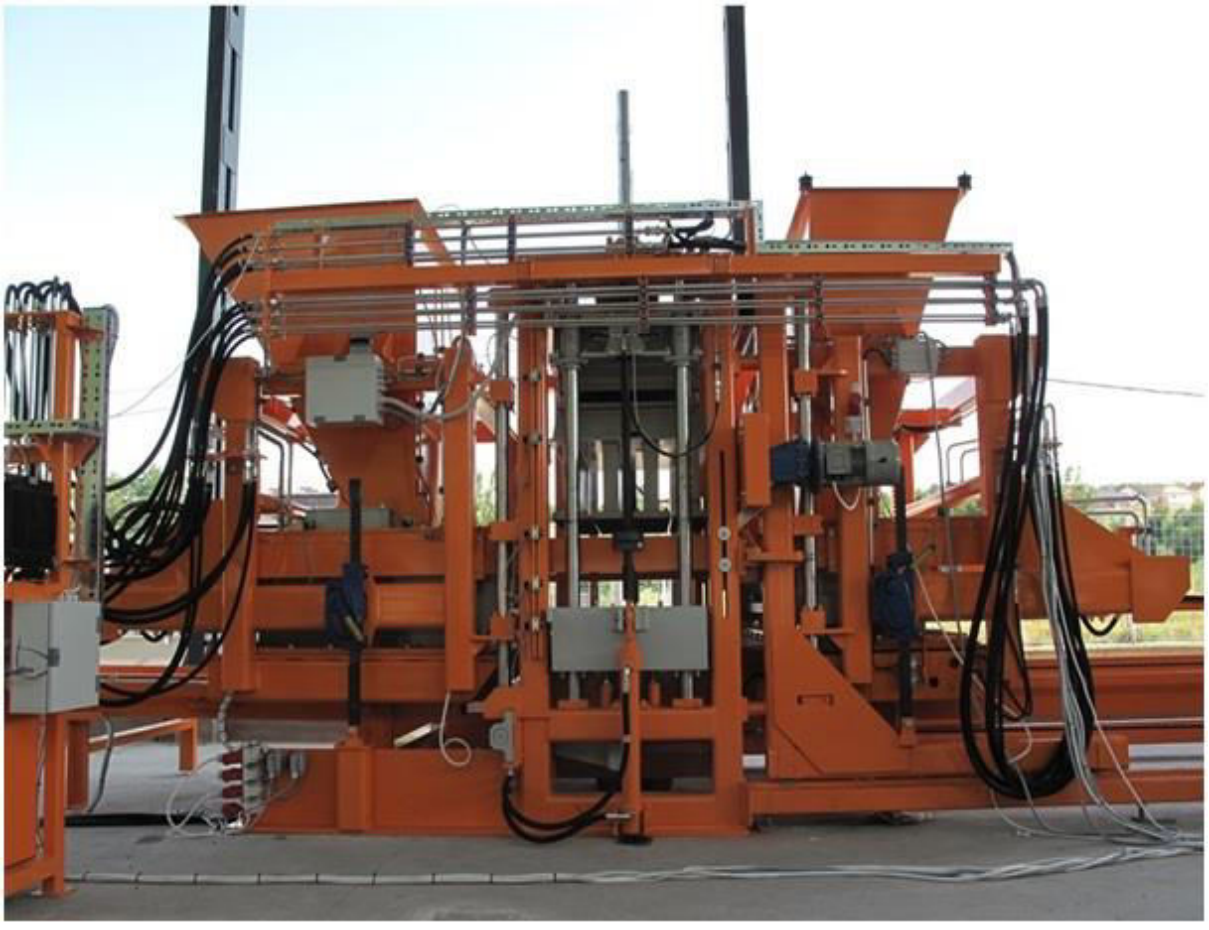
Maintenance manual

PROMETAL

UNIVERSAL 1000

Concrete block making machine



Contents

Used symbols

This section explains symbols that are used in this manual.

These symbols are used in this manual for warnings to avoid possible dangers for the operator and damages for the machine. In addition, these symbols indicate ways of safe and easy operating which will allow efficient use of machine.

Warning!

It is important to follow strictly maintenance manual to avoid possible danger for operators health. It is necessary to follow work safety instructions strictly!

Caution!

It is important to follow strictly maintenance manual to avoid possible damage for the machine. It is necessary to follow work safety instructions strictly!

Note

Following instruction will allow easy and safe operating.

Maintenance manual

-Preface-

- This maintenance manual is designed to make it easier for personnel to familiarize themselves with the machine/system and to utilize possibilities offered.
– This manual contains important information on reliable, workmanlike and economical operations of the machine/system. By following this manual carefully will help avoid accidents, repair costs/downtimes and enhance the reliability/service life of the machine/system.
- This manual is always to be kept together with the machine/system.
- We recommend careful study of manitenance manual, since we cannot accept any liability for damage and malfunctions resulting from non-observance.
- This manual is to be read and put to appropriate use by all persons whose job it is to work with the machine/system, e.g. - In case You encounter any problems or if You have any question, do not hesitate and contact our technical support.

NOTE:

All technical details in this manual are subject to change without further notice.

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Outline

- The complete maintenance manual is divided in several sections.
- It contains necessary inspections and maintenance to be done. These sections include:

  - Maintenance plans (daily, weekly, monthly, half year, yearly maintenance routines)
  - Lubrication plans, lubricants (summary of lubricating points, hydraulic oil and grease)
  - Mechanical maintenance (maintenance, lubrication, inspection and adjustment work)
  - Hydraulic maintenance (maintenance, inspection and adjustment work)

- If you adhere to these inspections and maintenance, it will considerably extend the life time of the machine/system. Therefore it must be in Your own interest, to follow this manual carefully, and maintain machine/system at regular intervals.

- Neglection or non compliance of inspection most likely will result in damaging machine/system and/or it sub parts and loss of guarantee!

Transport hint

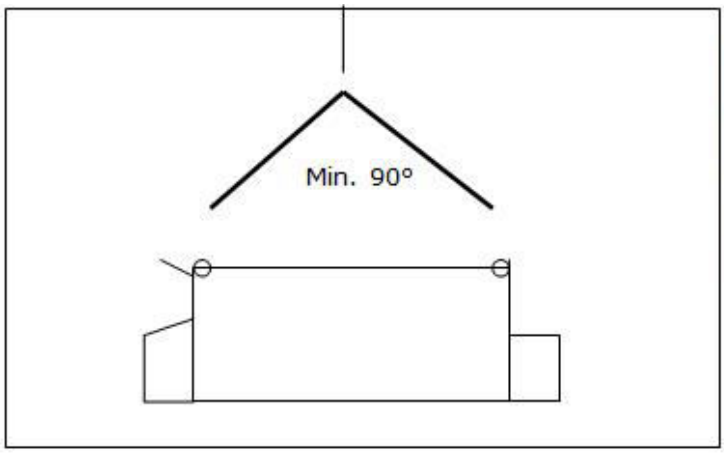
Do unloading of the machine exclusively with the help of a crane. Avoid absolutely to unload the machine by means of inclined ramps.

WARNING!

Incorrect lifting or inadequate lifting capacity can result in severe personal injury or equipment damage. MINIMUM LIFTING CAPACITY REQUIRED IS INDICATED ON THE LIFTING LABEL.

Lifting points are provided for use with a shackle and pin type lifting aid. Chains of suitable length and lifting capacity must be used. Lifting points are designed to position the crane age point as close to the centre of gravity of the machine as possible, but due to design restrictions it is not possible to ensure that the frame will remain horizontal while lifting.

Care is therefore needed to avoid personal injury or equipment damage. The correct lifting arrangement is shown on the label attached to the lifting lug. (See sample below). Please refer to the specific drawing on the final page of this instruction book for lifting points.



Safety

-Staff safety-

ATTENTION DANGER

1. It is not allowed for persons to stay within the danger-area of the machine. Even parts of the machine not moving at the moment could start to move at any time.
2. When servicing and repairing the machine always switch to “0” the main switch on the cabinet, panel or box. Close the stop-cocks of the hydraulics and put retaining bolt for tamper head. All main switches must be put to “0” and locked.
3. When doing repair work on the hydraulics with mould raised, the latter must be secured mechanically against its lowering.
4. No workshop processes and operations are allowed which could be dangerous for persons and interfere with the safety devices of the machine.
5. All valid accident prevention regulations must be observed.

- It is to be ensured that staff keeps long hair tied back and that they don’t wear loose clothing or jewelry, including rings, due to the accident risks involved.
- Personal protective equipment is to be used where necessary or stipulated.
- Heed all safety and hazard warning instruction given on the machine/system.
- Make sure all safety and hazard warnings on the machine/system and legible.
- Always avoid any course of action which could jeopardies safety.
- Before switching on/starting up the machine/system, make sure that there is no-one in the danger area.
- Never climb on parts of the machine.
- Make exclusive use of suitable lifting gear with appropriate loadbearing capacity which is in proper working order. Never stand under or work beneath suspended loads.
- When performing overhead maintenance employ suitable means to prevent falling.
- Keep all steps, railings, handles, pedestals, platforms and ladders clean and free of dirt, e.g. snow, ice, oil.

-Always cross transportation track at appropriate points.

-Safety instructions concerning certain operating phases-

- Ensure that the machine/system is in proper working order. Make sure all safety features and safety-related equipment such as detachable guards, emergency stops and sound absorbers

have been fitted and are serviceable.
- Check machine/system at least once per shift for visible signs of damage and defects. Any changes (including changes to operating behavior) are to be reported immediately to those responsible. If applicable, shut down and secure machine without delay.
- In the event of malfunctions, machine/system is to be shut down immediately and secured. Have rectified faults without delay.

-Safety regulations for use of concrete product machine-

- Make exclusive use of genuine fuses with prescribed rating. Switch off machine/system if there are any faults in the power supply.
- The electrical equipment of the machine/system must be checked/inspected at regular intervals.
- Work on electrical system or parts must be performed by electrician or qualified personnel under the guidance and supervision of an electrician in line with the appropriate regulations.
- Machine and system components that are under inspection, repair or maintenance must be de energized where prescribed.
- For parts that are isolated, check for no voltage first.

-Hydraulics-

Warning! Oil drippings and leakages may also develop risks to the operational safety! The hydraulic system contains high pressure! Remedy the fault immediately!

- Work on hydraulic facilities may be performed only by qualified personnel.
- All lines, hoses and screw connections are to be regularly checked for leakage and visible signs of damage. Eliminate any damage immediately. Oil splatter can cause injury and fire.

- Hydraulic stop-cocks
Stop-cocks are located at the machine frame.

Caution!

For all work at and within the machine, the stop-cocks have to be closed. First, switch off hydraulic pumps.

Before starting again the hydraulic pumps, first open stop-cocks again.

-Oils, greases and other chemical substances-

- Take precautions when handling hot process materials (danger of burns or scalding).
- The appropriate safety regulations are to be observed when handling oils, grease and other chemical substances.

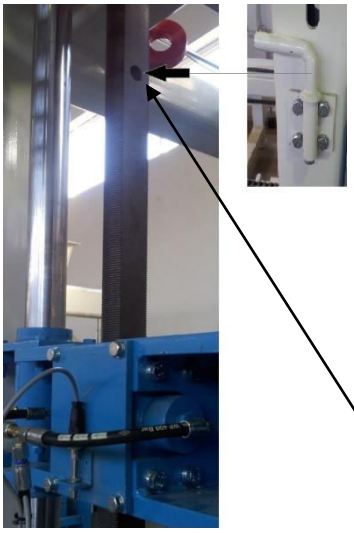
-Lubrication (preliminary remarks, storage and servicing)-

- Careful lubrication is a prerequisite for trouble-free operations and prevents costly repairs. This is particularly true of the proper lubrications of all anti-friction bearings. - Poor or frequent lubrication will shorten the service life of the anti-friction bearings and result in failure.
- Lubrications itself and other associated operations are to be performed with the machines/system stopped.

- Lubricants, such as oil and grease, are to be kept in clean, closed containers (cans, drums, tins) to prevent the ingress of dust and moisture and to reduce oxidation effect of the air level to minimum. Storage location should be dry and cool.

- The lubricant fill in a bearing gradually losses it's lubrication capacity in the course of its service life as a result of mechanical loading, ageing and increasing contamination. Grease fills must be therefore topped up or replaced from time to time and oil fills constantly filtered in addition to replacing the oil at specific intervals.

-Safety regulations for use of concrete product machine-

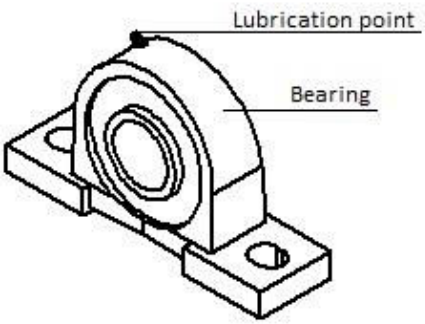


-Industrial safety-

When or in the area of the mould or tamper head, always secure tamper head so it cannot come down and switch off pump of main hydraulic system when carrying out work in the machine. Holes are provided in the two locking rods for fixing the tamper head in the upper position. The tamper head is raised above these holes and the locking pins are inserted in same. After that tamper head is lowered until it makes contact with the pins. This procedure stops tamper head from dropping.

- As a general rule, adjustment work should never perform with the machine running. The sole exception to the above is speed regulation in the hydraulic system by way of the throttle-type check valves under the directional control valves and adjustment of the pressure limiting/pressure reduction valve. These valves are installed in the system in such a manner that they are outside the hazard zone. However, increased care is to be taken when performing such task.
- When cleaning hoppers, main hydraulic system is to be turned off.
- Wear safety helmet on entering machine pit.
- Caution: Even if the pump is switched off, pipes can be pressurized if the cylinders are perpendicular and the plunger rods loaded but still not fully retracted or extended. For example, this is the case of mould, tamper head, hopper outlets and height adjustment.
- In the events of faults, always switch system component(s) concerned to manual and shut down all hydraulic facilities.
- Switch cabinets are not to be opened until main switch had been turned off.
- Hydraulic system is to be turned off and de-pressured before working on them. Vessels and pipes are to be drained.
- Never crawl under raised, non-secured filling units. If it is necessary to perform work beneath such units, secure beforehand with height adjusters.
- Never reach into components that are operating.

-Checking/cleaning of bearings-

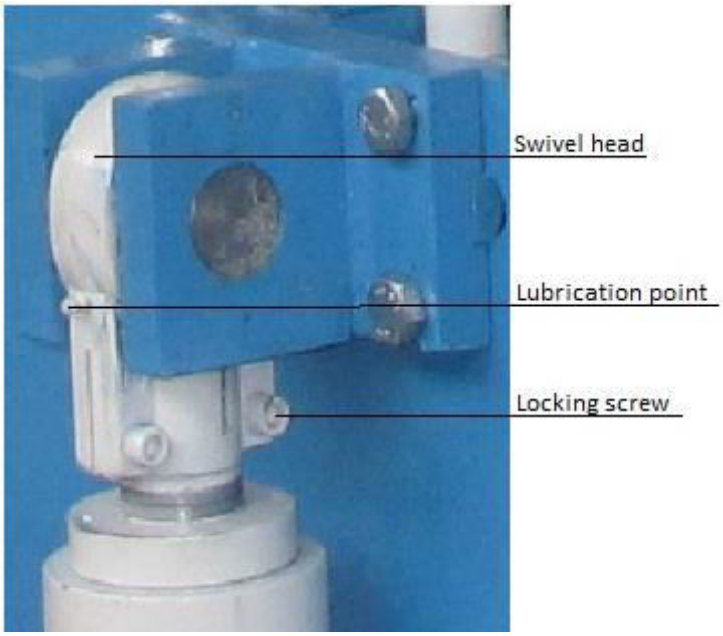


- Anti-friction bearings must be checked and cleaned from time to time with the inspection intervals being governed by the operating conditions. If it's possible to monitor condition of the bearings during the operation by listening to running noise, measuring the bearing temperature or checking the lubricant, it is generally sufficient to thoroughly check and clean the bearings (races, cages and rolling elements) and all other parts of the mounting in the course of general machine inspection or repair. However, more frequent checks are needed if bearings are subjected to heavy loading.

- After cleaning every component with suitable cleaning agent, bearings must be thoroughly dried and then immediately protected against corrosion by oiling or greasing them. This part is especially important for the machine that remains shut down for a lengthy period of time.

-Screwed and electrical connections-

- After 20-30 hours screws and bolts have to be checked whether they are tight or not.
- Self-locking nuts are to be used only once.
- The machine components have to withstand high loads and stress during production due to mechanical forces and vibrations. Especially the tight fit of the screwed connections on safety related components must be checked regularly.
- Check regularly the tight fit of the electrical connections.



ATTENTION!

After 20 - 30 working hours screws and bolts have to be checked wether they are tight or not!
Read this manual carefully!

-EMergency – OFF-

Strike Button: The unit is equipped with Emergency-off strike buttons (with lock). Upon actuating the emergency-off switches, the complete control voltage is disconnected.

Hint! Reconnecting of control voltage is possible only by switching on the key switch, after unlocking the emergency switch.

Key Switch: The key switch **"Control Voltage On"** is located on the control panel or on the end wall of the control cabinet. With this the control voltage is switched on. With switch **"Control Voltage Off"** is switched off.

Maintenance

-Cleaning-

Cleaning at the end of production is essential prerequisite for proper functioning of the machine.

It is appropriate to start with filler boxes and hoppers by knocking off residual concrete. After this, open hopper outlets to enable the loose concrete to drop into filler boxes with which the concrete is moved into mould and removed from the machine together with the pallet.
Tamper head brushes are likewise to be cleaned.
Special care needs to be taken when cleaning mould. Especially if mould is of complex design (e.g. hollow block mould), which is more difficult, but also more important. Old solid concrete on the tamper head and mould, and above all on the tamper head plates, on the bottom of the mould and between the webs promotes wear and the finished products are then often no longer true to size and shape. Blowing out with compressed air has proven to be and effective means of general cleaning. Then loose concrete falls into machines pit, from where it is easy to be removed.
Rubber buffers, rubber profile strips, rubber discs and bronze parts should not be allowed to come into contact with oil, grease or other media which have an adverse effect on them, as this would shorten service life.

-Lubrication-

The number of lubrication points on the machine has been kept to the minimum. Types of lubricants to be used are given in our lubricant table. The points concerned are listed in a separate lubrication chart outlining the lubrication intervals.

-Servicing-

By its very nature, a heavy-duty vibration machine is subject to considerable loading and there is bound to be component wear. Design measures and the use of appropriate materials help to offset this factor. It is then up to customers to do the same by keeping the machine in good condition and performing systematic service work. The information given in the following is designed to provide assistance with the above. It is important to have good cooperation between the machine operators and the maintenance staff (mechanics and electricians). A brief production stoppage to tighten a loose screw is better and cheaper than waiting until the screw drops out and causes major damage.

-Vibration unit-

Check tightness of all screws on vibration unit as these are subject to particularly severe stress. Renew damaged rubber buffers. The scraper plates bolted to the vibration table needs to be renewed if severely worn. Renew damaged rubber universal joints at articulated shafts. The brake shoes of the vibrator brakes must move freely to enable them to lift rapidly off the brake disc after braking. Renew worn brake pads in good time, so as to prevent subsequent damage to braking discs/motors. Renew worn brake discs. To check the vibrator bearings, the

unbalance weights should be pushed by hand and must then oscillate. If this is not the case, then it is most likely the sign of imminent bearing damage.

-Mould support-

Check condition of rubber profiles and bronze strips in mould holders, particularly on mould replacement. Secure loose parts and renew damaged ones. Renew damaged or worn bushings.

