

AKONA ENGINEERING PVT LTD.

GEMC-511687707520242

DATE 24-04-2023

**OPERATION, MAINTENNANCE
MANUAL FOR -50 TPH
STONE CRUSHER
MODEL-AJC-50**



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AS_TENDER@AKONAINdia.COM

STONE CRUSHER –AJC-50



AKONA ENGINEERING PVT LTD.

FOR: DIRECTOR GENERAL BORDER ROADS, SEEMA SADAK BHAWAN RING ROAD, NEW DELHI 110010

STONE CRUSHER -MODEL:-AJC-50



OPERATION AND MAINTENANCE MANUAL WITH SPARE PARTS MANUAL FOR ACJ-50

M/C. SL.NO. -AKONA-2023/11/01 MODEL: AJC-50 YEAR OF MANUFACTURING 2023-CUSTOMER-HQDG

AKONA ENGINEERING PVT LTD.

H.O.:- A-455, HINDON VIHAR, MEERUT ROAD, GHAZIABAD 201001 (U.P.) INDIA

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AKONA ENGINEERING PVT LTD. (AEPL)

AN ISO-19001: 2015 & CE CERTIFIED COMPANY

INTRODUCTION

WE (Akona Engineering Pvt. Ltd.), would like to introduce ourselves as a leading Construction Equipment Manufacturer Company since 1991, was established by our Founder Mr. R.B. Rathore (Managing Director). The company is devoted and engaged in manufacturing of all types/ capacities of Concrete Batching & Mixing Plants, Mobile mixer, Mini mixer, Hot mix Plants, WMM Plants, **Stone Crusher** & other construction equipment. We proudly announce that we are the only manufacturer, who deals in all types of mixer i.e. Twin Shaft Mixer, Planetary Mixer, Pan Mixer and Reversible Drum Mixer. Our qualified & well trained engineers are capable to manufacture the equipment, plants as per customers' specifications/requirements. For more details please visit our office, manufacturing unit or our website. www.akonaindia.com.

We have gained a wide experience for an over 32 years in the development of **Mobile concrete mixer**, and has become a market leader in north India for just this very purpose. To protect the customer's investment is our main duty and means that we at **AKONA**, inputs a maximum in serviceability, functional reliability and professionalism in- to our plants and mixing machinery. After all, customer satisfaction is a premium and has been demonstrated in more than **3 decades of service**.

We have been providing exceptionally good building and construction materials since its inception in the year 1992. Within this period of a two decade and half, the company has carved a niche for itself in the business scenario. We are very much famous for **high quality concrete construction equipment** – such as **concrete batching plants**, dry batching plant, dry mix plant, **hot mix plant**, **wet mix plant** concrete equipment and related spares. We are geared up to offer Indian infrastructure organizations with International standards and global technical improvements in construction field. With massive investment strategies in its commercial infrastructure, solid R&D, comprehensive range of excellent batching products, extremely trustworthy post sales services & worldwide disperses service system. Akona Engineering is currently an embellished brand for its unique products of top notch quality.



AKONA ENGINEERING PVT LTD.

: OUR QUALITY POLICY:

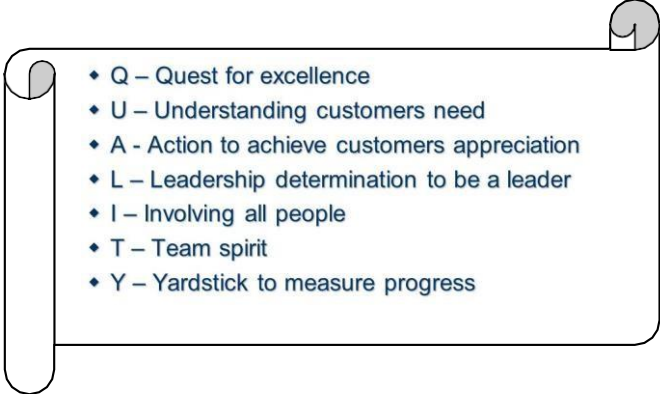
We would like to introduce ourselves as a leading construction equipment manufacturer since 1991, in northern India.

