



H-4169
Instruction Manual
AUTOMATIC MECHANICAL
COMPACTOR

Manufactured by:

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1. Introduction

It is recommended that these instructions be read through to become thoroughly familiar with the operation of the machine before attempting to run it.

The Mechanical Compactor more closely duplicated hand compaction methods and results. It is suitable for standard or modified proctor compaction tests with adjustment for 12" or 18" drop and accommodating 4" or 6" inside diameter molds. Test result show that the Humboldt Compactor can give results within 1% when compared with hand compaction on a 4" diameter mold.

It is recommended for any automatic compaction machine that it be bolted to a concrete floor or mounted on a concrete base. We recommend a base approximately 15" wide x 24" deep x 12 to 18" high. The machine should be firmly bolted in position. The bolt holes are 10 5/8" centers and with 14 1/2" centers in depth. The machine should be set level, checking that the turntable is level in both directions.

The electric cord should be plugged into a convenient receptacle of the correct voltage.

One of the hammers that are packed separately for shipping, should be inserted into the hammer cage, the round type 4" mold or wedge foot for 6" diameter mold. In order to perform this operation proceed as follows:

- 1.1 Open the sheet metal doors by means of a front latch.
- 1.2 Place a mold on the turntable. A 1/4" diameter pin 1/8" high extends from the center of the turntable. This pin is used to locate the mold. After locating the mold in position, bolt it down to the table. Two sets of holes are located on the base plate for mounting, one for the 4" diameter mold and one for the 6" diameter mold.
- 1.3 By means of the jog switch located on the right hand side of the machine, run the machine until the carriage is in the upper most position, this will withdraw the hammer-lifting bolt to its rearward position. The hammer-lifting bolt is situated at the top of the carriage. (See also notes on the hammer-lifting mechanism).
- 1.4 Remove the front cage bar by pulling down the spring-loaded retaining pin on top of it and lift out. Insert hammer with foot down into the hammer cage from the front of machine. Slide hammer down slow, do not drop, taking care not to trap fingers. Replace front cage bar.
- 1.5 The hammer can now be lifted by manipulating the jog switch, until it is high enough to place a mold on the turntable. Close the hinged cover and secure the latch.

- 1.6 Whenever a mold is being changed or inspected, run the hammer up in the machine by means of the jog switch. Then swing the hammer safety arm, painted yellow, under the hammer opening. If the hammer should float down from its own weight, it will come to rest on this safety device. When ready to proceed with the testing, just jog the hammer up and swing the safety arm out of the way to the right.

2. Operation

2.1 For Compaction with a CBR Mold, 6" Inside Diameter

Place the first layer of soil (in the case of AASHTO compaction, one-fifth by weight of the expected final total specimen weight) in the mold and place the mold in position on the turntable and clamp tightly. The height change cam should be in the top position for 18" drop. (See Height Change Cam Instructions) Set the pre-determining counter to 54 (See Instructions for Pre-determining Counter). This will insure that 55 blows are struck; at the end of said number the machine will automatically stop. Press the green start button on the right hand side of the machine. Immediately the carriage will rise lifting the hammer until such time as the hammer-lifting bolt is withdrawn by the uppermost cam on the carriage guide bar. The hammer will fall and as the carriage completes its cycle, it will pick up again. As the carriage rises lifting the hammer with it, the table-rotating switch is accuated, which accuates the timing circuit, which accuates the turntable. For further details see below under Table Mechanism.

The machine will continue to run until such time as 55 blows have been struck. When the machine stops, the hammer should be lifted by means of the jog switch and an additional layer of soil placed in position in the mold and roughly leveled. Reset the predetermining counter to 54 blows and repeat as above. Continue until all five layers have been compacted. The collar should be on the mold at least for the last two layers.

In using a 6" inside diameter mold the wedge foot hammer must be used. See Hammer Instructions and Table Adjusting instructions.

2.2 For Compaction with Proctor Mold, 4" Inside Diameter

Remove hammer from machine and arrange it for the 5- 1/2 lb. total weight. (See Hammer Instructions) Replace hammer.

Place first layer of soil (in case of AASHTO compaction test, one-third of expected total final weight) in the mold and place the mold in position on the turntable and clamp tightly.

See that the height change cam is set for 12" drop. (See Height Change Instructions)

Set the predetermining counter to 24 and press start button on machine. Machine will continue to run until 25 blows have been struck. Raise hammer by using jog switch, add second layer of soil and repeat. Repeat for third layer of soil.