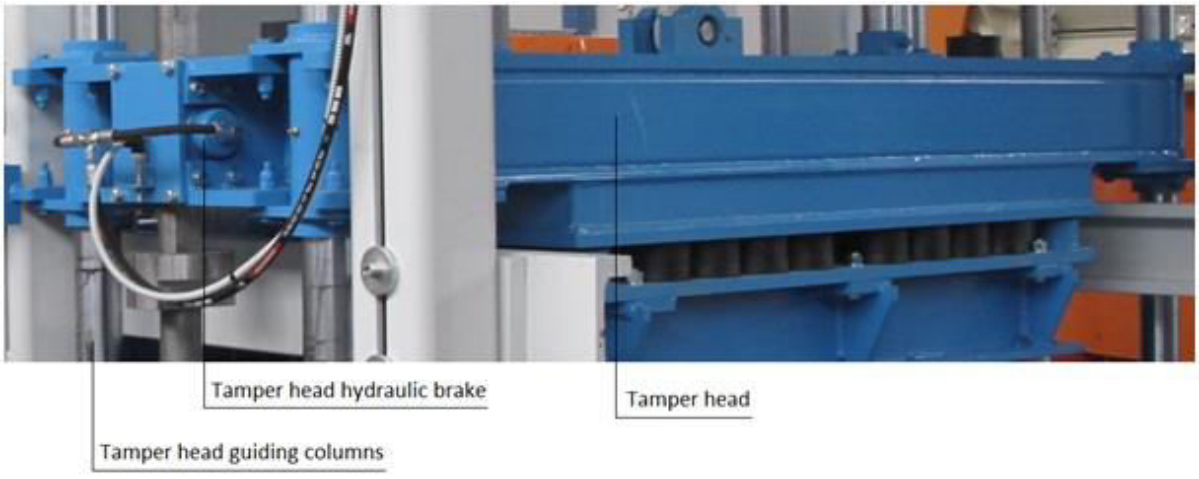
-Filler box table and hopper-

Check tightness of bronze wear strips on end faces of filler-box tables. Secure loose strips; renew if damaged or severely worn. Check scraper plates of filler-box tables and replace if necessary.
Check functioning of hopper outlets. Renew worn bolts and bronze bushings in mount. If level indicators are fitted, check cables for damage and renew if necessary.

-Filler box drive-

Check proper functioning of scraper. Adjust scrapers on both filler boxes. Check top-mounted shaking grate; it must move freely back and forth. Replace worn and seized bushings. Tamper head cleaning brush on front of filler box must be adjusted in line with wear. Renew self-aligning plain bearings and shafts. Renew damaged or worn rubber bushings. Make sure that filler box walls are not too worn; if they are, rework or replace filler box. Check rollers for bearing damage.

-Tamper head brake-



Renew damaged rubber buffers between tamper head frame and tamper head carrier. Make sure that there is no residual concrete left in the tamper head carrier. Renew damaged/worn bushings. If top vibrators are fitted, check their attachment to the tamper head carrier. Cables to top vibrators are to be examined for damage. If leakage occurs at the cylinders of the tamper head brake, the seals are to be renewed. Check linkage and plates for damage. Replace

return springs for brake shoes if these are severely worn. Brake shoes must move freely to permit rapid release of the tamper head.

-Mould and tamper head mounting-

The hard chromium-plated columns are to be checked for damage and can be turned if necessary (from bottom to top). Whether or not the gunmetal bearing shells need replacing can be seen during production. In this case, there will be a gap between column and bearing such that the tamper head can oscillate even in its upper position. Scraper rings are likewise to be changed on replacing bearings.Check tightness of bronze wear strips on end faces of filler-box tables. Secure loose strips; renew if damaged or severely worn. Check scraper plates of filler-box tables and replace if necessary.
Check functioning of hopper outlets. Renew worn bolts and bronze bushings in mount. If level indicators are fitted, check cables for damage and renew if necessary.

-Hydraulic drive-

Perform first filter change after installation/commissioning, however at the latest if the gauge on the housing cover is in the yellow zone. This likewise applies to subsequent operation. Eliminate any leaks. The plunger rod gaskets are to be renewed in the event of leakage at the plunger rods of the hydraulic cylinders. Tighten loose pipe clamps, as otherwise switching impact in the hydraulic system could overload the pipe unions and cause them to brake off. Always keep oil cooler away from dust. It is appropriate to clean it at frequent intervals with compressed air so as to maintain the cooling capacity. The best temperature range for hydraulic oil is approximately 40°C - 65°C. The temperature of the hydraulic oil should never bebelow 15°C or above 70°C, as pump damage could occur outside this range.

-Electrical system-

Make sure the electrical system has been de-energized before working on it. Switch off main switch. Work on the electrical system is only to be performed by a qualified electrician. Practice has shown that it is difficult to keep switch cabinets completely free from dust. Electrical devices and switching contacts thus become dusty. It is appropriate to blow out the electrical devices and switchgear at regular intervals with clean, dry air. Contact cleaning spray is a good solution if devices are heavily contaminated. It is beneficial to retighten the terminal studs during the initial period. This likewise applies to those at contactors, including terminals which are not being used. Loose screws can drop out and cause damage. Clean cooling fins and cooling-air slots on electric motors on a regular basis. Never use fuses with a higher rating than those stated.


Control desk
Electric cabinet

Maintenance plan

- Every mould change
- Daily
- Weekly
- Vibrator table
- Monthly
- Half yearly
- Yearly

Maintenance at every mould change		
Part	Point of maintenance	Maintenance activity
Hydraulic tamper head clamping	Clamping surfaces, push rods	Checking, cleaning
Mould clamping	Rubber buffers	Cleaning
Vibrator table	Impact bars	Checking distance and parallelism
Charging frame	Guide rails	Cleaning

Daily maintenance (based on a 1-shift-operation)		
Part	Point of maintenance	Maintenance activity
Mould guide/clamping	Area of the mould guide	Clean from remaining concrete
Mould guide/clamping	Supporting screws	Check and clean
Filler box/agitator cart	Inside	Clean from remaining concrete
Filler box/agitator cart	Wheel/wheel path	Check and clean
Agitator		Check condition and clean
Filler box	Stripper frame, strings	Check and clean
Table plate		Check condition and clean
Concrete hopper	Concrete hopper, hopper flaps	Check condition and clean
Hydraulic unit	Inspection glasses	Check oil level
Hydraulic unit	Pressure gage	Check system pressure for main function
Hydraulic unit	Electronic pressure sensor	Check accumulator pressure

Also take care of following:

- Lubricate mould and tamper head guide bearings
- Clean machine pit
- Check entire vibration unit for loose parts or worn brakes: push against unbalanced weights to check for bearing damage
- Drain service unit and fill lubricator with oil if needed

Weekly maintenance (every 50 hours)		
Part	Point of maintenance	Maintenance activity
Safety related screwed connection	e.g. swivel heads,pedestal bearings	Checking the tight fit of screws and nuts
De-moulding cylinder	Swivel heads, push rods	Lubricating, cleaning
Tamper head cylinder	Pedestal bearings, swivel heads	lubricating
Tamper head cylinder	Bearings, push rods	Checking the tight of screws, cleaning
Machine	Guiding columns	Checking and cleaning
Synchron bars	Sprocketwheels, synchron chains	Lubricating, cleaning
Tamper head brake	Brake bars, brake linings	Checking and cleaning
Tamper head safety bolt		Checking condition and presence
Tamper head	Tamper head vibrators	Checking the tight fit of screws
Tamper head	Rubber buffers	Checking the condition
Mould guide/clamping	Bearings, rubber buffers, moulder stoppers	Lubricating, checking and cleaning
Vibrator table	Wear ledges and impact bars	Checking distance and parallelism
Vibrator table	Rubber buffers	Checking the condition
Rocker arms	Bearings, hydraulic cylinder	Lubricating, checking the tight fit of screws
Filler box/agitator cart	Stripper brush	Checking the tight fit of screws
Agitator cart	Crank arm drive, hydraulic cylinder	Checking the tight fit of screws
Agitator	Profiles, screws, distance	Checking the tight fit of screws
Table plate	Clamping	Checking the tight fit of screws
Cocnrete hopper	Crank arm, hopper flaps	Checking the tight fit of screws, lubricating
Pallet transport	Latches, wheels and wheel paths	Checking, cleaning, lubricating
Pallet transport	Guide pulley, drive chain	Lubricating, checking the chain tension
Lifting device	Rocker bearings, flange rollers	Lubricating, checking the tight fit of lock nuts, cleaning
Mould change cart	Flange bearings	Checking the tight fit of screws
Hydraulic unit	Vis. clogging indicator/press. filter	Checking
Hydraulic unit	Vacuum indicator/air breather unit	Checking

Hydraulic unit	Possible drippings and leakages	Checking
Valve bank, accumulator	Electronic pressure sensor	Checking hydraulic control oil pressure

Vibrator table maintenance			
Part	Point of maintenance	Maintenance activity	Interval
Vibrator table	Bearings	Lubricating	Every 40 hours
Vibrator table	Bearing covers	Checking the tight fit of screws	Every 200 hours
Vibrator table	Flanges	Checking the tight fit of screws	Every 200 hours

Monthly maintenance (every 200 hours)		
Part	Point of maintenance	Maintenance activity
Motors	Electrical connections	Checking the tight fit
Tamper head brake	Brake linings	Checking the thickness
Tamper head cross stripper brush	Bearings, sprocket wheel, columns	Checking, lubricating, cleaning
Tamper head cross stripper brush	Chain tension	Checking, adjust if necessary
Charging frame	Lifting spindles	Checking for wear
Charging frame	Guide, columns, locking	Checking, cleaning
Agitator cart	Crank arm drive	Checking for backlash
Agitator cart; hydraulic cylinder	Swivel head, pedestial bearing	Lubricating
Stripper frame		Checking for wear
Lifting device	Flange rollers	Checking, cleaning
Mould change cart	Bearings, fl.rollers, sprocket wheels	Lubricating, checking, cleaning
Hydraulic unit	Oil cooler	Clearing

Half yearly maintenance (every 1000 hours)		
Part	Point of maintenance	Maintenance activity
Charging frame	Lifting spindles	Cleaning, lubricating
Hydraulic unit	Return flow filter	Changing the filter insert
Hydraulic unit	Tank breather filter	Changing the filter insert
Hydraulic unit	Oil cooler; oil side	Cleaning
Electrical cabinet	Air filter	Checking the filter mat; cleaning or changing

Yearly maintenance (every 2000 hours)		
Part	Point of maintenance	Maintenance activity
Tamper head	Tamper head vibrator	Changing completely
Vibrator table	Vibrator bearing	Changing completely
Hydraulic unit	Pressure filter	Changing filter inside
Hydraulic unit	Hydraulic oil	Changing
Powersupply unit	Bufferbattery	Changing

Recommendation: yearly exchange (every 2000 hours)		
Part	Point of maintenance	Maintenance activity
Tamper head vibrator	Complete tamper head vibrators	Changing
Vibrator table	All vibrator bearings	Changing
Power supply unit	Buffer battery	changing

Hydraulic system maintenance

-General-

 **Precaution!**

Comply with instructions of chapter "Safety" when carrying out repair, setting and maintenance work on the hydraulics. All stop-cocks must be closed and the control voltage switched off.

With mould lifted, it must be secured against lowering. Bring into position the retaining bolts for securing of the tamper head.

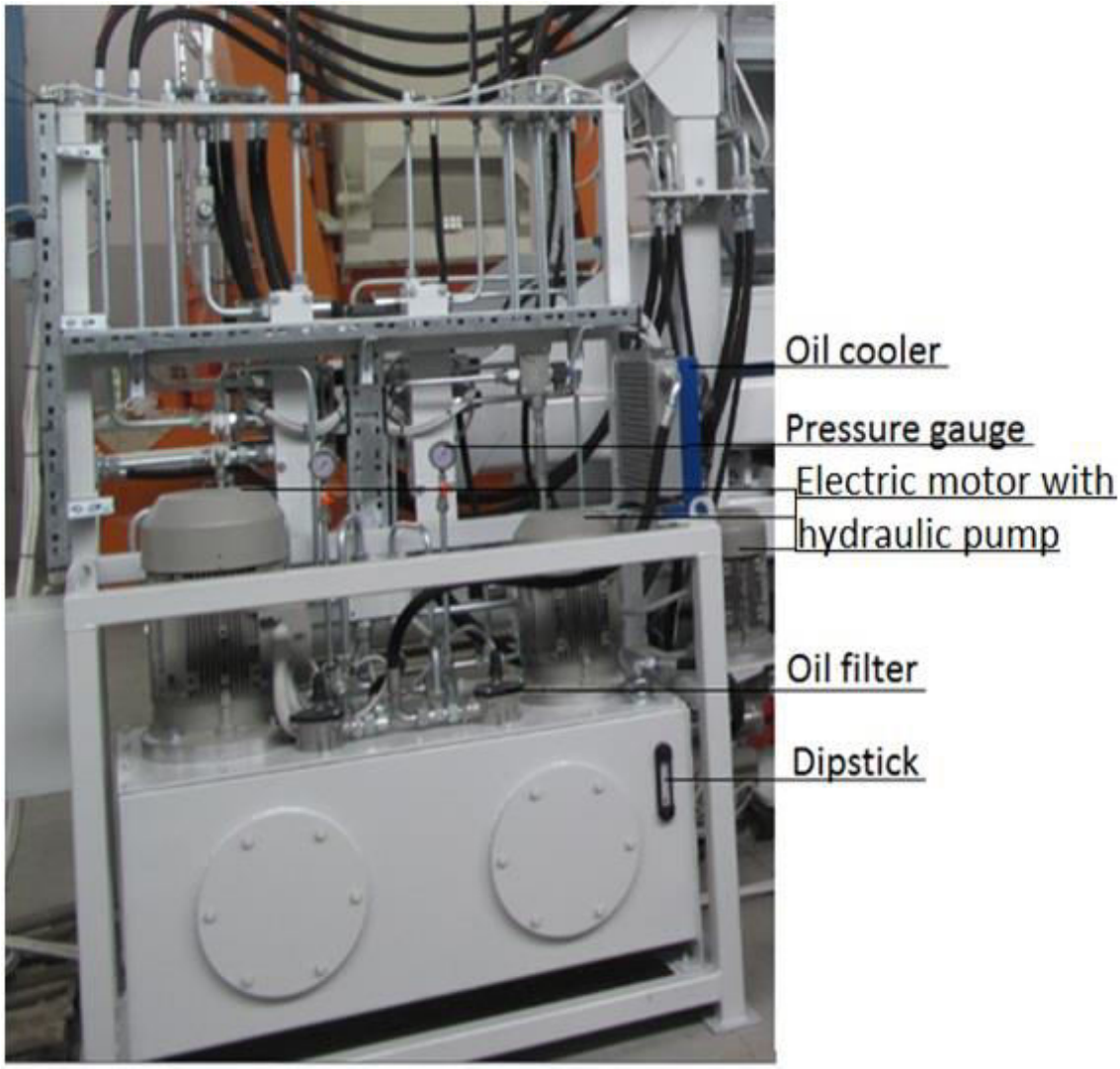
Any work on equipment incorporating accumulators, must be carried out after release of the fluid pressure.

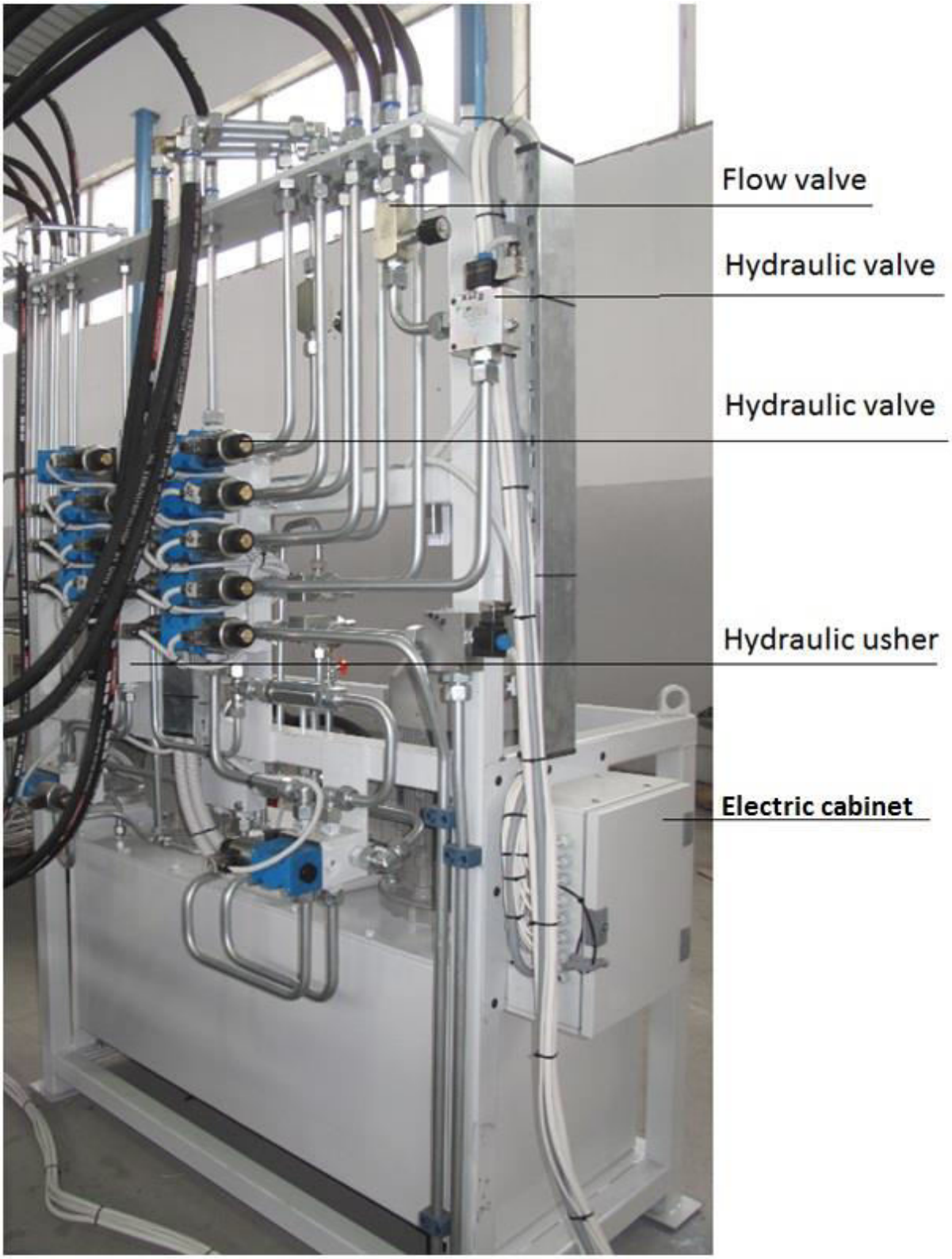
Hydraulic pump

Hydraulic pump rating is max 170 bar. Pressure limiting valves are set in order to ensure that pump is never overcharged not even in continuous run at maximum load. This setting is done in factory and **must not be changed!**

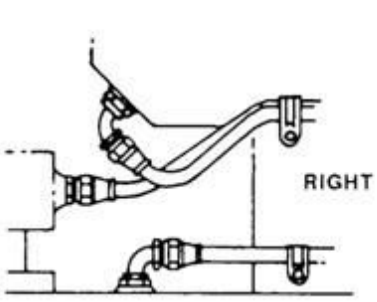
The downstream hydraulic slide valves operate the individual movements of the machine. As to order and number of hydraulic slide valves see electric circuit diagrams. The oil flows from the hydraulic slide valves to the associated hydraulic users and a return oil filter with dirt indication, back into the oil tank.

