

LECO Rockwell Hardness Tester

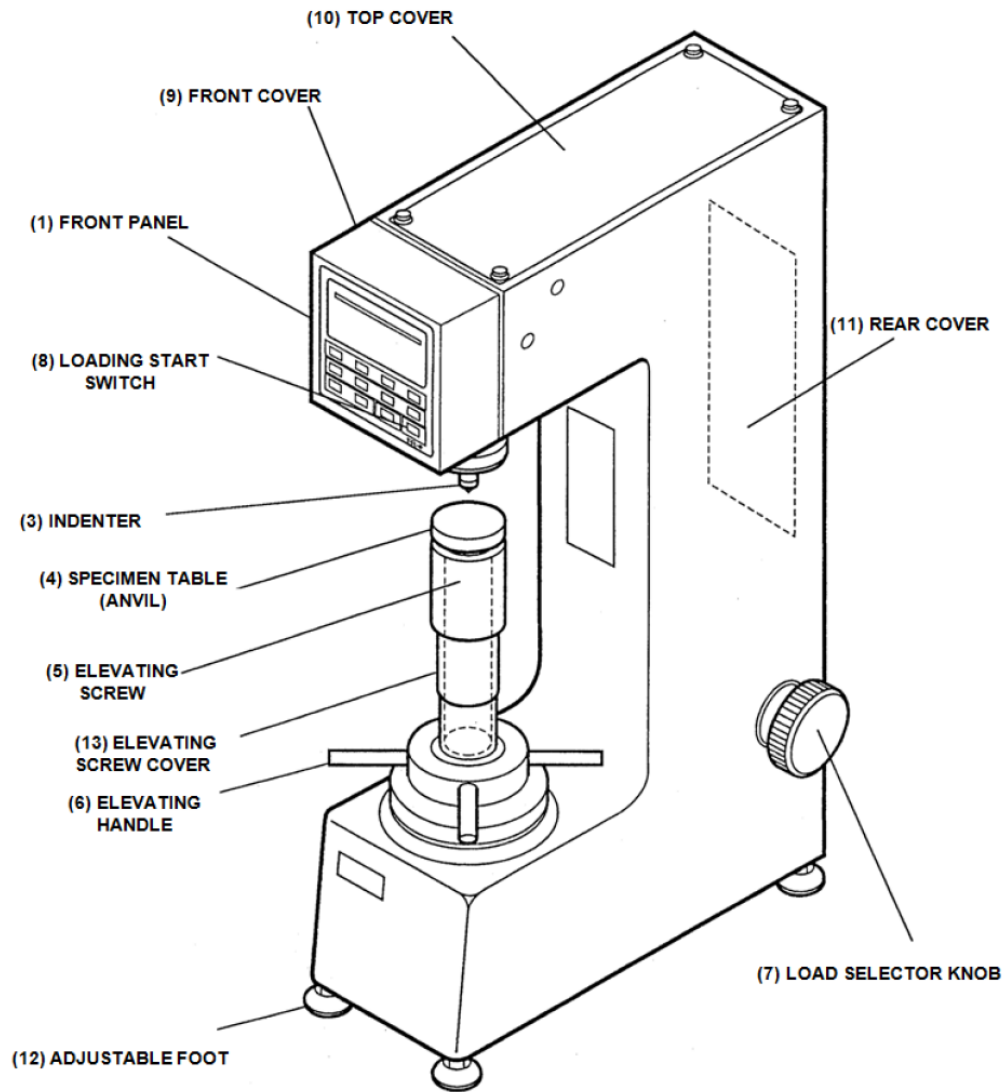


Figure 2-9
External Parts Identification

General Procedures

Part 1: Adjusting Settings

1. Switch on the power supply located on the rear of the machine.
2. Select and attach appropriate indenter tip and anvil.
 - a. Changing the indenter
 - i. When attaching an indenter, first loosen the thumbscrew.

