

LANGRY®

LR-M Series
Pull-out Anchor Tester
Operating Instructions



PREFACE

Your choice of the products made by Jinan Langrui Detection Technology Co., Ltd. (LANGRY) is greatly appreciated. We are committed to deliver you excellent products and satisfied sales services. Please carefully read the instructions prior to use.

1. The instructions are prepared to provide the correct and complete descriptions of related products and data.

However, we do not guarantee that there are no errors or omissions. Therefore, we will not bear responsibilities for any resulting consequences.

2. Langry keeps the right of updating the instructions without prior notice.

3. Langry bears no responsibilities for possible losses from data deviation or incorrect testing conclusion arising from instrument failure and other errors.

4. When the instrument is put into operation, it means that you have carefully read and had full picture of all terms in the instructions, and you have fully agreed to all the terms in the instructions.

5. Langry will not bear responsibilities for all the signed agreements violating the statement during the sales and services process not involving Langry.

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1.Overview

1.1 Application and characteristics

The LR-M series Pull-out Anchor Tester, developed and produced by LANGRY are suitable for testing the anchoring force of anchor, rebar, expansion bolts and other anchorage body. These testers are one of the necessary to check the quality of anchor shank supporting projects.

The LR-M series Pull-out Anchor Tester is composed of hand pump, hydraulic cylinder, intelligent digital pressure gauge, HP hose, etc. The hand pump is designed with a single plunger and the pump body is made of hard aluminum alloy. For proper operation, it only requires a quick adaptor for connection between the hand pump and hydraulic cylinder. These testers have the characteristics of lightness, durability, compact structure, and convenient carrying.

The characteristics of the instrument are as follows:

- ◇ Segment LCD;
- ◇ Liquid crystal blue-ray lighting;
- ◇ Peak holding;
- ◇ Up to 500 data storage;
- ◇ Overloading protection assuring safe operation.

Applicable standards:

GB50367 Code for Design of Strengthening Concrete Structure

JGJ 145 Technical Specification for Post-installed Fastenings in Concrete Structures

1.2 Specification

Model Parameters	LR- M 1	LR- M 1.5	LR- M 2	LR- M 3	LR- M 4	LR- M 5
Hydraulic cylinder center hole	18mm	18mm	18mm	18mm	18mm	18mm
Hydraulic cylinder weight	2.2kg	2.2kg	2.2kg	2.2kg	2.2kg	2.2kg
Piston stroke	50mm	50mm	50mm	50mm	50mm	50mm
Measurement range	0~10 kN	0~15 kN	0~20 kN	0~30 kN	0~40 kN	0~50 kN
Resolution	0.001kN	0.001kN	0.001kN	0.001kN	0.001kN	0.001kN
Common anchorage	Ø6~12	Ø6~12	Ø6~12	Ø6~12	Ø6~12	Ø6~12
Pull rod	M12	M12	M12	M12	M12	M12
Converter	M6~10	M6~10	M6~10	M6~10	M6~10	M6~10

The LR-M series Pull-out Anchor Tester is illustrated below:

