

GREENLEE
#545 Electric
Double End Tenoner

Instructions for Operator

INSTRUCTIONS FOR OPERATOR

GREENLEE #545 ELECTRIC DOUBLE END TENONER

MAIN BED AND HEADSTANDS:

Heavy sectional steel cover plates enclose the top of the bed to keep it free from dirt and shavings and protect the conduits leading to the magnetic switches that are enclosed in steel cabinet mounted on the end of the bed. These cover plates are held by screws and should be kept tight. A large conduit that carries the wires for the motor units on the movable headstand, rests on top of these covers, and coils and uncoils as the column is adjusted on the bed for required settings for length of stock handled. Convenient disconnect boxes are provided for the spliced wires that permit removing any motor unit without disturbing the wires in the large conduits.

Before moving the left-hand sliding headstand, the ways should be inspected and oiled after being wiped free from dirt. The large adjusting screw and nut should also be cleaned and oiled frequently. When adjusting the left-hand column to secure the desired shoulder distance between tenons, or distance between saws, the operator should first move the unit by power to a point beyond the desired distance and then bring it back to the correct position. This takes up any slack in lead screw and the final exact setting is then made by turning the adjusting hand-wheel to the right until the dials show the exact location obtained.

MAIN DRIVE SHAFT:

The bearings in the chain beams for the main feed shaft should be greased every two months. Feed shaft and keyways should be cleaned daily from accumulated dust. When necessary to remove the main shaft, the side cover plate of the gear case must be taken off to give access to the large nut on the end of the shaft. After this is removed, the key is withdrawn by turning a screw in the tapped hole in the end of the key. Then remove the key for the right-hand adjustable sprocket, and also loosen the cap screws in the cover of this adjustable sprocket housing. After the shaft sleeve bearing at the left end of the machine is loosened by removing the set screw and grease fitting, the shaft can then be moved toward the left enough to take off the large gear and ball bearing in the feed gear case, so that the shaft can be completely withdrawn at the right end, as is necessary on standard machines.

CHAINS, TRACKS AND AUTOMATIC OILERS:

There are two types of chains--smooth and corrugated. The former is for the general run of work where dogs are used, and the latter is recommended where stock may at times be run without dogs, such as in sizing large panels with overhanging veneer. When the feed chains are assembled on the machine, the front adjustable idlers should be so set that the sagging of chains at the center is 21 inches from top of chain to maximum sag. The travel of the feed chains is started and stopped by convenient push buttons, which also provide for jogging the chains.

The tracks and chains should be cleaned daily of all grit and dirt and should be blown out with air daily, especially on installations where the shavings exhaust system is not efficient. The felt wipers which are mounted below to clean the chain links before they reach the front idler sprocket, should be examined from time to time, and the felts be replaced when necessary. If oil pumps are on the machine, the operator should check the automatic oilers at the front end of each chain beam to see that they are supplied with oil. Also occasionally remove the bleeder screw to determine the quantity of oil being pumped, and reset the adjusting screw on cover as necessary to secure the proper amount of lubrication and avoid excess oil that would get on the stock. Machine oil should be used for these automatic oilers which are filled to the top of the filler plug.

The right-hand chain on all machines is supplied with an adjusting device, in connection with the rear feed sprocket, which enables the operator to locate this chain ahead or behind the opposite chain, as necessary to position the feed dogs for angle cutting. When setting this device, the four cap screws holding the outer plate of the sprocket housing, must be loosened before the adjustment is made with a crank on the squared end of the worm shaft. When making an adjustment, always back up right hand chain beyond desired setting and then bring it forward to take up slack. These screws must be securely tightened for locking when the desired square or angle setting is obtained. When dogs are staggered, each chain may surge at a different time. This causes a weaving motion of the stock and a consequent uneven cut.

DOGS:

Various patterns of dogs can be supplied, the more common ones are plain, wood-faced dogs and drop dogs. The plain dogs are standard and most generally used and these are squared up at the factory. Each dog is numbered with the corresponding chain link so that when replaced after being taken off, they will be in square relation with their mates on the opposite chain. The dogs are located by an accurately fitted cross slot in the chain link, and each dog is securely held by one screw so it can be easily and quickly taken off and put on. In case of breakage requiring replacement of a dog or if there is wear on the front face of any dog to throw it out of alignment with its mate on the opposite chain, the face of the forward dog should be touched up lightly with a file to put it in square relation.