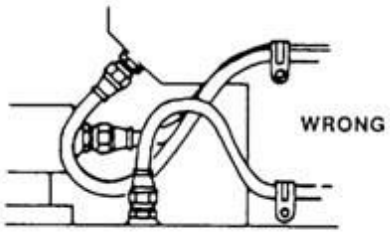
Hydraulic system

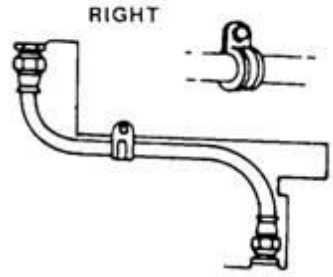


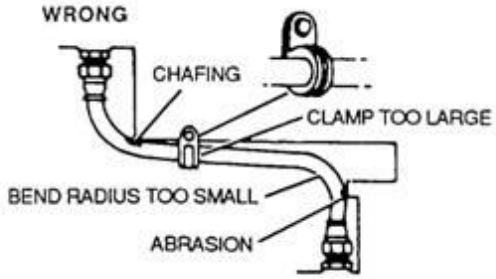

Flow valve
Hydraulic valve
Hydraulic valve
Hydraulic usher
Electric cabinet

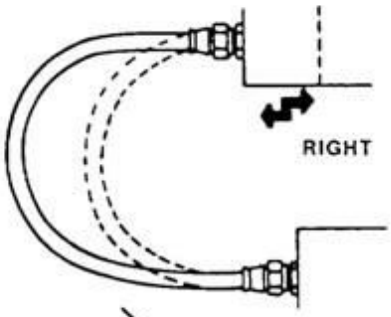
Basic principles for the installation of hose assemblies

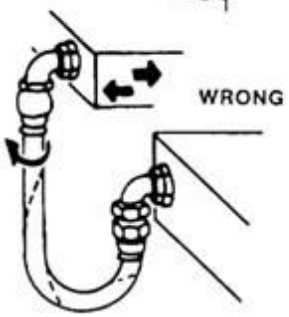


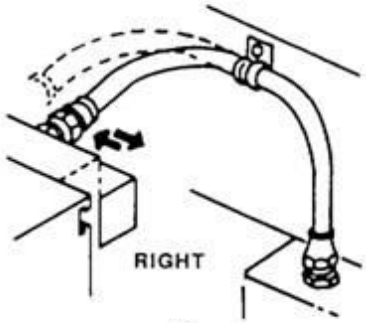


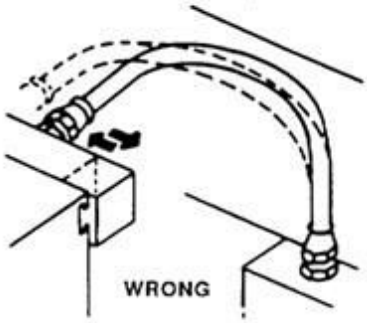












Check daily with hydraulic cylinders retracted, oil level on oil level gauge of hydraulic tank. The right level of oil in hydraulic tank is a decisive factor for the life time of hydraulic components. Fill up hydraulic oil if it is necessary.

-Checking the oil level-

Check daily the oil level on the inspection glasses. The level should never exceed the upper marking MAXIMUM. If the oil level starts dropping after some working period it indicate that there is a leakage somewhere within the hydraulic system. Before fill up with new oil check all fittings and hoses for leakages!

Observe always that oil level **will not** drop below the mark MINIMUM!

Pay attention on enclosure stating recommended oil grades.

It is recommended to use a quality oil of a known brand, 46 cSt, at 40 degrees C. In cold regions or in winter time change to 32 cSt at 40 degrees C.

Hydraulic oil should be changed twice a year. When changing also clean oil reservoir.

Oil quantity for tank is aproximately 400 liters.

-Establishing faults in hydraulic system-

Work on hydraulic equipment must be carried out only by persons with special knowledge and experience in hydraulic system.
Any contamination will reduce the service life of a hydraulic system.
Check all lines, hoses and screwed connections regularly for leaks and obvious damage.
Repair damage immediately.
Splashed oil can cause injury and fire.
It is a basic requirement to keep the environment clean while working on hydraulic installation.
Use only original spare parts.
De-pressurize all system sections and pressure pipes to be removed in accordance with the specific instructions for the unit concerned, before carrying out any repair work.

<u>Take extra care on following:</u>

- Loose line connections/unit mounts
- External leakage
- Unusual noise and vibration
- Malfunctions, e.g. decrease in torque or speed/pressure or delivery
- Filter contamination (filter indicator only gives correct reading when system is at operating temperature)
- External contamination and damage particularly in the case of air/oil heat exchangers
- Formation of rust in tank
- Water discharge after lengthy stoppages

- Foaming in tank
- Pressurized fluid

Experience has shown that errors are often made and insufficient care taken when inspecting the pressurized fluid despite the fact that its condition is a quick and reliable pointer to the condition of the hydraulic system.

The pressurized fluid is one of the most important elements in a hydraulic system and performs a number of tasks. In addition to the familiar inspection items, namely:

- Level in tank
- Discoloration (milky, dark, foamy)
- Temperature in tank

which are to be constantly monitored, it is necessary to perform further checks. Assessment of the pressurized fluid and any changes from the condition when new makes it possible to recognise irregularities in the hydraulic system at an early stage before they can result in machine damage.

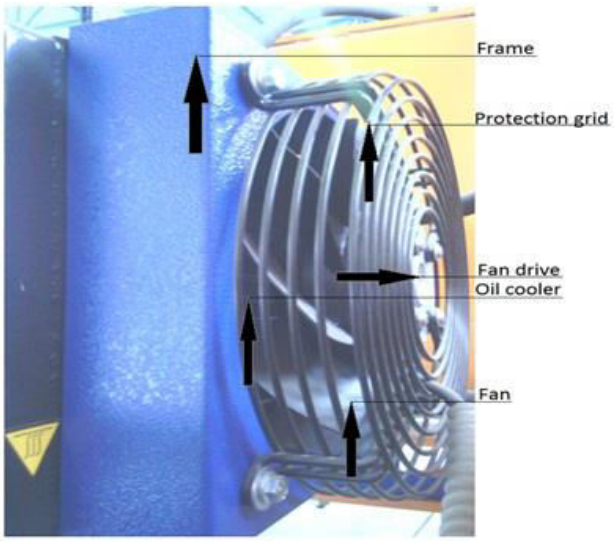
-Maintenance of hydraulic components-

Experience has shown that 80 % of faults/damage in hydraulic oil systems are due to selection of the wrong oil and poor oil condition.
Pumps, valves and motors are maintenance-free. Maintenance work is therefore concentrated on oil checks and filter element replacement. Maintenance intervals depend on the system concerned and are governed by operating conditions and applications.

-Pressurized fluid-

- Always use filters when topping up pressurized fluid (filter mesh as for service filter).
- Bypass filtering with mobile filter unit is to be employed for additional conditioning of the fluid fills.
- Pressurized fluid with non-monitored fills is to be replaced every 1000 - 5000 operating hours, however at least once a year or in line with results of laboratory test. Shorter oil change intervals are to be envisaged in the case of installation subject to high thermal load.
- Clean oil tank whenever oil is changed.
- Always use filters when filling. Filter unit must at least correspond to service filter. Mobile manual or electrically operated pump filter units have proven to be appropriate.

-Cooler maintenance-



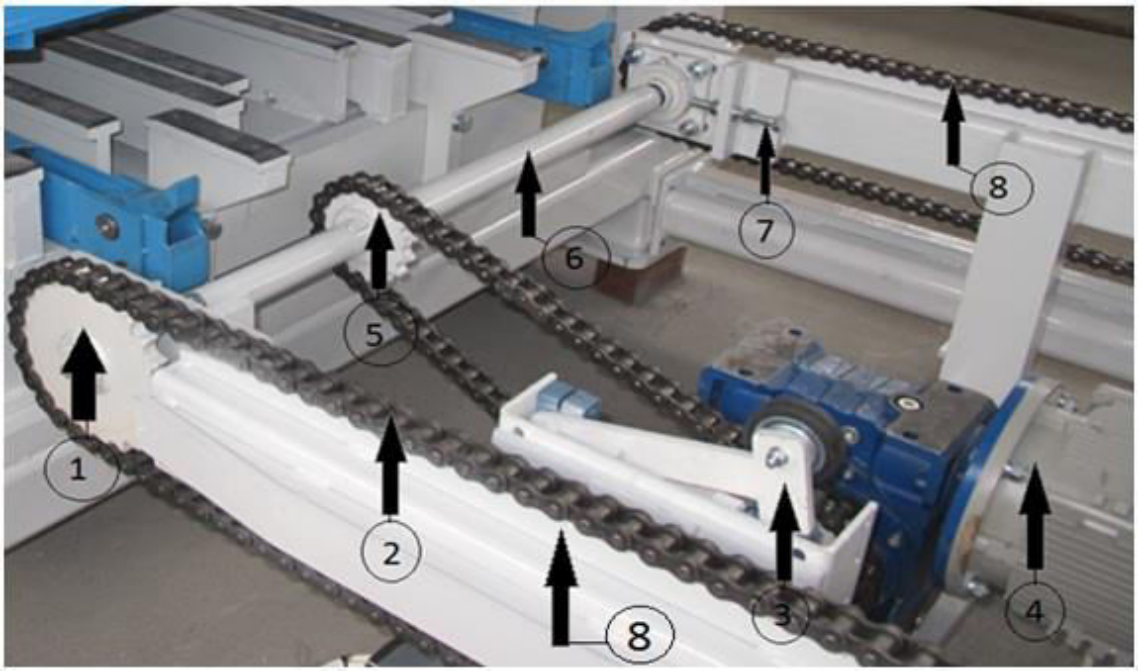
The oil cooler does not require any special maintenance. Anyhow, it is recommended in dusty environment, to perform regularly cleaning work! This should be done monthly (every 200h). In an extremely dusty environment should be the cleaning intervals shortened.

- Clean the air side of the oil cooler with compressed air or water. The cleaning direction must be parallel to the fins, to prevent damaging. The cleaning result may be boosted by cleaning agents. Pay attention that this will not react with aluminum!
- Oil- and grease can be removed with a steam- or hot water cleaner. The pressure should be carefully adjusted!
- The drive motor as well as the pump motors below must be covered during cleaning!
- To clean the oil side, the cooler unit must be separated from the oil circulation (In- and Out)
- The oil side should be cleaned half yearly (every 1000h). Light dirt in the oil passages can be flushed away with perchlorate.
- The required flushing time depends on dirt condition and should be between 10 and 30 minutes afterwards the cleaning agent must be completely removed with compressed air
- Decreasing cooling performance can be best determined by checking the upper part of the cooler. If it does not get warm anymore, it must be switched off immediately!

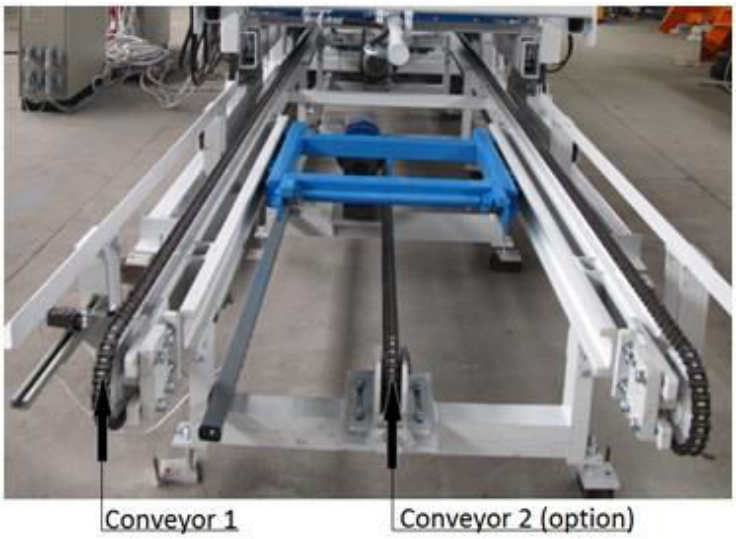
-Oil filter maintenance-

- Always replace filter element after commissioning.
- With non-monitored filters replace element after every 500 hours of operation.
- Filter elements are to be stored on the machine in original packaging so as to avoid contamination. Elements replaced are to be closely scrutinized. If abnormal dirt deposits are found the cause is to be traced and the inspection period must always be reduced.

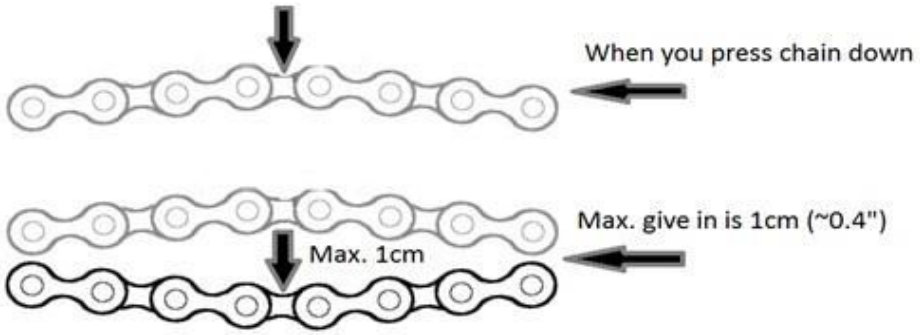
Conveyor maintenance



1. Sprocket wheel
2. Transport chain
3. Rocker limit switch
4. Gear motor
5. Sprocket wheel
6. Drive shaft
7. Adjusting screw with lock nut
8. Skid rails



The right tension of the transport chains is very important for a troublefree transport of the production pallets. A regulary inspection is therefore required!



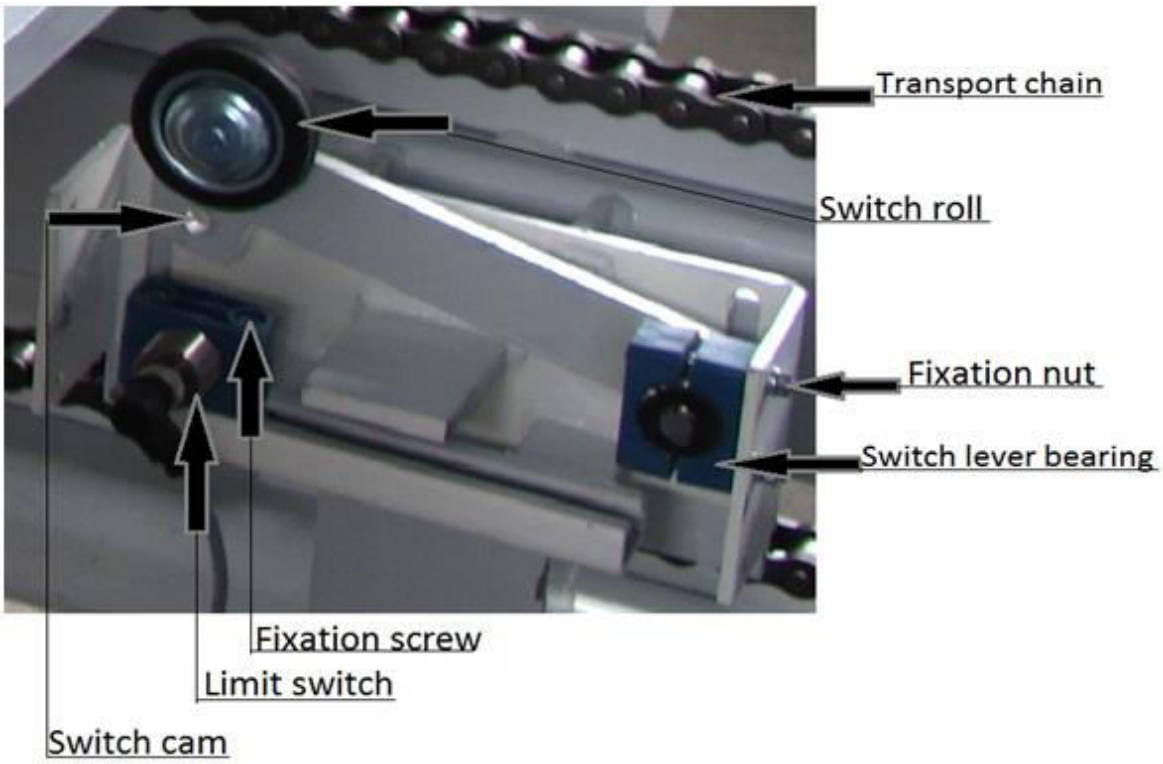
In case there is too much slack, follow this procedure:

- open the lock nut on the adjusting screw
- turn the adjusting screw slightly to the right, see if the tension is sufficient
- secure this setting with the lock nut

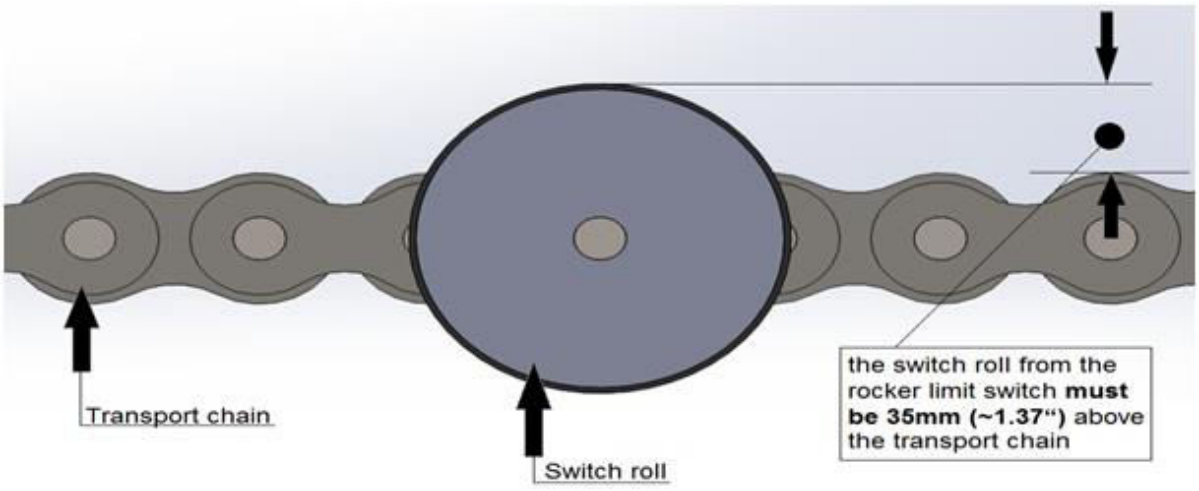
Maintain chain conveyor regulary!

Point of maintenance	Maintenance work	Maintenance interval
Chain conveyor		
Drive shaft Bearings	Lubricating	Weekly (every 50 hours)
Drive chain Chain tension Drive chain, sprocket wheels	Checking Re-adjusting, cleaning	Weekly (every 50 hours) If necessary
Transport chain Transporting chain Sprocket wheels, skid rails Chain tension	Checking Cleaning Re-adjusting	Weekly (every 50 hours) Weekly (every 50 hours) If necessary
Rocker limit switch Function Switch position Setting	Checking Checking Re-adjusting	Weekly (every 50 hours) Monthly (every 200 hours) If necessary

Check condition of the transport chains **weekly (every 50 hours),** if case of any wear or damages, **exchange immediately!**
Clean the transport chains **weekly (every 50 hours).**
Also clean the skid rails below the transport chains.
Rocker limit switch



The switch cam on the rocker **must** be at the minimum 8mm (~0.32 “) below the limit switch!



There are several rocker limit switches installed on the chain conveyor. Their purpose is to monitor and ensure a trouble free transportation. Regulary inspection is therefore required!
Check the functionality of every rocker limit switch **weekly (every 50 hours).**
Check the switching position on every rocker limit switch **monthly (every 200 hours)**.

Adjusting the rocker limit switch

You must regulary inspect the rocker limit switches on the chain conveyor. In case, they do not switch properly, **re-adjustment** of the rocker limit switch is **urgently** required!

The switch cam on the rocker **must** be **min. 8mm (~0.32“) below** the limit switch!
If right adjusted, the switch roll **must** be **35mm (~1.37 “) above** the transport chain!

-Pallet transport maintenance-

Pallet transport fixture must be maintained regulary!
Check weekly (every **50 hours**) that the latches are moving easily.
Clean weekly (every **50 hours**) the wheels and the wheel path.
Check weekly (every **50 hours**) the tension of the drive chain.
Chain should give in not more than **2 ... 3 cm** (approx. **1“**)!