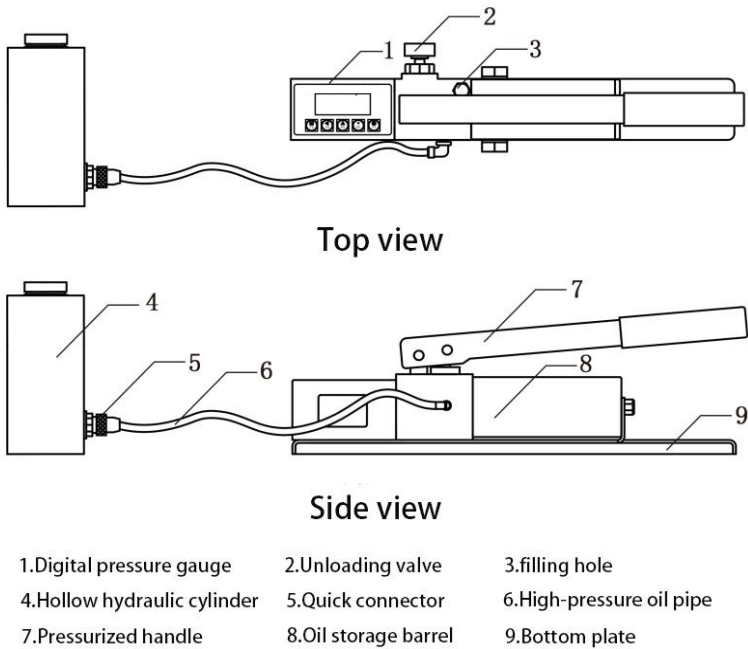


Fig.1

2. Operation Steps

2.1 Oil Level Inspection


In case that the hydraulic cylinder piston fails to fully retract to position, it should be first connected to the hand pump by high-pressure fuel pipe. Turn the pump-mounted unloading valve counterclockwise to return the hydraulic fluid in the hydraulic cylinder back to the oil tank of hand pump. Unscrew the oil filler cap from the front of the hand pump and check the oil volume. There should be 1/5 of the space in the oil tank. If the oil is not full, fill N32 wear-resistant hydraulic fluid.

Note: The distance between the oil surface in the oil filling hole and the upper surface of the pump body should be about 10mm.

2.2 Venting

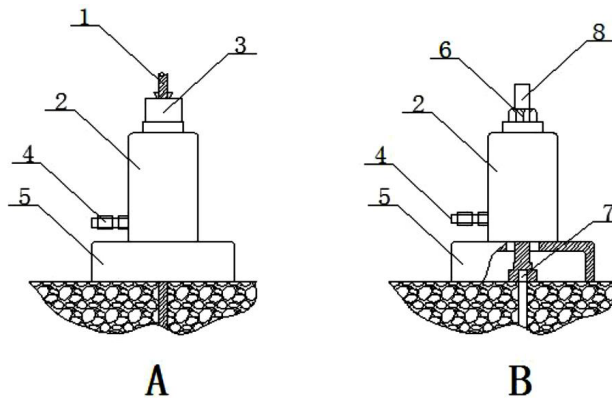
Air is usually mixed in the high-pressure fuel pipe, and hydraulic cylinder when the hydraulic system is installed. Air must be purged off to assure the normal operation of the hydraulic system. The method is: loosen the filler cap, place the hand pump slightly higher than the hydraulic cylinder, tighten the unloading valve clockwise, press the hand pump to make the piston of the hydraulic cylinder extend to the maximum stroke, and then open the unloading valve to make the piston retract. Repeat the above steps for several times.

2.3 Digital pressure gauge inspection

Press  and hold the pressure gauge for 1 second to start up, and the instrument will automatically jump to the force measurement interface after self-test for 2 seconds. Since it will affect the use of the meter when the battery voltage is too low, please charge the battery in time when the battery power is displayed as a blank space. As the battery capacity is limited, switch off the gauge after use to extend the life of battery.





3. Anchor test

Connect the high-pressure fuel pipe quick connector to the oil cylinder inlet when using the LR-M series Pull-out Anchor Tester. As illustrated in Fig. 2, connect the oil cylinder and the anchor to be measured. Complete connection as illustrated in Fig. A in case of anchor made of deformed rebar. For round steel anchor with exposed thread, perform connection as illustrated in Fig. B. This instrument comes standard with 4 types of anchors of $\text{Ø}6 \sim \text{Ø}12$ specifications, 3 types of converter of M6-M10 specifications and M12 extension rods.



- | | | |
|----------------------------------|---------------------------|-------------|
| 1.Measured anchor (Deformed bar) | 2.Hydraulic cylinder | 3.Anchorage |
| 4.Oil inlet | 5.Reaction pressure plate | 6.Nut |
| 7.Measured anchor(Anchor bolt) | 8.Extension rod | |

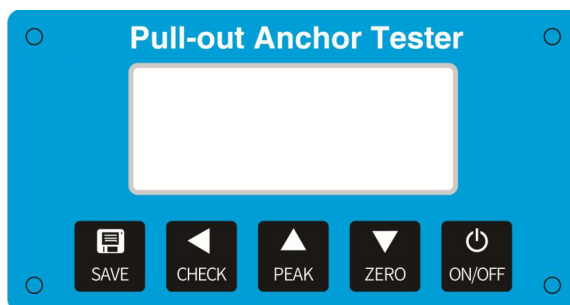
Fig.2

Tighten the unloading valve clockwise. Slowly press on the hand pump to release the piston rod for about 10mm so as to prevent piston rod damage arising from hammering the wedge for installation of anchorage device, and help anchor retraction. Install the anchorage devices or nuts for the anchor shank and secure them properly. Press  to turn on the intelligent digital pressure gauge, press  to turn on the peak switch, the word "peak" appears in the upper left corner of the LCD, and then press  to clear the current pressure. At this time, it can be detected. Press the hand pump evenly, increase the pressure until it reaches the maximum value and maintain it. Stop pressurizing, the value displayed on the gauge is the maximum tensile strength of the rebar, record or press  to save the pressure gauge data and then turn off the power.






