



Cone Crusher Operations (1000mm & 1300mm Cones)

It is important that the operator carries out regular checks before operating the plant especially with operational safety in mind including (but not limited to) those listed below.

Additionally, the operator should always consider what particular safety hazards could occur at specific operating sites and take steps to eliminate them before commencing work.

Pre Start Checks

All PPE must be worn

Ensure that you have a good understanding of the plants operations before operating this machine. The operator's manual should have been read before using the machine for the first time. Initial use of this machine should be supervised by another experienced operator.

The plant may only be operated if the safety instructions provided in the operator's manual have been observed and the described procedures have been performed.

Pre start checks should concentrate on ensuring that the machine is ready to work safely and reliably.

Checks should include:

- Read and understand all warning signs on machine
- Engine coolant
- Engine Oil level
- Cone lube Oil level
- Hydraulic Oil level
- Clutch oil level
- Fuel level
- Emergency Stops
- Check alignment and tension of crusher drive belts
- Check mantle and concave
- Check all guards and hand rails are in position and secure

ALL WALKWAYS AND AREA AROUND THE MACHINE ON GROUND LEVEL SHOULD BE CLEAN AND FREE OF LOOSE MATERIAL AND BUILD UP

Use the appropriate walkways!

(no walking over bonnet or on top of the machine)



Safe Start-Up Procedure:

Before starting up the machine it is important that all safety aspects are checked:

- Observe all safety warnings
- Check for build up under machine
- Ensure the full length of both tracks are in contact with a firm level surface
- Check the crushing chamber and feed hopper is empty
- Check current gap and adjust if necessary
- Check all 5 emergency stops are operational and in the out position
- Check the throttle or toggle switch is at idle position
- Check that all guards are in position and secure
- Visually check that all tools and equipment that are hazardous to operation are removed from the immediate site

Don't crank the engine for too long, if it doesn't start promptly you can do serious damage to the starter motor and over heat the wiring, if it won't start check for a problem.

While the engine is warming up carry out a visual inspection around the machine for any oil leaks, wear and tear, loose bolts etc.

After Start Checks:

Once you have started the machine check that the oil pressure is OK, if not shut it down and find out why or serious damage can be done to the engine.

- Observe all safety warnings
- With engine idling, start the lube oil pump (pump will start 5min warm up)
- Start product belt
- While machine is warming up check for leaks or faults
- After lube pump has been through the 5 min delay, and with engine still idling, start crusher
- Increase engine rpm to 1750-1800 rpm, wait 10 seconds
- Start feeder
- Check the stability of the plant. The chassis **SHOULD NOT** have undue vibration during operation
- Run the plant empty for a short period of time and check for abnormal noises, vibration or excessive heat from shaft bearings
- Ensure that all drives are running before any feed is introduced to the plant and that the feed is maintained at a constant rate, irregular and excessive feed rates reduce the efficiency of the plant
- Ensure crushing pressure is satisfactory and upper frame is not bouncing
- Ensure that the cone feed is both satisfactory and not segregating in the crusher chamber

IN AN EMERGENCY SITUATION, STOP THE ENGINE USING THE EMERGENCY STOP BUTTONS.

AVOID standing on the upper maintenance platform whilst the crusher and feeder are operating

Never stand on any part of the machine including walkways while the machine is being walked.



Operation

A properly designed mobile crushing operation should not need any person to be regularly present on the crusher access platform during normal crushing operations

Being on the access platform during normal operation presents the following risks:

- Struck by objects ejected from the crusher, such as bits of stone or metal.
- Being pulled into the crushing chamber when attempting to pull out contaminants (e.g. reinforcing bar).
- Struck by excavator or loader bucket if the access platform is within the working radius of the loading machine
- Falling if adequate guardrails and access arrangements are not provided
- Noise, Process noise at this level can cause deafness and adequate hearing protection is required
- Dust, especially in the case of crushing concrete, approved respiratory protection must be used
- Whole body vibration. Anyone on the platform would be subjected to constant low frequency vibration

It may be necessary for a person equipped with appropriate PPE (e.g. ear protection, dust mask, eye protection, hard hat, protective footwear, high visibility clothes) to spend a few minutes to carry out general checks.



Blocked belt procedure

If a conveyor belt is overloaded or jammed, the machine must be shut down and locked out before any work is carried out.