- ii. Insert the indenter with the tip facing down and flat side facing the thumbscrew.
 - iii. Lightly tighten the thumbscrew until it is screwed all the way in
 - iv. Rotate the indenter 90° counter-clockwise
- b. Changing the anvil
- i. Remove the unwanted anvil by lifting it up
 - ii. Insert desired anvil and lightly press down into place
3. Select **R** (rockwell) or **S** (surface) by rotating the minor load selector knob

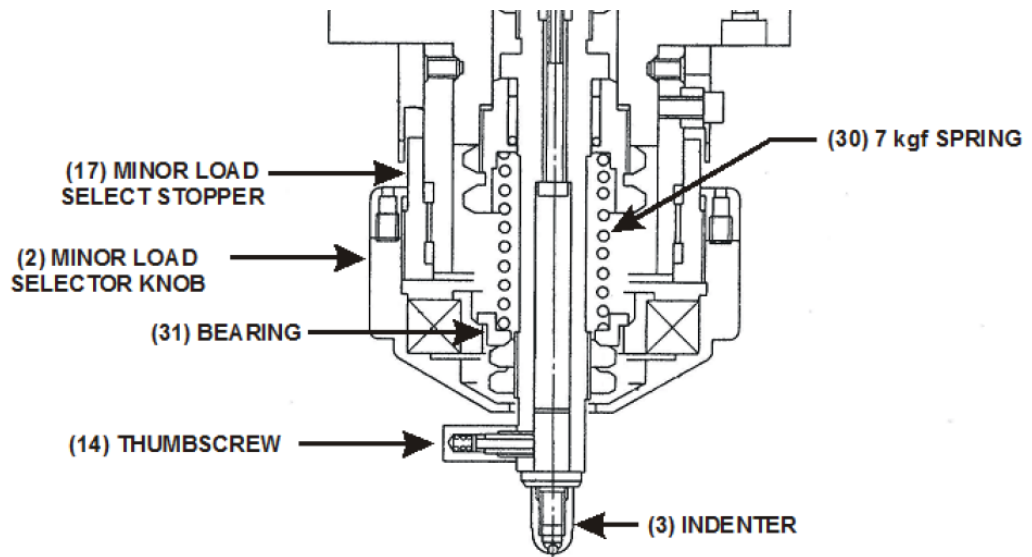


Figure 2-11
LR-300T Minor Load Selector

4. Select the measurement mode by pressing the “D/B” button

Indenter Type	Mode
Diamond	HRC
Ball	HRB

Minor Load Indicator

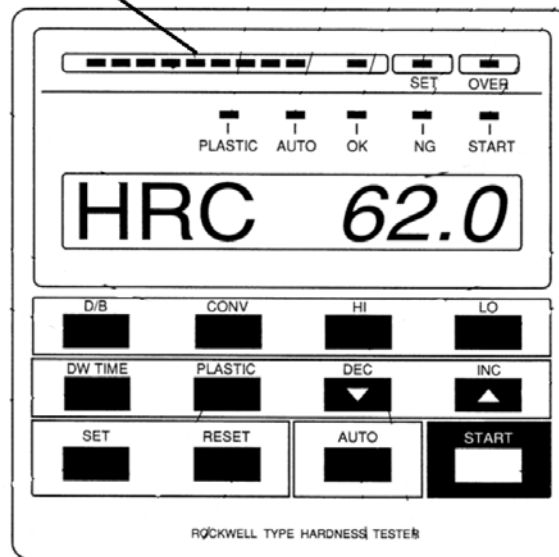


Figure 3-1
Front Panel Controls

5. Press the AUTO button (a green light should light up above the “Auto” near the display)
6. Set the test load by using the knob on the right side of the machine
7. Set the dwell time. Units are in seconds and recommended setting is 2 sec
 - a. Press DW TIME button (LDT should be displayed on the screen)
 - b. Adjust it with the INC (increase) and DEC (decrease) buttons
 - c. Then press SET

Part 2: Evaluating the calibration

1. Collect the appropriate standard
 - a. Ensure the standard is within the load range and the correct mode
 - i. Range and mode of the standard can be found on/inside the box and etched on the side
2. Place the standard on the anvil
3. Press the RESET button to ensure the machine has been zeroed
4. Rotate the elevating handle clockwise until it is close to the indenter tip.

5. Locate an area of the standard that is free of indentations
 - a. General Rule of thumb is to find a spot that is 2.5 times the width of the indentation away from the nearest indentation and/or edge
6. Then SLOWLY keep rotating the elevating handle. You will observe the the minor load RED LEDs lighting up. Keep going until the GREEN LED above the SET indicator on.
 - a. In the case that you exceed the set load, a red LED will be turned on above the OVER indicator and you will have to redo the measurement on another spot.
7. Machine will automatically take the measurements. Allow a few seconds for the result to be displayed.
 - a. In the case that it does not do it on its own, go back and make sure it is on the AUTO setting
8. Conduct 2 to 3 indents to allow for seating
9. Then conduct and record 3 indents. Then take the average of the results and compare to the standard's known hardness values
 - a. Measurements should be within the allowed range of the standard
 - b. If the results are not within the allowed range, double check if you are using the appropriate settings, indenter, and anvil. In the case that the problem persists then contact the lab manager.