The company is devoted and engaged in manufacturing of all types capacities of building construction as well as road construction equipment such as, batching and mixing plant, hot mix plant, wmp plant, Bitumen Sprayer, Stone crusher.

Our qualified & well trained engineers capable to manufacturer the equipment, plant as per customer specification, requirements.

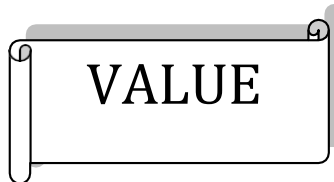
AKONA ENGINEERING PVT. LTD. committed to enhance customer satisfaction by innovative design, consistent product quality and one time delivery through continually improving on all our process, system, recourse and technology

“To Offer the Products and services to the satisfaction of the Customer and strive Continuously Upgrade Quality in all Respect through the Joint Efforts of all Employee”

- 
- ♦ Q – Quest for excellence
 - ♦ U – Understanding customers need
 - ♦ A - Action to achieve customers appreciation
 - ♦ L – Leadership determination to be a leader
 - ♦ I – Involving all people
 - ♦ T – Team spirit
 - ♦ Y – Yardstick to measure progress



TO BE THE COUNTRY'S LEADING MANUFACTURER OF CRUSHING & SCREENING PLANTS
AND BULK MATERIAL HANDLING SYSTEM (QUALITY-WISE)



- EXCELLENCE: - *Our Only Standard*
- TEAM WORK: - *We share the same vision*
- CUSTOMERS: - *We create Superior value for our Customer*
- COMMITMENT: - *We do what we say*
- INNOVATION: - *We believe in it*
- PEOPLE: *Our Sincere and hard working people are strength.*



AKONA ENGINEERING PVT LTD.

FOREWORD

Dear Customer

We are happy to provide you STONE CRUSHER STATIONARY type Model-AJC-50 with screening arrangement (AKONA) O & M model with latest revision.

STONE CRUSHER Model-AJC-50 with screening system, are developed for wide range of application meeting your requirement.

We are sure that all necessary safety precautions and regulations have been adhered to in the design material and manufacturing of AJC (S) series.

This manual provides specifications and operations guidelines routine maintenance, service maintenance procedure. The performance of crusher Plant largely depends on its proper maintenance. Hence please maintain your machine properly as per the guidelines and schedules given in this manual. We recommend that only trained manpower should perform the operation and maintenance task of the jaw crusher / screen or complete machine.

Continuous improvements in the product design are incorporate from time to time which may not be included in this manual.

Should you have any quarries fully equipped and trained team from Akona Engineering Pvt Ltd. Customer care will be happy to provide the help.

In case of any difficulty Please contact

AKONA ENGINEERING PVT LTD,

Customer Support

Plot No.-219, VILL-RAIPUR, TH-BHAGWANPUR, ROORKEE (U.Kh.)

247661

Help Desk - +91-9891949701, +91-9958695766

Help Desk id – as_tender@akonaindia.com

Visit us at – www.akonaindia.com

NOTE:-All the information in this manual is based on latest product information available. [A.E.](#) reverses the right to make changes at any point of time without any notice & incurring any obligations thereof.



AKONA ENGINEERING PVT LTD.

STANDARD WARRANTY FOR 50 TPH STONE CRUSHER AKONA MAKE MODEL-ASC-ST 50 (S)

This warranty applies to ASC-ST 50 capacities 50 Ton per hours operates by different rating of motors.