- 1. Shut down machine**
- 2. Lock and Tag out**
- 3. Inspect machine for the cause of the overload ? example- roller jammed, belt slipping, torn skirts, hole in belt, etc**
- 4. If the belt is to be shovelled off, all safety precautions must be observed, at no point should anyone be on the belt itself if it's above 1.8m with out hand rails or safety harness (**contact supervisor if you cannot access belt from under 1.8m in height**)**
- 5. After belt has been emptied, Inspect for any damage or causes for the blockage**
- 6. Remove Tag and Lock , run belt and check for any problems**
- 7. Make any notes on time sheet or notify supervisor if immediate action is required**

Shut down procedure:

Observe all safety warnings

Ensure that the feeder and crusher are empty, and that all materials have run off the conveyor

Stop the feeder belt

Using the speed control, decrease the engine rpm to 1200rpm (idle)

Disengage crusher

Stop the product belt

Idle the machine for at least 5 minutes before shutting down.

Zero out cone to determine days wear

Stop the engine



Turn isolation key off, remove keys, shut and lock the control box to prevent unauthorised use

Following the shut down procedure above, it is recommended that at the end of production for the day the plant is routinely cleaned down and thoroughly examined to check for any damage, breakages, wear, leaks etc which should be rectified before further operations

It is recommended to check air cleaner after shutdown

Safe Operating Tips:

Don't operate the machine unless you have an appropriate licence or are training under the supervision of a competent operator.

Read and understand your machines operator's manual and any warning labels on the machine.

Ensure good house keeping

Be alert while operating the machine.

Avoid frequent starting and stopping of the machine.

The crusher should be fed by an excavator such that the bucket does not pass over or near to personnel or the machine apart from the feed hopper.

Plan your work, and operate on a level work surface whenever possible.

Always be aware of other people, machinery working nearby.

Never allow anyone on or near the machine while operating.

Never work close to overhead or underground power lines unless a full risk assessment has been completed and you are satisfied that it is safe to do so. Aurora energy provides specific advice on working near lines. If unsure always check before commencing work.

Always keep the machine a safe distance from the edge of a bench or excavation. Be alert for unstable ground.

Never undermine the machine while excavating material.

Never operate underneath an overhang



General Maintenance

Practice safe maintenance

Observe all safety warnings

Only suitably competent personnel with the necessary training/experience should approach the task

A person should never work alone.

Understand service procedure before doing any work. Keep area clean and dry

Disengage all power and operator controls to relieve pressure.

Stop the engine.

Implement lockout procedure.

Allow machinery to cool.

Never lubricate, clean, service or adjust machine whilst it is moving.

Keep hands, feet and clothing clear of power driven parts and in-running nip points

Securely support any machine elements that must be raised for service work.

Do not stand on handrails to gain height

Remove any build up of grease, oil or debris.

Disconnect battery cable (-) before making adjustments on electrical systems or welding on machine

BEFORE WORKING ON PLANT, SWITCH OFF, "LOCKOUT", AND "TAGOUT"



Lubrication and servicing

Regular lubrication of the plant in accordance with this schedule is essential.

Air filters must be checked on a regular basis

Clutch oil level must be checked daily

Do not climb on machines to reach high greasing points, if the machine does not have remote greasing points at ground level or on a hand railed walkway, notify your supervisor

The frequency of the lubrication required is as follows:

- 12 grease nipples located around upper frame only grease when wedge pressure gets to high, consult Pegson manual
- Conveyor belt bearings: grease once per week, 4-5 pumps per bearing.

To deliver the specified quantity of grease to each bearing, ascertain the amount your grease gun will deliver with each "pump".

Do not assume! Check the greasing equipment used on a regular basis.

It is bad practice to mix greases. Use only one brand.

It is the operator's responsibility to ensure that all bearings are greased with the correct quantity and quality of grease at the correct intervals specified above.

Fuelling up

Do not fill tank to capacity.

Allow room for expansion and clean up spilt fuel immediately

Diesel is highly flammable

Never remove the filler cap or refuel, with the engine running

Do not smoke while refilling or carrying out maintenance on the fuel system.

Do not carry out maintenance on the fuel system near naked lights or sources of sparks, such as welding equipment.



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Remember If you are unsure about something, ask your supervisor for advice