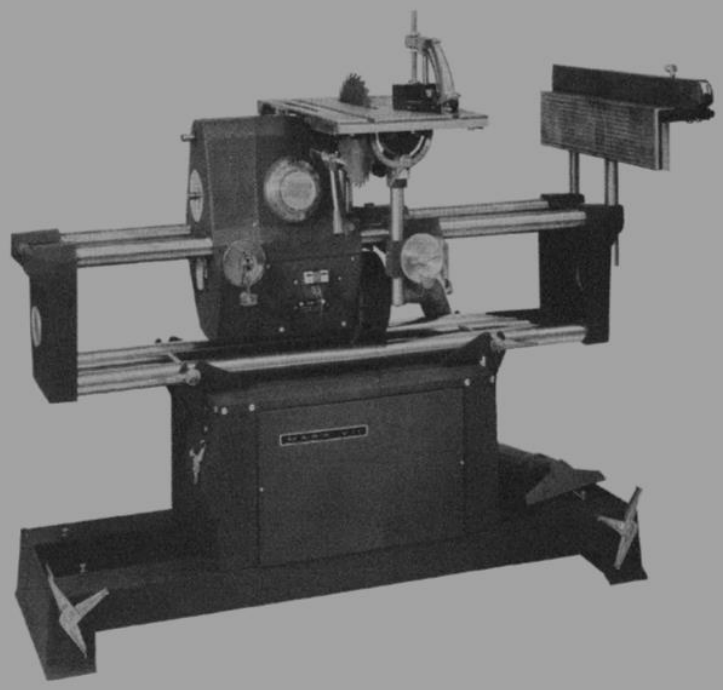
OWNER'S MANUAL



SHOPSMITH

MARK VII

T.M. Reg. U. S. Pat. Off.
Bulletin No. 507841 — 2/66 JSS
Litho in U.S.A.

MAGNA AMERICAN
CORPORATION
Interstate 75, Evendale • Cincinnati, Ohio 45215

WE KNOW YOU ARE ANXIOUS TO USE YOUR NEW SHOPSMITH - BUT

The features incorporated in SHOPSMITH 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. At your very first opportunity study this entire manual, it will make you a better and happier craftsman.

1. Always turn SPEED-DIAL to "slow" (below 1200) before changing from one operation to another. Never turn SPEED-DIAL unless spindle is turning under power.
2. Always allow machine to come to full stop before turning key and pushing button to reverse rotation of spindle.
3. When mounting attachments to SHOPSMITH MARK VII always check to see that they are operating in correct rotation. Never use any accessory arbor except the special 1/2" (Item No. 505505 and 5/8" (Item No. 505506) arbors on the SHOPSMITH MARK VII. These arbors operate safely in either direction.
4. The auxiliary spindles (for Power Mount operation of accessory tools) of SHOPSMITH furnish a rotation for power take off in a direction opposite to rotation furnished by the main spindle. In some instances the SHOPSMITH must operate in "Reverse" to obtain proper rotation of an attachment on the main spindle.
5. When operating one tool on Power Mount and another on the main spindle, never exceed maximum safe speed for the slowest tool.
6. For detailed instructions on SHOPSMITH techniques and operation see the book, POWER TOOL WOODWORKING FOR EVERYONE, Item No. 505507.

SPEED DIAL SETTING

SHOPSMITH MARK VII SPEED-DIAL (right) 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 on the back cover of the Parts Manual.

Turning the dial CLOCKWISE (with motor on), increases speed; turning COUNTERCLOCKWISE decreases speed.

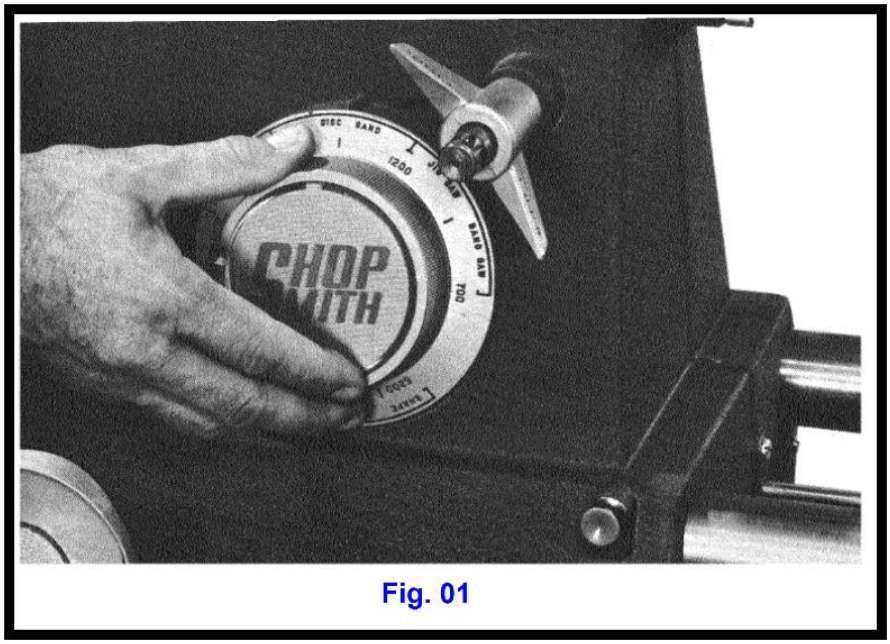


Fig. 01

NEVER ATTEMPT TO CHANGE SPEEDS WHEN THE MOTOR IS TURNED OFF.

{You can bend things in the Speed Change Mechanism.}

MAKE IT A HABIT TO TURN SPEED-DIAL TO "SLOW" BEFORE SHUTTING OFF MOTOR FOR POSITION OR ACCESSORY CHANGE. {You do not want an accessory that is rated for only slow speeds to come on in high.}

TABLE OF CONTENTS

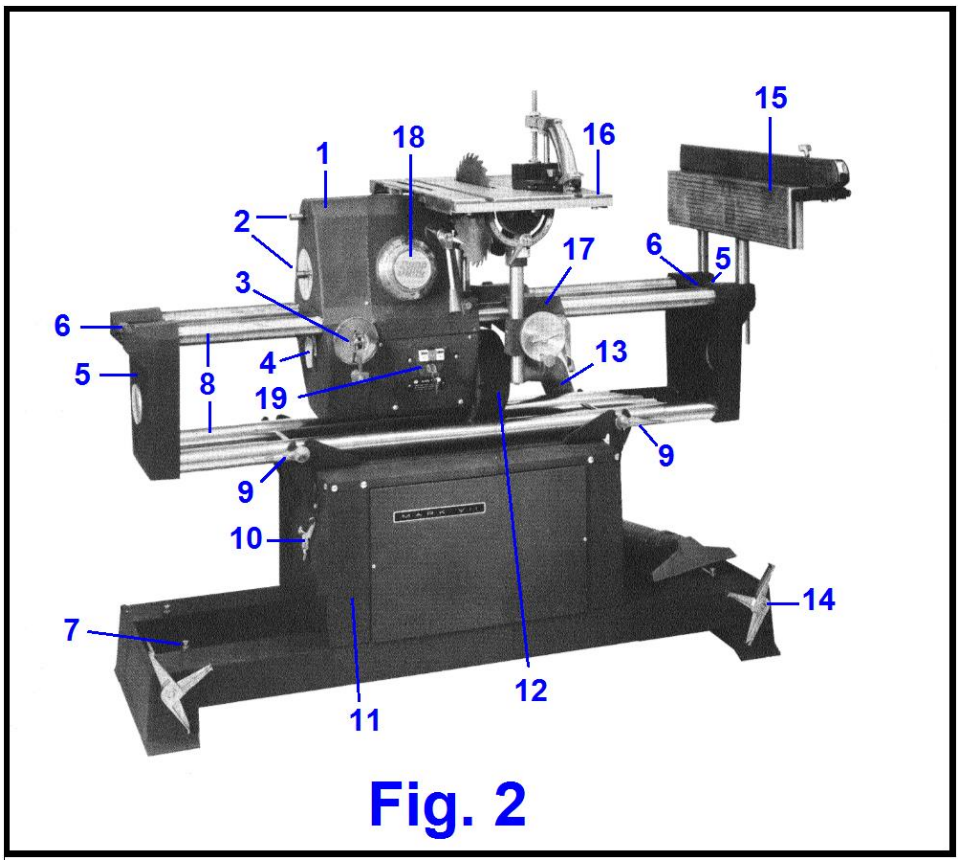


Fig. 2

MARK VII NOMENCLATURE

1. **POWER HEAD** - Motor and all rotating parts totally enclosed in solid, pressure cast, aircraft quality aluminum alloy.
2. **AUXILIARY SPINDLES** - Extra spindles for dual mounting of complementary tools. Safety flat on upper spindle,
3. **POWER HEAD TRAVERSE AND LOCK** – Moves headstock to any position along tubular ways and locks it there.
4. **TRAVERSE RELEASE** - Instant release of traverse gearing for free-sliding power head when desired.
5. **POWER MOUNT** - For mounting extension table or major accessories such as Jointer or Jigsaw. One at each end.
6. **HAND GRIP LOCKS** - One at each end-positive lock for extension table, tailstock or accessories.
7. **STOP SCREW** - For vertical alignment in tilt-up position. Two at each end.
8. **QUAD - TUBULAR BED** – Center-less ground twin way tubes provide extreme rigidity and accuracy. Anti-corrosion hard-chrome plated.
9. **TRUNNION LOCKS** - One at each end-secure SHOPSMITH in horizontal position - allow vertical operation at either end.
10. **SAFETY LATCH** - Holds machine securely for vertical operation. One at each end.
11. **STAND** - Integral part of machine. Eliminates need to buy or build wood structure.
12. **IMPELLER** - Provides vacuum to remove sawdust, etc. from working areas.
13. **VACUUM HOSE** - Lightweight, flexible easy to handle.
14. **RETRACTABLE CASTERS (OPTIONAL)** - Permits ease in movement of unit.
15. **EXTENSION TABLE** - Mounts at either end of machine or to main table - affords exceptional capacity for sawing, drilling, sanding, etc. Also usable as auxiliary table for upper auxiliary spindle.
16. **TABLE** - Raises, lowers, tilts 90° either direction.
17. **CARRIAGE** - Supports table or lathe tool rest. Slides on tubular ways. For carriage detail nomenclature
18. **SPEED-DIAL** - The correct speed for any operation merely by turning a dial.
19. **FORWARD-OFF-REVERSE SWITCH** - Key operated interlock for protection against accidentally turning on machine. Removal of key renders machine inoperative.

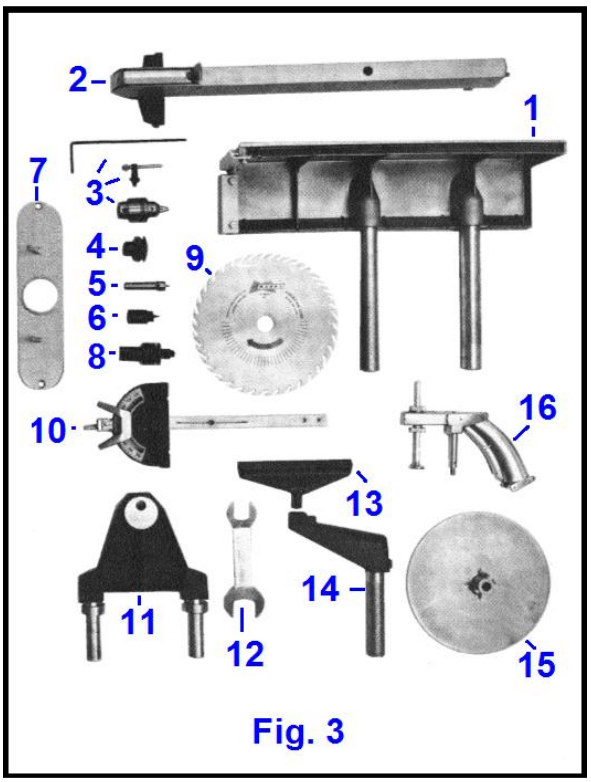


Fig. 3

STANDARD ATTACHMENTS

(1) - **Extension table** - Mounts on either end of machine or to table.

(2) - **Rip fence** - Used for ripping cuts on table saw. Also used as guide, stop, support and jig for other operations.

(3) - **Allen wrench, chuck and key** - Jacobs chuck for tools with 5/64" - 1/2" diameter shanks. SHOPSMITH MARK VII Tool Kit.

(4) - **1-1/4" saw blade arbor** - Special arbor for 9" and 10" blades; attaches to main spindle and positions blade to minimize run-out and wobble.

(5) - **Cup center** - For tailstock end of spindle turning. Seats in tapered hole in eccentric cup mount.

(6) - **Drive center** - For spindle turning. Attaches to main spindle.

(7) - **Shaper insert** - For using shaper cutters or drum sander.

(8) - **Universal arbor** - 1/2" arbor with collars and spacers for mounting shaper cutters or saw blades up to 8" diameter.

(9) - **10" saw blade** - MAGNA all-purpose saw blade; used for both crosscutting and ripping.

(10) - **Miter gauge** - Used for crosscutting and mitering operations on table saw. Also used as stop, guide and jig for many other operations.

(11) -**Tailstock** - Holds eccentric for cup center mount.

(12) - **Spanner wrench** - for saw arbor.

(13) - **Lathe tool rest** - Guide and support for lathe turning tools.

(14) - **Tool rest arm and post** - Used in front hole of table carriage to support lathe tool rest.

(15) - **Sanding disc** - Double sided 10" sanding disc; one side flat and one side tapered for greatest versatility. Attaches to spindle---balanced for vibration-free operation.

(16) - **Miter Gauge Safety Grip** - Provides added safety and accuracy and facilitates use of Miter Gauge.

PLUG-IN INSTALLATION

SHOPSMITH MARK VII is normally delivered set up and ready to go. All you have to do is plug it in. If for some special reason you have SHOPSMITH MARK VII delivered in the crate, you can quickly set it up, following directions.

CAUTION - Before starting the motor check your line fuses. Because a powerful motor draws an initial starting load greater than required during continuous running, it is good practice to equip the circuit supplying current to the machine with a DELAYED ACTION FUSE. This is the same type fuse called for on circuits for washing machines, driers, and other household appliances. Operate the unit on a separate unloaded circuit.

- If an extension cord is required it must be not smaller than #12 wire and no longer than 25 feet.
- All electrical appliances should be grounded when in use. Be sure the SHOPSMITH power cord is plugged into a grounded outlet.

ASSEMBLY OF MARK VII STAND

There are pre-punched holes in each foot for mounting retractable casters, an extremely useful accessory which makes SHOPSMITH a mobile unit easily relocated anywhere in or outside the home or shop. Item No. 505500.

AFTER UNCRATING, SET UP THE STAND AS FOLLOWS:

1. **Attach end frames to base rails** using three 1/4 - 20 x 1/2 hex head bolts with 1/4" nuts and lock washers at each attachment area. (Fig. 4) Leave bolts finger tight until step 7.

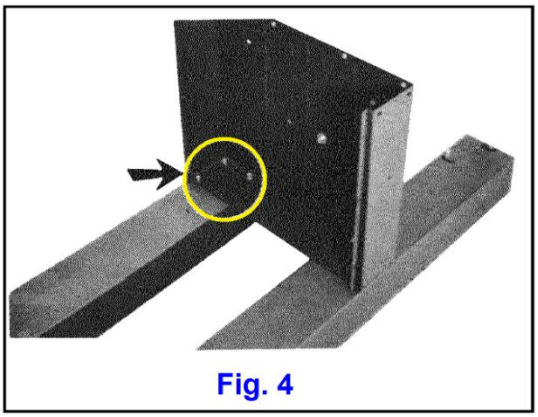


Fig. 4

2. **Mount deck** on top of end frames with deck flange on outside. Fasten with sixteen 1/4 - 20 x 3/8 truss head screws, with nuts and lock washers (Fig. 5). Screw heads go outside. Leave all screws finger tight until step 7.

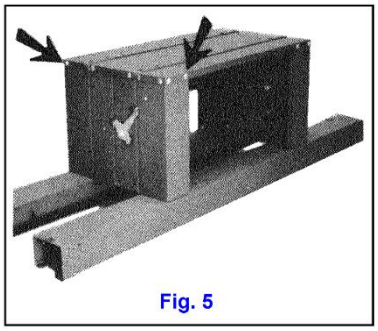


Fig. 5

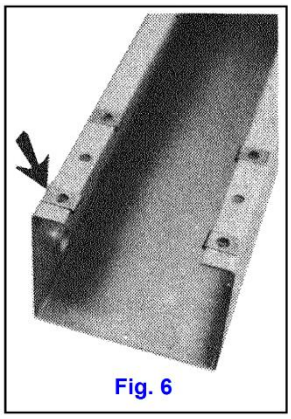


Fig. 6

3. **Assemble feet to rails.** Turn unit upside down. Push four #1024 Tinnerman nuts onto rail end flanges, using outer pair and inner pair of holes only (Fig. 6). Make certain that the plain round hole is on outside of flange. If accessory retractable casters are to be mounted, put Tinnerman nuts (from caster package) on middle holes also. See direction sheet supplied with casters.

Assemble foot by engaging lip of top of foot and then bringing flange mounting holes into line using a rolling action (Fig. 7). Assemble screws into Timmerman nuts. When all screws have been engaged, tighten firmly.

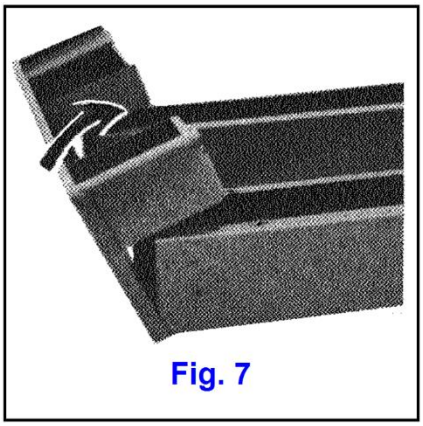


Fig. 7

Turn stand right side up and install #6x3/8 sheet metal screw through top lip of foot into each rail (Fig. 8). Leave them slightly loose until step 7.

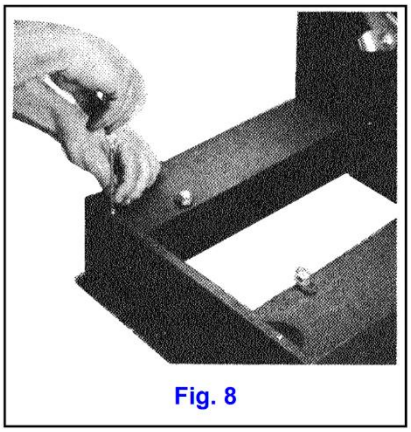


Fig. 8

4. **Mount trunnion brackets** on each end of stand (Fig. 9), using four 5 16 -18 x 5/8 hex head bolts with 11/32 x 11/16 plain washers and 5/16 lock-washers and nuts on the underside to attach each bracket to deck. Leave these bolts finger tight.

Use two 1/4 -20 x 1/2 hex head bolts, lock washers and nuts on each end to attach to end frames. Leave these bolts quite loose.

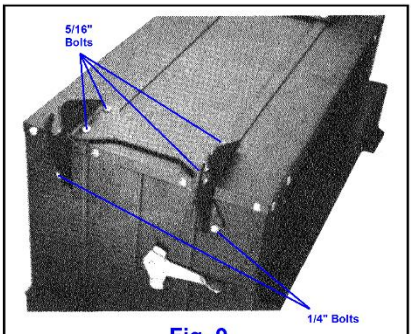


Fig. 9

5. **Mount tubular bed and power head assembly**. Determine front of stand: Safety latches (No. 10, Fig. 2) are nearer front side. Position trunnion handles (No. 9, Fig. 2) at 45° so that keys of trunnion are vertical and set power head and bed assembly in the brackets (Fig. 10). Jockey brackets until trunnion keys at both ends seat properly and then lock in place by turning handles down to horizontal position.

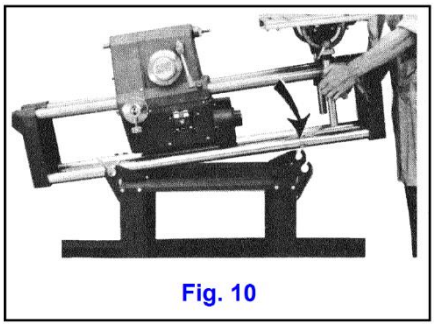


Fig. 10

6. **Tighten trunnion brackets**. With trunnions locked, center brackets on stand both sideways and endways. Then tighten to eight 5/16" bolts through the deck.

7. **"Levelize" the stand**. The stand is designed to adapt to small variations of floor flatness. To adjust stand to your floor, locate the unit where it is intended to be used and, with headstock centrally positioned on the ways, grasp headstock and jostle it forward and backward several times. Refer to Fig. 11 and start by tightening the four truss head screws "A" on each end of deck (Total 8). Next tighten the eight truss head screws "B" on front and back of deck. Then tighten the twelve hex bolts "C" holding end frames to rails and the four 1/4" bolts "D" holding trunnion brackets to end frames. Last, tighten sheet metal screws "E" at end of rails.

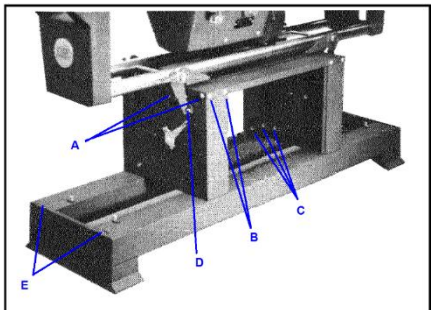


Fig. 11

8. **Adjust tilt-up stops**. Unlock Trunnion on one end and tilt machine unit to vertical on opposite end. Safety latch handles should be pointing up.

Adjust stop screws on top of rails ("F", Fig. 12) until bed tubes are square with stand top. Use carpenter square and sight across tubes. Tighten stop screw jam nuts. Safety latch should now engage lower lip of end cap. Some springing of the end frame is normal when engaging safety latch.

Return machine to horizontal and lock trunnion. Adjust stop screws for other end in same manner.

9. **Install front panel.** Return machine to horizontal and install front panel using #6 - 32 x 1 truss head screws and Tinnerman nuts, one each in middle on each side.

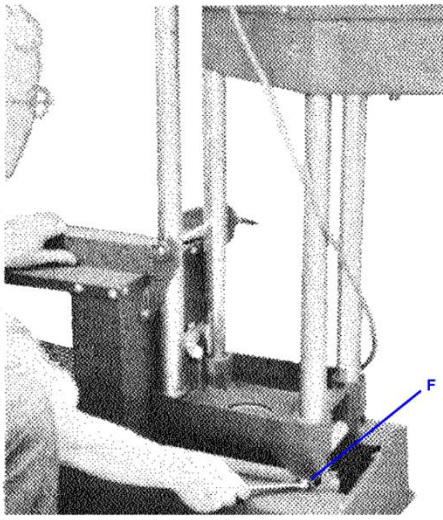


Fig. 12

10. **Install rear panel.** Unfold sawdust vacuum bag and lay it on inside of rear panel so that bag matches panel and inlet tube of bag lines up with large flanged hole in panel. Tuck tube about one inch through hole and spread it so that one end of the short hose can be inserted. Make sure bag is still square with panel and secure it by pushing hose adapter into panel hole, thereby sealing hose to bag tube. Mount rear panel with hose at upper left corner, (Fig. 13) using the two #6 plastic head thumb screws and Tinnerman nuts. Rest bottom of bag on rear rail.

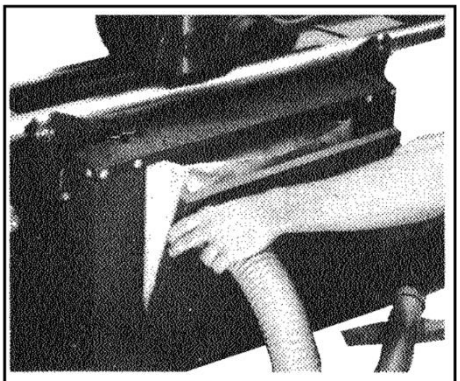


Fig. 13

11. **Connect discharge hose**. Plug other end of hose into impeller outlet duct opening ("G", Fig. 14). On some units the duct has two outlets, one direct and one offset ("H"). The offset opening allows vacuum to be used when carriage is next to headstock. Plug unused hole with push-in plastic cap provided.

12. **Connect vacuum hose**. Plug long hose into impeller housing inlet ("J", Fig. 14) and your machine is ready to run.

BEFORE OPERATING YOUR SHOPSMITH MAKE THE ACCURACY CHECKS WHICH FOLLOW IMMEDIATELY ON NEXT PAGE

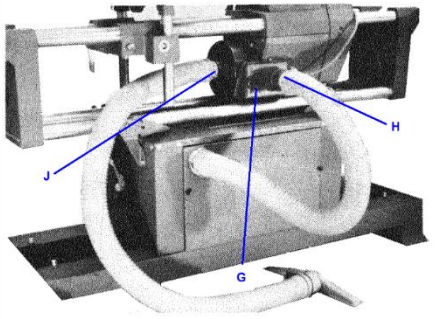


Fig. 14

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 for checking.

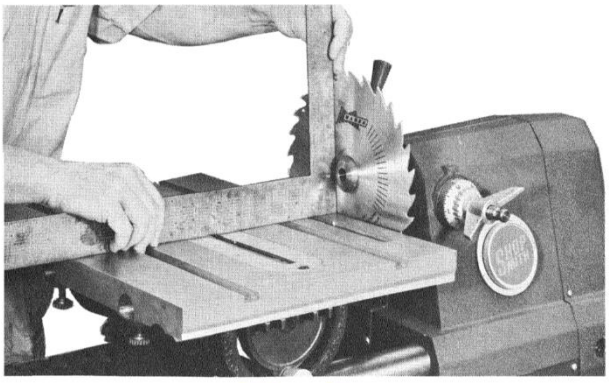


Fig. 15

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 1/8" away from the saw blade. Be sure the square used for checking rests flat against the blade and that it seats between the teeth.

