MANUAL DE USO DUROMETRO ROCKELL HR-150A

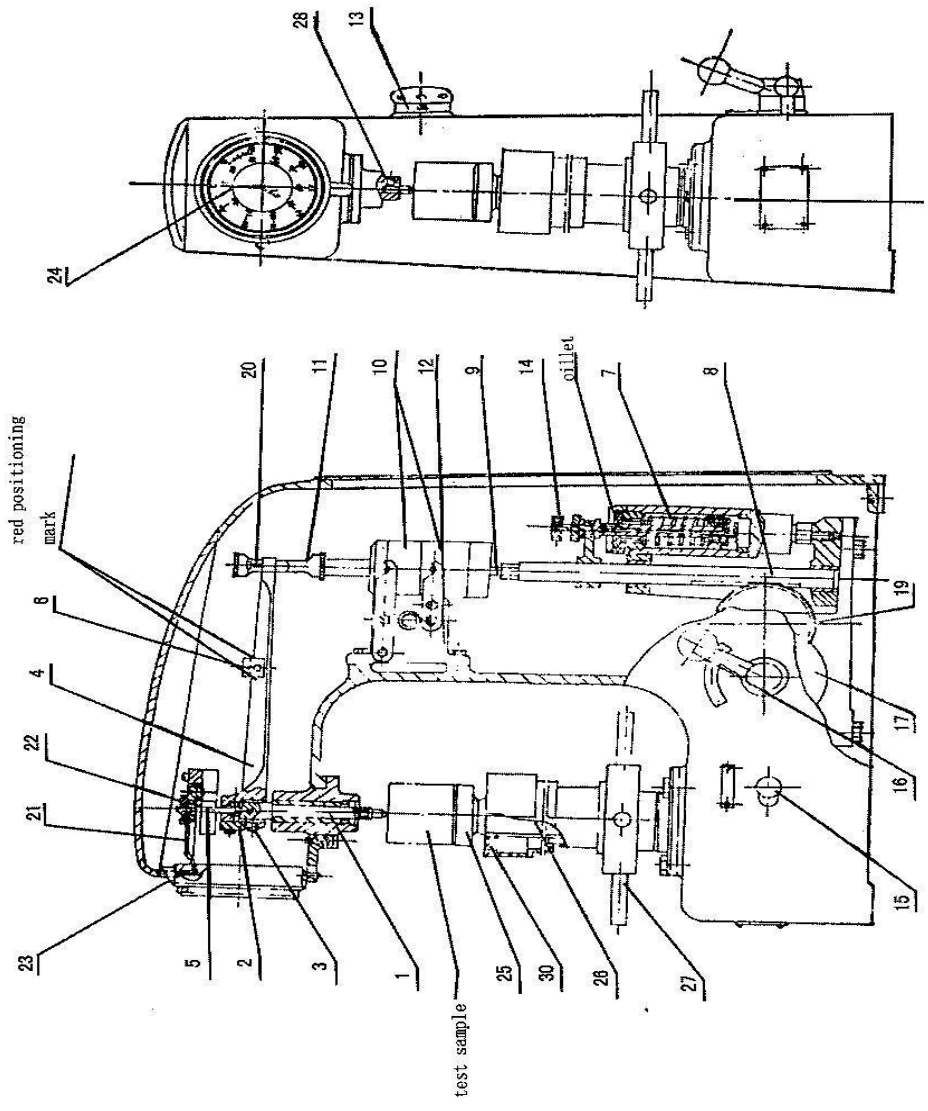

Fig. 1

clean machine oil and meanwhile push and pull many times the handles (15) (16) to get the piston up and down time and again, and exhaust the air completely from the buffer till the piston drops to the bottom and oil overflows from it.

6. Use the standard test block supplied with the tester to check periodically the accuracy of the hardness tester.

1) Clean the anvil and the standard block and carry on test with the working surface of the block. It is not allowed to test with its supporting surface.

2) If the error of the indicated value is rather big, besides checking according to the item 4 of this chapter, check whether the supporting surface of the standard test block is with burrs. If in this case, polish it with oil stone.

3) If testing on a standard block in different positions, the block should be pulled on the surface of the anvil and not taken off from the anvil.

penetrator, please read off the black figures outside the panel circle while testing with steel ball penetrator read off the red figures inside the panel circle.

