

Sears

*owners
manual*

**MODEL NO.
113.23163C**

Serial
Number _____

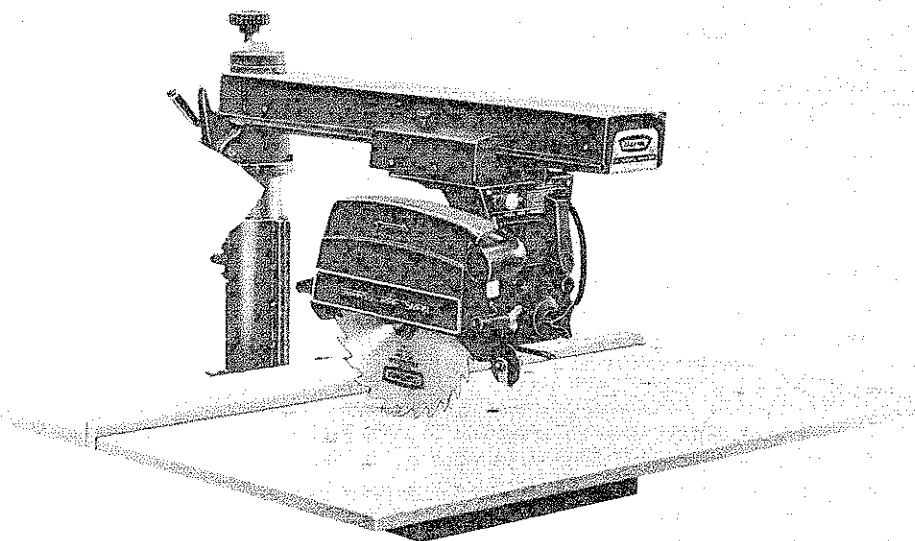
Model and serial
number may be found
at the front of the base.

You should record both
model and serial number
in a safe place for
future use.

CAUTION:

**Read GENERAL
and ADDITIONAL
SAFETY
INSTRUCTIONS
carefully**

SPD



Sears

CRAFTSMAN.

10-INCH RADIAL SAW

- *assembly*
- *operating*
- *repair parts*

Sold by: SIMPSON-SEARS LIMITED, TORONTO, ONTARIO, CANADA M5B 2B8

FULL ONE YEAR WARRANTY ON CRAFTSMAN STATIONARY POWER TOOLS

If within one year from the date of purchase, this Craftsman Stationary Power Tool fails due to a defect in material or workmanship, Simpsons-Sears will repair it, free of charge.

Warranty service is available by simply contacting the nearest Simpsons-Sears store or Service Center throughout Canada.

SIMPSON-SEARS LIMITED, TORONTO, ONTARIO, CANADA M5B 2B8

GENERAL SAFETY INSTRUCTIONS FOR POWER TOOLS

1. KNOW YOUR POWER TOOL

Read the owner's manual carefully. Learn its application and limitations as well as the specific potential hazards peculiar to this tool.

2. GROUND ALL TOOLS

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

3. KEEP GUARDS IN PLACE

In working order and in proper adjustment and alignment.

4. REMOVE ADJUSTING KEYS AND WRENCHES

Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.

5. KEEP WORK AREA CLEAN

Cluttered areas and benches invite accidents. Floor must not be slippery due to wax or sawdust.

6. AVOID DANGEROUS ENVIRONMENT

Don't use power tools in damp or wet locations or expose them to rain. Keep work area well lit. Provide adequate surrounding work space.

7. KEEP CHILDREN AWAY

All visitors should be kept a safe distance from work area.

8. MAKE WORKSHOP KID-PROOF

— with padlocks, master switches, or by removing starter keys.

9. DON'T FORCE TOOL

It will do the job better and safer at the rate for which it was designed.

10. USE RIGHT TOOL

Don't force tool or attachment to do a job it was not designed for.

11. WEAR PROPER APPAREL

No loose clothing, gloves, neckties or jewelry to get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.

12. USE SAFETY GOGGLES

Safety goggles must comply with CSA Z94.3, 1969. Also use face or dust mask if cutting operation is dusty and ear protectors (plugs or muffs) during extended periods of operation.

13. SECURE WORK

Use clamps or a vise to hold work when practical. It's safer than using your hand, frees both hands to operate tool.

14. DON'T OVERREACH

Keep proper footing and balance at all times.

15. MAINTAIN TOOLS WITH CARE

Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

16. DISCONNECT TOOLS

before servicing; when changing accessories such as blades, bits, cutters, etc.

17. AVOID ACCIDENTAL STARTING

Make sure switch is in "OFF" position before plugging in tool.

18. USE RECOMMENDED ACCESSORIES

Consult the owner's manual for recommended accessories. Follow the instructions that accompany the accessories. The use of improper accessories may cause hazards.

19. NEVER STAND ON TOOL

Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.

Do not store materials above or near the tool such that it is necessary to stand on the tool to reach them.

20. CHECK DAMAGED PARTS

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

21. DIRECTION OF FEED

Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.

22. NEVER LEAVE TOOL RUNNING UNATTENDED

Turn power off. Don't leave tool until it comes to a complete stop.

additional safety instructions for radial saws

WARNING: DO NOT CONNECT POWER CORD UNTIL THE FOLLOWING STEPS HAVE BEEN SATISFACTORILY COMPLETED:

- A. Assembly and installation.
- B. Examination and operating familiarity with ON-OFF switch, elevation control, bevel index and lock, carriage lock, guard clamp screw, spreader and anti-kickback device, and miter index and lock.
- C. Review and understanding of the Safety Instructions and Operating Procedures which follow.

CAUTION: Always disconnect the power cord before removing the guard, changing the cutting tool, changing the set-up or making adjustments. Shut off motor before performing layout work on the saw table. ALWAYS RETURN THE CARRIAGE TO THE FULL REAR POSITION AFTER EACH CROSSCUT TYPE OPERATION.

STABILITY

1. The saw should be bolted down if there is any tendency to tip, walk, or slide during normal operation. The saw table should be approximately 39" above the floor.

WORK AREA AND MACHINE POSITION

1. Position your entire saw (or saw and bench) to slope slightly rearward, so the carriage will not roll forward due to gravity or vibration.
2. The saw should be positioned when ripping so neither the operator nor a casual observer is forced to stand in line with the saw blade.
3. The saw work area should have adequate overhead, non-glare light and adequate surrounding work space.
4. Set carriage lock before moving machine.

KICKBACKS-COMMON WAYS THEY CAN HAPPEN

Kickbacks can cause serious injury: A kickback occurs when a part of the workpiece binds between the saw blade and the rip fence or other fixed object, rises from the table, and is thrown toward the operator. Kickbacks are usually caused by one or more of the following conditions:

1. Failure to determine that the saw blade is parallel to the rip fence.
2. Confining the cut-off piece when ripping.
3. Failure to use the spreader when ripping, or failure to maintain the spreader in alignment with the saw blade.
4. Ripping wood that has a twisted grain, does not have a straight edge to guide along the fence, or wood that is twisted or not flat (which may rock on the table and pinch the blade).
5. Improperly conditioned (dull) saw that permits the material to pinch on the out-feed edge of the saw and rise from the table.
6. Ripping by applying the feed force to the section of the workpiece that will become the cut-off (free) piece (feed force when ripping should always be applied between the saw blade and the fence ... use a push stick for narrow or short work).
7. Releasing workpiece before operation is complete ... not pushing the workpiece all the way past the saw blade.

8. Failure to adjust the nose of the guard to just clear the workpiece.

KICKBACKS — COMMON WAYS THEY CAN BE AVOIDED OR INJURY FROM THEM PREVENTED OR MINIMIZED

1. Avoiding any of the causes noted above.
2. Keeping your face and body — and observers — always out of line of possible kickbacks.
3. Always wear safety goggles.
4. Making sure (by trial) before starting the cut that the anti-kickback pawls will stop kickback once it has started.
5. Whenever possible, perform rip, bevel rip, and plough cuts with the saw in the in-rip position. Refer to "6" under "Kickbacks — ... Happen" and "6" under "Operational Instructions."
6. Keeping points of anti-kickback pawls SHARP!
7. Positioning nose of guard to just clear work and positioning anti-kickback pawls properly.
8. Plastic and composition (like hardboard) materials may be cut on your saw. However, since these are usually quite hard and slippery, the anti-kickback pawls may not stop a kickback. Therefore, be especially attentive to following proper set-up and cutting procedures for ripping these materials. Do not stand, or permit anyone else to stand, in line with a potential kickback.

PERSONAL CLOTHING AND EQUIPMENT

1. Do not wear gloves while operating the saw. Loose flowing garments, jewelry (rings, wrist watches, etc.) and neckties must never be worn. Long sleeves must be rolled to above the elbows.
2. Always wear safety goggles, (complying with CSA Z94.3 1969) to protect the eyes. In addition, wear a face shield if the operation is dusty, and ear protectors (plugs or muffs) during extended periods of operation.

OPERATIONAL INSTRUCTIONS

1. Before starting work, verify that no play exists in the carriage, and that arm, yoke, and bevel locks/clamps are tight.
2. Never place your fingers or hands in the path of the saw blade.
3. Use only accessories that are designed for this machine.
4. A large proportion of saw accidents is caused by dull, badly set, improperly filed cutting tools, by gum or resin adhering to cutting tools, and by saw blade misalignment (out-of-parallel) with the fence. Such conditions cause the material to stick, jam, stall the saw, or kickback at the operator. NEVER ATTEMPT TO FREE A STALLED SAW BLADE WITHOUT FIRST TURNING THE SAW "OFF". Avoid potential injury by proper cutting tool and machine maintenance.
5. **CAUTION: DO NOT cycle the motor switch ON and OFF rapidly, as this might cause the saw blade to loosen. In the event this should ever occur, allow the saw blade to come to a complete stop and re-tighten the arbor nut normally, not excessively.**

additional safety instructions for radial saws

6. Provide proper support for the workpiece, based on its size and the type of operation to be performed. Hold the work firmly against the fence. When ripping short workpieces (under 12-inches long) or narrow pieces (under 6-inches wide), use a push stick applied to the section of the workpiece between the blade and the fence.
 7. Never use a length stop on the free end or edge of the workpiece whether crosscutting or ripping. Never hang onto or touch the free end of workpiece, or a free piece that is cut off, while power is "ON" and/or the saw blade is rotating. In short, to guard against kickbacks or other potential accidents, the cut-off piece in any thru-sawing operation must never be confined — it must be allowed to move laterally.
 8. Do not leave a long board unsupported so the spring of the board causes it to shift on the table. A support should be used to catch the end of the board you are cutting.
 9. Whenever you have a choice, use the "IN-RIP" (instead of "OUT-RIP") setup. This provides more space on the fence side of the blade in which to use a push stick.
 10. Make sure your fingers do not contact the terminals of power or motor plugs when installing or removing the plug to or from a live power source.
 11. Never climb on or near the saw when power is on. Never leave the saw with power on, or before the cutting tool has come to a complete stop. Lock the motor switch and put away the key when leaving the saw.
 12. Avoid awkward hand positions, where a sudden slip could cause a hand to move into a sawblade or other cutting tool. Never reach in back of or around the cutting tool with either hand to hold down the workpiece.
- CAUTION: Never reposition the Guard or anti-kickback/spreader with power ON.**
13. Always position the GUARD and the anti-kickback and spreader assembly for rip type operations. Also make sure the cutting tool, arbor collars and arbor nuts are installed properly. Keep guard in place.
 14. When performing crosscut type operations, be sure the Guard is clamped solidly in the horizontal position, and the anti-kickback assembly is adjusted so the pawls just clear the workpiece. Tighten securely. This provides additional guarding.
 15. Never operate this saw when equipped with a molding head unless the proper molding head guard is installed — see listing of recommended accessories. The only exception is when "top-side" molding when the sawblade guard must be used. See detailed instructions that accompany the molding head and molding head guard.
 16. Do not use any blade or other cutting tool marked for an operating speed lower than 3450 RPM. Never use a cutting tool larger in diameter than the diameter for which the saw was designed. For greatest safety and efficiency when ripping, use the maximum diameter blade for which the saw is designed, since under these conditions the spreader is nearest the blade.
 17. The use of abrasive or cut-off wheels, or wire wheels can be dangerous and is not recommended. (Abrasive or cut-off wheels are used to saw many different materials including metals, stone, and glass.)
 18. Do not position the arm so the operation you are

performing permits the cutting tool to extend beyond the edges of the table.

19. Never turn your radial arm saw "ON" before clearing the table or work surface of all objects (tools, scraps of wood, etc.) except the workpiece and related feed or support devices for the operation planned.
20. Objects can be thrown upward toward the operator by the back of the blade if proper operating procedures are not followed during cross-cut type operations. This usually occurs when a small loose piece of wood or other objects contacts the rear of the revolving blade and ricochets off the fence or the wall behind the saw toward the operator. It can be avoided by removing all loose pieces from the table immediately after they are made, using a long stick, and keeping the guard in place at all times.
21. Never perform any operation "free hand". This term means feeding the carriage into the workpiece or feeding the workpiece into the saw blade or other cutting tool without using the fence or some other device which prevents rotation or twisting of the workpiece during the operation. Never "rip" (cut with the grain) narrow or long workpieces in the crosscut position. Never make a miter cut with the arm in the 90° crosscut position.
22. "ALWAYS return the carriage to the full rearward position at conclusion of each crosscut type cut. Never remove your hand from the bevel index handle unless the carriage is in this position. Otherwise the cutting tool may climb up on the workpiece and be propelled toward you."
23. "Never lower a revolving cutting tool into the table or a workpiece without first locking the Carriage Lock Knob. Release the knob only after grasping the Bevel Index Handle. Otherwise the cutting tool may grab the workpiece and be propelled toward you."
24. NOTE THE FOLLOWING DANGER LABELS WHICH APPEAR ON THE FRONT OF THE GUARD AND YOKE.

DANGER
For your own safety/Pour votre propre sécurité

1. Read and understand owner's manual before operating machine.
2. Wear safety goggles.
3. Keep hands out of path of saw blade.
4. Know how to avoid "kickbacks".
5. Use "push-stick" when ripping short or narrow work.

1. Lisez et comprenez le manuel de l'acheteur avant de faire fonctionner cette machine.
2. Portez des lunettes de sécurité.
3. Maintenez les mains hors du chemin de la lame de scie.
4. Sachez comment éviter les "retours".
5. Utilisez un "baton-poussoir" pour refendre un travail court ou étroit.

DANGER
To avoid injury do not feed material into cutting tool from this end.
Pour éviter les blessures ne faites pas avancer du matériel dans l'outil de coupe par ce bout.

Safety is a combination of operator common sense and alertness at all times when the saw is being used.

WARNING: DO NOT ALLOW FAMILIARITY (GAINED FROM FREQUENT USE OF YOUR SAW) TO BECOME COMMONPLACE. ALWAYS REMEMBER THAT A CARELESS FRACTION OF A SECOND IS SUFFICIENT TO INFLICT SEVERE INJURY.

IF YOUR RADIAL SAW MAKES AN UNFAMILIAR NOISE OR IF IT VIBRATES EXCESSIVELY CEASE OPERATING IMMEDIATELY UNTIL THE SOURCE HAS BEEN LOCATED AND THE PROBLEM CORRECTED.

If any part of this radial saw should break, bend, or fail in any way or any electrical component fail to perform properly, or if any is missing, shut off power switch, remove power supply cord from power supply and replace damaged missing and/or failed parts before resuming operation.

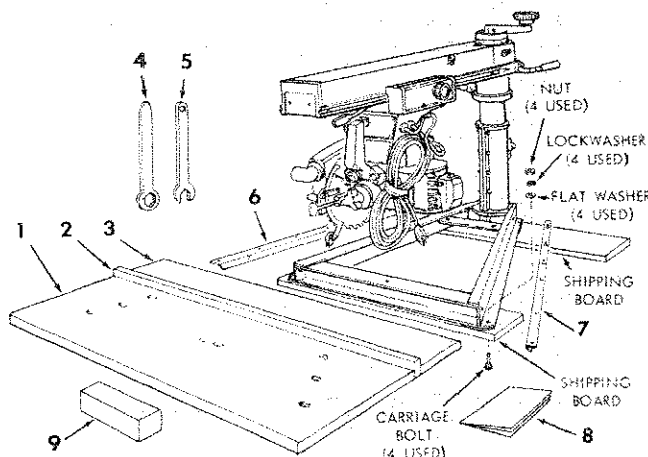
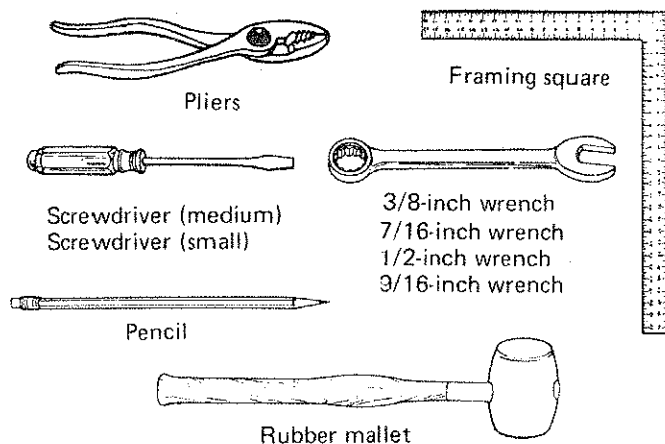
unpacking and pre-assembly

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TOOLS NEEDED



1. Unpacking and Checking Contents.

- Before proceeding with the assembly of your new Craftsman 10-inch Radial Saw, you should read these instructions and follow them carefully.
- This saw is shipped complete in one carton. However, in order to prevent damage during shipment and facilitate packaging, certain items are removed at the factory and must be reassembled when the saw is received by the purchaser. These "loose parts" are shown in the following "Table of Loose Parts".
- Separate all "loose" parts from packing materials and check each item with "Table of Loose Parts", making sure all items are accounted for before discarding any packing material. The four carriage bolts, nuts, flat washers and lock washers, used to secure the saw base to shipping boards may be retained for mounting the saw.