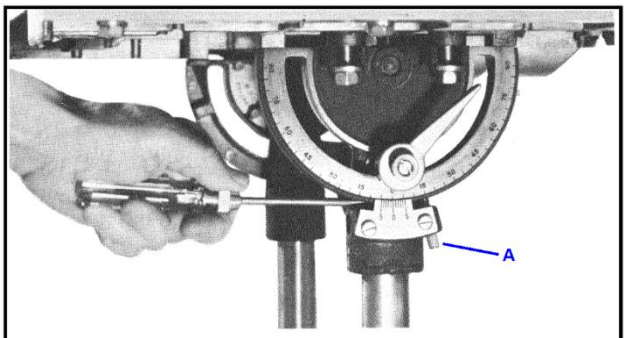


Fig. 16

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

Loosen table tilt lock and pull out trunnion plunger ("A", Fig. 16). Set table at exactly 90 degrees and secure table tilt lock. Push in plunger turn auto - stop set screw until it just bears against plunger (Fig. 16). Adjust trunnion vernier plate until middle calibration is lined up exactly with "0" mark on trunnion.

Pull out plunger and tilt table to the right until middle calibration on trunnion vernier plate lines up exactly with 45 degree mark on trunnion. Lock table. Push in plunger and adjust auto-stop 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 miter gauge in either slot and clamp Allen wrench to its face so that it extends just enough to touch one tooth of the blade set In direction of miter gauge (Fig. 17). Mark tooth with a pencil or chalk. (Miter gauge stop rod, if available, may be used in place of Allen wrench.) Rotate saw blade backwards by hand until that SAME tooth is at rear of the insert slot.

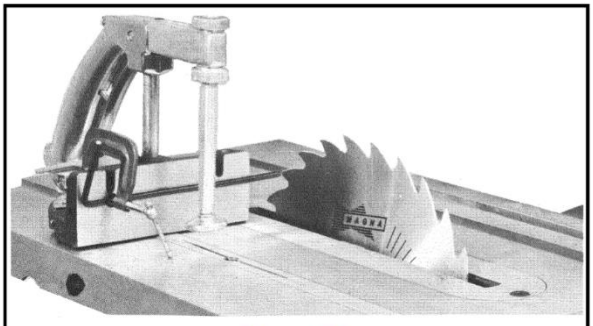


Fig. 17

Move the miter gauge ahead and check to see if Allen wrench just barely touches that same tooth (Fig 18).

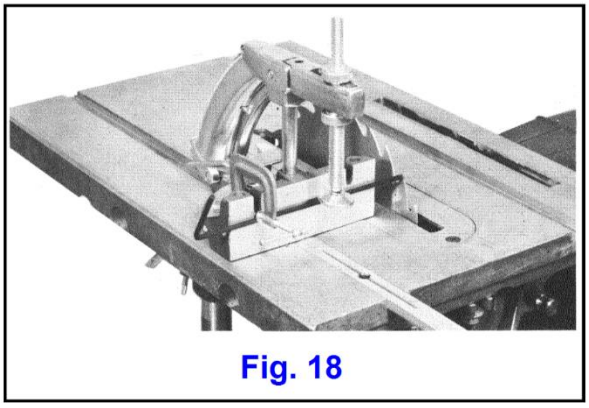


Fig. 18

IF TABLE SLOTS ARE NOT PARALLEL TO SAW BLADE

Loosen four hex head cap screws which secure table to trunnions (No, 20, Fig. 26). Do not loosen more than one full turn. Tap table lightly with hammer handle or wood block to "rotate" it into correct alignment (Fig. 19).

Before tightening screws, check for extension table alignment, step 5. Lock by tightening the four cap screws, turning each one a small amount, then repeat until each is secure.

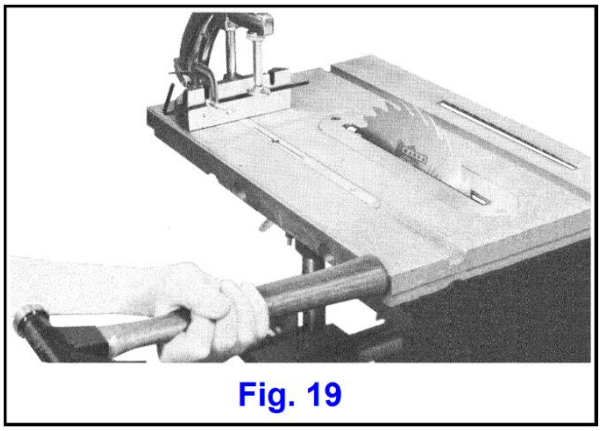


Fig. 19

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 (Fig. 20). Be sure that one arm of square is held firmly against face of miter gauge and the other is flush against side of the second table slot.

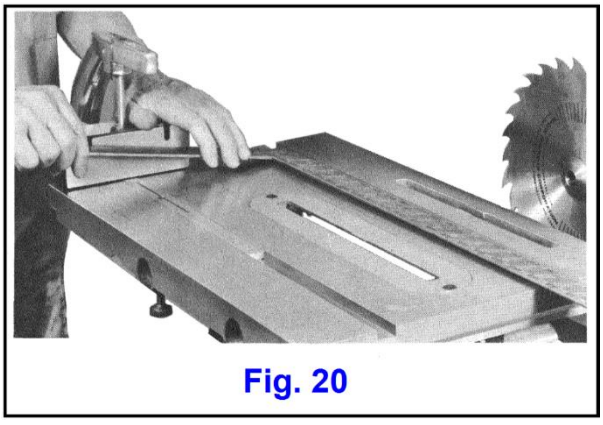


Fig. 20

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

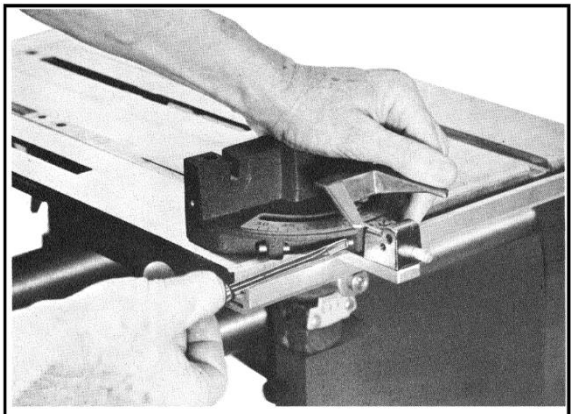


Fig. 21

Raise lock lever and pull out miter gauge plunger (No. 3, Fig. 25). Adjust miter gauge head exactly square to blade and lock in place.' Push in plunger and adjust auto-stop set screw until it just bears against plunger (Fig. 21). Adjust miter gauge vernier plate until middle "calibration is lined up exactly with 90 degree mark on miter gauge.

Unlock 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 45 degree auto-stop 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 rip fence on table, positioned so that one side of fence is flush with one side of either table slot.

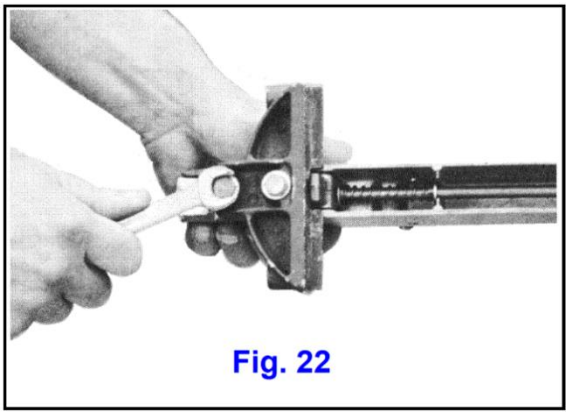


Fig. 22

IF RIP FENCE IS NOT EXACTLY PARALLEL TO TABLE SLOTS

Loosen the two cap screws which secure fence to base casting (Fig. 22). By feeling with finger tips at both ends of fence, set fence exactly parallel to either table slot (Fig. 23) and lock by depressing locking handle. Retighten the two cap screws while fence is locked in position.

5 THE EXTENSION TABLE MUST BE ALIGNED WITH SAW TABLE

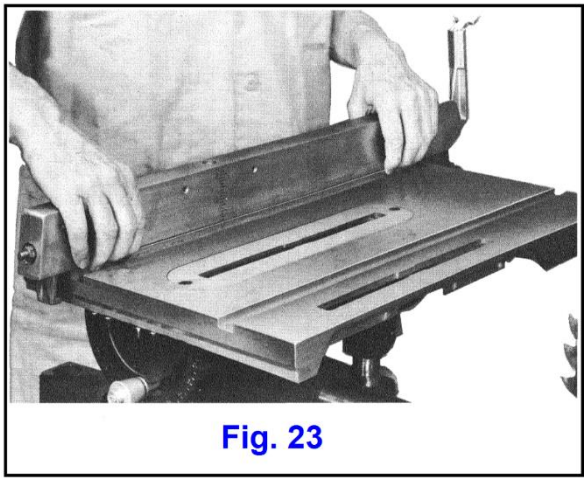


Fig. 23

Check by setting extension table to height of saw table and moving carriage to extreme right end. Place a straight edge across front edges of table bars (Fig. 24).

IF IT IS NOT IN LINE ACROSS THE FRONT:

Loosen the four cap screws which secure saw table to trunnions (No. 20. Fig. 26). Tap saw table forward or back until front edge of table bar is in line with edge of extension table bar. Retighten four cap screws turning each a small amount until all four are secure. Recheck saw table for alignment with saw blade as covered by step 2.

IF IT IS NOT PARALLEL TO MAIN TABLE AFTER ABOVE CHECKS

Loosen the four set screws holding the end cap (part 501542) to way and bed tubes. Tap the end cap out on front edge and in on rear edge, or vice versa as required, until tables are parallel. Tighten all our set screws securely.

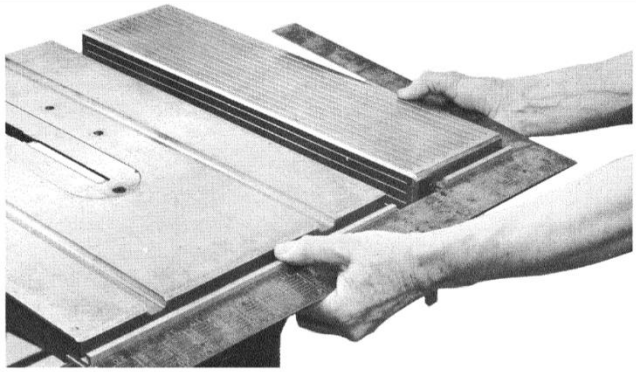


Fig. 24

SHOPSMITH 10-INCH SAW

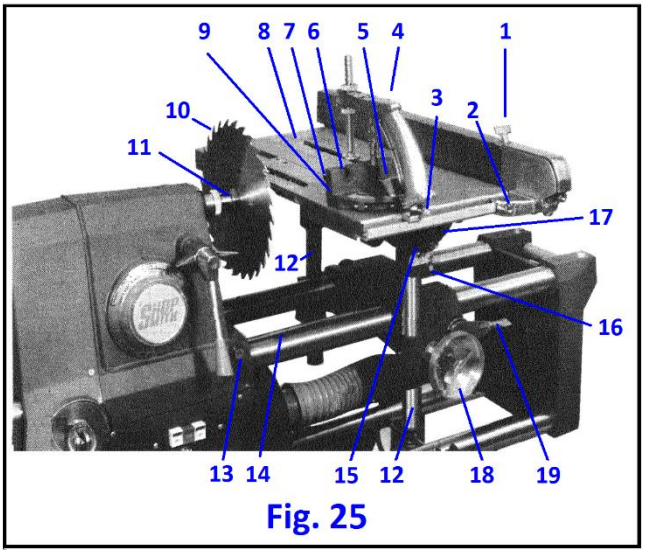


Fig. 25

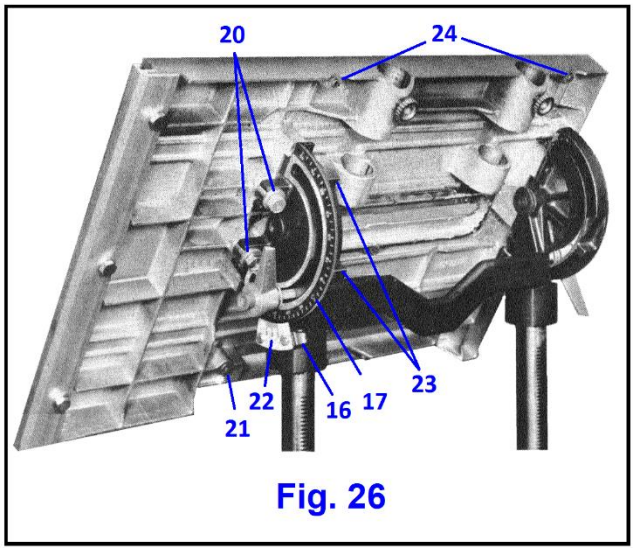


Fig. 26

NOMENCLATURE

1. **Rip fence lock handle** - Depressing handle into fence automatically squares fence to table and locks it front and rear.
2. **Angling screws** - To set fence slightly out of parallel, for special set ups or operations, without disturbing basic parallel setting of fence.
3. **Miter gauge plunger** - Pin against which auto-stop set screws bear at 45, 90 and 45 degrees.
4. **Safety grip** - Provides safe, positive grip for square or angle cuts.
5. **Miter gauge lock** - Locks miter gauge settings.
6. **Miter gauge extension slots** - For mounting miter gauge extensions.
7. **Miter gauge lock screw** - Locks miter gauge in table slot for jig setting.
8. **Insert** - Removable insert is coined and “bowed" for accurate, flush fit; integral projections prevent saw blade cutting insert.
9. **Stop rod holes** - Permit mounting of miter gauge stop rods for duplicate cutting.
10. **Saw blade** - 10" all-purpose blade furnished. Always mounted on main spindle.
11. **Saw arbor** - 1-1/4" - Blade stays mounted on arbor - Tools can be changed in seconds
12. **Table tubes** - Rack cut for raising or lowering table.
13. **Inter latch release** - Pushing button releases latch. Pulling button engages latch.
14. **Inter latch rod** - Latches carriage to headstock at sawing position for either table slot.
15. **Table tilt locks** - Lock table at any angular setting, both front and rear- for heavy work.
16. **Trunnion plunger** - Pin against which auto-stop set screws bear at 0 and 45 degrees.
17. **Trunnion** - Guides table through tilt range - calibrated for angular settings.
18. **Table height control** - Turn wheel crank to raise or lower table. Turn wing nut in center to lock or unlock height setting.
19. **Carriage lock** - One quarter turn clockwise locks carriage in any position along tubes.
20. **Cap screws** - Hold table to trunnions front and rear. Loosen for table alignment.
21. **Table auto-stop screws for drill press** - Adjustable Nylok set screws provide automatic 90 degree setting.
22. **Trunnion vernier plate** - Adjustable, stamped plate for tilting table to exact degree.
23. **Trunnion auto-stop set screws** – Adjustable Nylok set screws afford automatic settings at most used angular settings.
24. **Table auto-stop screws** - for shaper operations.

HOW TO USE THE TABLE SAW

POSITIONING THE POWER HEAD

The power head, or headstock, is positioned along the way tubes by turning the traverse and lock crank (No. 3, Fig. 2) and is locked at any point by folding the crank over so that its finger knob is turned inward.

For quick positioning of power head, release the lock and turn traverse release lever (No. 4, Fig. 2) to vertical. Power head can now be pushed along ways. To re-engage traverse gearing, return release lever to horizontal and turn traverse crank until clutch engages.

CAUTION - Always keep the traverse engaged when unit is tilted to vertical, as for drill press or shaper operations.

MOUNTING THE SAW BLADE

The 10" saw blade mounts on the special 1-1/4' saw blade arbor. Remove arbor nut by turning it clockwise. Thread is left hand so nut will tend to tighten as saw turns in forward direction.

CAUTION: DO NOT run spindle in reverse as arbor nut will loosen. Hold arbor with flats pointing toward your left. Slip on saw blade with teeth pointing in your direction (Fig. 27). Replace nut and finger tighten by turning counterclockwise. Place arbor on spindle with set screw positioned over tapered flat and lock in place with Allen wrench. Hold arbor flats with one wrench and arbor nut with special wrench provided (No. 12, Fig. 3) and tighten.

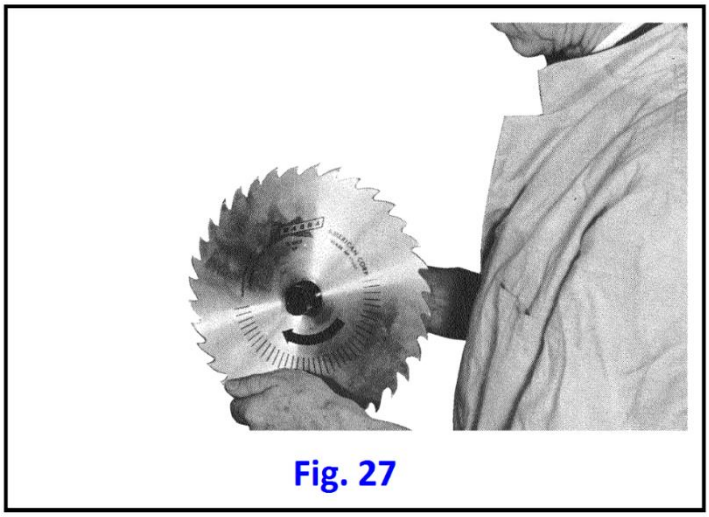


Fig. 27

Assembling the Saw on Saw Arbor

All spindle attachments should be positioned with the locking set 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 blade from arbor loosen arbor nut while arbor is still mounted on spindle or remove arbor and grip 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 SHOP-SMITH 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.

POSITIONING THE TABLE

Rack table to its highest point and lock. Slide carriage toward headstock until headstock and carriage inter-latch catches in first notch for using table edge slot, or second notch for center slot. Pushing inter-latch button (No. 13, Fig. 25) renders latch inoperative until button is pulled out again. Lower table and saw blade should be approximately centered in slot.

If blade is not centered in slot when inter-latch is engaged, adjust by loosening locknut on inter-latch rod and screwing rod in or out as required. (Fig. 28). Retighten locknut.

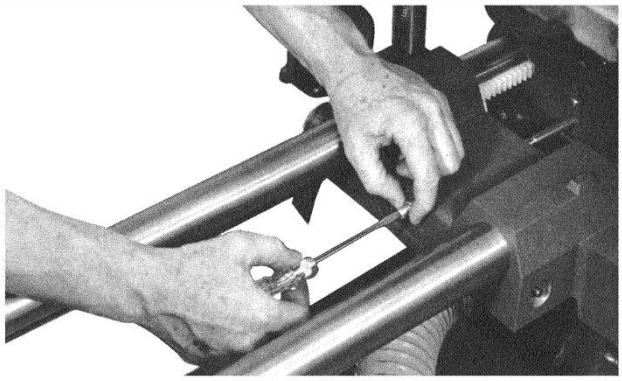


Fig. 28

Adjusting Inter-latch setting

BLADE PROJECTION

Avoid extremes in blade projection above work. For flat ground blades, 1/4" to 1/2" or exposure to deepest gullet of blade, is safe and efficient. With hollow ground blades exposure should be at least 3/4".

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 rip fence. Bring fence close to blade and lock in position. Raise or lower table until cutting tool height is correct (Fig. 29). This exclusive SHOPSMITH feature guarantees accurate depth of cut since it is not affected by blade sharpening, various blade sizes, etc.

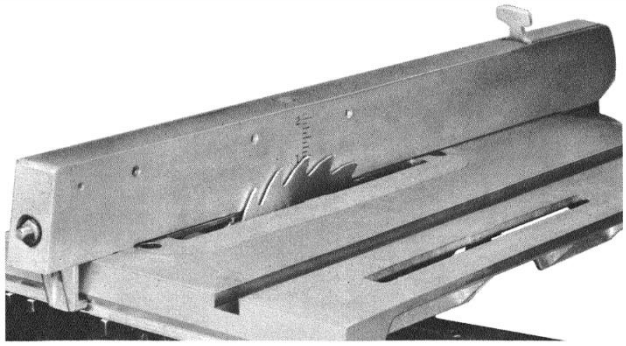


Fig. 29

Using Rip Fence Scale to adjust blade height

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 1/8" of the setting required. Lock the fence and make the final, critical adjustment by advancing the quill (Fig. 30) and locking it in position with the quill lock.

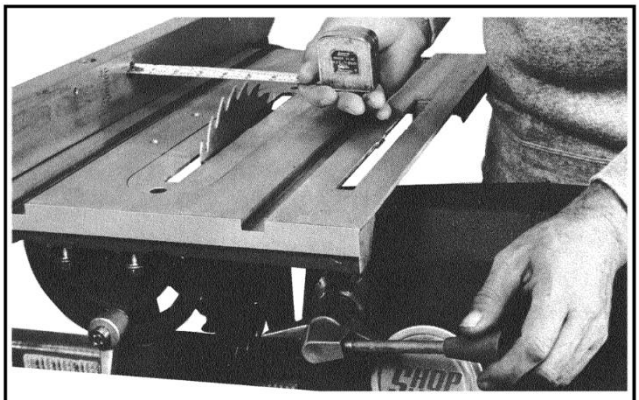


Fig. 30

Using Quill Feed for blade to fence setting

CROSSCUTTING

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

If the miter gauge is used without the safety grip, hands should be placed on miter gauge as shown (Fig. 31), 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.

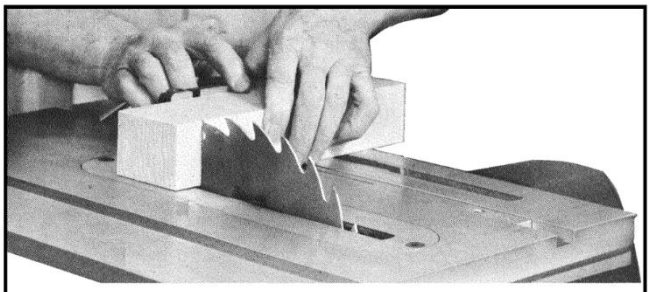


Fig. 31

Correct use of Miter Gauge when crosscutting

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, keep hands in same position and return work and miter gauge to the starting point. Never attempt to remove the cutoff until you have switched off the machine and the blade has stopped turning. This takes but a second and will avoid accidents.

MITER GAUGE SAFETY GRIP

A MAGNA exclusive, this revolutionary miter gauge hold down is a useful, practical device that is furnished as a standard item with the SHOPSMITH MARK VII. 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. You can do cross-cutting, mitering, cross beveling, etc., easier, safer and with more accuracy than ever before possible. 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 quickly done since the SHOPSMITH MARK VII miter gauge is designed for the hold down, this item will prove so useful you will never remove it.

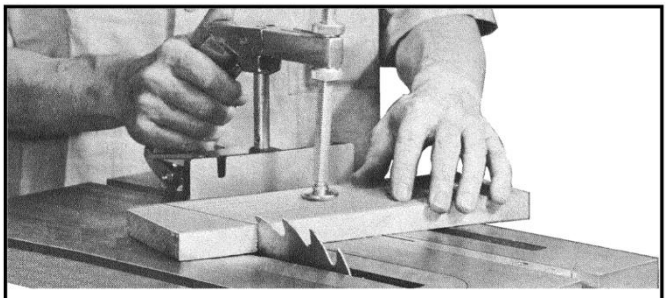


Fig. 32

Safety Grip provides accuracy as well as safety

Take out the slotted screw and its spacer washer from the bottom corner of the grip. Screw the threaded stud into the 3/8-16 tapped hole in the top of miter gauge, while fitting bottom of grip over miter gauge indicator mount. Tighten stud with Allen wrench through cross hole. Install slotted screw and spacer washer. Washer should be on right hand side.

MITER CUTS

Miter cuts (Fig. 32) are made like crosscuts 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 is especially useful on cuts of this nature.

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.

Instead, clamp a stop block to the rip fence as shown in Fig. 33. The block 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.

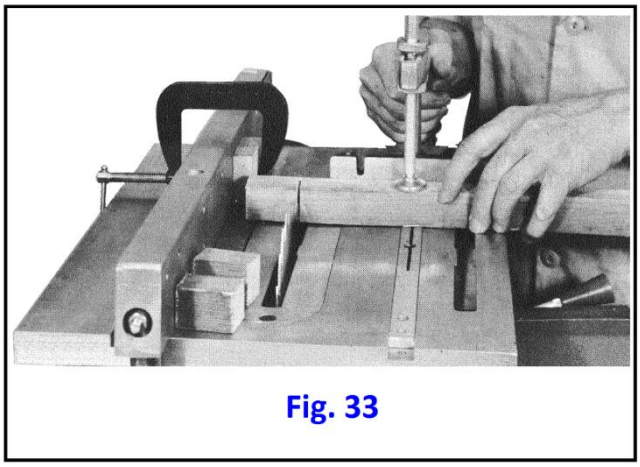


Fig. 33

Duplicate Cutting - Stop Block clamped to Fence

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 (Fig. 34). 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.

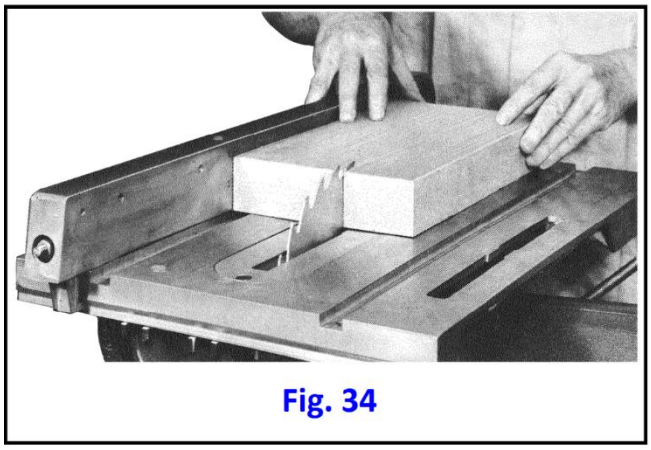


Fig. 34

Hook fingers over Fence when ripping

Cuts which are narrower than 3 or 4 inches should never be pushed through by hand. Always use a push stick (Fig. 35). You may, if the work is long, start the cut by hand but the last six inches should be pushed through with the stick.