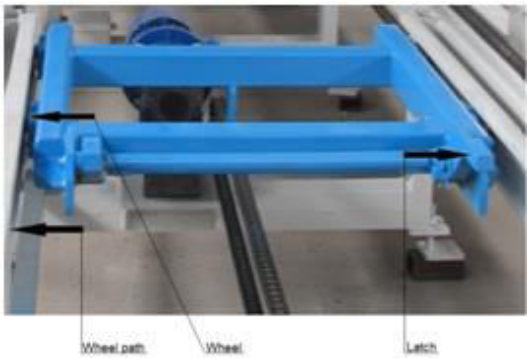
In case there is too much slack:

- open the fixation screws which hold the expander bearing on the frame, these are four (4) screws
- open the lock nuts from the adjusting screws
- turn the adjusting screws so far, that the chain becomes the right tension

- secure this setting with the lock nuts
- lock all four (4) fixation screws from the base plate of the expander bearing again

Note

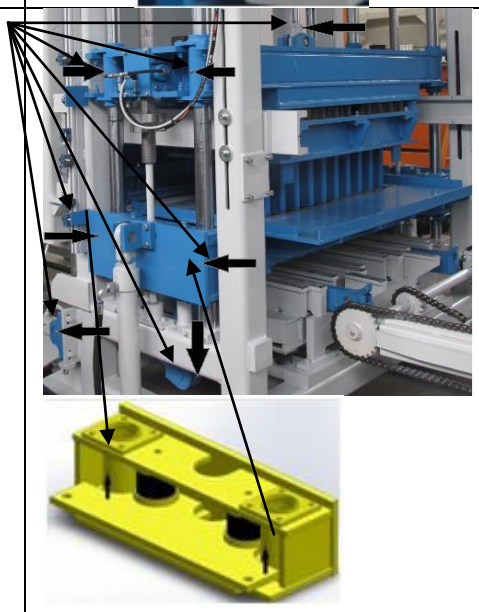
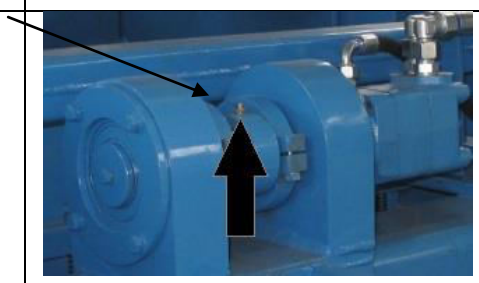
Do not forget to clean the drive chain with diesel!

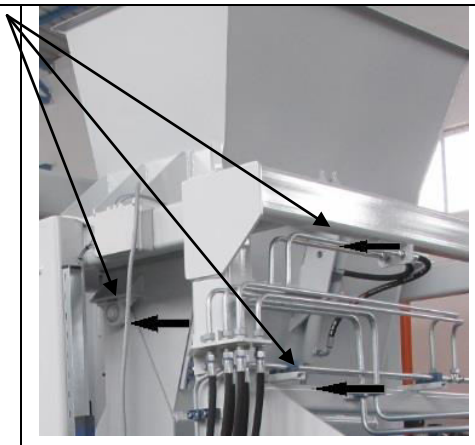
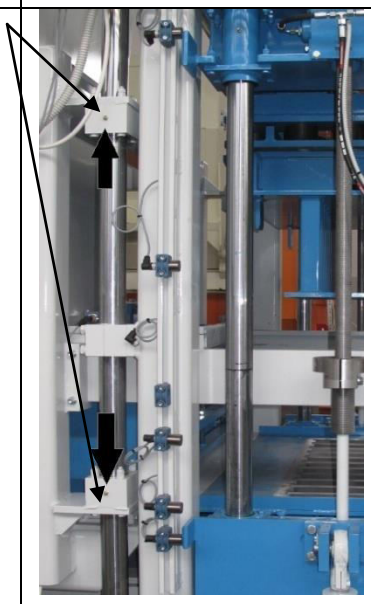


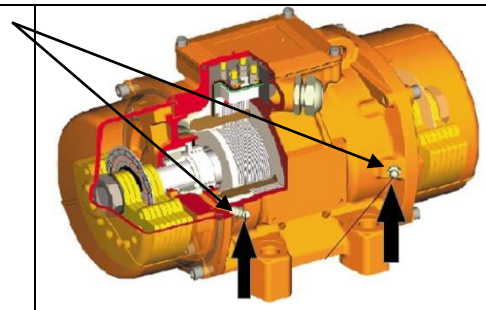
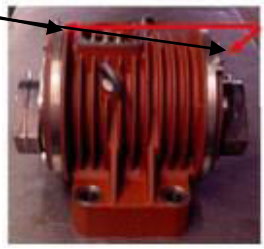
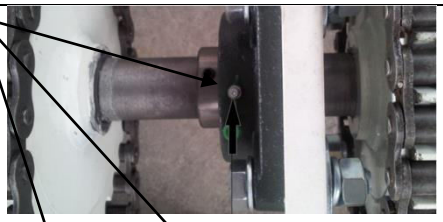
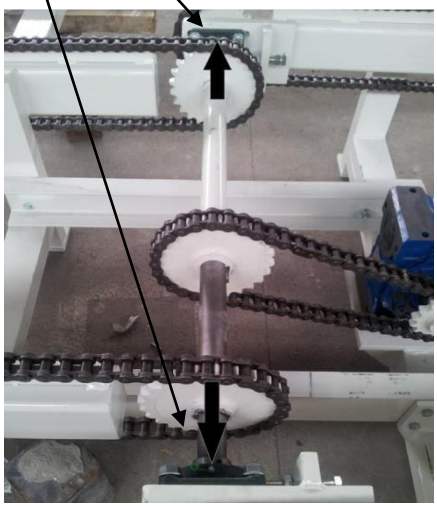
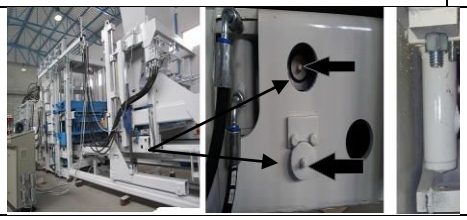
Lubrication plan and points

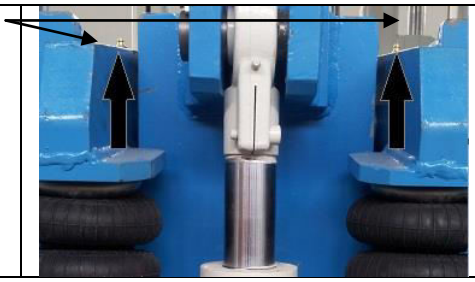
Use **only** high quality lubricants recommended by **PROMETAL!**

Before You start lubricating, nipple heads **must** be cleaned thoroughly!

Pos		Piece	Greasing points	Piece /Grease nipple	Working hours			
					20	40	100	200
1		8	Filler box roller bearings	8		**X**		
2	 Mould points (look from the inside)	13	Mould and tamper head	13		**X**		
3		1	Agitator	1		**X**		

4		4	Hopper bearings (2 in total) and hydraulic cylinder	4		**X**		
5		8	Machine frame	8		**X**		
6			Swivel head			**X**		

7		2	Tamper head vibrator	4	400 hours			
8		2	Mould vibrators	4	400 hours			
9	 	4	Conveyor	4		X		
10		2	Table plate lifter	4		X		

11		2	Pneumatic mould clamping –option-	4		**X**		

Warning! Oil drippings and leakages may also develop risks to the operational safety! The hydraulic system contains high pressure! Remedy the fault immediately!

Hydraulic oil should be changed twice a year. When changing clean also oil reservoir.

For lubrication of the vibrator bearings use roller bearing grease:

CALYPSOL H 443-HD 88

Multi-purpose greases are **not** appropriate and **should not** be used. In order to avoid any confusion with unfit greases, use above mentioned grease also for all other greasing points of the machine.

Alternative greases:

MANUFACTURER	GREASE TYPE
Mobil Oil AG	BP Engergrease LS-EP2
FINA	FINA Marson EPL 3
Dow Corning	Molykote BR2 plus
DIVINOL	Multitherm 2
Deutche BP SG	BP Engergrease LS-EP2

Lubrication plan for vibrators

Mould vibrators

During an 8 hour continuous operation lubrication should be done according to the following index:

Type VZ-280 400h operating hours

with 6 strokes of a grease gun (0.8g grease each)

After lubricating for the 10th time, disassemble the vibrator, clean and grease the antifriction bearing.
It is done by:

1. Dissasemble vibrator
2. Clean all parts
3. Examine parts for damage and replace if necessary
4. Fill antifriction bearings with grease

Lubricants can be obtained through PROMETAL

Multi-purpose greases are not appropriate and **should not** be used. In order to avoid any confusion with unfit greases, use above mentioned grease also for all other greasing points of the machine.

Tamper head vibrators

All bearings are correctly lubricated on mounting the vibrator.
Never mix greases even if they have similar features. Excessive quantity of grease causes increased heating of the bearings and consequent anomalous current absorption.

Lubricants can be obtained through PROMETAL

Tamper head maintenance

Warning!

When some maintenance work is carried out on the tamper head guide bridge, tamper head main plate or tamper head itself the stopcocks must be closed and the retaining bolts for securing the tamper head must be in position!

Also control voltage must be switched off!

Machine that are equipped **with tamper head vibration,** the tamper head and tamper head plate respectively are connected with the guide bridge by means of rubber buffers.

Tamper head bridge carrier.

In order to avoid an inclined setting-up of the tamper head (that can result in an unequal stone height), supporting screws are placed before and behind the metal buffers. These screws should be adjusted 1- 2 mm lower than rubber buffers in order to avoid transmission of vibrations on to the tamper head bridge.

Also the two traction-discharge screws are installed on every side of the suspension which prevents the metal buffers to be strained by tractive powers. With uncharged buffers backlash of 1-2 mm should be maintained.

Setting the tamper head:
To set up tamper head stroke, please follow these instructions:

- activate master switch on the control panel for the function: **tamper head up**

SAFETY NOTE!

Before You start any inspection, maintenance or repair work, ***insert first the tamper head safety bolts!***

- insert four distance pieces into outer mould cavities, their height must be exactly corresponding with the height of the intended products
- activate master switch on the control panel for the function: **tamper head down** (remove tamper head safety bolts first)
- unscrew and **move to end down** position **tamper head stoppers**
- tight the both tamper head stoppers with all 4 screws
- activate master switch on the control panel for the function: **tamper head up**
- remove the distance pieces from the mould

Now tamper head stroke is adjusted to wanted block height.

Maintenance on tamper head cylinders and bearings

The tamper head cylinders **must** be mainteined regulary!

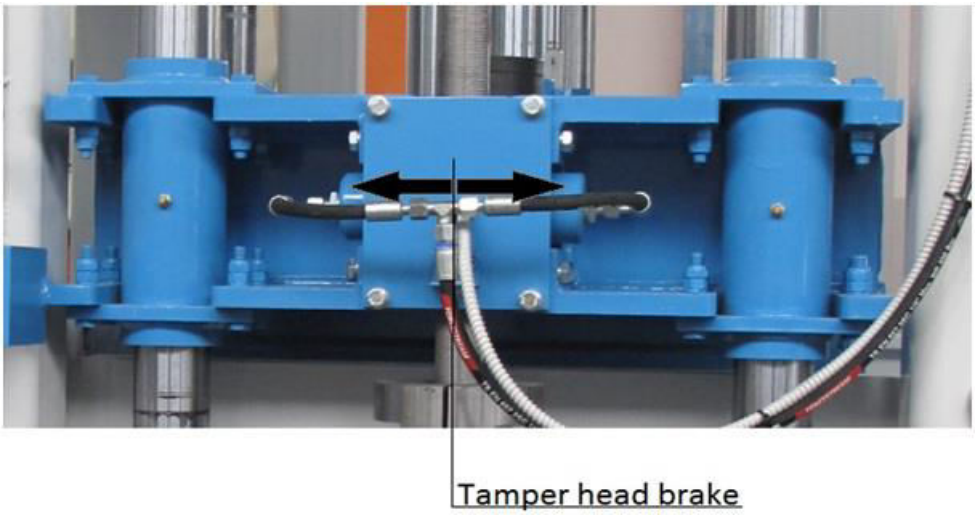
Lubricate the pedestal bearings on every tamper head cylinders weekly (based on 1 shift, every 50 hours).

Clean push rods on tamper head weekly (based on 1 shift, every 50 hours). Also check condition of push rods.

Check hydraulic fittings and seals for possible leakage.

Also, check weekly (every 50 hours) the tight fit of the fixation screws on the pedestal bearings

Tamper head brake



Tamper head brake must be maintained regulary for safety reasons!

Clean the brake bars weekly (every 50 hours) from dirt and dust. Scratches are always sign of dirt. Check the reason and remedy it. Smoothen the bar with a bench stone or a emery cloth. Use clean and dry rag, not oil soaked one.

Check monthly (every 200 hours) for thickness of brake linings. They should **not** be less than 2-3mm (0.080“-0.120“)!
Check if the linings are equaly worn. Unequal linings wear is sign that one of the hydraulic cylinders aren’t working properly! Check the reason!
Also check weekly (every 50 hours) that the brake linings are not oily.
If there is, for any reason, a leakage in the hydraulic brake system, repair immediately!

Check weekly (every 50 hours) the tight fit of the fixation screws on the tamper head brake. They must be tightened with 710 Nm.

After replacing brake linings or repairing, it is important to follow next steps!

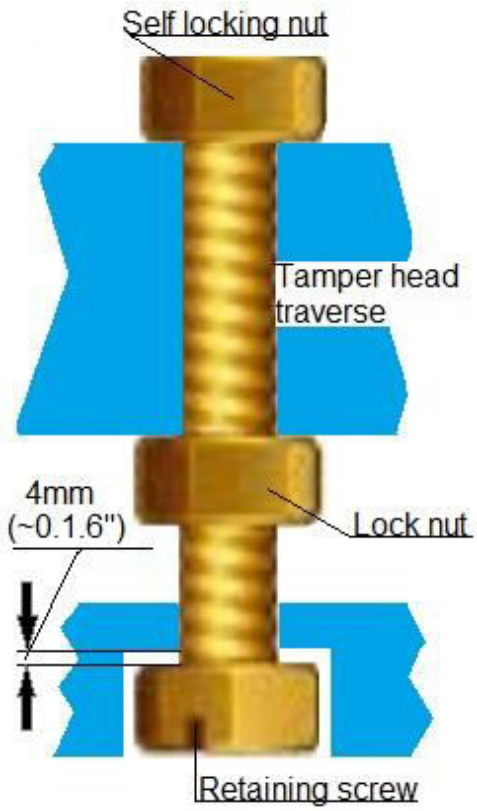
1. Clean threads and use **high quality** lubricant to grese them
2. Use **only** new screws
3. Use **only** new washers
4. Use **only** a torqua wrench

Check daily if tamper head safety bolts are in the provided storage sleeves and check weekly (every 50 hours) condition of safety bolts.

Hydraulic tamper head clamping (option)

Check the hydraulic tamper head clamping at **every** mould change!
Clean clamping surfaces on the slides at every mould change!
Clean the push rods on the hydraulic cylinders at every mould change, also check also the condition of the push rods.
Check the hydraulic fittings and seals for possible leakage.

Retaining screws for tmper head plate



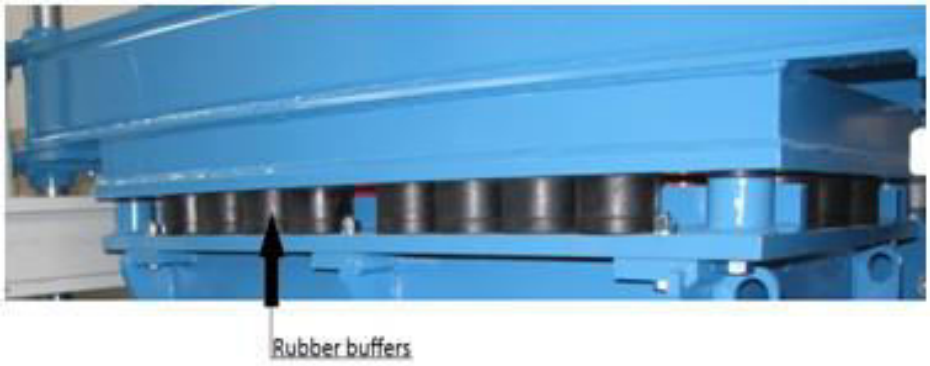
There are 4 (four) retaining screws to secure the tamper head plate. They must be set with a distance of 4 mm (~ 0.160“) between the screw head and the tamper head plate.

1. Open the self locking nut on top of the tamper head traverse
2. Turn the lock nut several turns down
3. Press the screw head up against tamper head plate , screw lock nut handtight against tamper head traverse and **mark** lock nut in front with a felt pen
4. Let the screw go and turn the lock nut exactly 2 turns up (while holding the screw in position)

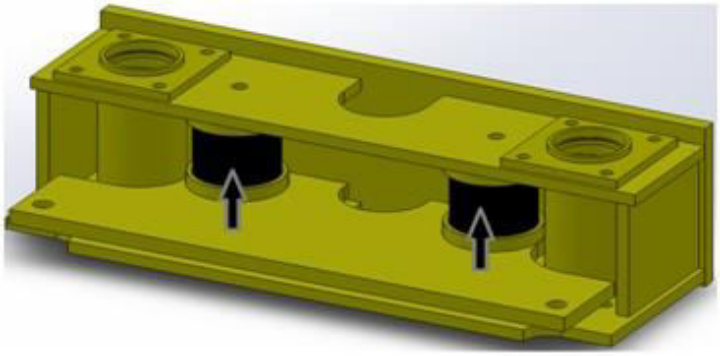
Tighten the self locking nut on top of the tamper head traverse

Rubber buffers on tamper head, mould and vibrator table

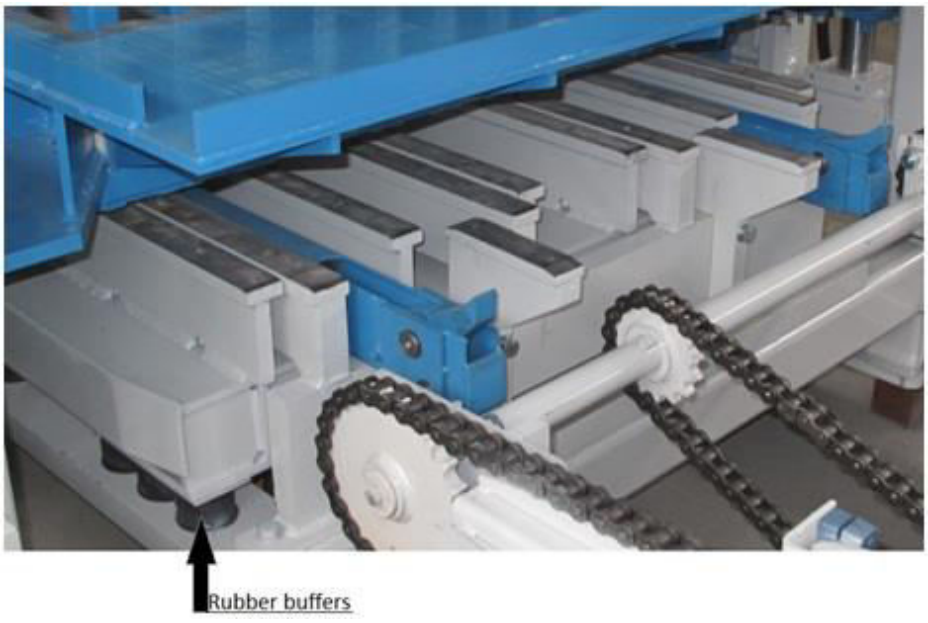
Rubber buffers **must** be exchanged regulary!