If any parts are missing, do not attempt to assemble the Radial Saw, plug in the power cord or turn the switch "on" until the missing parts are obtained and are installed correctly.

2. Mounting the Saw.

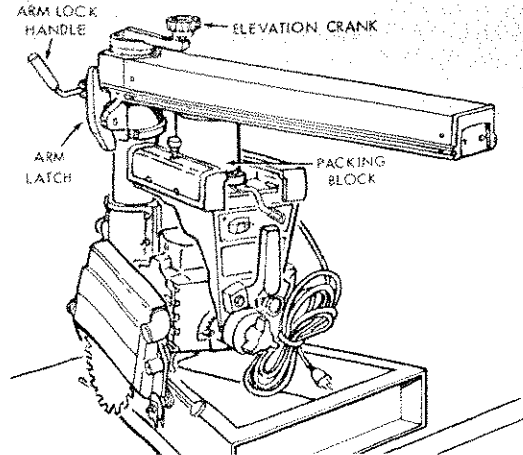
- After removing the two shipping boards place the saw assembly upright on a suitable sturdy work bench, or Craftsman Power Tool Bench.
- The base of the saw must be mounted flush to a flat surface on the bench to prevent distortion of the saw base. The nuts, screws and washers which attach the wooden shipping skids to the saw base may be used to secure the saw base to the work bench (or tool bench).
- Position the work bench or tool bench with the front edge slightly higher than the rear — enough to prevent the carriage from creeping forward with the motor running and carriage lock knob loose. This should be checked after the saw has been set up and is ready to be operated.

Key No.	Table of Loose Parts	Qty.
1	Table, Front	1
2	Fence, Rip	1
3	Table, Rear	1
4	Arbor Wrench	1
5	Shaft Wrench	1
6	Table Support, Left-hand	1
7	Table Support, Right-hand	1
8	Owner's Manual	1
9	Loose Parts Bag (containing the following):	
	Washer, Plain, 11/32 x 7/8 x 1/16"	4
	Lockwasher, 5/16 x .125 x .078"	4
	Screw, Hex. Hd., 5/16-18 x 3/4"	4
	Screw, M. Pan. Sl., 1/4-20 x 1"	6
	Washer, Plain, 17/64 x 5/8 x 1/32"	7
	Lockwasher, Steel, 1/4 x .109 x .062"	6
	Nut, Hex., 1/4-20 x 7/16 x 3/16"	6
	Nut, Tee	1
	Screw, M. Pan. Sl., 1/4-20 x 1-1/4"	1
	Screw, Sl. Cup Pt., Set, 1/4-20 x 1/2"	1
	Nut, U-Clip (1/4-20)	1
	Clamp, Table	2
	Switch Key	2
	Shoe, Carriage Lock	1
	Knob Carriage Lock	1

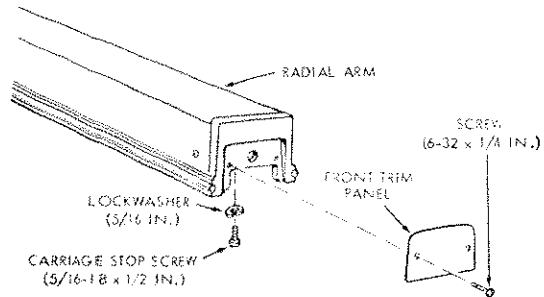
assembly and adjustments

3. Installing Motor and Carriage Assembly on Radial Arm.

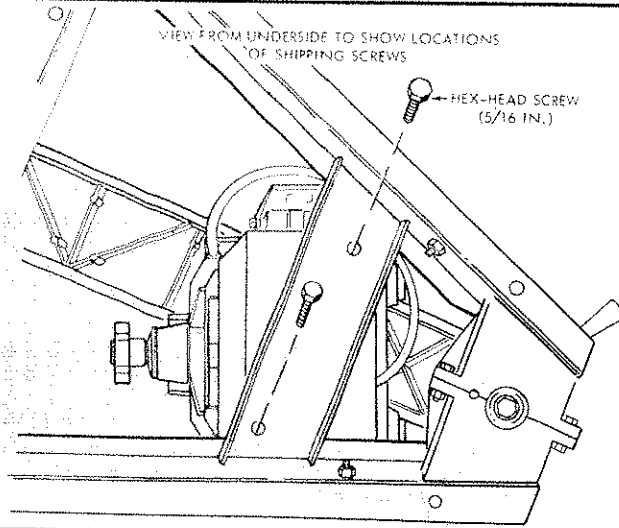
- Rotate the elevation crank counterclockwise approximately 20 turns to raise the radial arm free of the carriage.
- Loosen the arm lock handle, engage the arm latch handle, then tighten arm lock handle firmly. Arm lock handle may be positioned on left side of radial arm. Lock handle can be positioned on either side of Radial arm.
- Remove and discard the packing block.



- Remove the front trim panel by removing two screws.
- Using a wrench remove the carriage stop screw and lockwasher.

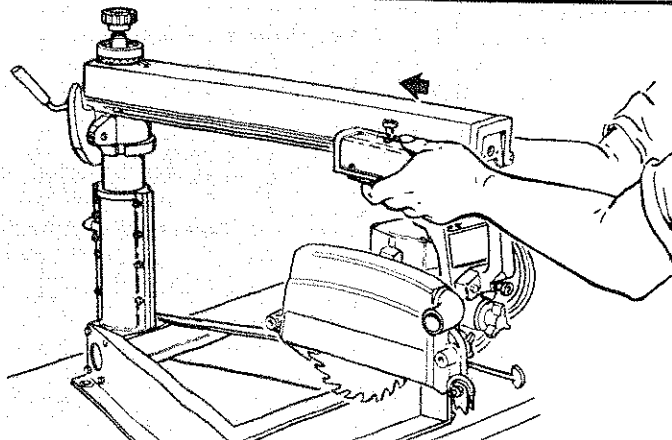


- Remove and discard the two 5/16-inch, hex-head screws from underside of base. These screws secure the motor during shipment.

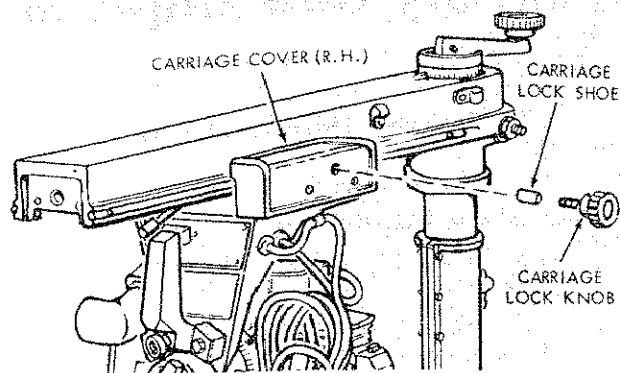


CAUTION: During the next operation be sure to hold the motor and carriage assembly parallel to the radial arm until all rollers are engaged with the tracks. If the assembly is allowed to tilt after rear rollers are engaged, the adjustment of rear rollers will be altered.

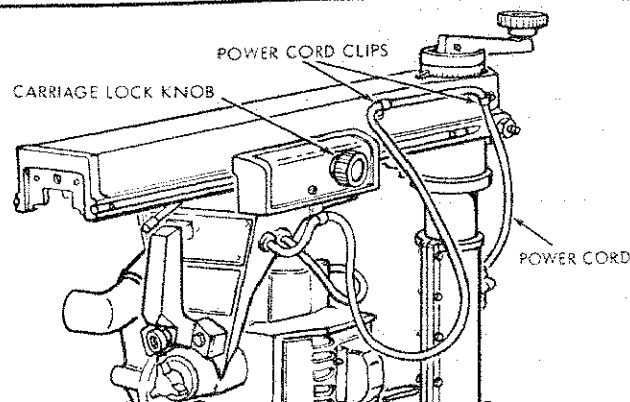
- Grasp the carriage with both hands and while holding it with carriage bearings parallel to the tracks on radial arm, slide the motor and carriage assembly carefully onto the arm.



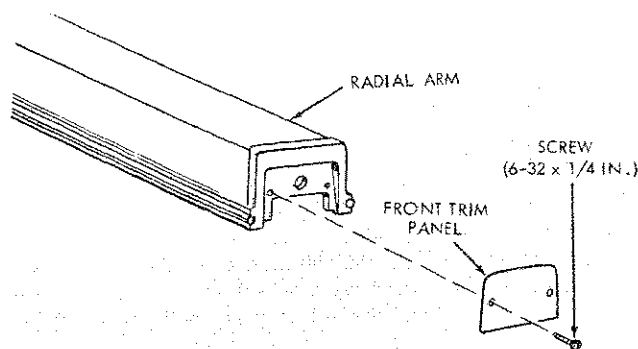
- h. Install the carriage stop screw and lockwasher.
- i. Install the carriage lock shoe and carriage lock knob and tighten the lock knob hand tight. This prevents the carriage from moving on the radial arm.



- j. Remove two power cord clamps from right-hand side of radial arm, by removing one screw from each clamp, place the power cord in position and re-install the cord clamps to secure the power cord to the arm.



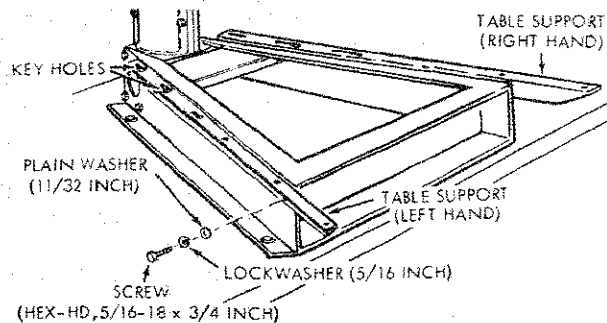
- k. Install the front trim panel at end of radial arm with two screws.
- m. Loosen the carriage lock knob and move the carriage back and forth on the radial arm. Movement should be "firm" but should not bind at any point along the arm.



4. Installing Table Supports.

NOTE: Right- and left-hand table supports may be identified by the three "keyholes" in the table attaching surface of each support. These keyholes are for attaching the table clamps and are located at the rear of the saw. Also, the angle of each support turns outward, away from the saw base.

- a. Place one 5/16-inch, split lockwasher and one 11/32-inch plain washer on each of the four 5/16-18 x 3/4-inch hex-head screws, all from the loose parts pack.
- b. Attach each table support to the saw base with two screws, lockwashers and plain washers.
- c. Position each support on the base so each screw is approximately centered in the slotted hole in the support.
- d. Tighten the screws just enough to hold the table supports in position, but loose enough for the supports to slip against the base channel when tapped with a rubber mallet.



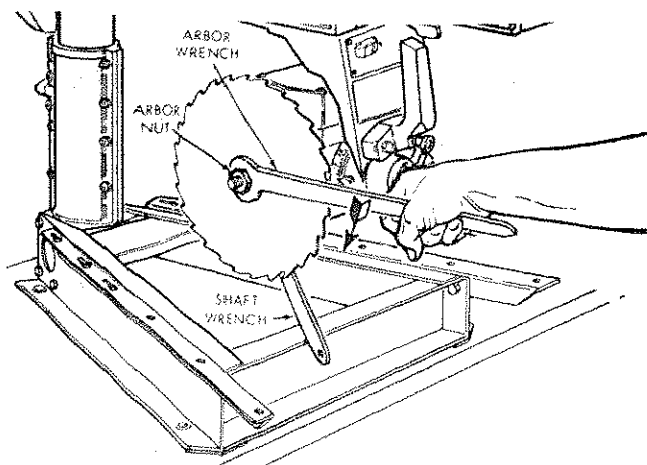
assembly and adjustments

ALIGNMENT INSTRUCTIONS

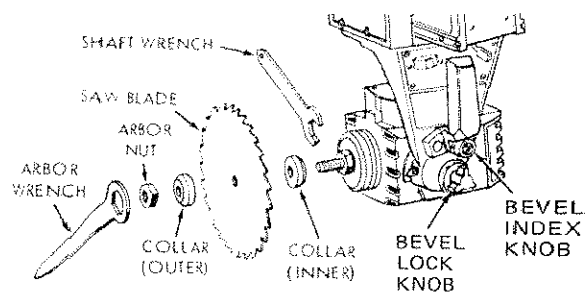
1. Adjusting Table Supports Parallel to Radial Arm.

- Loosen the guard clamp screw and remove the guard.
- Secure the carriage (approximately midway on radial arm) by tightening the carriage lock knob.
- Using the shaft wrench on hex portion of motor shaft (at inner edge of saw blade) and the arbor wrench on shaft nut, loosen the shaft nut.

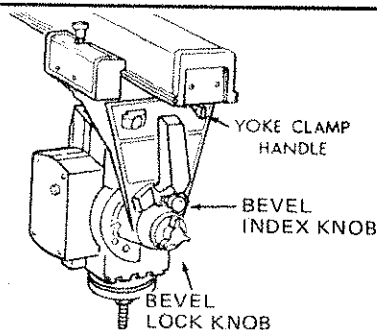
NOTE: The motor shaft has left-hand threads.



- Remove the shaft nut, outer collar, saw blade and inner collar.



- Loosen the bevel lock knob, pull out on the bevel index knob and swivel the motor to position the saw end of shaft pointing straight down. Tighten the bevel lock knob and check the yoke clamp handle to make sure it is tight.

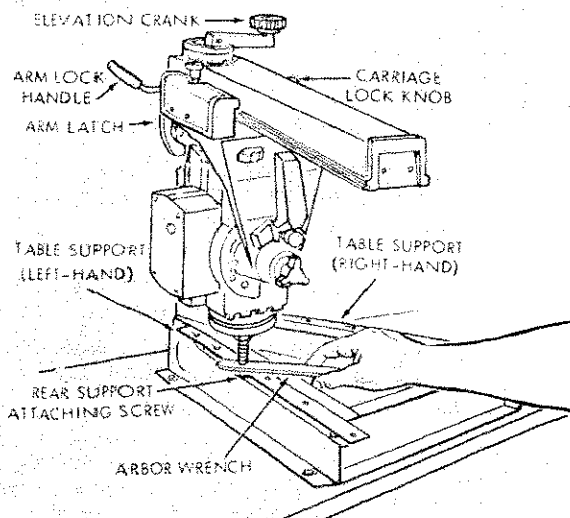


- Loosen the arm lock handle, release the arm latch handle and loosen the carriage lock knob.

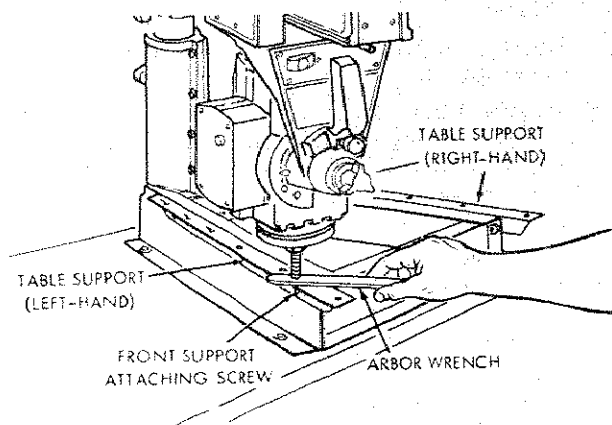
NOTE: For safety reasons in accordance with the UL standard, stops have been provided to prevent 360° rotation of the radial arm.

- Move the radial arm to the left against the stop. Position the end of motor shaft over the table support as close as possible to rear support attaching screw.
- Hold the arbor wrench between end of motor shaft and top surface of table support and use the wrench as a "feeler" gauge to insure an accurate adjustment.
- Lower the motor with the elevation crank until the end of motor shaft just touches the arbor wrench. Then, carefully adjust the motor up or down (with elevation crank) until the arbor wrench can be slipped back and forth with only slight resistance.

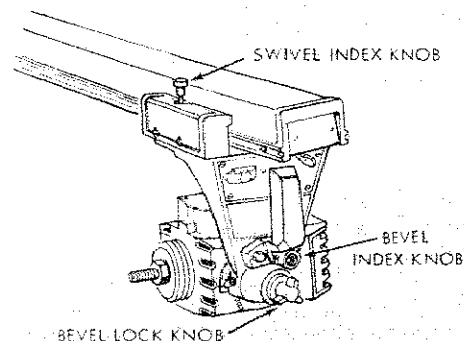
NOTE: Do not change the elevation setting of the motor until both right, and left-hand table supports have been adjusted.



- j. Move the carriage out near the end of radial arm and move the arm until the end of motor shaft is over the table support above the front support attaching screw. Tap the table support upward or downward until the arbor wrench slides with the same "feel", as in the previous setting of left-hand support.
- k. After setting the forward position of table support, move the carriage rearward to the first position checked in order to make sure that adjusting the forward position did not affect the rear setting. Tap the table support upward or downward as required. Several trial settings may be required.
- l. Tighten the two hex-head support attaching screws securely to retain the adjustment. Recheck to make sure that tightening screws did not affect the accuracy of the adjustment.
- m. Move the radial arm over to the right-hand table support and adjust it in the same manner. Make sure all four table support attaching screws are tight.

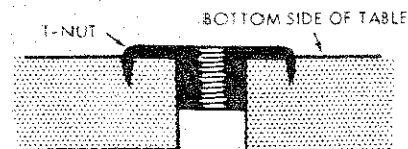


- n. Loosen the bevel lock knob, pull out on bevel index knob and rotate the motor and carriage assembly until the swivel index knob indexes the motor with the shaft in a horizontal (zero) position. Tighten the bevel lock knob.