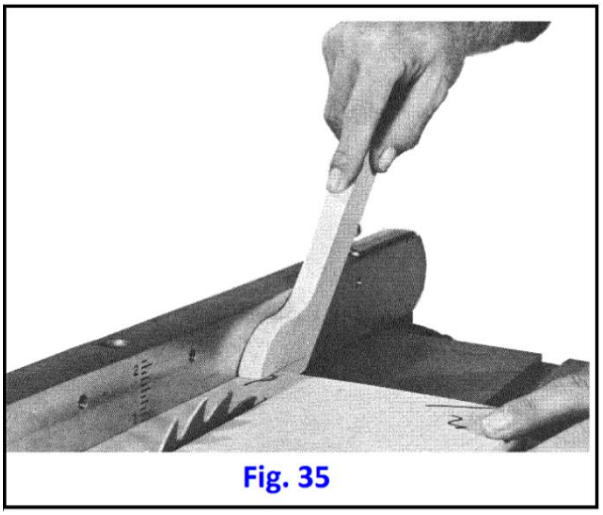


Fig. 35

Use a Push Stick on narrow cuts

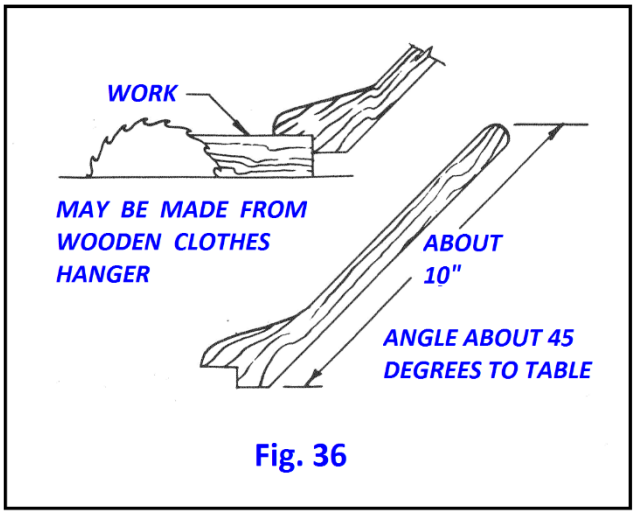


Fig. 36

Construction details of Push Stick

Push sticks are very easy to make (Fig. 36) and should be kept handy for use at all times.

BEVEL RIPPING

Bevel rip cuts are accomplished by tilting the table to the right to the angle needed, locking it in place and making the pass as you would for a normal rip cut (Fig. 37). 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.

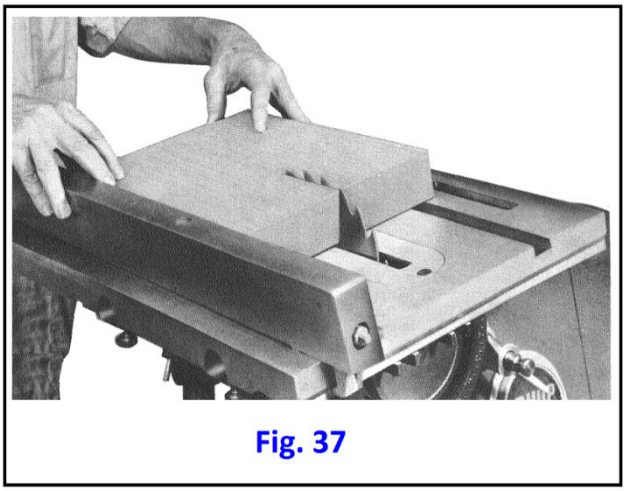


Fig. 37

Hand and body position on Bevel Rip Cut

To tilt to 45 degrees, pull plunger out and tilt table to the right to maximum setting, then push in plunger and return table until 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.

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 work piece is long, lock the headstock and table at the right end of the way tubes (Fig. 38). Length of work is then limited only by the distance between floor and ceiling.

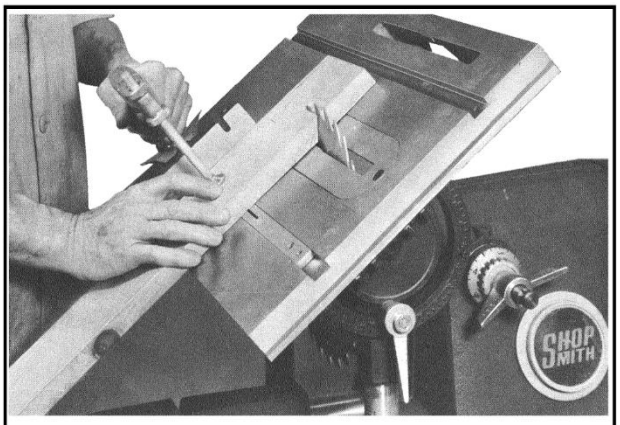


Fig. 38

Cross Bevel Cut - Saw at right end of tubes

COMPOUND ANGLE CUTS

Any type of framework with slanting sides requires a combination of miter gauge setting and table tilt (Fig. 39). 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.

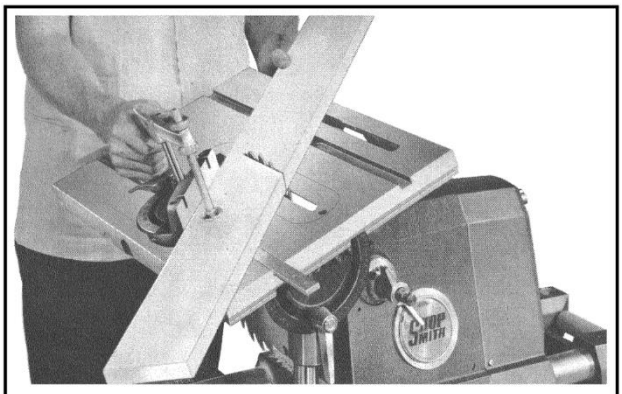


Fig. 39

Compound angle is combination Miter and Bevel

THE EXTENSION TABLE

The SHOPSMITH extension table provides additional support when crosscutting long pieces and affords a maximum blade-to-fence dimension of 48" (Fig. 40). 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 (Fig. 41).

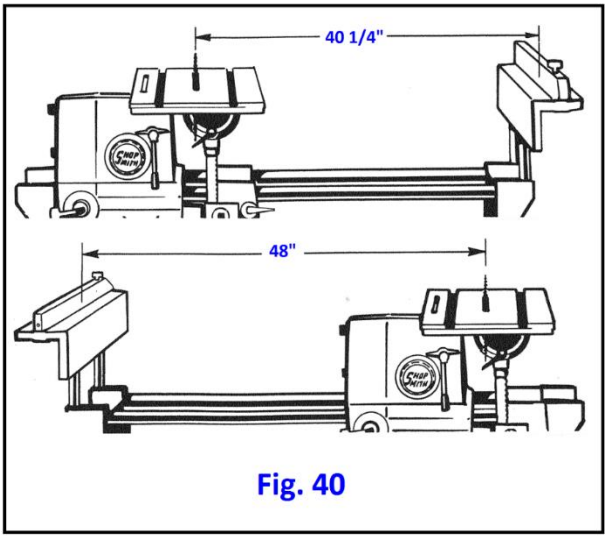


Fig. 40

SHOPSMITH MARK VII Table Saw Capacities

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.

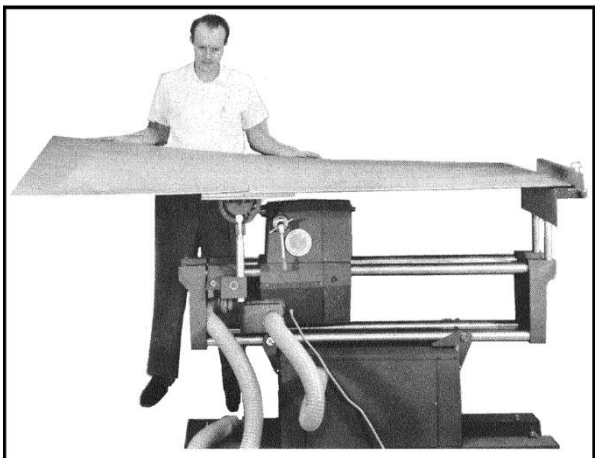


Fig. 41

Plywood Panels are easy to cut on SHOPSMITH MARK VII

SAW BLADES

Most woodworkers like to have a full assortment of blades on hand (Fig. 42), and use each for the job it was designed to do.

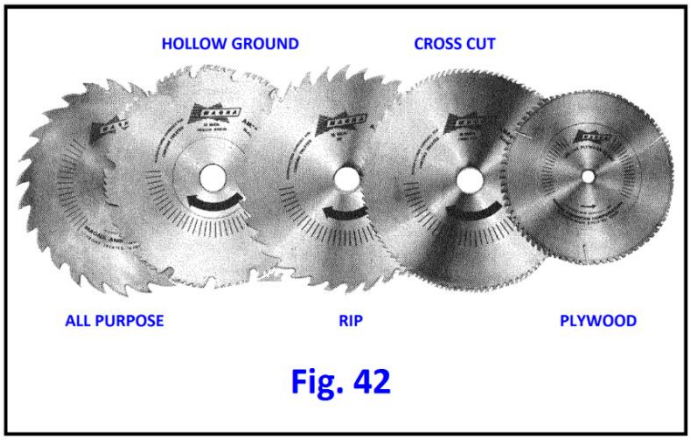


Fig. 42

SHOPSMITH MARK VII Saw Blades

The standard SHOPSMITH MARK VII blade is a 10" **All-Purpose** type 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 H**ollow Ground Blade**. This is usually the choice for a second blade. It should never be used for rough sizing cuts and should always be set so that it projects about 3/4" above the work.

The R**ip Blade** 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 Blade**, 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 Blade** is especially designed to make smooth, splinter free cuts in all plywood sawing.

ARBORS

Arbors (Fig. 43) are economically priced so that SHOPSMITH owners can make it a rule to 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 1-1/4" arbor is used with 9" and 10" saw blades. The 5/8" arbor is used for mounting smaller saw blades and other accessories with a 5/8" arbor hole. The 1/2" arbor is used with accessories having a 1/2" arbor hole. SINCE THE SHOPSMITH MARK VII IS REVERSIBLE USE ONLY ARBORS HAVING A KEYWAY AND TONGUED WASHER (Item Nos. 505505 and 505506). Ordinary arbors are not recommended but may be used on the main spindle only and in forward direction.

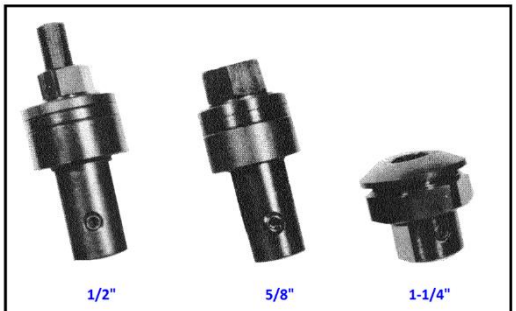


Fig. 43

Mount each Accessory on its own arbor

DADO TOOLS

A wide, recessed cut designed to take the edge of a board is cut with a dado. Of the two types available (Fig. 44) the MAGNA Dado is the most popular. It has a special extra heavy blade which cuts a normal kerf 5/32"wide and is infinitely adjustable to a maximum of 7/8". Any width cut in between is possible with a simple Allen wrench adjustment. SPEED-DIAL is engraved to indicate proper speed for MAGNA Dado use.

The 6" Dado Assembly is a standard tool which employs two outside blades and a set of inside chip-pers. The size of the groove is determined by the number and size of the chippers used between the blades.

Either dado tool must be used with a special Dado Insert which replaces the saw blade insert.

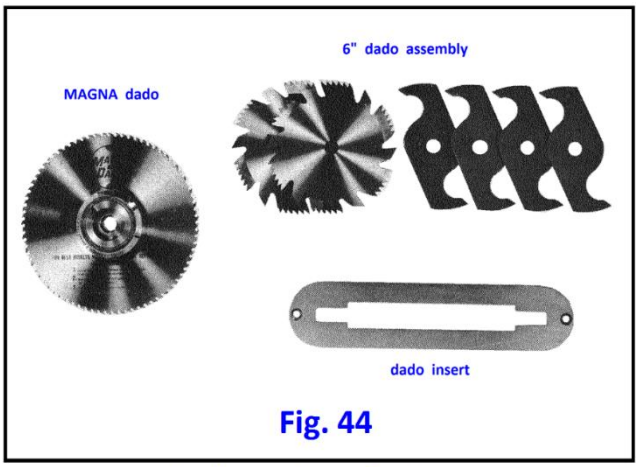


Fig. 44

Accessories for cutting Dado, Grooves, etc.

Always check tool clearance by turning by hand before making any cuts with a dado.

MAGNA MOLDER

The MAGNA Molder (Fig. 45) makes it possible to do edge 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 MAGNA Molder mounts directly on the SHOPSMITH spindle. Molding table insert must be used.

Here are some of the jobs you can do with the MAGNA 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 (Fig. 46) and many other operations which would be tedious or difficult to do otherwise.

Always check tool clearance by rotating by hand before making any cut with a molder.

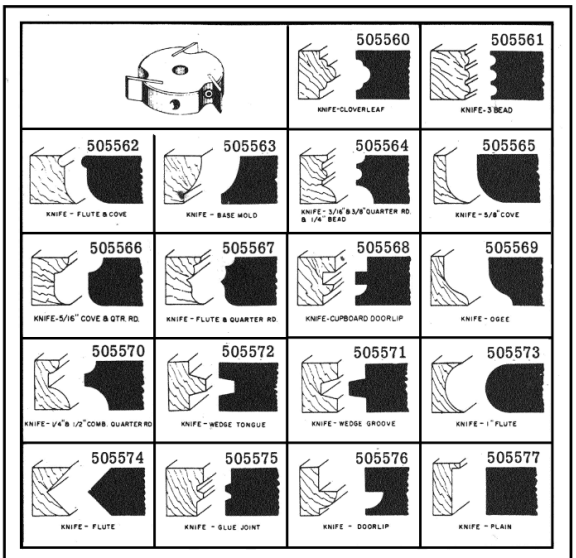


Fig. 45

Profiles of Magna Molder cutters

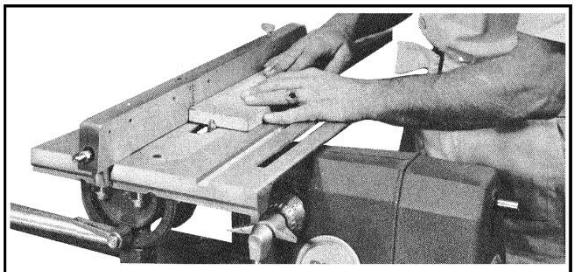


Fig. 46

Surface cutting with Molder

SAW GUARDS-OPTIONAL

The SHOPSMITH lower sawdust collector/guard fits under table and encloses the saw blade beneath the table, providing also a sawdust chute for attaching the MARK VH vacuum hose (Fig. 47) for virtually dust free operation. (Item No. 505705)

The Upper Saw Guard mounts on the lower sawdust collector/guard and provides a splitter to keep the kerf from closing and binding the blade, anti-kickback fingers to prevent blade from throwing the work back toward the operator, and a self-adjusting blade guard above the table. (Item No. 505627)

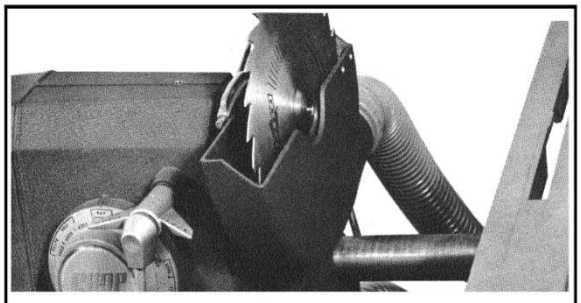


Fig. 47

Collector / Guard mounts on Mark VII quill

MITER GAUGE EXTENSION

The miter gauge extension 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 it as a guide for positioning work for cross-cutting. (Item No. 505630)

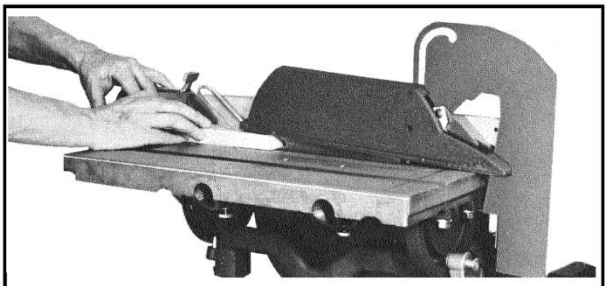


Fig. 48

Upper Saw Guard is raised by work approaching blade

SHOPSMITH 16 1/2 INCH DRILL PRESS

NOMENCLATURE

1. **Quill feed lever** - May be used on either side of headstock. Positions radially merely by .unscrewing a few turns.
2. **Feed stop** - Turning clockwise locks setting for controlled depth drilling.
3. **Depth control dial** - Dial to depth setting required. Setting locked with feed stop.
4. **Drill chuck** - Three jaw chuck for drills and tools with shanks from 5/64" to l/2" diameter.
5. **Quill lock** - Turning clockwise locks quill in any extended position for routing, shaping, and many other operations.
6. **Safety latch** - Holds SHOPSMITH in vertical drill press position.

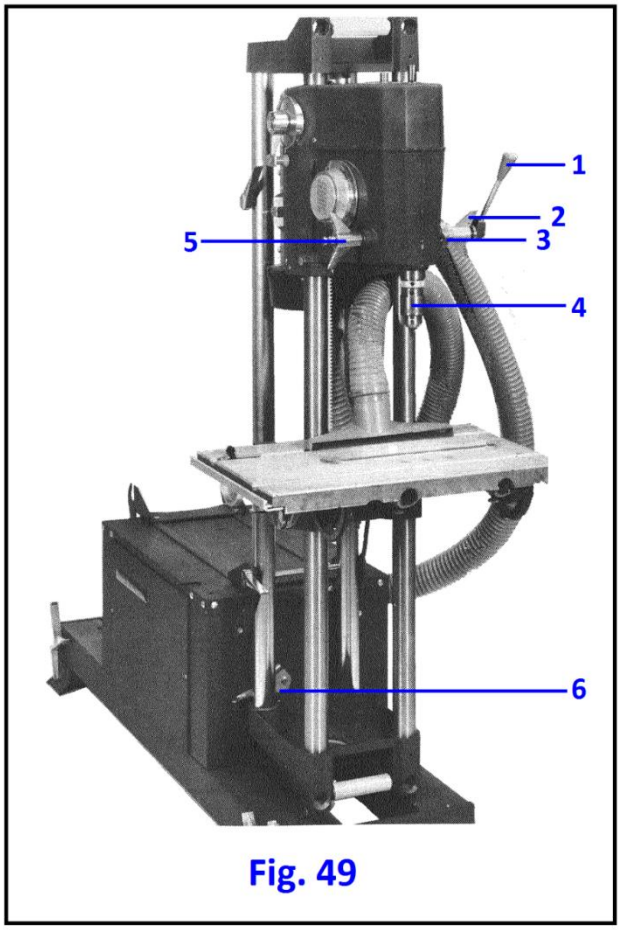


Fig. 49

SHOPSMITH MARK VII Vertical Drill Press

HOW TO USE THE DRILL PRESS

SETTING UP

Raise table to highest point and tilt to the left until two stop screws (No. 21, Fig. 26) underneath table rest on tubes. Secure setting with table tilt locks and use a square to check the angle of the table to the way tubes. If it is not exactly 90 degrees, the two stop screws must be adjusted so they will serve as automatic stops. Use the Allen wrench and 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 VII in vertical drill press position.

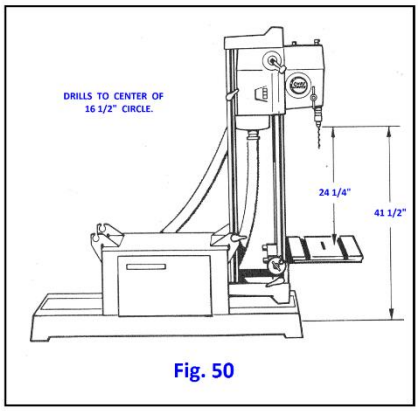


Fig. 50

SHOPSMITH MARK VII Vertical Drill Capacities

Lock the carriage at a point about 15 inches from right end. Lock the headstock so that there is about 10 inches between spindle and table. BE SURE BOTH HEADSTOCK AND CARRIAGE ARE LOCKED SECURELY.

Lift up left hand trunnion lock lever and then, gripping tubes behind headstock, lift SHOPSMITH to vertical position. Lock safety latch.

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

DRILLING

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 the work and the table (Fig. 51).

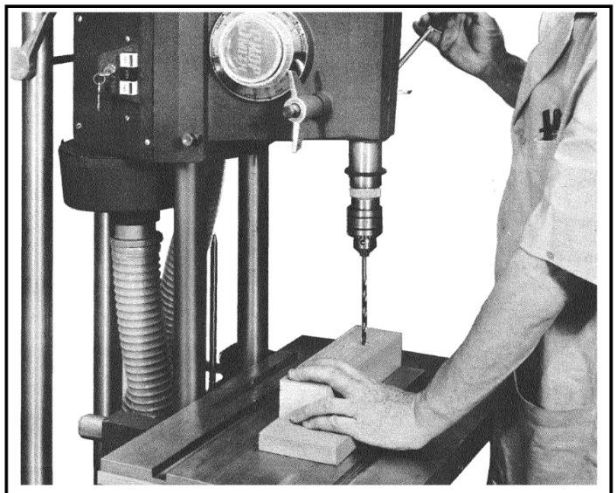


Fig. 51

Using Scrap Block between work and table

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

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 (Fig. 52) 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.

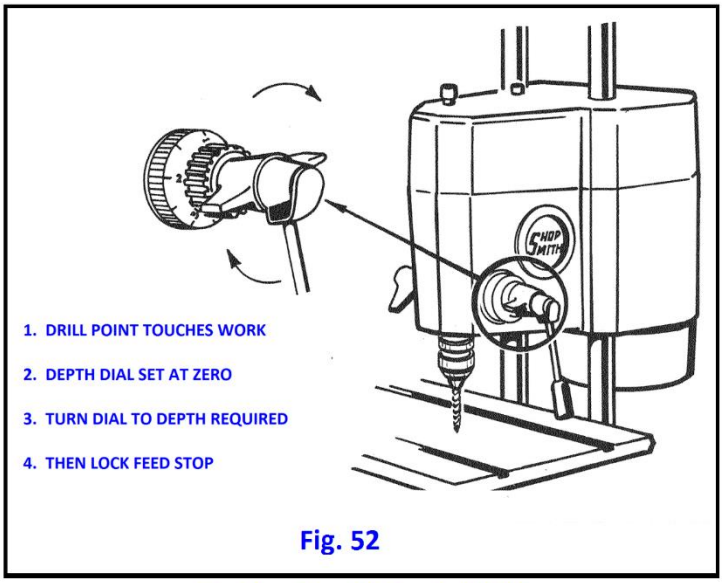


Fig. 52

Setting Depth Control Dial

PARALLEL DRILLING

The rip fence is an excellent guide for maintaining edge distance on a series of equal holes. (Fig. 53) 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 SHOPSMITH 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.

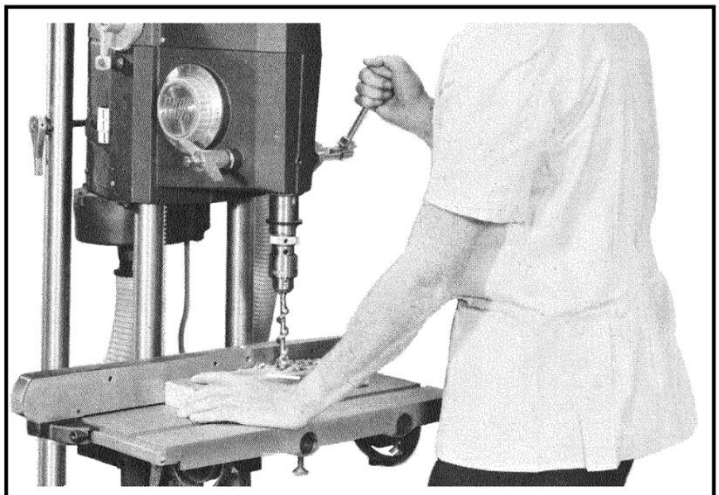


Fig. 53

Using Rip Fence for parallel drilling

JIG DRILLING

The rip fence and miter gauge may be utilized as jigs for duplicate drilling (Fig. 54). 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 so that no clamps are needed. Then place each piece in position and drill the hole.

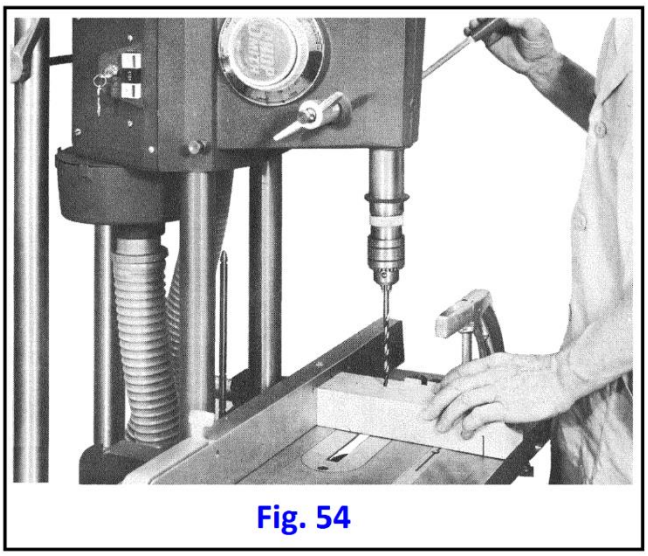


Fig. 54

Using Miter Gauge and Rip Fence as a jig

FLOOR MODEL DRILL PRESS

SHOPSMITH 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. Mortising or drilling for door locks is typical of the operations conveniently handled with this set up. (Fig. 55)

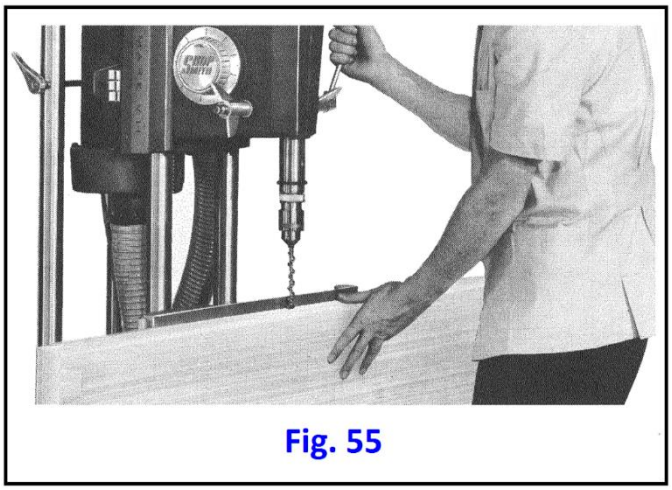


Fig. 55

V-BLOCK DRILLING

Diametrical holes are easily drilled on SHOPSMITH 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. (Fig. 56) The V-block both holds the work and positions it for accurate drilling.

