MODEL X-3 TESTER

MOUNTINC DIMENSIONS

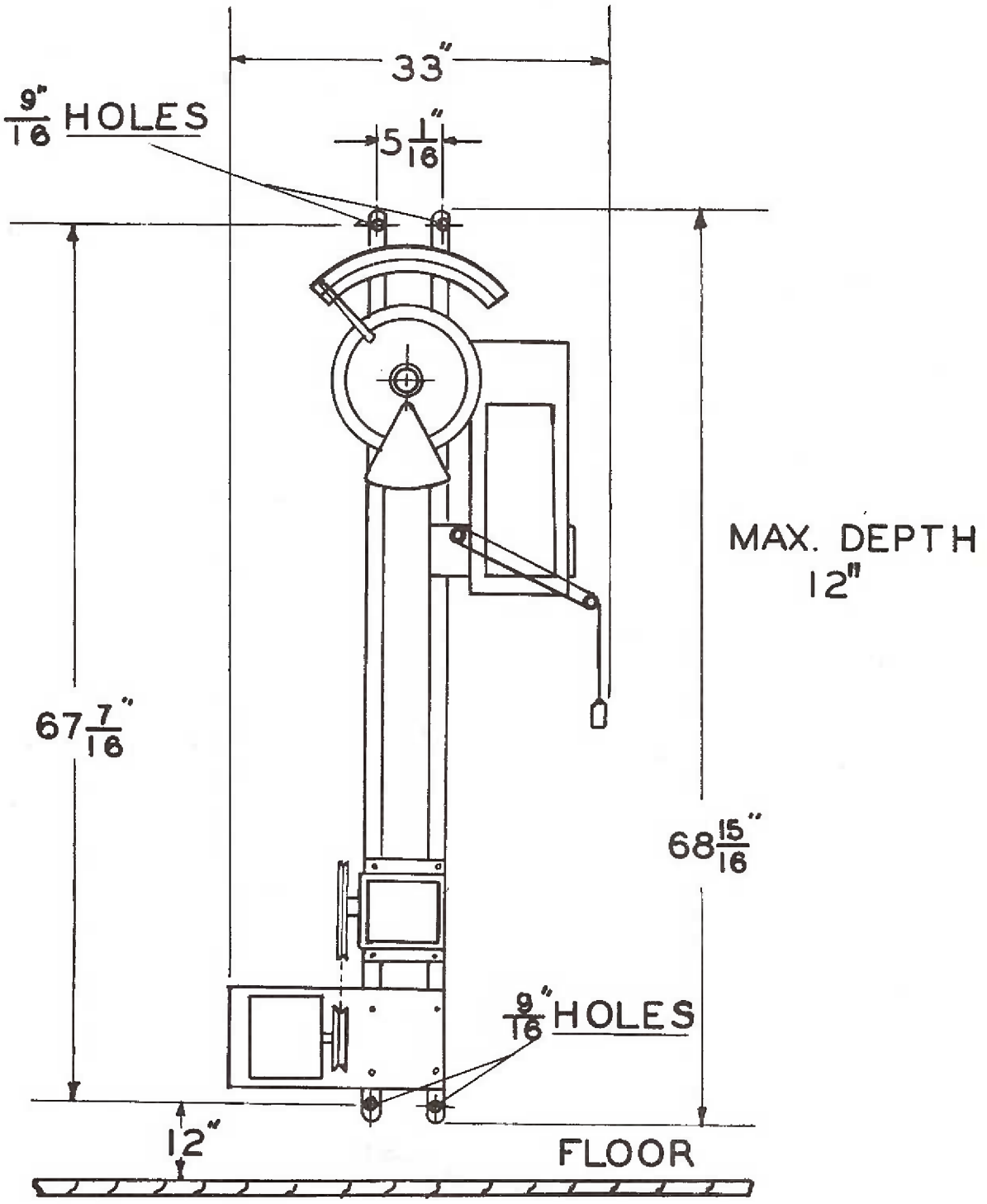

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FIG. 1

1. INTRODUCTION

1.1 This tester was developed for tensile strength and elongation testing of paper, textiles, wire, rubber and similar materials.

1.2 Read carefully paragraphs 2 and 3 before proceeding further.

2. UNPACKING

2.1 P.T.E.S. INC. exercises extreme caution and thoroughness when packaging testing machines and equipment. Damage in transit seldom occurs, nevertheless it is suggested that a check be made of the shipping box and of its contents for damage resulting from mishandling. If damage is found, make claims to the transportation company before proceeding further with the unpacking.

