

LAARMANN[®]

Innovators in Solids



LMC200 JAW CRUSHER USER MANUAL

Laarmann Group B.V.
Op het Schoor 6
6041 AV
Netherlands

info@laarmann.eu
www.laarmann.eu
webshop.laarmann.eu
+31 6 23 40 00 33

LMC200 JAW CRUSHER

Contents	Page
1 Safety information	4
1.1 Personal Protective Equipment (PPE)	4
1.2 Safety rules during unpacking and installation	5
1.3 Safety rules during operating	5
1.4 Safety rules during maintenance	5
2 Unpacking details	6
2.1 Before Unpacking	6
2.1 Unpacking	6
3 Transportation & Handling	7
3.1 General safety rules	7
3.2 Storage, Transportation and Handling	7
3.3 Storage	7
3.4 Transportation	7
3.5 Handling	7
4 Installation	8
5 Description	8
5.1 Technical specifications	8
6 Operation	9
6.1 Materials to be crushed	9
6.2 Before starting	9
6.3 Electrical connection	9
6.4 Daily operation	10
6.5 Workplace preparation	10
6.6 Opening the door	10
6.7 Placing the jaw plates and side liners	11
6.8 Setting zero point gap	11

LMC200 JAW CRUSHER

7 Maintenance	12
7.1 Lubrication	12
7.2 Jaw replacements	12
7.3 Electrical connection	12
8 Test and Inspection Procedures	13
8.1 Special Test Equipment	13
8.2 Crusher will not start	13
8.3 Testing Standards	13
8.4 Adjustments for Test or Inspection	13
8.5 Troubleshooting Guide	13
9 CE certificate	14

1 Safety Information

MSDS Warning

Ensure that, prior to operation of this equipment, all operators and maintainers read the Material Safety Data Sheets in Section 10 of this Manual for any Lubricants used in this machine

The following two (2) tables (**Warning** and **Note**) will generally only be used in the Installation, Lubrication, Maintenance and Workshop parts of the manual. They will always appear as shown with the word **Warning** or **Note** followed by the nature of the **Warning** or **Note**.



Warning: Personnel Danger/Hazard – or unspecified cautionary note



Note: Machinery Damage/Hazard – unspecified hazard or cautionary note

1.1 Personal Protective Equipment (PPE)

The following table contains all the necessary Personal Protective Equipment (PPE) which may be required to be used. Each section - Installation, Lubrication, Maintenance and Workshop - will have an individual table showing what minimum PPE is required for that step or section.

Minimum Personal Protective Equipment (PPE) required while working on the LMC200 Jaw Crusher



A



B



C



D



E



F



G

A Eye protection must be worn

B Foot protection must be worn

C Head protection must be worn

D Hand protection must be worn

E Dust mask must be worn

F Aisle must be kept clear i.e. work area

G Hearing protection must be worn



Beware of moving machinery



Fork lift hazard



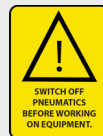
Sharp edges, watch your fingers



Pinch point



Switch off power before working on equipment. As per Client/Owner isolation procedures



Switch off pneumatics before working on equipment. As per Client/Owner isolation procedures

1.2 Safety rules during unpacking and installation

Provision of the following is the responsibility of the end user.

- Electrical supply and isolation procedures conforming to relevant company requirements.
- Control safeguards and operational procedure including start-up and shutdown protocols.
- Implementation of power loss restart.
- Setting and controlling all safety set points and limitation.
- Do not lift the machine by any point other than the lifting eyes or slots provided, unless specifically stated otherwise.
- Only lift the machine by using all of the lifting eyes or slots provided.
- Under no circumstance are the cover handles to be used for any purpose other than opening the covers.

1.3 Safety rules during operating

The following safety rules should be adhered to at all times to ensure the safety of the operator and the correct operation of the machine.