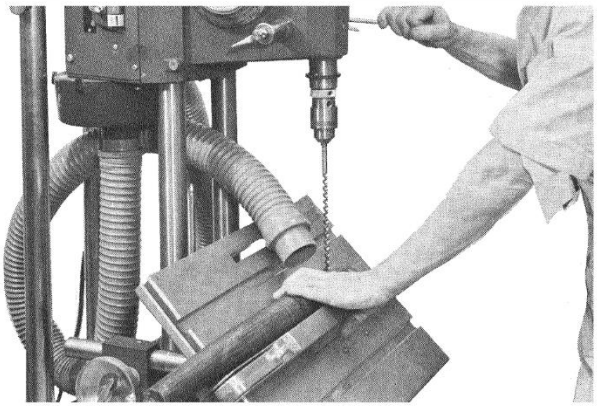


Fig. 56

V-Block Jig for drilling round stock

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 (Fig. 57). 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. MAGNA mortising chisel and bit sets are available in sizes from 1/4" to 1/2".

The mortising attachment (Item No. 505623) is easily attached to the quill collar and is needed to hold and position the square mortising chisel. The hold down (Item No. 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.

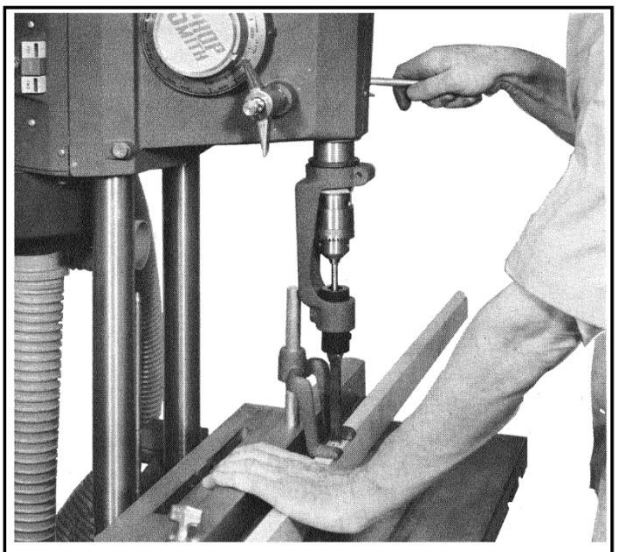


Fig. 57

Cutting a Mortise

SHOPSMITH MARK VII SHAPER

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

SETTING UP

Raise table to highest point and tilt table to the right until two stop screws underneath table (No. 24, Fig. 26) rest against tubes. Secure setting with table tilt lock and use a square to check the angle of the table to the way tubes. If it is not exactly 90 degrees, the two stop screws must be adjusted so they will serve as automatic stops. Use the Allen wrench and thread the screws in or out until the angle is correct. This check should be made the first time you set up the SHOPSMITH MARK VII in the vertical shaper position.

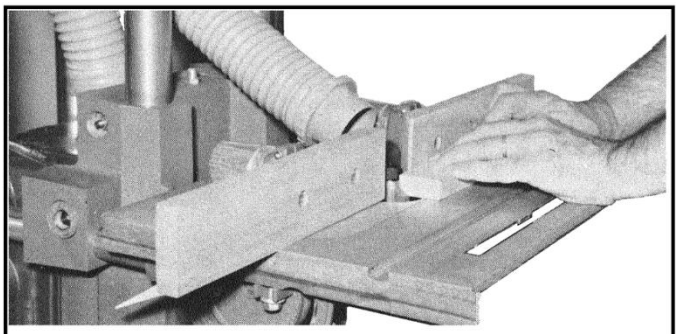


Fig. 58

Shaper Fence in use

Move carriage to its closest position to the head-stock. Position headstock and carriage at about midpoint on the ways and lock headstock and carriage.

Lower table until it rests against the stop boss at rear of the carriage. Lock the table. Release right hand trunnion lock lever and lift SHOPSMITH to left hand vertical position. Lock safety latch.

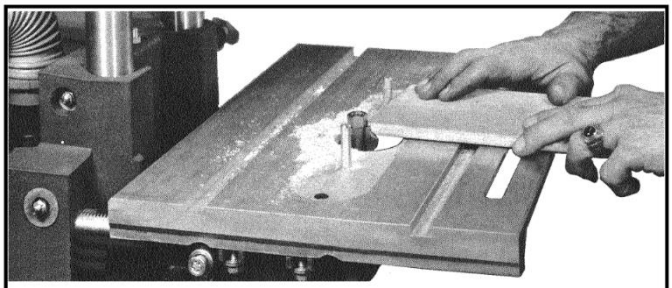


Fig. 59

Shaping curved stock with Shaper-Insert

The SHOPSMITH Shaper Fence (Item No. 505508) is by far the best in the field. It is a strong unit with extra-long hardwood fences and exclusive infeed fence screw adjustments with spring "clickers" which indicate every 1/64" of adjustment.

The special Shaper Insert, furnished with your MARK VII, which is used with the fence is actually a tool in itself since it permits freehand shaping against collars on inside or outside curves (Fig. 59). Removable fulcrum pins are supplied to provide bearing surface at the start and end of each cut.

The 1/2" universal arbor, furnished with your MARK VII, is used as an adapter to mount three-lip shaper cutters on the spindle. Shaper collars are used as depth control guides when shaping freehand and also as spacers between cutters.

A good assortment of three-lip Shaper Cutters is available. (Fig. 60) 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.

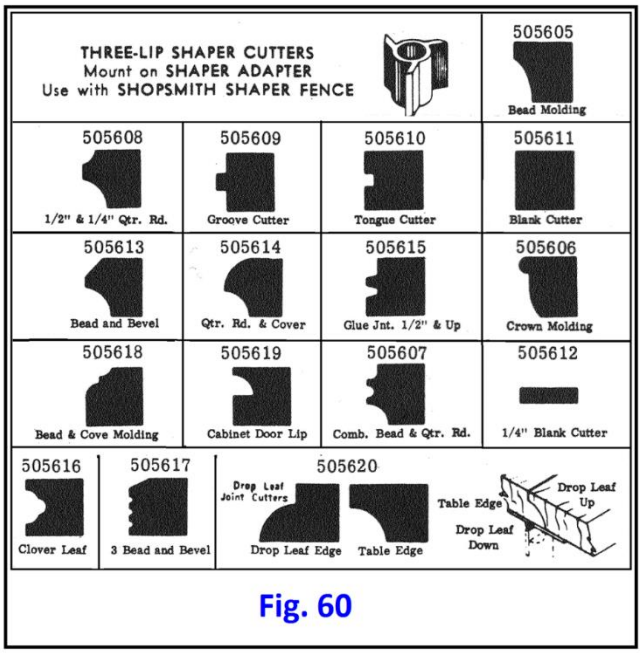


Fig. 60

Profiles of 3- lip Shaper Cutters

ROUTING WITH SHOPSMITH

SHOPSMITH makes it easy to do routing operations. The rip fence is an excellent guide for straight routing (Fig. 61). SHOPSMTH'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 only in the special router chuck. (Item No. 505597)

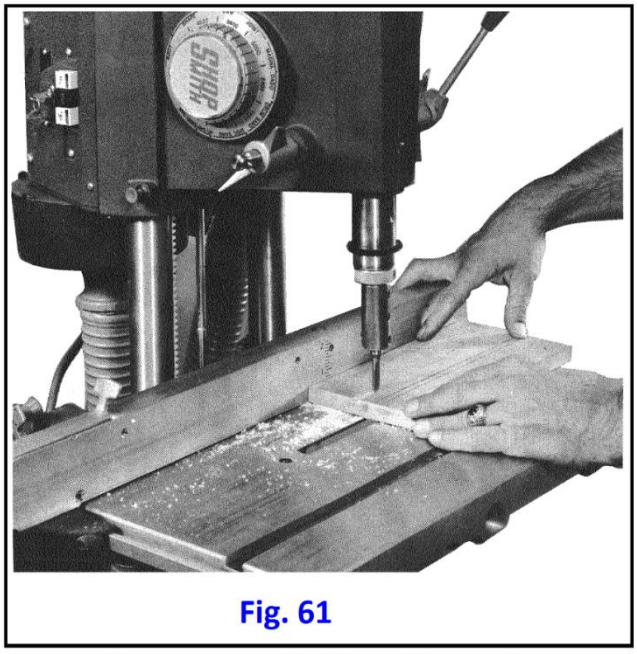


Fig. 61

Rip Fence as a guide for straight routing

SHOPSMITH HORIZONTAL DRILL

SHOPSMITH gives you the only adequate horizontal drill press available in the home workshop 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 DRILL

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

DRILLING FOR BUTT DOWEL JOINTS

Drilling edge holes for a butt dowel joint is easily accomplished in wide or narrow boards with the setup shown in Fig. 62. 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.

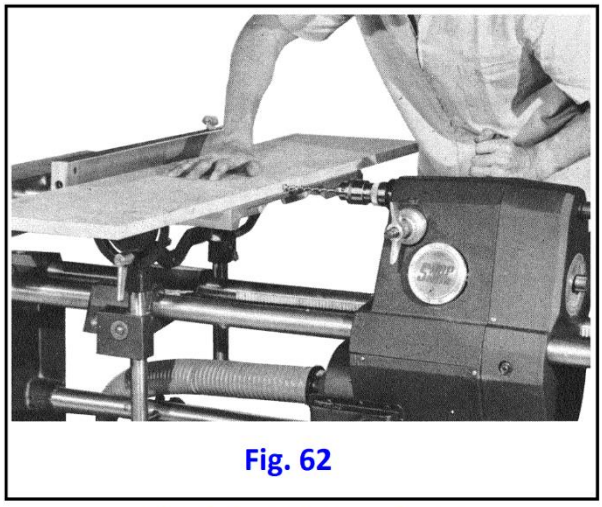


Fig. 62

Drilling 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 (Fig. 63). 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.

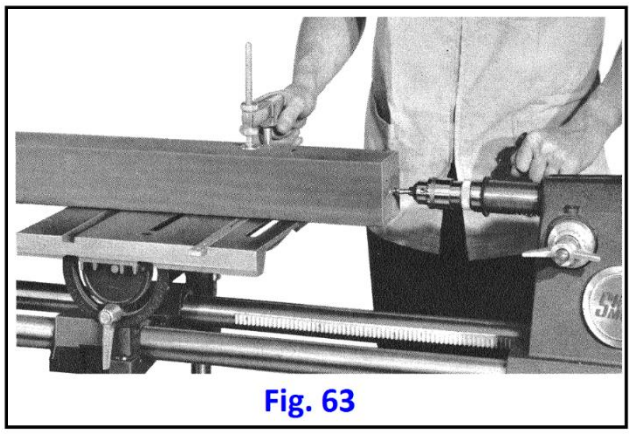


Fig. 63

Drilling end hole in horizontal position

JIG DRILLING

Figure 64 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.

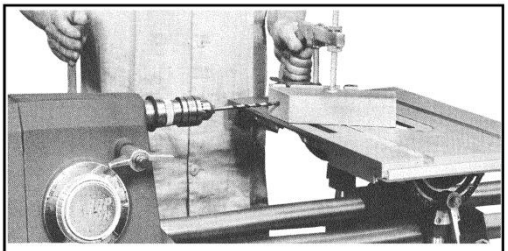


Fig. 64

Locked Miter Gauge is jig for drilling miter

CONCENTRIC DRILLING

Concentric holes needed in lamp bases and similar projects are easily drilled as shown in Figure 65.

The tailstock and cup center (see section on THE LATHE) are mounted in the right hand power mount holes. 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.

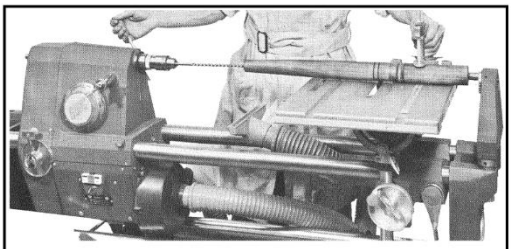


Fig. 65

To set up for Concentric Drilling

OTHER OPERATIONS WITH HORIZONTAL SPINDLE

Auxiliary operations usually performed on a "Polishing Head", with its own separate stand and motor and limited capacity, can be done better on SHOPSMITH. With MARK VII 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 complementary tools. Not only the traditional saw-jointer setup (Fig. 66) but other worthwhile combinations.

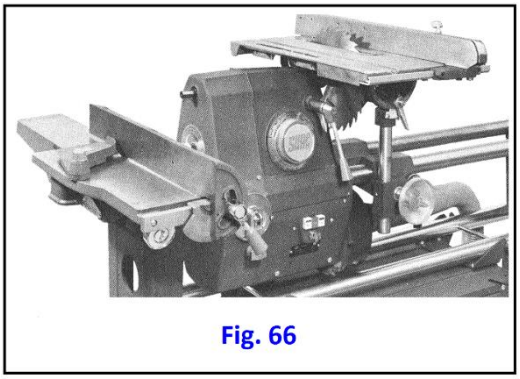


Fig. 66

Saw-Jointer Combination

When mounting accessories on the MARK VII spindles be sure to use arbors with a keyway and tongued washer - Item Nos. 505506 (5/8" arbor) and 505505 (1/2" 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 unless rotation of the spindle for the particular application is counterclockwise when viewed from the shaft end.

Before mounting combinations check operational speeds of each. The Rubber Bonded Abrasive Wheel mounted on the rear spindle is very useful for keeping lathe chisels sharp as you are turning BUT BE SURE THE LATHE TURNUP DOES NOTI 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, with a different grit paper, on the upper auxiliary spindle using the extension table to support the work. (Fig. 67)

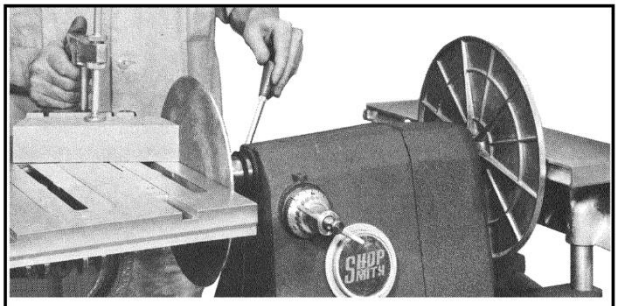


Fig. 67

Dual Sanding on SHOPSMITH MARK VII

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. (Fig. 68) Encrusted kitchen utensils can be cleaned by wire brushing and items like golf clubs easily refinished.

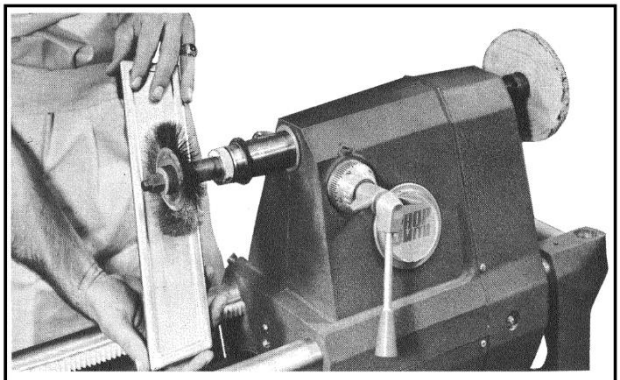


Fig. 68

Wire brushing metal surface

POLISHING AND BUFFING

Accessories are locally available which enable you to do a quick, easy job of such household chores as putting a high shine on the family shoes. Plastics and metals may be cleaned and polished by using a buffing wheel, polishing pad or bonnet. The polishing bonnet is made so it can be used over the drum sander. The polishing pad fits neatly over the 6" face plate.

RUBBER BONDED ABRASIVE WHEEL

The rubber bonded abrasive wheel (Item No. 505579) is an excellent tool for putting a keen, sharp edge on plane blades, kitchen knives, scissors, etc.; and for touching up lathe chisels while you are turning. (Fig. 69) IT SHOULD NOT BE USED FOR DIMENSIONAL GRINDING OPERATIONS.

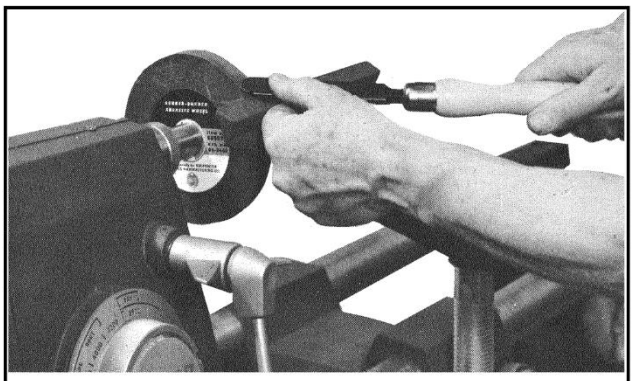


Fig. 69

The ideal Honing Tool

CAUTION - ALWAYS OPERATE SANDING, POLISHING, CLEANING AND SHARPENING TOOLS AT RECOMMENDED SPEEDS AND ALWAYS WEAR SAFETY GOGGLES. STAND ASIDE SO THAT YOU WILL NOT BE IN LINE WITH THE TURNING TOOL, PROTECT SHOPSMITH TUBES FROM DIRT AND GRIT WITH A FIRE PROOF MATERIAL OR A METAL PLATE.

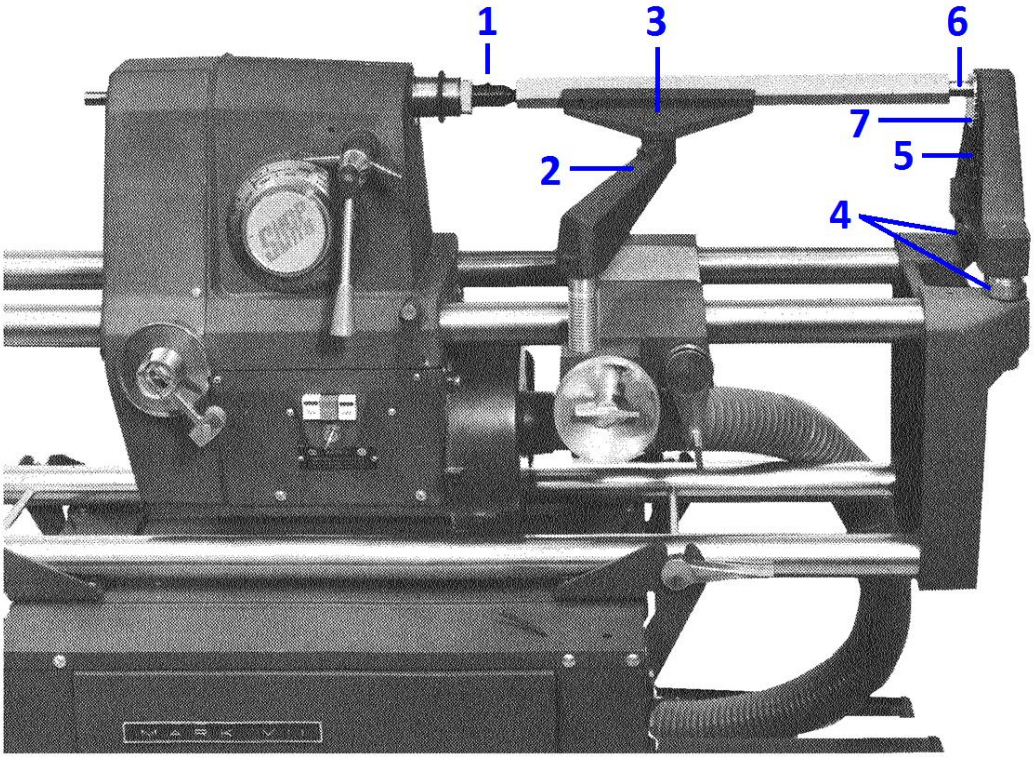


Fig. 70

SHOPSMITH MARK VII

SHOPSMITH 16 1/2 INCH BY 34 INCH LATHE

NOMENCLATURE

1. **Drive center** - Attaches to spindle - has point for centering work; spurs for non-slip grip.
2. **Tool rest arm** - Supports tool rest - rack adjustable up or down - swings 360 degrees.
3. **Tool rest** - Locks in tool rest arm - used as guide and support for lathe chisels - swings 360 degrees.
4. **Height collars** - Correct tailstock height always maintained after initial setting.
5. **Tailstock** - Locks securely in end cap - supports eccentric cup center mount.
6. **Cup center** - #2 Morse Taper - supports spindle turnings at tailstock end.
7. **Eccentric cup center mount** - Locks in place with Allen screw permits offset turning for tapers.

HOW TO USE THE LATHE

Points on drive and cup centers should be in perfect alignment. To check, bring headstock to right end of way tubes. Extend quill until spur point almost touches cup point. Look down on the points and if they are not in perfect alignment loosen setscrew for eccentric center mount (No. 7, Fig. 70) and turn mount to bring cup center point in line with drive point. Lock cup center mount.

Raise or lower the tailstock to achieve horizontal alignment. When the setting is correct, lock the height collars (No. 4, Fig. 70) on the tailstock tubes.

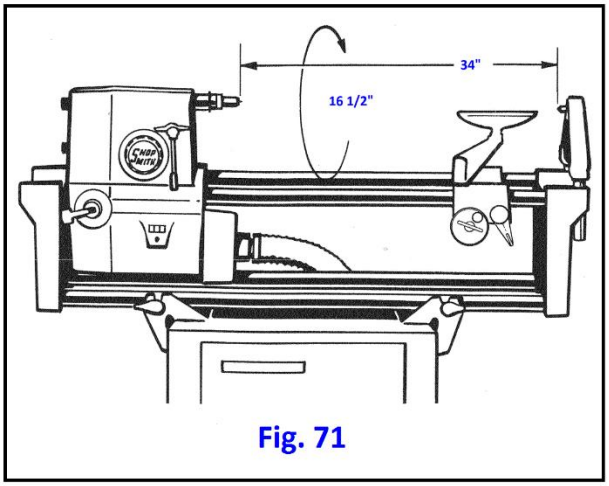


Fig. 71

SHOPSMITH MARK VII Lathe Capacities

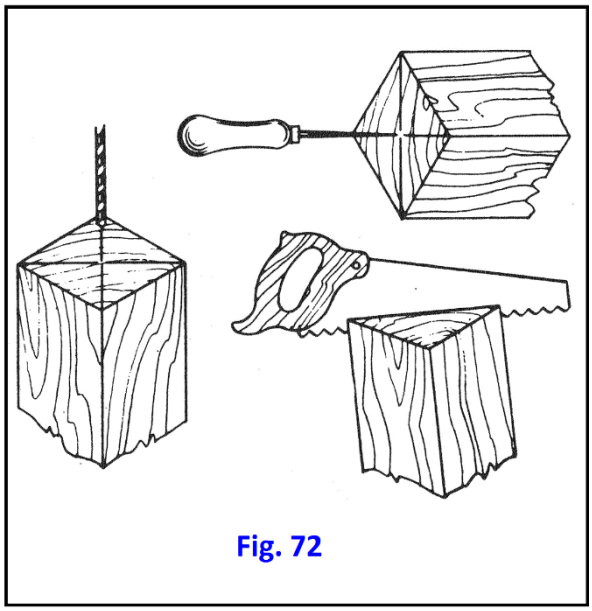


Fig. 72

Marking spindle work for mounting

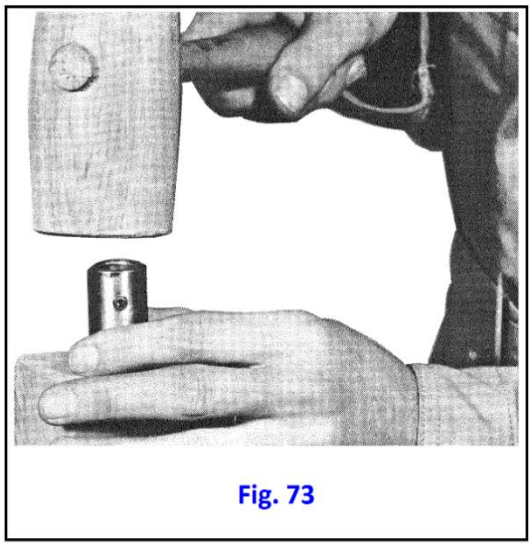


Fig. 73

Setting drive center with mallet

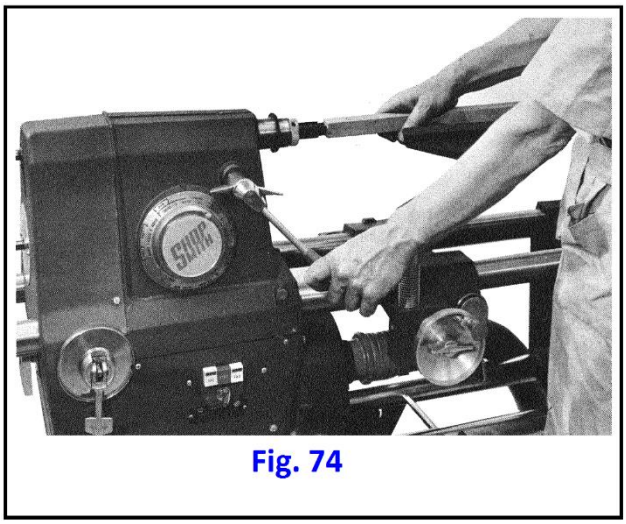


Fig. 74

Extending Quill to mount spindle work

MOUNTING SPINDLE WORK

Stock for spindle turning is usually cut square before it is mounted. , Next step is to draw intersecting diagonals across each end of the stock. (Fig. 72) For soft wood use an awl to form a small hole at each intersection. For hardwood or plastics drill 3/16" diameter hole for tailstock cup center point and make shallow saw cuts for spurs of drive center.