The wood-faced dogs are used to back up the stock to prevent its tearing out at the back side. Wooden blocks of proper size are screwed to the front face of these dogs and allowed to pass through the cutter which properly forms it to act as a chipbreaker. These wooden blocks can be renewed to suit different shaping jobs, but they are seldom required except when the shaping cut is made across the grain on the last pass through the machine. Wooden blocks can be replaced with soft aluminum blocks if required.

The drop dogs require specially machined center chain links which are recessed at the sides to keep the dog within the standard chain width yet be so located that any chips fall away to the side and do not interfere with its operation. These dogs can be readily removed so that plain dogs can be used on the same link when desired.

CORE GAUGE:

A combination core and lumber gauge is supplied on all furniture machines and is regularly mounted on the left-hand chain beam. When handling material having overhanging veneers, the blade edge of the gauge is set for height to go between the veneers and engage the core of stock. The angle iron gauge itself can be reversed in position so as to present a wide face as necessary to serve as an ordinary lumber gauge. It is necessary that this gauge be set square with the chain beams so that it is parallel with the travel of the feed chains. Accurate machining of gauge makes this possible. If core gauge is dropped, it can be thrown out of alignment.

FEED GEAR CASE, FEED MOTOR AND VARIABLE DRIVE:

The feed gear case entirely encloses the gear mechanism which runs in oil. Regular machine oil is used in the back reservoir only and a level to the center of the oil sight glass near the bottom must be maintained. In the front reservoir where the worm and worm wheel are located, only Compound EE oil or its equivalent should be used, with the level equal to the plug in the cover. Oil should be drained and the case flushed out twice a year before replacing with new oil.

The variable feed drive mechanism provides a wide range of feeding speeds to cover practically all operating needs and care should be used to avoid faster feed rates than the cutters can handle to give satisfactory quality of work. The rates are regularly from 17 to 55 feet per minute, but for special needs, slower feeds can be had by addition of a larger pulley ring to standard pulley, and faster rates by use of special gearing. The high speed is always about 3-1/2 times the slow feed rate.

The face of the taper disc pulley must be kept clean and free from grease. Also check daily and shift unit through its entire speed range by turning the hand crank for feed control from the slowest to the fastest feed. See that the vee belt runs level and true. If one side rides high, one disc may be sticking on the splined shaft because of improper lubrication or from the shaft getting gummed up. In such cases, remove the vee belt and clean the disc hubs and splined shaft thoroughly with kerosene until the discs move freely. Then re-lubricate the shaft and put the belt back on, but reverse the belt occasionally so it will run in the opposite direction than before.

Lubricate daily with soft ball bearing grease of consistency similar to that of Vaseline. The discs are held under spring tension which should be no greater than necessary to avoid belt slippage. The springs are set properly when machine is tested and should not be changed until necessary. The tension should be the same on both sides for proper belt performance.

See Reeves Maintenance Manual G-3015-2 for care of new style Reeves Vari-Drive.

On older model machines, a safety rattle clutch in gear box stops the feed and sounds a warning to the operator when the chains are overloaded. The spring which regulates the amount of load for the clutch is set at the factory, but the tension can be increased or decreased as required. This is done by the operator removing the small cover on left side of gear box and adjusting the hex jam nut to obtain the desired spring tension. This nut should not be turned more than one-half of a turn between trials. A lock nut holds the setting. On newer model machines the safety clutch is inside the driven pulley, and adjustment procedure is similar.

All feed motors are equipped with a brake to stop the feed chains instantly. Some machines have a plugging switch type brake, others have solenoid operated disc brakes.

These brakes should be inspected regularly for wear and possible re-adjustment according to adjustment chart on inside of brake.

A hand crank is furnished to permit turning the driven feed pulley for the purpose of moving the feed chains by hand. This procedure is necessary if the chains are to be moved in reverse from their normal direction of travel. (It is very important to release hold-down pressure on stock in the machine before cranking chains backwards.) Disc brakes must be released before doing this. For maximum safety, the safety latch switch at the front of the right hand top pressure hold-down beams should be locked in the "OFF" position and this should be the rule when changing saws, heads or when honing or setting knives, etc. The crank must be disengaged and removed before again starting the feed.

HOLD-DOWN BEAMS:

The hold-down beams are hinged from a pivot at the outfeed end to enable the operator to swing them out far enough to step onto the bed cover plates and have complete access to the top and bottom tenon heads and scoring saws for knife whetting or any necessary changes. These swinging beams when brought back in place, are supported in a horizontal position by an extension fitting into a machined pocket and the beams are then securely locked with two clamp screws. Be sure this pocket is clean before cocking the screws.