- Lubrication must not be carried out when the machine is running.
- All guards must be fastened in place before the machine is started.
- Prior to starting the machine, check the electrical cables for obvious defects.
- Ensure that the work area is clear of any obstruction or material that may be detrimental to a safe working environment.
- Do not climb or sit on the machine.
- Electrical safety requirements are to be followed as per user's company requirements.
- Wear the following, appropriate personal protective equipment when using the machine:



Gloves



Safety Glasses



Ear Protection



Dust Mask

1.4 Safety rules during maintenance

Before carrying out any other work on the machine, ensure that the power supply is disconnected and that any relevant isolator is locked out and labelled with a suitable warning notice.

Should it be necessary for maintenance purposes to put the machine into operation, it must be fitted with notices to the effect that it may start without warning; and that under no circumstances are tools, equipment or personnel to be allowed in the vicinity of the moving parts of the machine.

Should access to the moving parts be required for any reason, the motor shall be isolated as described and not reconnected to the power supply until all equipment and tools have been removed and personnel are clear of the internals of the machine.

2 Unpacking details

Minimum PPE



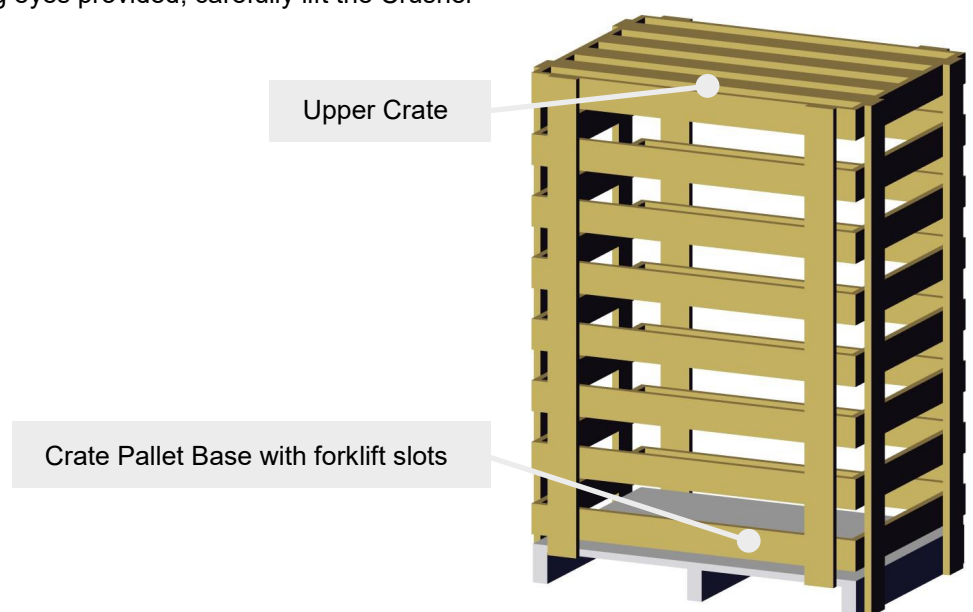
2.1 before unpacking

Prior to unpacking, make a visual inspection of the packaging for transit damage. If any damage is evident, advise the transport company at the time of delivery or take photos and notes to forward to your supplier or LAARMANN in case more serious damage is detected once the machine is unpacked.

2.2 Unpacking

On delivery, the device is screwed onto the transport pallet. Remove the screws from the transport pallet. Using a forklift, lift the Crusher up. Always use the forklift to lift and move the Crusher. Placing the Crusher close to the installation point, prior to unpacking, will prevent unnecessary moving and therefore reduce the risk of injury. In summary, please follow the next steps after receiving the machine

- Ensure a visual inspection upon delivery and take note of any damage that may have taken place.
- Remove the screws that hold the front of the packing crate in place, release the front of the crate and set aside out of the way.
- Remove the top, sides and rear panels of the packing crate.
- Carefully remove the plastic protective wrapping and discard.
- Carefully cut the strapping used to secure the Crusher to the crate base and discard.
- Using a forklift and the lifting eyes provided, carefully lift the Crusher off the crate base.



Typical open slat type packing crate.

3 Transportation & Handling

The following section outlines all the relevant storage, transport and handling requirements for the LMC200 Jaw Crusher.