7) Rotate the handwheel to get down the test sample and then move it away. Start new test according to the procedures from 2) to 6) as mentioned above.

8) The screw protective jacket (30) aims to protect the screw (26) from dust invasion. When the tester is not in use or the height of the test sample is less than 80mm, the jacket should be placed outside the screw. If the test sample is higher than 80mm, it must be taken off to avoid the anvil being supported up and the test being invalid.

VI MAINTENANCE OF THE HARDNESS TESTER

1. If the tester is not in use for a long time, it should be covered with a dustproof cover.

2. Fill priodically some machine oil on the contacting surface of the screw (26) and the handwheel (27).

3. Before use of the tester, make clean the top surface of the screw (26) and the up end surface of the anvil.

4. If the hardness value indicated is found too big in error:

1) Remove the anvil and check whether its surface contacted with the screw is clean.

2) Check whether the protective jacket supports up the anvil.

3) Check whether the penetrator is damaged.

5. When applying main test force, the indicator pointer rotates too fast at beginning and then slowly, it means that the machine oil in the buffer is too less. In this case, lift up the felt gasket on up end of the buffer (7), fill in slowly

2) Selection of test force:turn handle (13) to get the selected test force align with the red mark. It should be noted that when changing test force, the handle (16) must be at release state (i.e placed at the back limit position).

3) Penetrator installation: when installing, pay attention to it to eliminate the clearance between the penetrator and the end surface of main shaft (1). Eliminating method is: put on penetrator and fix it lightly by screw (28), then place the standard block or workpiece on the anvil, turn handwheel (27) and apply preliminary test force, pull handle (15) to apply main test force to penetrator and then fasten screw (28), thus the clearance between the penetrator and the end surface of the main shaft is eliminated.

2. Test procedure:

1) Make clean the top surface of screw (26) and both up and down surfaces of the selected anvil, place the anvil on screw (26).

2) Make clean the contacting surface of the test piece and place it on the anvil, turn handwheel (27) to lift the anvil slowly to support up the penetrator till the small pointer points at the red mark and the big pointer turns 3 circles and stops vertically. (It is allowed to have a error of ± 5 graduations. If it exceeds 5 graduations, this point should be invalid and do a new test again.)

3) Rotate the outer shell of the indicator (24) to get the long carved line between C and B align with the big pointer (it is OK to rotate clockwise or anticlockwise).

4) Pull handle (15) to apply main test force, at this time the big pointer of the indicator rotates anticlockwise.

5) When the indicator pointer stops clearly, push back the releasing handle (16) to release the main test force. Please take care that the applying and releasing of the main test force should carry on slowly.

6) Corresponding readings in the indicator, When testing with diamond

6) Loosen nut (13), dismantle the croocked screw (12) and take off the weight fixing plate (14).

7) With hand holding hoisting ring (10) to lift up slowly weight group (17) and meanwhile take out the weight fixing support block (18), then put down lightly the weight group(17) to let the weight cylindrical pin (15) falling down into the groove of the support plate (16) to support the weight.

8) Untie the fastening rope of the small lever (4).

9) Rotate handwheel (1) to make the screw (2) descending and take out the penetrator pad (3).

2. Remove the protective jacket (30), use kerosene to clean away the antirust oil on the screw and handwheel, then fill some lubricant in the contacting place of screw and handwheel, put on the screw jacket again.

3. Check whether the adjusting block (6) of the large lever (4) is between the two red marks, otherwise reassemble it onto its right position.

4. Mount the big anvil onto the up part of serew (26) and place the leveler on it, put in some wedges or spacer under the tester to get in within the horizontality of 0.2/1000.

V OPERATING METHOD (see Fig.1)

1. Preparation before test:

1) Adjust the loading speed of the main test force: place the handle (16)at unloading position, turn handle (13) to 1471N position, place the hardness block of HRC40 50 on the anvil, turn handwheel (27) to make the hardness block to raise the main shaft, apply preliminary test force, pull handle (15) and apply main test force, observe the big pointer of the indicator and the time from beginning to rotate till stop should be within 4 to 8 seconds. If not, turn oil pin (14) to adjust time and again till suitable.

