

Proctor Soil Compactor



INSTRUCTIONAL BOOKLET



FIFTH EDITION
May 2005

RAINHART SERIES 662

AUTOMATIC TAMPER

OPERATION AND SERVICE MANUAL

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Equipment Selection

See Catalog Section, page 15

Installation of Equipment

Unpack. Remove all shipping ties and uncrate. Carefully unpack all containers. Check the packing list against the shipment for losses and damage.

Overall height. Although 9-1/2 foot ceiling would appear to be required for vertical clearance when mounted on 30 inch pedestal, many laboratories provide a small hole between the ceiling joists to accommodate the raised tamping shaft.

Electric motor drive and its mounting brackets assembly are ready for installation although packed separately. Mount the motor bracket assembly as shown in the drawing on page 3. secure the two motor mount brackets with the furnished 3/8NF24 x 3-1/2 inch cap screws and install their nuts below the tamper bed.

Bench mounting the tamper. The tamper can be bolted to a solid bench not over 30 inches high for easy handling of materials and molds.

A concrete pedestal “whose weight exceeds 200 lb.,” is required of complying with ASTM hand molding specifications. Remove and discard the four 662-250-10 foot assemblies and cast in four hook bolts jiggled to this layout, easily fabricated from 3/8 inch diameter all thread rod. The flywheel should be approx. 4-in. back from, and parallel with, the right-hand side and the bed plate should be even with the front of the pedestal, see the drawing on page 3.

Apply grout approx. 3/4-in. deep to the top of the pedestal to accommodate the cap screw heads and nuts under the tamper bed. Place and level the tamper. After the grout has set, tighten the four corners securely.

Install the belt. Slip the supplied BEL1003 belt (Section “A”, 58-in.), over the flywheel and engage the grooves of the large flywheel pulley and the gear-head motor. The weight of the motor supplies the

correct belt tension and will automatically compensate for belt stretch. A Cat. No. 662BG Belt Guard can be furnished.

Vent the gear-box of the motor before operating. Remove the topmost pipe plug and replace it with the furnished vented plug to avoid blowing the shaft seal when the oil heats and expands. Check the oil level in the gear housing by removing the pipe plug which defines the oil level. Add only SAE 90 weight hypoid oil when needed.

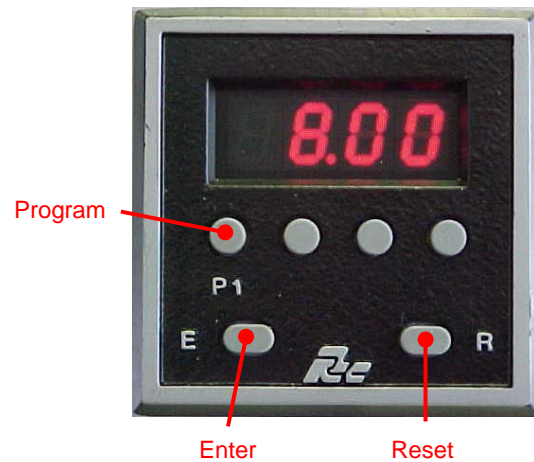


Figure 1

Programming the counter Cat #662-1650. a one-time counter adjustment for any specific program.

- Push the red emergency stop button in.
- Press the PROGRAM button on the counter to enter the program mode. The counter will automatically exit the program mode after approximately 10 seconds of inactivity.
- The current program will be displayed.
- Press the button below each digit until the desired program is set. The counter is programmable from 1 blow to 9999 blows.
- Press enter to complete the programming cycle and then reset to set the counter to the new program.

Electric hook-up. Plug the motor’s cord into the back of the counter control box and the counter’s cord into a 115VAC 60Hz

outlet. (Other voltages and frequencies are available on special order)

Install the handle. (The handle assembly complete with pulley and spacer is packed separately for shipment). Make sure that the -126 spacer is slipped onto the -124A pivot axle and then screwed into the cable throw -127 quick-changer body. Wrench tighten the nut between the handle and the flywheel cable pulley. Install the factory length-adjusted cable loop on the flywheel -62 pulley.

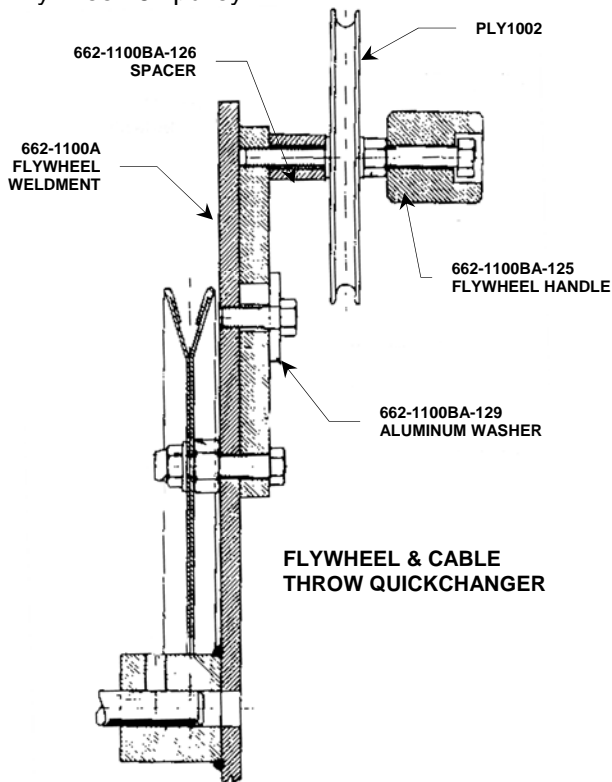


Figure 2

Install the tamping head (rammer). All tamping heads are installed by screwing onto the shaft and wrench tightened. *Avoid cross threading.* The shaft is furnished with a 1-1/16 in. hex for wrench tightening and a 3/4-in. taper pipe thread for mounting any of the tamping heads. The three most commonly used tamping heads, illustrated in the catalog section, are eccentric---

- 1) Cat. No. 662H4C Circular Face,
- 2) Cat No. 662H4S Sector Face, both are for 4-in. molds, and---

- 3) Cat. No. 662H6S Sector Face, for 6-in. molds).

Each has an area of pi square inches and weighs 3 lb. so that their weight plus 2 1/2 lb. shaft totals 5 1/2 lb.

For 10-lb. drops with the above three tamping heads install Cat. No. 662HSW Supplemental Weight of 4.5 lb. This bolts immediately on top of the tamping head. Make sure that its two lugs straddle the shaft with approximately equal clearances. Securely wrench tighten the furnished 1/2 NF20 x 5 1/2-in. cap screw.

The Cat. No. 662H6D Double Sector Face Tamping Head for 6" diameter mold, weighs 7 1/2 lb. (10 lb with shaft assembly) and is used primarily for compacting sand. This has two pie-shaped heads apex to apex.

Adjust the index bars. Loosen the cap screw on the top of the two -214 index bar brackets and retract the -215 index bars out of the way, see drawing on page 3. Place the mold assembly on the mold mount plate and place the tamping head inside the mold. Rotate the tamping head and move the mold along the two horizontal axes parallel with the mold mount plate until the clearance between the tamping head and the mold is uniform all the way around. Gently push both index bars against the mold. Wrench tighten the clamp screws of both index bar brackets. Recheck the concentricity of the mold.

ASTM type molds¹. Use a Cat. No. 662-1500 Angle Clamp Assembly, illustrated in the photograph on the front cover. This secures mold base plates which are approximately 6 x 6 inches for 4 inch diameter molds and 8 x 8 inches for 6 inch diameter molds. These are normally supplied with toggles for 3/8 inch thick mold base plates. Toggles for 1/2 inch thick base plates are available and other thicknesses can be furnished on special order.

¹ For open bottom molds, identified by an annular tapered groove in the outside wall near each enc, see the Catalog Section. These molds and installation hardware are available

The angle clamp assembly, Cat. No. 665MFA, does two things:

1. It spring loads the mold assembly down against the mold mount plate, and
2. It holds ASTM type molds positively against the index bars.

With the mold placed against the index bars (which have been adjusted and secured as described above), rotate the mold assembly until the sides of its square base plate are parallel with the sides of the mold mount plate.

Toggles restrain the mold assembly vertically. These must be installed in the inner holes for 6 inch molds and in the outer holes for 4 inch diameter molds, see drawing on page 6.

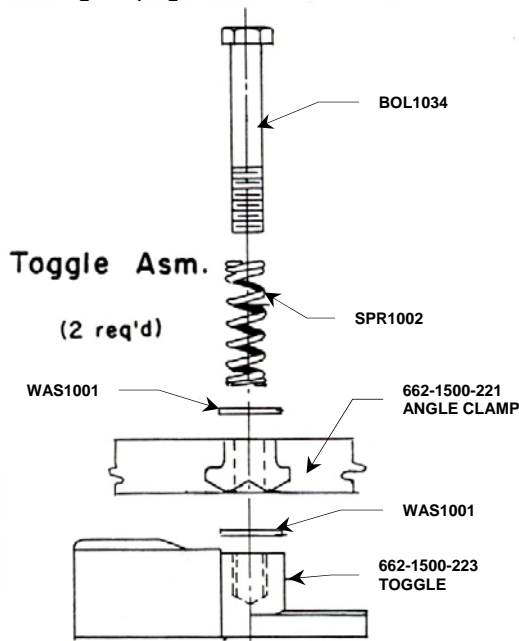


Figure 3

Open the two toggles by rotating them parallel with the mold mount plate and register the step in the angle clamp apex over the corner of the mold base plate furthest from the two index bars.

Adjust the two screw (round head machine, 3/8NC16 x 2-1/2) so that they *just* contact the vertical sides of the mold mount plate

and wrench tighten their locking nuts, illustrated next page.

Frequent change overs from 4 to 6 inch molds can be expedited with a second 665MFA Angle Clamp Assembly; this will eliminate toggle relocation and stop screw adjustments. (Marks in the index bars would allow repositioning).

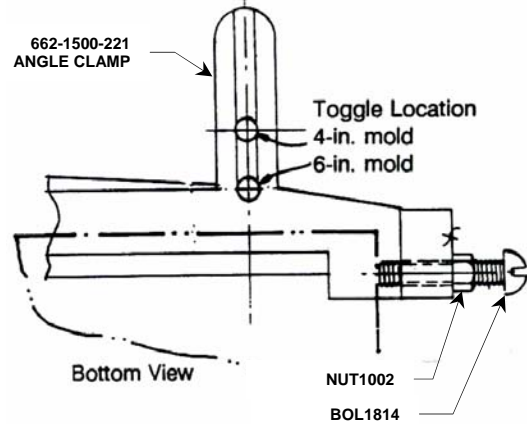


Figure 4

Quick change over between 12 and 18 inch drops require only three simple adjustments:

1. Quick changer (on the flywheel). Loosen the quadrant clamp screw, swing the quick changer outward for 18 inch or inward for 12 inch drops and securely wrench tighten. This changes the radius and therefore the amount of cable travel
2. Cable attachment to the grabber is with the end ball for 18 inch and with the inner ball for 12 inch drops. To change cable attachment points, unscrew the slotted 662-1300-14 cable quick disconnect (modified cap screw) from the underside of the grabber's lever, see 662G3-2 on drawing, page 11. Pull the cable down an inch or two to provide working room. Slide the cable quick disconnect off the ball's stem and remove it sideways. Assemble in reverse order.

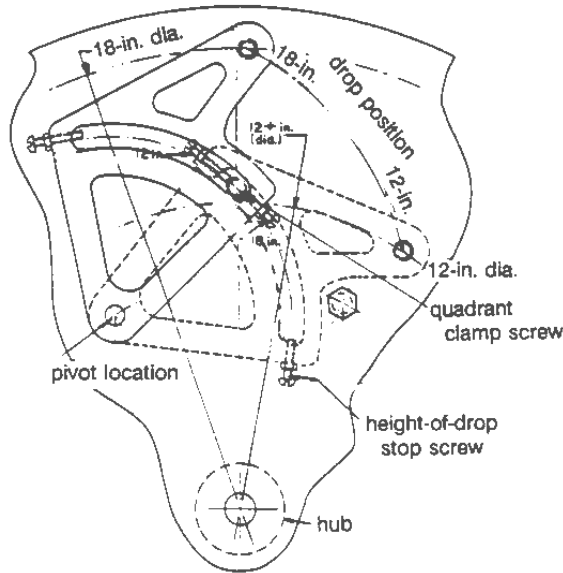


Figure 5

3. **Engager adjustment.** Adjust the height and rotation of the engager so that the 662G3-1200-11 bumper wheel is reliably actuated—

- Place a layer of soil in the mold. Place the tamping head on the soil.
- Unclamp the engager and slide it down to the bottom of the -111 spacer rod.
- Run the motor. The grabber will slide harmlessly up and down and will fail to engage the shaft.

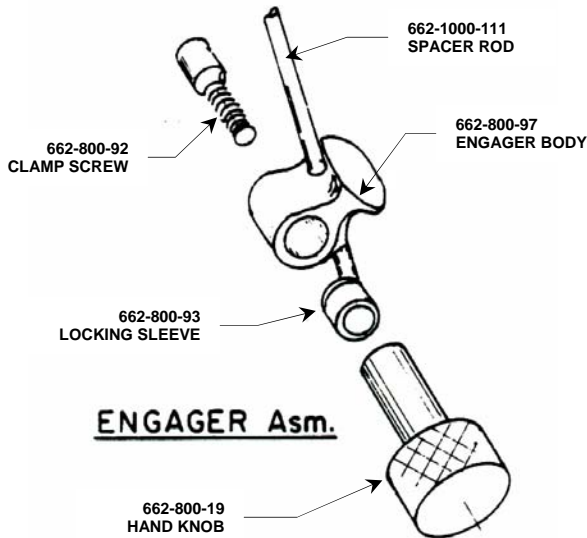


Figure 6

- Slowly raise the engager until it *just reliably* actuates the grabber bumper

wheel. Rotate the engager for *maximum* grabber body clearance and firmly hand tighten. Allow only the bumper wheel to touch the -97 engager's body.

Visual aid for height-of-drop. A series of bands can indicate the height-of-drop. These can be applied to the outside of a guide rod—avoid interference with the tamper shaft's passing guide disc—to indicate at a glance the relative positions of the guide disc at the top and bottom of each drop.

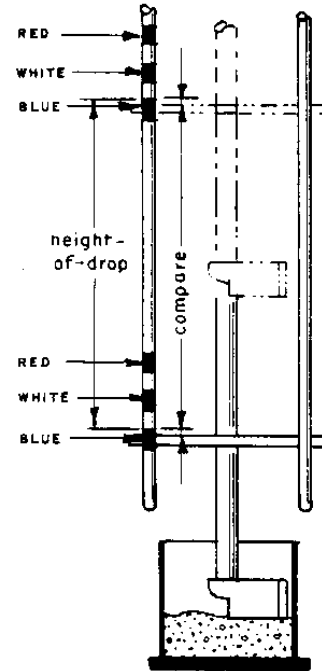


Figure 7

If, for example, the hammer comes to rest with the guide disc at the center of the lower blue stripe, the height-of-drop will be properly adjusted if the shaft is released when the guide disc is at the center of the mating upper blue stripe. The height-of-drop can be checked at any time during actual operation from anywhere near the tamper!