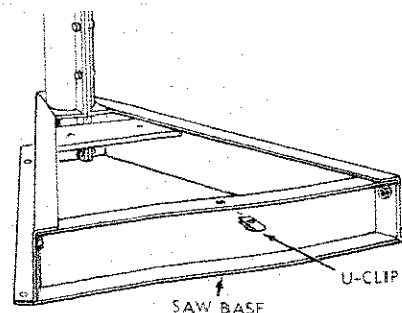


2. Installation of Front Table.

- a. Place the large table board upside-down on the floor. Distinguish between the one through-bored (leveling screw) hole near the center of the table board, and the seven counterbored holes. The counterbores are in the top surface of the board.
- b. Drive the T-nut into the through-hole. (Illustration shows the T-nut installed.)

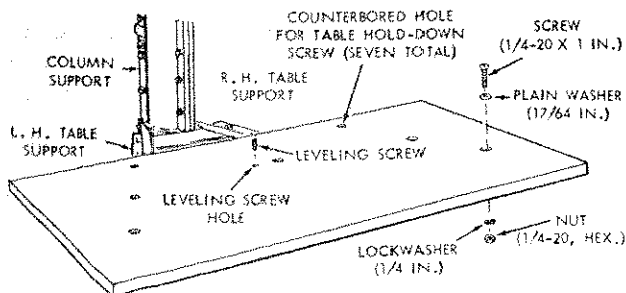


- c. Place the 1/4-20 U-clip nut on the base cross member to receive the center front table attaching screw.

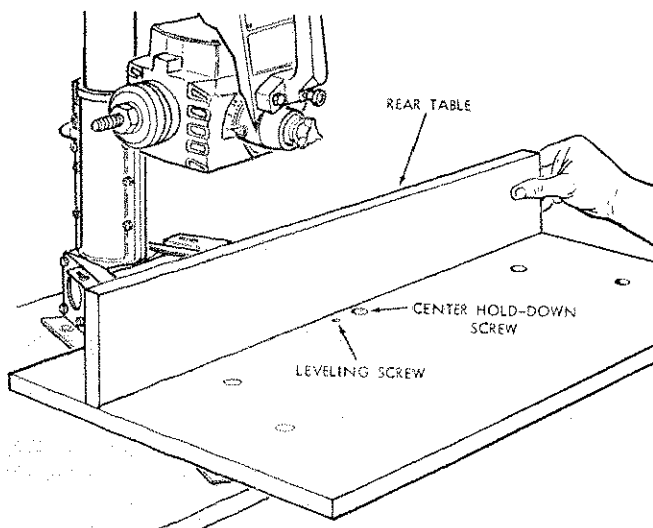


assembly and adjustments

- d. Place the large, front table board on the table supports.
- e. Align the counterbored holes with matching holes in table supports.
- f. Place a 17/64-inch plain washer and a 1/4-20 x 1-inch screw (from loose parts pack) in each of the six counterbored holes that match corresponding holes in table supports. Use a 1/4-20 x 1-1/4-inch screw in counterbored hole at the center of the table board.
- g. Start the leveling screw into the T-nut on front table, but do not allow the tip of the screw to protrude beyond the bottom surface of front table.
- h. Install lockwashers and nuts on the six screws in the table supports and tighten them finger tight. Start the 1/4-20 x 1-1/4-inch screw, located in the counterbored hole near the center of front board into the U-clip on saw base, but leave it approximately two turns loose.

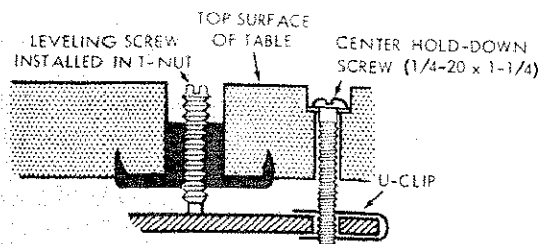


- i. At this time the front table should be checked and adjusted at the center position as follows:
 - (1) Move the carriage to maximum rear position.
 - (2) Using one edge of the rear table board as a straightedge, place the board on the front table.



- (3) Sight between edge of rear table and surface of front table, to determine if the front table is low or high at the center position. If the table is high, tighten the center hold-down screw until it is level, then rotate the leveling screw clockwise until it is "snug" against the base front member. If the table is low at the center, loosen the hold-down screw and rotate the leveling screw clockwise until the front table is level, then tighten the hold-down screw.

NOTE: After tightening screws, as described above, always recheck to make sure the front table remains level. In some cases, a final "touch-up" adjustment may be required.

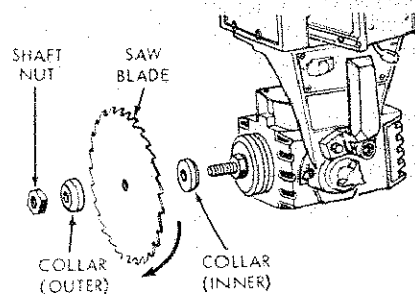


3. Squaring the Crosscut Travel.

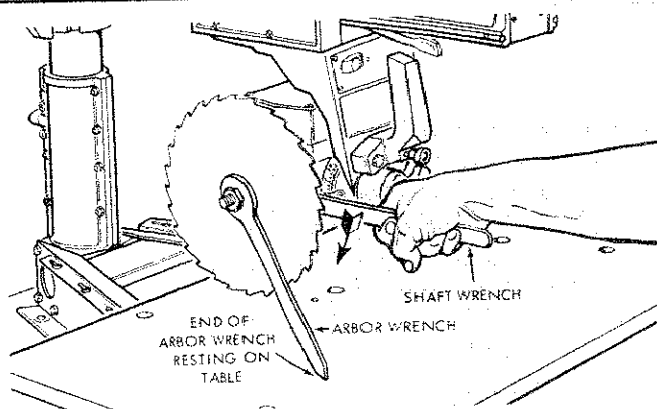
- a. Check to make sure the arm latch handle is securely latched in the detent and the arm lock handle is still tight.
- b. Install the saw blade as follows:
 - (1) Place the inner collar on motor shaft with flange next to saw blade.
 - (2) Slide the saw blade on motor shaft. Make sure teeth are pointed in direction of saw rotation.
 - (3) Install outer collar, with flange next to saw blade.

NOTE: The arbor shaft has left-hand threads.

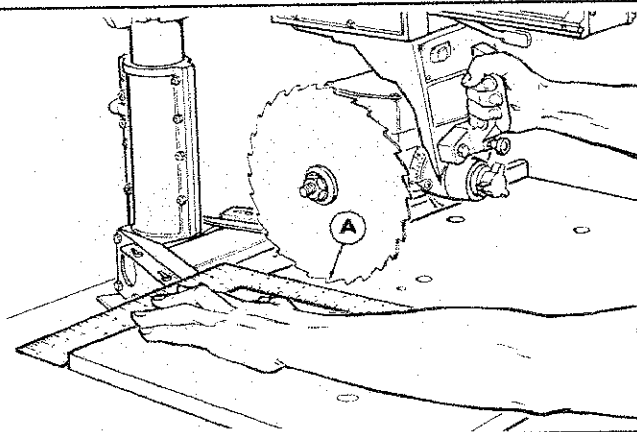
- (4) Install the shaft nut.



- (5) Use the shaft wrench on motor shaft and arbor wrench on arbor nut to tighten the shaft nut.

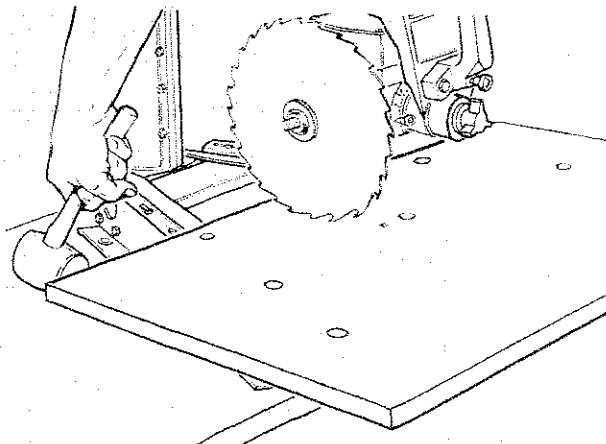


- c. Place a square on the table and position the saw and square until the long leg of the square just contacts a tooth of the saw blade. (Position "A") Mark this tooth with a soft lead pencil.
- d. When the blade is moved back and forth on the radial arm, the saw tooth "A" should just touch the square at all positions. If saw tooth "A" does not touch the square at all points, make the following adjustments:



- (1) If saw tooth "A" moves away from the square when moving the blade from the rear toward the front of the table, tap the left rear edge of front table board with a rubber mallet until the table is square with the saw blade.
- (2) If saw tooth "A" moves into the square when moving the saw from the rear toward the front of the table, tap the left front edge of the table until it is squared.
- (3) Recheck for blade squareness and, if correct, tighten the six table hold-down screws that secure the front table to table supports.

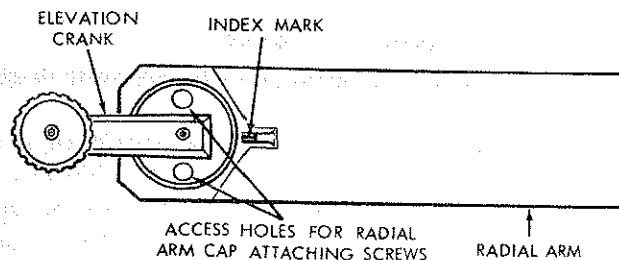
NOTE: If any difficulty is experienced in squaring the crosscut, refer to "Trouble Shooting" and adjust the arm latch. Then complete the preceding adjustments.



assembly and adjustments

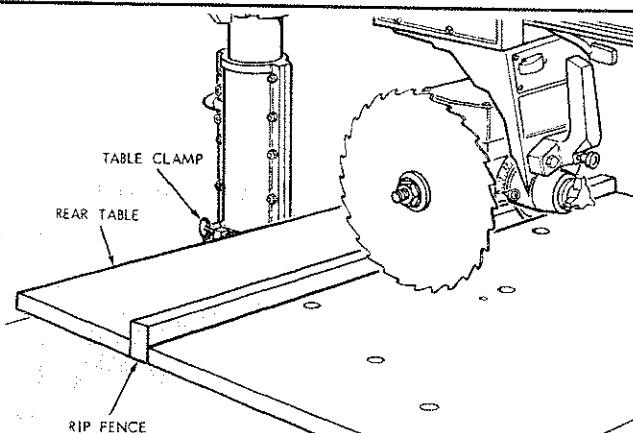
e. After the crosscut travel has been accurately squared, check the 0° position on the indicator scale of the radial arm cap to determine if the 0° position on the scale is aligned with index mark on radial arm. If not aligned, proceed as follows:

- (1) Rotate the elevation crank to a position which will locate the two access holes over screw heads of radial arm cap attaching screws.
- (2) Loosen the two screws with a screwdriver inserted through the access holes in elevation crank.
- (3) Reposition the radial arm cap by hand until the 0° mark is aligned with the index mark and tighten the two screws.



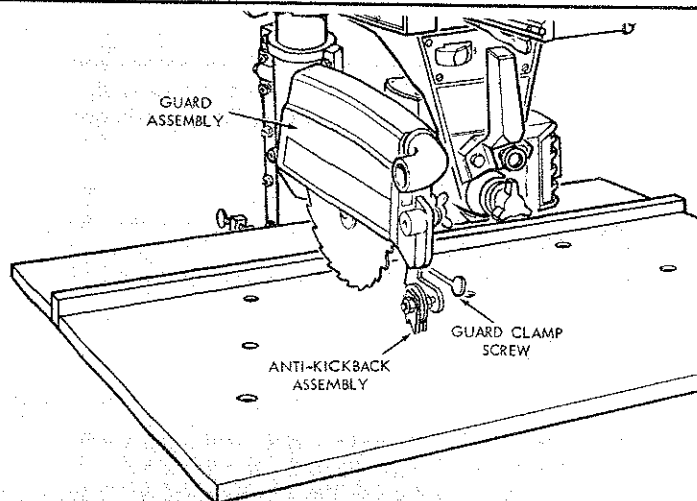
4. Installing Remaining Table Boards.

- a. Place the rip fence against rear edge of front table, place rear table against fence. Slide them into position so that ends are even with front table.
- b. Engage a table clamp in the exposed "keyhole" in each table support and tighten the two clamps to secure rear table.



5. Installing the Guard.

Attach the guard assembly and secure it by tightening the guard clamp screw finger tight.

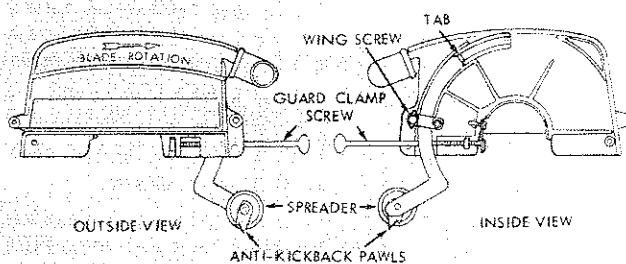


6. Alignment of anti-kickback and spreader assembly, for ripping.

WARNING: NEVER POSITION THE GUARD OR ANTI-KICKBACK ASSEMBLY WITH POWER ON; NOR POSITION ANTI-KICKBACK PAWLS BY GRASPING PAWLS OR SPREADER.

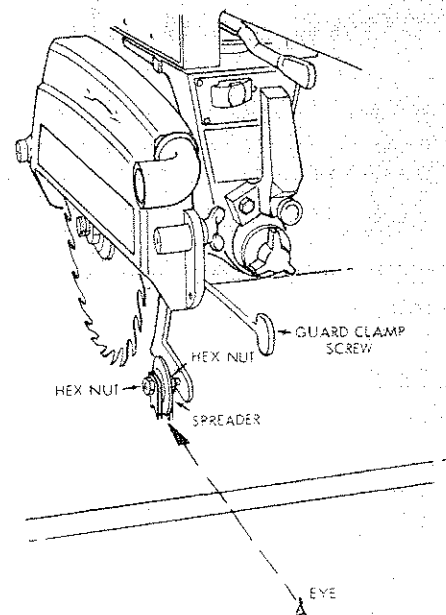
Check and adjust the spreader as follows:

- a. Loosen the wing screw and with the "tab" position the anti-kickback and spreader assembly to near the bottom of the blade. Tighten the wing screw.



b. Sight (visually) to check for proper alignment of spreader with saw blade as shown. If the spreader is not aligned, adjust it as follows:

- (1) Loosen two hex nuts, one on each side of spreader.
- (2) Rotate hex nuts with fingers until the spreader is directly in line with saw blade.
- (3) Tighten both hex nuts firmly.

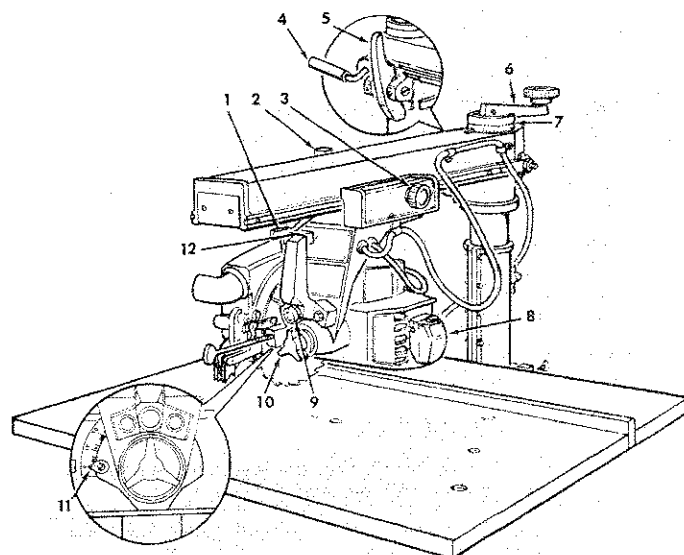


operating controls

OPERATING CONTROLS

Location and Function of Controls

1. **"Depth of Cut"**. The elevation crank (6) is used to raise and lower the blade. One complete turn of this handle will raise or lower the radial arm 1/8 inch.
2. **"Angle of Cut"**. Two levers are involved in releasing, securing and indexing the angle of radial arm. These are: arm lock handle (4) and arm latch handle (5). The arm is unlocked by loosening the arm lock handle and pushing the arm latch handle out of the detent notch. It is locked by tightening the arm lock handle. The radial arm has positive index stops at 0° and 45°, left and right, and is released from these index positions by pushing the arm latch handle. In order to provide the most positive and accurate settings at the index positions, the following is recommended:
 - a. Move the radial arm into the index position (do not bump or jar) and depress the arm latch handle solidly into the detent notch with the palm of the hand.
 - b. Lock the radial arm by tightening the arm lock handle fully hand tight.
3. **"Yoke Pivot"**. Two controls are used in this operation. They are: swivel index knob (2) and yoke clamp handle (1). The swivel index knob automatically indexes the yoke at each 90° position and both 0° positions. Lift the knob to release it. The yoke clamp handle locks the yoke to the carriage in any position. Push the handle to the right to release it; push to the left to tighten it.