Minimum PPE used in this section



3.1 General safety rules

Only trained operators of forklifts or cranes are to lift or move the crated or un-crated LMC200 Crusher.

3.2 Storage, Transportation and Handling

The sections below outline steps and procedures for the transportation, handling and unpacking of the LMC200 Crusher and storage of the machine if required.

3.3 Storage

If the machine needs to be stored for any reason, it should be indoors or undercover away from the effects of the weather.

3.4 Transportation

The packing crate has a pallet base for ease of access and movement with a forklift. The forklift must have a rated capacity to lift the crated machine.

Please note, under no circumstances are slings or chains to be used to lift the crated machine. Always lift the machine utilizing the recesses in the pallet base with a forklift.

3.5 Handling

Always use the forklift to lift and move the Crusher. Placing the Crusher close to the installation point, prior to unpacking, will prevent unnecessary moving and therefore reduce the risk of injury.

4 Installation

1. Ensure that the support structure is capable of safely supporting the weight of the crusher.
2. The crusher should be positioned to allow safe, easy access for operation & maintenance
3. Securely fasten the unit to the support structure
4. Connect to power supply

Before starting

1. Check to see jaws are free.
2. Check direction of rotation.
3. Set the gap for the product required.
4. Grease the outer bearings and toggle bushes.

Prior to full time operation

1. Run the machine empty for approximately 2 hours.
2. Adjust the tension on the Vee belts to give no slip (Check this regularly)
3. Check bearing temperatures. Initially these will run quite hot, but after running over time it should get to a stage where the housings are warm to touch.
4. Feed the crusher slowly for one or two days until the cast wear surfaces have been worn smooth, the feed at Full Rate.

5 Description

The LAARMANN laboratory Jaw Crusher is a robustly constructed single-toggle type with one fixed jaw plate and one moving jaw plate. Designed for the smaller laboratory, or use by prospectors. It is capable of quickly crushing materials up to 85% of the jaw opening (65 mm x 65 mm). It is robust and long wearing and made of parts and materials easily serviced in a remote area.

5.1 technical specifications

Jaw Inlet	215 x 90 mm
Max feed size	115 x 90 mm
End fineness	< 2mm (depending on material size and characteristics)
End fineness setting	2 – 25mm
Capacity	250kg/u (depending on material size and characteristics)
Electrical requirements	5.5 kW (3x 400V/50Hz) other voltages available
Dimensions (LxWxH)	613 x 650 x 1212 mm
Weight	480kg
Material side liners	manganese (standard)
Toggle speed	325rpm

6 Operation

CAUTION :Wear suitable eye and hearing protection when operating this crusher. All guards must be installed correctly. Keep hands clear of all moving parts.

Minimum PPE



Eye PROTECTION
MUST BE WORN



Foot PROTECTION
MUST BE WORN



Head PROTECTION
MUST BE WORN



Hand PROTECTION
MUST BE WORN



6.1 Materials to be crushed

The LMC200 Jaw Crusher will crush most types of crushable materials and will accept particles with dimensions up to 85% of the jaw openings. However, wet and sticky materials, which have a tendency to pack or extrude, should be avoided as these will induce heavy loads on the machine with risk of damage to the crusher mechanisms. Likewise, slipper self-lubricating materials similar to talc should be avoided. Although these will crush, lengthy periods of time are required.

6.2 Before starting

1. Check that jaws do not touch during rotation.
2. Check direction of rotation;
3. Check the drive belt adjustment.

6.3 Instructions



Use the control box to start and stop the machine



Use the lever to adjust the gap



Place the sample in the feeder

CAUTION ! Do not allow jaw plates to touch in operation.

The following steps outline the procedure for correct wet commissioning of the Crusher.

- Perform a visual check on the machine to ensure there are no damaged or broken parts.
- Start the Crusher.
- Ensure the machine is running normally.
- Open the hopper lid and add a quantity of sample material.



Note: Machinery Damage/Hazard – The Crusher must be running before adding sample material. Failure to adhere to this requirement will cause damage to the machine and void the warranty.