Blow overlap is controlled by the angle of the -111 spacer rod from vertical by establishing the amount of grabber rotation each drop. Adjustment of the bottom of the spacer rod towards the column will increase the amount of overlap. A 20-25% overlap is the general practice.

Safety First

All accidents share the element of surprise! The following three unique potential hazards *must* be avoided.

1. **Lower guide bracket.** *Never* place a hand on either the lower guide bracket or on the guard. In operation, the guide disc rises and falls past the lower horseshoe-shaped guide rod bracket with less than finger room clearance! The knuckle-skipping potential of the guide disc is outstanding!
2. **Flywheel.** Stay clear of the flywheel's cable attachment hardware.
3. **Tamping head** entering the mold. Avoid having a hand struck by the dropping tamping head. *Never* level or tidy loose particles of soil in the mold between drops. Never touch the mold or the tamping head—whether the tamper is running or not—unless the tamping assembly is safely parked on the catcher arm. To interrupt a sequence, see page 8.

Tamper head striking the mold is the most common cause of damage to the equipment.

- The tamping head and mold must be of matching diameters.
- The mold must be concentric with the tamping head.

Either the index bars, or the angle clamp is incorrectly adjusted or installed, page 5. *A bent shaft can not be straightened and must be replaced.*

Safe access is provided by interrupting the sequence of blows (page 8) and parking the guide disc on the catcher arm. Even if the motor is started, the grabber will harmlessly rise and fall between the releaser and the guide disc—the tamping assembly cannot drop! This is a must when cleaning the mold mount plate or tamper bed, mounting the mold assembly, placing or leveling layers of soil, removing the mold with its compacted specimen or installing or removing a tamping head.

Use the guide disc for a convenient handle. Lift the tamping head assembly with the left-hand high enough to flip the catcher arm into its horizontal holding position with the right-hand. Lower the assembly so that the guide disc rests on the extended catcher arm.

Operation

Mount the mold. Place the mold assembly on the mold mount plate against the two index bars and rotate until the edges of the square mold base plate are parallel with the edges of the mold mount plate. The angle clamp, when properly adjusted (see page 5), will drop onto the mold base plate and its horizontal adjustment screws will overhang the two edges of the mold mount plate. Rotate the vertical restraining toggles so that their ends are engaged underneath the mold mount plate and their handles click into the detent position parallel with the angle clamp lugs.

It may prove helpful to mark one corner of the mold base plate in repetitive work. If using a series of molds with a variation in their base plate size, replace the locking nuts of the lateral restraining adjustment screws with the wing nuts and finger tighten for each mold.

Frequent change-overs from 4 to 6-in. molds can be expedited with a second 665MFA Angle Clamp Assembly; this will eliminate toggle relocation and stop-screw adjustments. (Marks on the index bars would allow repositioning).

Filling the mold. Many laboratories use a filter paper disc placed in the bottom of the mold to prevent the specimen from sticking to the base plate (Cat. Nos. FT-662-4 [4" diameter] and Ft-662-6 [6" diameter]) with the tamping head in the parked position, pour materials for one layer into the mold. Spillage can be reduced by using a funnel collar. Level the loose materials and make sure that aggregates are uniformly distributed.

Place the tamping head on the soil. Release the grabber by manually pushing the 662G3-1200-11 bumper wheel downward. Lift the tamping assembly high enough to flip the catcher arm out of the way, and gently place

the tamping assembly on top of the soil. Manually rotate the flywheel handle counterclockwise until the grabber is at its lowest point. The grabber will automatically engage when its bumper wheel strikes the engager and is flipped into its engaged position, see page 6.

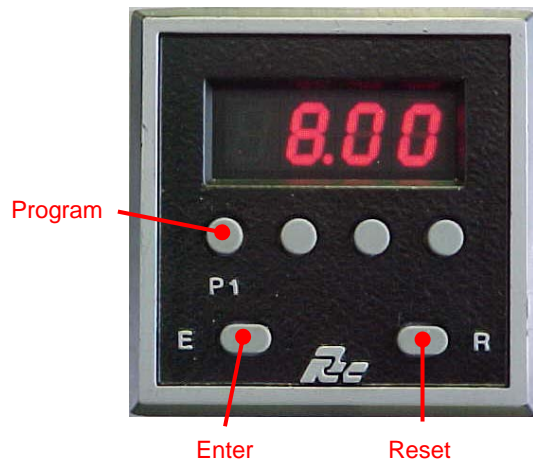


Figure 8

Tamping cycle—

To start a sequence of drops—

Note: **for first time operation** (or if the power has been interrupted, either by unplugging the tamper or a power outage), press the emergency stop button in; connect the power, then press the “Relay Reset” button on the back of the counter. The tamper should operate normally.

- Push the red emergency stop button in to turn the tamper power off. The emergency button is in located just below the digital counter.
- Press the *RESET* button on the counter.
- If the number of programmed blows displayed on the counter is not the number desired. Program the counter for the desired number of blows. See **Programming the counter** page 3.
- Twist the red emergency stop button clockwise to start the tamping process.

To pause the tamping cycle, push the emergency stop button in. The tamping cycle will stop and the counter will hold the counts remaining. To resume the interrupted

cycle, twist the red emergency stop button clockwise and the tamping cycle will finish its program.

To stop the tamping cycle before the program is complete, push the emergency stop button in and press the *RESET* button on the counter. The counter will reset to the previous program and is now ready to begin the next cycle.

- The apparatus will automatically stop when the preset program is completed.

Park the tamping assembly when the scheduled number of drops have been accumulated and the tamping cycle has terminated.

Repeat with additional layers.

To start a new cycle—

To repeat the same program, press the *RESET* button. The counter will reset and the tamper will **immediately** start tamping.

Remove the mold. With the hammer parked, rotate the toggles parallel with the mold mount plate, lift the angle clamp straight up and set it aside. Remove the mold assembly from the tamper.

If performing a testing procedure where a struck-off mold is used to establish the volume of the sample, run an ice pick or small spatula around the inside of the collar inclined at an angle that will touch the top of the mold. A tapered undercut in the collar's neck provides access. This will allow the collar to be lifted off without breaking out soil from the compacted specimen.

Maintenance & Adjustments

Lubrication—

- **Shaft—operate dry!** Do *not* lubricate! Occasionally degrease the shaft with alcohol or naphtha. Whenever a high gloss develops on the shaft because of the polishing action of the released grabber, remove the gloss with steel wool or #400 wet-or-dry abrasive paper

using water for a cleaner/lubricant. Do *not* lubricate.

- **Gearhead motor** should have its gear case oil level checked once a year. A pipe plug in the gear housing defines the operating level. Add only S.A.E. 90 differential oil. The outboard bearing at the armature end should occasionally be given a few drops of light machine oil.
- **Guide disc.** Occasionally rub the contact edge of the guide disc with a dry anti-seize lubricant.
- **Flywheel bearing** is prepacked and factory sealed and requires no attention.

Height of drop adjustment. Prepare the tamper by performing the normal three quick change over procedures (if necessary) to select 12" or 18" drops, see **Quick change over** page 5.

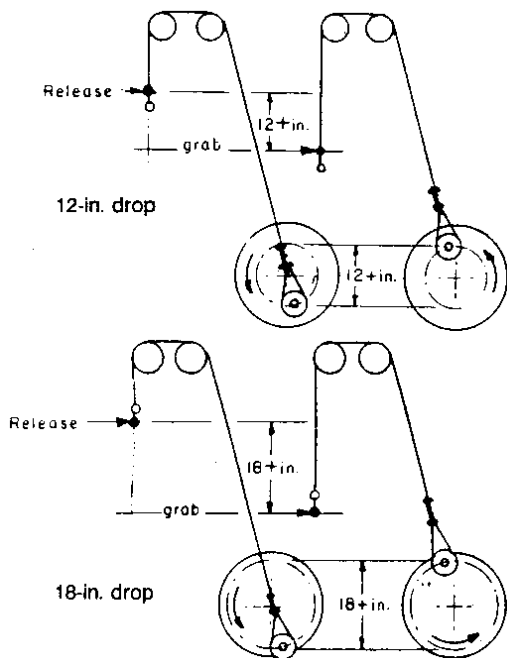


Figure 9

Determine the actual height of drop. Automatically tamp a typical soil specimen to near final density. Avoid *soil* substitutes because tamping head assembly bounce can be unrealistic. Stop the tamper. Place the tamping head on the specimen. Measure up from the top of the guide disc and pencil mark the required height of drop on a guide rod. Commence automatic tamping. Observe the maximum height of the guide disc in relation to the pencil mark and note *which direction* and *how much* correction is

required. Example: if the actual drop is 18-1/2", it must be *reduced* by 1/2".

Adjust cable travel. The height of drop is controlled *only* by cable travel. Hence, the flywheel cable pulley path diameter controls the height of drop.

The quick changer swing-adjusts the *radius* of the cable crank action. To reduce the cable travel, the quick-changer cable pulley is move *towards* the flywheel *axle* and or vice versa, see **Figure 5** on page 6 to change the diameter (cable travel) 1/2", the quick-changer cable pulley pivot is unclamped, moved *only* 1/4" (radius) measured from the rim of the flywheel and reclamped. (The memory stop screws may have to be backed off).

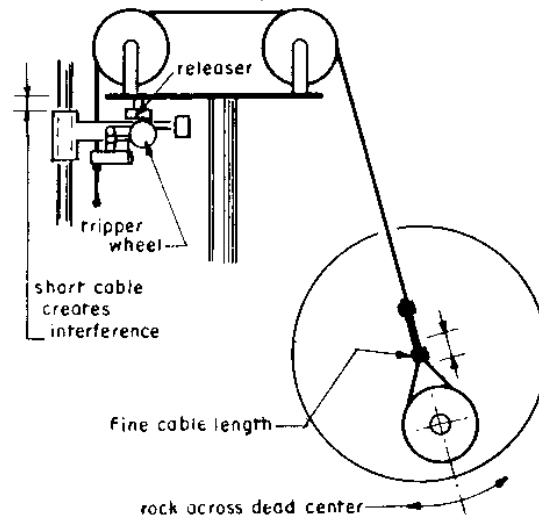


Figure 10

Cable length is critical and must be adjusted whenever—but only whenever—the height of drop is adjusted. The flywheel is oscillated across bottom dead center (approximately 5:00 o'clock see **Figure 10**) to lift the grabber to its maximum top position. The cable length is adjusted with the cable clamps at the flywheel end until a 1/2" gauge block just slides between the grabber tail boss and the releaser (-82) see **Figure 11** on page 10. The lower cable clamp is used for fine cable length adjustment.

- A *too short* (tight) cable causes the grabber to *slam* into the 662-700A Releaser Body and can break the BRG3003 Cam Follower bearing stem

(an all too popular—and unnecessary!—replacement item!)

- A *too long* (loose) cable will prevent the grabber from rising high enough to release.

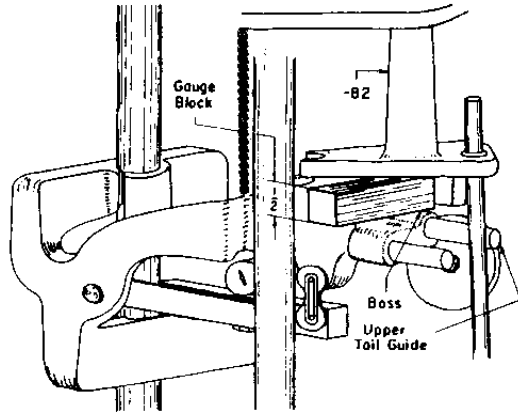


Figure 11

The cable length is changed the same distance—but in the *opposite* direction—as the quick-changer adjustment. Example: if the quick-changer is adjusted to $\frac{1}{2}$ " *smaller* radius, the cable length must be *increased* $\frac{1}{2}$ " to restore the correct grabber release position. Readjust the engager, see **Engager adjustment** page 6.

Force calibration, after repeating a variety of in house tests and reviewing the accumulated feedback from our customers, Rainhart has discontinued factory calibration by lead deformation of our series 662 Automatic Tampers. We will continue to catalog the apparatus.

We have proved that calibration is meaningless unless performed in the setup in which it is to be used. The principal variation is how and on what the tamper is mounted, see page 2.

Several laboratories have reported that by removing the aluminum 662-200 Feet and bedding in grout on a concrete pedestal, they have been able to discard our factory installed calibration surcharge weights. Many laboratories purchase the tamping equipment and the lead deformation apparatus and take it from there.

The mold mount plate, supported on three points, will also attenuate some of the impact. Grouting between the mold mount and bed plates with epoxy will bring the

pedestal into full play. Wax paper will prevent adhesion permitting removal. This grout should be kept well back from the edges so that the angle clamp's toggles will pass under the plate.

Grabber operation

As the released tamping assembly free falls, the released grabber is lowered by the flywheel controlled cable at a slightly slower rate than the acceleration of gravity and then is smoothly decelerated as it approaches bottom dead center.

Nearing the bottom, the bumper wheel is flipped into the engaged position. The weight and inertia of the grabber is multiplied by the 662-1300-02 Lever and this clamping force is again increased with the additional weight of the tamping assembly.

As the ascending grabber nears the top of the lift, the bumper wheel contacts the 662-700A Releaser and flips the 662-1300A tripper arm to open the grabber, disengaging the tamping assembly.

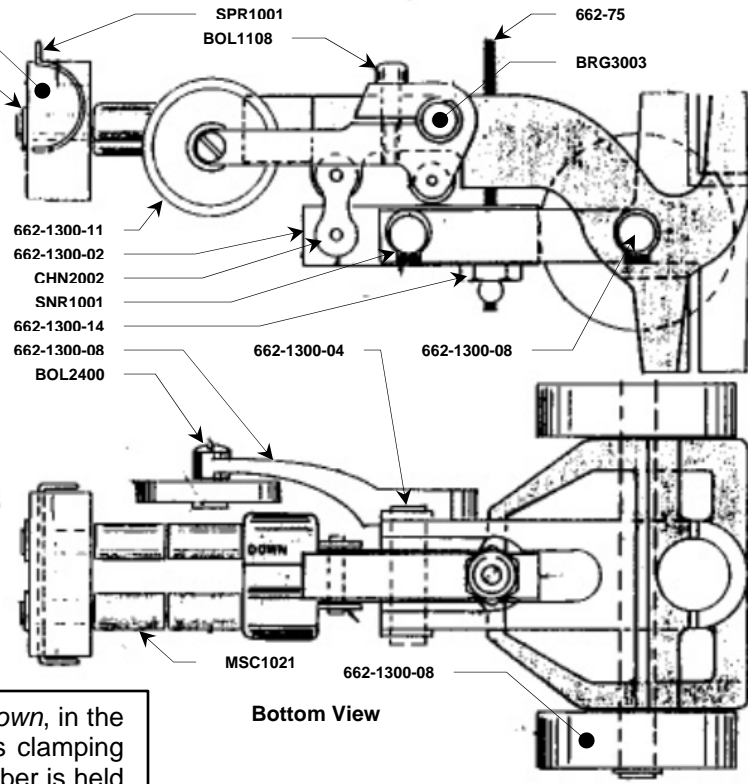
The smooth acceleration afforded by the flywheel handle/pulley crossing dead center at both engaging and releasing positions minimizes shock and abuse and allows the speed of operation to be approximately 60 drops per minute.