- | | |
|-----------------------|-----------------------|
| 1. Yoke Clamp Handle | 7. Radial Index Scale |
| 2. Swivel Index Knob | 8. Manual Brake |
| 3. Carriage Lock Knob | 9. Bevel Index Knob |
| 4. Arm Lock Handle | 10. Bevel Lock Knob |
| 5. Arm Latch | 11. Bevel Index Scale |
| 6. Elevation Crank | 12. On-Off Switch |

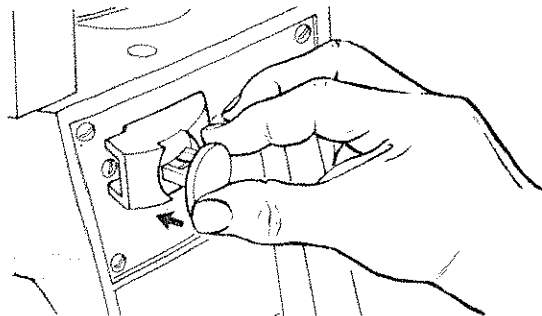
4. **"Carriage Lock"**. The carriage lock knob (3) is rotated clockwise to prevent movement of the carriage on the radial arm, and counterclockwise to release it. Avoid excessive tightening of this knob.
5. **"Blade Angle"**. The two controls used in angular positioning and indexing of the motor to provide the desired saw blade angle are: bevel lock knob (10) and bevel index knob (9). The bevel index scale indicates the angular position of the motor with respect to the horizontal position, from 0° to 90°, in either vertical position. The swivel index knob indexes the motor at 0°, 45°, and 90°, up and down. Pull the knob out to release the motor from any of the index positions. At any other position, the swivel index knob is not engaged. The bevel lock knob locks the motor to yoke when the motor is any position.

operating controls

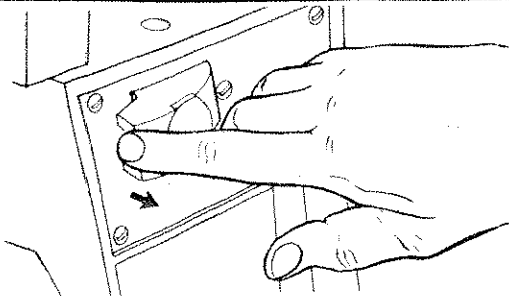
6. "Power Switch and Key". This ON-OFF switch (12) is located in the upper left-hand area of the carriage and is a red colored lever.

a. Instructions for Use of Key and Switch.

(1) Insert Key into switch lock.

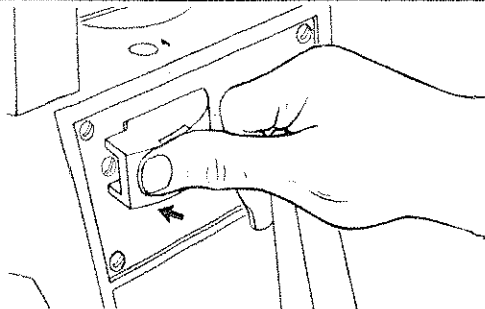


(2) Insert finger under end of switch lever and pull end out, to turn switch on.



(3) Push lever in with thumb to turn switch off.

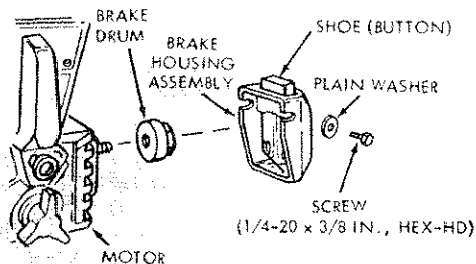
WARNING: FOR YOUR OWN SAFETY ALWAYS LOCK THE SWITCH "OFF" WHEN SAW IS NOT IN USE. REMOVE KEY AND KEEP IT IN A SAFE PLACE... ALSO IN THE EVENT OF A POWER FAILURE (ALL YOUR LIGHTS GO OUT) TURN SWITCH OFF. LOCK IT AND REMOVE THE KEY THIS WILL PREVENT THE SAW FROM STARTING UP AGAIN WHEN THE POWER COMES BACK ON.



b. The Manual Motor Brake.

(1) The manual brake (8) is located on the motor shaft at the right-hand end of motor.

(2) Pressing on the brake button with finger or thumb, after turning off the ON-OFF switch, will greatly reduce blade coasting time.

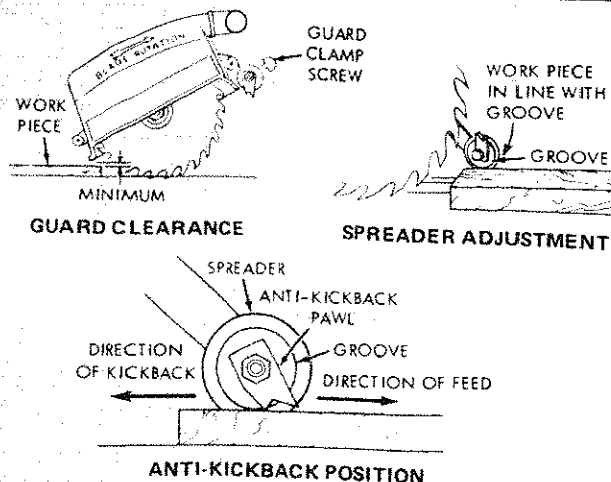


POSITIONING ANTI-KICKBACK AND SPREADER ASSEMBLY, FOR RIPPING.

WARNING: NEVER POSITION THE GUARD OR ANTI-KICKBACK ASSEMBLY WITH THE POWER ON. NEVER POSITION THE ANTI-KICKBACK PAWLS BY GRASPING THE PAWLS OR SPREADER.

For all crosscutting operations (those operations in which the carriage is traveled along the radial arm to feed the saw blade into the workpiece) both the guard and anti-kickback and spreader assembly must be elevated to clear the workpiece or the fence, whichever is higher.

1. The blade guard is positioned by loosening the guard clamp screw and rotating the guard so that it just clears the workpiece as shown.
2. The anti-kickback and spreader assembly is used during ripping operations and is adjustable to accommodate the thickness of the board being ripped. A wing nut in the guard secures the assembly.



(Make sure by trial before starting the cut that the Anti-Kickback Pawls will stop a Kick-back once it has started)

3. Loosen the wing screw and with the tab provided, position the anti-kickback and spreader assembly until the groove on the spreader is even with the top surface of the workpiece. Tighten the wing screw.

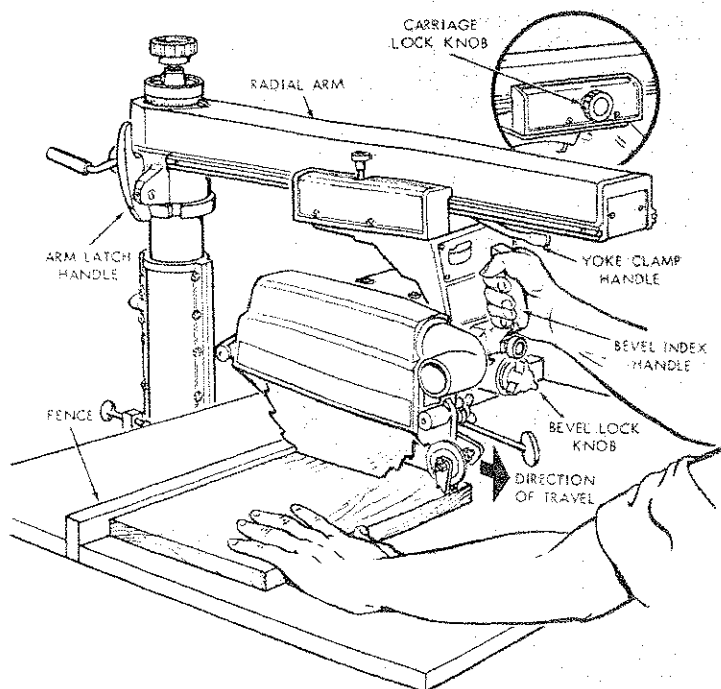
Before making the cut, check the effectiveness of the anti-kickback pawls by sliding the workpiece under the pawls in the direction of feed and then attempting to slide it in the reverse direction — the direction of kickback. If the pawls do not catch, readjust.

basic saw operations

BASIC SAW OPERATIONS

Your Craftsman 10-inch Radial Saw is capable of performing innumerable cuts with sufficient accuracy to satisfy discriminating wood-working requirements. Basic saw operations are summarized into six categories, explained and illustrated in the following paragraphs. A manual entitled "The Radial Saw" is available at your nearest Sears Retail Store or Catalog Order House and contains considerable data and project ideas applicable to the radial saw. **Be sure to read and follow, "Safety Rules" and "Instructions to the Operator",** included in this manual.

NOTE: Refer to paragraphs under "OPERATING CONTROLS" for illustrations and descriptions of these controls.



REQUIREMENTS FOR CROSSCUT

1. Be sure you return the carriage to the full rearward position at the conclusion of each cut. Never remove your hand from the bevel index handle unless the carriage is in this position. Allow the saw blade to come to a complete stop before removing the workpiece from the saw table.
2. The arbor nut must be tight and saw blade guard installed in a horizontal position with anti-kickback device in full up position.
3. The arm lock handle (4) must be tight.
4. Work must be always held firmly against table and fence. For workpieces thicker than the fence is high, it is recommended that a higher fence be cut (at least workpiece thickness) and inserted for that operation being performed. Always place the fence in the most forward position (farthest from the column support) compatible with the workpiece being processed and the operation being performed. With the carriage fully retracted, the blade should not contact the workpiece when placed against the fence, within the stated capacities of your saw.
5. Blade should be sharp and correctly set.
6. Hands must be kept well away from the saw blade.
7. The yoke clamp handle must be in locked position.
8. The bevel lock knob must be tight.
9. For operations No. 3 and No. 4, observe additional instructions under paragraph, "Operating Controls", "Blade Angle".

PRELIMINARY CROSSCUT AT THE 0° POSITION

1. Loosen the carriage lock knob and move the carriage to position the saw blade just forward of the rip fence.
2. Lower the radial arm until the saw blade just clears the table top.
3. Tighten the carriage lock knob.

CAUTION: Before making the cut, make sure the arm latch handle is fully engaged in the detent notch.

4. Plug in the power cord (if not already connected.)
5. Insert the safety lock key and pull the switch lever to "ON" position.
6. Lower the radial arm, by rotating the elevation crank, until the saw blade cuts into the table top surface to a depth of approximately 1/32 inch.

NOTE: Some owners prefer to cover the saw table with thin plywood, tacking it outside of saw travel area in order to protect the table surface.

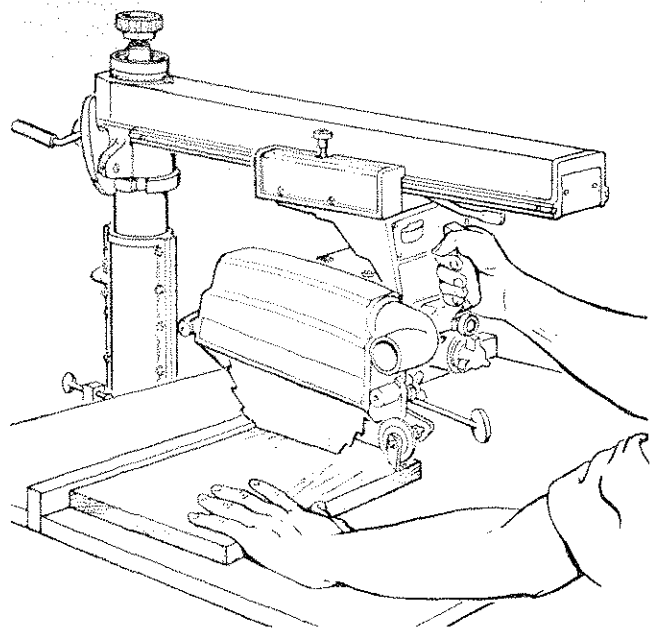
7. Operate the saw in the same manner as shown and complete the blade clearance groove in the table rip fence as follows:
 - a. Loosen the carriage lock knob and slowly pull the carriage out to the extreme end of its travel.
 - b. Push the carriage slowly rearward to the extreme end of the travel. This stroke will cut through the rip fence.
 - c. Push the switch to "OFF" position.

basic saw operations

OPERATION NO. 1 – CROSSCUT

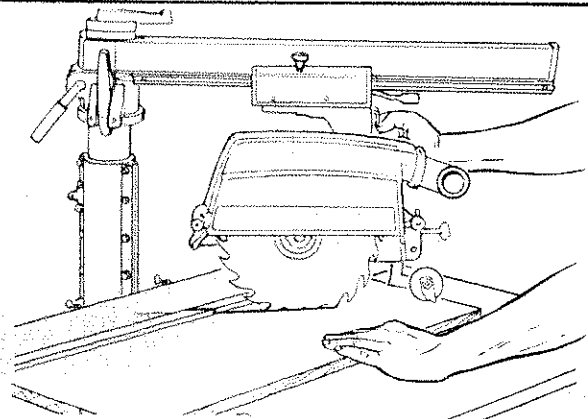
Crosscutting is the process of sawing the workpiece by pulling the saw blade through it and using the fence as a support for the edge of the workpiece. Never crosscut freehand.

WARNING: BEFORE CROSSCUTTING, MAKE SURE THE ARM LATCH, BEVEL LOCK AND YOKE CLAMP ARE ALL SECURED. NEVER USE A LENGTH STOP OR A FIXED GUIDE ON THE FREE END OR EDGE OF A WORKPIECE, (SEE INSTRUCTION 7 UNDER "OPERATIONAL INSTRUCTIONS".) DO NOT CROSSCUT WORKPIECES THAT PLACE YOUR HANDS CLOSE TO THE PATH OF THE SAW BLADE. WHEN MORE EXPERIENCE IS GAINED BY USING THE SAW, IT WILL BE NOTICED, THAT WHEN PULLING THE SAW TOWARD YOU DURING CROSSCUTTING, THE BLADE TENDS TO FEED ITSELF THROUGH THE WORK, DUE TO THE ROTATION OF THE BLADE AND THE DIRECTION OF THE FEED. THEREFORE, THE OPERATOR SHOULD DEVELOP THE HABIT OF HOLDING HIS RIGHT ARM STRAIGHT FROM THE SHOULDER TO THE WRIST.



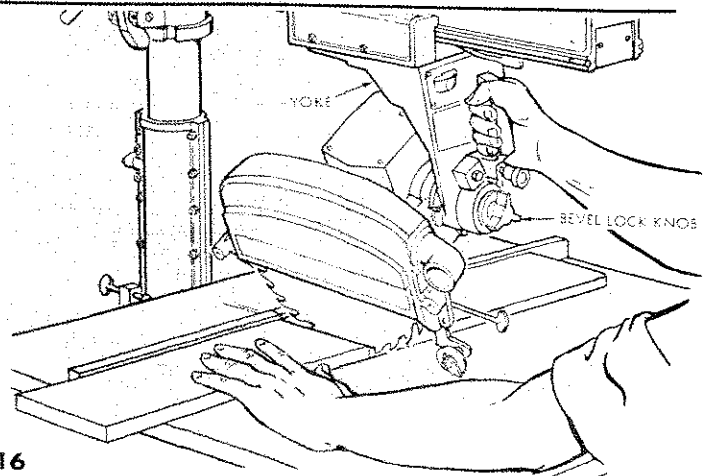
OPERATION NO. 2 – MITER CROSSCUT

Miter crosscutting is the process of sawing a board at any angle other than a 90° (square) cut. The 45° miter angle is a popular angle, since two boards cut to 45° can be assembled to form a 90° corner for producing a square or rectangular frame. The radial arm is set to the desired angle of cut; the bevel setting is indexed at 0° ; the yoke is indexed to position the saw blade parallel with radial arm, and all settings locked. The board being cut is held firmly against the fence and the carriage pulled forward along the radial arm to perform the desired cut. The carriage should be returned to full rear position and the saw blade allowed to come to a complete stop before removing the boards from saw table.



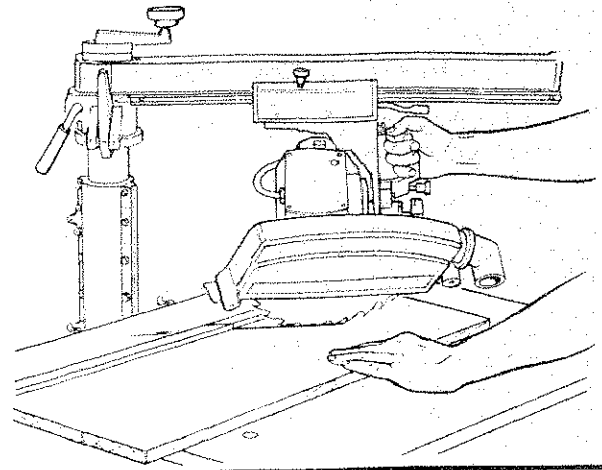
OPERATION NO. 3 – BEVEL CROSSCUT

Bevel crosscutting is the process of sawing at 90° (square) across the board with the saw blade set at an angle other than 90° to the saw table. The radial arm is indexed at 0° ; the yoke is indexed to position the saw blade parallel with the radial arm, but the bevel is set to the desired angle of cut. All settings must be locked. The board is held firmly against the fence and the carriage pulled forward along the radial arm to produce the cut. The carriage should be returned to full rearward position and the saw blade allowed to come to a complete stop before removing the boards from saw table.



OPERATION NO. 4 — COMPOUND CROSSCUT

Compound crosscutting is the combination of miter and bevel crosscuts. The radial arm and bevel are set to produce the desired cut; the yoke is indexed to position saw blade parallel to the radial arm. All settings must be locked. The board is held firmly against the fence and the carriage pulled forward along the radial arm to produce the cut. Again, the carriage should be returned to full rearward position and the saw blade allowed to come to a complete stop before removing boards from saw table.