2.2 Preparation of area:

2.2.1 The Model X-3 will require a power supply from a 115 volt, 60 cycle, single phase electrical outlet or the special requirements of your order.

2.2.2 The tester is furnished for floor mounting and it will require an area of 33" wide by 28 5/8" deep and a clearance of 98" above this area. Enough room in front of this area should be allowed for operator movement.

2.2.3 Testers to be mounted on a wall will require a wall that is free from vibrations and capable of holding a load of at least 300 pounds. If this is not available, the wall may be reinforced with a plank at least 84" long, 10" wide and 2" thick. The plank may be bolted to the wall with the lower end resting on the floor then the tester bolted to the plank.

The tester will require a clear area of 84" high and 33" wide. (See figure 1 for mounting dimensions.) An allowance of 3'

by 4' must be made for the operator in front of the machine. Thus a total clear area of 4' in width and 4' out from the wall must be allowed.

Holes should be drilled for four 1/2" steel holding screws or bolts, as indicated in Fig. 1 for mounting the tester to the prepared wall.

2.3 This precisionly balanced machine is a delicate instrument. Carelessness in handling the tester may mean a factory overhaul to restore it to operating condition. Under no circumstances use hammers or any other tools to pry at the shipping box or tester. Follow the instructions below, step by step, and the tester will be suitable for correct operation.

2.4 There is needed for proper installation of this tester, approximately one pint of new SAE 30 oil.

2.5 To remove the tester from the shipping box when there is no pedestal mount attached:

2.5.1 Remove all screws holding the braces and remove all loose braces. Do not let them fall on the tester. Do <u>not</u> remove any of the twine lashings on the tester.

2.5.2 The tester should be then lifted out carefully by means of the mounting frame and not by any of the projections from this frame.

2.5.3 Check the contents of the shipping box with those checked on exhibit A.

2.6 When the tester is shipped with a floor mount attached, the unpacking sequence is:

2.6.1 Follow the instructions of paragraph 2.5.1.

2.6.2 Remove all loose parts and check them with those checked on exhibit A.

2.6.3 Carefully stand the shipping box up on end

so that the tester is in an upright position and work the tester out of the box. (CAUTION: Use only the mounting frame as a means of moving the tester. Do not use any of the projections from this frame.)

3. **INSTALLATION:** Reference to the numbered parts in figure 2 will be made in the following paragraphs.

3.1 Attach the tester with 1/2" bolts directly to the prepared wall when this type of mounting is to be used. Otherwise, position the tester in the space selected.

3.2 To level the tester, hold a spirit level against the upper rack (29) as close to the top of the gear box as possible. It is important to level the tester on the upper rack rather than the frame or other parts of the tester. Plumb the tester in both directions and tighten the mounting screws.

Re-check the level to make sure the upper rack is truly plumb.

This check should be made again after a few weeks of use in case the tester has settled.

3.3 Cut all twine bindings and remove all the boards attached to the tester.

3.4 The scale arc (28) may have one, two, or three graduated scales. A head capacity weight (10) has been supplied for each scale, and is so marked. Fit the proper head capacity weight (10) onto the two pins on the face of the head wheel (23) and attach it through the back of the wheel with the T-head screw furnished.

3.5 To check the freedom of the head wheel, lift the pawls (19) clear of the ratchet on its rim with the left hand; with the right hand, swing the head capacity weight (10) back and forth gently to make sure the head wheel (23) moves freely. If it does not, the brake (26) should be examined to see whether it has been damaged in handling. NOTE: The brake band should be clear of the head

wheel. Also check for and remove any obstructions such as twine bindings at the back of the head wheel.

With the head wheel (23) free, return the pawls against it.

3.6 The upper clamp balance weight (18C) is shipped with the loose parts. Attach it to the chain (38) at the front of the head wheel (23) as shown in Figure 2.

3.7 A slight adjustment may be necessary to set the pointer (27) at zero on the scale. The pointer is attached to the head wheel in the same way a clock hand is attached; tapping with a finger is sufficient to move the pointer to zero.

3.8 To check the ratchet action, turn the head wheel (23) slowly to the right; release the wheel as the pawls (19) engage each successive tooth on the ratchet to make sure the pawls hold properly at all points.