Description. A pair of scissor action 662-1300-01 Jaws, which fit the 662-1200A shaft, are pivoted together with 662-1300-23 Pivot Pin. The jaws are interrupted with annular trash collecting grooves. When their extended "handles" are forced together, the jaws grip the shaft. The 662-1300-02 Lever is supported at its outer end with a 662-1300-06 Connecting Link from the upper "handle" and its center is hinged with a 662-1300-04 Pivot Pin to the lower "handle". The 662-75 actuating cable is attached to the inner end of this lever and the closing force exerted by the upward pull of the cable is multiplied by this lever and again by the scissor action jaws.

- When the 662-1300-11 Bumper Wheel is *up*, the grabber is free to grip the shaft and the lift of the cable will clamp the jaws.

662-1300 Grabber

662-1300	Grabber complete	
662-1300-01	Grabber body.....	1
662-1300-02	Lever.....	1
662-1300-04	Pivot pin (short)	1
662-1300-08	Tripper arm.....	1
662-1300-11	Bumper wheel.....	1
662-1300-12	Flange nut.....	1
662-1300-14	Cable quick disconnect.....	1
622-1300-15	Tail guide rods.....	2
662-1300-16	Counterweight discs	2
662-1300-17	Counterweight halves (tail).....	2
662-1300-23	Pivot pin (long).....	1
MSC1021	Bronze bushings.....	4
SPR1001	Bail spring.....	1
SNR1001	3/8 External snap ring.....	4
SNR3000	1/4 e-clip.....	2
CHN2002	#50 Connecting link.....	1
BRG3003	Cam follower.....	2
BOL1108	10-32 x 7/8 SH cap screw	1
BOL2400	10-32 X 1/2 Binder head screw	1



- When the Bumper Wheel is *down*, in the position illustrated, the lever's clamping action is blocked and the grabber is held in the open or release position.

Replacement of the grabber is necessary when the cable end of the 662-1300-02 Lever strikes the grabber body during lifting, preventing proper jaw closing and clamping. Rainhart can often relieve this area and recondition the jaws.

Malfunction in a system which is otherwise properly adjusted requires off machine repair.

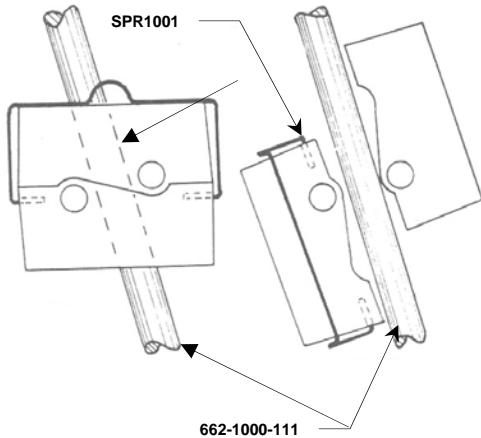


Figure 12

To remove the grabber, park the tamping assembly on the catcher arm. Remove the angle clamp and mold assembly from the mold mount plate. Disconnect the cable from the grabber. Open the 662-1300-17

Counterweight halves by unsnapping the SPR1001 bail spring to provide an escape for the -111 spacer rod.

The shaft length just allows its top end to escape the 662-1200-184 Upper Guide Bushing and the frame's top plate when the tamping face rests on the mold mount plate. Cock the tamping assembly to allow the shaft's guide disc to escape from the guide rod cage. (The mold's base plate and the first lift of soil keep the shaft captive when tamping).

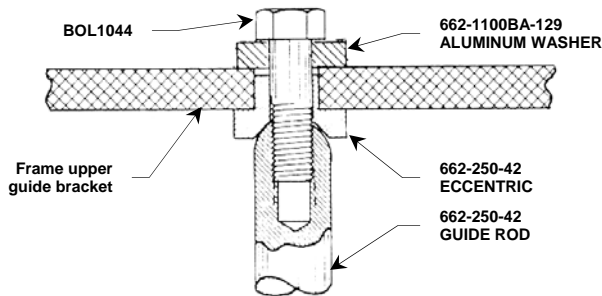
Various styles of tamping heads can be quickly interchanged at only the minor expense of fitting each with its own permanent shaft.

Note: if desired, the shaft can be kept captive when resting on the mold mount plate by remounting the 662-1200-184 Upper Guide Bushing on the *underside* of the frame's top plate using three oversize nuts for standoffs.

Oil is a NO—NO! Degrease both the grabber jaws and the shaft. Use *fresh* solvent: alcohol, methyl ethyl ketone, contact cleaner in the handy spray can, etc. Be sure that the solvent is *not* contaminated! Wipe with a clean rag or paper towel.

Trash. Check the annular trash grooves in the jaws, clean and degrease. Build up is a symptom of an oily or sticky condition which should be immediately corrected.

Grabber disassembly. A locally procurable pair of special pliers such as Truarc #2 or #22 Industrial #102 or equivalent (generally found at a bearing supply house or auto parts store) will facilitate removing the SNR1001 retaining rings to remove the two main pivot pins. Remove the link and the lever. The jaws are separated for cleaning. Clean tend shuffle the MSC1021 Bronze Bushings to expose new surfaces to wear. Clean thoroughly. Reassemble in the reverse order and operate completely dry!



Guide rod clearance. The guide rods are adjusted to approximately 0.016" total clearance with the -182 Guide Disc.

- If the clearance is too low, the shaft assembly will bind and can absorb some of the impact of the dropping tamping assembly.
- If the clearance is too high, there can be chattering and the danger of striking the mold is increased.

Upper end adjustment. Remove the tamping head and the grabber and reinstall the shaft with guide disc. Adjust only one rod at a time. Loosen the cap screw slightly and rotate the 662-250-42 Eccentric with a 3/4" open end wrench engaged on the square portion immediately below the upper guide rod bracket.

Rotate the rod to provide a fresh wearing surface. Set the clearance between the rod and guide disc with a 0.008" feeler gauge (available from any auto parts store).

Lower end adjustment. Work with only one rod at a time. Loosen both cap screw and swing the guide rod plates in or out as required to establish 0.008" clearance per side.

With the hammer and grabber still removed, toss the guide disc up to the top of the cage and let it free fall, catching it near the bottom of the guide rod cage to check for freedom from friction or chatter.

Rainhart Cat. No. 662BGK Belt Guard

Instructions:

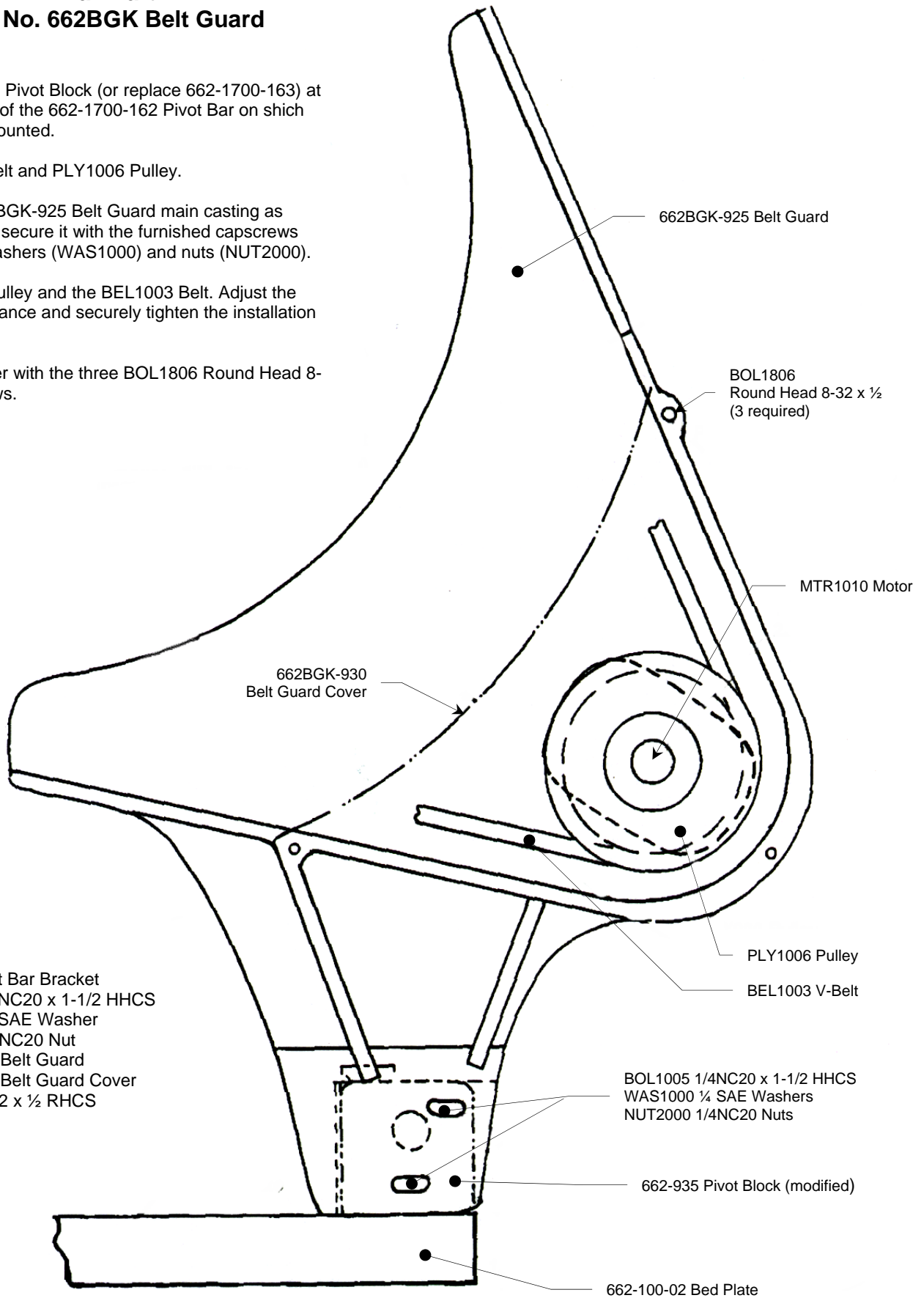
Install 662-935 Pivot Block (or replace 662-1700-163) at the pulley end of the 662-1700-162 Pivot Bar on which the motor is mounted.

Remove the belt and PLY1006 Pulley.

Install the 662BGK-925 Belt Guard main casting as shown. Lightly secure it with the furnished capscrews (BOL1005), washers (WAS1000) and nuts (NUT2000).

Reinstall the pulley and the BEL1003 Belt. Adjust the guard for clearance and securely tighten the installation capscrews.

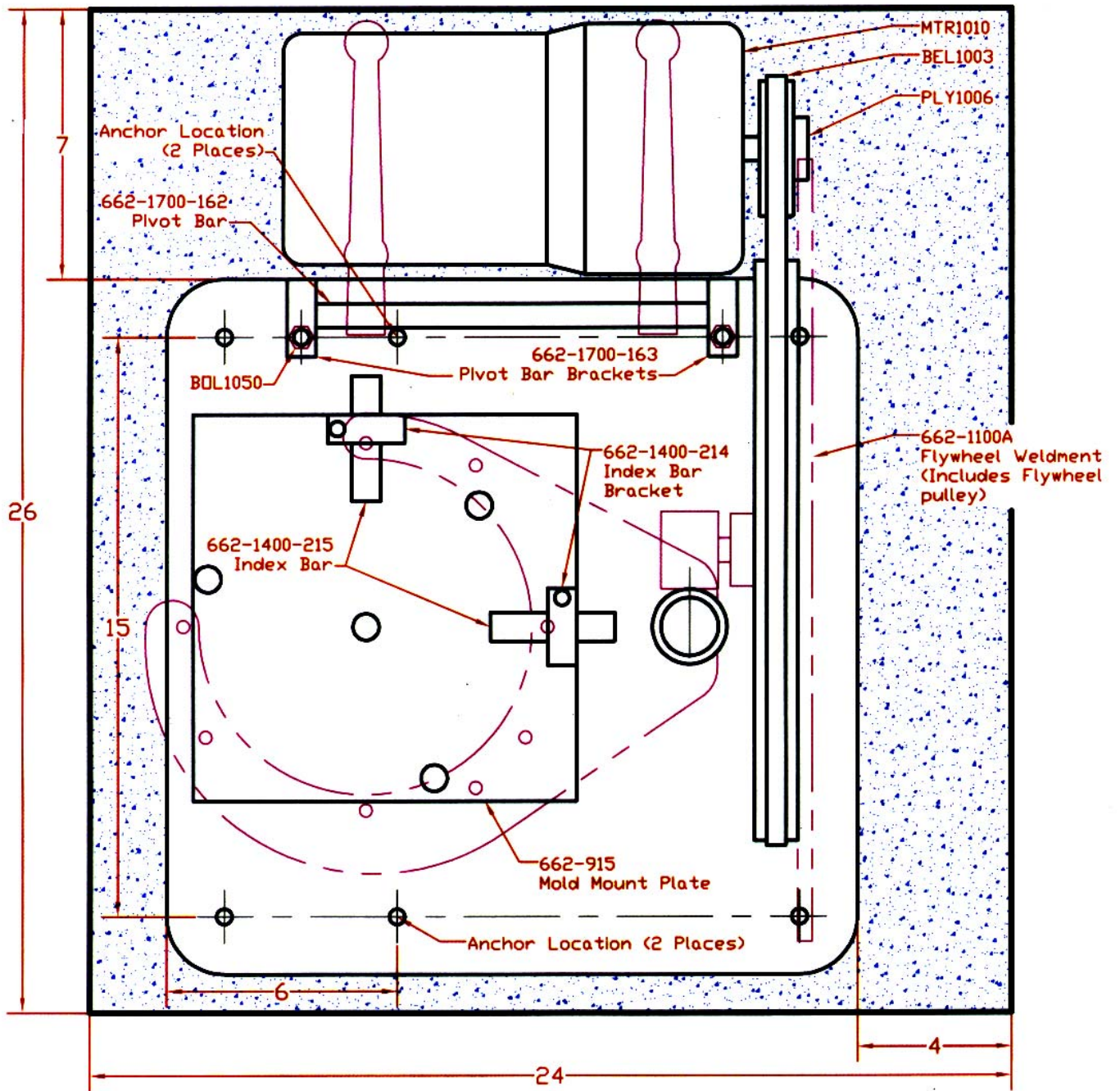
Install the cover with the three BOL1806 Round Head 8-32 x 1/2 screws.