WARRANTY CARD

In the event of any defective part being discover within a period of one year from the date of delivery/commissioning(as per S.O.) then said defective part/s will have to be returned to dealer/workshop on freight basis. We shall impact such part/s thoroughly. On satisfaction, if the defect is found due to faulty material or poor workmanship, the same will be repaired or replaced with a new one free of cost but freight charges will be borne by the customer. The defective part/s, which has been replaced or repaired, will be sole property of the A.E.P.L

The benefit of warranty is given to the owner and cannot be transferred if the machine resold or send out.

Warranty is not applicable for:-

1. Starter, Capacitor, Hydraulic element, Electronic component, Belt, Pulleys, Chains, Gear, Couplings, Plumbing's accessories, Tyre and Tubes, & Bearings etc. However the company will passion to the customer the benefit of any guarantee/warrantee of the electronic motors and engines given by the manufacturers and will on behalf of the customer take up with such manufacturers any complains which they may have regarding the workmanship.
2. Defect due to wear and tear, accident, improper adjustment, misuse, or lackof maintenance.
3. Spare manufactured by the party/customer and then fitted to stone crusher supplied by the AKONA ENGINEERING PVT LTD.

Limitations and Exclusions:

1. To fair wear and tear or to damage due to negligence or improper handling or incorrect application or improper handling or incorrect applications or incorrect installation by the purchaser, or his employees or agents or in the case of repairs or alterations carried out by the purchaser without or knowledge and written approval.
2. Any damage due to use of lubrication oil, fuel quality and grade not recommended by us.
3. Any damage resulting from improper shutdown.

4. Any failure to meet its obligations here under which are due to circumstances beyond its reasonable control including but not limited to industrial disputes, fire, severe weather conditions, government decisions, material shortage, power or machinery breakdown or failure or war.
5. We will not be responsible for loss or damage to goods beyond the delivery point as stated in our tender and we will repair or replace free of charge goods damaged in transit up to the point of delivery (consignee location) as specified above.
6. Strike, Lockout, Fire ,Theft , Accident during transit from consignee location to user end and anything by the act of God constituting the force Majeure.

Warranty:-

Machine Type :

Invoice No. & Date. :

Warranty card no. :

Machine Serial No. :

Dealer's Seal & Address :



AKONA ENGINEERING PVT LTD.

:-TECHNICAL LITERATURE CONTENTS OF 50 TPH STONE CRUSHER PLANT:- MODEL:-AJC 201M

S.No.	Literature content	Page Akona Make	Page No –KIRLOSKAR
i	Operational, Repair and maintenance manual for both engine and equipment	1.1. To 1.22	1 to 30
ii	Workshop, manual for both engine and equipment	2.1 To 2.16	1 to 30
iii	Illustrated Parts catalogue for both engine and equipment	3.1 To 3.28	1 to 127
iv	Illustrated list of special Maintenance tool, if any	4.1 To 4.2	1 to 30
v	Lubrication charts for complete equipment	5.1 To 5.3	1 to 30

IMPORTANT NOTE

THE DATA'S INDICATED IN THIS OPERATING INSTRUCTION MAY DIFFER FROM PLANT TO PLANT IN A ACCORDANCE WITH CONSTANT IMPROVEMENT, AND WE RESERVE ALL RIGHT TO CHANGE OR MODIFY ANY PARTS AT ANY TIME WITHOUT ANY PRIOR NOTIFICATION

ATTENTION

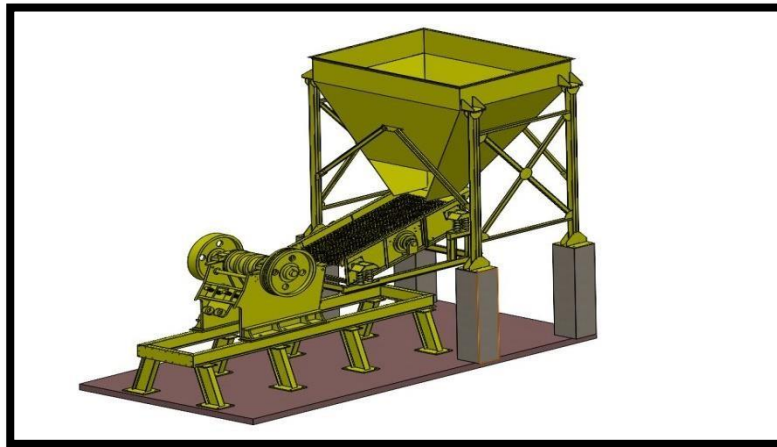
THE NON-APPLICATION OF THE USE AND MAINTENANCE RULES MENTIONED WITH THE PRESENT MANUAL WILL ENTAIL THE AUTOMATIC LOSS OF ALL WARRANTY INSURANCE COVERINGS.



