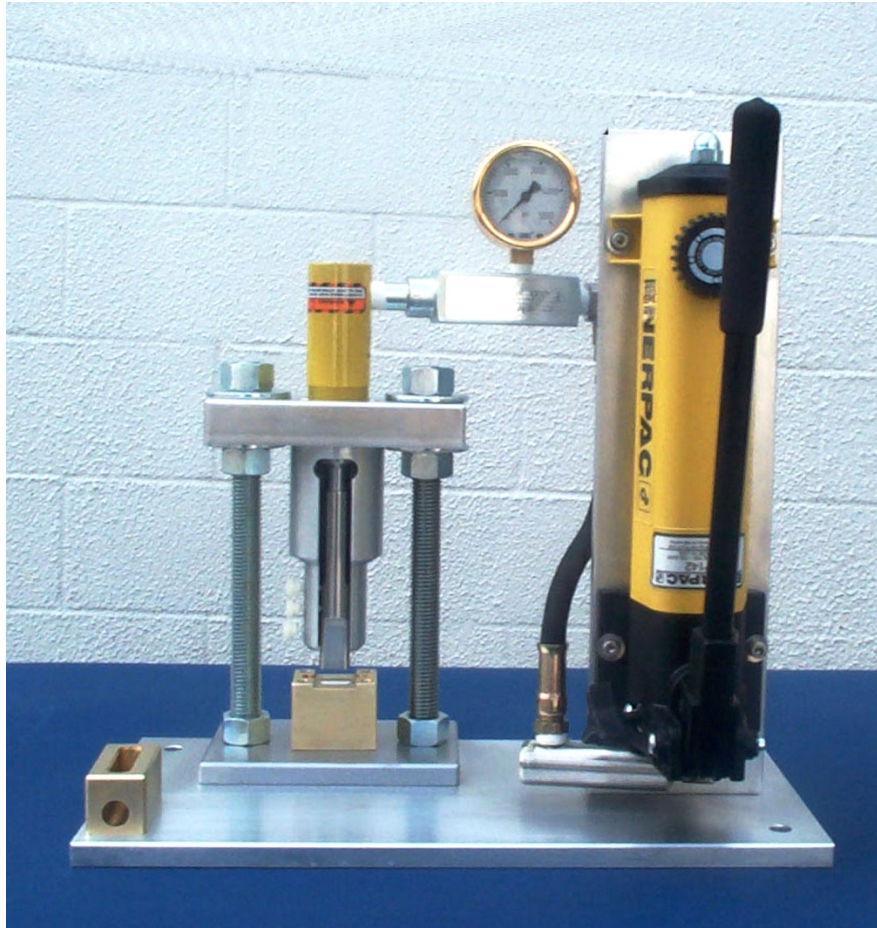


# INSTRUCTION MANUAL

## MANUAL TABLET COMPACTION MACHINE

### PART No: 1230 TABLET

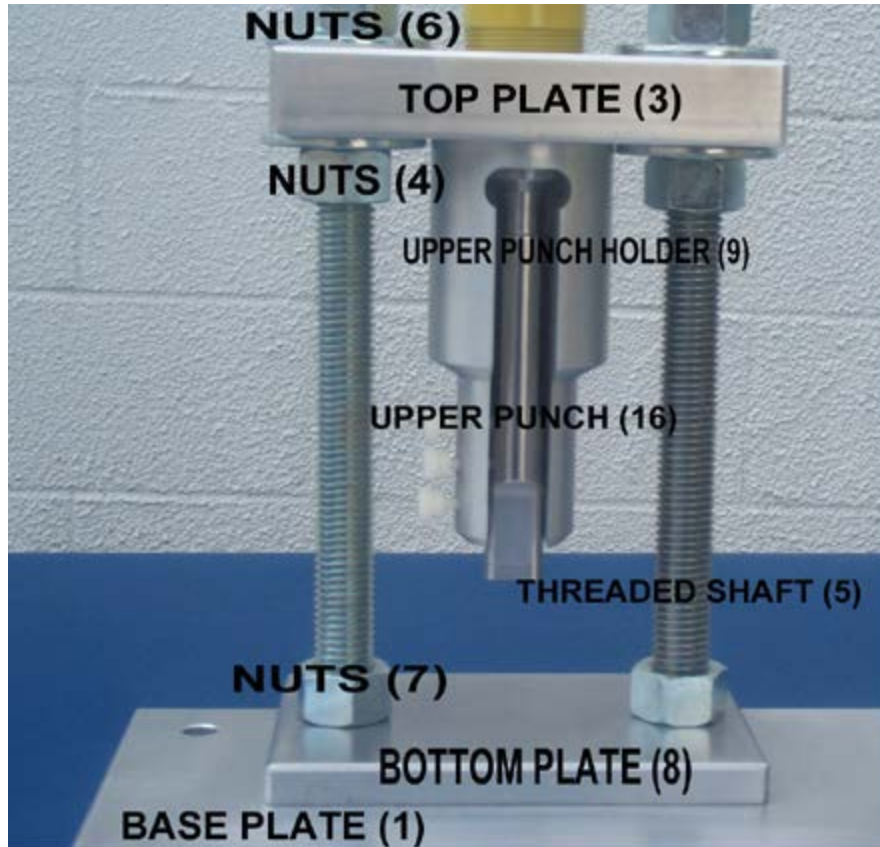


## Contents

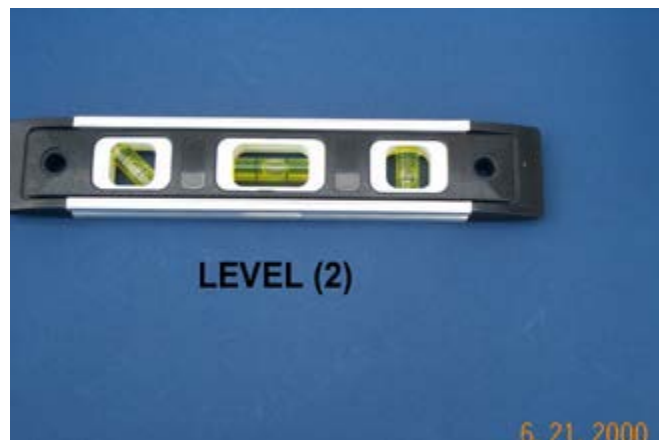
Page	Description
2	Installation Instructions
4	Operation
7	Cleaning
8	Calibration
9	Standard Operating Procedure
10	Punch Maintenance

## INSTALLATION:

1. Check to make sure there are no oil leaks from the pump or the piston.
2. The Base Plate (1) of the machine has four holes at the corners. Bolt the machine to the top shelf of a cart or a bench by using 3/8" bolts.