Kit consists of:

- 1 ea. 662-935 Pivot Bar Bracket
- 2 ea. BOL1005 1/4NC20 x 1-1/2 HHCS
- 2 ea. WAS1000 1/4 SAE Washer
- 2 ea. NUT2000 1/4NC20 Nut
- 1 ea. 662BGK-925 Belt Guard
- 1 ea. 662BGK-930 Belt Guard Cover
- 3 ea. BOL1806 8-32 x 1/2 RHCS

- BOL1005 1/4NC20 x 1-1/2 HHCS
- WAS1000 1/4 SAE Washers
- NUT2000 1/4NC20 Nuts



Minimum Area Needed for Installation

Pt#	Description	qty
662-100	Frame Weldment.....	1
662-200	Foot Assemblies.....	4
662-200-11	Foot Body.....	4
MSC2000	Stem Bumper.....	4
BOL1045	3/8NF24 X 1-1/2 HH Cap Screw.....	4
WAS1001	3/8 SAW Washer.....	4
662-300	Mold Mount Anchor Assemblies.....	3
662-300-21	Modified Cap Screw.....	3
NUT1006	5/8NF18 Nut.....	3
662-600	Catcher Arm Assembly.....	1
662-600-34	Catcher Arm Weldment.....	1
HSE1007	Vinyl Tube.....	8"
NUT2007	5/8NF18 Lock Nut.....	1
662-250-40	Guide Rod Assembly.....	4
662-250-42	Eccentric (Square Shoulder).....	4
662-250-43	Guide Rod.....	4
662-250-44	Adjustment Plates.....	4
662-1100BA-129	Aluminum Washer.....	4
BOL1042	3/8NF24 x 1 HH Cap Screw.....	3
BOL1044	3/8NF24 x 1-1/4 HH Cap Screw.....	4
BOL1045	3/8NF24 x 1-1/2 HH Cap Screw.....	1
BOL1045.7	3/8NF24 x 1-3/4 HH Cap Screw.....	1
NUT2003	3/8NF24 Lock Nut.....	2
WAS1001	3/8 SAE Washer.....	4
662-400	Horizontal Pulley Assembly.....	1
662-400-61	Pulley Guard.....	2 of 6
662-400-63	Pulley Bracket.....	1
PLY1005	Pulley.....	1 of 4
BOL1028	3/8NC16 x 1-1/4 HH Cap Screw.....	2
BOL1030	3/8NC16 x 1-3/4 HH Cap Screw.....	1
WAS1001	3/8 SAE Washer.....	4
662-500	Vertical Pulley Assembly.....	2
662-400-61	Pulley Guard.....	4 of 6
662-500-71	Pulley Post.....	2
662-500-900	Spacer (modified nut).....	2
PLY1005	Pulley.....	2 of 4
BOL1028	3/8NC16 x 1-1/4 HH Cap Screw.....	1
BOL1048	3/8NF24 x 2-1/2 HH Cap Screw.....	1
NUT2003	3/8NF24 Lock Nut.....	1
WAS1001	3/8 SAE Washer.....	3
662-700	Releaser Assembly.....	1
662-700A	Releaser Body.....	1
MSC1080	Rubber Grommet.....	1
BOL1027	3/8NC16 x 1 HH Cap Screw.....	1
WAS1001	3/8 SAE Washer.....	1
662-800	Engager Assembly.....	1
662-800-19	Hand Knob.....	1
662-800-92	Clamp Screw.....	1
662-800-93	Locking Sleeve.....	1 of 3
662-800-97	Engager Body.....	1
662-900	Spacer Bar Assembly.....	1
662-900-101	Spacer Bar.....	1
HSE1007	Vinyl Tube.....	4"
NUT1007	5/8NF18 Nut.....	2
662-1000	Spacer Rod Assembly.....	1
662-1000-111	Spacer Rod.....	1
662-1000-112	Spacer Clamp Block.....	1
662-1000-95	Hand Nut (3/8NF24).....	1
662-800-93	Locking Sleeve.....	2 of 3
662-1100	Flywheel Assembly.....	1
662-1100A	Flywheel Weldment.....	1
	(Includes Flywheel, Hub and Pulley)	
BRG4000	Flywheel Bearing.....	1
662-1100BA-125	Flywheel Handle.....	1
662-1100BA-126	Spacer for Flywheel Handle.....	1
BOL1815	3/8NC16 x 3-1/2 RSH Cap Screw.....	1
NUT2002	3/8NC16 Lock Nut.....	1
PLY1005	Pulley.....	1
662-1100B	Cable Quickchanger Assembly.....	1

Pt#	Description	qty
662-1100B-127	Cable Quickchanger Body.....	1
662-1100BA-129	Aluminum Washer.....	1
BOL1809	8-32 x 1 Round Slotted MS.....	2
NUT1011	8-32 Nut.....	2
662-1700	Electric Motor Drive Assembly.....	1
662-1700-161	Motor Mount Bracket.....	1
662-1700-162	Motor Pivot Bar.....	1
662-1700-163	Pivot Bar Bracket.....	2
BEL1003	V-Belt.....	1
BOL1004	1/4NC20 x 1-1/4 HH Cap Screw.....	2
BOL1006	1/4NC20 x 1-3/4 HH Cap Screw.....	2
BOL1037	3/8NC16 x 3-1/2 HH Cap Screw.....	2
COL1004	5/8 Collar.....	2
ELC1000	Chord Set.....	1
MTR1010	Gear Head Motor.....	1
NUT2000	1/4NC20 Lock Nut.....	4
NUT2002	3/8NC16 Lock Nut.....	2
PLY1006	Motor Pulley.....	1
WAS1000	1/4 SAE Washer.....	8
WAS1001	3/8 SAE Washer.....	2
662-1650	Digital Programming Counter.....	1
662-1650-600	Digital Counter Enclosure.....	1
662-1650-610	Enclosure Front Panel.....	1
662-1650-615	Retroreflective Tape.....	1
662-1650A	Digital Counter Mounting Bracket.....	1
BOL1002	1/4NC20 x 3/4 HH Cap Screw.....	3
ELC1084	Socket for Relay (ELC1109).....	1
ELC1085	Retaining Clip for Relay (ELC1084).....	2
ELC1106	Solid State Relay.....	1
ELC1109	Ice Cube Relay.....	1
ELC1806	Receptacle (Motor Socket).....	1
NUT5015	1/4NC20 Cap Nut.....	3
WAS1000	1/4 SAE Washer.....	3
ELC1224	Sensor.....	1
ELC1039	Digital Counter.....	1
ELC1003	Anchor for Chord.....	2
ELC1000	Wiring Chord Set.....	1
ELC1225	E-Stop Button.....	1
BOL1805	8-32 x 3/8 RSH Machine Screw.....	2
ELC1206	Momentary Push Button Switch.....	1
662-1200	Shaft Assembly Kit.....	1
662-1200-182	Guide Disc.....	1
662-1200A	Shaft Weldment.....	1
NUT5000	Conduit Nut.....	1
662-1200-184	Upper Guide Bushing.....	1
BOL1017	1/4NF28 x 1/2 HH Cap Screw.....	3
662CK	Cable Kit.....	opt.
662-75	Cable.....	3
CBL1011	Cable Clamp.....	3
662MMPK	Mold Mount Plate Kit.....	1
662-915	Mold Mount Plate.....	1
BOL1132	3/8NF24 x 1 SH Cap Screw.....	3
665MMFK	Mold Mount Fixtures.....	1
662-1400	Index Bar Assembly.....	2
662-1400-214	Index Bar Bracket.....	2
662-1400-215	Index Bar.....	2
BOL1028	3/8NC16 x 1-1/4 HH Cap Screw.....	3
662-1500	Angle Clamp Assembly.....	1
662-1500-221	Angle Clamp.....	1
662-1500-223	3/8 Toggle.....	2
BOL1034	3/8NC16 x 2-1/4 HH Cap Screw.....	2
BOL1814	3/8NC16 x 2-1/2 RSH Cap Screw.....	2
NUT1002	3/8NC16 Nut.....	2
SPR1002	Spring.....	2
WAS1001	3/8 SAE Washer.....	4
662MF	Mold Mount Fixtures, Special.....	opt.
662BG	Belt Guard.....	opt.
662-1300	Grabber (for individual parts list see diagram on page 10)	

COMPACTION SETS

(all provide both 12 & 18-14. drops)

5.5-LB RAMMER

(ASTM DESIGNATION: D698, AASHO
DESIGNATION: T99)

CAT. NO. 662S1 COMPACTING SET—662EP Automatic Tamper; 665-4-MK Mold Assembly (Old # 665M4S), 4 in. ID x 1/30 cu. Ft.; and 662-TMP-4C Tamping Head (Old # 662H4C), circular face. Approx. Ship. Wt.-320 lbs.

CAT. NO. 662S3 COMPACTING SET—662EP Automatic Tamper; 665-4-MK Mold Assembly (Old # 665M4S), 4 in. ID x 1/30 cu. ft.; and 662-TMP-4S Tamping Head (Old # 662H4S), sector face. Approx. Ship. Wt. 320 lbs.

CAT. NO. 662S5 COMPACTING SET—662EP Automatic Tamper; 665-6-MK Mold Assembly (Old # 665M6S), 6 in. ID x 1/13.333 cu. ft.; and 662-TMP-6S Tamping Head (Old # 662H6S), sector face. Approx. Ship. Wt.-325 lbs.

(Bureau of Reclamation Designation E-11)

CAT. NO. 662S15 COMPACTING SET—662EP Automatic Tamper; 662S4TBR Specimen Mold, 4.131/4.431 in. tapered ID x 1/20 cu. ft.; 662C4 Mold Collar; 662MF instead of 665MF2 Mold Mount Fixtures; 662-TMP-4C Tamping Head (Old # 662H4C), circular face; extra 662-1300 Grabber (Old # 662G3); and Designation E-37 Calibration not more than five days before shipment. Approx. Ship. Wt.-325 lbs.

10-LB RAMMER (Also 5.5 LB. when Supplemental Weight is not used)

(ASTM Designations: D1557 & D698, AASHO
Designation: T180 & T99)

CAT. NO. 662S7 COMPACTING SET—662EP Automatic Tamper; 665-4-MK Mold Assembly (Old # 665M4S), 4 in. ID x 1/30 cu. ft.; 662-TMP-4C Tamping Head (Old # 662H4C), circular face; and 662-TMP-SW Supplemental 4.5 lb. Tamping Weight (Old # 662HSW). Approx. Ship. Wt.-325 lbs.

CAT. NO. 662S9 COMPACTING SET—662EP Automatic Tamper; 665-4-MK Mold Assembly (Old # 665M4S), 4 in. ID x 1/30 cu. ft.; 662-TMP-4S Tamping Head (Old # 662H4S), sector face; and 662-TMP-SW Supplemental 4.5 lb. Tamping Weight. (Old # 662HSW) Approx. Ship. Wt.-325 lbs.

CAT. NO. 662S11 COMPACTING SET—662EP Automatic Tamper; 665-6-MK Mold Assembly (Old # 665M6S), 6 in. ID x 1/13.333 cu. ft.; 662-TMP-6S Tamping Head (Old # 662H6S), sector face; and 662-TMP-SW Supplemental 4.5 lb. Tamping Weight (Old # 662HSW). Approx Ship. Wt.-330 lbs.

All combinations of ASTM Tests

CAT. NO. 662S13 COMPACTING SET—662EP Automatic Tamper; 665-4-MK Mold Assembly (Old # 665M4S), 4 in. ID x 1/30 cu. ft.; 665-6-MK Mold Assembly (Old # 665M6S), 6 in. ID x 1/13.33 cu. ft.; 662-TMP-4C Tamping Head (Old # 662H4C), circular

face; 662-TMP-4S Tamping Head (Old # 662H4S), sector face; 662-TMP-6S Tamping Head (Old # 662H6S), sector face; and 662-TMP-SW Supplemental 4.5 lb. Tamping Weight (Old # 662HSW). Approx. Ship. Wt.-340 lbs.

(Test Method Tex-113-E)

CAT. NO. 662S17 COMPACTING SET—662EP Automatic Tamper; 665-6X8.5-MK Mold Assembly (Old # 665S6S81/2), 6 in. ID x 8 ½ in. high; 662-TMP-6S Tamping Head (Old # 662H6S), sector face; and 662-TMP-SW Supplemental 4.5 lb. Tamping Weight (Old # 662HSW). Approx. Ship. Wt.-330 lbs.

OTHER COMPACTING SETS—With variations, eg. different molds, manual distribution of blows, etc. Quoted upon request giving pertinent data.

OTHER AUTOMATIC TAMPERS

CAT. NO. 662E AUTOMATIC TAMPER—A 662EP Automatic Tamper less 662-1650 Digital Counter. It does not turn itself off after the final blow in the series. Approx. Ship. Wt. 285 lbs.

CAT. NO. 662 AUTOMATIC TAMPER—A 662EP Automatic Tamper less 662-1650 Digital Counter and 662-1700 Electric Motor Drive Assembly. The flywheel is manually rotated. Approx. Ship. Wt.-235 lbs.

TAMPING COMPONENTS



CAT. NO. 662-TMP-4C TAMPING HEAD—Machined 2 in. dia. (pi sq. in.) face for use only with 4 in. ID molds. Attaches to tamping shaft of Automatic Tamper to form 5.5 lb. rammer. Ductile Iron. Approx. Ship. Wt.-4 lbs.



CAT. NO. 662-TMP-4S TAMPING HEAD—Machined pi sq. in. sector face for use only with 4 in. ID molds. Attaches to tamping shaft of Automatic Tamper to form 5.5 lb. rammer. Ductile Iron. Approx. Ship. Wt.-4 lbs.



CAT. NO. 662-TMP-SW SUPPLEMENTAL 4.5 LB. TAMPING WEIGHT—Attaches to above Tamping Heads to form 10.0 lb. rammer. Ductile Iron. With BOL1056 Capscrew. Approx. Ship. Wt.-5 lbs.



CAT. NO. 662-TMP-6S TAMPING HEAD—Machined pi sq. in. sector face for use only with 6 in. ID molds. Attaches to tamping shaft of Automatic Tamper to form 5.5 lb. rammer. Ductile Iron. Approx. Ship. Wt.-4 lbs.



(Test Method Tex-113-E)
CAT. NO. 662FT FINISHING TOOL—Special 5-15/16 in. circular plate with stem for hammering and smooth bottom for finishing compacted specimen. Approx. Ship Wt.-12 lbs.



CAT. NO. 662-TMP-6D DOUBLE SECTOR FACE TAMPING HEAD—Two symmetrical sector faces each pi sq. in. (Test Method Tex-113-E) for use only with 6 in. ID molds. Attaches to tamping shaft of Automatic Tamper to form 10.0 lb. rammer. Machined ductile iron. 6 in. sponge rubber pad included. Approx. Ship. Wt.-9 lbs.