Tamper head rubber buffers



Mould rubber buffers (4 rubber buffers in total)



Vibrator table (12 rubber buffers in total)

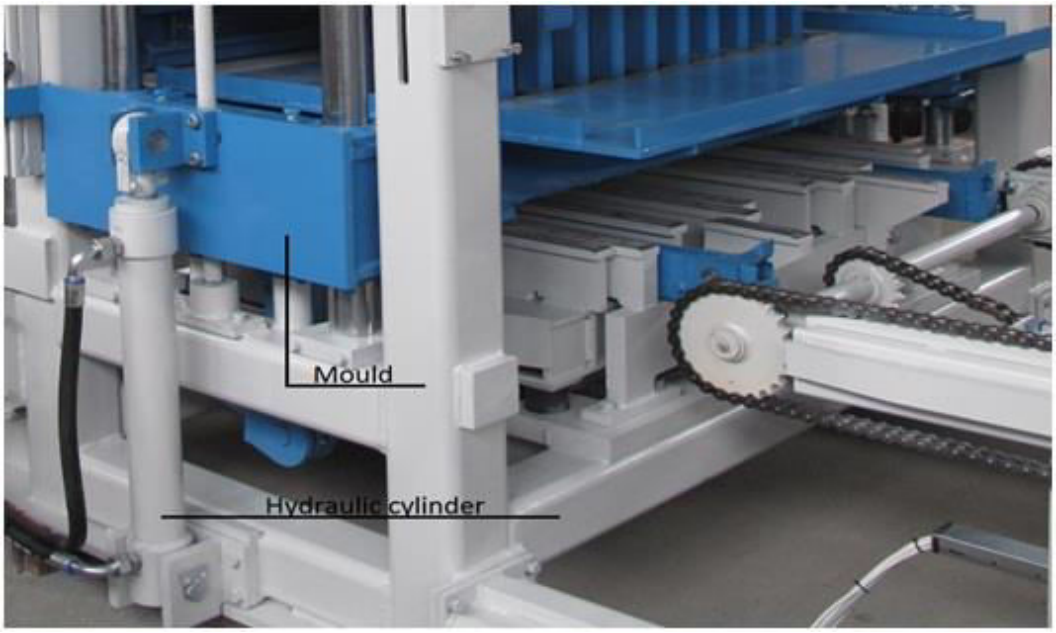
Check weekly (every 50 hours) condition of rubber buffers. In case they show any wear, replace them **immediately!**

This maintains the security status of the machine, as well as the precision and therefore the quality of the product! The time for changing these rubber buffers is directly related to the production:

- exchange based on a 1-shift operation : yearly
- exchange based on a 2-shift operation : half-year
- exchange based on a 3-shift operation : 3 months

Always completely exchange rubber buffers!
Use **only** original spare parts!

Mould maintenance



Mould system consisting of:

- mould guide
- mould clamping

Mould change

NOTE!

Before setting up the mould, observe the following points:

- check that the tamper head securing bolts are putted in securing position

- check the rubber buffers on mould clamping

- check the easy movement of mould clamping

For a mould change it is important to observe that filler box guide on filler box under plate is in line with filler box guide on mould.

Distance of a mould to filler box under plate must be approx. 1mm.

The area around mould guide should be cleaned whenever possible, to reduce the possibility of wear on the guiding elements. Check this area daily (based on 1-shift operation), and clean if needed!

Never perform any setup, repair or maintenance work with mould guide lifted up! Before You start any setup, repair or maintenance work **first insert safety bolt!**

For mould change please follow next procedure:

<u>Mould and tamper head dismantling</u>

- check that filler box is in start position
- move up mould for about 25 cm under floor

SAFETY NOTE! **Turn in position OFF main switch on electric board before continue with next mould change steps!**

-remove protective meshes from both sides of machine that you can reach screws that tight mould to mould clamping part

-unscrew mould from mould clamping part

-low down tamper head into mould that distance holders are laying on moulds up surface

SAFETY NOTE!

Turn in position OFF main switch on electric board before continue with next mould change steps!

-unscrew all 12 screws that hold tamper head tighten to tamper head bridge

-unscrew holders of electric cables that supply tamper head vibrators and pull out cables

-Put under the mould holders (wooden or other) 5-10 cm of height

-turn **ON** main electric switch

-Move mould in down position – mould and tamper head together are laying on holders

-move machine in direction **FORWARD**

-mould and tamper head are than laying on floor disconnected from machine

-Dismantle vibrator – motor sets from mould

-Important hints for mould changing-

1. For every change of moulds, please attend to the correct setting of the supporting screws at the quick change devices. These screws must be adjusted uniformly l – 2 mm lower than the rubber buffers are high. They have one purpose only; during demoulding, the buffers are pressure strained and somewhat compressed. It is in this moment that the supporting screws enter into action. They prevent the mould from tilting whereby the just manufactured concrete components could possibly be destroyed.

2. The short metal buffers attached to the mould enable a free vibration behavior of the mould standing in filling position. Moulds lying on the production floor are braking the oscillations of the vibrators. Result: A bad compaction of the stones. If after a certain period the metal buffers wear out, they have to be renewed in time or to be lined with sheet metal, the floor clearance of the moulds after filling should be 2 - 3 mm, this distance allowing an irreproachable vibration of the mould above the production floor.

3. One supporting screw each is attached laterally to the mould lifting angles. After installation of the mould, these screws should have abt, 1 mm clearance between screw head and mould and have to be nut looked in this position.

4. For even newly installed mould, the lowering speed must be adjusted accordingly. The speed should be set in such a way that the mould will never thump hard on the production floor as this would destroy the mould lower side.

5. Tamper head and mould must well fit into each other. A pad filling leads to an early wear and to a possible demolition of the mould.

 **Caution!**

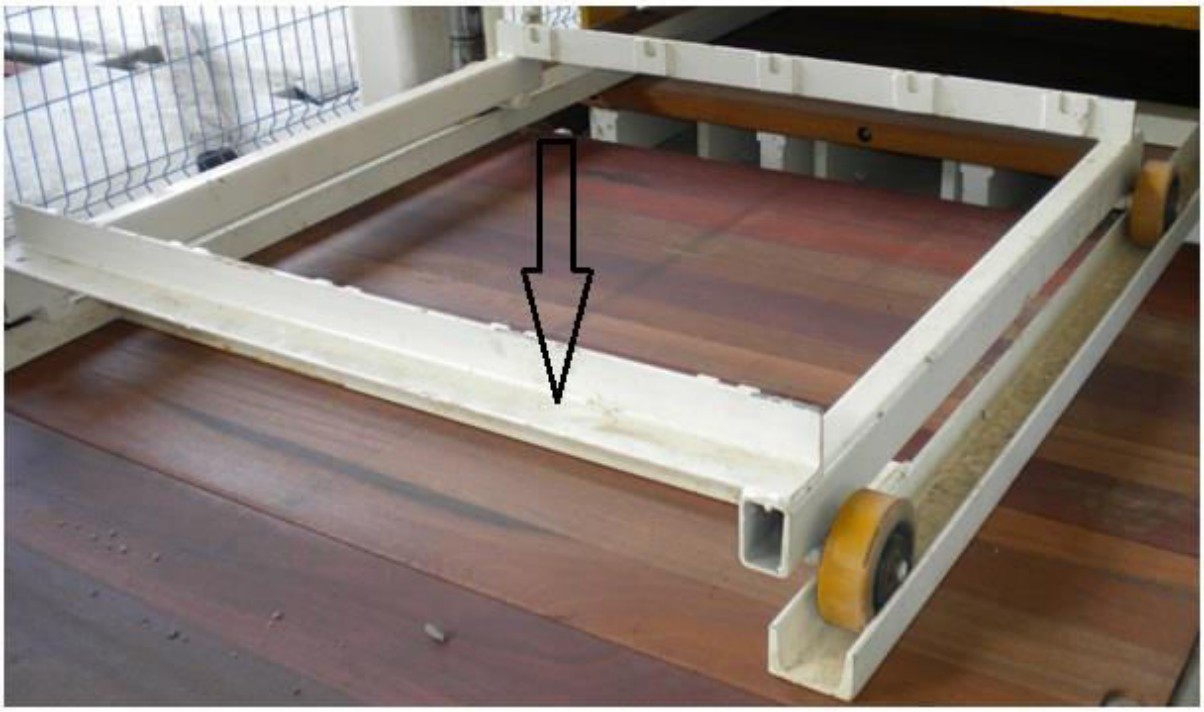
A direct firm contact between mould and machine is not admitted anywhere.

When demoulding and mounting mould up safety precautions **must** be done!

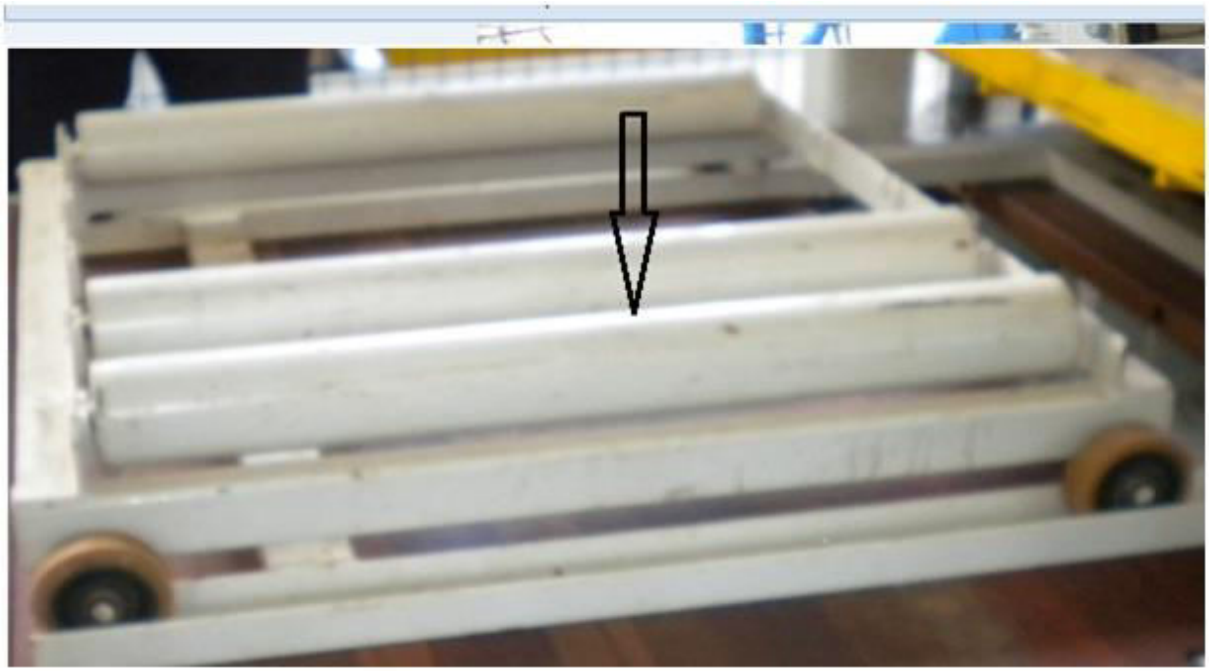
-Mould changing-

First insert mould changing track.

After this is done insert mould changing cart into this track.



Put cylinders into cart.



Now insert cart under mould and tamper head.

This is followed with unscrewing all screws.

Now lower down tamper head and mould

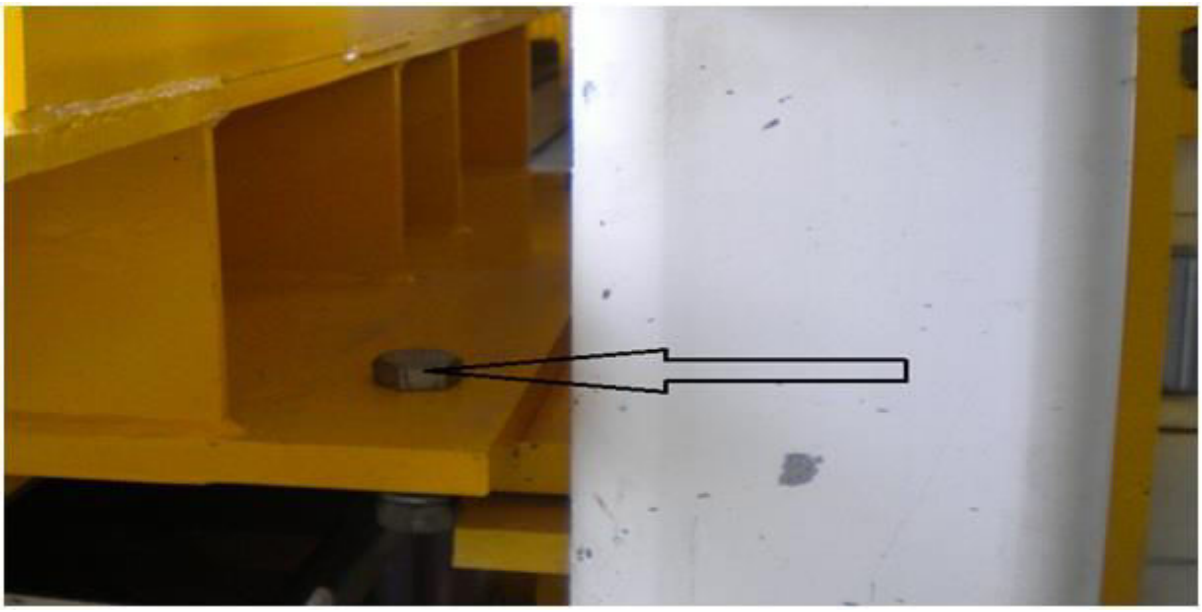
Pull out cart with mould on itself

After You safely remove used mould insert new one

Put cart into track and move it inside

Put mould bolts back but don't screw them!

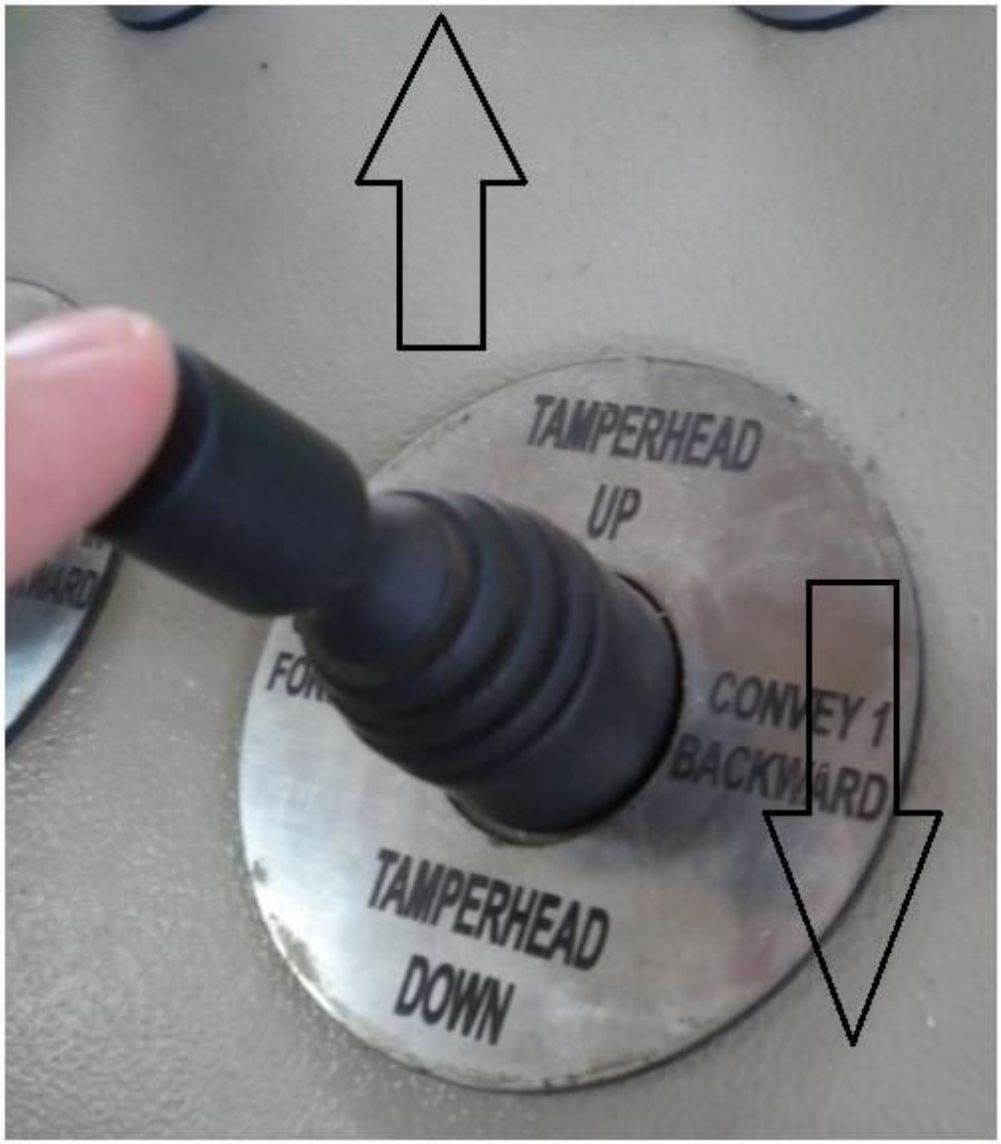
(Using new bolts and screws on every mould change is highly recommended)



Tight up tamper head screws and bolts

Lift tamper head up and down and use pre-vibration with extreme caution!

(this is done to adjust mould and tamper head)



Lift up or lower down (mould depending) machine frame using rack winch (this is used to adjust mould and floor plate on the same height level)