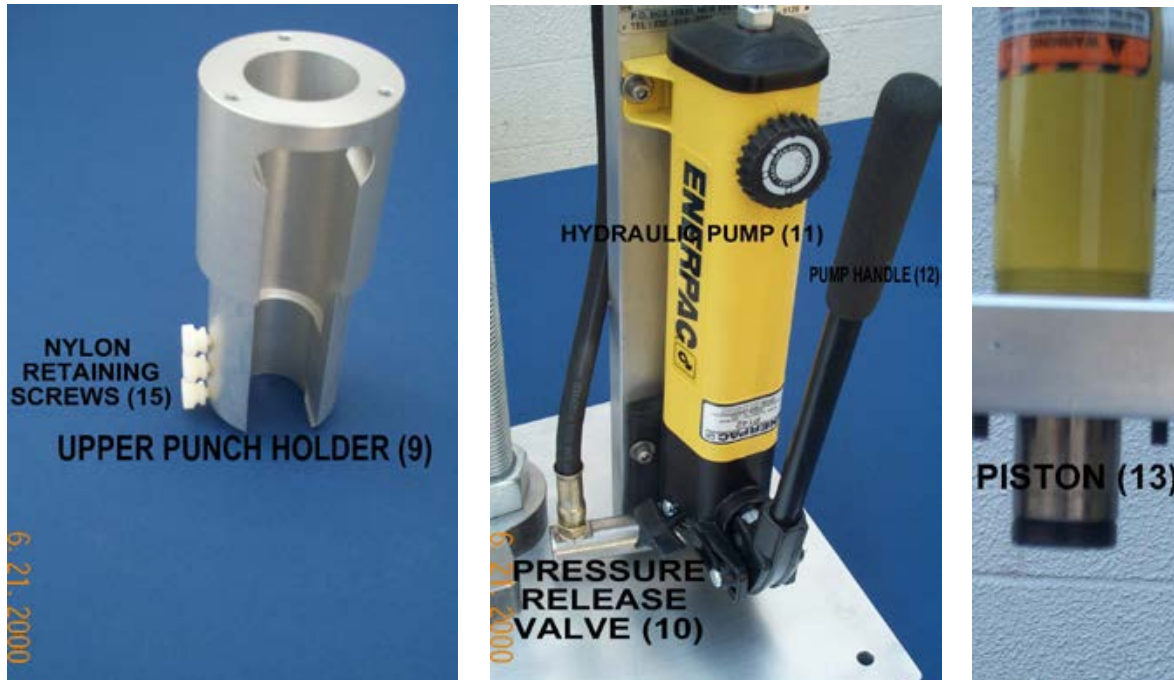


3. Make sure that the machine is levelled. Use a Level (2). Level (2) is not provided with the machine.



4. The height of the Top Plate (3) can be adjusted, if necessary, as follows:

- a. Loosen the Nuts (4) on the Threaded Shafts (5) under both ends of the Top Plate (3)
  - b. Move the Nuts (4) up or down as necessary and tighten.
  - c. Tighten the Nuts (6) on the upper side of the Top Plate (3).
  - d. Level the machine again using Level (2).
5. Tighten the Nuts (7) on the Bottom Plate (8).
  6. Usually, the machine is supplied with the Upper Punch Holder (9) already installed. If not, install the Upper Punch Holder (9) on the underside of the Top Plate (3) as follows:



- a. Check to make sure the Pressure Release Valve (10) on the Hydraulic Pump (11) is closed.
- b. Using the Pump Handle (12) pump pressure until the Hydraulic Piston (13) is all the way out.
- c. Slide the Upper Punch Holder (9) over the Hydraulic Piston (13) making sure the open side of the Upper Punch Holder (9) is facing you.
- d. Fasten the Upper Punch Holder (9) to the bottom side of the Top Plate (3) by tightening the three Allen screws (14).



e. Now, release the pressure by opening the Pressure Release Valve (10).

NOTE: This procedure allows perfect alignment of the piston and the upper punch holder.

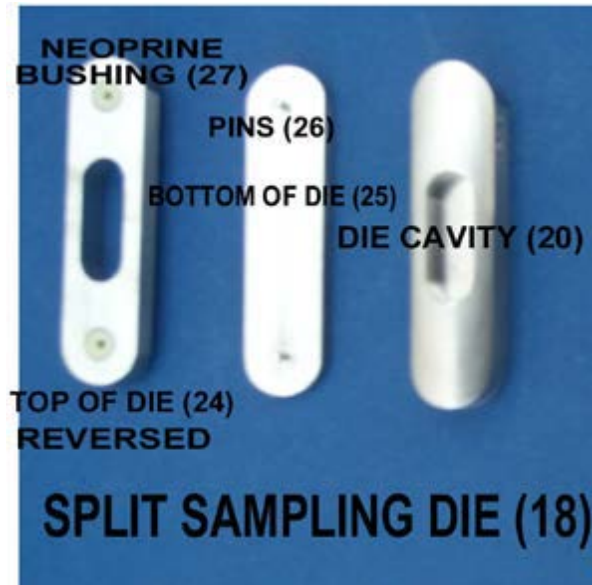
## OPERATION:

1. Loosen the Nylon Retaining Screws (15) on the side of the Upper Punch Holder (9). If there are three screws provided, remove the bottom most one and save it as a spare part. Otherwise, this bottom most screw may obstruct the punch from going down.
2. Insert the Upper Punch (16), which is actually the lower punch on a regular tablet press, into the Upper Punch Holder (9) and tighten the top two Nylon Retaining Screws (15) to retain the punch in place.
3. Place the Compaction & Ejection Block (17) on the Bottom Plate (8) directly under the tip of the Upper Punch (16).