SERIES 665 MOLD ASSEMBLIES



These quality Mold Assemblies can expedite compactions. They are ideal with Automatic Tampers or Series 670 Manual Compaction Hammers. Their unique features permit easier, quicker and more secure assembling or disassembling, greatly facilitate insertions of loose materials and significantly speed up sample extractions. When the funnel-collar is removed, the upper 1/8 in. of the mold is exposed, and there are no interfering obstructions during sample top finishing operations. The mold base is 3/8 in. steel plate for high rigidity and has a machined 1/16 in. deep mold recess. Two all-thread studs about 1/8 in. shorter than the mold are locked to the mold base. All molds are machined from very high quality seamless steel tubing for dimensional stability and have exceptionally smooth and concentric interior surfaces to expedite sample extractions. Samples are even more easily extracted from tapering diameter molds. All molds can be used with either end up. The mold is secured by rotating the clamp-ring until two of its slots engage with the upright studs and then tightening two wing nuts. The 2-1/2 in. high funnel-collar with two all-thread studs is secured by rotating it until the studs engage with the remaining clamp-ring slots and then tightening two wing nuts. When so installed, it provides 3/4 in. of straight wall above the mold top. The funnel-collar and mold are removed by reverse procedures. The hold down ring has handles for the operator's convenience. All parts are Aluminum alloy or Zinc plated.

Straight Mold Kits

(ASTM Designations: D698 and D1557, AASHTO Designations: T99 and T180)

CAT. NO. 665-4-MK MOLD ASSEMBLY—
(Old Pt # 665M4S) Approx. Ship. Wt.-14 lbs.
Includes:

- 665-MLD-4S Mold (4" ID x 1/30 cu. ft.)
- 665-BAS-4 Base Plate
- 665-HDR-H4 Hold Down Ring
- Fastening hardware.

CAT. NO. 665-4-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR—

(Old Pt # 665M4S) Approx. Ship. Wt.-16 lbs.

Includes:

- 665-MLD-4S Mold (4" ID x 1/30 cu. ft.)
- 665-BAS-4 Base Plate
- 665-HDR-H4 Hold Down Ring
- 665-COL-C4F-001 Funnel Collar
- Fastening hardware.

CAT. NO. 665-6-MK MOLD ASSEMBLY—

(Old Pt # 665M6S) Approx. Ship. Wt.-16 lbs.

Includes:

- 665-MLD-6S Mold (6" ID x 1/13.333 cu. ft.)
- 665-BAS-6 Base Plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware.

CAT. NO. 665-6-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR—

(Old Pt # 665M6S) Approx. Ship. Wt.-18 lbs.

Includes:

- 665-MLD-6S Mold (6" ID x 1/13.333 cu. ft.)
- 665-BAS-6 Base Plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware.

CAT. NO. 665-4X6-MK MOLD ASSEMBLY (TEXAS)—

Approx. Ship. Wt.-14 lbs.

Includes:

- 665-MLD-4S6 Mold (4" ID x 6" Tall 1/23 cu. ft.)
- 665-BAS-4 Base Plate
- 665-HDR-H4 Hold Down Ring
- Fastening hardware.

CAT. NO. 665-4X6-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR (TEXAS)—

Approx. Ship. Wt.-16 lbs.

Includes:

- 665-MLD-4S6 Mold (4" ID x 6" Tall 1/23 cu. ft.)
- 665-BAS-4 Base Plate
- 665-HDR-H4 Hold Down Ring
- 665-COL-C4F-001 Funnel Collar
- Fastening hardware.

CAT. NO. 665-6X6-MK MOLD ASSEMBLY —

Approx. Ship. Wt.-18 lbs.

Includes:

- 665-MLD-6S6 Florida LBR Mold (6" ID x 6" Tall .098 cu. ft.)
- 665-BAS-PER Perforated Base Plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware.

CAT. NO. 665-6X6-FMK MOLD ASSEMBLY WITH COLLAR —

Approx. Ship. Wt.-20 lbs.

Includes:

- 665-MLD-6S6 Florida LBR Mold (6" ID x 6" Tall .098 cu. ft.)
- 665-BAS-PER Perforated Base Plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware.

CAT. NO. 665-6X6-MK MOLD ASSEMBLY—

Approx. Ship. Wt.-19 lbs.

Includes:

- 665-MLD-6S6 Florida LBR Mold (6" ID x 6" Tall 1/10 cu. ft.)
- 665-BAS-PER Perforated Base Plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware.

CAT. NO. 665-6X6-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR—

Approx. Ship. Wt.-21 lbs.

Includes:

- 665-MLD-6S6 Florida LBR Mold (6" ID x 6" Tall 1/10 cu. ft.)
- 665-BAS-PER Perforated Base Plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware.

CAT. NO. 665-6X8.5-MK MOLD ASSEMBLY—

Approx. Ship. Wt.-24 lbs

- 665-MLD-6S8.5 Mold (6 in. avg. ID x 8 ½ in. high .139 cu. ft.)
- 665-BAS-6 Base plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware

CAT. NO. 665-6X8.5-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR—

Approx. Ship. Wt.-26 lbs

- 665-MLD-6S8.5 Mold (6 in. avg. ID x 8 ½ in. high .139 cu. ft.)
- 665-BAS-6 Base plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware

CAT. NO. 665-6X6.111-MK MOLD ASSEMBLY—

Approx. Ship. Wt.-18 lbs.

- 665-MLD-6S6.111 Mold (6 in. avg. ID x 6.111 in high 1/10 cu. ft.)
- 665-BAS-6 Base Plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware

CAT. NO. 665-6X6.111-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR—

Approx. Ship. Wt.-20 lbs.

- 665-MLD-6S6.111 Mold (6 in. avg. ID x 6.111 in high 1/10 cu. ft.)
- 665-BAS-6 Base Plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware

CAT. NO. 665-6X7-MK MOLD ASSEMBLY—

Approx. Ship. Wt.-19 lbs.

- 665-MLD-6S7 CBR Mold (6 in. avg. ID x 7 in high .115 cu. ft.)
- 665-BAS-PER Perforated Base Plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware

CAT. NO. 665-6X7-FMK MOLD ASSEMBLY WITH COLLAR—

Approx. Ship. Wt.-21 lbs.

- 665-MLD-6S7 CBR Mold (6 in. avg. ID x 7 in high .115 cu. ft.)
- 665-BAS-PER Perforated Base Plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware

Tapered Mold Kits (1/8-in. per ft.)

CAT. NO. 665-4T-MK MOLD ASSEMBLY —

(Old Pt #665M4T) Approx. Ship. Wt.-12 lbs.

Includes:

- 665-MLD-4T Mold (4 in. avg. ID x 1/30 cu. ft.)
- 665-BAS-4 Base Plate
- 665-HDR-H4 Hold Down Ring
- Fastening hardware

CAT. NO. 665-4T-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR —

(Old Pt #665M4T) Approx. Ship. Wt.-14 lbs.

Includes:

- 665-MLD-4T Mold (4 in. avg. ID x 1/30 cu. ft.)
- 665-BAS-4 Base Plate
- 665-HDR-H4 Hold Down Ring
- 665-COL-C4F-001 Funnel Collar
- Fastening hardware

CAT. NO. 665-6T-MK MOLD ASSEMBLY —

(Old Pt #665M6T) Approx. Ship. Wt.-16 lbs.

Includes:

- 665-MLD-6T Mold (6 in. avg. ID x 1/13.333 cu. ft.)
- 665-BAS-6 Base Plate
- 665-HDR-H6 Hold Down Ring
- Fastening hardware

CAT. NO. 665-6T-FMK MOLD ASSEMBLY WITH FUNNEL COLLAR —

(Old Pt #665M6T) Approx. Ship. Wt.-18 lbs.

Includes:

- 665-MLD-6T Mold (6 in. avg. ID x 1/13.333 cu. ft.)
- 665-BAS-6 Base Plate
- 665-HDR-H6 Hold Down Ring
- 665-COL-C6F-001 Funnel Collar
- Fastening hardware

OTHER MOLD ASSEMBLIES—quoted upon request giving pertinent data.

CAT. NO. 665MMFK MOLD MOUNT FIXTURES—

Attached to 662-MP Mold Mount Plate, they index and hold Series 665 Mold Assemblies or virtually any others except our Series 662 Specimen Molds. (Standard part of Automatic Tampers) Approx. Ship. Wt.-2 lbs.

OTHER TAMPER PRODUCTS

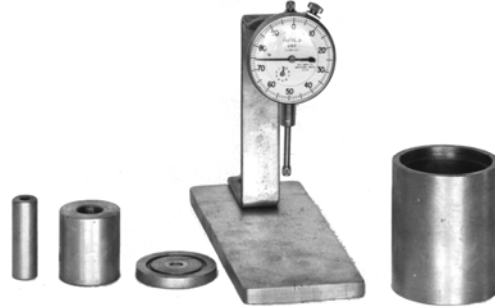
CAT. NO. 662-1700 ELECTRIC MOTOR DRIVE ASSEMBLY—For any 662 Automatic Tamper. This labor saver produces better compactions and lengthens tamper service life through smoother operation. Complete with Instructions, 1/3 HP/115V/60C/1PH gear head motor, drive attachments, mounting fixtures and all hardware. Please specify flywheel hub diameter when ordering. Approx. Ship. Wt. -50 lbs.



CAT. NO. 662-1650 PROGRAMMING COUNTER—Liberates operator for other duties during actual compacting and reduces compaction costs. Desired number of blows for series is easily preset in counter. Series is started each time reset button is pressed. Compaction is automatically stopped after last blow. A built-in manual switch permits interruption without altering total blows for series and provides a safety shut-off between series. Works on any electrically driven Automatic Tamper. Standard 3-prong single-phase (grounded) counter cord plugs into laboratory power supply; 3-prong (grounded) receptacle accommodates tamper motor or other apparatus. If other than normal 3-prong (USA) type electric fitting or a different voltage is required, please request quotation. Complete with instructions and all necessary installation parts. Approx. Ship. Wt. 8 lbs.

SERIES 660 CALIBRATION APPARATUS

For calibrating mechanical laboratory soil compactors (Bureau of Reclamation Designation: E-37, ASTM Designation: D2168).



CAT. NO. 660LD LEAD DEFORMATION SET—Consists of anvil, guide collar, striking pin, guide sleeve pedestal, 660LC Lead Alloy cores and 660CW2 Calibration Weights. Approx. Ship. Wt. – 20 lbs.

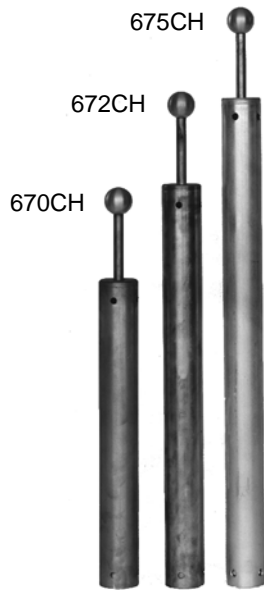
CAT. NO. 660DC DIAL COMPARATOR—Cadmium plated steel stand and dial indicator of 1 in. travel with 0.001 in. graduations. Approx. Ship. Wt. – 5 lbs.

(Not Illustrated)

CAT. NO. 660LC LEAD ALLOY CORES, BAG/500—Lead cylinders specified for deformation. Approx. Ship. Wt. – 11 lbs.

CAT. NO. 660-10 CALIBRATION WEIGHTS—Cadmium plated weights and capscrews for attaching to Tamping Heads (see Tamping Components). Enough for one 10 lb. rammer or two 5.5 lb. rammers. Approx Ship. Wt. – 2 lbs.

MANUAL COMPACTION



One of these Compaction Hammers with Series 665 Mold Assemblies or Series 662 Molds and accessories makes an ideal manual compaction outfit. 1/8 in. thick guide sleeves minimize the dangers of dents and resulting restricted falls. Then vented guidesleeve, 2 in. dia. Hardened head and 1/2 in. shaft are Cadmium plated steel. When the hammer is bottomed, the Aluminum hand knob on the shaft is 4 in. above the guide sleeve.

CAT. NO. 670CH COMPACTION HAMMER—5.5 lb. rammer with 12 in. drop in determining moisture-density relations of soils (ASTM Designation: D698). Approx. Ship. Wt. – 10 lbs.

CAT. NO. 672CH COMPACTION HAMMER—5.5 lb. tamper with 18 in. drop for Proctor Compaction Test (Bureau of Reclamation Designation E-11). Approx. Ship. Wt. – 11 lbs.

CAT. NO. 675CH COMPACTION HAMMER—10 lb. rammer with 18 in. drop in determining moisture-density relations of soils (ASTM Designation: D1557, AASHTO Designation: T180). Approx. Ship. Wt. – 16 lbs.

CAT. NO. 665SP SWELL PLATE (LBR)—5-7/8 in. dia. X 1/4 in. thick plate with 1/16 in. perforations, adjustable height stem and locking knurled nut; all brass. Approx. Ship. Wt. 5 lbs.

CAT. NO. 762MA MOLD ASSEMBLY—Similar to Series 665 Mold Assemblies. 6 in. ID x 7 in. high mold. Base plate with 1/16 in. perforations. Complete with clamp ring, funnel-collar, securing studs and wingnuts. All parts are plated or Aluminum alloy. Approx. Ship. Wt. 22 lbs.

CAT. NO. 660-SD-1.416 SPACER DISK—A cast aluminum alloy platform machined to 5-15/16 in. dia. X 1.416 in. high with bottom cavities providing excellent finger grip.

CAT. NO. 660-SD-2.416 SPACER DISK—A cast aluminum alloy platform machined to 5-15/16 in. dia. X

2.416 in. high with bottom cavities providing excellent finger grip.



CAT. NO. 665ST SWELL TRIPOD—To support 1 in. x 0.001 in. American Design Group 2 dial indicator over center of 6 in. ID mold. Cast brass accurately machined. Approx. Ship. Wt. 6 lbs.

CAT. NO. 765AW ANNULAR WEIGHT—(Old Pt # 762AW) 5 7/8 in. dia. Lead with 2-1/8 in. dia. Center hole and weighing 5 lb. Approx. Ship. Wt. 6 lbs.

CAT. NO. 765SW SPLIT WEIGHTS, PAIR—(Old Pt # 762SW) A pair of semicircular halves 5-7/8 in. dia. Lead with 2-1/8 in. dia. Center hole and each half weighing 2 1/2 lbs. so any pair is 5 lbs. Approx. Ship. Wt. 6 lbs.

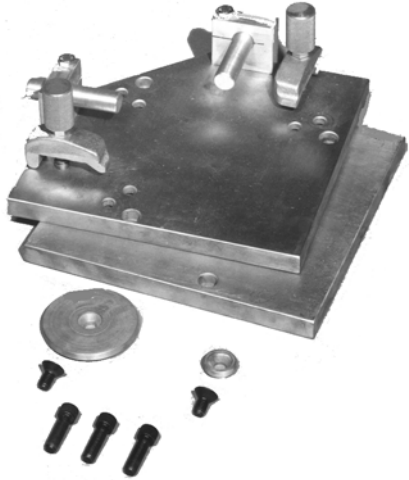


MANUAL DISTRIBUTION of BLOWS

Manual distribution of blows is for a random compactive effort. The Tamping Heads attach concentrically to the tamping shafts of Automatic Tampers. Both are Cadmium plated steel.