After testing, unscrew the unloading valve so that the piston can automatically retract to position. In case of the need for disassembly at a condition as illustrated in Fig. 2A, hammer the casing of anchorage device to allow disengagement of clamping piece from the casing, and then remove the hydraulic cylinder. In case of the need for disassembly at a condition as illustrated in Fig. 2B, unscrew the nuts before removal of hydraulic cylinder.

4.Intelligent Digital Pressure gauge operation description

Digital pressure gauge LCD panel




4.1 Key description

Content	Function description
	Under measurement: press on the key to start view. Under check: press on the key to return to measurement. Under password and setting: move the modified bit under change.
	Under calibration: press on the key to set the measurement as the calibration point value. Under setting: press on the key to save change made to parameter. Under measurement: press to save the pressure value. Under check: press to hold for 2 sec. to delete all records on pressure values. Under password: press to go to the calibration process if password is set at 1111. Otherwise, it is not working.
	Under measurement: enable or disable the peak status. Under check: go to view the previous record. For parameter change under password and setting: increase the parameter changed.
	Under measurement: press and hold for 2 sec. to clear measurements, and set the current measurement as zero Under check: go to view the next record. For parameter change under password and setting: decrease the parameter changed.
	Under any circumstance: press on the key to switch on/off the instrument.


4.2 Operation status



The instrument provides 5 display statuses, which are appropriately marked in Chinese in the top left corner of LCD, i.e., measurement, check, password, parameter, and calibration.


4.3 Operation Description

◇ Press  to switch from the measurement to check, or vice versa. There is a two-row display under measurement, and one-row display under check.

◇ Under measurement, in case that the measured value is beyond “99999”, “-oL” indication and peak record of “99999” will show.

◇ In case that measurements are not more than the set point with in the range of the permissible zero clearing under measurement, press on  to clear the measurements, and set the current measurement as zero.

◇ It is possible to view stored data records under check, and scroll to view all records by means of press on  and .





◇ Press and hold  for 2 sec. under check to delete all recorded data and return to the measurement.

◇ The battery of this machine is 4.2V lithium battery. Please use the supplied adapter and connect the charging plug to the charging hole on the side of the instrument when charging.

4.4 Instrument calibration


Calibration setting is protected by password (the password is 1111). Pressure calibration status can only be accessed to with a correct password. Carry out shut down to exit the system in response to

entrance by mistake!

Step: ① Access the password status by pressing to hold the  key, and then enter password 1111. Press  to enter in to the calibration status. ② The instrument provides “0%” indication at the top row. Now, ensure that the instrument is not pressurized, and the standard dynamometer reading is zero. The instrument provides “100%” reading at the top row in response to press on . Now, start pressurization with hand pump until the standard dynamometer reading arrives at the full-scale pressure of the instrument. Press  to complete calibration at 100% scale point. After calibration, the instrument automatically exits the calibration status. The calibration accuracy can be maintained despite power-off. Repeat the steps above if the accuracy re-measurement is still unsatisfied, or carry out the segment data correction (Section 4.5). Since the instrument adopts high-precision sensors and high-precision AD chips, the measurement data has a good linearity. Generally, it can meet the requirements of conventional detection without data correction. Therefore, the functional description of the data correction can be ignored.

4.5 Date correction

Principle of data correction: when the sensor input signal arrives at the instrument, make comparison with the standard conversion value at each data point in the line chart in the order of conversion values, and then obtain corresponding measured value at the line chart in the appropriate zone. Following the calibration of measured value, automatically start the data correction.


Under password status, enter 3333, and press on  to go to the data correction status. A data point requiring correction in any zone is available by






and



key. Start pressurization with hand pump. When the

pressure value corresponds to a data point, press on  to save the current data point.