REQUIREMENTS WHEN RIPPING

(Operations 5 and 6)

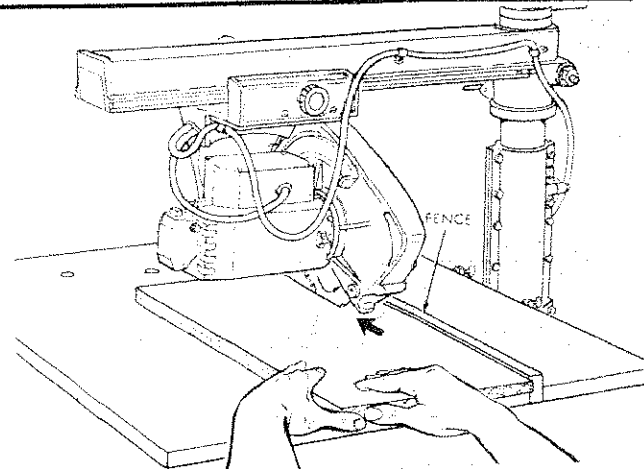
1. Carriage lock knob must be tight.
2. Radial arm must be locked in 0° position.
3. Work must be held firmly against the table and fence while feeding through.
4. The guard and anti-kickback mechanism must be properly set. Observe instructions in paragraph "Adjusting Guard and Anti-Kickback Rod for Ripping".
5. The blade should be sharp and correctly set.
6. Hands must be kept well away from saw blade.
7. When ripping narrow or short stock, always use a pushboard.

OPERATION NO. 5 — OUT-RIPPING AND IN-RIPPING

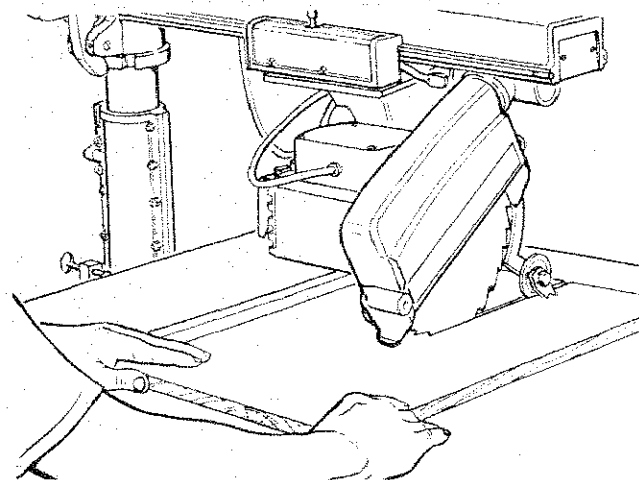
1. Ripping is the process of sawing the workpiece by feeding it into the saw blade when using the fence as a guide and as a positioning device to obtain the desired width of cut.

WARNING: NEVER RIP FREE-HAND. BEFORE RIPPING, MAKE SURE THE GUARD AND ANTI-KICKBACK PAWLS ARE SET UP PROPERLY. ALSO, MAKE SURE THE SAW BLADE IS PARALLEL WITH THE FENCE. NEVER RIP WORKPIECES SHORTER THAN THE SAW BLADE DIAMETER.

2. Since the work is pushed along the fence, it must have a reasonably straight edge in order to make sliding contact with the fence. Also, the work must make solid contact with the table, so that it will not wobble. Provide a straight edge, even if this means temporary nailing of an auxiliary straight-edged board to the work. If the workpiece is warped, turn the hollow side down.
3. Always use the saw guard and make sure the anti-kickback rod is correctly set. Wood cut with the grain tends to spring the kerf closed and bind the blade, and a kickback could occur.
4. Stand a little to one side of center to avoid being sprayed with sawdust and to be clear of work in case of kickback.
5. When ripping short or narrow work, always use a push stick applied to the section of the workpiece between the blade and fence . . . push the work past the blade so it is clear of the blade. This procedure will minimize the possibility of kickbacks.



In-Ripping. The radial arm and bevel are indexed at 0° and locked. The yoke is rotated 90-degrees in a clockwise direction (viewed from above) from the crosscut position and locked. Thus, when standing in front of the saw, the blade would be rotating counterclockwise. After positioning the guard and anti-kickback mechanism the workpiece is fed from the right-hand side of the saw as shown.

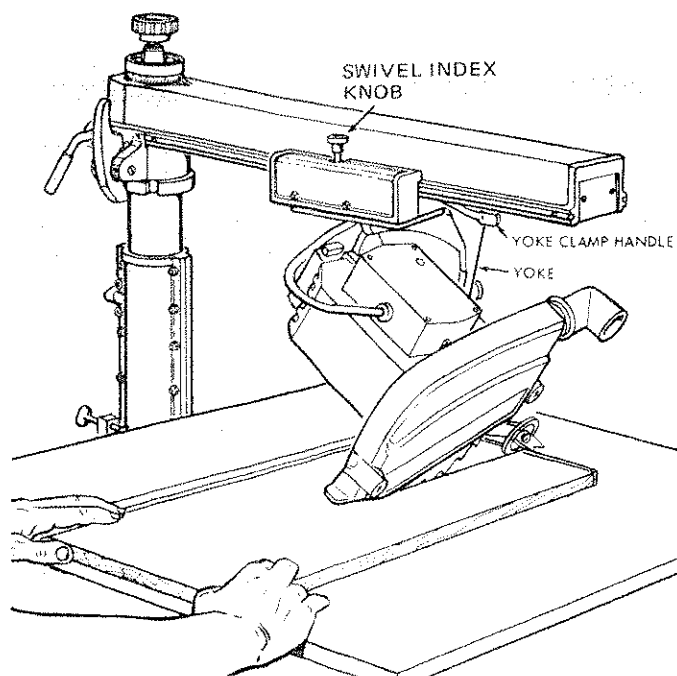


Out-Ripping. The bevel is indexed and locked at 0°. The yoke is turned 90-degrees in a counterclockwise direction (viewed from above), from the crosscut position. When you are standing in front of the saw, the blade will rotate clockwise. Before positioning the guard and anti-kickback rod, lower the blade to just cut into the table. After positioning the guard and anti-kickback rod, the workpiece is fed from the rear (left-hand) side of the guard as shown.

basic saw operations

OPERATION NO. 6 — BEVEL RIPPING

Bevel ripping is either in-ripping or out-ripping as described in preceding instructions, except the saw blade is tilted out of perpendicular to the saw table surface. The illustration shows a typical bevel out-ripping operation. The radial arm is indexed at 0°; the bevel is set to the desired bevel angle and the yoke is positioned for out-ripping (saw blade at front) or in-ripping (saw blade at rear), as required. All settings must be locked. Requirements and observations applicable to normal ripping operations also apply to bevel ripping.



electrical connections

POWER SUPPLY

1. Motor specifications

The A-C motor used in this saw is a capacitor-start, non-reversible type having the following specifications:

Voltage	120
Amperes	12.5
Hertz (cycles)	60
Phase	Single
RPM	3450
Rotation as viewed from saw blade end	Clockwise

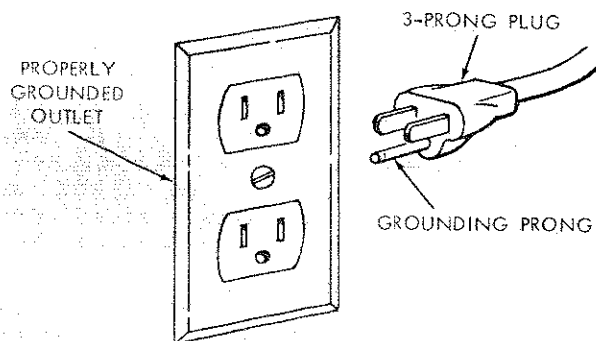
CAUTION: Your saw is wired for 120v operation. Connect to a 120v, 15-amp. branch circuit and use a 15-amp., time-delay fuse or circuit breaker.

WARNING: DO NOT PERMIT FINGERS TO TOUCH THE TERMINALS OF PLUGS WHEN INSTALLING OR REMOVING THE PLUG TO OR FROM THE OUTLET.

WARNING: IF NOT PROPERLY GROUNDED THIS POWER TOOL CAN INCUR THE POTENTIAL HAZARD OF ELECTRICAL SHOCK, PARTICULARLY WHEN USED IN DAMP LOCATIONS, IN PROXIMITY TO PLUMBING, OR OUT OF DOORS. IF AN ELECTRICAL SHOCK OCCURS THERE IS THE POTENTIAL OF A SECONDARY HAZARD SUCH AS YOUR HANDS CONTACTING THE SAW BLADE.

If power cord is worn or cut, or damaged in any way, have it replaced immediately.

If your unit is for use on less than 150 volts it has a plug that looks like below.



This power tool is equipped with a 3-conductor cord and grounding type plug which has a grounding prong, approved by Underwriters' Laboratories and the Canadian Standards Association. The ground conductor has a green jacket and is attached to the tool housing at one end and to the ground prong in the attachment plug at the other end.

This plug requires a mating 3-conductor grounded type outlet as shown.

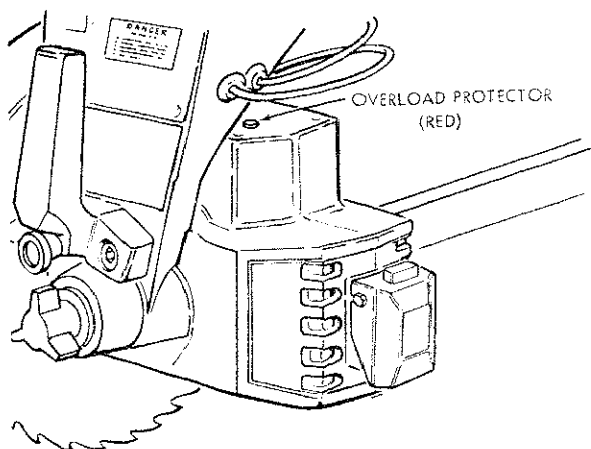
If the outlet you are planning to use for this power tool is of the two prong type **DO NOT REMOVE OR ALTER THE GROUNDING PRONG IN ANY MANNER.**

It is recommended that you have a qualified electrician replace the TWO prong outlet with a properly grounded THREE prong outlet.

MOTOR SAFETY PROTECTION

NOTE: This motor should be blown out, or "vacuumed", frequently to prevent sawdust interference with normal motor ventilation.

Your saw motor is equipped with a manual-reset, thermal-overload protector designed to open the power-line circuit when the motor temperature exceeds a safe value.



1. If the protector opens the line and stops the saw motor, immediately press the saw switch to the "OFF" position, and allow the motor to cool.

2. After cooling to a safe operating temperature, the overload protector can be closed manually by pushing in the red button on the top of the motor. If the red button will not snap into place immediately, the motor is still too hot and must be allowed to cool for a while longer. (An audible click will indicate protector is closed.) In some cases this could take 20 to 30 minutes.
3. As soon as the red button will snap into running position, the saw may be started and operated normally, by pulling out the saw switch to the "ON" position.
4. Frequent opening of fuses or circuit breakers may result if motor is overloaded, or if the motor circuit is fused differently from recommendations. Overloading can occur if you feed too rapidly or if your saw is misaligned so that the blade heels. Do not use a fuse of greater capacity without consulting a qualified electrician.
5. Although the motor is designed for operation on the voltage and frequency specified on motor nameplate, normal loads will be handled safely on voltages not more than 10% above or below the nameplate voltage. Heavy loads, however, require that voltage at motor terminals equals the voltage specified on nameplate.
6. Most motor troubles may be traced to loose or incorrect connections, overloading, reduced input voltage (such as small size wires in the supply circuit) or to an overly-long supply circuit. Always check the connections, the load and the supply circuit, whenever the motor fails to perform satisfactorily. Check wire sizes and lengths with the table following.

WIRE SIZES

The use of any extension cord will cause some loss of power. To keep this to a minimum and to prevent over-heating and motor burn-out, use the table below to determine the minimum wire size (A.W.G.) extension cord. Use only 3 wire extension cords which have 3 prong grounding type plugs and 3-pole receptacles which accept the tools plug.

Extension Cord Length	Wire Size A.W.G.
Up to 100 Ft.	12
100 - 200 Ft.	8
200 - 400 Ft.	6

For circuits of greater length the wire size must be increased proportionally in order to deliver ample voltage to the saw motor.

trouble-shooting

TROUBLE-SHOOTING

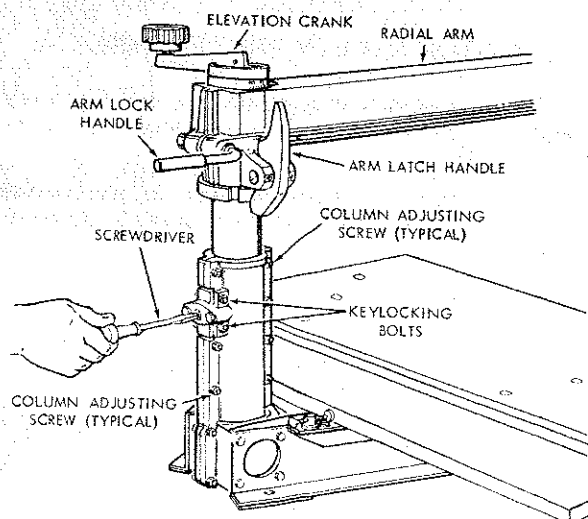
Even though the finest materials and precision workmanship have been incorporated into your Craftsman saw, it is reasonable to expect some wear after long periods of use. Adjustment facilities have been built into the saw to compensate for this wear. Looseness due to wear, rough handling, or improper adjustments will usually be indicated by reduced accuracy, or the inability of the saw to perform as intended. The usual operating "troubles" are listed in the following paragraphs with necessary corrections described and illustrated.

1. Looseness of Column Tube in Column Support.

When this condition exists radial arm will have side play, and square crosscuts are likely to be difficult to make and repeated cuts inaccurate. Check and adjust as follows:

a. Eliminating Radial Arm Side Play.

- (1) Move the radial arm to the center (crosscut) position and engage the arm latch handle in the detent notch. Tighten the arm lock handle.
- (2) Apply side force with one hand on radial arm in both directions. If side play can be felt, an adjustment is required.
- (3) Loosen keylocking bolts and insert a screwdriver into the set screw that adjusts the column tube wedge key. Rotate the set screw slowly in (clockwise) until no side play can be felt in radial arm, when checked as in the preceding step.
- (4) Check for binding by rotating the elevation crank. If the crank rotates with noticeable resistance, loosen the set screw by rotating the screwdriver counterclockwise until rotation is normal. An effective method for finalizing the set screw adjustment is to rotate the screw while the elevation crank is being rotated, checking for side play in radial arm as the adjustment progresses. The adjustment is correct when all side play of radial arm is eliminated and only very slight additional resistance can be felt when rotating the elevation crank.
- (5) If some radial arm side play can still be detected after performing the above adjustment, it will be necessary to adjust the forward five column adjusting screws that pass through the flanges on the right- and left-hand column supports as follows:
 - (a) While rotating the elevation crank, tighten the five column adjusting screws slightly at the forward edge of column supports. Each screw should be tightened only slightly, and each one the same amount, until a slight resistance can be felt when rotating the elevation crank, then each screw backed off just enough to restore a normal feel to the elevation crank.
 - (b) Recheck the adjustment of the column tube, wedge-key set screw as outlined in preceding instructions.



- (6) After the above adjustments have been completed, re-check the radial arm for absence of side play and lock the column tube key in place by tightening the two keylocking bolts.

2. Blade Does Not Make Square Cuts and Accurate Repeat Cuts Cannot Be Made.

If this condition exists the trouble might be due to one, or a combination of, the following conditions.

a. Looseness between column tube and column support.

Adjust as described in the preceding paragraph 1, a.

b. Crosscut travel not properly adjusted.

Refer to paragraph "Squaring the Crosscut Travel", under "Alignment Instructions". If crosscut travel cannot be adjusted as described, refer to paragraph h, following.

c. Table Supports not properly adjusted.

Correct adjustment of table supports can be checked with satisfactory accuracy without removing the table boards, by checking at various positions on the top surface of the table. Use the same procedure described in paragraph "Adjusting Table Supports Parallel to Radial Arm", under "Alignment Instructions".

d. Saw blade not square with table.

Adjust as described in paragraph i, following.

e. Carriage bearings loose on tracks.

Adjust carriage bearings as described in paragraph 3, f, following.

f. Yoke does not index properly.

Check for proper yoke indexing, noting that the swivel latch pin fits into its detent properly. If the swivel latch pin spring is weak or damaged, replace it.

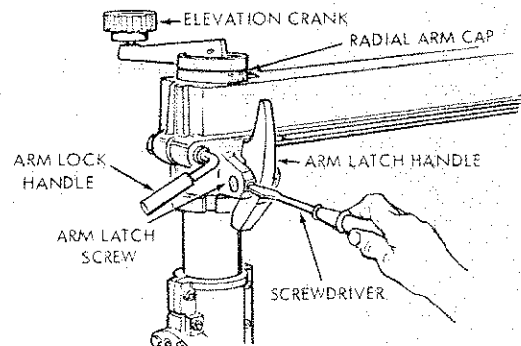
g. Yoke clamp arm does not tighten the yoke when in full locking position.

Refer to paragraph "Yoke Clamp Arm Adjustment", paragraph j, following.