### COMPACTION & EJECTION BLOCK (17)



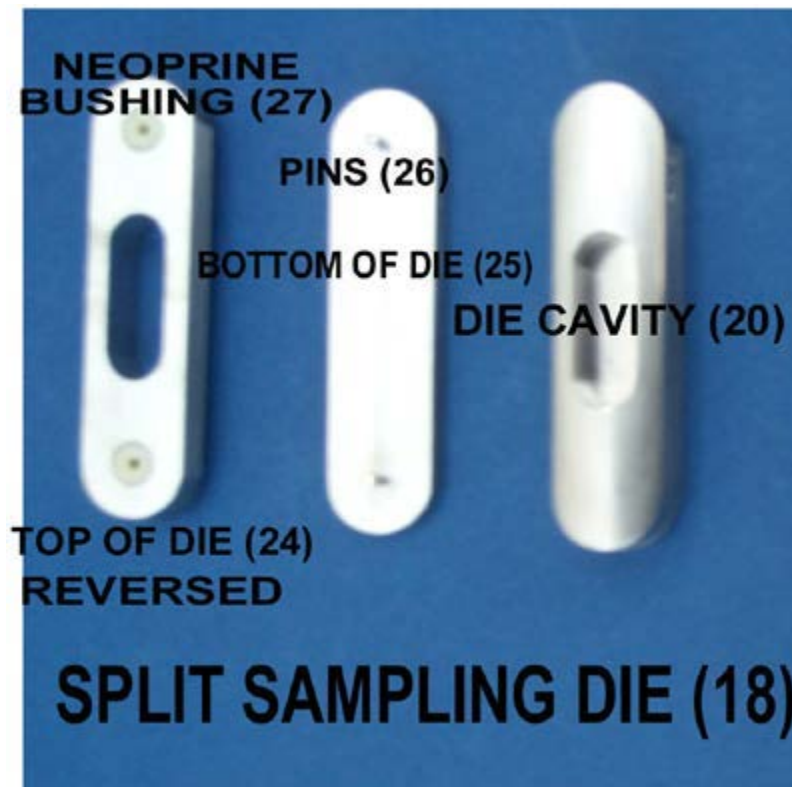
4. Insert the Split Sampling Die (18) with powder sample into the Die Receiving Pocket (19) of the Compaction Block (17). NOTE: If the Split Sampling Die (18) goes tight inside the Die Receiving Pocket (19), loosen the screws on the top face of the Compaction Block (17).



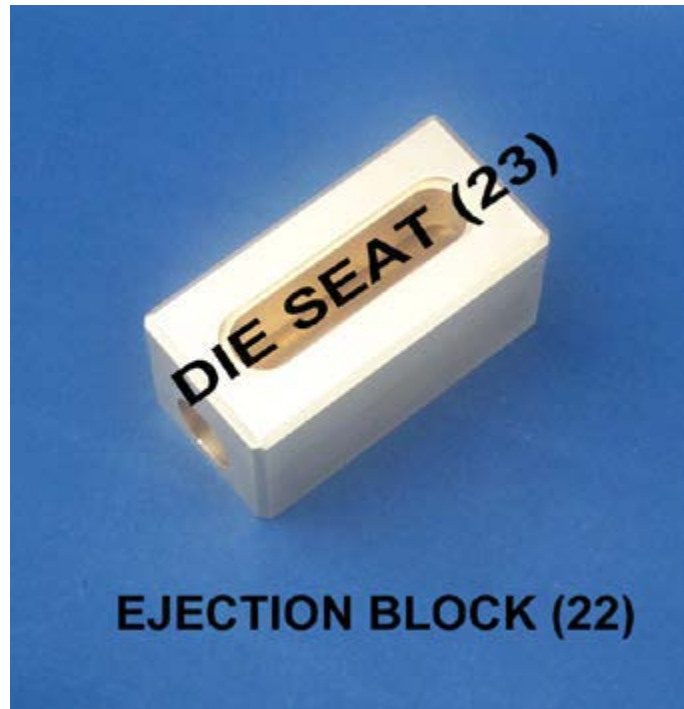
5. Close the Pressure Release Valve (10) on the Hydraulic Pump (11).
6. Manually push the Upper Punch (16) down with your fingers until the tip of the punch enters the Die Cavity (20), while moving the Compaction Block (17) slightly for alignment. This step allows alignment of the Upper Punch (16) with the Die Cavity (20).
7. Start pumping the pressure using the Pump Handle (12) until desired pressure is achieved, as observed on the Pressure Gauge (21).
8. Release the pressure by slowly opening the Pressure Release Valve (10). (If it is opened to quickly, oil will be released as well.)
9. Loosen the Nylon Retaining Screws (15) and push the Upper Punch (16) up with your fingers and tighten the Nylon Retaining Screws (15) back.



10. Remove the Split Sampling Die (18) from the Compaction Block (17) and separate the Top of Die (24) and Bottom of Die (25) by pulling them apart with fingers.



11. Place the Ejection Block (22) on the Bottom Plate (8) directly under the tip of the Upper Punch (16) with the Die Seat (23) facing up.



12. Place the Top of Die (24) with the compacted tablet from Step 10 on the Die Seat (23) of the Ejection Block (22).
13. Repeat Steps 5 and 6.
14. Start pumping pressure using Pump Handle (12) until the tablet is ejected into the space inside the Ejection Block (22), and collect the tablet into a sampling vial.