3.9 When the pointer (27) reaches the limit of the scale, pull down sharply on the brake handle (26). DO NOT RELEASE THE BRAKE HANDLE, but ease it gradually, just enough so that the head wheel turns slowly back to its zero position.

NOTE: Insofar as the brake handle raises the pawls when partially released, it also will let the pawls drop back onto the ratchet if fully released. Damage to the pawls and ratchet may result if this is done while the head wheel is returning to zero.

3.10 Attach the lower clamp balance weight stamped (33) to the lower rack as shown in Figure 2. This weight counter-balances the lower clamp (36).

3.11 Lubricate the shafts and bearings with a good grade of light machine oil through the two oil holes on the left side and the one on the right side of gear box (16). Remove the oil level plug and the filler plug. Pour approximately 3/4 of a pint of clean new SAE 30 oil through the filler plug until it

reaches the area of the level plug. If the oil exceeds this amount, it will overflow. Replace the two plugs. Fill the oil cups on the electric motor (1) with new SAE 30 oil.

3.12 The distance between the clamps is determined by the position of the lower stop dog (32). Raise the starting handle (11) until it latches in; it may be necessary to turn the gear box pulley (15) by hand to accomplish this. After the starting handle (11) has latched in, turn the gear box pulley (15) until the distance between clamps -- nip to nip -- is equal to the test length of the samples. Back off the set screw in the lower stop dog (32), move the stop dog up hard against the bottom of the gear box. Tighten the set screw firmly.

3.13 Locate the manual starter switch, supplied, in a convenient spot and wire the motor to it. Wire the starter switch to the electrical supply specified on the motor name plate. Direction of rotation must be in accordance with the arrow stamped on the gear box (16).

3.14 The downward movement of the lower clamp (36) is limited by the position of the upper stop dog (31). When this dog strikes the starting handle (11) the downward movement of the clamp stops. Using the set screw in the stop dog, set the distance from the dog (31) to the starting handle (11) equal to the desired downward travel of the lower clamp (36).

4. OPERATION

4.1 Start the electric motor (1) and lock the upper clamp guide (24) by pushing up the locking lever (37).

4.2 Clamp the test sample between the clamps in the appropriate manner for the sample and clamps being used.

4.3 To start the test:

1. Unlock the upper clamp guide (24) by pulling down on the locking lever (37). THIS IS IMPORTANT.

2. Pull up the starting handle (11). The lower clamp (36) will move down and stop automatically when the upper stop dog (31) hits the starting handle.

3. Pull the return lever (12) to the front to return the lower clamp to its starting position. If your tester has no recorder, the lower clamp will return automatically to its starting position when the upper stop dog (31) pushes the starting handle down.

4. Note the result of the test by reading the position of the pointer (27) on the scale (28).

4.4 To return the head wheel (23):

1. Pull down sharply on the brake handle (25) to release the pawls and to lock the head wheel (23).

DO NOT RELEASE THE BRAKE HANDLE, but ease it gradually, just enough so that the head wheel turns slowly back until the pointer reads zero. Then release the brake handle.

4.5 Repeat the above step for each sample. Do not stop the electric motor during a series of tests - the starting handle (11) and return lever (12) control the gear box. Stop the motor whenever the tester is to be idle for a period of twenty minutes or more.

5. MAINTENANCE

5.1 The oil level of the gear box (16) should be checked every three months as specified under paragraph 3.11 of the Installation section.

5.2 The bearings of the shafts which were also mentioned in paragraph 3.11 of the Installation section should be oiled weekly.

5.3 When ordering replacement parts, please give the serial number of your tester.

RECORDER FOR MODEL X-3 TESTER

10-HEAD CAPACITY WEIGHT
30-LOWER RACK
A -BRACKET
B -PEN LIFTER
C -STYLUS CARRIAGE
D -CLIPS
E -RECORDER PLATEN
J -CARRIAGE GUIDE ROD
K -CABLE
R -WEIGHT
S -PULLEY
T -PULLEY
U -FITTING
W -SET SCREW
X -SET SCREW
AD- CABLE ANCHOR
AE- CABLE PULLEY
AF- STUD
AG- RECORDER COUNTERWEIGHT
AH- KNURLED THUMB SCREW
AJ- PIN
AK- HOOK