CAT. NO. 662-TMP-H55 TAMPING HEAD—(Old Pt # 662H55) Forms 5.5 lb. rammer with 2 in. dia. Face for manual distribution of blows. Approx. Ship. Wt. – 4 lbs.

CAT. NO. 662-TMP-H10 TAMPING HEAD—(Old Pt # 662H10) Forms 10.0 lb. rammer with 2 in. dia. Face for manual distribution of blows. Approx. Ship. Wt. 9 lbs.



CAT. NO. 662MX MOLD MOUNT PLATES—Mold assemblies are held by 665MF Mold Mount Fixtures (Series 662 Specimen Molds by 662MF Mold Mount Fixtures) to the moveable upper plate. The motion of the upper plate is restrained by its bottom recession and a post attached to the lower plate. The lower plate is secured to the Automatic Tamper as usual. Thus, a mold can be repositioned manually (randomly) each time the rammer is lifted during compaction. Consists of upper and lower plates, restraining posts and attaching screw for 4 and 6 in. molds and three securing Allen head capscrews. Approx. Ship. Wt. – 50 lbs.

CAT. NO. 665MF MOLD MOUNT FIXTURES—For use with 662-MX Mold Mount Plates, these fixtures index and hold Series 665 Mold Assemblies or virtually any other except our Series 662 Specimen Molds, Approx. Ship. Wt. – 2 lbs.

WARRANTY

Rainhart Co. warrants all merchandise sold by them to be as they represented, unless further improved, and to be free of significant defects in material or workmanship.

The Original **Mary Ann**[®] Laboratory Sifter

INSTRUCTIONAL BOOKLET

Cat. No. 637D Combination of 12 and 8 inch
With Digital Timer



Note: for first time operation (or if the power has been interrupted, either by unplugging the sifter or a power outage), press the emergency stop button in; connect the power, then press the "Relay Reset" button in the top panel inside the cabinet. The sifter should operate normally.

This combination model Rainhart Laboratory Sifter efficiently reproduces hand sieving. Rapid production, quiet operation, low sieve wear and freedom from inconvenient clamping, are her unique features. This patented system is extremely gentle.

Capacity: pan, six 12" dia. x 3-in. high or ten 8" dia. x 2-in. high standard laboratory sieves and covers. (If interested only in 8-in. sieving, see Cat. No. 635)

Floor stand of aluminum tubing with rubber feet has horizontal 22-in. long rails for sieve storage. The case revolves from 45° to near vertical to allow convenient vertical loading of a heavy stack of sieves and for easy cleaning. Floor space: 18 x 40-in. 1/3 hp 115VAC 60HZ ball bearing motor drives two rubber covered trunions and 10 hammers with hardwood heads. An idler roller stabilizes 12-in. sieves. Special power requirements can be met.

The cabinet is fitted with aluminum control panel and timer/switch. Sound suppressing lid is shipped unattached to avoid damage and is easily hinged on either side (or omitted) and swings 3/4 turn to hang vertically. All shaft bearings are maintenance-free sealed ball pillow blocks.

To convert from 8 to 12-in. operation, the turntable is inserted in the correct pillow block and the hammer spring tension is adjusted with a flip of a lever on the control panel.

Cat. No. 637 Laboratory Sifter, 12 & 8-in. Model: (less sieves) complete with 15 min. timer/switch and Laboratory Sifter Booklet; will sieve up to 26-in. stack of unclamped 12 or 8-in. dia. laboratory sieves at 45°. Approx. Ship. Wt. 135 lb.

Mary Ann

During development, when the prototype was returned from field evaluation with excellent comparison data, we were delighted to find that the lab technician had affectionately written “Mary Ann” across the control panel. Mary Ann, according to a Calypso ballad, spent all her time “down by the seashore, sifting sand.” Thus was she christened.

Principle of operation

The inclined, rotating stack of sieves provides a gentle, thorough, agitated, tumbling action, which exposes the climbing particles to a vast multiplicity of chances and angles to pass through the mesh. Gravity keeps the material bearing on the progressively changing rotating mesh which either passes the particles or carries them up the incline to tumble back with the nesting particles pouring out of the apertures and down into the percolating pile. This process is repeated again on the next below smaller meshed sieve—and so on down through the stack. Sifting is extremely rapid and thorough.

The uphill action is sifting; downhill is cleaning. A mixture of material of widely varying specific gravities will be sifted without problems.

The fixed angle of the stack is critical—

- A more vertical angle will cause the material to nest in the mesh and block the apertures;
- A more horizontal angle will prevent the material from being carried up by the sieve and hence from sifting.

Tapping action is provided at right angles to the sieves. This encourages the lighter and finer near-mesh materials to clear the apertures allowing a larger specimen to be sorted. The hammers are cocked by a cam and cam-follower and then triggered; a spring throws them upward to tap the frames of the sieves at right angles to the axis. Their normal at-rest position is well below the sieve frames to give the hammers room to retreat after striking.

Degradation of Material

Do not expect this gentle sifter to disintegrate even small lumps of dry clay—Mary Ann is not that kind of a girl! Material degradation, sieve abrasion and particle jamming are not her vices. Dry clay lumps must be pulverized before sifting to avoid being classified by their lump sizes.

About Sifting

Sifting with laboratory sieves is the standard method for classifying granular materials in a cohesionless state by particle size. After the end point is reached, the material retained by each mesh in a series of designated progressive sizes is weighed and tabulated as a percentage of the total sample; this data is often plotted into a convenient curve which displays the particle size distribution.

Nomenclature

- **Retained** particles are those which have passed through all the larger mesh sizes and have accumulated on each size of mesh; these materials are assumed to be free of all pass particles and will be weighed and recorded in the blank labeled with the sieve’s mesh size; and
- **Pass** particles are all the smaller unclassified sizes which could escape through the designated mesh. To go one step further, all particles that are retained can be classified into—
- **Bulk** particles which are so large that they have no tendency to mate with the sieve; and
- **Near-mesh** or **near-size** particles. These are so close to the mesh size that they will engage in the screen wire and blind the apertures until the sieve is cleaned.
- **Blind** is used to refer to a sieve that has been blocked by near-mesh particles. Near-mesh particles can be further subdivided into—
- **Nested** particles, which will blind a sieve by engaging in the mesh but have little

tendency to jam and require only non-destructive manipulation to be removed by canting at a steep angle or inverting.

- **Lodged** particles are those which require mild assistance in cleaning such as using bare fingers, conventional sieve brush action, rapping the rim with a hardwood brush handle, etc. and
- **Jammed** are stubborn particles, which require drastic or potentially destructive methods to dislodge such as by applying high pressure with a metal probe—never a recommended practice!

Note: How easily these particles are dislodged is the important difference between nested vs. lodged vs. jammed particles and is of major importance when evaluating sifting equipment. Jammed particles are nested particles that have been driven home by high amplitude vibration generally associated with violent impact or with drumhead excited sieve wire. In general, the more violent the apparatus, the worse the jamming! One characteristic of the gentle Rainhart Laboratory Sifter is its canted self-cleaning action which pours the nested particles back into the percolating pile; fewer of the nested particles are lodged and therefore the sieves are more quickly and easily cleaned and suffer less damage. Larger lodged particles can generally be removed with bare fingers and a few taps on the rim. A few strokes across the bottom with the sieve brush will generally suffice with the finer mesh.

- **Overloaded sieve**—regardless of the quantity of material—is one whose mesh becomes blind with near-mesh particles; further passage will be drastically curtailed and will invalidate the results of this and all smaller sizes. (This situation is true for both the hand method and for all mechanical “sieve shakers” regardless of the type or make of the apparatus).
- **Stack** of sieves. In mechanical sieving, the sieve family is arranged starting with the pan on the bottom; the finest through the coarsest, by mesh size, are superimposed into a stack.
- **Pan** is the receptacle at the bottom of the stack; it accumulates the pass particles from the smallest

mesh sieve. The pan is engaged with the sieve above by the conventional friction flange arrangement. The material accumulated in the pan is called “pan” and is weighed and recorded on the report form in the space labeled “pan.”

- **Pan with extended rim** (for example, our 8-inch diameter Cat. No. SSP-8-2), which engages the friction flanges of the adjacent sieves above and below, can be inserted anywhere within a stack and is used to accumulate the pass materials from any particular sieve (often used when checking the endpoint; it will also allow two short stack of sieves to be run simultaneously).

- **End-point.** Since perfect sifting is impossible, an arbitrary end-point must be a compromise between practicality and significance. A survey of procedures yielded—

ASTM Designation D 422: “When mechanical sieving is used, test the thoroughness of sieving by using the hand method of sieving as described above...”

AASHTO Designation T 88-57: “When sieving machines are used, their thoroughness of sieving shall be tested by comparison with hand methods of sieving as above described...”

AASHTO Designation T 27-60: “When mechanical sieving is used the thoroughness of sieving as described above...”

Bur. Of Rec. Designation E-4: “Item 85, 1 ea., sieve shaker, motor-driven, electric or gasoline equipped with timer...”

ASTM Designation C 136: “...after completion, not more than 1 per cent by weight of the residue on any individual sieve will pass that sieve during 1 min. of continuous hand sieving performed as follows: Hold...”

Guidelines

Once the idiosyncrasies of a specific material are established, many shortcuts can be practiced for routine sifting. Whether by hand or machine the following hints may assist accurate or preliminary grading—

1) Sieve quality. A defective sieve will invalidate this and all finer gradations! Carefully examine each sieve visually for oversize holes; if not too numerous, these can be permanently closed with soft solder. Jammed particles affect only the rate and capacity of the sieve by reducing the area. Inspect sieves of #50 and finer for snags and tears and for broken (fatigued) wire around the edge at the solder joint; this is a commonly overlooked failure point. Press the mesh with the fingertips progressively around the rim to make sure that there is no concealed by-pass!

2) Make sure the end-point has been achieved.

Since sifting may not have been completed and since finer materials may still be trapped in a blind sieve, it is imperative that the completion of each and every gradient be proved. Mechanically sift the sample for four or five minutes. Starting the largest size and successively prove that each sieve is not blind and that the endpoint has been reached.

3) Inspection. Hand sieve a few strokes over a clean receptacle to discover if the end-point has been apparently reached. Then test for blindness. First, hold the sieve overhead and examine the bottom for hanging nested particles. Wedge-shaped particles (which are merely nested) are particularly adept at blinding sieves. If these specimens have been run in a Rainhart Laboratory Sifter, tilt the sieve to its normal angle of approximately 45° and rotate it to and fro about its axis so that the bulk materials will flow away leaving on the nested materials displayed for inspection across the top of the mesh.

4) Quarantining near-mesh. If an occasional sieve is extensively blinded, carefully pour off the bulk material into a clean “holding” receptacle slowly and gently to encourage as many near-mesh particles as possible to cling. Unfortunately, most of the nested particles will be poured off with the bulk materials. Clean the sieve into a second clean receptacle to isolate and quarantine as many of the near-mesh particles as possible. These particles have already been proved as retained and will be recombined at weighing.

5) Repeat sifting if necessary. If the end-point has not been reached, transfer the material in the hold-

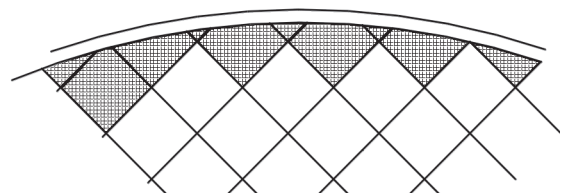
ing receptacle back into the cleaned sieve for additional sifting. Since many of the troublemakers were quarantined from the batch, the sieve will remain open longer. After sifting, repeat the inspection and again quarantine the lodged and jammed particles by cleaning into the quarantined material. Repeat as many times as necessary to arrive at the end point. (It is customary not to disturb the most tenacious particles—particularly in the very fine meshes—for fear of damaging the sieve).

6) Unloading a sieve. If a material is very heavy in a single size or has a serious nesting problem, a smaller specimen may have to be used (half-size by weight, for example) or an uncalled for slightly larger mesh size can be introduced in the stack to help unload this sieve. Any material retained on the additional size can be combined with that retained on the desired size since it has satisfied the conditions of passing all of the above larger sieves and would have been retained by any smaller mesh. Example—Sieves #4 and #8 are specified and #8 is overloaded. Introduce a #5 or #6 in the stack and combine its material with the #8 at weighing.

7) End-point. The most careful particle size analyzation is accomplished by sifting any questionable sieve size into its own pan (or pan with extended rim). The amount of material that passed this sieve and was collected in the pan will indicate the approach to—or the proof that—the end-point has been reached. This material can then be combined with the bulk material in the next smaller sieve. All of the end-points assume that the sieve is not blind.

8) Weighing. When the end-point is reached, weigh the combined retained, quarantined and near-mesh particles.

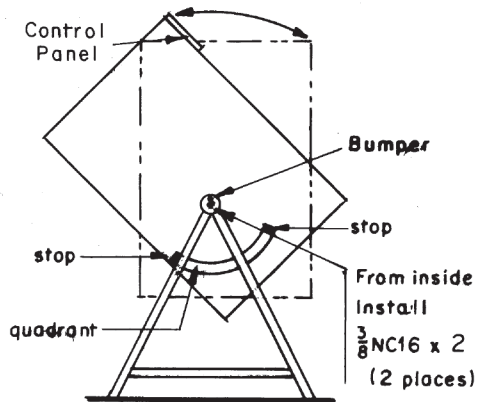
9) Odd shaped apertures. Laboratory sieves are constructed of square woven wire mounted in round frames; this produces border interstices that are neither square nor standard.



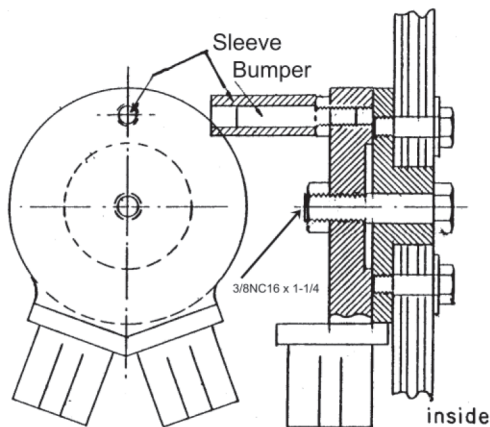
The larger the mesh size, the more ridiculous this becomes. Particles which should have passed—particularly when they are wedge-shaped or are long slivers—will be retained in these off-square apertures and are the most troublesome to remove when cleaning. It is unfortunate that current principal testing procedures are silent on this point other than to recommend using the larger diameter sizes when grading larger size aggregates (Rainhart Cat. No. 637D also accommodates 12-inch diameter sieves).

Assembly 637D

- 1) Carefully unpack the sifter, stand and door.
- 2) To attach the stand to the cabinet, lay the cabinet down on its back and slide the stand over the cabinet between the stops on the quadrants and align with the cabinet's pivots. The stand is symmetrical.



- 3) Install the two 3/8-in. dia. Capscrews from the inside of the cabinet by screwing them into the pivots at the top of the stand.



- 4) Adjust the bolt tension to eliminate play but allow the cabinet to pivot freely between the quadrants' end stops. Install and tighten the lock nuts.