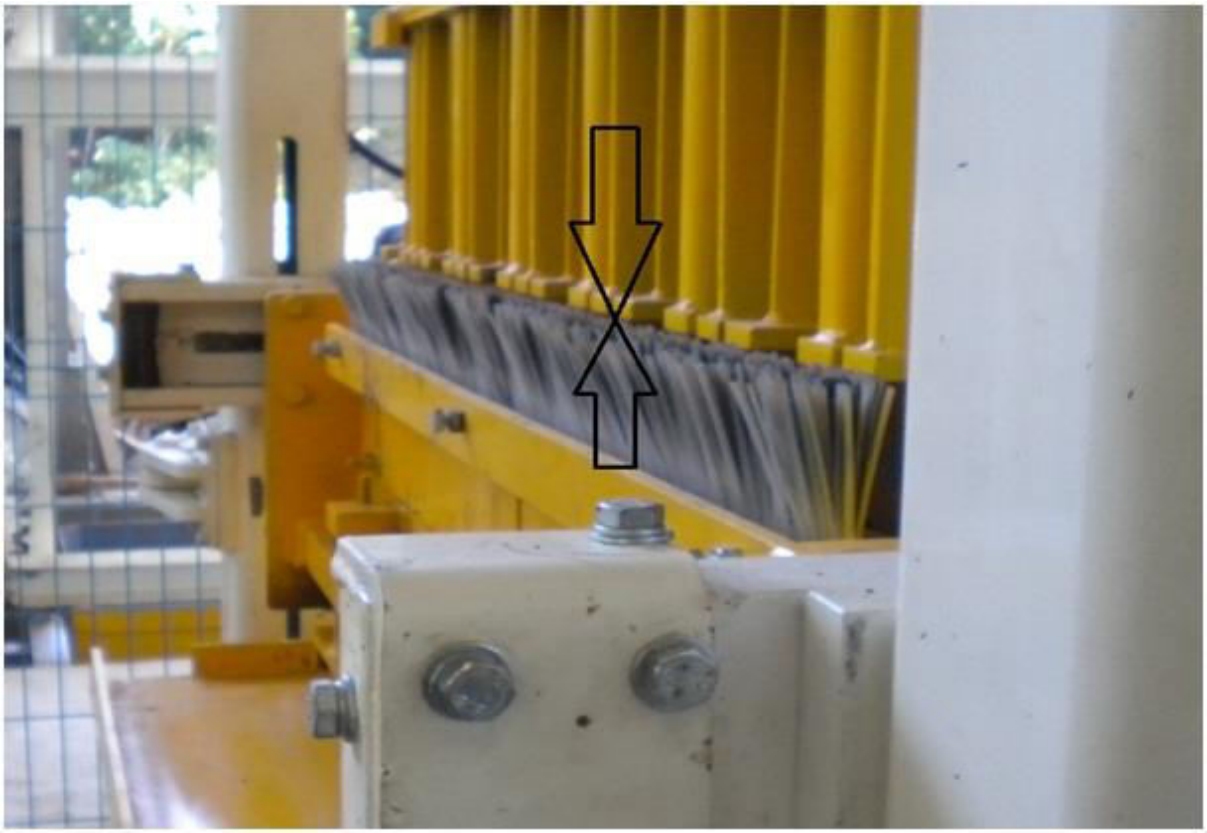
After adjustment is done

Release floor plate screws and adjust distance of mould and floor plate

After adjustment is done tight all screws up

Lift tamper head up and move filler box over mould

This is done for brush adjusting

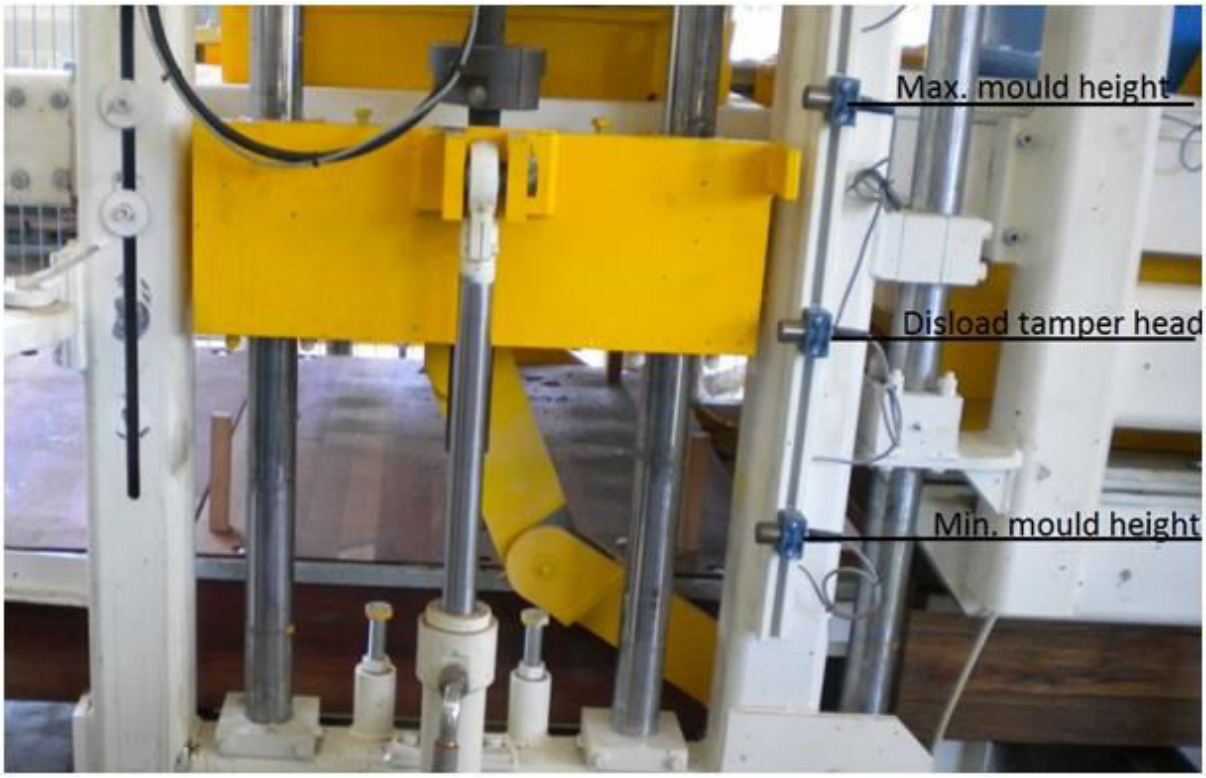


Adjust height of tamper head and brush so it can clean tamper head during work

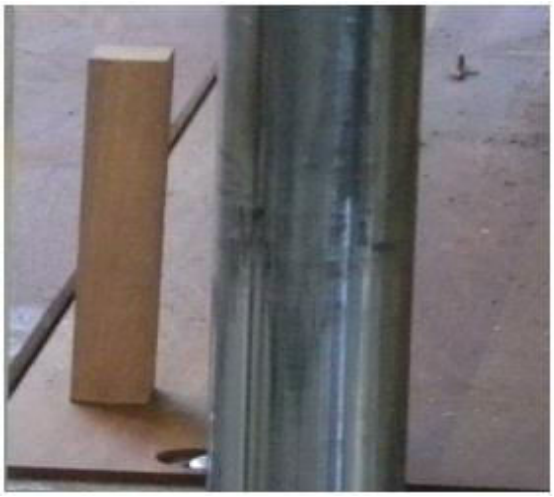
Sensors adjustment

There are 3 sensors for mould and 4 sensors for tamper head

Mould sensors

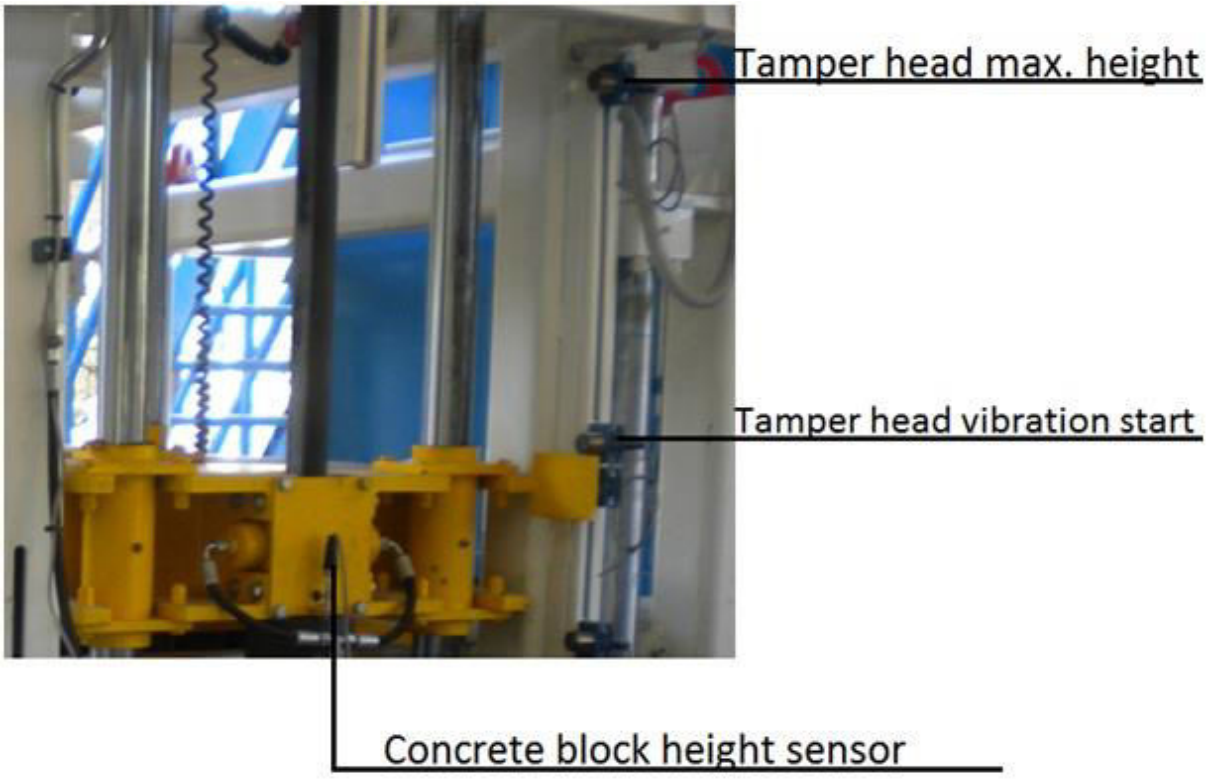


Disload of tamper head is point where tamper head leaves mould and continue lifting up without mould.



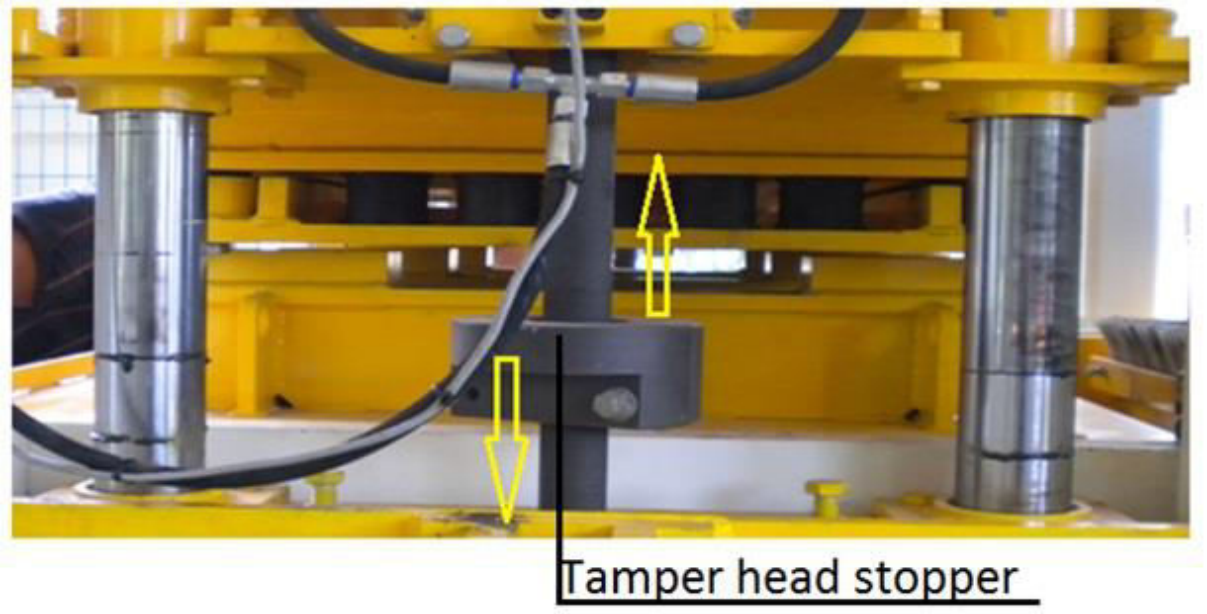
Distance (it determins height of Your desired production. For example 200mm concrete block)

Tamper head sensors



Concrete block height sensor is located on both sides.

Tamper head stopper



Mould and tamper head mounting on machine frame

Mounting of mould and tamper head is going in opposite way from dismantling.

-tight vibrators on mould

-tight mould to machine frame, rubber buffers must be aligned well between mould and mould clamping device – without distortion

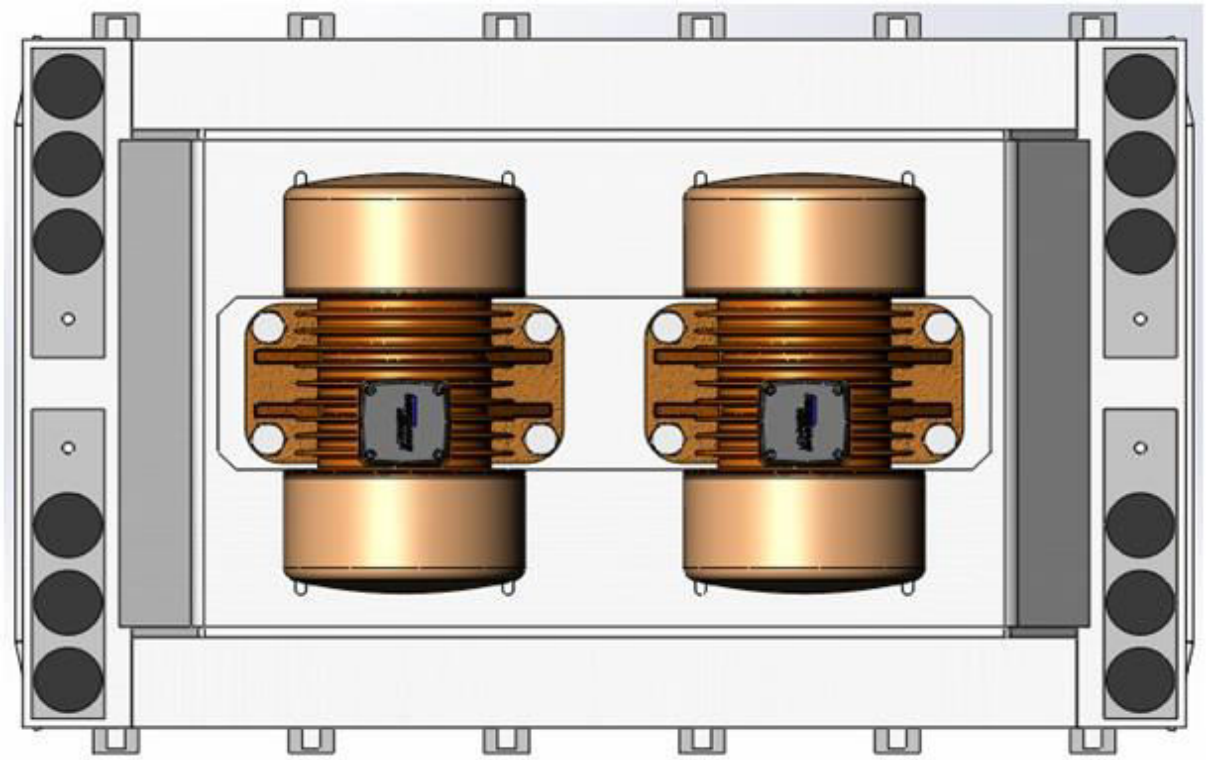
-check that tamper head shoes are well centered in mould body

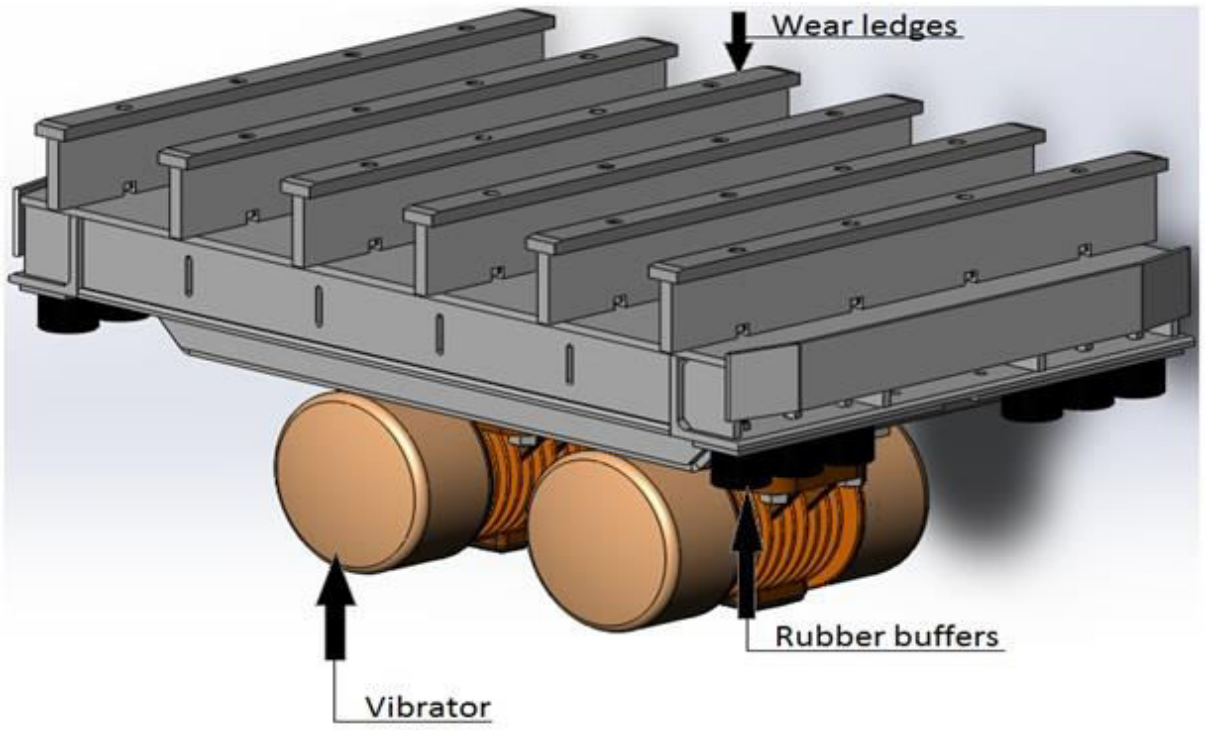
-tight well screws that fixes tamper head to tamper head bridge

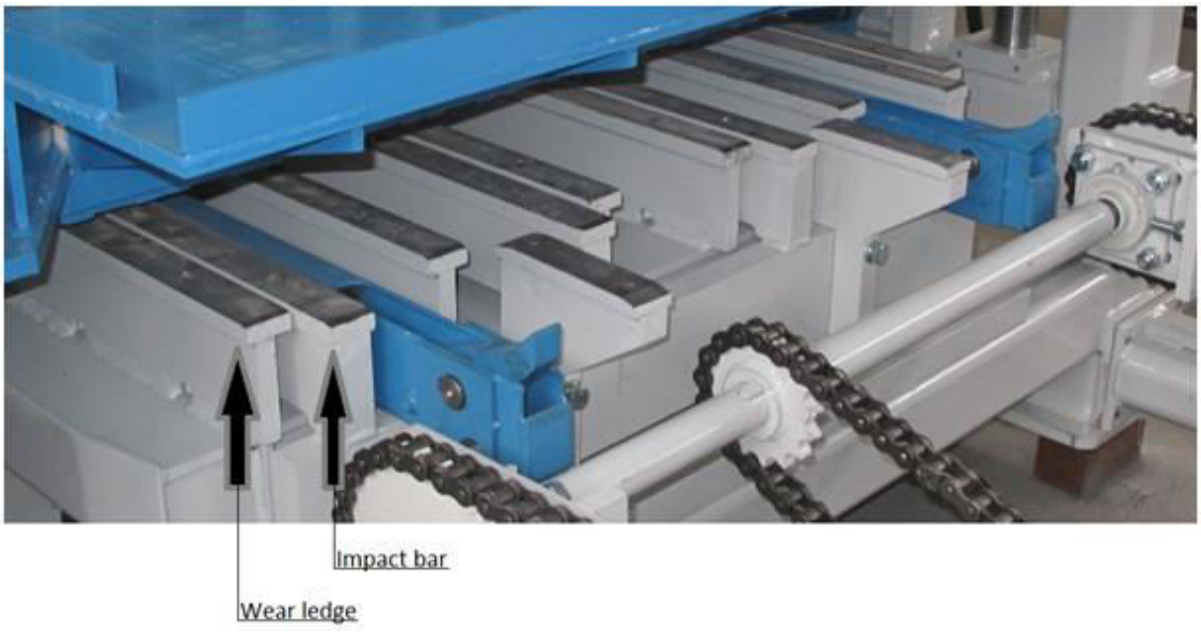
-check the electric cables and connectors for vibrators and if they are not damaged, plug them in

These instructions are valid for all mould types.

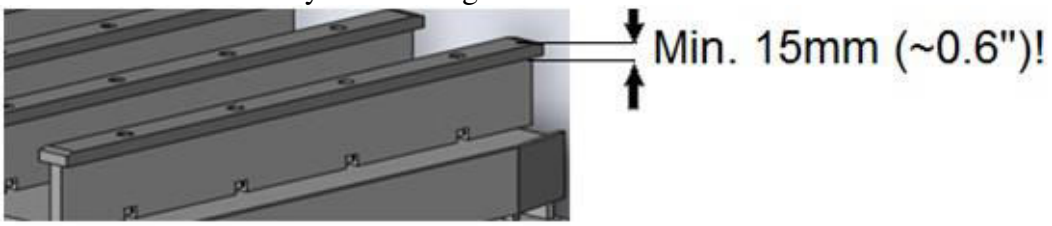
Vibrator table maintenance



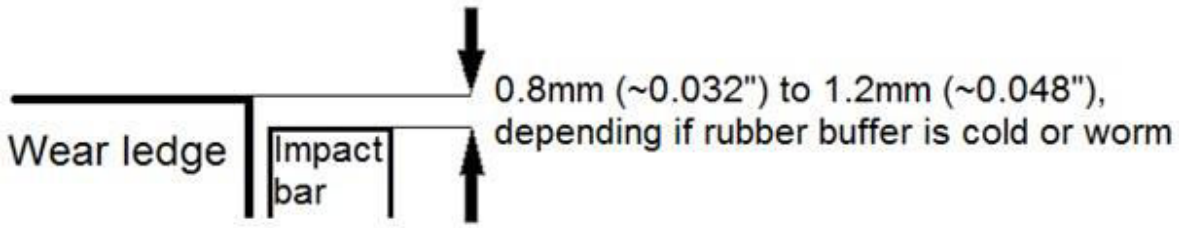




Wear ledges and impact bars
Check the thickness of the wear ledges weekly (every 50h) - minimum = 15mm (~ 0.600")
We recommend changing the wear ledges at a thickness from < 17mm (0.670")! But atleast at a thickness of 15 mm (0.590") the wear ledges must be changed, otherwise the heads of the fixation screws will be worn so much, that they can not be removed anymore!
Remove possible paint from the bearing surface, when changing them!
Check weekly (every 50hours) distance and parallelism between wear ledges and the impact bars. But at least at every mold change!