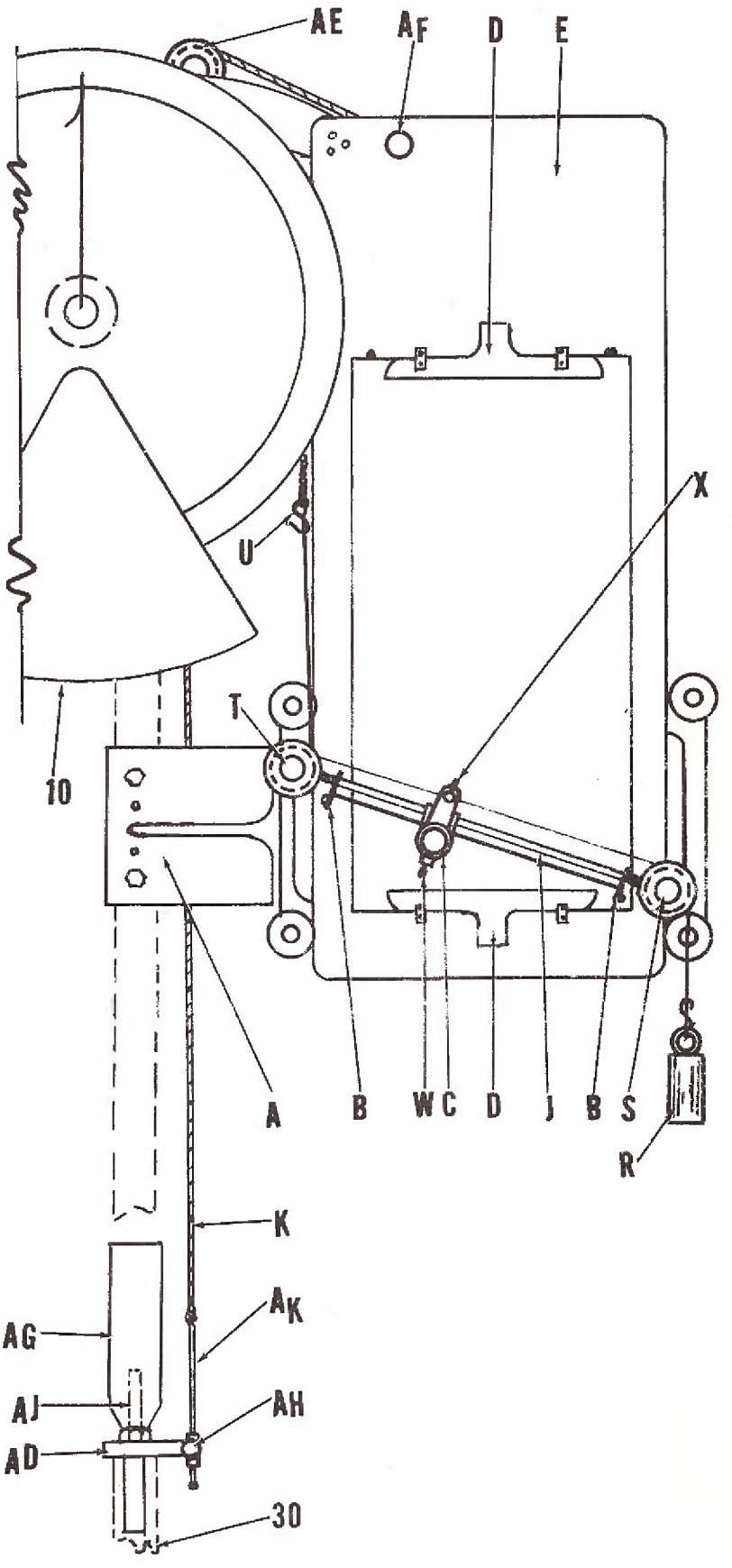

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FIG. 3

INSTALLATION OF RECORDER

6.1 When ordered as part of Tester:

6.1.1 The bracket (A) at the left of the Recorder has two dowel pins and two drilled holes for the mounting screws furnished. Place the Recorder in the position shown in Figure 3 of the Tester Instructions so that the dowels fit into the dowel holes in the Tester mounting frame (2). Secure the bracket (A) with the two mounting screws furnished.

6.1.2 A Recorder counterweight (AG) is shipped with the loose parts. This weight differs from the rack counterweight (33) in that its hole is not tapped. Place the Recorder counterweight (AG) so that its untapped hole fits over the pin (AJ) at the top of the lower rack (30).