Take LR-M1 pull-off anchor tester as an example. The tester is configured for a full-scale of 10KN. In response to data correction in a range of 1-2KN, the instrument shows 0% after accessing the data correction status. Press on  to vary to 10%. Start pressurization to 1KN in the standard dynamometer. Press on , and the instrument shows 20%. Then, start pressurization to 2KN in the standard dynamometer, and press on . Now, reboot the instrument to end correction.

5.Common troubleshooting

Failure	Causes	Solutions
No pressure reading in pressure gauge	Oil deficiency in oil tank	Open the filling valve to refill
	Unloading valve not tightened	Tighten clockwise
	Adapter leak	Tighten the adapter
	Hand pump not horizontally installed	Start pressurization when it is horizontally aligned
	Pressure gauge damage	Remove for repair or calibrate
Expected pressure not reached	Oil deficiency in hand pump	Refill
	Adapter leak	Check the adapter and seal ring
	Use of incorrect oil or contaminated oil	Oil change
Hydraulic cylinder leak	Seal ring breakdown	Change seal ring
Pressure gauge reading dropping sharply	Serious leak at adapter	Tighten or replace seal ring
	Sealer breakdown	Replace with similar seal ring
	Oil contamination	Clean the oil tank, pump, hose and oil cylinder with kerosene, followed by oil change
	Each check valve not properly	Return to manufacturer for repair

	sealed	
Pressure gauge reading in place, but no pressure in hydraulic cylinder	Hose plugging	Clean the hose
	Adapter plugging	Clean the adapter

6. Safety warning

1. The pull-out anchor tester operators shall have full understanding of the instrument structure, and carefully read the manual before use.
2. Before use, the dynamometer shall be subject to loading with air compressor. No use when finding any abnormal condition.
3. For safety reason, nobody is allowed to stand around the oil cylinder across the drawing test.
4. Hydraulic pump operators shall increase pressure slowly.
5. The valve in the hydraulic pump has been set prior to delivery. No adjustment is allowed without permission.
6. Stop operation to make check should leak is found during operation. Carry out troubleshooting before reuse.
7. Fill the oil tank with clean N32 wear-resistant hydraulic fluid. Do not overfill. An appropriate space in the hose (about 1/5 space) can facilitate air removal.

7. Precautions

1. The tester must operate within the limit, i.e. max. 50KN for LR-V5. Otherwise, permanent damage may occur.
2. Keep the hydraulic system clean. After the operation of oil cylinder, unscrew the hand pump unloading valve to retract the piston. Frequently grease the ID and OD of piston rod to

prevent rust. The nozzle adapter shall be protected from dust and collision.

3. Put the oil cylinder on a solid ground so that it can sustain pressure vertically. Operation beyond the specified stroke is prohibited.
4. The hydraulic oil filled should be clean.

8.Package, transport, and storage

The LR-M series Pull-out Anchor Tester is packaged in a plastic sealed box. together with operation manual, certificate of conformity, packing list, attachments, etc. Please carefully check to avoid omission. The tester in container may be shipped in the common mode of transport. Provisions shall be made to prevent overspill and exposure to bad weather during shipment. Store the tester in a well-ventilated place free of exposure to bad weather.

9. Accessories and Warranty

The tester is typically delivered complete with:

1. One hydraulic cylinder
2. One hand pump
3. A total of 4 Ø6- Ø12 anchors
4. Three adapters(M6、 M8、 M10)
5. One M12 extension rod
6. Operation manual and certificate of conformity

The product is guaranteed for one year under the specified conditions of use and maintenance for life. If there is a problem with the product, please contact us in time.

Manufacturer warranty

LANGRY guarantees that the tool is free from defects in materials and manufacturing processes when it leaves the factory, and the warranty is valid only if the user correctly installs, operates, maintains and cleans the tool in accordance with Langry's operating instructions.


The warranty covers the free replacement or repair of damaged parts during the whole service life of this tool. If the parts need to be repaired or protected due to normal wear and tear, they are not covered by the warranty.

Other claims are not covered by the warranty unless there is a different provision under the specific law of the customer's country. In particular, langry shall not be liable for any direct, indirect, incidental or inevitable damage, financial loss or additional expenses caused by or related to the improper use or abuse of this tool. Expressly exclude implied warranties of merchantability and fitness for a particular purpose.

In case of repair or replacement, the tool or relevant parts shall be sent to Langry's market organization immediately after the failure is determined.

V1.2

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