For the general run of furniture and cabinet work, the pressure beams should be set so that the rubber blocks compress about 1/16". More pressure is required for heavy work as in case of millwork, etc. The hold-up shoe unit at the front of each pressure beam is adjustably mounted and provided with spring tension and it acts to hold the stock back against the dogs and avoid any tendency of the rubber blocks to move the stock. This unit should be set about 1/8" below the rubber blocks and its pivoted mounting permits setting to suit flat stock handled singly, or narrow pieces on edge handled in multiples.

The bearings on the front and rear of the beams should be inspected for lubrication. The felts on top of the beam should be removed when they become hard. Pertaining to machines prior to about mid-year 1943, the drip oilers should also be shut off when the machine is idle. Later machines have sight feed oilers that do not require attention other than care should be taken to see that oil shows in the glass at all times. If beams should become lower in front than in back, adjust set screws on back of slides.

DIAL INDICATORS:

Each cutting unit is fitted with a small dial indicator with widely spaced markings which register in $1/64$ " for convenient and dependable accurate setting. Scales are also used for approximate setting.

The tenon carriages for each headstand are adjusted vertically by two octagon handwheels and one-eighth turn of a handwheel moves the carriage $1/64$ ". These handwheels will adjust separately or can be locked together and moved simultaneously to maintain the tenon thickness while changing its position above the chain level. All newer models have dials graduated in .001" increments to show adjustments of tenon units.

The dial arrangement that indicates the setting of the movable headstand in relation to the fixed headstand, for changes in length of stock handled, consists of one large and one small dial mounted horizontally for visibility. The large dial is marked in both feet and inches for the full range of the machine, and this has a large pointer pivoted at the center and locked with a hand knob. This pointer is moved by hand for a change in length to the marking for distance as indicated on the face of the dial. The pointer is then locked, and motor push button is depressed, which causes the movable headstand to travel to the indicated setting and then automatically stop. On newer machines, a spring return selector switch is used to move sliding base in or out. The small dial is graduated in $1/64$ ", and this is connected to the large dial and also through spiral gears to the motor shaft, which operates the long adjusting screw for moving the headstand. The handwheel, which is held out of engagement by a spring, is used for the final accurate setting of the small dial and this setting should always be made by turning the handwheel toward the right so as to take up all slack.

The resetting of the dials is made by loosening the knob on the top of the small dial and revolving this dial until the reading on both the large and small dials exactly corresponds to the distance between the cutting units. For the original dial setting, a piece of stock that has been fed through between the cutters should be measured for length and the small dial be set as above outlined to obtain the exact reading. The feed chains should be idle when the movable column is adjusted.

SAW, TENON AND COPE UNITS:

The normal cutting position for the cut-off saws is above the chains. A 45 degree tilting up and down is provided and the lock should be used at all times to hold its setting. A lock is provided to hold the spindle in position when changing saws. On all cutting units, one turn of handwheels or cranks gives $1/8$ " movement vertically or horizontally or 1 degree tilting.

The tenon units are usually of the non-tilting type although tilting units can be furnished in place of horizontal tenon units when wanted. All 5 HP units are machined suitably for later receiving scoring saw attachments.

The cope units have horizontal, vertical and tilting adjustments and a lock is also provided to hold the spindle in position when changing heads. A spring pin keeps this lock in its "OUT" position. A foot pedal brake is provided for the cope spindles.

To remove the spindle assembly from any of the above units, the two end covers should be taken off and the lock nut, fan and bearing at the rear end of the spindle be removed which will permit withdrawing the complete spindle from front of the housing.

The spindle bearings when provided with fittings should be greased about every two months, depending on usage, and all adjusting screws should be kept clean and the bearings for same be given a few drops of oil weekly. Twice a year, the drain under each ball bearing housing should be removed to drain excess grease and then flush with kerosene. Newer machines have permanently sealed bearings that require no attention.

SCORING SAWS:

Scoring saws are regularly mounted on the tenon carriages so as to adjust with them and maintain their proper relation with the tenon heads. Independent vertical and horizontal adjustment, however, is also provided.