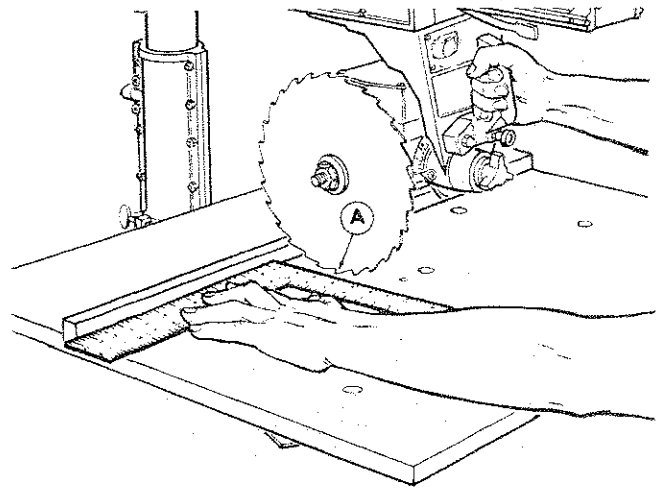
h. Adjusting the arm latch handle to correct crosscut travel.

In some remote cases, due to rough handling, etc., the crosscut travel cannot be squared by the usual method. (Refer to "Squaring the Crosscut Travel", under "Alignment Instructions".) If this condition is encountered, it will be necessary to adjust the arm latch handle as follows:

- (1) Using a screwdriver, loosen the two set screws that lock the arm latch screws.



- (2) Place the long leg of a framing square against fence and a tooth "A".
- (3) Move the saw blade forward along the square to determine in which direction the radial arm must be adjusted.
- (4) If the saw blade moves away from the square as it comes forward, loosen the front arm latch screw with a screwdriver and tighten the rear arm latch screw. Recheck blade travel and repeat if necessary.
- (5) If the saw blade moves toward the square as it comes forward, loosen the rear arm latch screw and tighten the front arm latch screw. Recheck blade travel and repeat if necessary.
- (6) When the adjustment is correct, both arm latch screws should be snug against the arm latch handle but not tight enough to bind the handle.
- (7) Tighten the set screws to secure the arm latch screws.
- (8) Adjust the indicator scale as described in paragraph, "Squaring the Crosscut Travel", under "Alignment Instructions".

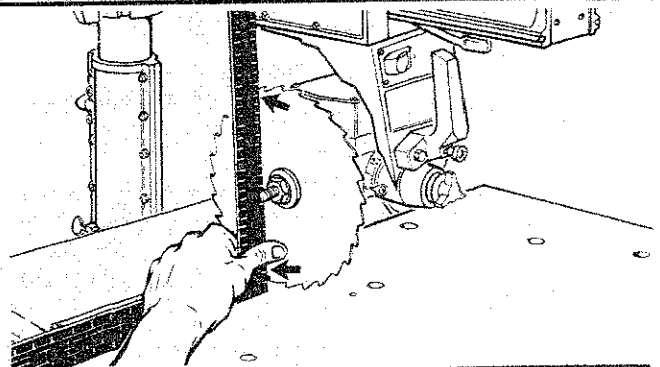


- (9) After these adjustments have been completed, the 45° index positions (right and left) of radial arm will be correct.

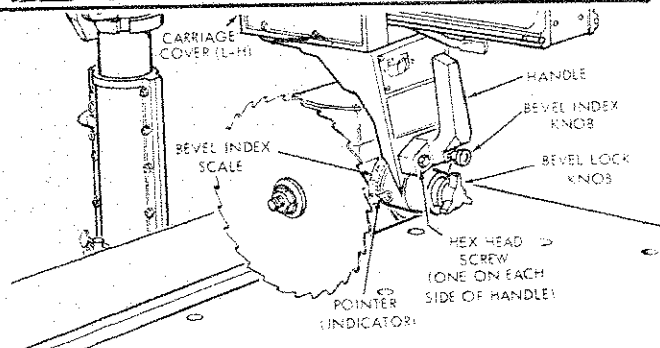
NOTE: The preceding procedure is also used to adjust the arm latch handle due to looseness resulting from wear.

i. Squaring the Saw Blade to the Table Top.

- (1) Place the edge of a framing square on the table top and against the saw blade.
- (2) When the saw blade is square to the table top, the leg of the square will touch the blade at both positions indicated by arrows. If the square does not touch the blade at both positions, perform the following operations:



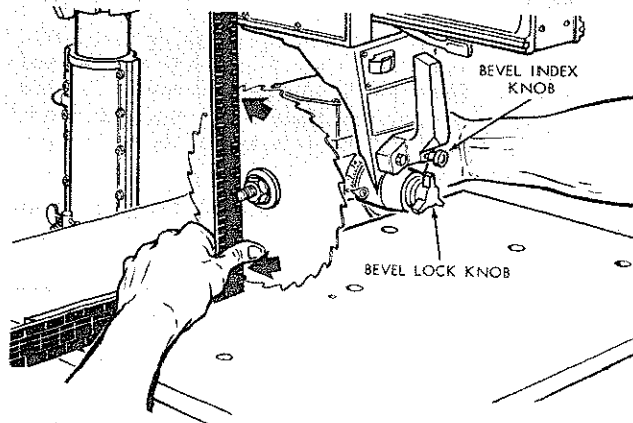
- (a) Loosen the bevel lock knob just slightly and, with a 1/2" wrench, loosen the two hex head screws that secure the handle to the yoke. A screw is located at each side of the bevel index knob.



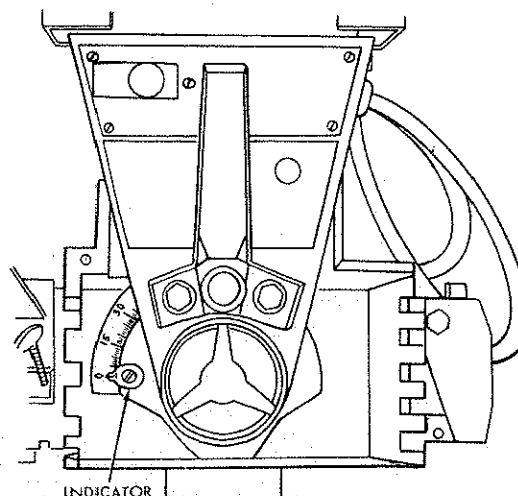
trouble-shooting

- (b) While holding the motor with one hand and the square with the other hand, tilt the motor until saw blade is square with table top. Then, while holding the square firmly against the saw blade and table top, tighten the bevel lock knob firmly to hold the blade in position.
- (c) Move the handle slightly toward left or right until the bevel index pin (knob) is properly seated. Push firmly against the bevel index knob (keeping the pin seated) and tighten the two hex-head screws. The bevel index pin should slide freely in the handle.

NOTE: It may be necessary to perform more than one trial operation before the saw blade remains perfectly square with table top after tightening the two hex-head screws.



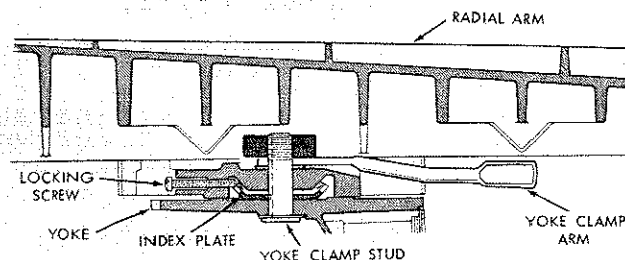
- (d) The bevel index indicator (pointer) should read 0° on the bevel scale. If not, loosen the indicator attaching screws, adjust indicator to zero and tighten the screw securely.



j. Yoke clamp arm adjustment.

The normal locking position of the yoke clamp arm is parallel with the radial arm. An adjustment will seldom be necessary; however, it may be accomplished as follows:

- (1) Loosen the carriage lock knob, move the carriage out to the forward end of radial arm and tighten carriage lock knob.
- (2) Locate the index plate locking screw at the rear of the yoke assembly.
- (3) Turn the locking screw outward at least $1/4$ inch from the tight position. This frees the index plate which is keyed to the yoke clamp stud, thus permitting the stud to be rotated when the yoke clamp arm is loosened.
- (4) Loosen the yoke clamp arm, and with screwdriver or arbor wrench, rotate the yoke clamp stud a small fraction of a turn (clockwise when viewed from bottom), then tighten the yoke clamp arm.
- (5) If the yoke clamp arm still does not line up parallel to the radial arm when in locked position, repeat the above operation.



- (6) Rotate the locking screw back into position to secure the adjustment by preventing subsequent movement of the index plate.

NOTE: It may be necessary to loosen the yoke clamp arm so that end of locking screw can enter a notch of the index plate. This would alter the arm adjustment slightly but not enough to be of any consequence.

3. Blade Heels to the Right or Left.

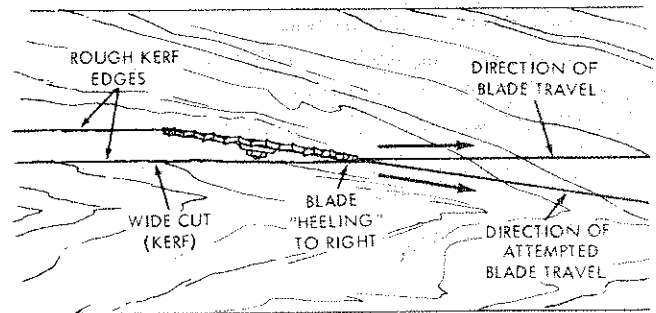
"Heeling" is a term used to describe a condition where the saw blade is not aligned with the direction in which it is forced to travel. This diagram shows the saw blade "heeling" to the right. Results of "heeling", even to a minor degree, can be detected by the tooth marks left on the edge of the saw kerf (cut edge) of the board. When using a hollow ground blade, even a small degree of "heel" will cause the wood to smoke as a result of the frictional heat produced. The various effects of "heel" are as follows:

a. Crosscutting

- (1) Heeling to the right will tend to slide the workpiece toward the right along the rip fence, as the cut is being made, and make a square cut almost impossible.
- (2) Heeling to the left will tend to slide the board to the left along the fence.

b. Miter Cutting

Same as crosscutting, except to a lesser or greater degree, depending upon the angle of the cut.



c. In-Ripping

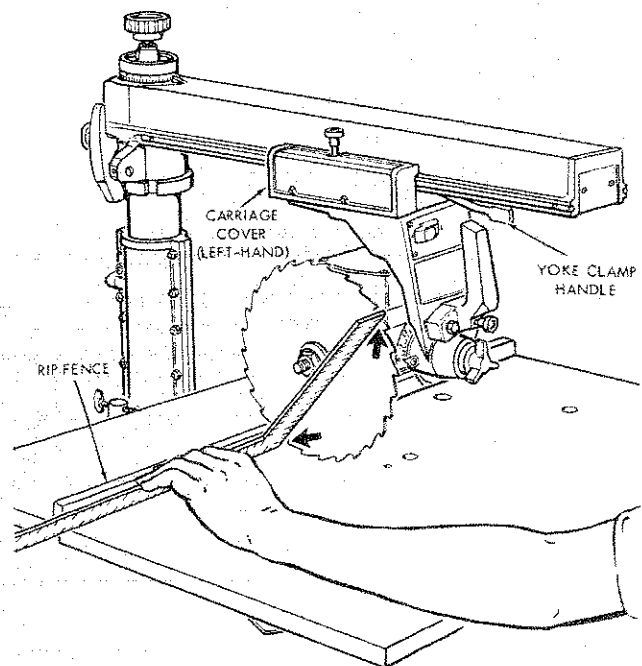
- (1) Heeling to the right will force the workpiece against the rip fence.
- (2) Heeling to the left will force the workpiece away from the fence.

d. Out-Ripping

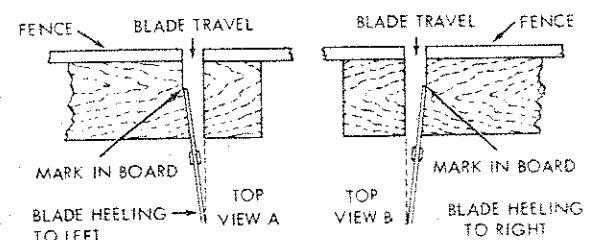
The exact reverse of in-ripping.

e. Checking the Saw Blade for Heel (Left and Right)

- (1) Place a square against the rip fence and the saw blade. The long leg of the square must be held firmly against the rip fence and the short leg must not touch any "set out" teeth on the saw blade.



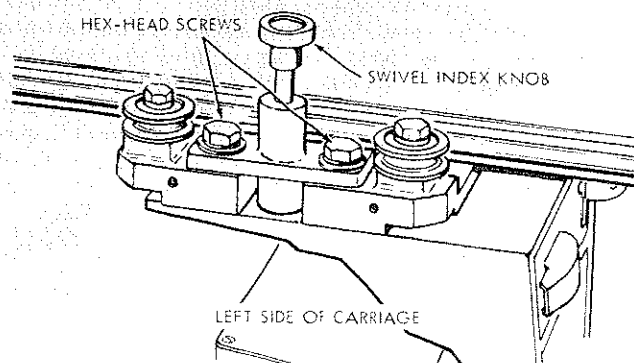
- (2) If the square does not touch the blade at the two points shown by arrows, one of two types of heel exists. The two types of heel are illustrated in views "A" and "B". To correct for either type of heel condition, proceed as follows:



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f. Adjusting to Eliminate Heel

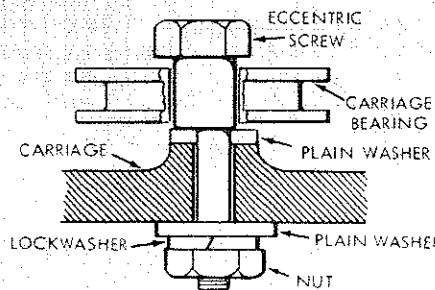
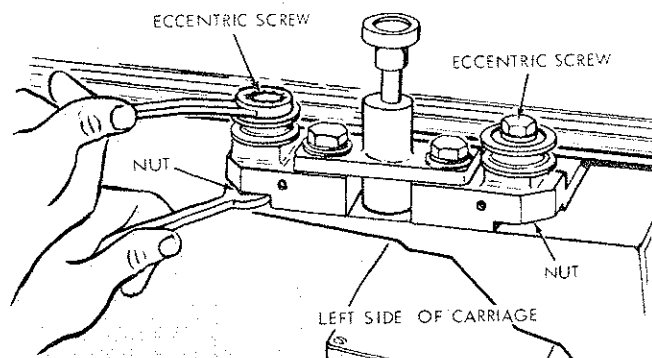
- (1) Remove the left-hand carriage cover by removing the two attaching screws.
- (2) Loosen the yoke clamp handle.
- (3) Loosen (slightly) the two hex-head screws at location shown.
- (4) With the square in position, shift the yoke until the gap between the saw blade and square is eliminated.
- (5) Tighten the yoke clamp handle. Then tighten the two hex-head screws.
- (6) Recheck for heel to make sure that tightening the hex-head screws did not affect the setting. Several trial settings may be required.
- (7) Re-install the left-hand carriage cover.



g. Carriage Bearing Adjustment

To test for looseness in the carriage, firmly grasp the carriage across the two carriage covers and apply a firm rocking motion. Noticeable looseness may be adjusted as follows:

- (1) Remove the left-hand carriage cover by removing two attaching screws.
- (2) Working on one bearing at a time, loosen the nut on the eccentric screw just enough to permit the screw to turn.
- (3) Rotate the eccentric screw a partial turn (left or right) as required to take up all looseness.
- (4) While holding the head of eccentric screw, tighten the nut. Correct adjustment exists when there is no "play" between the carriage and radial arm, and yet the carriage moves freely.
- (5) Adjust the other carriage bearing in the same manner.
- (6) Install the left-hand carriage cover with two screws.



4. Wood Smokes and Motor Slows Down or Stops When Ripping

This condition can be caused by several conditions as follows:

a. Dull Blade or Warped Board.

Sharpen or replace the saw blade. Avoid the attempted use of severely warped material.

b. Crosscut Not Properly Squared.

Adjust as described in paragraph "Squaring the Crosscut Travel", under "Alignment Instructions".

c. Radial Arm Not Securely Locked in 0° Position

Loosen the arm lock handle, press the arm latch handle firmly into its detent (notch) and tighten the arm lock handle.

d. Blade Heels to the Right.

Refer to preceding paragraph 3, e, "Checking the Saw Blade for Heel (Left and Right)".

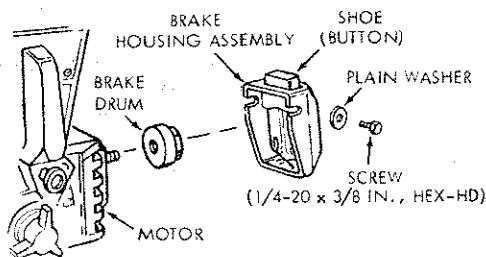
5. Board Binds, or Pulls Away from Fence, When Ripping.

Refer to "Adjusting Guard and Anti-kickback Assembly, For Ripping", under "Operating Controls".

6. Saw Blade Continues to "Coast" Even With Finger Force Applied to Manual Brake Button.

a. Oil or grease on brake drum or brake button (shoe).

Remove the brake housing assembly and clean all parts of brake assembly with commercial cleaning solvent.



b. Damaged, or badly worn brake shoe.

Replace the brake shoe.

c. Repairing Manual Brake Assembly.

- (1) Disconnect the saw from power source.
- (2) Remove two screws and plain washers that attach the brake housing to motor housing.
- (3) Lift off the brake housing assembly.
- (4) Inspect the brake drum and brake shoe (button) for scoring on braking surfaces and excessive wear. Replace worn or scored items.
- (5) Check the spring and replace if broken or too weak to hold the shoe against top of housing (button protruding).
- (6) If removal of the brake drum is required, use the arbor wrench to screw it off end of motor shaft.
- (7) Installation is in exact reverse of removal.

LUBRICATION

This Craftsman saw is precision built and should be kept clean and properly lubricated. Certain parts require occasional lubrication; however, it is just as important that certain parts are **not** lubricated.