6.1.3 The Recorder platen (E) is shipped centered in its bracket. Cut the binding twine holding the platen (E) and push the platen up as far as it will go.

6.1.4 Turn the gear box pulley (15) by hand (see Tester Instructions) until the lower rack (30) is all the way down and the upper rack (29) is all the way up.

6.1.5 One end of cable (K) is already attached to the cable anchor (AD) at the top of the lower rack (30).

6.1.5.1 On Recorders with a 1:1 ratio, the other end of cable (K) passes up over the single sheave of the cable pulley (AE) and is tied back to the cable with binding twine. Cut the twine and slip the loop on the free end of the cable (K) over the back of the stud (AF) at the top of the Recorder platen (E).

6.1.5.2 On Recorders with ratios other than 1:1, the other end of cable (K) leads into one sheave of the cable pulley (AE) and is fastened. A second, shorter cable leads from the other sheave of the cable pulley (AE) and is tied back to cable (K) with binding twine. Cut the twine and slip the loop on the free end of the shorter cable over the back of the stud (AF) at the top of the Recorder platen (E).

6.1.6 The cord through the stylus carriage (C) is shipped with the ends of the cord leading around the pulleys (S & T) on the sides of the recorder platen and tied together. Untie the ends of this cord. Drop the right end of the cord over the pulley (S) and hook the weight (R) in the loop at the end of the cord. Lift the left end of the cord up and hook its loop into the fitting (U) at the end of the chain (in the recessed rim of the head wheel).

6.1.7 A small weight stamped "18R" is shipped with the loose parts. Attach this weight to the upper clamp counterweight (18C) (see Tester Instructions) with the pin furnished.

6.1.8 Insert a Tensilgram under the clips (D) on the Recorder platen (E) so that the Tensilgram is against the pins at the top and right side of the platen. Make sure that the notation on the bottom of the Tensilgram agrees with the capacity scale to be used; the notation should correspond with the head capacity weight (10) being used.

6.1.9 Fill the stylus pen with ink and clamp the pen in the stylus carriage (C) with set screw (W). The stylus pen is filled in the same manner as any sac-type fountain pen and should be cleaned frequently with plain water.

6.1.10 Loosen set screw (X) and move the carriage (C) so that the pen point rests on the left hand vertical line on the Tensilgram; tighten the set screw.

6.1.11 If the pen point does not rest on the bottom line of the Tensilgram, adjust the knurled nuts (AH) at the cable anchor (AD) until it does. If insufficient adjustment can be made with these nuts, untie the knot in the lower end of the cable (K) and retie with the pen point in approximately the right position.

IMPORTANT: The lower rack (30) must be all the way down (upper rack (29) all the way up) when this adjustment is made or damage to the machine will result.

7. INSTALLATION OF RECORDER

7.1 When ordered separately.

7.1.1 Attach the Recorder to the Tester as described in paragraph 6.1.

7.1.2 A pin (AJ), threaded at one end, a lock nut and a cable anchor (AD) are shipped with the loose parts. The cable anchor has one end of the cable (K) led through the fitting (AK); the end of the cable is tied in a knot to keep it from slipping through the fitting. Place the cable anchor so that the fitting (AK) projects out to the right with the other end of the anchor resting on top of the lower rack (30); the knotted end of the cable should be down. Attach the cable anchor (AD) to the lower rack (30) with the pin (AJ) and secure it with the lock nut.

7.1.3 Place the Recorder counterweight (AG) as described in paragraph 6.2.

7.1.4 The cable pulley (AE), mounted on a bracket, is shipped with the loose parts.

Attach the bracket to the top of the right rail of the Tester frame (2) with the two 1/4 -20NC screws and the lockwashers furnished. Properly spaced holes have already been drilled and tapped in the Tester frame for this purpose.

7.1.5 Follow the instructions in paragraphs 6.3 and 6.4.

7.1.6 On Recorders with a 1:1 ratio, lead the cable (K) from the cable anchor (AD) up over the cable pulley (AE) and fit the loop in the end of the cable over the back of the stud (AF) at the top of the platen (E).