- 5) Attach the Door (the door has been packed separately because pre-hinged doors have been damaged in shipment). It can be hinged to open either left or right. Insert the pin into the control panel's ear, align with the open top of the case and install the lower hinge plate. A rubber-covered door stop is installed to prevent the open cover from being damaged when open.

- 6) With two people, lift the cabinet and stand to upright position.

Turntable

Install the turntable by inserting its stem into the lower bearing in the footboard for 8-in. and into the upper bearing for 12-in. sieves—concentric with the stack of sieves.

Lever on the Control Panel

Turn the lever on the control panel right to "8" for 8-in. sieves and left to "12" for 12-in. sieves. This puts a second spring into play to increase the force of the clappers when using the heavier sieves.

Tilt

The cabinet is pivoted to near vertical for loading. It is gravity restrained in either the vertical or its 45° position against the end stops of the quadrants in contact with the stand.

Nesting the sieves

Place the pan on a table. Stack the sieves from finest to coarsest in sequence nesting one on top of the other. Any number of sieves or stacks of sieves (if divided with a sieve separator pan with extended rim nesting skirt) can be run simultaneously up to the capacity of the apparatus.

Sample size

Try a sample of up to 10 lb. When using 12-in. sieves and up to 5 lb. using 8-in. Adjust from there. The type and grading will dictate optimum size, see About Sifting, above. Pour the sample into the top of the stack and install the lid.

Installing the stack

Lift the stack of sieves vertically and place it on the turntable and against the rollers. Tilt the cabinet to its 45° angle against the quadrant's stops.

ATTENTION: the "emergency" push button on the control panel should be left in the off (pushed in) position when the sifter is not in use!

Note: for first time operation (or if the power has been interrupted, either by unplugging the sifter or a power outage), **press the emergency stop button in;** connect the power, then press the "Relay Reset" button in the top panel inside the cabinet. The sifter should operate normally.

Power 115VAC 60Hz. (Unless special order)
Plug the cord into a convenient receptacle.

Starting the sifter

1) Push the red emergency stop button in to turn the sifter power off. The emergency button is on the right hand side of the control panel.

2) Press the RESET button on the timer.

3) If the sifting time displayed on the timer is not the time desired, Program the timer for the desired sifting time. See "Programming the timer" below.

4) Twist the red emergency stop button clockwise to start the sifting process.

To pause the sifting cycle, push the emergency stop button in. The sifting cycle will stop and the timer will hold the time remaining. To resume the interrupted cycle, twist the red emergency stop button clockwise and the sifting cycle will finish its program.

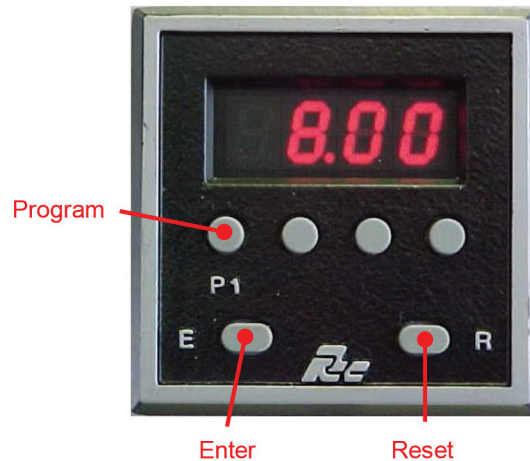
To stop the sifting cycle before the program is complete, push the emergency stop button in and press the RESET button on the timer. The timer will reset to the previous program and is now ready to begin the next cycle.

To repeat the same program, press the RESET button. The timer will reset and the sifter will immediately start sifting.

Programming the timer

5) Push the red emergency stop button in.

6) Press the PROGRAM button on the timer to enter the program mode. The timer will automatically exit the program mode after approximately 10 seconds of inactivity.



7) The current program will be displayed.

8) Press the button below each digit until the desired program is set. The timer is programmable from 1 second to 99 minutes and 59 seconds.

For example: 12.30 will run twelve minutes and thirty seconds.

9) Press enter to complete the programming cycle and then reset to set the timer to the new program.

Remove the stack

Tilt the cabinet to near vertical. Open the door. Lift the stack and place it vertically on the bench.

Remove the stack's lid and set it aside. Remove the sieves one at a time and pour their contents into individual containers; weigh and record. (Verify the end-point if not confident as described in About Sifting, above).

To clean the cabinet

With the cabinet empty of sieves and vertical, brush any dust out the front into a catcher pan.

The dust is generally particles that have escaped through the closely fitting joints

between sieves and can therefore usually be added to "pan."

Sieve storage

The two parallel horizontal tubes in the stand will hold a stack of nested extra sieves; these are accessible from either side.

Rims of sieves

There are no rigid specifications on the exact height of sieve rims or on the diameter of the external rolled bead; hence the exact height, location and precise diameter of the sieve rims cannot be predicted. In addition, sieves are available in both 2-in. and in mini-skirt models from many manufacturers and may be used interchangeably with 1-in. and 2-in. deep pans. Occasionally, a rim is so large in diameter that it supports several adjacent sieves causing wobbling and possible sieve separation. When the stack has been allowed to run long enough to automatically mark this high spot, the stack can be removed and the rubber cut away from the roller to provide bead clearance. With the rollers running, serrate the tire down to the metal shaft with a sharp knife. Stop the rollers and cut away this narrow (perhaps 1/2 in.) band.

Cleaning the sieves

The sieves can be nondestructively cleaned by inverting the empty stack and running it in the sifter for perhaps 3 minutes. All nested, most lodged and some of the jammed particles will accumulate in the lid.

Hammers

It is immaterial whether the hammers tap the frame or the bead of the sieves. Any hammer that is not covered by a sieve will be thrown quite high; by the time it has returned, it will be out of sequence with the rest of the gaggle. When using a short stack of sieves, the extra hammers can be removed to eliminate the unnecessary noise and broken rhythm.

MAINTENANCE

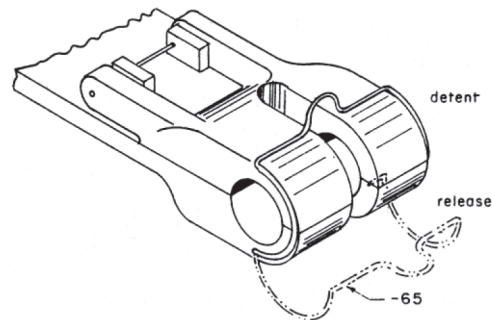
Hammers

To be effective, the hammers must be perfectly free to rotate on their shafts; if removal and cleaning of the shaft and nylon bearings with a solvent (such as alcohol) fails to free the assembly, replacement of the

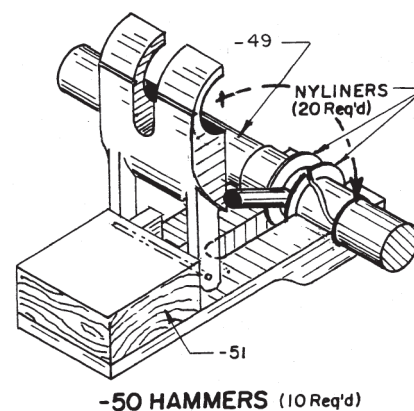
Nyliner bearings may be necessary.

DO NOT LUBRICATE! Nylon is an excellent lubricant.

- To remove the hammer, open the -65 hammer detent spring.



- Nylon sleeve bearings are wrapped off and on the shaft; their flanges contact the drive



pin (which is straddled by the hammer). It may be necessary to replace the Nyliner bearings to provide perfectly free movement.

Lubrication

Do not lubricate. All shafts and motor bearings are permanently sealed ball bearings, which cannot be lubricated. The replaceable nylon sleeve hammer bearings are installed on a ground stainless steel hammer shaft. No lubrication is required (wet lubrication will load these bearings with detrimental abrasives!) The replaceable -44 Nupla Face on the cam follower, is also run dry.

V Belts

1) BEL1000 connects the drive motor with a jack shaft. Tension is adjustable by moving the motor closer to the side of the case. The four motor mounting slotted round head, screws are accessible on the sifter bed below the sieve rollers.

2) BEL1001 connects a roller with the cam pulley. It is tightened by relocating the self-aligning flange bearing on the cam shaft. Loosen the nuts of the attaching bolts, move the cam pulley downward, and retighten.

3) BEL1002 connects the jackshaft with the rollers. Tension is adjusted by relocating the jackshaft flange-type self-aligning bearing. Loosen the nuts, move the pulley down to tighten the belt. Re-secure.

Rollers

The rubber covers of the rollers were factory installed using Cat. No. 635T ROLLER COVERING TOOL; if not available, the user will find it impossible to recover the shafts except by using many short pieces. A pair of rubber covered shaft assemblies are therefore offered for replacement; after installing the new shafts, it is suggested that the customer return his shafts for factory recovering or exchange if reusable.

To do it yourself:

- 1) Remove the drive belt and drive pulley.
- 2) Using a 3/32 allen wrench, loosen the setscrews at the (upper) headboard bearing.
- 3) Remove the lower footboard bearing together with the roller through the footboard.
- 4) Release the lower bearing set screws and remove the dirt slinger washer and spacer ring.
- 5) Transfer the hardware to the new rollers.
- 6) Install in reverse order.

Hammer shaft

Since the hammers can be individually removed and replaced, the removal of the shaft is unnecessary unless a self-aligning pillow block (bearing) requires replacement.

To disassemble:

- 1) Remove the roller drive belt and two roller drive pulleys.
- 2) Unhook the cam spring at its upper end.
- 3) Unbolt both the upper and lower hammer shaft pillow blocks and their shaft lock set screws.
- 4) Remove the cam follower casting (set screw and key).
- 5) The shaft can then be jockeyed upward to clear the footboard and then downward to free it of the case.
- 6) Replace any malfunctioning parts and reinstall in the reverse order.

Timer

The digital timer is not field repairable and should be sent to Rainhart for repair or replacement (part # ELC1041)

- 1) Push the emergency stop button on the control panel in.
- 2) Unplug the cord from the wall.
- 3) Remove the top service panel (3 screws)
- 4) Disconnect the two plugs from the back of the timer, DO NOT pull on the wires pull only on the plug itself; it may be necessary to use a small screwdriver to pry the plug off the But back of the timer.
- 5) Use a Philips screwdriver to loosen the two screws in the two mounting brackets on either side of the timer. Pivot the screw heads away from the timer and remove them from their sockets.
- 6) Slide the timer out of the control panel.
- 7) Replace the timer in reverse order.

Motor

If the motor fails to start properly, first check the timer/switch. The following instructions will temporarily bypass the timer, emergency stop switch and relay, this will eliminate each as a source of the malfunction.

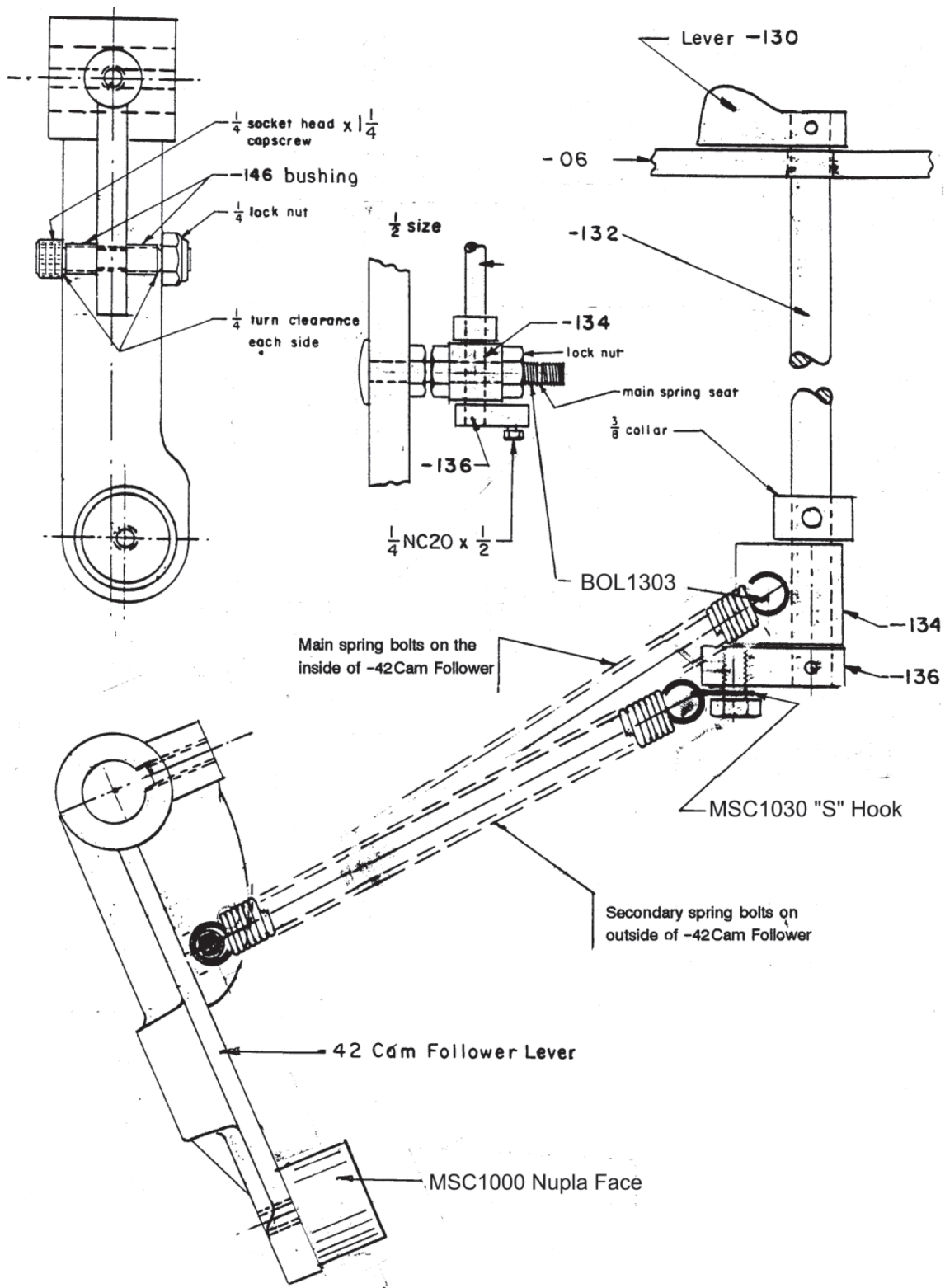
- 1) Disconnect the plug from the wall outlet.
- 2) There is a three conductor cord that runs from the motor (in the back of the cabinet) to the electronics (in the top of the cabinet). The three wires are black red and white. Remove the white wire from pin 2 of the solid state relay. Note that there are three white wires connected to pin 2 of the solid state relay; we are interested in the white wire that is part of the three conductor cord that runs up from the motor. Clamp it together with the red wire in this same cord under the screw on pin 1 of the solid state relay.
- 3) Keep in mind that you have bypassed the emergency stop button, therefore, when the power cord is plugged into the wall outlet the sifter will immediately start, unless of course there is a problem with the motor.