The right height distance between wear ledges and impact bars must be maintained!
The parallelism over the total surface is **very important!**



- Clean all wear ledges and impact bars properly, before You start adjusting them
- Unlock all fixation screws on the vibrator table; on every vibrator table open the screws at least 2 turnes
- Open the lock nut on the adjusting screw for the wegde type hight adjuster
- Place a ruler across the wear ledges and measure the distance between wear ledges and impact bars (measure distance equally outer side of the vibrator table)
- Adjust the exact dimension by turning adjusting screw to the right (or left). Repeat this process on every adjusting screw
- Secure this setting with lock nut on adjusting screw
- Tighten fixation screws with 710 Nm (every thread **must** be greased **only** with high quality grease), use **only** torque wrench

Vibrators

-Safety during working with vibrators-

The operating staffs have to be informed before execution of mounting, start-up and maintenance work! According to the operating instructions a proctor has to be appointed.
All operations at the vibrators are principally to be carried out when the machine has come to a standstill. Protection doors, flaps and other mechanical safety devices are only to be opened after standstill of the vibrator, machine or plant.
Before beginning to operate the vibrators machine or plant the drives and additional features have to be protected against incidental activation. The switching-off procedure of the operating instruction has to be considered.
During the exchange of large and heavy components suitable chain hoists and similar aids should be held ready and used. The components are to be fastened carefully to the chain hoist and to be secured.

Attention! *Only suitable and technically perfect chain hoists should be used! Do not stop or work under floating loads! Make sure that only experienced and trained personnel willbe assigned for the fastening of loads and for the instruction of the crane operators!*

-Tamper Head Vibrators-

Caution!

Comply with safety instructions.

Switch to "O" main switch on cabinet, box or panel! The main switch can be locked up against non authorized switching on by means of a patent lock.

-Mouning-

The vibrator must be fixed to a perfectly flat surface using bolts (quality 8.8 - DIN 931-933) and nuts (quality 8.8 - DIN 934) which are able to support high coupling torques. Use a dynamometric wrench.
It is also indispensable to control that the bolts are tightened fully home. This control is particularly necessary during the initial functioning period.

Remember that most damage and faults are due to irregular fixing or badly performed tightening.

Re-control tightening after a brief functioning period.

Attention: **This operation must be carried out exclusively by specialised staff with the power supply disconnected.**

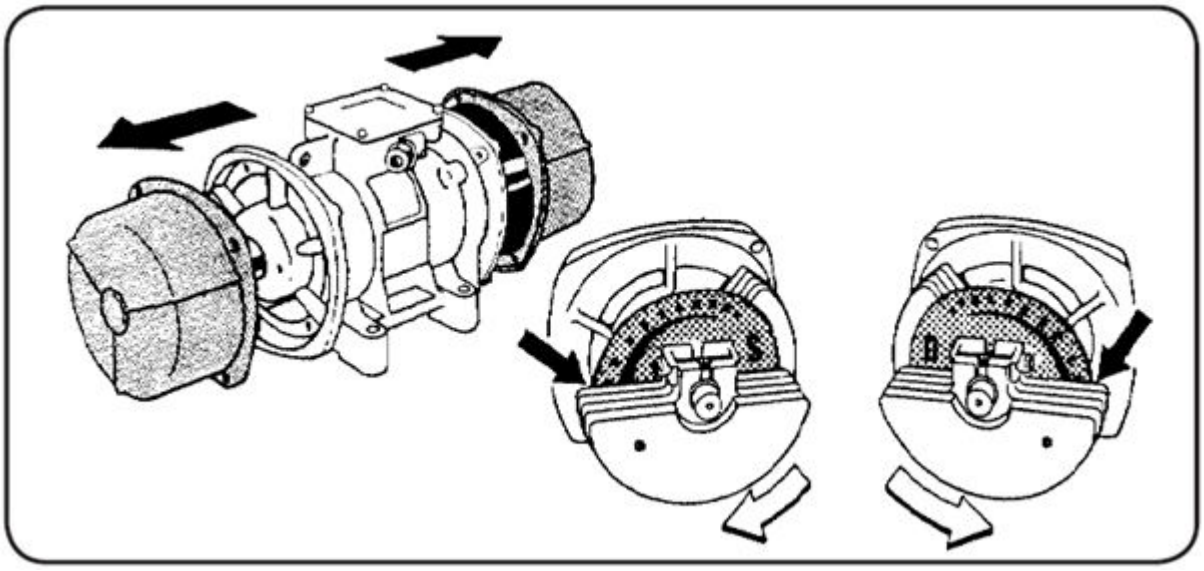
- To adjust vibration intensity it is necessary to remove the weight covers.
- It is usually necessary to adjust the weights in the same direction in the two ends. To allow exact adjustment of the weights, the vibrators are equipped with a patented system that prevents the adjustable weight to turn in the wrong direction.
- Unscrew the mobile weight screw fastener or nut. The adjustable weights positioned at the two ends of the shaft must be positioned in a way to read the same value on the reference percentage scale. The weights positioned at the two sides of the vibrator can only be adjusted on two different values for particular machines and for special uses.
- Once the eccentric weight has been taken to the desired value tighten the screw fastener or nut using the dynamometric wrench and repeat the same operation on the opposite weight.
- Once the operation on the two sides has been carried out, re-mount the covers on the screws and washers paying attention that the seals are correctly positioned in their houses.

Maintenance

Only authorised technicians can intervene on the parts that make up the vibrator.
Before carrying out maintenance on the vibrator wait until the temperature of the vibrator case is not above +40° C and ensure that the electrical power supply has been disconnected.
If parts must be replaced, only ITALVIBRAS original spare parts must be used.

We recommend to replace both bearings even if one bearing only is defective, normally the other bearing would fail in a short time.
During the repairing check the conditions of all parts, replace them if necessary.
Switch-off the power supply from the vibrator, dismount it from the machine, remove the weight covers and the OR seals, mark position of eccentric weights and disassemble them with keys

Adjustment of the direction of rotation

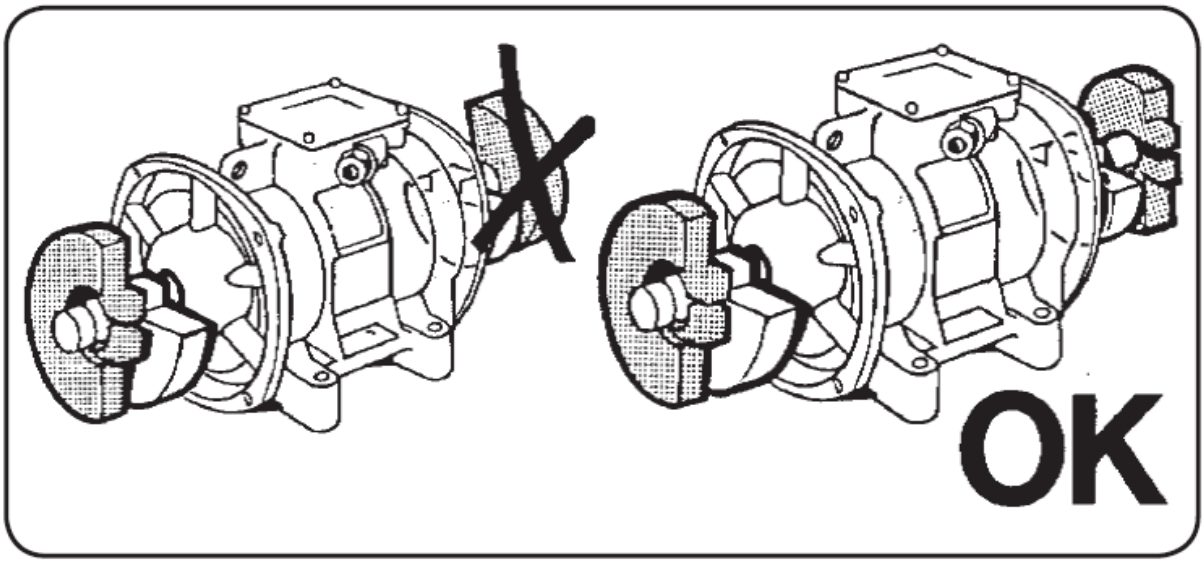


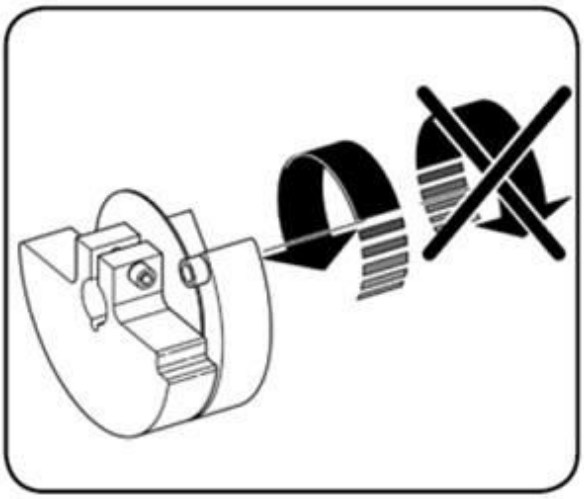
- Remove a weight cover
- Wear protective glasses
- Power the vibrator for a brief period of time
- If the direction of rotation must be inverted, act on terminal board connections, after having removed the power supply from the vibrator
- Reposition the covers, ensuring that the seals(OR) are correctly positioned and tighten the screw fastener

Vibration force adjustement

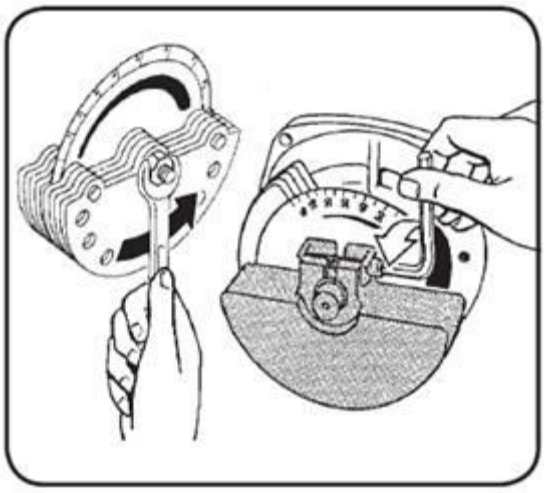
Attention: **This operation must be carried out exclusively by specialised staff with the power supply disconnected.**

- To adjust vibration intensity it is necessary to remove the weight covers.
- It is usually necessary to adjust the weights in the same direction in the two ends (like on picture bellow).



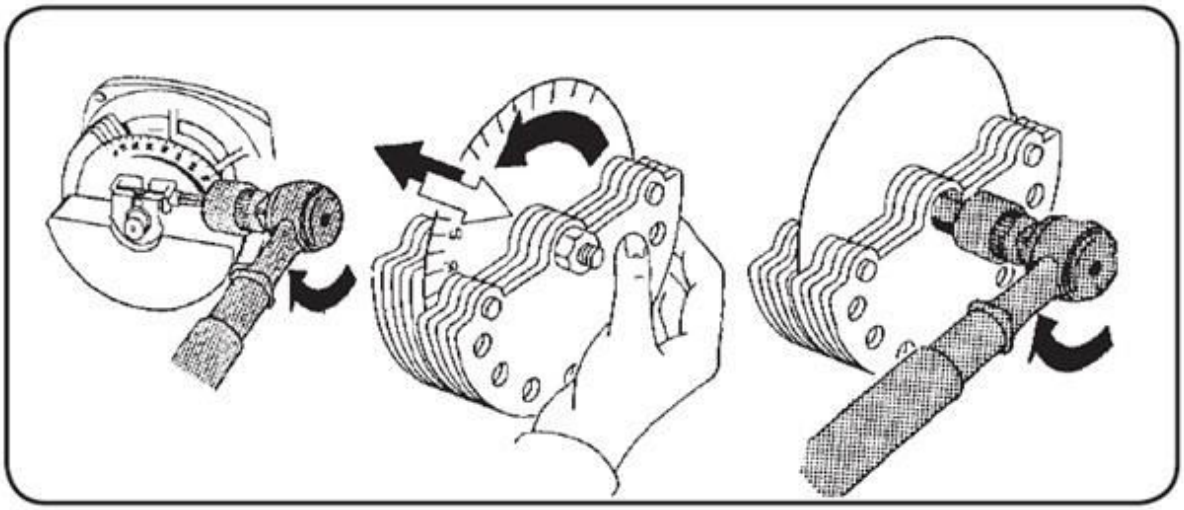


To allow exact adjustment of the weights, the vibrators are equipped with a patented system that prevents the adjustable weight to turn in the wrong direction .

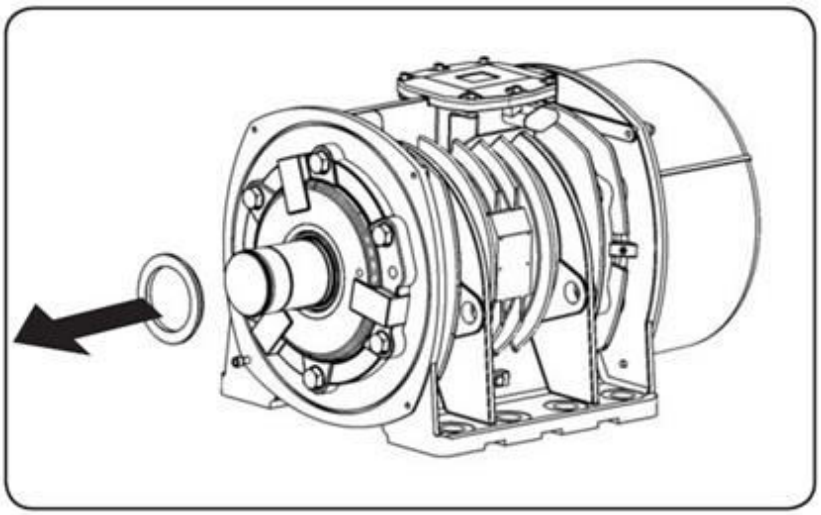


Unscrew the mobile weight screw fastener or nut. The adjustable weights positioned at the two ends of the shaft must be positioned in a way to read the same value on the reference percentage scale. The weights positioned at the two sides of the vibrator can only be adjusted on two different values for particular machines and for special uses.

- Once the eccentric weight has been taken to the desired value tighten the screw fastener or nut using the dynamometric wrench (picture bellow) and repeat the same operation on the opposite weight.



- Once the operation on the two sides has been carried out, re-mount the covers on the screws and washers paying attention that the seals are correctly positioned in their houses (picture bellow).



-Vibrator table vibrators-

-Mounting-

Mounting surface of vibrating table **must** be cleaned thoroughly before installing vibrators! Bolt connection is to be secured with by chemical means of screw locking, e.g. with Locktite 601 or similar.
All bolts connections are to be carried out with a torque according to the manufacturer specification for screws and nuts. Also for the fixing attachment use only bolts with grade of 8.8 and nuts of grade 6.

Vibrators designation	Housing size	Hexagon bolts for "threaded holes"		Hexagon bolts for "cleareance holes"		Tightening torque
		Dimension	DIN	Dimension	DIN	Nm
VZ 280	K5	M24x100	931 8.8	M24 with nut M24	931 8.8 934-8	647

Caution!

Inappropriate mounting can lead to increased power consumption of the vibrator.

-Electrical connection-

Caution!

The electrical connections are only to be executed by experts!

-Adjustment Of Vibrators-

Before working on the equipment is has to be ensured that the motor can not be switched on! It also has to be secured that nobody is in the danger area of the imbalances when the covers are opened!

Caution!

The vibrators of newly supplied machines are pre-set by the makers for an average centrifugal force as per table. As far as no other values are available from experience, introduction should begin with this adjustment. If necessary, the centrifugal force it may be increased by adjusting the balance weights until the desired compaction is obtained. The peak values, shown in the

table, must not be exceeded. The lower the centrifugal force is set, the less is the wear of moulds and vibrators.

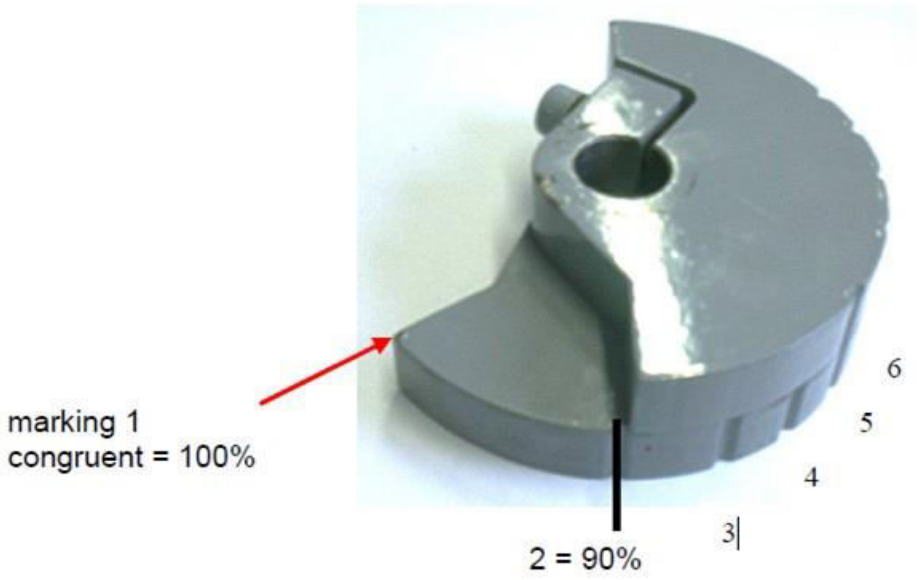
Adjustment of the direction of rotation

1. Remove a cover to be able to check the direction of rotation.
2. Switch on the vibrator shortly and detect direction of rotation.
3. If it is necessary to change the rotation, turn the main switch off and secure it against incidentally activation.
4. Swap the connection of 2 leads of the power cable, e.g. at the connector or at the distribution panel. Do not swap leads in the terminal box of the vibrator!
5. Mount the cover again.

Adjustment of the unbalance

The unbalances of the vibrators are normally set to the maximum generation of centrifugal force for which the vibrator was designed for.

1. Remove both covers.
2. Loosen the clamping screw of the adjusting unbalance on one side and adjust according to the following diagram on the next page
3. Adjust the unbalance on the other side of the rotor shaft the same way
4. Tighten clamping screw again.
5. Perform the same adjustment of the unbalance on the other side of the rotor shaft and tighten the clamping screw.
6. Remount the covers.



Diagram

Assure that both unbalance sides are adjusteed in the same direction, that they show the same marking and that they are positioned firmly against each other. The two basis unbalances (inner weights) should in no case be adjusted. Should it be however necessary please assure that both basis unbalances are mounted in exactly the same position and unidirectional on the shaft. Furthermore ensure that the basis unbalance will be pressed firmly against the distance ring.

Warning!