Seat the drive center at one end of the stock by tapping it in place with a mallet (Fig. 73). 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 1/4" away from the other end of the stock. Lock the headstock and advance the quill to engage the work. (Fig. 74) Press the spur solidly in place and then retract the quill enough to smear some beeswax or tallow on the cup center point and cup, in order to eliminate binding and burning of the wood at the cup point. Advance quill again, reseating centers lightly but firmly LOCK QUILL.

Machine oil or cup grease on the stationary center will prevent burning but will stain the work.

ADJUSTING TOOL REST

The tool rest is mounted in the front table tube hole. It is locked in the carriage by the wing nut which locks the table height control.

The tool rest is positioned as shown in Figure 75. 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.

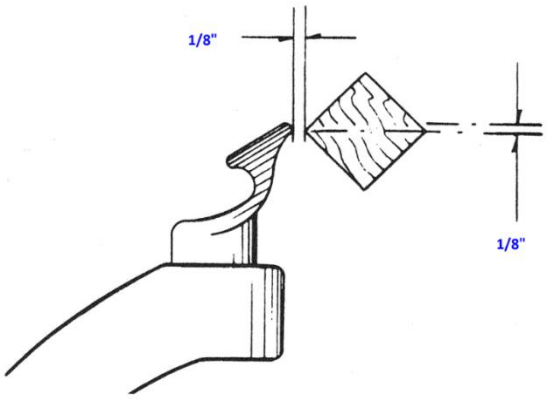


Fig. 75

Proper Position of Tool Rest

OFFSET TURNING

The SHOPSMITH MARK VII 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 1/2". 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 correct alignment.

Clamp the turning tool (the gouge will do a good job) to the top of the tool rest arm (Fig. 76) and situate it for a light cut. Turn on the machine and advance the tool slowly by sliding the carriage. Move the carriage slowly and make successive passes until the taper is complete. Smooth with sandpaper as you would any other turning.

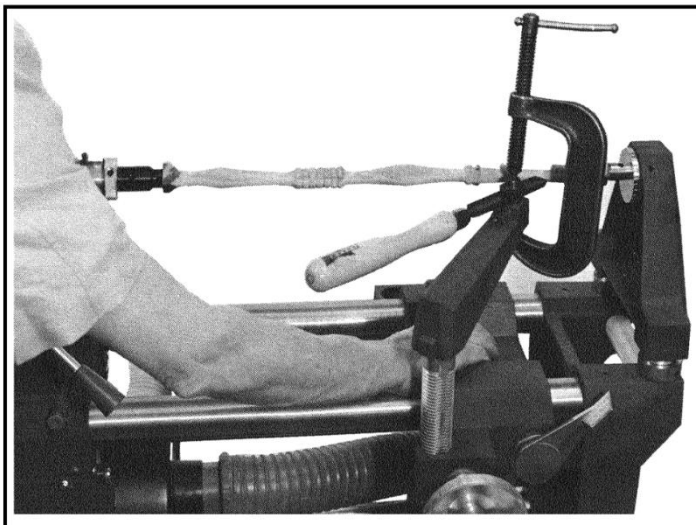


Fig. 76

Accurate tapers are easy on a SHOPSMITH MARK VII

TURNING TOOLS

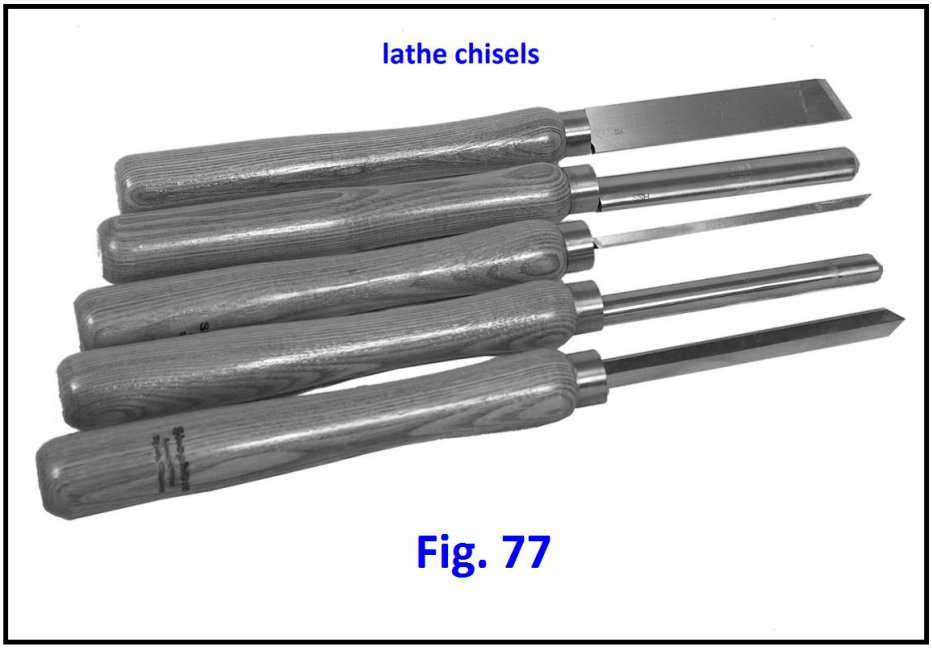


Fig. 77

SHOPSMITH Lathe Turning Tools

SHOPSMITH lathe chisels (Item No. 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 (Fig. 77) and include:

- **1" skew** - For smoothing and finishing surfaces, trimming cuts on ends and shoulders and for V-cuts.
- **3/4" gouge** - For roughing stock from square to round and for preliminary dimensional shaping. Also good for cove cutting.
- **1/4" gouge** - For light roughing cuts, dimensional shaping and smaller cove cuts.
- **1/2" round nose** - All-around tool for inside and outside contours. For hollowing, coving circular grooving and general stock removal. This tool is used for all roughing and finishing operations on face plate turning. Do not use the 3/4"or 1/4" gouges for face plate turning.
- **1/2" parting tool** - Used mostly for dimensional cuts to determine cylinder diameters. Also useful for touching up and cleaning corners and shoulders.

LATHE WORK ACCESSORIES

The **Screw Center** (Item No. 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 Live Center** (Item No. 505602) has a precision ball-bearing tip which turns with the work piece and prevents burning of the stock. It is especially useful for heavy work and for metal spinning operations.

The **Tailstock Chuck Arbor** (Item No. 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 **3-3/4"** and **6"** sizes. (Item Nos. 505590 and 505591) 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 10 INCH DISC SANDER

NOMENCLATURE

1. **10" Double Faced Sanding Disc** - One side conical, other side flat. Affords 78 square inches of sanding area. Attached 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. Unparalleled accuracy for single or duplicate parts because amount of work sanded off can be mechanically controlled with the feed stop.

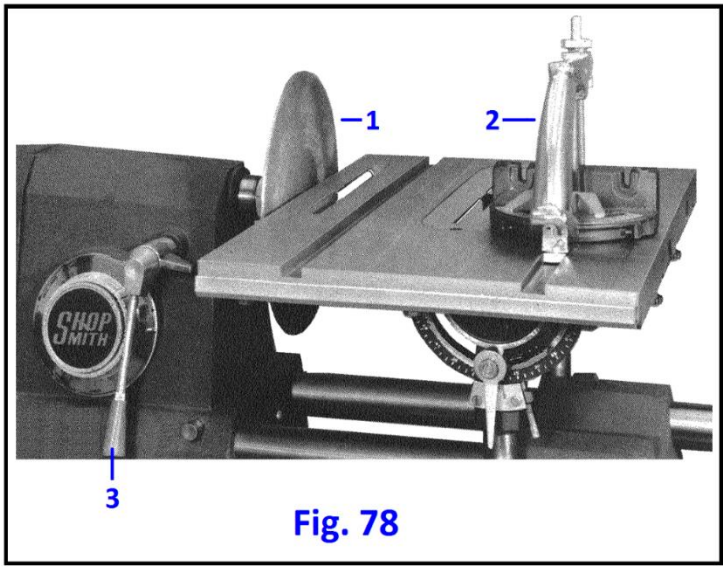


Fig. 78

SHOPSMITH MARK VII Sander

HOW TO USE THE DISC SANDER

ATTACHING SAND PAPER

Liquid Adhesive (Item No. 505554) is applied to both the disc and sandpaper sheet. 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.

Remove old sandpaper and adhesive completely before applying a new sheet.

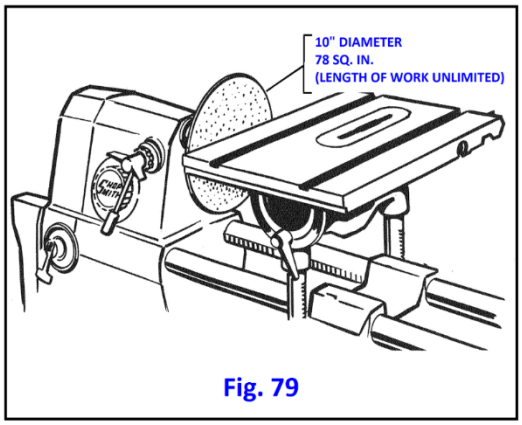


Fig. 79

Disc Sander Capacities

MOUNTING

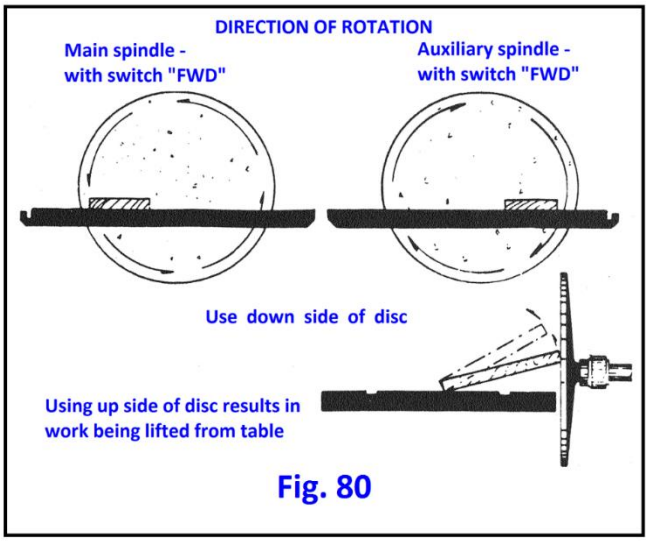
The SHOPSMITH 10" disc can be used on either the main spindle or the upper auxiliary spindle. On the main spindle it can be flat face out or with coned face (hub side) out. Either way around it may be used with the accessory lower saw guard in place for dust collection. On the auxiliary spindle the disc can be mounted only with the flat face out.

Sanding is always done on the "down" side of the disc (Fig. 80). If it is ever necessary to use the "up" 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.

SANDING

Hold the work flat on the table and move it into the turning disc, or quill-feed the disc into the work.

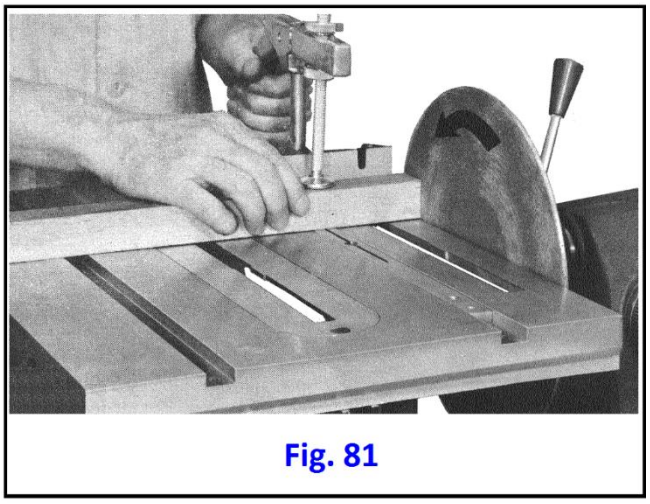
Whenever possible use the miter gauge as a guide. Curved edges are revolved in a sweeping motion. Feed should be light and smooth, even when a great deal of material must be removed. It is better to touch the work to the disc several times than it is to force it against the disc and hold it there. Burned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



Work placement relative to Disc Rotation

END SANDING

Nothing does a cross grain smoothing job like the disc sander, and SHOPSMITH is designed to further this end. Hold the work with the miter gauge and use it as a guide to square the work to the disc. The work may be advanced into the disc (Fig. 81) or it may be grasped firmly against the miter gauge head and the disc fed into it.



Locked Miter Gauge as guide to end sander

SANDING TO LENGTH

Hold the work with miter gauge safety grip and advance quill for fine feed (Fig. 82). Duplicate pieces are quickly and easily sanded to exact length by the following method: Lock the table about 1/2" 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 work piece 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.

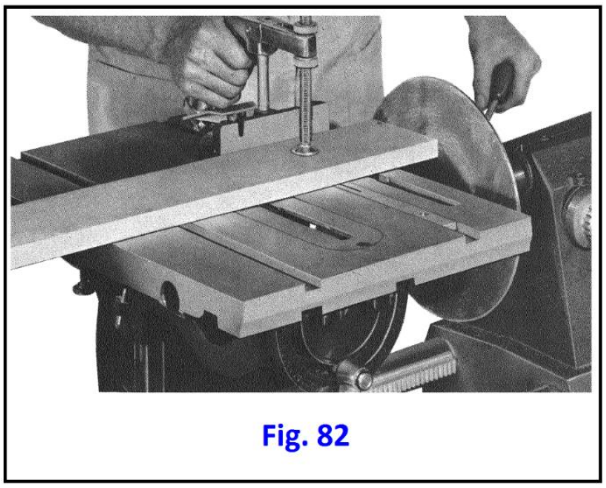


Fig. 82

Quill Feed Disc for sanding to length

MITER SANDING

The best way to get perfect miters is to saw the pieces about 1/16" oversize and sand them to exact length (Fig. 83). Lock the 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.

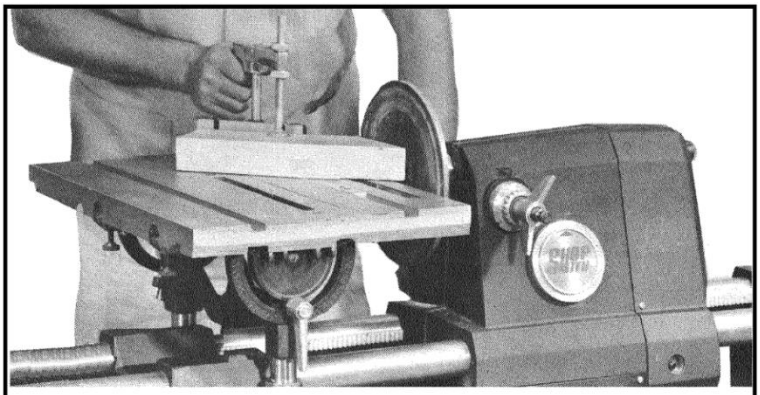


Fig. 83

Lock Miter Gauge as guide for miter sanding

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.

JOINTING ON DISC SANDER - FLAT SIDE

Long straight edges are sanded smooth and square in an operation that combines sanding, jointing and finishing to exact width. Use angling screw (No. 2, Fig. 25) 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 work piece. Angle of the fence should be such to allow contact from outer edge of the disc to just short of the center. With forward rotation of spindle work is fed through FROM THE BACK toward the front of the table while contact is maintained with the fence throughout the pass. Can also be setup for feed from the front if spindle is operated in reverse (Fig. 84). As always, work slowly - do not force the cut. This setup is a very practical method of jointing plywood.

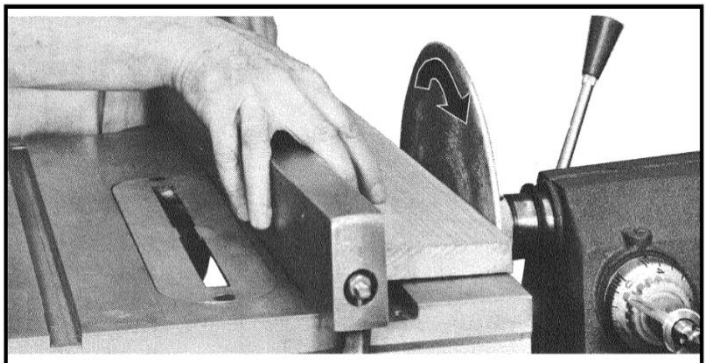


Fig. 84

Edge sanding between Disc and Fence

JOINTING ON DISC SANDER-CONICAL SIDE

1. Square table to taper of conical side of disc. (Fig. 85)

2. Use the fence in normal parallel position for a guide. Determine work dimension by measuring between center line of sander disc and fence. Work is fed through against the rotation of the sander disc.

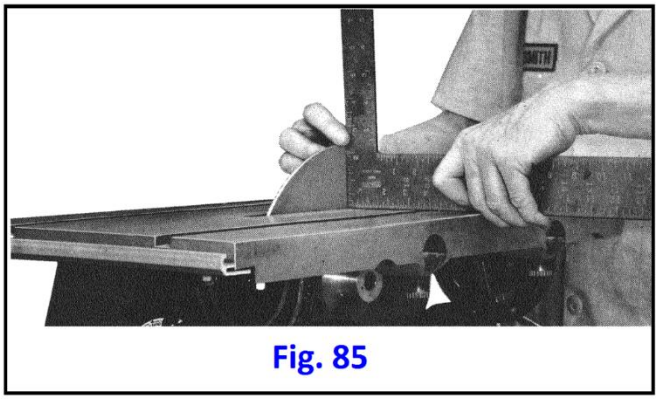


Fig. 85

Squaring Sander Disc taper to table

DRUM SANDER

The drum 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 is used with the drum sander to give support in the area immediately surrounding the drum.

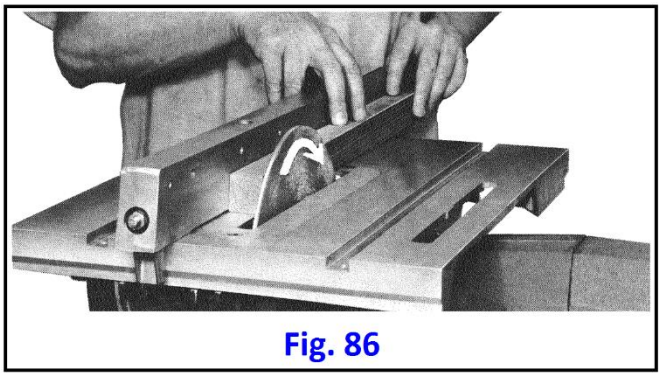


Fig. 86

Jointing on conical side of Sander Disc

SANDPAPER

Sandpaper, in disc form for the disc sander and in sleeves for the drum, is available in course, medium and fine grits. Paper for 10" disc has score mark for removal of center piece for hub clearance on conical side.

SHOPSMITH SPEED CAM-LOCKS

- Cam-locks are provided on the headstock traverse, carriage traverse, fence and miter gauge. Occasionally, adjustment may be desired to provide desired clamping action.
- In all cam-locks except miter gauge the adjustment to increase clamping is made by tightening adjusting nut on clamp rod at rear of machine.
- For miter gauge, remove pistol grip and turn clamping lever clockwise one turn.
- CAUTION: Cam-lock clamping action is very powerful. Excess tightening of the adjusting screw can result in damage to parts.

SHOPSMITH SAFETY RULES

SHOPSMITH MARK VII has the highest safety standards ever built into a home power tool; but

SHOPSMITH is still a machine: it cannot think for you. Do, not stand in line with any cutting or abrading tool.

- Never Rush a job. Correct tool speed is important, but rushing the job is poor craftsmanship. Wear Safety Goggles when abrading and grinding. Do not wear jewelry when working in the shop. Take off your tie, keep sleeves tight around the wrist or above the elbow.
- Using a Push Stick or hold down is good shop procedure.
- Secure All Machine Locks before turning on the machine.
- Check Locks when going to vertical position. Never reach over a machine for a tool. Do not adjust any energized power tool.
- Never Remove a Cutoff from the saw table while the blade is in motion.
- When Sawing, Keep Blade Projection Just High Enough to do the job - avoid the extreme.
- Keep Cutting Tools Sharp.
- Never use the rip fence As a Stop for cutting off duplicate pieces.
- When Ripping, feed with the thumb and two fingers; Keep other Two Fingers hooked over the fence.
- Never operate any tool In Excess of Maximum Recommended Speed.
- Never Cut Freehand on table saw.
- When crosscutting, Use the Miter Gauge--when ripping, Use the Rip Fence.
- Be sure that Inserts are flush with the top of the Table. When inserting, tighten front screw first and then tighten rear screw until insert is flush.

MAINTENANCE AND LUBRICATION

TUBULAR WAYS: Hard chrome plating requires an occasional cleaning with paint thinner followed by an application of Paste Wax rubbed to a polish. Be sure to protect tubes during any abrading operation. This same procedure should be followed with extension table tubes, tailstock tubes and table tubes.

BED TUBES: These are anti-corrosion plated. Occasional waxing will maintain the original appearance.

QUILL: Lock quill in maximum extended position. Apply light coat of grease to rack teeth. Place a few drops of machine oil on top surface of 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 bearing.

CAM-LOCKS: Occasionally apply a drop or two of machine oil on the handle lock thrust washers.

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.

OILING PROCEDURE

SLIDING SHEAVES for SHOPSMITH MARK VII

The SHOPSMITH MARK VII 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. Before oiling, turn Speed-Dial to "Rout-Shape" range. Turn off switch and unplug cord. Use good-quality machine oil (SAE 10 weight). 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.

After oiling start machine and operate through complete speed range several times.

OILING INTERMEDIATE SHAFT

(Fig. 87) Remove nameplate on back of headstock by prying with screwdriver in notch at bottom of metal escutcheon plate (like removing a hub cap). Hand turn spindle until hole in sheave hub can be seen. Place about three drops of oil in hole. Replace nameplate by pressing it on.

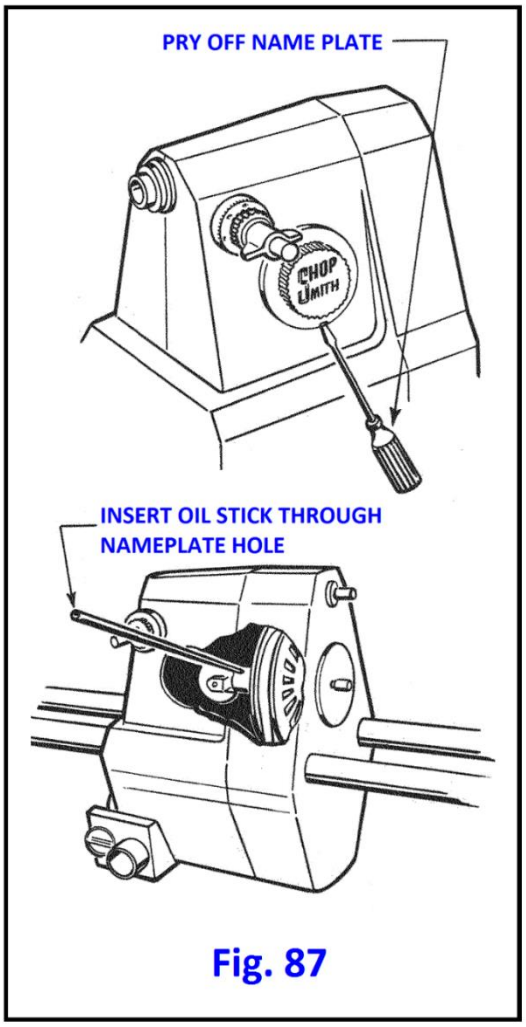


Fig. 87

OILING MOTOR SHAFT (Fig. 88) Remove screws holding Belt Guard to headstock and slide guard along tubes, away from the unit. Hand turn spindle until hole in sleeve hub can be seen. Spread coils of spring with screwdriver and place about three drops of oil in hole. Replace Belt Guard.

IMPORTANT-Remember to Oil about Every Ten Hours Actual Running Time.

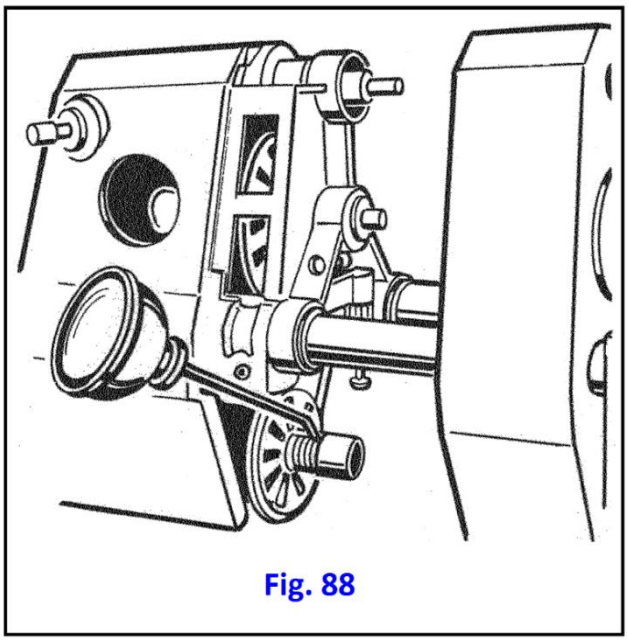


Fig. 88

ADDENDUM 1 - Supplemental information not in original manual

These are things I included that are not part of the original manual, that I thought you might find helpful in your understanding of the Mark VII. Although there are some parts that are common with a Mark V or appear functionally the same, some will interchange, others will not. - Everett

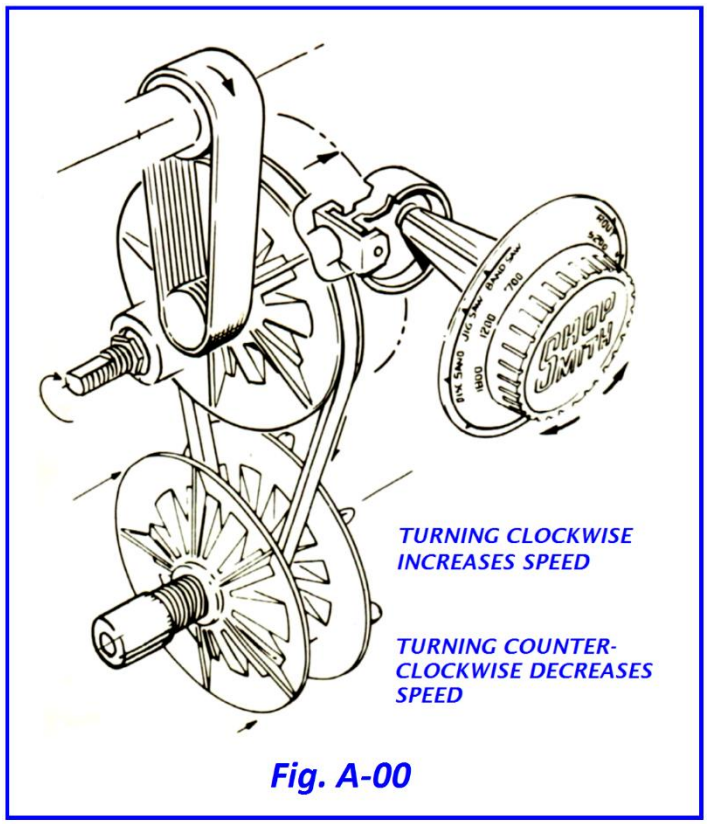


Fig. A-00

Speed Changer Mechanism

Speed Changer Mark VII

An important component definition: The term Sheave or Pulley is often used by sailors, crane operators, mechanics, machinists, and others interchangeably.