AKONA ENGINEERING PVT LTD.

1

*OPERATION, REPAIR AND MAINTENANCE
MANUAL FOR BOTH PLANT AND ENGINE
OF
AKONA MAKE
STONE CRUSHER
MODEL:-AJC-50
CAPACITY:-50 TPH*



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OPERATION OF STONE CRUSHER MODEL: -AJC- 50

PRINCIPLES FOR OPERATION

Following principles govern the operation of Stone crusher plant:

1. The Operation should be carefully planned, so that the final product is of a highly quality.
2. The Operation should be run by a competent manager, who with his supporting staff, are all fully conversant with the plant, its operation and maintenance.
3. The aim should be continuity in operation, avoid break-down and intermittent working.
4. The adequate stock of ingredients must be ensured.

The guidelines point given below should also be taken care of before starting, shutting down and running the plant.

- i. Stone crusher must be 0, 0 level surfaces on ground.
- ii. Do the complete and proper Erection and commissioning Procedure.
- iii. After Commissioning the plant check visually all it should be ok
- iv. Check the hopper visually and not insert in the hopper any non-aggregate material just like that, steel block, steel rod etc.
- v. Same Check as jaw crusher and check its jaw plate must proper tight.
- vi. The operation of Jaw Crusher (Setting of Jaw & Toggle PLATE) should be checkout twice daily and more frequently, if variation appears in the Jaw and got calibrated, if required.
- vii. Make sure the Jaw mouth open 1.5" before start the jaw crusher
- viii. The operation of the Pan feeder should be checked regularly.
- ix. Check And proper setting of all conveyor Chutes before the starting the plant
- x. Check the oil level in all gear box as well as DG set
- xi. Check the panel connection it may be proper tight.

START UP PROCEDURE

- A normal civil work foundation is required for making plant stationary (Vibratory Screen) and so that it could bear the affecting load and sustain the occurred vibration.
- Material like Stone should be in sufficient; lack of material can cause reducing efficiency of the plant.
- Special attention should be taken where the ground soil is soft. In case of soft soil, concrete should be used to make the soil hard otherwise ground will sink and it can cause misalignment.
- Power cables must be used with proper safety / shielding to avoid any damage that may occur during operation.
- Make certain that no loose objects are placed on the Jaw before start double check make certain that no unauthorized people are close to Jaw Crusher.
- Make certain that all fuses are intact and free of dirt. It is important that the fuses fit the plug in use.
- Check the power Supply DG and panel properly before start. And also check motor connection if Connection reverse are then system can move in opposite direction. Hence changes the connection accordingly.

INSTALLATION PROCEDURE OF STONE CRUSHER

The crusher should be mounted on a rigid RCC foundation or steel structure bolts should be sufficiently inserted into the pocket and level before grouting. Leave ample space around the crusher for easy dismantling/ servicing. Be sure that the crusher products get discharged freely. Otherwise materials may jam the crusher and break the toggle or cause other damage.

DIRECTION OF ROTATION

The direction of rotation of model **AJC-50** crusher is anticlockwise viewed at the machine from the Drive pulley side. The direction is marked on both flywheels. The prime mover should be installed in such a way that it rotates in the said direction only. Before start -up it must be confirmed that the prime mover rotates in the right direction.