The scoring saws run in the same direction as the feed and their primary purpose is to just cut through the veneer to prevent the veneer from tearing, and leave the remainder of the cut to be made by tenon heads or cope cutters. Scoring saw motors can be 1 HP size when used chiefly for the above purpose, but if heavier cuts are to be made, larger motors of 1-1/2 HP, 2 HP, or 3 HP size are available. The same instructions as for other units for greasing and disassembling apply also to the scoring attachment.

DADO ATTACHMENT:

The purpose of the jump dado is to cut partial grooves in the top of the stock and the cutter jumps out at a predetermined point. Special cams can be arranged so the cutters will drop into the stock and out again before the edge is reached so as to leave both ends blind. The cutter usually runs in the same direction as the feed for smooth cuts in veneered panels, but for heavy cuts the rotation is against the feed. The dado shaft passes through the motor so the shaft can be withdrawn toward either end as may be most convenient for set-up changes. When grooves are to be cut close to the ends of the stock, cutters can be placed between the pressure beams and their supporting brackets so as to make cuts outside the chain line. The standard cams are made in two sections, each having one node, and when these are in line the jump action occurs every 32" of chain travel. The cam sections can be adjusted with reference to each

other and when the nodes are opposite, the jump is every 16". Special cams can be obtained to suit unusual requirements. A graduated dial in 1/8" increments is supplied to duplicate set-ups for jobs previously handled on which records have been made. Cams have graduations every 8" to facilitate set-up.

Where dado cuts are made in long stock, an overhead support with center steady bearing for the dado shaft is needed and for extreme requirements, two supports and steady bearings can be obtained. Where a long dado shaft is used, but the housings brought close together for handling short work, the left hand overhead tubing that carries the center bearing can be moved in the opposite direction to support the outer end of the shaft to prevent same from whipping. Stock hold-down shoes for mounting on the overhead supporting tube are often required for use in connection with lower stock supports, which are level with the chains and these hold the stock flat during the dado cuts.

When the jump feature of the dado attachment is not required, the cam roller lever is moved out of the cam path by a long screw through the recessed cover of the feed gear case. Straight-through dado cuts can then be made the same as with our stationary dado attachment, which is just like the jump dado except that no provision for cam operation is included. The dado shaft and motor bearings require greasing daily when used and the carriage ways must be kept clean and well oiled when the jump feature is used. When the dado attachment is in place and the movable headstand is to be adjusted, the dado shaft should be cleaned and oiled and the self-centering lock for the left-hand shaft bearing must be loosened. (Newer machines have permanently sealed bearings that require no attention.)

RELISHING ATTACHMENT:

The purpose of the relishing attachment is to clip off the ends of tenons at two or all four corners. To apply same, the cope hood bracket is removed and the relishing attachment is mounted on top of the cope carriage in its place and take its drive from the cope spindle through which it passes and to which it is locked with the regular cope spindle nut. Be sure to clean bottom of the relishing attachment and the top of the cope cover before mounting. Double cams are furnished which are adjustable to suit ordinary requirements. Special cams for unusual needs can be supplied. The gear case should be cleaned and refilled with grease about twice a year and other bearings and pivots should be greased each week.

CONTROL CABINET:

The control cabinet is assembled complete with magnotic switches and thermal relays for the interlocked wiring to the various units. The bus bar is stamped to show which unit each switch controls. The failure of any motor cuts off all of the current and stops all of the motors and an examination of the switches will show which relay has opened up. The cabinet is arranged to take in the three wires from the supply line, but it is recommended that a disconnect line switch be located close to the machine so that power can be cut off there when any electrical work is being done on the machine, or when the regular operator is away from the machine so as to prevent others from starting it.

A master stop station is fitted in the push-button panel and also at the rear of the machine convenient to the off-bearer. Another stop device is applied to the front of the top pressure beam in connection with an adjustable latch which can be set for the thickness of stock handled and thus avoid jams from misplaced or oversize material. This device has a master lock lever which engages the stop button and prevents the accidental starting up of any cutting unit.

On the newer machines, a maintained contact switch on the right hand side of the machine (operator's side) serves as a master stop. Once this switch is tripped manually by the operator or the stock, power to the machine is cut off until it is manually re-set. However, when tripped, the operator would have no way of knowing whether or not there is power on the machine, and if it is safe to make a set-up. Thus a light situated on top of the column shines when there is power on the machine.

Further, on the left hand beam, a standard switch (without maintained contact) is used to permit stops to be made because of oversize stock, or in the event of an emergency.

Always be sure that all cutting units that are in working position, are running before stock is fed through the machine.

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