1. Do Not Lubricate the Following:

- a. Ball races or ball bearings.
- b. Motor bearings. These are sealed ball bearings and require no added lubrication.

2. Lubricate the Following Points Periodically.

- a. Use SAE No. 10W-30 automotive engine oil and refer to exploded views in the Parts List for locations described below:
- b. Always wipe the area clean with a shop towel or clean cloth prior to applying the lubricant.
- c. Apply lubricant as follows:
 - (1) Remove the left-hand carriage cover and apply a few drops of oil along the swivel index pin (only if the pin has a tendency to stick). Use the oil sparingly to prevent it from getting on ball bearings or races.
 - (2) A light film of oil should be wiped on the face of the column tube and keyway (as needed) to lubricate the fit between this part and the key and column support.
 - (3) An oil hole is provided in the top of elevation crank to facilitate lubrication of the elevation shaft and radial arm cap bearing surface. Apply a few drops of oil occasionally.
 - (4) The threads on elevation shaft are lubricated by removing the elevation crank and radial arm cap. Oil when binding or rough operation occurs.

Make sure the teeth of the **ANTIKICKBACK** pawls are always sharp. Replace if not sharp.

recommended accessories

ITEM	CAT. NO.
Stand	9-27541
Castors	9-27531
Key Chuck	9-28612
** Molding Head Guard — 7-Inch	9-27035
Rotary Surface Planer — Carbide Tip	9-27033
Dust Collector	9-28124
Taper Jig	9-27049
Satin Cut Dado — 7-Inch	9-27720
** Molding Head Single Cutter	9-27605
** Molding Head Three Cutter	9-27731
Sanding Drum — 3-Inch	9-28435

** Before purchasing or using any of these accessories, read and comply with additional safety instruction No. 15 on p.4 of this manual.

The above recommended accessories are current and were available at the time this manual was printed.

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TROUBLE SHOOTING CHART—MOTOR

NOTE: Motors used on wood-working tools are particularly susceptible to the accumulation of sawdust and wood chips

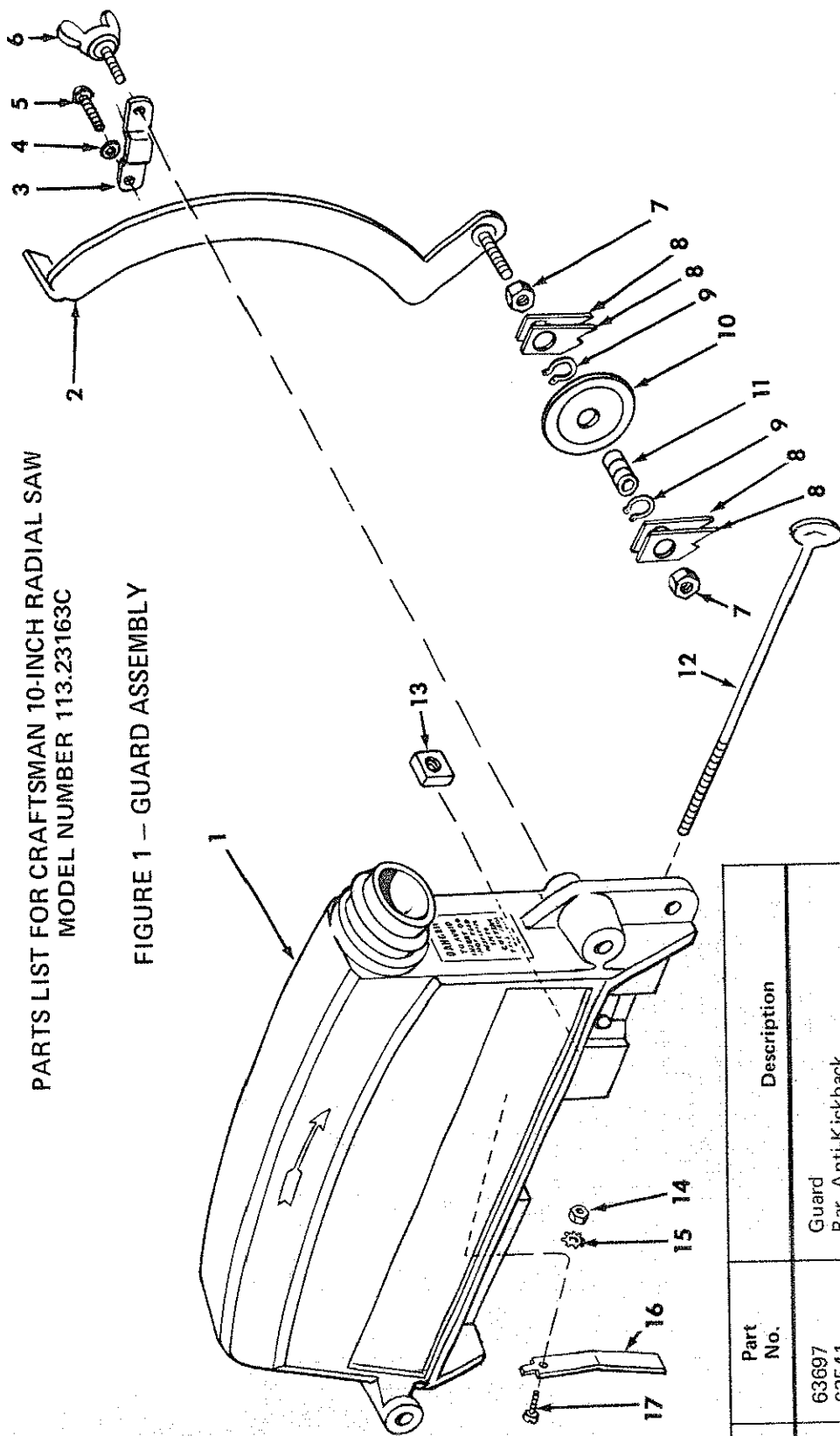
and should be blown out or "vacuumed" frequently to prevent interference with normal motor ventilation.

TROUBLE	PROBABLE CAUSE	REMEDY
Motor will not run.	<ol style="list-style-type: none"> 1. Protector open; circuit broken. 2. Low voltage. 	<ol style="list-style-type: none"> 1. Reset protector by pushing in on red button, located on top of motor junction box (indicated by audible click). 2. Check power line for proper voltage.
Motor will not run and fuses "BLOW."	<ol style="list-style-type: none"> 1. Short circuit in line cord or plug. 2. Short circuit in motor terminal box or loose connections. 	<ol style="list-style-type: none"> 1. Inspect line cord and plug for damaged insulation and shorted wires. 2. Inspect all terminals in motor terminal box for loose or shorted terminals.
Motor fails to develop full power. (Power output of motor decreases rapidly with decrease in voltage at motor terminals.) For example: a reduction of 10% in voltage causes a reduction of 19% in maximum power output of which the motor is capable. while a reduction of 20% in voltage causes a reduction of 36% in maximum power output.	<ol style="list-style-type: none"> 1. Power line overloaded with lights, appliances and other motors. 2. Undersize wires or circuit too long. 3. General overloading of power company's facilities. (In many sections of the country, demand for electrical power exceeds the capacity of existing generating and distribution systems.) 4. Incorrect fuses in power line. 	<ol style="list-style-type: none"> 1. Reduce line load. 2. Increase wire sizes, or reduce length of wiring. 3. Request a voltage check from the power company. 4. Install correct fuses.
Motor starts slowly or fails to come up to full speed.	<ol style="list-style-type: none"> 1. Low voltage—will not trip relay. 2. Starting relay not operating. 	<ol style="list-style-type: none"> 1. Correct low voltage condition. 2. Replace relay.
Motor overheats.	<ol style="list-style-type: none"> 1. Motor overloaded. 2. Improper cooling. (Air circulation restricted through motor due to sawdust, etc.) 	<ol style="list-style-type: none"> 1. Correct overload condition. 2. Clean out sawdust to provide normal air circulation through motor.
Starting relay in motor will not operate.	<ol style="list-style-type: none"> 1. Burned relay contacts (due to extended hold-in periods caused by low line voltage, etc.) 2. Open relay coil. 3. Loose or broken connections in motor terminal box. 	<ol style="list-style-type: none"> 1. Replace relay and check line voltage. 2. Replace relay. 3. Check and repair wiring.
Motor stalls resulting in blown fuses or tripped circuit breakers).	<ol style="list-style-type: none"> 1. Starting relay not operating. 2. Voltage too low to permit motor to reach operating speed. 3. Fuses or circuit breakers do not have sufficient capacity. 	<ol style="list-style-type: none"> 1. Replace relay. 2. Correct the low line voltage condition. 3. Replace fuses or circuit breakers with proper capacity units.
Frequent opening of fuses or circuit breakers.	<ol style="list-style-type: none"> 1. Motor overloaded. 2. Fuses or circuit breakers do not have sufficient capacity. 3. Starting relay not operating (motor does not reach normal speed.) 	<ol style="list-style-type: none"> 1. Reduce motor load. 2. Replace fuses or circuit breakers. 3. Replace relay.

repair parts

PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW MODEL NUMBER 113.23163C

FIGURE 1 - GUARD ASSEMBLY



Key No.	Part No.	Description
1	63697	Guard
2	63541	Bar, Anti-Kickback
3	63540	Guide, Anti-Kickback
4	STD 551010	*Washer, 13/64 x 5/8 x 1/32
5	STD 601103	*Screw, Type T Pan Hd., 10-32 x 3/8
6	60219	Screw, Wing
7	STD 541231	*Nut, Hex., 5/16-18
8	63271	Pawl, Anti-Kickback
9	60220	Ring, Retaining
10	63270	Spreader
11	63269	Bearing
12	63539	Screw, Guard Clamp
13	120399	*Nut, Square, 5/16-18 x 9/16 x 7/32
14	STD 541008	*Nut, Hex, 8-32
15	STD 551108	*Lockwasher, External Tooth No. 8
16	63538	Clamp, Guard
17	STD 510807	*Screw, Mach., Pan Hd., 8-32 x 1/2

Always order by Part Number — not by Key Number

*Standard Hardware Item — May be Purchased Locally.

repair parts

PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW MODEL NUMBER 113.23163C

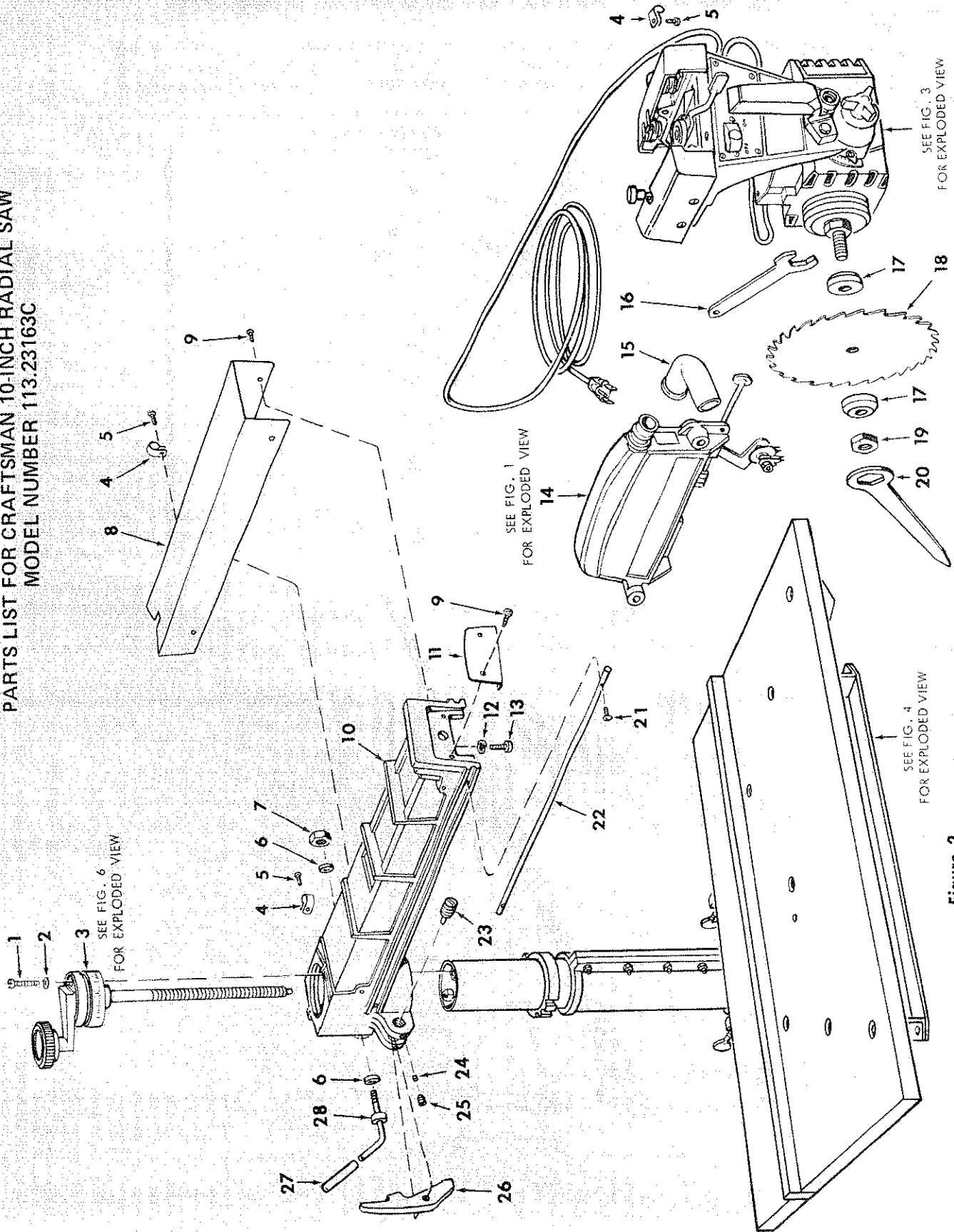


Figure 2

PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW
MODEL NUMBER 113.23163C

FIGURE 2

Key No.	Part No.	Description	Key No.	Part No.	Description
1	191230	*Screw, Mach., 1/4-28 x 1, Fill.Hd.Slotted	16	63062	Wrench, Shaft
2	STD 551225	*Lockwasher, Ext. Tooth 1/4	17	62445	Collar, Saw Blade
3	63183	Cap Assembly, Radial Arm (See Figure 6)	18	60175	Blade, Saw, 10"
4	30613	Clamp, No. 2 Cord	19	30495	Nut, Shaft
5	STD 600803	*Screw, No. 8-32 x 3/8, Type 23,	20	3540	Wrench, Arbor
6	63038	Pan Hd. Slotted	21	448905	*Screw, No.6-32 x 1/2, Type 23,
7	120238	Washer, Arm Clamp			Fill.Hd. Slotted
8	63590	*Nut, Hex.Jam, 1/2-13 x 3/4 x 5/16	22	63034	Track
9	STD 600602	Trim, Arm	23	63035	Screw, Arm Latch
10	63589	Screw, No. 6-32 x 1/4, Type 23,	24	63037	Plug
11	63348	Pan Hd. Slotted	25	STD 502503	*Screw, Set, 1/4-20 x 3/8
12	STD 551131	Arm, Radial	26	63036	Latch, Arm
13	STD 523106	Panel, Front Trim	27	60261	Grip
14	-----	Lockwasher, 5/16	28	60265	Handle, Arm Lock
15	63258	*Screw, 5/16-18 x 1/2, Hex.Hd.Cap		63591	Bag of Loose Parts (Not Illustrated)
		Guard Asm. (See Figure 1)		63687	Owners Manual (Not Illustrated)
		Elbow			

*Standard Hardware Item — May be Purchased Locally.