The various procedures that follow provide information on checking and starting the LMC200 Jaw Crusher, as well as adjusting & stopping the machine. Prior to starting the machine, perform the following checks and verifications:

- Check the Lubrication Schedule to determine if lubrication is required. If required, perform the relevant lubrication procedure - as outlined in the Lubrication Section of this Manual.
- Carefully check for any loose, worn, missing or broken parts on the machine.
- Check the electrical cables for any damage. Do not use the machine if any electrical cable is damaged. Notify the relevant authority to have the machine tagged and the damage repaired.



SAFETY NOTE: ISOLATE THE MACHINE BEFORE MAKING ANY ADJUSTMENTS. FAILURE TO DO THIS MAY CAUSE SERIOUS INJURY TO THE OPERATOR OR DAMAGE TO THE MACHINE

6.4 Daily Operation

Prior to operating the LMC200 Jaw Crusher, ensure the verification procedure above has been performed. Check-lists for the operation of this machine are as per the user's company requirements. While operating the Crusher, perform a general visual check to ensure there are no damaged or broken parts. Check that all panels are secured and the dust extraction system is correctly attached.

6.5 Workplace preparation

Vibration dampers have been placed to reduce the amount of vibration on the working area. The machine has been built for operating in laboratory environment. Therefore the environmental conditions should be the following:

- Temperature from 5° C to 40° C
- Humidity up to 85% RH, non-condensing

6.6 Opening the door

Some additional safety features are in place. Use the picture as reference to open the door



1. remove the collector



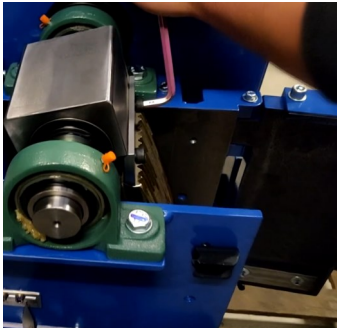
2. Open bottom the handle



3. Use the upper handle to open the door by pushing inwards

6.7 Placing jaw plates and side liners

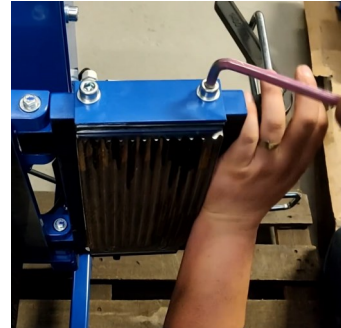
Upon receiving the LMC200 Jaw Crusher the side liners and jaw plates have to be attached before using



Place the large jaw plate with the breaking plate holder and attach it



Place the second jaw plate



Attach it with the included plate



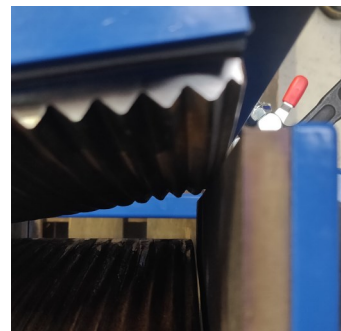
Attach the side liner with the correct



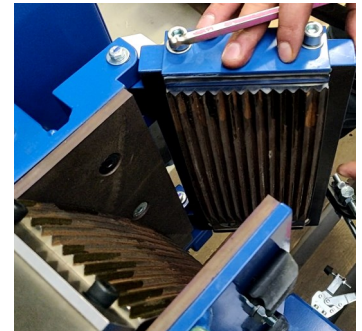
Attach the second side liner with the correct screws



Use the wrench tool to easily attach the side liner



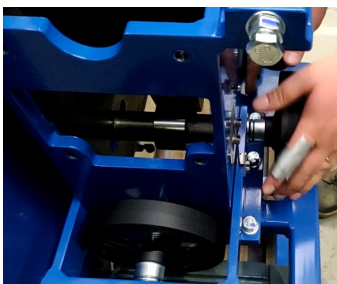
If the door can't be closed loose the screws and change the position of the jaw plate