Mark	Centrifugal force
	VZ280
	N
1 100%	28000
2 90%	25200
3 80%	22400
4 70%	19600
5 60%	16800

The values of the centrifugal force can be adjusted continuously and are allowed for continuous operation!

-Maintenance Of Vibrators-

General care

The outer housing of the vibrators should be cleaned regularly from strong contaminants. Housings with cooling fins are to be kept dirt-free in order to secure good heat dissipation.

The cleaning with high pressure steam or high pressure water is not permitted because water can penetrate into the interior and destroy the electrical winding.

The fixing bolts of the vibrator foot and those of the unbalance covers should be examined for the right tightening torque and should be re-tightened if necessary. Defective fixing bolts should be replaced by new screws.

Maintenance

The minimum maintenance plan has to be kept obligatory.

After the first 10 operating hours all fixing bolts and nuts should be examined of their tightness and if necessary should be tightened or replaced by new bolt connections. Secured bolt connections (we recommend with Loctite) should not be re-tightened but should be exchanged and secured again if these have loosened.

The power consumption and the operating temperature of the vibrators should be supervised. The power consumption shall not exceed the value of the nameplate and the operating temperature measured on the surface of the motor housing shall not exceed +70°C.

The connecting cables should be examined for abraded spots. Arising resonant vibrations of the connecting cable should be prevented by securing or by rewiring the cable.

Caution!

It is important to fix bolts for vibrators fixing firmly! If bolts are not fixed firmly vibrators are producing drop-kicks which may destroy the mould within a short time.

Corrective maintenance

Corrective maintenance must be accomplished depending upon requirement, if necessary also daily!
1. Examine all fixing bolts and nuts on their tightness, if necessary tighten or replace screws and nuts. Torque data should comply with the regulations of the screw manufacturer. Secured bolt connections (e.g. with Loctite) should not be pulled tight but should be exchanged and secured again if these have loosened.
2. Connecting cables should be examined on resonant vibrations and also on abraded spots, if necessary rewire vibration free or renew the cable.

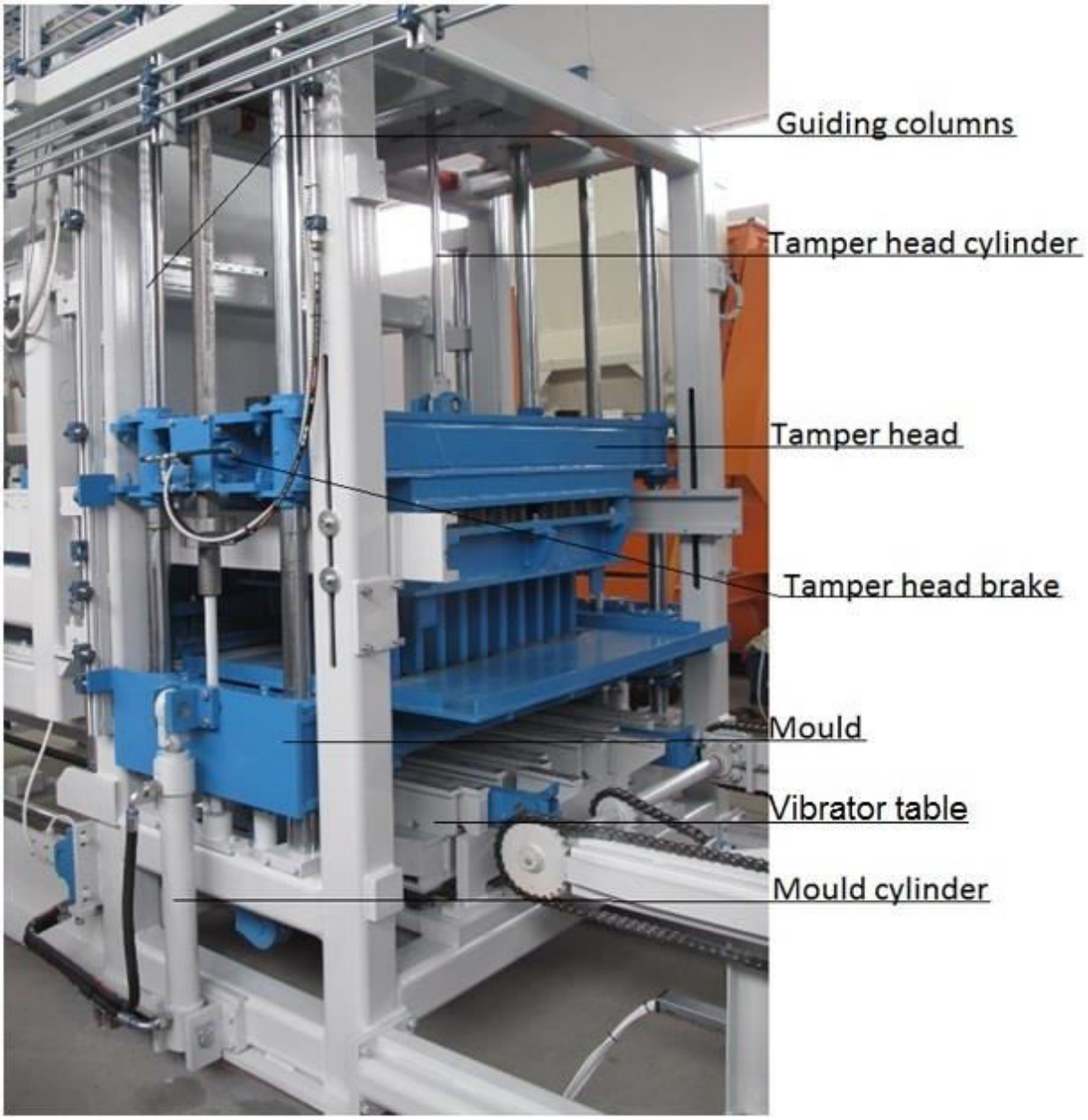
Lubrication plan and points

Please check lubrication plans and points chapter in this manual.

Important notice for all vibrators!

Check both tamper head and vibrator table vibrators screws daily! Surface must be flat and cleaned, not even paint is permited, due to fact that paint cannot hold the tightening force for a long time (bolts will get loose). In case there is paint or dirt, there is high chance that fixing bolts and nuts will break.
Please do not paint the area under vibrators, in case it is painted, grind it off.

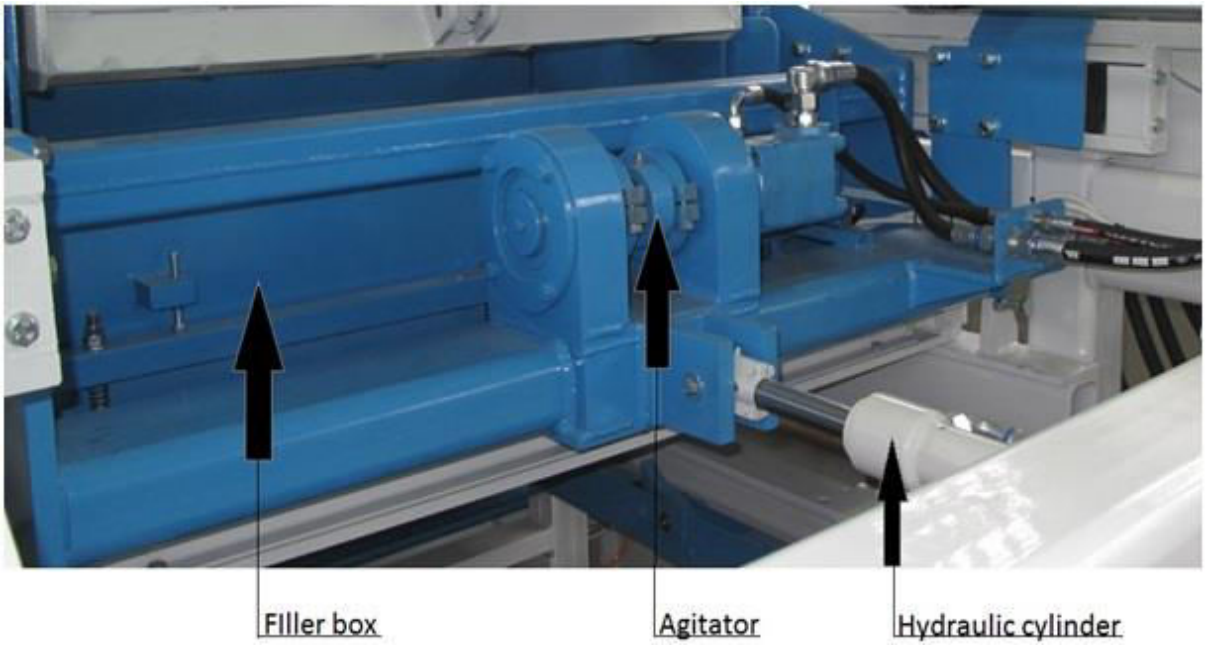
Machine-center part



There are several points which have to be maitained **regulary**!

Check condition and clean guiding columns weekly (every 50 hours).
Wear/scratches on the guiding columns always shows a serious sign of insufficient cleanliness!

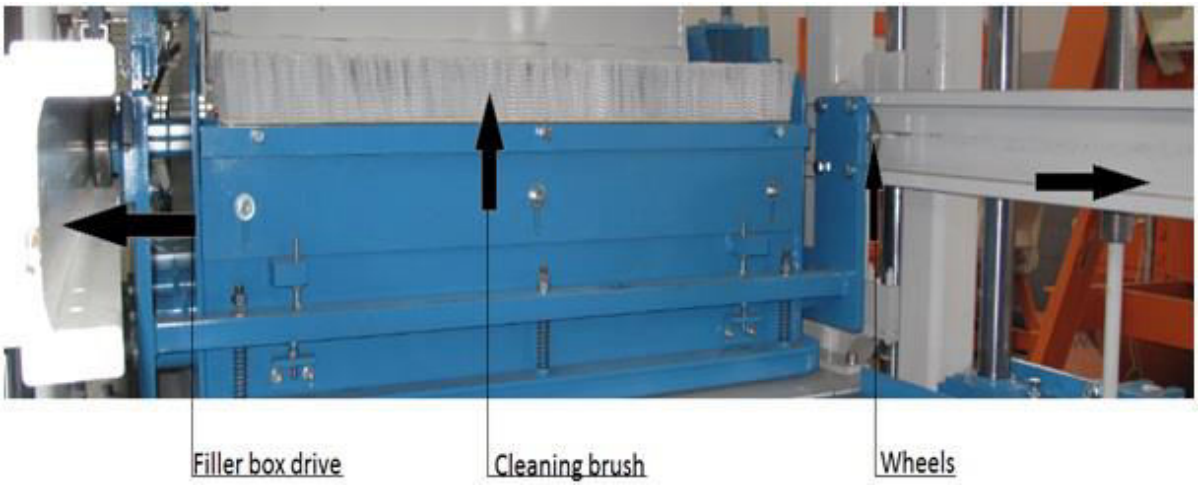
Filler box and agitator maintenance



Filler box and agitator **must** be maintained regulary!

Clean filler box and agitator daily (based on 1-shift operation).

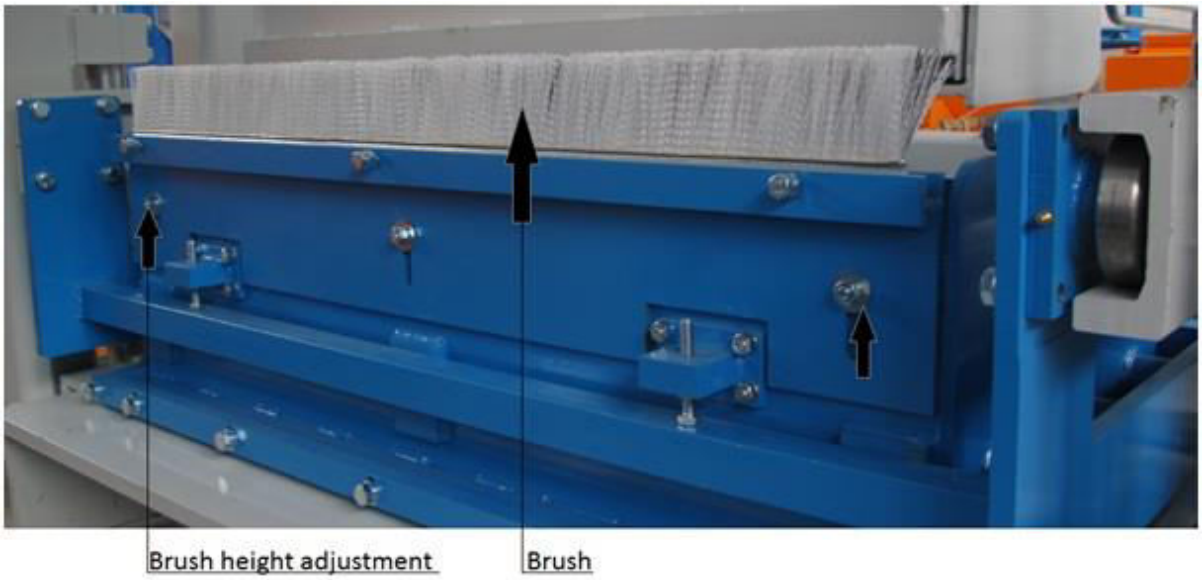
Check and clean the wheels and the wheel path on filler box and agitator cart



Check weekly (every 50hours) condition of cleaning brush on the filler box.

Check weekly (every 50hours) fixation screws on the cleaning brush.

Cleaning brush maintenance



Brush frame for the coarse mix as well as for the face mix must be maintained regulary.

Clean and check brush frame daily (based on a 1-shift operation).

Check and clean the springs on brush frame daily (based on 1-shift operation).
Use diesel oil for cleaning.

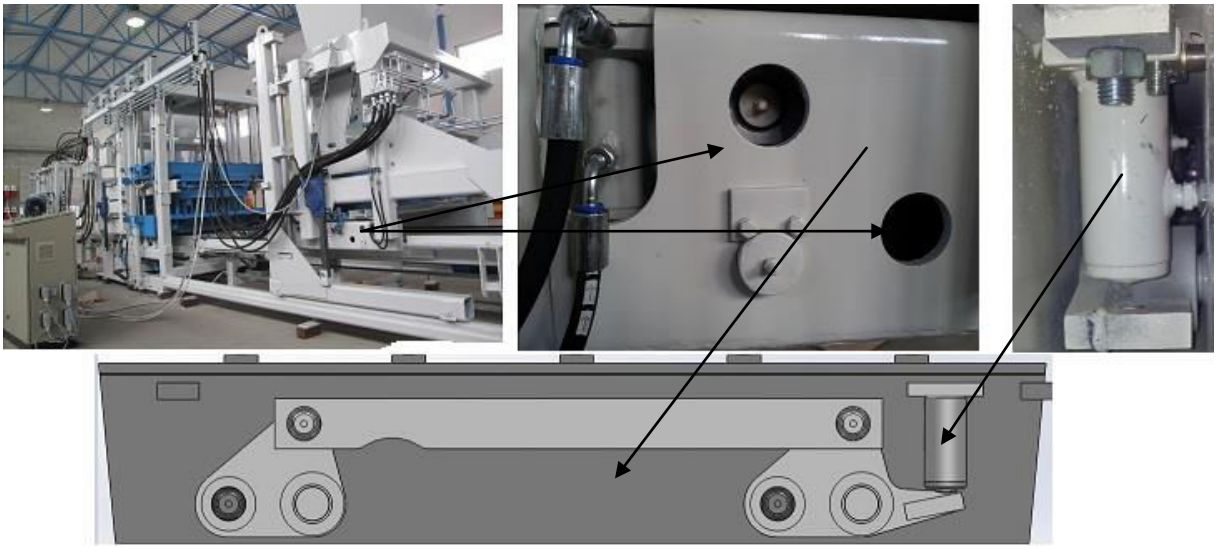
Hopper maintenance

Check condition of hydraulic cylnder and bearings regulary! Clean if needed and lubricate according to plan (use **only** high quality grease).

Clean hopper by knocking off residual concrete. After this, open hopper outlets to enable the loose concrete to drop into filler boxes with which the concrete is moved into mould and removed from the machine together with the pallet.

Check all fixation screws.

Table plate lifter



Check and clean **daily** (**based on a 1-shift operation**) the condition of the table plates it can not be avoided, that a certain wear on the table plate will appear. You may turn the table plate, if the front is worn too much!

-Table plate clamping-

Check **weekly** (**every 50 hours**) the tight fit of the fixation screws from the table plate clamping!

-Table plate adjusting-

On every side are two (2) adjusting screws for the alignment of the table plate. They are secured with a lock nut. You can adjust the table plate as follows:

- open first the lock nuts
- open all lock nuts; on both sides - in front and back

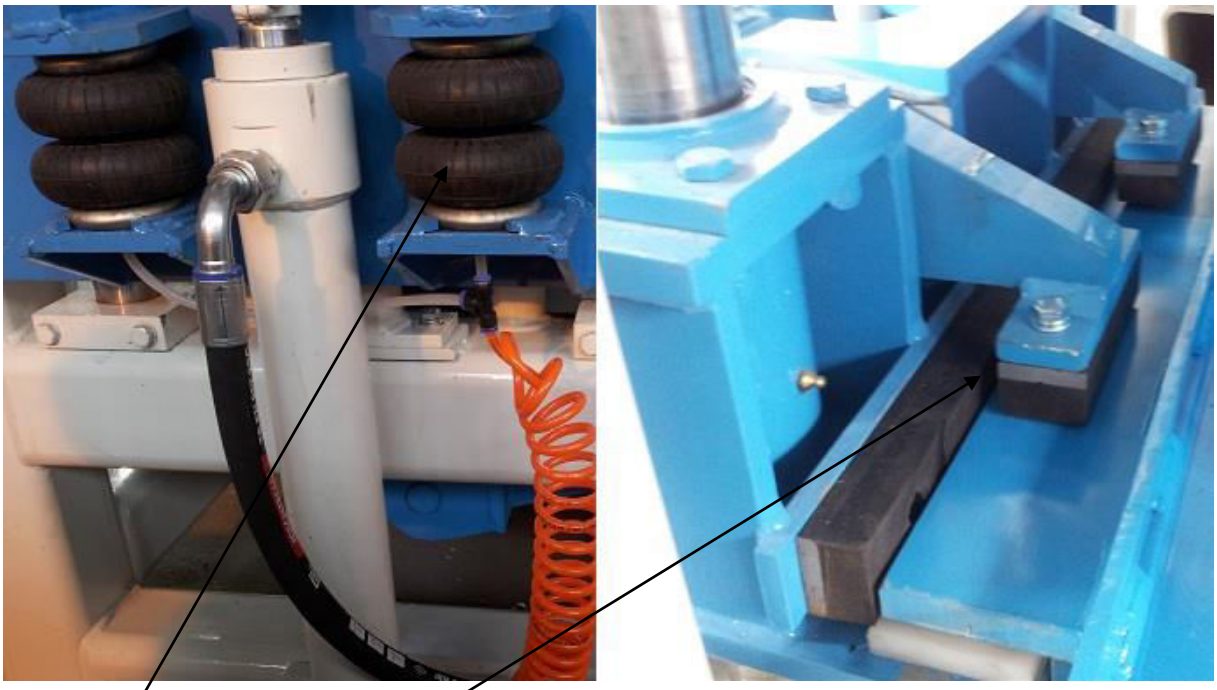
Turn the adjusting screws in the desired direction:
• to the right - to adjust the table plate up
• to the left - to adjust the table plate down

-Lifter unit for the table plate-

Below the table plate, on the outside, but inside the frame are the lifter units for the table plate located

- clean and check regulary the push rods on the lifter units
- check the mechanical components for wear

Pneumatic mould clamping (Option)



Check air suspensors **regularly!** In case there are holes and air is leaking, exchange immediately!

Also check rubber clamps on the inner side **regularly!** In case of wear exchange immediately!

During maintenance depressurize pneumatic system **first!**

Pallet stabilizer

Check pallet stabilizer for signs of wear **regularly!** If Rubber clamp is damaged, exchange immediately!

Lubricate all points every **50 hours.**

Pallet stabilizer is pre-adjusted by manufacturer and ready.