: These tubes are chrome plated strictly to prevent corrosion. They should be periodically waxed.

QUILL: Lock quill at maximum extended position. Apply a light coat of high-quality grease to the rack teeth. Place a few drops of oil on the top surface of the quill and run quill in and out several times to spread the oil.

BEARINGS: All spindle bearings are grease sealed and require no lubrication for the life of the machine.

HEADREST LOCK HANDLE: Place a light coating of vaseline or grease on the cam surface. Occasionally, place a drop of oil on the threads.

RIP FENCE: Apply a few drops of machine oil on the threads of the rip fence lock rod.

ALL METAL SURFACES: An occasional application of paste wax, rubbed to a polish will keep the machine clean, protect the metal, and allow work to slide more smoothly.

TABLE TUBES: The teeth on the table tubes used to raise and lower the table can build up a sawdust deposit that can cause damage to the pinions. These teeth should be cleaned occasionally with a wire brush.

PRY OFF NAMEPLATE

INSERT OIL STICK THROUGH NAMEPLATE HOLE

PRY OFF PLUG BUTTON

INSERT OIL STICK THROUGH PLUG BUTTON HOLE

Oiling Procedure

The SHOPSMITH MARK V speed changer relies on sliding sheaves to increase or decrease diameters of driving and driven pulleys for changing speed. These are precision, close-fit parts that require oiling for smooth movement of sliding sheaves.

GENERAL: Apply oil, as per directions, about every ten hours of actual running time. Use good-quality lightweight machine oil. A special oil can is not required. Merely dip a wire or slender stick in oil and allow a few drops (about three) to drip into holes described. Before oiling, turn Speed-Dial to "Rout-Shape" range. Turn off switch. Do not over lubricate.

OILING INTERMEDIATE SHAFT: Remove nameplate on back of headstock by prying with screwdriver in notch at bottom of nameplate (like removing a hub cap). Hand turn spindle until hole in sheave hub (close to sheave) can be seen. Place about three drops of oil in hole. Replace nameplate by pressing it on.

METAL SHAFTS: The main and auxiliary spindle shafts and the quill extension handle shaft have been black oxided to prevent rust. Wipe occasionally with oily cloth to extend the protective life.

OILING MOTOR SHAFT: Use screwdriver to pry off plug botton. Hand turn the spindle until hole in sleeve hub can be seen. This hole is about ½" from the sheave casting and can be difficult to find because of the spring. A flashlight and small mirror is sometimes helpful. Place about three drops of oil in hole. Replace plug button by pressing it on.

IMPORTANT

REMEMBER TO OIL ABOUT EVERY TEN HOURS ACTUAL RUNNING TIME. USE JUST A FEW DROPS.

MARK V QUICK REFERENCE

WOODWORKING OPERATIONS CHART

OPERATION	SPEED-DIAL SETTING HARD-WOOD	SOFT-WOOD
TABLE SAW		
General Sawing	R	R
Heavy Ripping	N	O
Trim Cuts	S	S
6" Dado Assembly	R	R
Magna Dado	L	M
Magna Molder	Q	R
DRILL PRESS OR HORIZONTAL DRILL		
Drilling, up to 1/4"	O	S
Drilling, 1/4" to 1/2"	N	P
Drilling, 1/2" to 3/4"	K	M
Drilling, 3/4" to 1"	G	K
Drilling, over 1"	A	B
Plug Cutting	P	Q
Routing	T	V
Shaping	U	W
Mortising	L	Q
DISC SANDER		
Coarse Paper	D	E
Medium Paper	F	G
Fine Paper	H	J
DRUM SANDER		
Coarse Sleeve	J	K
Fine Sleeve	K	L

NOTE: For unusual operations or speeds for metal or plastic, see SHOPSMITH Owner's Manual or the book POWER TOOL WOODWORKING FOR EVERYONE. Speeds on this chart are recommended average speeds . . . whenever there is any doubt, start with a lower speed.

OPERATION	SPEED-DIAL SETTING HARD-WOOD	SOFT-WOOD
BELT SANDER		
Coarse Belt	E	F
Medium Belt	G	H
Fine Belt	H	J
JIGSAW		
Heavy Stock	A	B
Medium Stock	C	F
Thin Stock	H	L
Filing or Sanding	A	B
BANDSAW		
1/8" Blade	C	C
1/4" or 3/8" Blade	B	B
1/2" Blade	A	B
Heavy Resawing	A	A
JOINTER		
Finishing Cuts	Q	S
Heavy Cuts	M	O

LATHE	Rough	Shape	Finish
Up to 2" diameter	C	N	T
2" to 4" diameter	B	M	Q
4" to 6" diameter	B	J	M
6" to 8" diameter	A	F	J
Over 8" diameter	A	A	B

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