Split Sheave Sets – form Variable Pulleys

For reference concerning components in a Shopsmith headstock: split sheave sets form a single variable diameter pulley. Shopsmith calls them sheaves (half-pulleys), and each sheave half may be orderable separately as a replacement part.

This makes the identification of each half of the sheave necessary either to describe each side's function within each assembly for servicing or for ordering replacement parts.

The Mark VII Parts Manual will have 1963 part numbers. If common parts are available today, the part numbers may be different. Call Shopsmith with any questions. They did not make this unit, and may not know. The forum is your friend in these matters.

The speed control mechanism in the Mark VII varies in design from the Mark 5 (Mark V) series. The Cam system as shown proved to be an inferior design and the cam will melt when subjected to extended use especially when not lubricated frequently. There are folks who are recreating these parts in different material. Check the Shopsmith Forums or on eBay.

Table Assembly Nomenclature

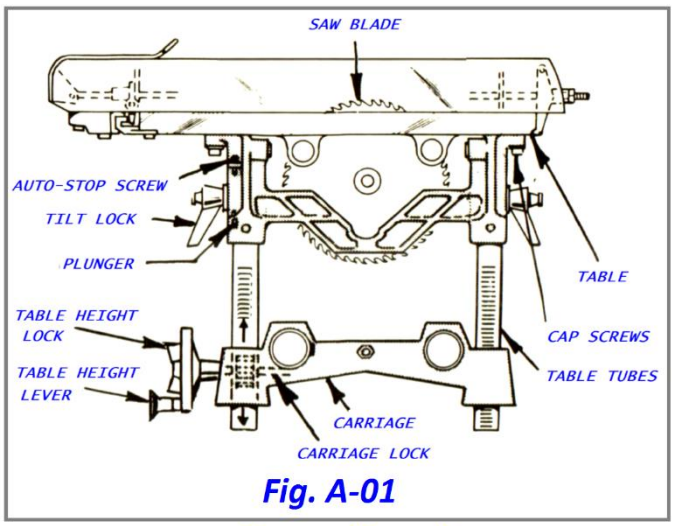


Fig. A-01

Table Assembly 1 of 3

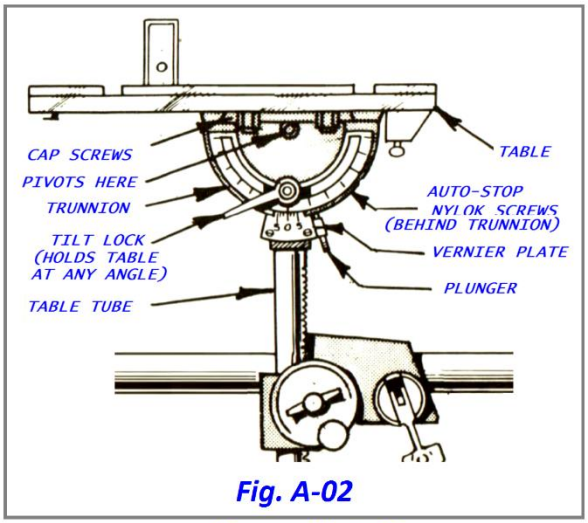


Fig. A-02

Table Assembly 2 of 3

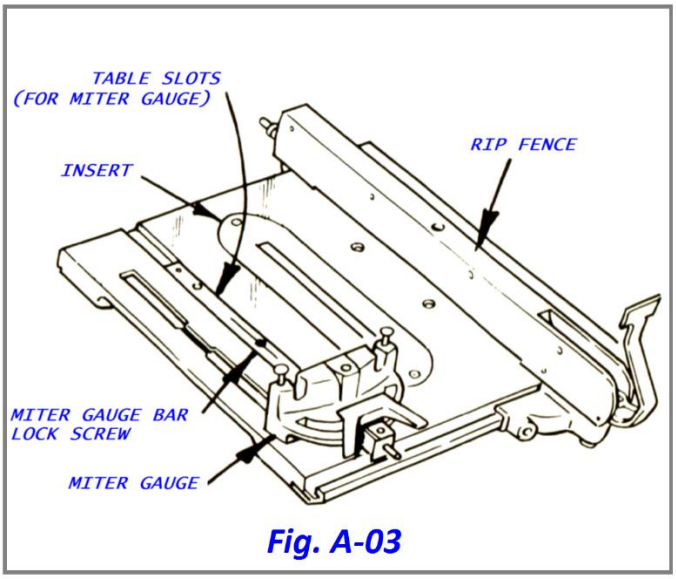


Fig. A-03

Table Assembly 3 of 3

Shaper Assembly Nomenclature

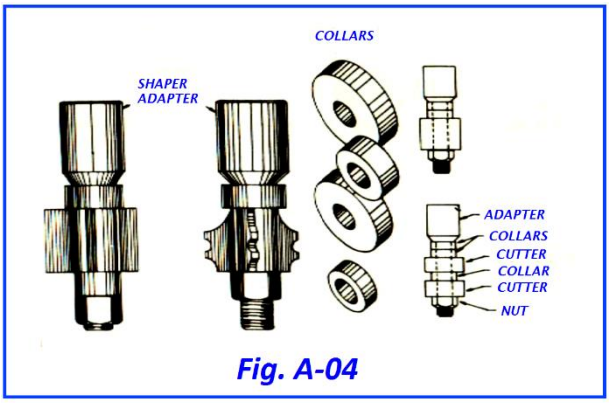


Fig. A-04

Shaper Arbor Assembly

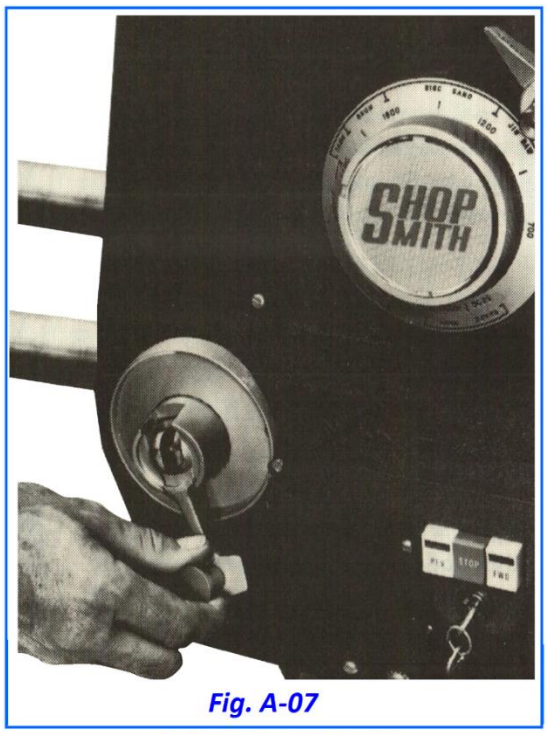


Fig. A-07

Rack Advance Mechanism

Rack Advance Mechanism

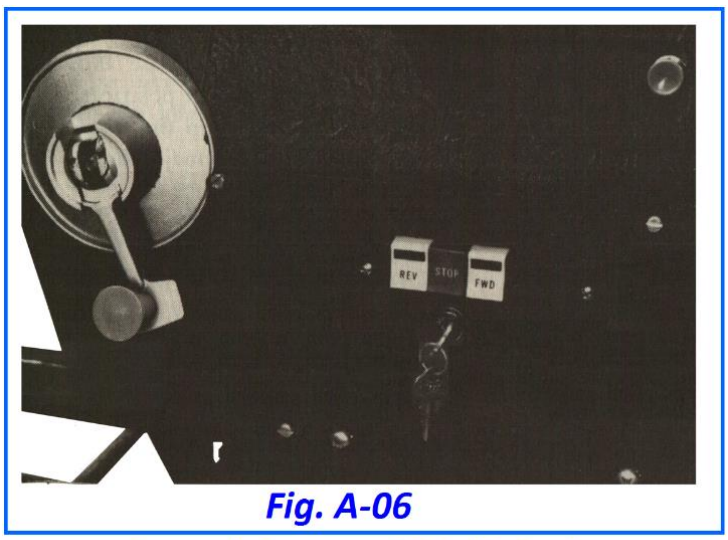


Fig. A-06

Forward - Reverse - Safety Key Lock

Forward – Reverse – Safety Key Lock

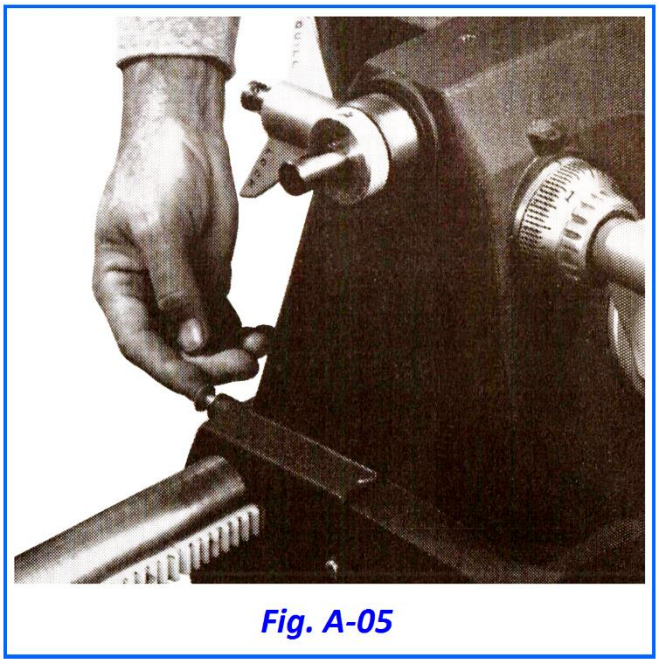


Fig. A-05

Inter-Latch Button

Inter-Latch Button

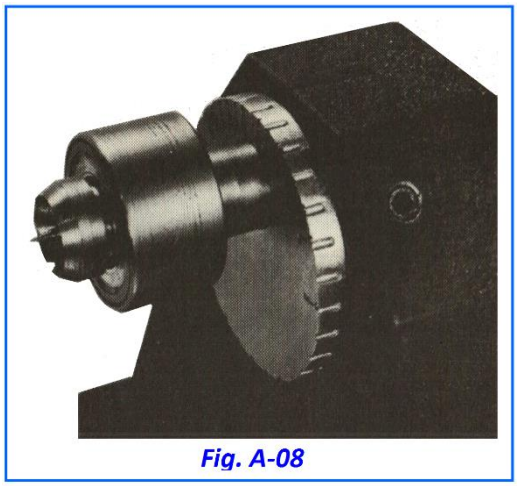


Fig. A-08

Lathe Tapering Eccentric with Ball Bearing Live Center

Lathe Tapering Eccentric with Live Center

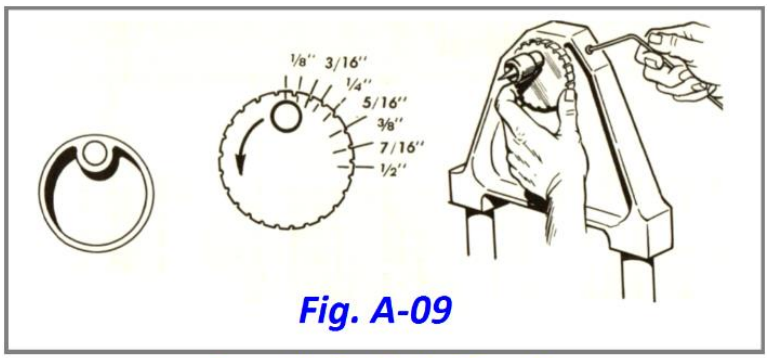


Fig. A-09

Eccentric for Lathe Tapering

Eccentric for Lathe Tapering Adjustment

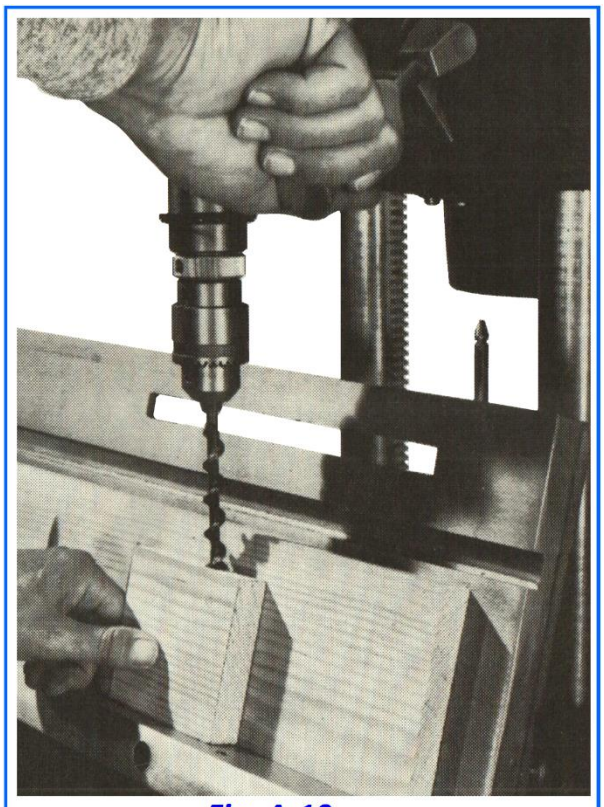


Fig. A-10

Levelling Block used in Cutting a Pocket Screw Hole

Levelling Block used for Pocket Screw Hole

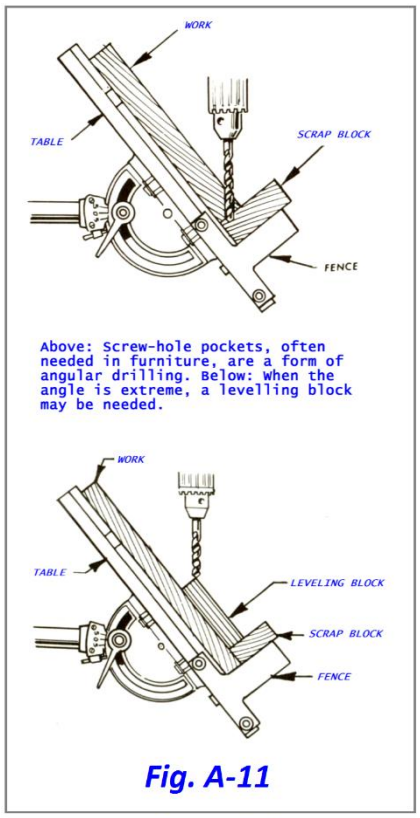


Fig. A-11

Screw Pockets Hole diagram

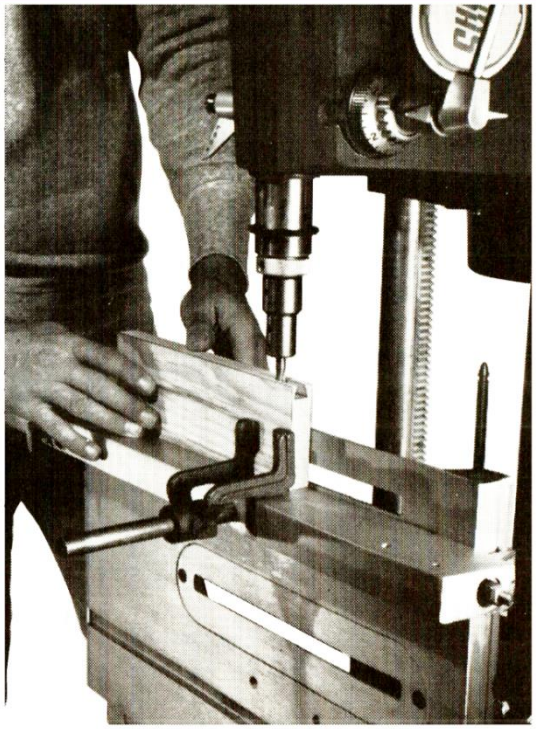


Fig. A-12

Using Mortising Hold Down to cut Dovetail Slot

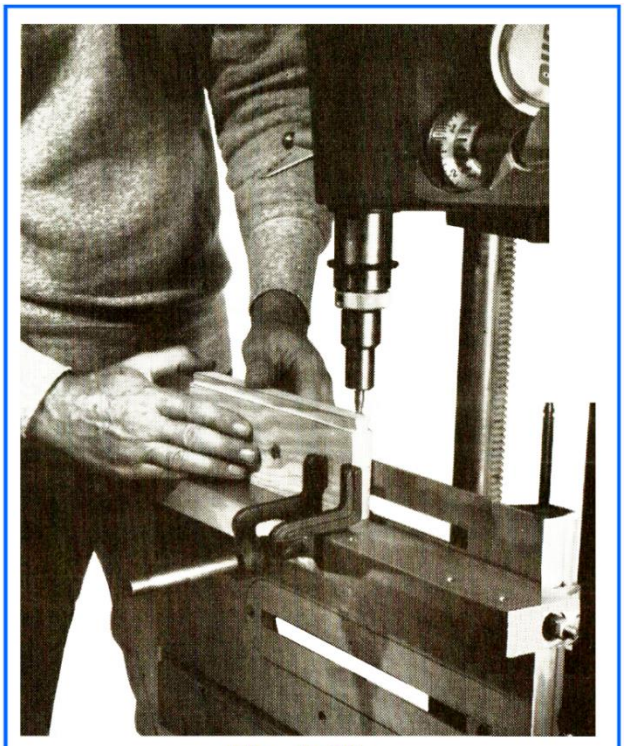


Fig. A-13

Using Mortising Hold Down to cut Dovetail Tenon

Using Mortising Hold Down

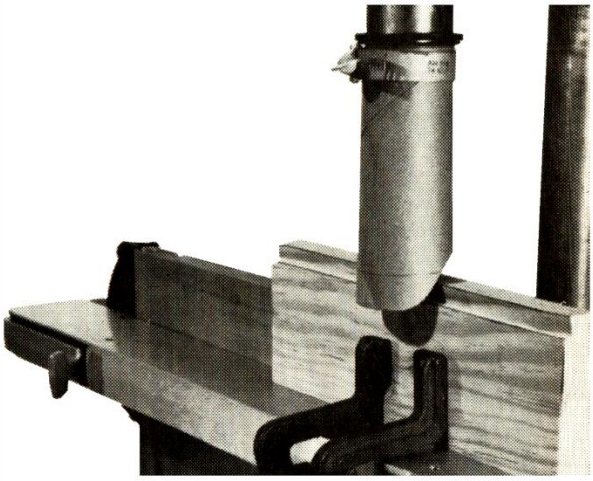


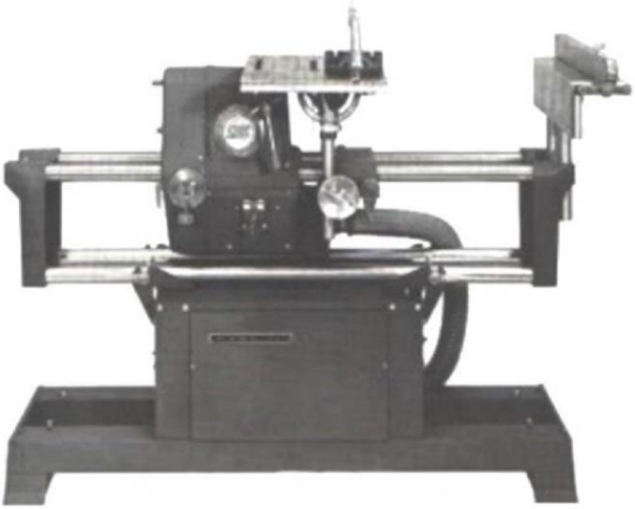
Fig. A-14

User fabricated Chip Deflector

Fig A-16

Magna Bandsaw on Mark VII

PARTS MANUAL



SHOPSMITH

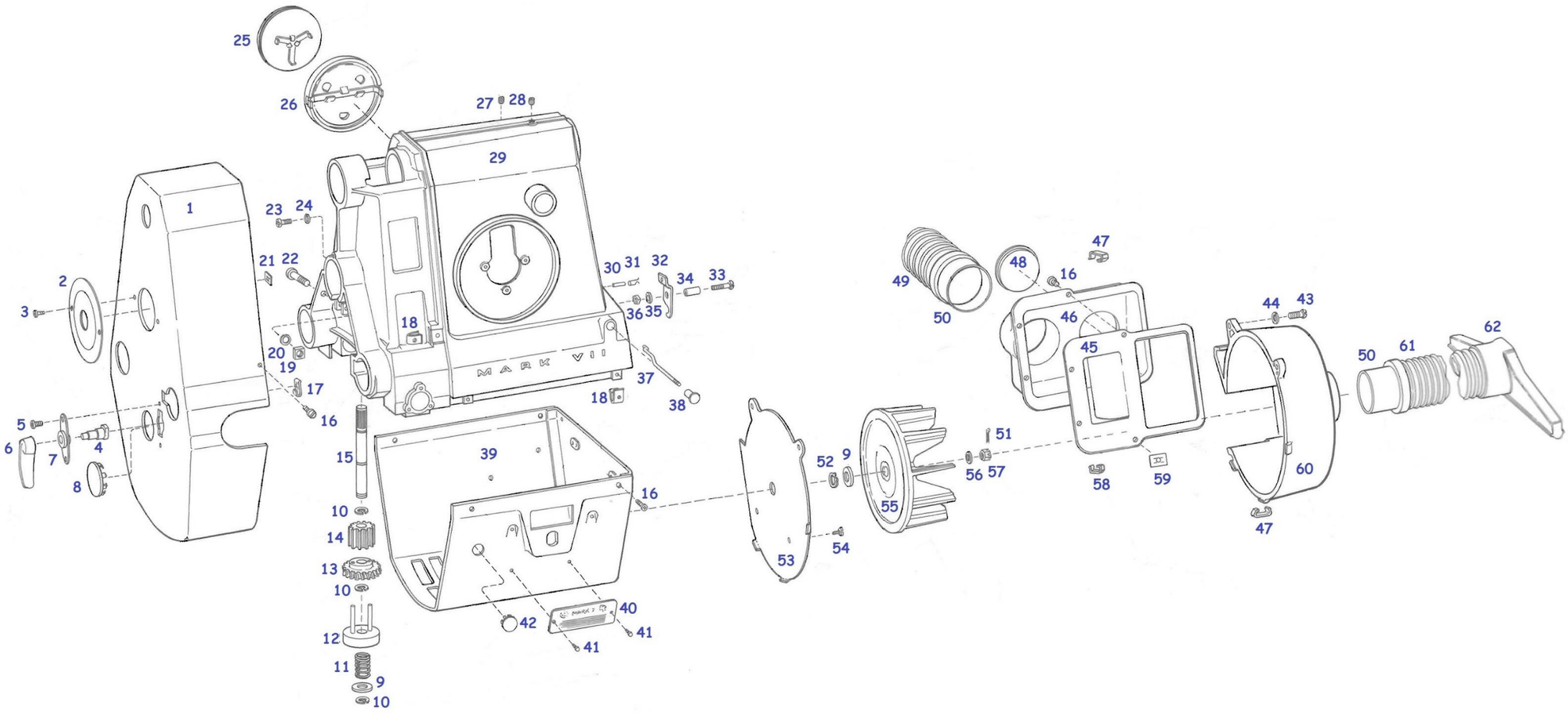
MARK VII

MAGNA AMERICAN CORPORATION

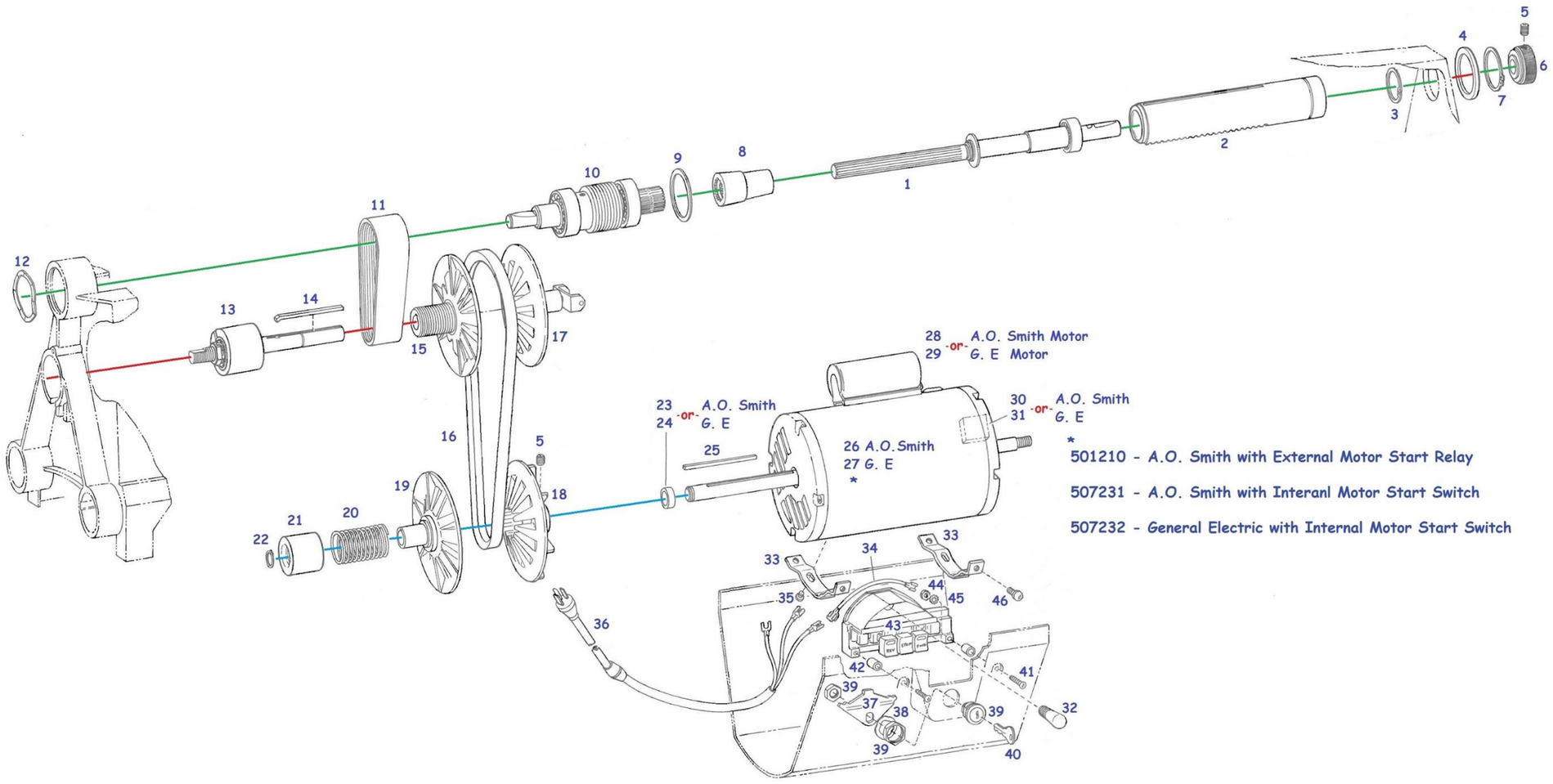
Interstate 75, Evendale • Cincinnati, Ohio 45215