### **CLEANING:**

1. Use validated cleaning procedures for cleaning the dies, punches and the punch holders. The Top of Die (24) and the Bottom of Die (25) should be apart when cleaned. The Rubber Bushings (27) should be removed from the Top of Die (24) by forcing them out and cleaned separately.

**CAUTION: Look under Punch Maintenance for proper maintenance of the punches to avoid rusting.**

2. If the Rubber Bushings (27) have to be replaced, use Santoprene Thermoplastic Rubber Tubing, FDA Grade, 1/16" ID, 3/16" OD, and 1/16" wall thickness. This part can be purchased from McMaster Carr and their part # is 51245K21.

## **CALIBRATION:**

The pressure gauge is calibrated against a standard load cell. The data are given below:

Pressure on the Gauge on MTCM, psi	Force at Punch Tip, lbs
600	461
1000	761
1500	1122
2000	1456
3000	2138
4000	2845
5000	3521

Slope for the above calibration data = 0.71 lbs/psi

Multiply the reading from the gauge by 0.71 to get the force in lbs.

## **MAINTENANCE OF HYDRAULIC PUMP:**

Please look at the Enerpac manual for maintenance of the Hydraulic Pump.



## **SOP FOR USING SPLIT DIES AND THE MANUAL TABLET COMPRESSION MACHINE**

1. Place the rectangular brass block on the bottom die plate directly in case of the smaller manual tablet compression machine (MTCM-II) or on the aluminium cylinder in case of the larger manual tablet compression machine (MTCM-I), making sure the solid side of the brass block is facing up.
2. Place the split sample die with the powder sample on the brass block.
3. Close the valve on the hydraulic pump.
4. Loosen the three Nylon thumb screws on the aluminium upper punch holder so that they are not in the way of the punch.
5. Insert the punch in the punch holder and tighten the top two Nylon screws by hand, making sure they are just tight enough to hold the punch in place. Do not tighten the lowest Nylon screw. This screw is used only when the punch is left in the punch holder and no compaction is anticipated. NOTE: Punch maintenance procedure is given at the end of this document.
6. Raise the brass block along with the split sample die with your left hand and let the punch tip enter the die cavity. This ensures proper alignment of the punch tip and the die cavity before applying hydraulic pressure.
7. While holding the brass block with your left hand with the punch tip inside the die cavity, apply hydraulic pressure until the pressure reaches the desired level, which is indicated on the pressure gauge.
8. Release the pressure by opening the valve on the hydraulic pump.
9. Loosen the Nylon screws on the punch holder, push the punch up and tighten the Nylon screws back.
10. Now, separate the two parts of the split die by hand. The top part of the die has the compressed tablet.
11. Place the brass block on the die table or the aluminium cylinder making sure the side of the brass block with cavity is facing up.
12. Place the top part of the die on the cavity on the brass block.
13. Close the valve on the hydraulic pump.
14. Loosen the Nylon screws on the punch holder.
15. Raise the brass block along with the top part of the die with your left hand until the tip of the punch enters the die cavity.
16. With your right hand, apply hydraulic pressure until the tablet is ejected out into the cavity on the brass block.
17. Open the hydraulic pressure valve.
18. Loosen the Nylon screws, push the punch up and tighten the screws back.
19. Transfer the sample tablet to a sample vial.

### **REPLACING THE RUBBER BUSHINGS ON THE BOTTOM SIDE OF THE TOP PART OF THE SPLIT DIES:**

1. Remove the old bushings by simply prying them out with a small screw driver.
2. Insert the new rubber bushings and trim them to be flush with the surface of the die.

## **PUNCH MAINTENANCE:**

Tablet punches are not made of stainless steel; instead they are made of tool steel, which will rust if it is exposed to water or moisture for a prolonged period of time. That is why we ship the punches greased. We do not make these punches; we have them made by a reputable tablet tooling manufacturer in USA.

Here is the procedure you need to follow so that the punches do not rust:

1. Whenever punches are not used, smear them with food grade grease or mineral oil and store them away from moisture.
2. Wipe the grease or mineral oil off the punches and clean with alcohol (isopropyl alcohol or denatured ethanol) thoroughly before using.
3. After use, wash with water (**CAUTION: DO NOT SOAK IN WATER**) and immediately rinse thoroughly with alcohol, wipe dry, and apply grease or mineral oil and store them away from moisture.