7.1.6.1 On Recorders with a 2:1 ratio, lead the shorter cable attached to the cable pulley (AE) once around the larger sheave and fit the loop in the end of the cable over the stud (AF) at the top of the platen (E). Then lead the cable (K) up from the cable anchor (AD) to the smaller sheave and through the small hole cut in the sheave. Properly done, the cable (K) should be just beginning to wind and the shorter cable should be wound almost a complete turn.

7.1.6.2 On Recorders with a 1:2 ratio, the procedure is the same as for Recorders with a 2:1 ratio except that cable (K) leads into the larger sheave and the shorter cable to the platen leads around the smaller sheave.

7.1.7 Follow the instructions in paragraphs 6.7 to 6.11 inclusive.

8. OPERATION OF RECORDER

8.1 Installed as described above, the Recorder is ready for operation. When a sample is tested

as described in the Tester Instructions, the stylus pen will draw a Stress-Strain curve on the Tensilgram.

9. MAINTENANCE OF RECORDER

9.1 Wipe the stylus carriage rod (J) daily with a clean rag.

9.2 Pulley bearings should be lubricated occasionally with a light machine oil.

10. REPLACEMENT PARTS FOR RECORDER

10.1 Replacement parts are carried in stock for immediate delivery. When ordering, please give the serial number of your Tester.

11. INSTALLATION OF VARIABLE SPEED GEAR BOX

11.1 When ordered as part of Tester:

11.1.1 When the variable speed gear box is ordered as a part of the Tester, the box is shipped assembled to the Tester gear box (16). Steps for installing the electric motor are the same as for the basic machine, except that the oil holes of the variable speed gear box should be lubricated with SAE 30 oil before operating the Tester.

11.1.2 When ordered as replacement for existing drive.

11.1.2.1 Remove the front covers from the Tester gear box (16) and the variable speed gear box.

11.1.2.2 Remove the V-belt from the pulley (15).

11.1.2.3 The pulley shaft extends into the gear box (16) and has a worm pinned to it. Drive out this pin and remove the pulley and shaft from the gear box (16).

11.1.2.4 Place the variable speed gear box so that the shaft on its right fits into the hub of the gear box (16) from which the pulley shaft was just removed.

11.1.2.5 When correctly placed, the hub on the variable speed gear box will fit over the hub on the Tester gear box (16). Lock the two hubs together with the set screws in the variable speed gear box hub.

11.1.2.6 The shaft from the variable speed gear box will now be extending into the Tester gear box (16). Hold this shaft as far to the right as it will go and slide the worm (previously removed from the pulley shaft) on to it.

11.1.2.7 Drill the shaft for a 1/8" taper pin through the taper pin holes in the worm. Pin the worm to the shaft.

11.1.2.8 Re-locate the electric motor (1) on the mounting plate (34) so that the motor pulley is aligned with the variable speed gear box pulley. Place the V-belt over these two pulleys.

11.1.2.9 Check motor wiring. Rotation of the pulley must be in accordance with the red arrow on the variable speed gear box.

11.1.2.10 Pull the variable speed gear box shaft to the left to its high-speed position. Rotate the pulley by hand to check alignment. Make any adjustments necessary to make the pulley turn easily and smoothly by hand.

11.1.2.11 Lubricate the shafts and bearings of the variable speed gear box with SAE 30 oil.

11.1.2.12 Replace the covers on the gear boxes.

12. OPERATION OF VARIABLE SPEED GEAR BOX

12.1 The variable speed gear box will drive the lower clamp at a speed of 20" per minute when the knob at the end of the pulley shaft is pulled all the way out to the left. Depending upon the individual unit, any or all of the following speeds are available by pushing the knob to the right to the proper graduation:

1, 2, 3, 4, 5, 10, and 12" per minute

12.2 Changes in speed may be made with the machine stopped or in operation by pushing in or pulling out the knob at the end of the pulley shaft.

12.3 Note: Until the machine has been run in for two or three days, it may be necessary to stop the motor to shift to a speed of 20 inches per minute. This situation is normal and does not mean that adjustments are needed.

13. MAINTENANCE OF VARIABLE SPEED GEAR BOX

13.1 Shafts and bearings should be lubricated with SAE 30 oil every three months through the oil holes provided. Keep the pulley shaft clean and lightly oiled at all times.

14. REPLACEMENT PARTS FOR VARIABLE SPEED GEAR BOX

14.1 Replacement parts are carried in stock for immediate delivery. When ordering, please give the serial number of your Tester.

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