PARTS MANUAL

Mark VII Headstock - PM2



Mark VII Headstock Drive, Motor and Housing - PM4



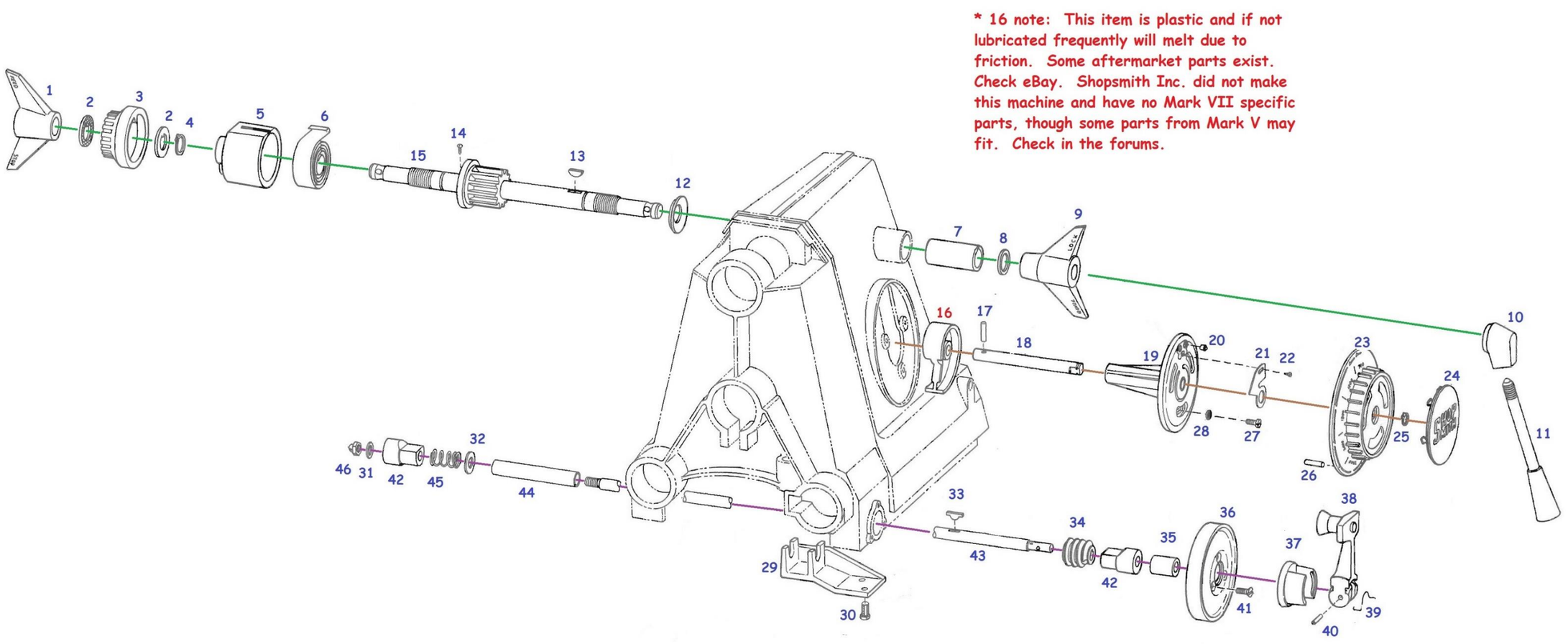
* 501210 - A.O. Smith with External Motor Start Relay

507231 - A.O. Smith with Interanl Motor Start Switch

507232 - General Electric with Internal Motor Start Switch

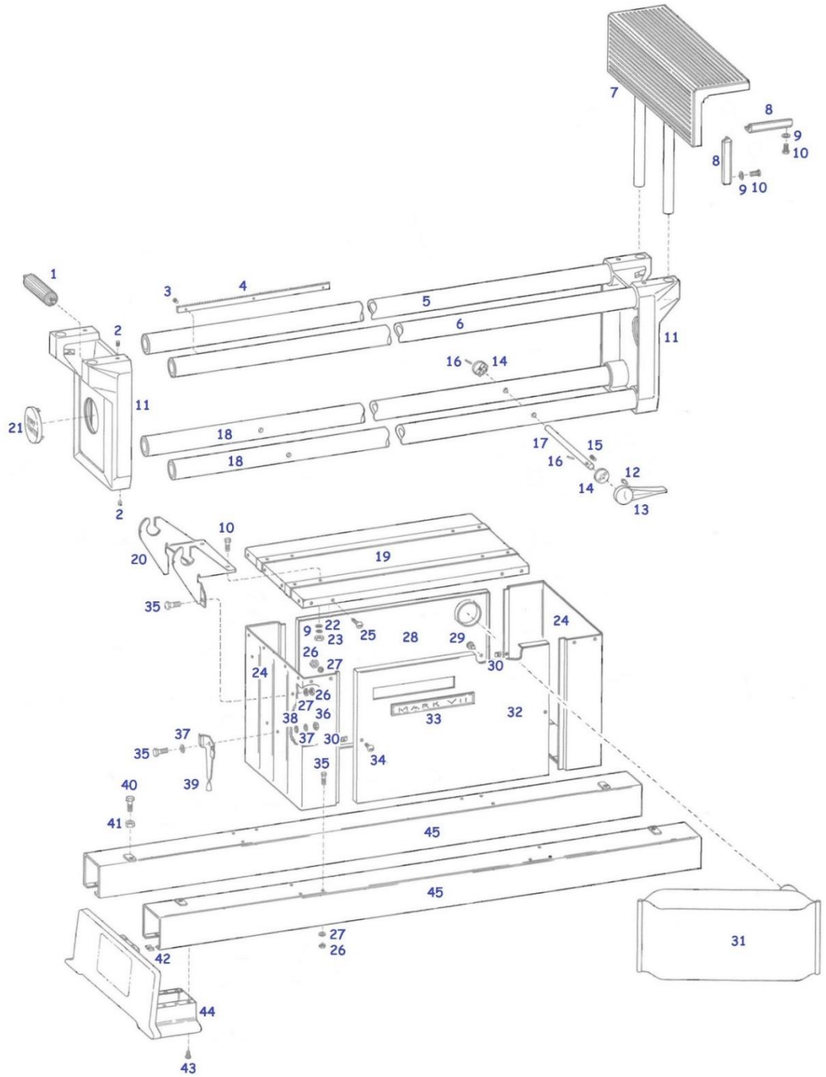
Mark VII Headstock Drive, Motor and Housing – PM4

Mark VII Headstock Quill, Speed Control and Rack Advance - PM6

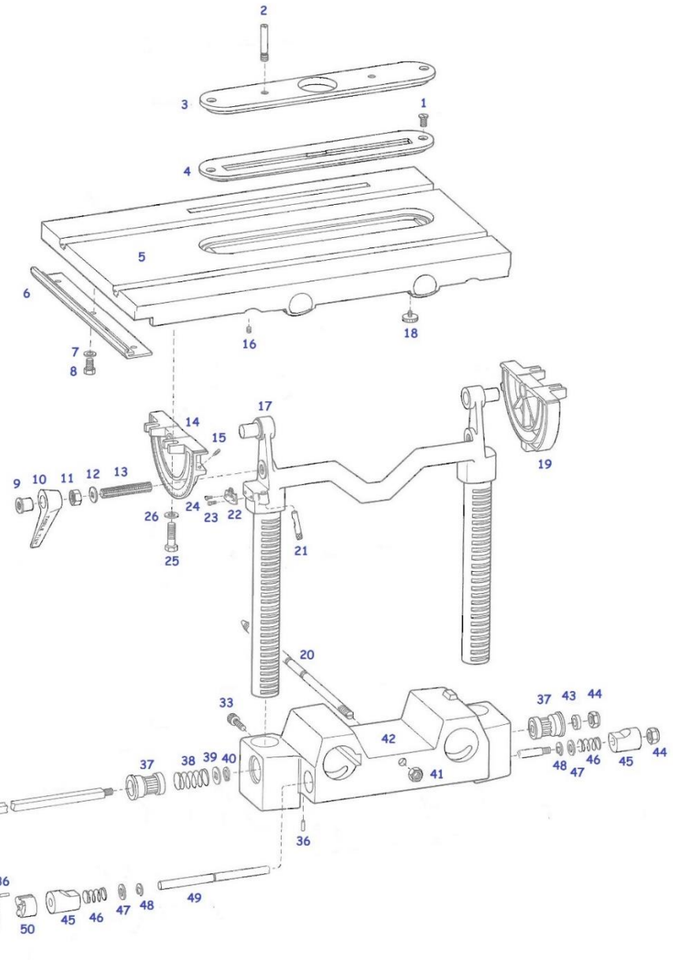


* 16 note: This item is plastic and if not lubricated frequently will melt due to friction. Some aftermarket parts exist. Check eBay. Shopsmith Inc. did not make this machine and have no Mark VII specific parts, though some parts from Mark V may fit. Check in the forums.

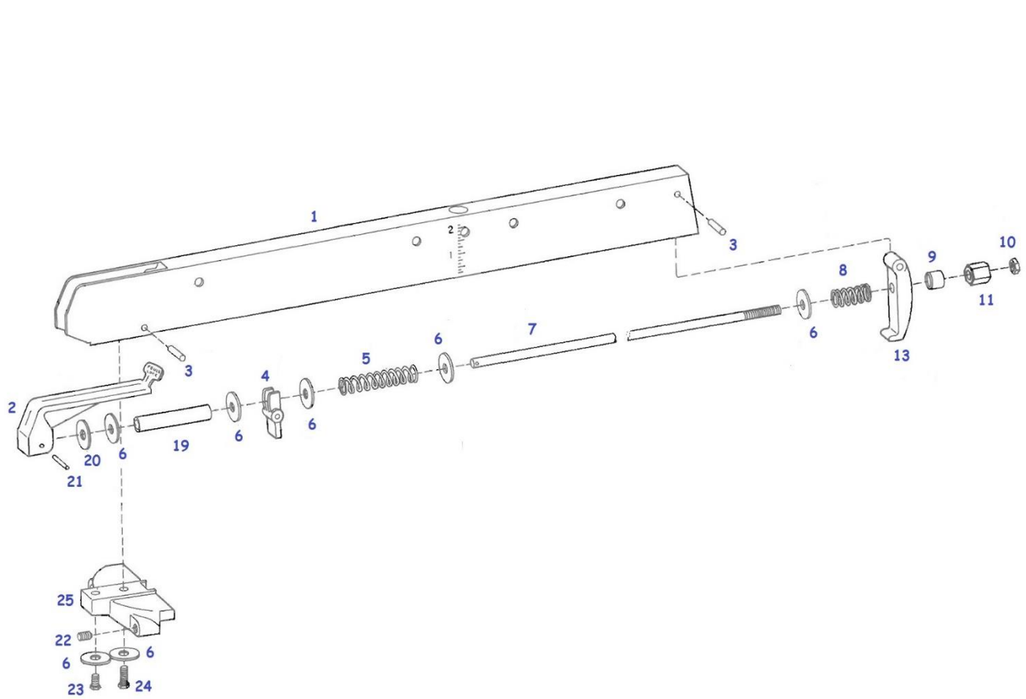
Mark VII Base and Bed - PM8

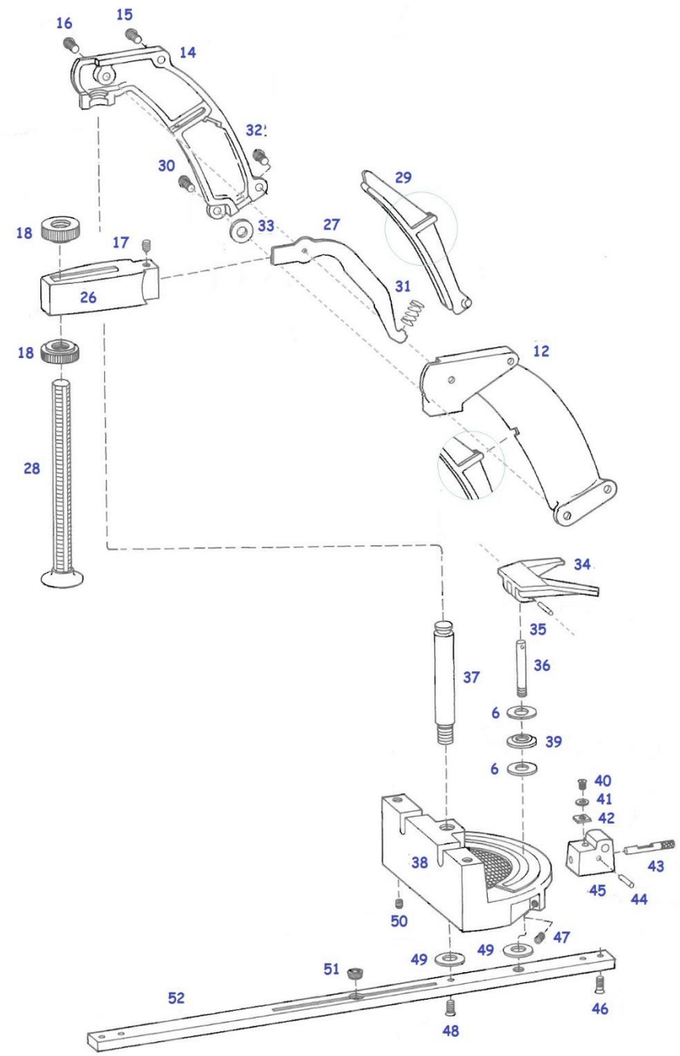


Mark VII Carriage and Table - PM10

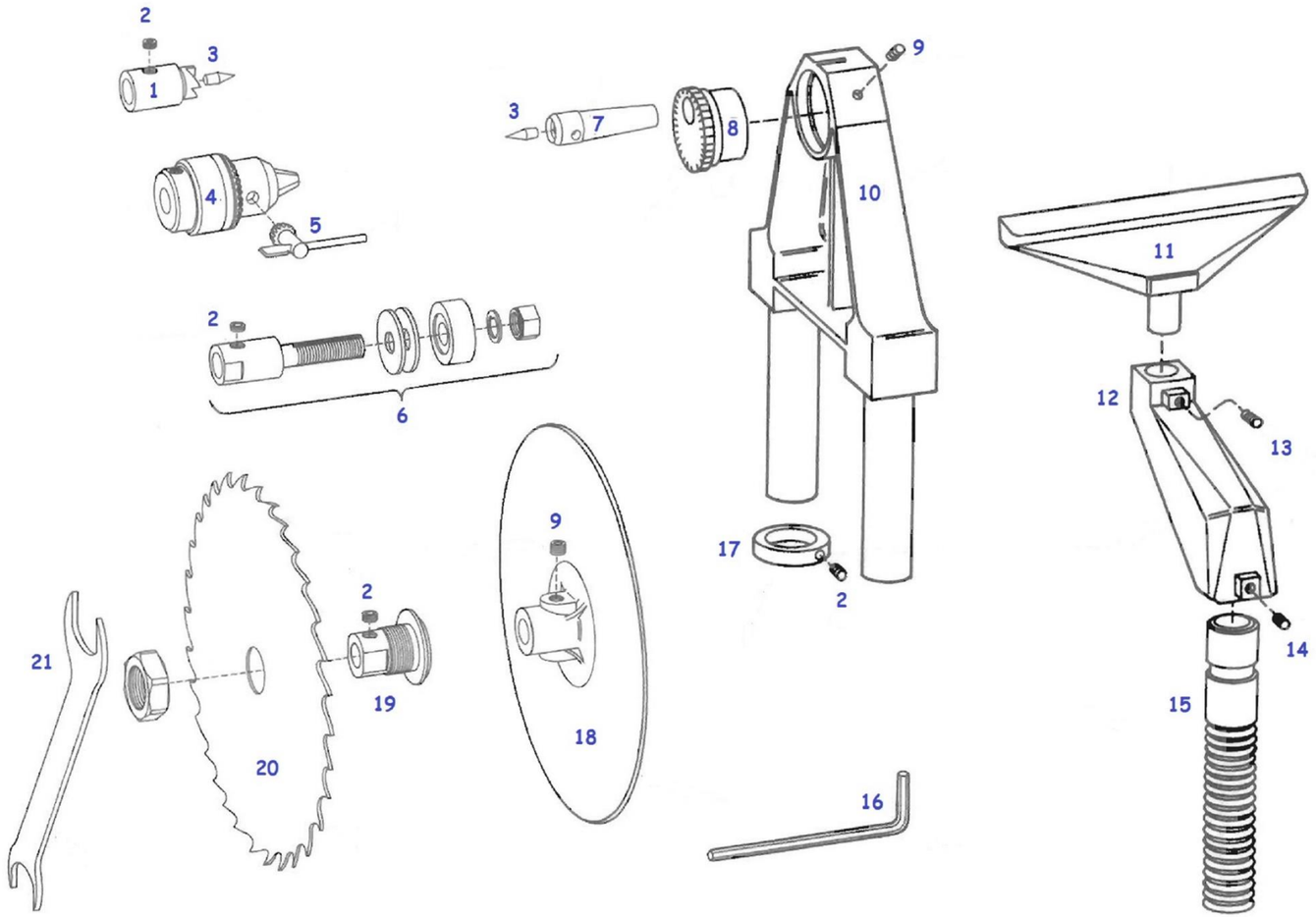


Mark VII Fence, Miter Gauge and Grip - PM12





Mark VII Tailstock, Tool Rest, Centers, Arbors, Saw & Sanding Disc - PM14



Mark VII Parts List to Illustrations Item Numbers

• Item Standard Hardware - May be Purchased Locally

Illustration	Ref No.	Part No.	Part Name
REFER TO PROPER ILLUSTRATION PAGE TO MATCH REFERENCE NUMBER TO PART			
			Mark VII Headstock - PM2
PM2		508454	Headstock Assembly - Includes all parts on pages PM2, PM4 & PM6 except 507141 (PM 2) and 501212 & 501231 (PM 6)
PM2	1	501356	Cover - Belt
PM2	3	507141	Cover - Vent
PM2	3	132696	• Screw - Machine (No. 6-32 x 3/8)
PM2	4	501362	Cam - Clutch
PM2	5	436692	• Screw - Machine (No. 8-32 x 5/16 Pan Hd.)
PM2	6	501361	Handle - Clutch (Incl. Setscrew)
PM2	7	501363	Mounting Plate - Clutch
PM2	8	501358	Plug - Button, 1-1 /2" Hole
PM2	9	120396	"Waster (1/2 Norn.)
PM2	10	501521	Ring - Retaining (1/2, Inverted)
PM2	11	501371	Spring
PM2	12	501368	Assembly - Clutch Plate
PM2	13	501250	Wheel - Worm
PM2	14	501279	Spur Gear - Traverse
PM2	15	501367	Shaft - Pinion
PM2	16	161869	• Screw - Sheet Metal (No. 8 x 5/8)
PM2	17	445341	• Nut - Tinnerman (No. 8-32 Type "J")

PM2	18	501656	• Nut - Tinnerman (No. 8, Type "U")
PM2	19	120373	• Nut - Square (3/18 - 18)
PM2	20	120214	• Lockwasher (5/16 Norm)
PM2	21	445124	• Nut - Tinnerman (No. 6-32 Flat Type)
PM2	22	502038	Screw - Soc. Cap (5/16 - 18 x 1-1/2)
PM2	23	501643	Screw - Sell Tapping (No. 10 x 1/2 Stove Hd. Type "Z")
PM2	24	501630	• Washer (No. 10 Norn.)
PM2	25	501683	Assembly - Medallion
PM2	26	501249	Assembly - Escutcheon Plate
PM2	27	115321	• Screw - Set (5/16 - 18 x 5/16 Cup Pt.)
PM2	28	501634	Screw - Nyloc Set (5/16 - 18 x 3/8 Half Dog
PM2	29	507488	Headstock
PM2	30	455532	Pin - Roll (I/8 x 1/2)
PM2	31	507482	Spring - Latch
PM2	32	501553	Lever - Latch
PM2	33	436735	• Screw (No. 10-24 x 7 8 Slotted Pan Hd.)
PM2	34	501558	Spacer - Latch
PM2	35	501589	Washer (9/32 x 3/4 x 3/32)
PM2	36	501572	Locknut (No. 10-24 Hex)
PM2	37	501554	Rod - Lever
PM2	38	501557	Button - Latch
PM2	39	501549	Motor Pan Assembly
PM2	40	501198	Plate - Caution
PM2	41	504031	• Screw - Sheet Metal (No. 6 x 1/4)
PM2	42	507041	Plug Button, 13/32" Hole
PM2	43	501606	• Screw - Machine (1 4-20 x 5/8 Pan Head)
PM2	44	120380	• Lock-washer (1/4 Nom.)
PM2	45	501236	Plate - Backing

PM2	46	507861	Duct (Includes Plug Cap)
PM2	47	501233	Clip - Blower
PM2	48	507195	Plug Cap - Duct
PM2	49	501502	Hose - Outlet (3 Ft. 8 In.)
PM2	50	501445	Adapter - Hose
PM2	51	9418403	Pin - Cotter (5/64 x 3/4)
PM2	52	501480	Ring - Retaining (1/2, Heavy Duty)
PM2	53	507757	Plate - Blower Housing
PM2	54	144811	• Screw - Sheet Metal (No. 10 x 1/2)
PM2	55	501234	Impeller
PM2	56	120394	• Washer (3/8 Nom.)
PM2	57	138489	• Lock-washer (3/8 Nom. Ext. Star)
PM2	58	102645	• Nut - Slotted (3/8 - 24)
PM2	59	501921	Clip - Duct
PM2	60	445132	• Nut - Tinnerman (No. 8, Flat Type
PM2	61	501238	Housing - Blower
PM2	62	501443	Hose - Inlet (5 Ft.)
PM2	63	507259	Nozzle - Utility

Mark VII Headstock Drive, Motor and Housing - PM4

PM4	1	504546	Spindle Assy. - Includes Bearing and Washer
PM4	2	504545	Quill
PM4	3	501622	Ring - Retaining (1-3/8, Internal)
PM4	4	501307	Ring - Bumper
PM4	5	102581	• Screw - Socket Set (5/18 - 18 x 3/8, Cup Point)
PM4	6	501306	Knob - Spindle
PM4	7	501624	Ring - Retaining (1-3/4, Inverted)
PM4	8	501294	Assembly - Drive and Ring

PM4	9	501621	Ring - Retaining
PM4	10	501284	Assembly • Drive Sleeve (Includes Item 8)
PM4	11	507491	Belt - Poly "V"
PM4	12	501299	Ring - Retaining (Waved)
PM4	13	501324	Assembly - Idler Shaft
PM4	14	501320	Key
PM4	15	501207	Sheave - Idler Shaft
PM4	16	507490	Belt - Motor Drive
PM4	17	501325	Sheave - Control Assembly
PM4	18	501227	Sheave - Motor Shaft
PM4	19	501209	Sheave - Floating
PM4	20	501628	Spring - Motor Shaft
PM4	21	501657	Case - Spring
PM4	22	501645	Ring - Retaining (5/8, External)
PM4	23	501343	Sleeve - Thrust (For A. O. Smith Motor Only)
PM4	24	501353	Sleeve - Thrust (For G. E. Motor Only)
PM4	25	501213	Key - Long
PM4	26	507231	Motor (1-1/8 H.P.), Including Capacitor - A. O. Smith
PM4	27	507232	Motor (1-1/8 H. P.), Including Capacitor - G. E.
PM4	28	502087	Capacitor, A. O. Smith Only
PM4	29	507393	Capacitor, G. E. Only
PM4	32	501344	Lamp - Switch (G. E. No. 6S6/3)
PM4	33	501221	Bracket - Motor
PM4	34	501596	Jumper
PM4	35	447821	Screw - Tapping (No. 10-24 x 3/8 Pan Hd.)
PM4	36	501211	Cord and Plug
PM4	37	501349	Plate - Selector
PM4	38	501689	Washer - Spring

PM4	39	501347	Assembly - Lock (Includes Key)
PM4	40	501348	Key - Lock
PM4	41	436672	• Screw - Pan Hd. (No. 6-32 x 1-3/4)
PM4	42	507694	Stand-off - Switch
PM4	43	501188	Switch
PM4	44	134530	• Hex Nut, 46-32
PM4	45	138473	• Lockwasher, 16 External Tooth
PM4	46	191986	Screw - Pan Hd. (1/4-20 x 3/8 Phillips Sem.)