repair parts

PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW MODEL NUMBER 113.23163C

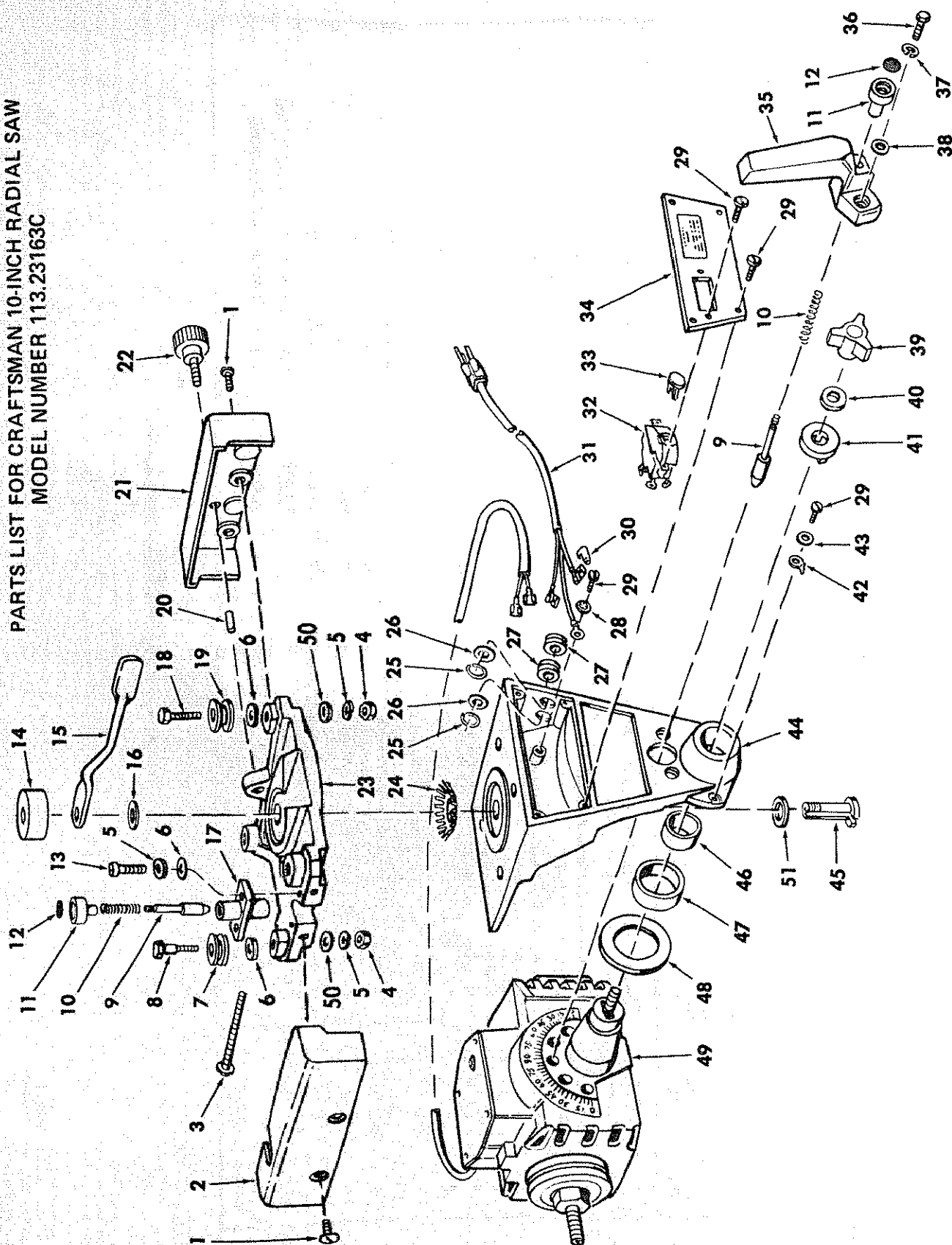


Figure 3

**PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW
MODEL NUMBER 113.23163C**

FIGURE 3

Key No.	Part No.	Description	Key No.	Part No.	Description
1	STD 600805	*Screw, No. 8-32 x 1/2, Type 23, Pan Hd. Slotted	25	60289	Ring, Clamp
2	63015	Cover, Carriage L.H.	26	60055	Washer, Fiber, .380 x 3/4 x 1/16
3	60052	*Screw, Mach., No. 10-32 x 1-1/2, Fill, Hd. Slotted	27	63045	Grommet
4	STD 541231	*Nut, Hex., 5/16-18	28	STD 551206	*Lockwasher, Int. Tooth, No. 6
5	STD 551131	*Lockwasher, 5/16	29	STD 600602	*Screw, No. 6-32 x 1/4, Type 23, Pan Hd. Slotted
6	60040	*Washer, .328 x 3/4 x 1/16	30	63467	Cap, Flag Terminal
7	63350	Bearing, Carriage	31	63518	Cord and Plug
8	37387	Screw, Eccentric	32	60267	Switch
9	63005	Pin, Latch	33	60256	Key
10	63004	Spring, Swivel Latch	34	63688	Switch Plate
11	63013	Knob, Swivel Index	35	63003	Handle
12	63513	Disc, Color	36	STD 523710	*Screw, 3/8-16 x 1, Hex. Hd. Cap
13	STD 523108	*Screw, Mach., 5/16-18 x 3/4, Hex. Ind. Hd.	37	STD 551131	*Lockwasher, 3/8
14	63587	Bumper	38	STD 551043	*Washer, .440 x 11/16 x 1/32
15	63532	Handle, Yoke Clamp	39	63588	Knob, Bevel Lock
16	STD 551062	*Washer, .688 x 1-1/8 x 1/32	40	63011	Washer, Knob Clamp
17	63351	Housing, Latch Pin	41	63010	Washer, Clamp
18	STD 523115	*Screw, Mach., 5/16-18 x 1-1/2, Hex. Ind. Hd.	42	63323	Indicator
19	63026	Bearing, Carriage	43	37935	Washer, Fiber, .140 x .250 x 1/32
20	63060	Plug, Brass	44	63044	Yoke
21	63535	Cover, Carriage R.H.	45	63027	Stud, Yoke Clamp
22	63061	Knob, Carriage Lock	46	63006	Bushing, Yoke
23	63349	Carriage	47	63007	Bushing, No. 2 Yoke
24	63028	Plate, Index	48	63009	Washer, Motor Clamp
			49	63689	Motor Asm. (See Figure 5)
			50	STD 551031	Washer, 21/64 x 5/8 x 1/32
			51	STD 551062	Washer, .630 x 1-1/8 x 3/32

*Standard Hardware Item — May be Purchased Locally.

repair parts

PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW MODEL NUMBER 113.23163C

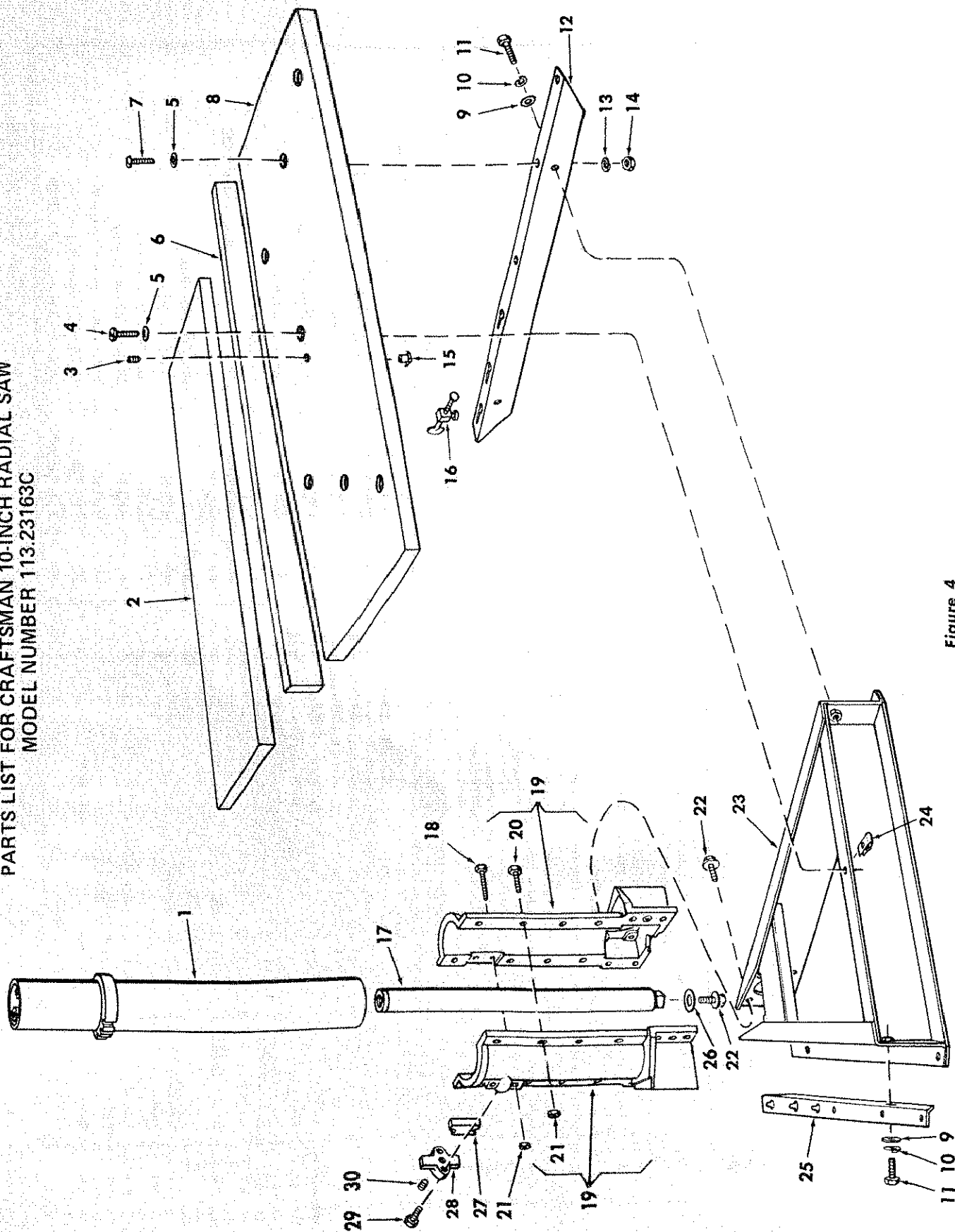


Figure 4

**PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW
MODEL NUMBER 113.23163C**

FIGURE 4

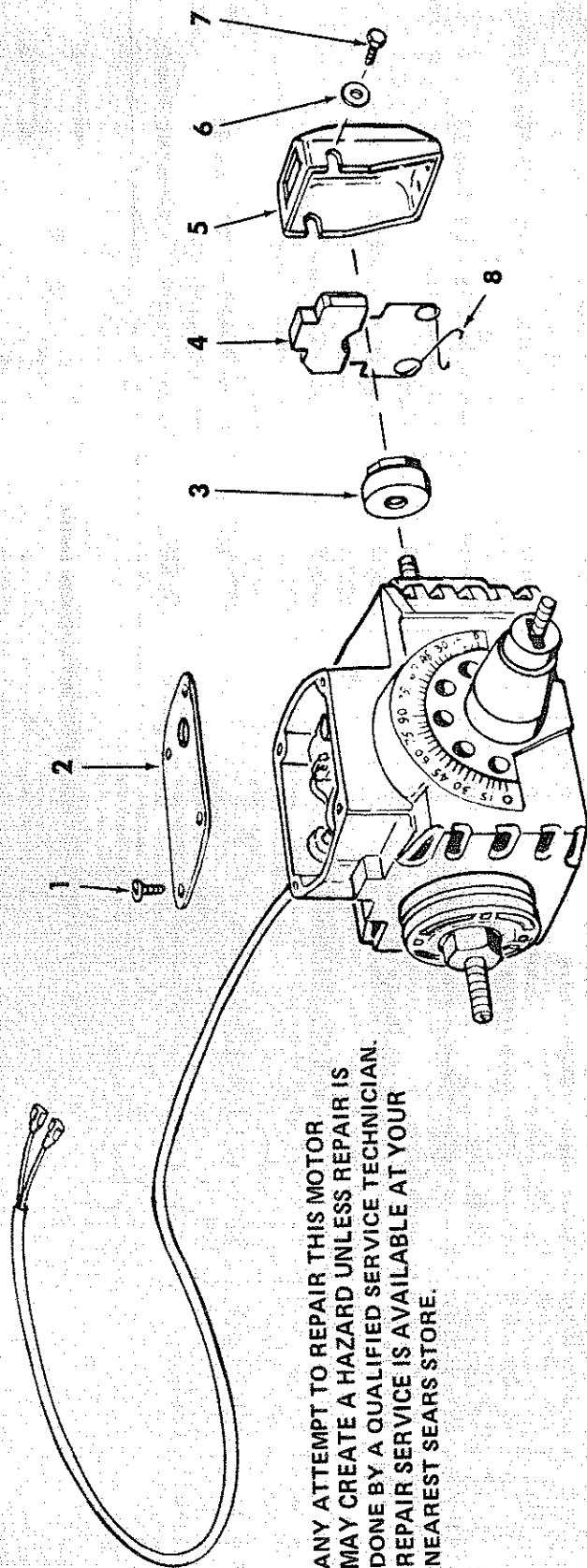
Key No.	Part No.	Description	Key No.	Part No.	Description
1	63523	Tube Assembly, Column	17	63042	Tube Assembly, Elevation
2	63586	Table, Rear	18	60035	*Screw, Mach., 1/4-28 x 1-3/4, Hex.Hd.Ind.
3	STD 502505	*Screw, Set, Slotted, 1/4-20 x 1/2	19	63041	Support Assembly, Column (Includes Key Nos. 20 and 21)
4	STD 522512	*Screw, Mach., 1/4-20 x 1-1/4, Pan Hd. Slotted	20	60034	*Screw, Mach., 1/4-28 x 7/8, Hex.Hd.Ind.
5	60128	*Washer, 17/64 x 5/8 x 1/32	21	STD 541525	Nut, Lock, 1/4-28
6	63522	Fence, Rip	22	9416187	*Screw, 5/16-18 x 3/4, Type 23, Hex. Washer Hd.
7	STD 512510	*Screw, Mach., 1/4-20 x 1, Pan Hd. Slotted	23	63000	Base
8	63585	Table, Front	24	37530	Nut, "U" Clip, 1/4-20
9	STD 551031	*Washer, 11/32 x 7/8 x 1/16	25	63023	Table Support, L.H.
10	STD 551131	*Lockwasher, 5/16	26	63056	Washer, Elevation Tube
11	STD 523108	*Screw, Mach., 5/16-18 x 3/4, Hex.Hd.	27	63057	Key, Column Tube
12	63022	Table Support, R.H.	28	63058	Cover, Key
13	STD 551125	*Lockwasher, 1/4	29	STD 522512	*Screw, 1/4-20 x 1-1/4, Type 23, Hex. Washer Hd. Ind.
14	STD 541025	*Nut, Hex., 1/4-20	30	222506	*Screw, Set, 3/8-16 x 5/8, Sl.Hd., Flat Pt.
15	37384	*Nut, "T"			
16	63059	Clamp, Table			

*Standard Hardware Item -- May be Purchased Locally.

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MODEL NUMBER 113.23163C

FIGURE 5 — 63689 MOTOR ASSEMBLY



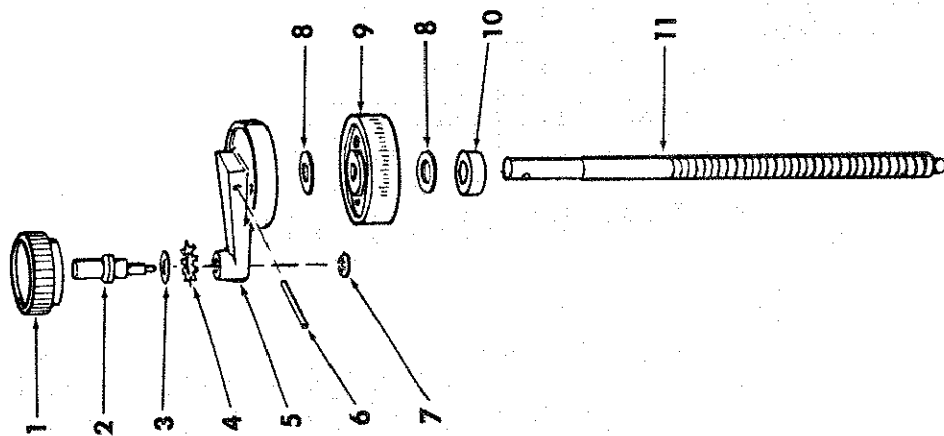
ANY ATTEMPT TO REPAIR THIS MOTOR
MAY CREATE A HAZARD UNLESS REPAIR IS
DONE BY A QUALIFIED SERVICE TECHNICIAN.
REPAIR SERVICE IS AVAILABLE AT YOUR
NEAREST SEARS STORE.

Key No.	Part No.	Description
—	63689	• Complete Motor Assembly
1	STD 600602	*Screw, Type 23, Pan Hd., No. 6-32 x 1/4
2	63690	Cover and Nameplate
3	65000	Drum, Brake
4	65002	Shoe, Brake
5	65003	Housing, Brake
6	STD 551012	Washer, 17/64 x 1/2 x 1/32
7	STD 522503	*Screw, Mach., Hex. Hd., 1/4-20 x 1/2
8	65001	Spring, Brake

*Standard Hardware Item — May be Purchased Locally.
• Any attempt to Repair This Motor May Create a HAZARD
Unless Repair is Done by a Qualified Service Technician.
Repair Service is Available at Your Nearest Sears Store.

PARTS LIST FOR CRAFTSMAN 10-INCH RADIAL SAW
MODEL NUMBER 113.23163C

FIGURE 6



Key No.	Part No.	Description
-	63183	Complete Radial Arm Cap Assembly
1	63051	Knob, Elevation Crank
2	63584	Shaft, Crank Knob
3	63053	Washer, Knob
4	63054	Ring, Retaining
5	---	†Crank, Lift
6	STD 571210	*Pin, Roll, 1/8 x 1
7	63583	Retainer, Shaft
8	STD 551025	*Washer, .505 x 1 x 1/32
9	---	†Cap, Radial Arm
10	63406	Collar, Thrust
11	---	† Shaft, Lift

*Standard Hardware Item — May be Purchased Locally.

†Purchase as part of Part No. 63183, Cap Assembly, Radial Arm.

Sears

Owners Manual

MODEL 113.23163C

**Sears service is available at or through
your Sears Retail Store
or Catalogue Sales Office.**

How to order repair parts

Always mention the Model Number when requesting service or repair parts for your Craftsman Radial Arm Saw.

Order all parts listed in your Owner's Manual at any Simpsons-Sears Ltd. Retail Store or Catalogue Sales Office. If the parts you need are not stocked locally, your order will be sent to a Sears Repair Parts Distribution Centre for prompt handling.

when ordering repair parts always give:

1. The Part Number
2. The Part Description
3. The Model Number 113.23163C
4. The name of the item
(Craftsman 10" Radial Arm Saw).

WE SERVICE WHAT WE SELL.

**WE MAKE THIS PLEDGE BECAUSE OUR CONCERN FOR OUR CUSTOMERS DOES NOT
END WITH THE SALE. TO HONOR OUR PLEDGE WE HAVE DEVELOPED A TOP-
NOTCH SERVICE PROGRAM STAFFED BY HIGHLY TRAINED SPECIALISTS. THEIR KNOWLEDGE
OF OUR NEW PRODUCTS IS CONSTANTLY UPGRADED. THEY USE ONLY
PARTS SPECIFICALLY DESIGNED FOR YOUR FINE SEARS PRODUCTS.**