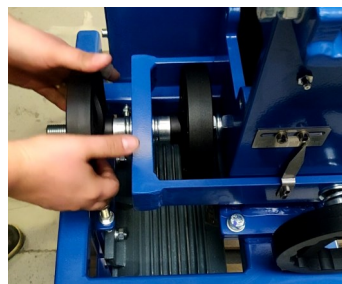
Move the jaw plate in the correct position and reattach it

6.8 Setting zero point gap

After the jaw plates and side liners are placed the measurement has to be set to zero



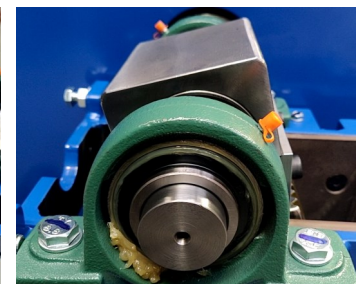
After placing jaw plates the measurement has to be placed to zero



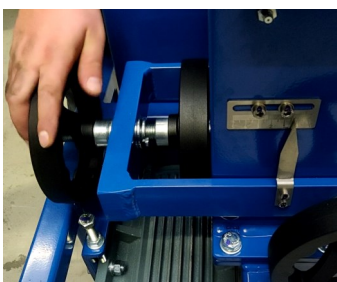
First use the wheels to move it to the closing point



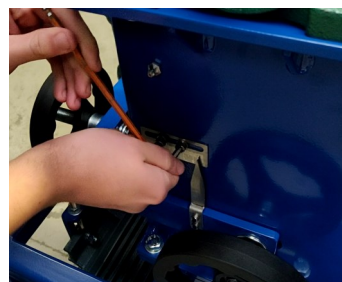
Remove the cover and move the crusher to it's highest position



View from the side to have an accurate view of the position (2)



Move the crusher to the closing point with the wheels



Loosen the screws to move the measurement plate



Set the measurements to zero and attach the measurement plate once again



You can now move the crusher to your preferred fineness

7 Maintenance

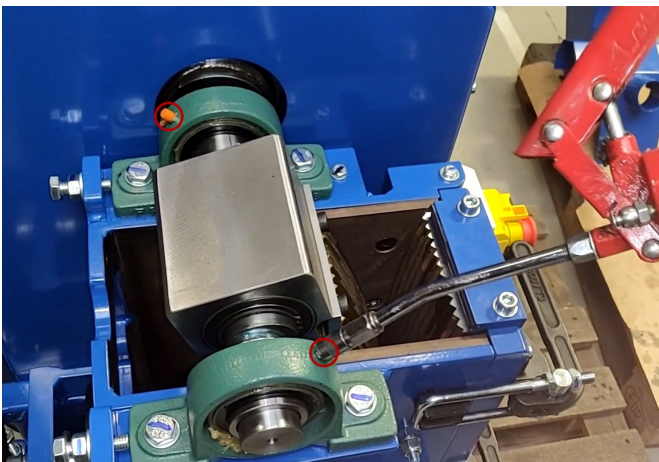
To ensure long life and trouble free operation frequent, regular checks of the equipment must be made.

Check the belt tension and condition. The belt should have no more than 11.5mm deflection at the centre with a 2 kilogram of force (spring balance will suffice).

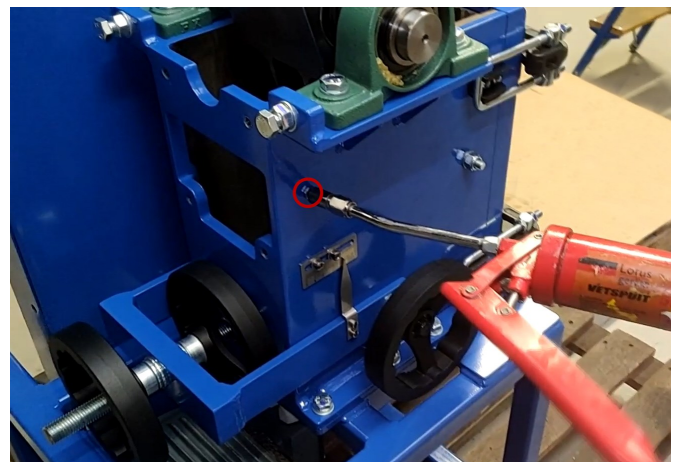
Inspect belt condition for cracks, swelling or softening. Inspect toggle seats and main bearings for any signs of wear and excessive movement.