2.3 Table Mechanism

The table mechanism assembly is fitted to and contained within the base of the machine. The table is rotated by a Slo-Syn motor. As the table-rotating switch, #701, is depressed, the table begins to rotate. The amount of rotation of the turntable can be controlled by the time delay circuit located in the switch box on the right side of the machine. Turn the knob clockwise for more rotation or counter clockwise for less.

Before starting the machine up the first time, turn the knob all the way to the left. Start machine without hammer, turn knob slowly to the right until the desired amount of index is accomplished. The knob setting can then be left set, except only for minor adjustments.

2.4 Table Adjustment

Loosen 4 hex bolts on the table-mounting base. The whole assembly now can be slid in or out for adjusting clearance between hammer and inside diameter of mold. This adjustment must also be made when changing from one size diameter mold to another.

2.5 Predetermining Counter

To set the predetermining counter, simply rotate dials until desired number appears in view. Always set counter one number less than the needed for test.

2.6 Height Change Mechanism

The top cam, #413 is located on the cam bar, #1410, at the rear of the carriage. The cam disengages the catch, #304 and causes the hammer to fall. There are two positions in which this cam can be placed. The lower position will release the hammer for a 12" drop and the upper position will release the hammer for an 18" drop. To change the cam from one position to another, it is only necessary to remove the socket cap crew. The cam is inserted in a slot and can be pulled out by hand. If it is rather tight, use a pair of pliers to remove it. Insert in the desired position and replace the socket cap screw, making sure that the screw is drawn up tight and that no part of the screws extends above the surface of the 5/8" round cam bar.

2.7 Hammer Lifting Mechanism

A ½ H.P. electric motor fitted with a reduction gearbox drives and endless chain. A link on this chain carried a spindle that fits into a bronze block. The bronze block

slides in a horizontal groove in the carriage, #2301. The carriage slides in a vertical direction on two steel guide bars. The cam bar, #1410, has a slot at the upper end in which the top cam, #413, is located. In a slot at the lower end, the pick-up cam, #414, is located, it is spring-loaded. With the carriage in the low position, the spring-loaded cam will push the catch #304, into the hammer grooves. The carriage will carry the hammer up where the top cam pulls the catch back and drops the hammer.

The motor and the idler gear that carry the endless chain are sealed ball bearings and need no lubrication. The carriage guide bar and the horizontal slot in the carriage should be kept well lubricated with light grease. A molybdenum type lubricant can be used such as Molycoat G Paste or Molycoat G Spray made by the Alpha-Molycoat Corporation.

2.8 Chain Adjustment

With the carriage in the down position, one should be able to move the chain about ¼” sideways. If it gets to be a lot more it can break the micro switch. To adjust, loosen the 4 bolts holding the idler. Push idler up with the ¼ “ bolt under the idler shaft. Then tighten bolts again.

2.9 Hammer

The hammer is guided in its free fall by three vertical rods. The removable rod, #403, acts as a guide to keep the pie hammer from rotating. It is necessary to keep it from rotating when using the pie foot in a 6” inside diameter mold. The hammer with 2” diameter foot or the hammer with the pie foot weigh 5.5 lbs. To use either hammer and obtain a weight of 10 lbs., a weighted plug is used. It is inserted into the top of the hammer and held in place with a socket head cap screw. Never drop hammer on turntable or in empty mold.

2.10 Hammer Note

On some models the notches on the hammer are eliminated toward the top, so it will not be picked up if no mold is on the table or if mold is empty. To allow pick up of hammer, place a board on top of mold and rest hammer on it. Manipulate jog switch and hammer will be picked up.

2.11 Molds

The molds are made special for the compactors. If replacement were needed, it would be best to buy them through your dealer or direct from us.

4” mold	4” split mold	H-4169.4
6” mold	6” split mold	H-4169.6

3. Warranty

Humboldt Mfg. Co. warrants its products to be free from defects in material or workmanship. The exclusive remedy for this warranty is Humboldt Mfg. Co., factory replacement of any part or parts of such product, for the warranty of this product please refer to Humboldt Mfg. Co. catalog on Terms and Conditions of Sale. The purchaser is responsible for the transportation charges. Humboldt Mfg. Co. shall not be responsible under this warranty if the goods have been improperly maintained, installed, operated or the goods have been altered or modified so as to adversely affect the operation, use performance or durability or so as to change their intended use. The Humboldt Mfg. Co. liability under the warranty contained in this clause is limited to the repair or replacement of defective goods and making good, defective workmanship.

CAUTION: Keep hands, clothing and other objects away from moving parts when the machine is in operation.

4. Drawing



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