Part 3: Measurements

1. Place the specimen on the anvil
2. Rotate the elevating handle clockwise until it is close to the indenter tip.
3. Locate an area of the sample that is free of indentations
4. Then SLOWLY keep rotating the elevating handle. You will observe the the minor load RED LEDs lighting up. Keep going until the GREEN LED above the SET indicator on.
 - a. In the case that you exceed the set load, a red LED will be turned on above the OVER indicator and you will have to redo the measurement on another spot.
5. Machine will automatically take the measurements. Allow a few seconds for the result to be displayed.

- a. In the case that it does not do it on its own, go back and make sure it is on the AUTO setting
6. Conduct 2 to 3 indents to allow for seating
7. Then conduct your measurements.
 - a. Recommended you conduct at least 3 measurements

Best Practices

- Make sure the specimen, anvil, and indenter tip are clean and stable.
- Before conducting any measurements make sure the reading of the machine is 0.0. If it is not press the RESET button to zero the machine.
- Do not overtighten the thumbscrew. It should be tight enough to hold it in place but loose enough to allow for the indenter to be removed without loosening.
- Never allow for the screw cover and anvil to make contact.
- Ensure the indenter is not damaged or chipped
- Use the Regular Rockwell Scales Chart shown on pg 6

<u>SCALE</u>	<u>INDENTER</u>	<u>LOAD (KGS)</u>	<u>APPLICATION</u>
A	DIAMOND	60	CEMENTED CARBIDES, THIN CASE HARDENED PARTS, THIN GAUGE STEEL
B	1/8 IN. BALL	100	UNHARDENED CARBON STEELS, COPPER AND ALUMINUM ALLOYS, MALLEABLE IRON
C	DIAMOND	150	STEEL, HARDENED STEEL, CASE HARDENED STEELS, PEARLITIC CAST IRON, TITANIUM AND OTHER MAT'LS HARDER THAN B100
D	DIAMOND	100	THIN STEEL SHEET MATERIAL, MEDIUM CASE HARDENED PARTS
E	1/8 IN. BALL	100	CAST IRON, BEARING MATERIAL, ALUMINUMS AND MAGNESIUM ALLOYS
F	1/8 IN. BALL	60	THIN, SOFT STEEL MATERIAL, ANNEALED COPPER ALLOYS
G	1/8 IN. BALL	150	MALLEABLE IRONS, PHOSPHOR BRONZE, BERYLLIUM COPPER
H	1/8 IN. BALL	60	ALUMINUM, LEAD AND ZINC
K	1/8 IN. BALL	150	BABBITT MATERIAL, LEAD-TIN ALLOYS, GRAPHITE, BEARING MATERIAL, VERY SOFT AND THIN MATERIAL
L	1/8 IN. BALL	60	
M	1/8 IN. BALL	100	
P	1/8 IN. BALL	150	
R	1/2 IN. BALL	60	
S	1/2 IN. BALL	100	
V	1/2 IN. BALL	150	

SUPERFICIAL ROCKWELL SCALES

<u>MAJOR LOAD (KGS)</u>	<u>N DIAMOND</u>	<u>T 1/8 IN. BALL</u>	<u>W 1/8 IN. BALL</u>	<u>X 1/8 IN. BALL</u>	<u>Y 1/2 IN. BALL</u>
15	15N	15T	15W	15X	15Y
30	30N	30T	30W	30X	30Y
45	45N	45T	45W	45X	45Y

Form Number 169-228

Consumables

Part Name	Part Number
Flat Anvil	863-242
9mm Spot Anvil	863-245
V-Shaped Anvil	863-243
Diamond Indenter (Rockwell Type)	989-101-968
Carbide Ball Indenter (1/16 inch)	862-414
HRC Low Range Test Block 20-30	861-870
HRC Mid Range Test Block 35-55	861-872
HRC High Range Test Block 59-65	861-873
HRBW Test Block 40-59	862-407
HRBW Test Block 60-79	862-408
HRBW Test Block 80-100	862-409

Maintenance Information

Instrument Name and Model	LECO CR-3E (or CR-300)
Customer Number	141434
Serial Number	FRT50081