7.1 Lubrication

Prior to applying grease, wipe the grease nipples, apply grease to all points, then leave a layer of grease on the nipple to protect against entry of dirt until the next lubrication time.



Lubrication points 1 and 2



Lubrication point 3

7.2 Jaw replacements

Jaw plates should be replaced when crushing product is no longer satisfactory and insufficient adjustment available. The wear time of the jaw plates is depending on the usage and the material that is being processed

8 Test and Inspection Procedures

Procedures for testing and inspection of the LMC200 Jaw Crusher are as per the user’s company requirements.

8.1 Special Test Equipment

Not applicable. No special test equipment is required for use on the LMC200 Jaw Crusher.

8.2 Crusher will not start

The following procedure outlines the steps for testing and inspecting the Crusher.

- Perform a visual inspection on parts that are likely to wear, such as the jaw plates and side liners, V belts and any breakdown of bearings.
- Check that there is no excessive dust build up around the Crusher.
- Check that all electrical cables, plugs and sockets are free from damage and connected correctly.
- Check the tension of the V belts.
- Ensure the hopper lid opens and closes freely and without obstruction.
- Ensure the lubrication points have been adequately lubricated.

8.3 Testing Standards

Not applicable

8.4 Adjustments for Test or Inspection

No adjustments for test or inspection are required on the LMC200 Jaw Crusher.

8.5 Troubleshooting Guide

The Troubleshooting Guide following outlines possible causes to any problems which may occur with the LMC200 Jaw Crusher. Refer to the Preventative / Corrective Maintenance Work Instructions for details.

Operation and Location	Every 10 Hours or every shift	Solution
Excessive dust inside machine	Dust extraction hose is disconnected.	Re-connect dust extraction hose.
	Dust extraction hose split or damaged	Replace hose
Excessive dust around the sample collection tray	Dust extraction hose is disconnected.	Re-connect dust extraction hose.
	Dust extraction hose split or damaged	Replace hose
Incorrect particle size being produced	Jaw gap size incorrectly adjusted	Re-adjust jaw gap
	Jaw plates excessively worn	Replace or rotate jaw plates
Material not feeding into Crusher	Product size too large	Feed smaller material
Required jaw gap unattainable	Jaw plates worn beyond gap adjustment ability	Replace or rotate jaw plates
V belts slipping or Crusher not operating	V belts loose or broken	Replace or adjust tension of V belts
Crusher will not start	Loss of power to machine	Restore power to machine



Innovators in Solids



Product	LMC200 Jaw Crusher
Power supply	400V 50/60Hz 3 phase
Serial Number

This declaration of conformity confirms compliance of the above mentioned equipment to the relevant sections of the following European Directives:

2006/42/EG	<i>Machinery Directive</i>
2014/35/EU	<i>Guidelines on the application of the Low Voltage Directive</i>
NEN-EN-ISO 12100:2010 en	<i>Safety of machinery - General principles for design - Risk assessment and risk reduction</i>
NEN-EN-ISO 13857:2019 en	<i>Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs</i>
NEN-EN-ISO 13850:2015 en	<i>Safety of machinery - Emergency stop function - Principles for design</i>
NEN-EN-IEC 61000-6-4:2019 en	<i>Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments</i>
NEN-EN-IEC 61000-6-2:2019 en	<i>Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments</i>
NEN-EN-IEC 60204-1:2018 en;fr	<i>Safety of machinery - Electrical equipment of machines - Part 1: General requirements</i>

WARNING:

This equipment is required to be operated strictly in accordance with the instructions given in the operating manual supplied with the product. All supply voltages and frequencies as stated on the rating plate must be used. External power cables and connectors must be supplied by LAARMANN. Any additional equipment used must be of a type approved by LAARMANN.

This conformity certificate will lose its validity in case of:

- Usage of unlicensed spares
- Usage of unlicensed accessories
- Any self made modifications of the machine