Handle (15) is used to apply main test force while handle (16) is used to release it. When handle (15) is pulled, can (17) can gear (19) begin to rotate, the rack shaft (8), push rod (9) and the buffer piston follow to descend, at the same time the handle (16) rotates anticlockwise. When the hoisting ring (11) is supported by the small knife (20) which is attached to the end of the large lever during its descending, the main test force acts stably at the penetrator through the large lever. When handle (16) is pushed back clockwise, the main test force is released.

The measurement indicating mechanism consists of push rod (5), small lever (21), adjusting plate(22), connecting rod (23) and indicator (24). When the workpiece is lifted up and the penetrator is pushed up, the push rod(5)pushes up the small lever(21) to get the pointer of the indicator rotating via connecting rod (23).

The workpiece supporting mechanism consists of anvil (25), screw (26) and handwheel (27), etc.

Ⅳ INSTALLATION OF THE HARDNESS TESTER

1 Case opening(see Fig.2):

1) After removing the top cover and all around plates of the packing case, dismantle the four fastening screws at the bottom of the machine, install the tester in a dry and clean room where there are no corrosive gases and vibration. The bench for installing the tester must be rigid and a bore with diameter over ϕ 50mm is made on the bench for screw passing.

2) Check the completeness of the spare parts according to the packing list.

3) Open the top lid (6) and back lid (19).

4) Loosen nut (8) and remove the crooked screw (9).

5) Take off the fixing press block (7) of the large lever and the fixing support block(11).

Ⅲ| DESCRIPTION OF MECHANISM

The hardness tester consists of machine body, loading mechanism, measuring indicating device and workpiece support (see Fig.1).

The machine body is of closed shell type and all the mechanisms, except the anvil, screw and control handle, are all built in. So it is easy to keep clean.

The loading mechanism consists of main shaft, levers, weights, knives, buffer, weight exchanging mechanism and control handle.

The preliminary test force is mainly produced by the weight of main shaft (1), round knife(2), long rhombic knife(3), large lever(4), small lever(21)and push rod(5)as well as the measuring pressure of the indicator(24). When the workpiece contacts the penetrator and continues to go up to get the large and small levers to horizontal position(the small pointer of the indicator points to the red mark and the big pointer is vertically upward), the penetrator thus receives 98.07N preliminary test force due to the weights of the levers and the measuring pressure of the indicator.

The total test force consists of the main test force (produced by the weights) and the preliminary test force. Two weights(10)and hoisting ring(11) are equipped on the buffer(7), rack shaft(8)and push rod(9). When pulling handle(15)to get the piston of the buffer coming down, rack shaft(8), push rod(9), hoisting ring(11)and weights(10)come down also. Therefore the weight of the weights(10)and hoisting ring(11)apply at large lever(4) to get the total test force to the penetrator.

Weight exchanging frame(12)is built in the machine body and when turn the exchanging handle(13)to different positions, the required three different test forces of 1471N, 980.7N and 588.4N can be achieved.

Adjustment of the oil pin(14)can keep the applying of the main test force at a specified speed and avoid impact.

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I APPLICATION RANGE

When measuring, please select penetrator and total test force according to the following table.

Scale	Penetrator	Total Test Force N(kgf)	Symbols Measuring Range
B	ϕ 1.588mm steel ball	980.7(100)	HRB 20–100
C	120° diamond	1471(150)	HRC 20–70
A	120° diamond	588.4(60)	HRA 20–88

Scale A: It is used for measuring the metals, the hardness of which is over HRC 70(such as tungsten carbide alloy, etc.)and also for measuring hard sheet materials and surface quenched materials.

Scale C: It is used for measuring the hardness of heat treated steel parts.

Scale B: It is used for measuring softer or middle hard metals and unquenched steel parts.

II MAIN TECHNICAL DATA

1. Preliminary test force ····· 98.07N(10kgf)
2. Total test force ····· 588.4N(60kgf), 980.7N(100kgf), 1471N(150kgf)
3. Graduation of indicator ····· C: 0–100; B: 30–130
4. Max. height of specimen ·····80mm with screw protective jacket
   170mm without screw protective jacket
5. Depth of throat ····· 135mm
6. Overall dimensions ····· 466 × 238 × 630mm
7. Net weight ····· 65kg

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