Mark VII Headstock Quill, Speed Control and Rack Advance - PM6

PM6	1	501203	Lock - Feed Stop
PM6	2	501311	Washer - Serrated
PM6	3	501314	Dial - Depth Gauge
PM6	4	501626	Ring - Retaining (3/4, External)
PM6	5	501310	Housing - Spring
PM6	6	501315	Spring - Quill
PM6	7	501318	Sleeve - Quill Feed
PM6	8	501631	Washer - Bowed
PM6	9	501204	Lock - Quill
PM6	10	501212	Hub - Quill Handle
PM6	11	501231	Handle - Feed Lever
PM6	12	501317	Washer - Spherical
PM6	13	110731	• Key - Woodruff (3/32 x 5/8)
PM6	14	145378	Screw - Drive (No. 6 x 5/16)
PM6	15	501312	Pinion - Quill Feed
PM6	16	501337	Cam - Control
PM6	17	455734	Pin - Roll (1/8 x 3/4)
PM6	18	501336	Shaft

PM6	19	501332	Bracket - Control Assembly
PM6	20	501912	Catch - Bullet (3/8)
PM6	21	501883	Stop - Plate
PM6	22	448013	Screw - Tapping (No. 8-32 x 1/2 Pan Hd.)
PM6	23	502792	Assembly - Control Knob (Includes #455532, Pin - Roll)
PM6	24	501683	Assembly - Medallion
PM6	25	501478	Ring - Retaining (7/16, External)
PM6	26	455532	Pin - Roll (1/8 x 1/2)
PM6	27	447823	Screw - Tapping (No. 10-24 x 1/2 Pan Hd.)
PM6	28	121801	Lockwasher - Internal Tooth (No. 10)
PM6	29	501246	Bracket - Worm
PM6	30	503865	Screw - Tapping (1/4-20 x 1/2 Hex Hd.)
PM6	31	120393	• Washer (5/16 Norn.)
PM6	32	120395	• Washer (7/16 Norn.)
PM6	33	501646	Key - Hypro
PM6	34	501241	Worm
PM6	35	501365	Spacer - Lock
PM6	36	501222	Stop - Lock
PM6	37	501218	Hub - Handle
PM6	38	501685	Assembly - Lock Handle
PM6	39	501599	Spring - Hub
PM6	40	273436	Pin - Roll (1/8 x 11/16)
PM6	41	447213	Screw - Tapping (No. 8-32 x 1/2 Flat Hd.)
PM6	42	501243	Wedge - Lock
PM6	43	501240	Shaft - Lock
PM6	44	504490	Spacer Tube-Spring
PM6	45	501242	Spring
PM6	46	443334	Nut - Hex (5/16-24 Flexloc)

			Mark VII Base and Bed - PM8
PM8	1	501286	Assembly - Handle
PM8	2	102580	• Screw - Set (5 16-18 x 1/4 Hex Soc. Cup Pt.)
PM8	3	501476	Rivet - Self-Heading
PM8	4	501190	Rack
PM8	5	501193	Tube - Rear Way
PM8	6	501280	Tube - Front Way
PM8	7	501416	Assembly - Extension Table
PM8	8	501270	Bar - Extension Table
PM8	9	120214	• Lockwasher (5/16 Nom.)
PM8	10	120228	• Bolt - Hex. Hd. (5/16-18 x 5/8)
PM8	11	501541	End Cap
PM8	12	501525	Catch - Bullet
PM8	13	501524	Handle - Trunnion Lock
PM8	14	501522	Key - Trunnion
PM8	15	450221	Screw - Tapping (No. 10-24 x 3/8 Fil. Hd. Phillips)
PM8	16	273337	Pin - Roll (1/8 x 5/8)
PM8	17	501523	Rod - Trunnion
PM8	18	501189	Bed - Tubular
PM8	19	501537	Deck
PM8	20	501542	Bracket - Trunnion
PM8	21	501677	Assembly - Medallion
PM8	22	120393	• Washer (5/18 Nom.)
PM8	23	120376	• Nut - Hex (5/16-18)
PM8	24	501547	Frame - End
PM8	25	137952	• Screw - Truss Hd. (1/4-20 x 3/8)
PM8	26	120375	• Nut - Hex (1/4-20)

PM8	27	120380	• Lockwasher (1/4 Nom.)
PM8	28	501544	Panel - Rear
PM8	29	501569	Screw - Thumb (No. 6-32 x 1)
PM8	30	445370	• Nut - Tinnerman (No. 6-32 Type "J")
PM8	31	505674	Dust Bag (Pkg. of 3)
PM8	32	501543	Panel - Front
PM8	33	507185	Logo - "Mark VI"
PM8	34	501568	• Screw - Truss Hd. (No. 6-32 x 1 Slotted)
PM8	35	120706	• Bolt - Hex Hd. (1, 4-20 x 1/2)
PM8	36	501613	Locknut - Hex (1, 4-20 Jam)
PM8	37	501589	• Washer - Plain (1/4 Nom)
PM8	38	501875	Washer - Bowed
PM8	39	501501	Latch - Safety
PM8	40	122007	• Screw - Adjusting (5/6-18 x 3/4 Hex Hd.)
PM8	41	124824	• Nut - Jam (5/16-18)
PM8	42	128273	• Sheet Metal Screw (#6 x 3/8)
PM8	43	501881	• Nut - Tinnerman (No. 10-24 Type"U")
PM8	44	436730	• Screw - Pan Hd. (No. 10-24 x 3/8)
PM8	45	507242	Assembly - Foot
PM8	46	507239	Assembly - Rail

Mark VII Carriage and Table - PM10

PM10	1	501637	Screw - Cap (1/4-20 x 1/2 Flat Hd.)
PM10	2	501551	Post - Shaper Insert
PM10	3	505509	Insert - Shaper (Includes Posts)
PM10	4	501379	Insert - Saw
PM10	5	501251	Table
PM10	6	501378	Bar

PM10	7	120214	• Lockwasher (5/16 Nom.)
PM10	8	120228	• Bolt - Hex Hd. (5/16-18 x 5/8)
PM10	9	501388	Cap - Trunnion Stud
PM10	10	501220	Handle - Table Tilt
PM10	11	120369	• Nut - Hex (3/8-24)
PM10	12	501387	Washer (3/8 Square Nom.)
PM10	13	501384	Stud - Trunnion
PM10	14	501481	Trunnion - Front
PM10	15	501407	Screw - Set (No. 10-32 Nylok Special)
PM10	16	501647	Screw - Set (5/16-18 x 5/8 Nylok)
PM10	17	507768	Assembly - Tie Bar
PM10	18	501410	Screw - Thumb
PM10	19	501482	Trunnion - Rear
PM10	20	501559	Shaft - Interlatch
PM10	21	501258	Plunger - Stop
PM10	22	501257	Rate - Indicator
PM10	23	447825	Screw - Tapping (No. 10-24 x 5/8 Pan Hd.)
PM10	24	447823	Screw - Tapping (No. 10-24 x 1/2 Pan Hd.)
PM10	25	9415838	• Screw - Machine (3/8-16 x 1 Hex Hd.)
PM10	26	501633	Washer - Special (3/8 Nom.)
PM10	27	504258	Shaft
PM10	28	507509	Knob - Table Height Lock
PM10	29	120388	• Washer (3/8 Nom.)
PM10	30	507498	Assembly - Wheel Crank
PM10	31	501598	• Washer (5/8 Nom.)
PM10	32	455921	Pin - Roll (1/8 x 1-1/2)
PM10	33	501536	Hub - Handle
PM10	34	455532	Pin - Roll (1/8 x 1/2)

PM10	35	501392	Assembly - Pinion
PM10	36	124925	• Nut - Hex Jam (3/8-24)
PM10	37	501390	Carriage
PM10	38	504259	Washer - Retaining
PM10	39	443334	Nut - Hex (5/16-24 Flexloc)
PM10	40	501243	Wedge - Lock
PM10	41	501242	Spring
PM10	42	120395	• Washer (7/16 Nom.)
PM10	43	501518	Ring - Retaining (7/16, "E" Type)
PM10	44	501260	Shaft - Lock
PM10	45	501530	Spacer - Cam Lock
PM10	46	501531	Handle - Lock

Mark VII Fence, Miter Gauge and Grip - PM12

PM12	1	501226	Fence
PM12	2	501224	Handle - Fence Lock
PM12	3	273336	Pin - Roll (3/16 x 1-1/4)
PM12	4	501399	Clamp - Fence
PM12	5	501415	Spring - Release, Front
PM12	6	120393	• Washer (5/16 Nom.)
PM12	7	501266	Rod - Lock
PM12	8	501267	Spring - Release, Rear
PM12	9	501882	Spacer - Back
PM12	10	124824	• Nut - Jam (5/16-18)
PM12	11	501538	Nut - Adjusting (5/16-18 Special)
PM12	12	501468	Grip - Left
PM12	13	501539	Lock - Back
PM12	14	501469	Grip - Right

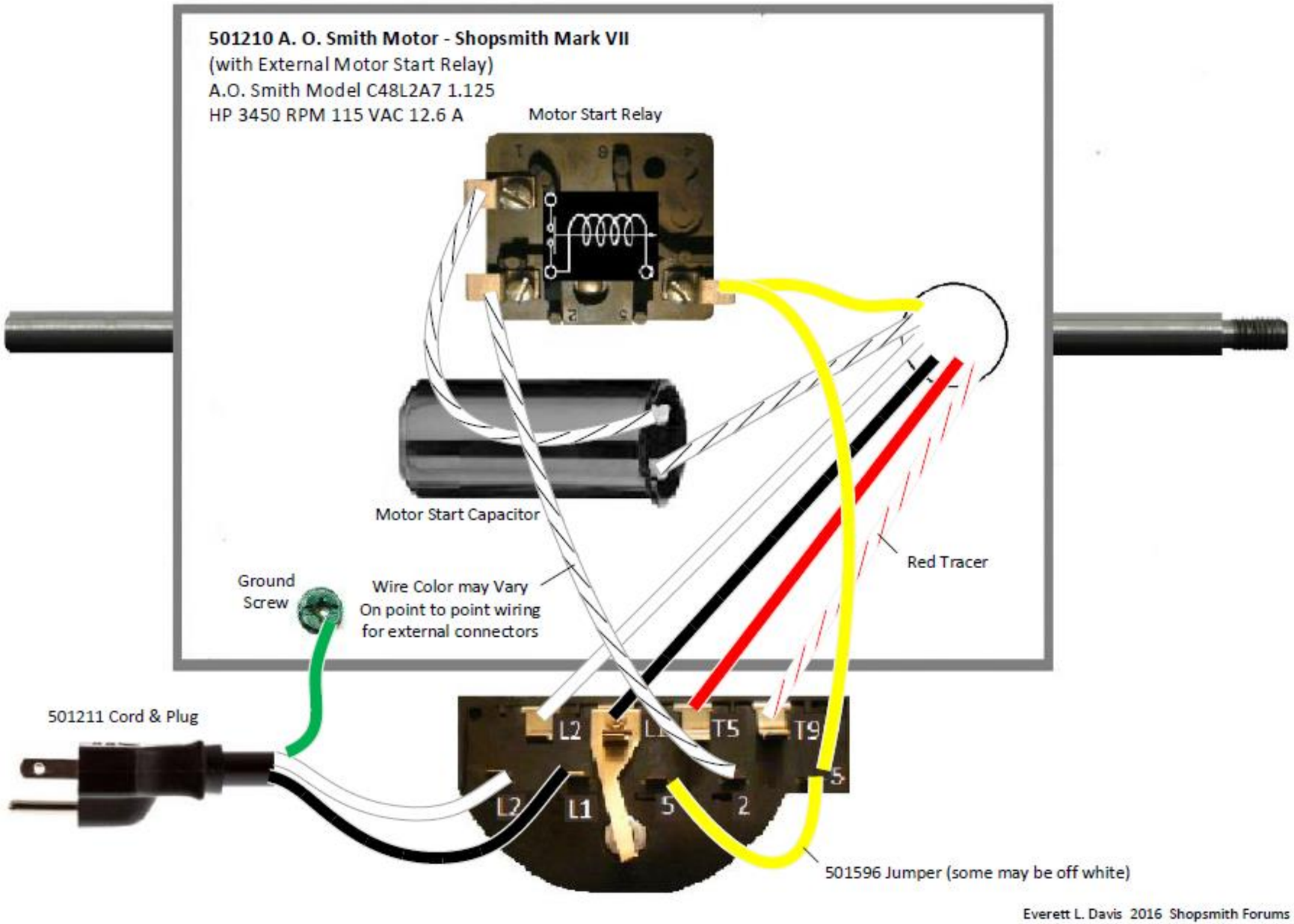
PM12	15	450213	Screw - Tapping (No- 8-32 x 1/2 Phillips Fil. Hd.)
PM12	16	450219	Screw - Tapping (No. 8-32 x 7/8 Phillips Fil. Hd.)
PM12	17	222458	Screw - Set (5/16-18 x 1/4 Fl. Pt.)
PM12	18	501482	Knob - Adjusting
PM12	19	501265	Spacer - Lock
PM12	20	501268	Washer - Fence
PM12	21	455862	Pin - Roll (1/8 x 7/8)
PM12	22	102388	• Screw - Set (5/16-18 x 1 1/4 Oval Pt. Soc.)
PM12	23	122027	• Bolt - Hex Hd. (5/16-18 x 1-1/4)
PM12	24	122040	• Bolt - Hex Hd. (5/16-18 x 1-1/2)
PM12	25	501414	Base - Fence
PM12	26	501463	Guide - Lock
PM12	27	501464	Lever - Lock
PM12	26	501471	Assembly - Lock Stud
PM12	29	501465	Trigger
PM12	30	132066	• Screw - Machine (No. 10-24 x 1-1/4 Slotted Fil. Hd.)
PM12	31	501467	Spring - Lever
PM12	32	450217	Screw - Tapping (No. 8-32 x 3/4 Phillips Fil. Hd.)
PM12	33	501470	• Washer (No. 10 Nom.)
PM12	34	501228	Handle - Clamp
PM12	35	273436	Pin - Roll (1/8 x 11/16)
PM12	36	501276	Stud - Protractor
PM12	37	501466	Stud - Grip
PM12	38	501412	Protractor - Miter Assembly
PM12	39	501922	Washer - Coned
PM12	40	436691	• Screw - Machine (No. 8-32 x 1/4 Pan Hd.)
PM12	41	501616	• Washer - Plain (No. 8 Nom.)
PM12	42	501409	Plato - Vernier

PM12	43	501403	Plunger - Stop
PM12	44	273337	Pin - Roll (1/8 x 5/8)
PM12	45	501402	Mount - Indicator
PM12	46	501635	• Screw - Machine (No. 8-32 x 1/2 Flat Hd.)
PM12	47	501407	Screw - Set (No. 10-32 Special Nylok)
PM12	48	501639	Screw - Machine (1/4-20 x 3/4 Fl. Hd Nylok)
PM12	49	502081	Washer - Special
PM12	50	501406	Plug - Glide
PM12	51	501401	Screw - Taper
PM12	52	501275	Bar - Miter
PM12	53	222458	Set Screw (5/16-18 x 1/4 Fl. Pt. Soc.)
PM12	54	501400	Miter Gauge Assy.

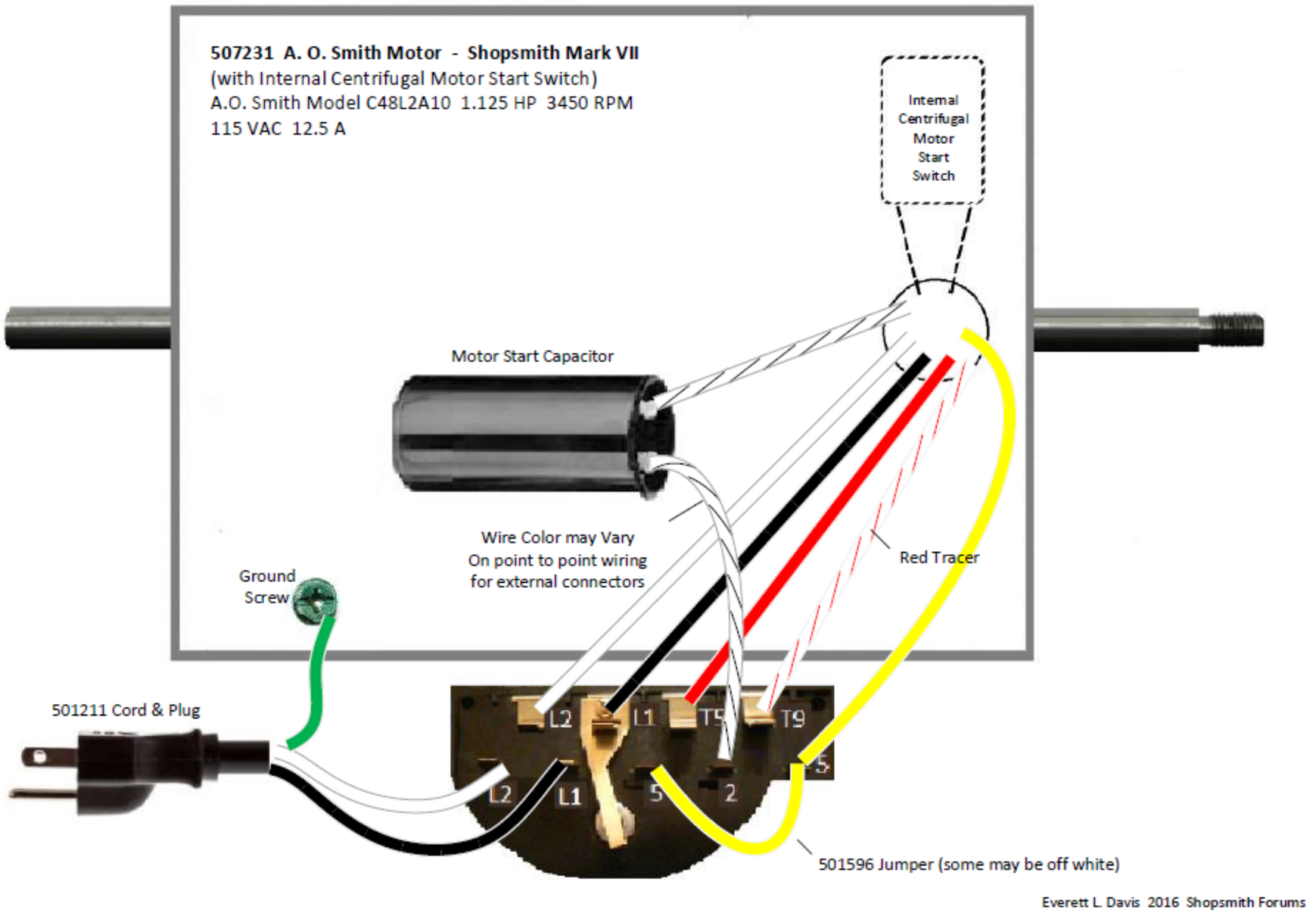
Mark VII Tailstock, Tool Rest, Centers, Arbors, Saw & Sanding Disc - PM14

PM14	1a	501428	Assembly - Drive Center
PM14	1	501429	Center - Drive
PM14	2	222458	Screw - Set (5 16-18 x 1/4 Flat Pt. Soc.)
PM14	3	801430	Pin - Center
PM14	4	805633	Chuck (Includes Set Screw & Key)
PM14	5	801419	Key - Chuck
PM14	e	505505	Arbor - 1/2 Inch (Incl. Spacers, Tongue Washer, Nut & Setscrew)
PM14	7a	501431	Assy. - Cup Center
PM14	7	801432	Center - Cup
PM14	8	801437	Eccentric Mount
PM14	9	222460	• Screw - Set (5/16-18 x 3/8 Flat Pt. Soc.)
PM14	10	501435	Assembly - Tailstock and Tube
PM14	11	801441	Rest - Tool
PM14	11	501442	Arm - Tool Rest

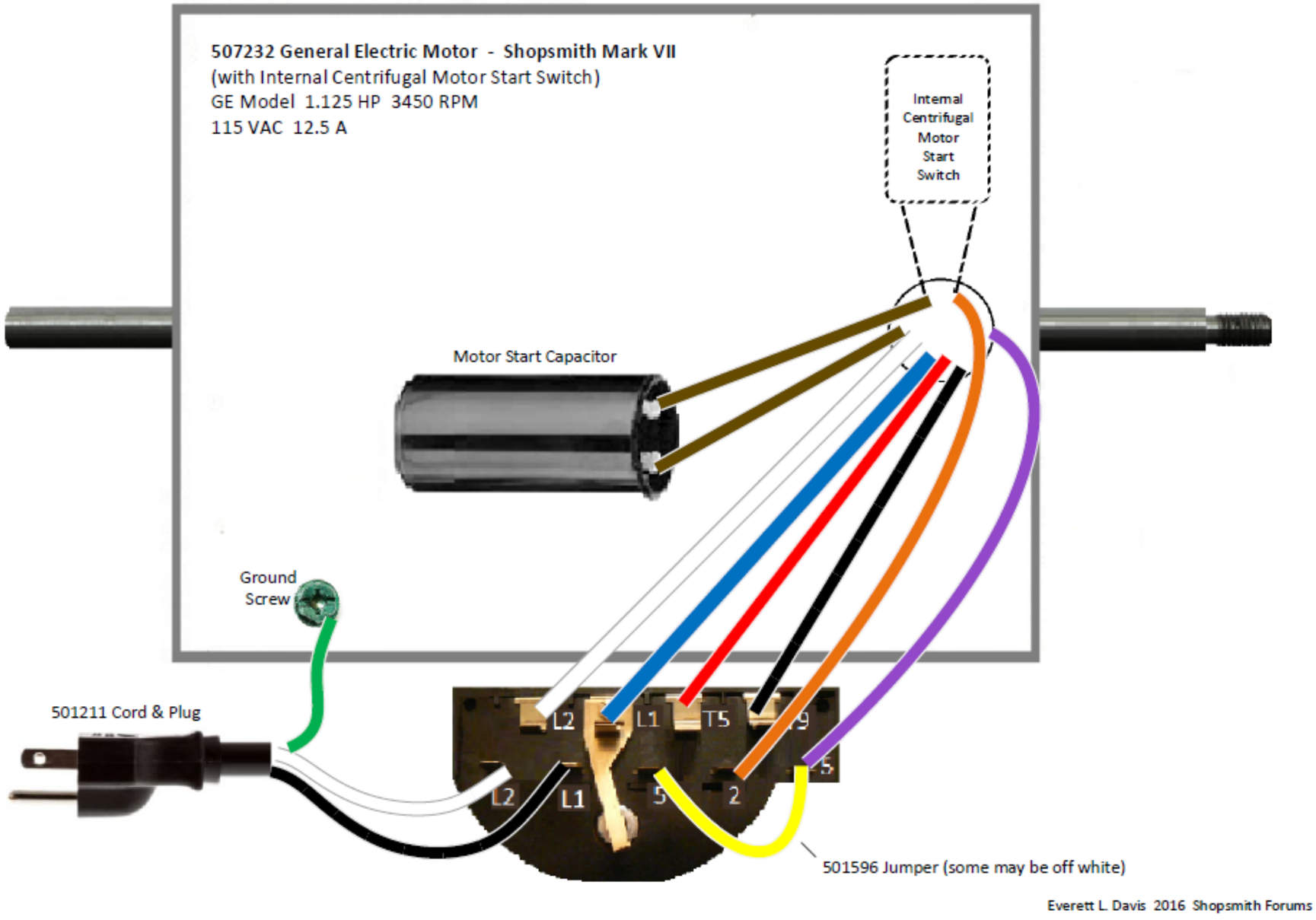
PM14	11	102585	Screw - Set (3/16-18 x 1/8 Cup Pt. Soc.)
PM14	14	102582	• Screw - Set (5/18-18 x 1/2 Cup Pt. Soc.)
PM14	15	501354	Tube - Tool Rest
PM14	16	801459	Allen Wrench (5/32 Extra Long)
PM14	17	501439	Collar - Tube
PM14	18	505550	Disc - Sanding (Incl. Setscrew)
PM14	19	505511	Arbor - Saw (Incl. Nut & Setscrew)
PM14	20	505544	Blade - All Purpose 10"
PM14	21	501425	Wrench - Arbor Nut



501210 A.O. Smith Motor with External Motor Start Relay Wiring



[507231 A.O. Smith Motor with Internal Centrifugal Motor Start Switch]



507232 G.E. Motor with Internal Centrifugal Motor Start Switch

MARK VII SPEED CHART

SHOPSMITH MARK VII SPEED CHART

OPERATION	SPEED-DIAL SETTING—100'S HARD-WOOD	SOFT-WOOD
TABLE SAW		
General Sawing	36	36
Heavy Ripping	27	30
Trim Cuts	39	39
6" Dado Assembly	36	36
Magna Dado	24	24
Magna Molder	30	36
DRILL PRESS OR HORIZONTAL DRILL		
Drilling, up to 1/4"	28	38
Drilling, 1/4" to 1/2"	26	31
Drilling, 1/2" to 3/4"	20	23
Drilling, 3/4" to 1"	13	20
Drilling, over 1"	7	8
Plug Cutting	31	33
Routing	43	50
Shaping	47	52
Mortising	22	33
DISC SANDER		
Coarse Paper	10	11
Medium Paper	12	13
Fine Paper	15	18
LATHE	Rough	Shape Finish
Up to 2" diameter	9	26 43
2" to 4" diameter	8	23 33
4" to 6" diameter	8	18 23
6" to 8" diameter	7	12 18
Over 8" diameter	7	7 8
DRUM SANDER		
Coarse Sleeve	18	20
Fine Sleeve	20	22

OPERATION	SPEED-DIAL SETTING—100'S HARD-WOOD	SOFT-WOOD
JIGSAW		
Heavy Stock	7	8
Medium Stock	9	12
Thin Stock	15	22
Filing or Sanding	7	8
BANDSAW		
1/8" Blade	9	9
1/4" or 3/8" Blade	8	8
1/2" Blade	7	8
Heavy Resawing	7	7
SPRAY FINISHING		
Internal Mix	10	
External Mix	10	
JOINTER		
Finishing Cuts	33	38
Heavy Cuts	23	28
BELT SANDER		
Coarse Belt	11	12
Medium Belt	13	15
Fine Belt	15	18

NOTE: For unusual operations or speeds for metal or plastic, see this 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.

SHOPSMITH** MAGNA** SPEEDIAL** SPEED-DIAL** **TRADEMARK *Reg. U. S. Pat.

MAGNA AMERICAN CORPORATION