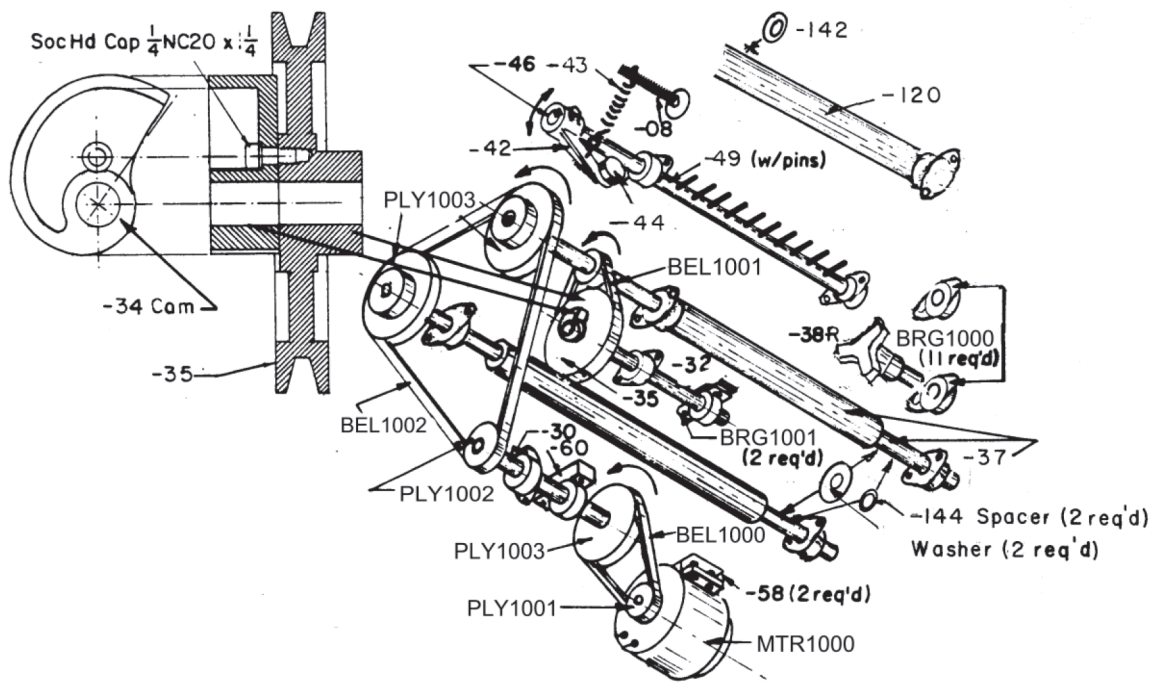
If the motor starts but growls and fails to gain normal speed almost immediately (the starting switch should click audibly), shut down almost immediately—servicing is required.

This is a common motor and can be serviced locally or it can be returned to Rainhart.

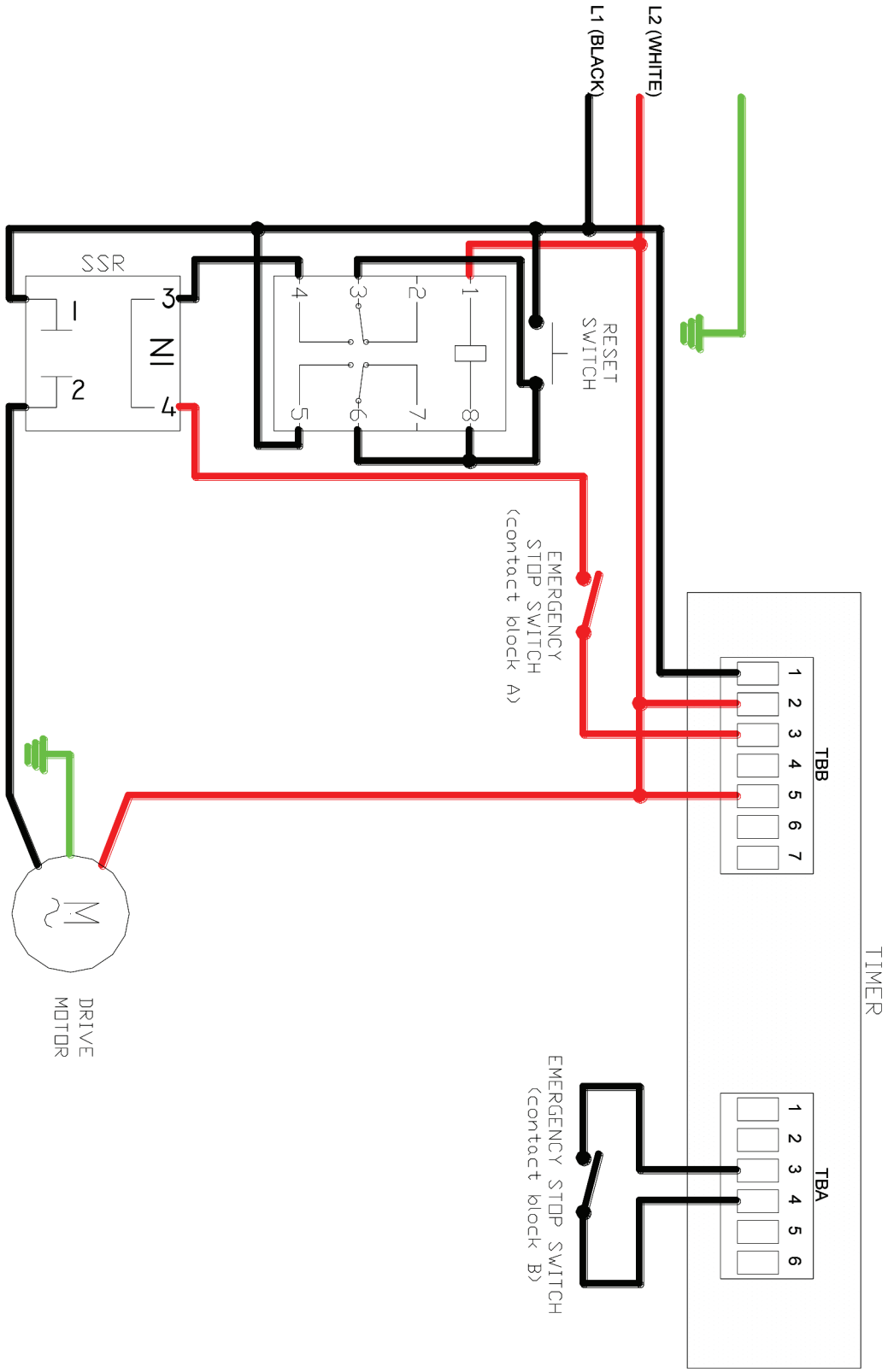
To remove the motor—

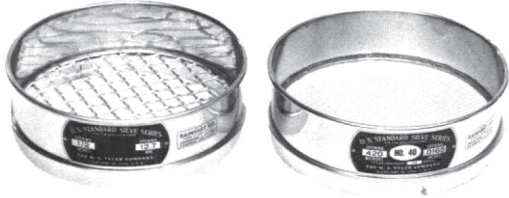
- 1) Unplug the sifter from the wall.
- 2) Have a helper support the motor while removing the four slotted round head mounting screws (found on the sifter bed under the rollers). The motor is secured with two strap nuts threaded to receive the motor mounting screws. The belt can be removed once the motor is unbolted.
- 3) Remove the cover plate from the bottom of the motor and disconnect the three conductor cable from the motor.
- 4) Reassemble in reverse order. The wiring diagram on the name plate for the motor illustrates the wiring configuration for low voltage.





Pt #	Description	qty	Pt#	Description	qty
637D-06	Control Panel	1	637-110	Pivot plate, case	2
637-07D	Case w/lid and back	1	637-700	Roller, idler 29	1
637-1000	Door stop	1	637-130	Lever, extra spring lifter	1
BOL1303	Spring attaching carriage bolt	1	637-200	2nd spring mechanism	1
637-09	Hinge Bar, lid	1	637-200-132	Shaft	1
637D-10	Door hinge	1	637D-200-134	Bearing Block	1
637-13	Hinge Plate (al casting)	1	637-200-136	Spring crank	1
635-400-30	Jack Shaft x 11 1/2	1	MSC1030	S-hook	2
635-500-32	Cam Shaft x 10	1	637-142	Spacer	1
635-500-34	Cam	1	635-144	Spacer, .15 thick	3
635-500-35	Pulley 6 x 5/8 (mod. For cam)	1	635-146	Bushing	2
637-600	Rollers, main, 33 1/2	2	MTR1000	Motor, 1/3 hp 115VAC	1
635-38	Turntable	1	ELC1000	Cord set	1
635-800A	Cam Follower Lever	1	ELC1041	Digital timer	1
635-800B	Spring	2	BRG1000	Pillow block, (flange)	11
MSC1000	Nupla Face	1	BRG1001	Pillow block, (standard)	2
635-41	Keys, 3/16 sq. x 1	8	BEL1000	V-belt	1
637-300A	Hammer Shaft x 31 w/ tension pins	1	BEL1001	V-belt	1
635-300B	Hammer, complete	10	BEL1002	V-belt	1
635-300B-51	Clappers, maple block only	10	PLY1001	Pulley 1 3/4 x 1/2	1
635-58	Strap Nut	2	PLY1002	Pulley 1 3/4 x 5/8	2
635-59	Spacer for Cam Shaft Pillow Block	1	PLY1003	Pulley 3 1/2 x 5/8	3
635-60	Pad for Jackshaft (wood)	1	COL1000	Collar, 3/8	1
SPR1001	Hammer detent spring	10	MSC1020	Nyliners	20
637-100	Stand	1	ELC1104	Solid state relay	1
635-100-311	Rubber feet	4	ELC1250	E-stop with 2 contact blocks	1
637-106	Quadrant stops	2	ELC1222	Contact block	2
637-100-108	Pivot plate, apex	2			





SERIES TB8 U.S. STANDARD SIEVES, BRASS—8 in. dia. (ASTM Designation: E 11). Polished brass frame with extended rim and nesting skirt. Coarse brass wire mesh, brass or bronze woven wire cloth permanently anchored tautly 2 in. below rolled top rim. For each sieve being ordered affix to Cat. No. US8 a hyphen (-) and designate the desired mesh (e.g. - Cat. No. US8-1 1/2 Cat No. US8-40). If half-height with mesh or cloth 1 in. below top rim is desired, also affix the letter "HB" (e.g. - Cat. No. US8-1 1/2HB; Cat. No. US8-40HB). Request quotation for other diameters or with round openings punched in plates. Approx. Ship. Wt. 3 lb.

SERIES TS8 U.S. STANDARD SIEVES, BRASS W/ SS. MESH—Same as above group except for having coarse stainless steel mesh or liner stainless steel woven wire cloth for corrosion resistance and longer service life. For each sieve being ordered affix to Cat. No. US8 a hyphen (-) and designate the desired mesh (e.g. - Cat No. US8-1 1/2; Cat. No. US8-40). If half-height with mesh or cloth 1 in. below top rim is desired, also affix the letter "HS" (e.g. - Cat. No. US8-1 1/2HS; Cat No. US8-40HS). Request quotation for other diameters or with stainless steel frames. Approx. Ship Wt. 3 lb.



SERIES TB8 STANDARD SIEVE ACCESSORIES—Conventional designs in polished brass that fit all 8 in. dia. U.S. Standard Sieves. Request quotation for other diameters or in stainless steel. Approx. Ship Wt. 1/2 to 3 lb.

- CAT. NO. SSP-8-2 SIEVE PAN – With extended rim.
- CAT. NO. SP-8-1 SIEVE PAN – 1 in. deep.
- CAT. NO. SP-8-2 SIEVE PAN – 2 in. deep.
- CAT. NO. TB8CR SIEVE COVER -- With recessed ring.

ACCESSORIES

Scoops



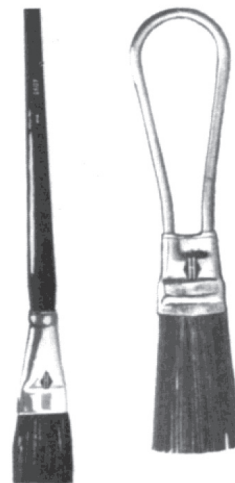
For handling concrete, sand, soils, tec. In the laboratory or field. One-piece aluminum, satin finish. Approx. ship Wt: 2 lbs.

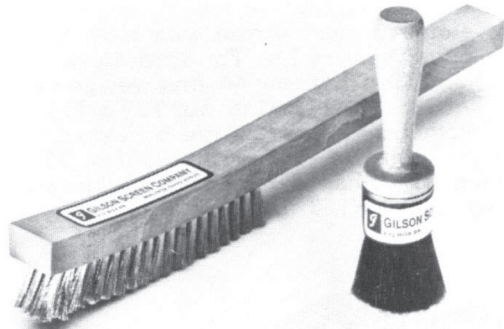
- CAT. NO. D29 SCOOP – (Round – 4" Width)
- CAT. NO. D30 SCOOP – (Square – 3 3/4" Width)

Brushes

CAT. NO. RDD1 BRUSH – (Wood Handle)
For cleaning FINE mesh sieves. Wood handle, with 1" wide bristles.

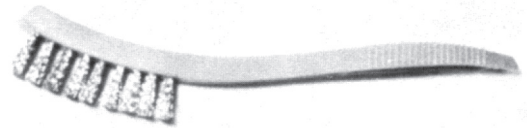
CAT. NO. RDD-2 BRUSH – (Wire loop handle)
For cleaning COARSE mesh sieves. Wire loop handle with 1" side bristles. Approx. ship Wt. 1/4 lbs





CAT. NO. RG TSA170 BRUSH, WIRE CLOTH (Bristle) – The round 1 ¼” dia. brush is a soft black bristle brush recommended for cleaning No. 16 and finer wire cloth. It has a nickel steel ferrule and clear lacquered handle. Overall length is 5-¾”. Ideal for round sieves and pans. Also useful for screen trays. Approx. shipping wt.: 2 lbs.

CAT. NO. RG TSA171 BRUSH, WIRE CLOTH (Brass for Trays) – it has 5½” of fine (.005) brass wire staple set in a 13” curved wooden handle. Wire slants to tip for cleaning corners of screen trays. Recommended for No. 30 and coarser wire cloth in trays only. Approx. ship wt.: .5 lbs.



CAT. NO. RG TSA172 BRUSH, WIRE CLOTH (Brass – For Sieves) – For No. 30 and coarser in round sieves. This 8 1/2” curved plastic handle brush has 2 ½” x 3/8” of slanted brass wire – perfect for round sieves in coarse sizes. Approx. ship Wt.: .2 lbs.

CAT. NO. RT1778SB BRASS BRISTLE SIEVE BRUSH – For cleaning #100 and coarser meshes. Approx. Ship Wt. 2 lbs.

CAT. NO. RTNBSB NYLON BRISTLE SIEVE BRUSH – For cleaning #100 and finer meshes. Approx. ship Wt. 2 lbs.



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