FEEDING

Fines and smaller material should be removed from the feed. These fines tend to cause a clogging action which results in heavy stresses in the machine causing rapid wear and tear. For maximum capacity, the feed should be small enough to flow freely into chamber. This is approximately 80% of the feed gap opening. The feed should be regulated so that the crushing chamber is always full.

INSTRUCTUINS BEFORE THE STARTING OF PLANT

Follow the all instruction before the starting of Plant.

1. Check visually complete plant before starting for any unwanted external object.
2. Check all fitment and gap of machine periodically.
3. The Engine should idle run for 2 minutes before starting production and stop after 3 minutes of idle running.
4. Check fuel before starting (Engine) D G Set.
5. Check jaw plate fasteners periodically.
6. Check the jaw mouth, it should be -1.5" open during operation.
7. Check the Screen visually it should be empty before start the plant.
8. Always clean the output chute and input before stopping the plant.
9. Apply ample of grease at all greasing points before start.
10. Do not insert bar/ rod/ hand during the operation of crusher in jaw chamber.
11. Replace both v-belts together.
12. Do not allow outside persons on site on which mc running
13. Operate the machine by trained operator only. Do not operate the machine if operator is not there.
14. Keep machine on level surface. Do not operate machine in overload conditions.
15. Check all conveyor idler fitments.
16. *Check all conveyor belt alignment properly before stating the plant.*

SAFETY INSTRUCTIONS

- ✓ Check all the electrical connections for tightness. Do not operate if electrical connections are loose.
- ✓ Check derives assembly. Do not operate machine if assembly not proper.
- ✓ Check all the lubricating point. Do not operate the machine if the lubricating points are dry or less oil.
- ✓ Check the entire nut and bolts for tightness regularly. Do not operate the machine if the nuts and bolts are loose.
- ✓ Operate the machine only by trained operator. Do not operates the machine if operator is not properly trained
- ✓ All the V-belts and pulley having guard covers.
- ✓ All the conveyor belts are partially covered to avoid accidents.
- ✓ Optional Emergency stop switches can be provided to stop the working of the entire plant at control panel and DG Panel control panel at an extra cost.
- ✓ All the motors are equipped with safety devices like overload
- ✓ Keep the equipment in good running condition.
- ✓ Never operate unsafe equipment.
- ✓ Be familiar with all controls, gauges, instruments.
- ✓ Look around before starting the plant and equipment.
- ✓ Never leave the equipment unattended with its engine running.
- ✓ Keep operator's Palace clean and free from oil and grease.
- ✓ Never carry out servicing, adjustment and repairs, when the equipment is running.
- ✓ Never permit unauthorized persons to handle the plant.
- ✓ The operator must have max unrestricted view of the operating area.

- ✓ Avoid loose connections in electrical system.
- ✓ Don't leave the control, when the equipment is working.
- ✓ Be careful in removing the radiator cap, after engine has been running.
- ✓ Store fuel and lubricants away from plant.
- ✓ Keep away from v-belt and vibration Area.
- ✓ Be careful while attending to Jaw crusher.
- ✓ Inspect all cables of plant periodically.

DAILY OPERATION INSTRUCTIONS

- ❖ Oiling & greasing to all Bearing, Chains, keep oil can filled up in the Machine for ready use.
- ❖ To check the oil level in the entire Gear Box. If found below level top it up with proper grade (S.A.E-140).
- ❖ To check all the fasteners by the Tool Before the operation/ starting of the plant.
- ❖ Clean the dust sludge & other foreign material from gears, Roller of Conveyor Belt and the Rotary Parts.
- ❖ Adjust All Belt though 2 tension screw provided at the lower end to keep it in proper tension and inline. Also check the positioning of belt guard cover.
- ❖ Check the Roller of all the Conveyers before the operation start.
- ❖ Before starting / operating the plant the Rotary parts are to be checked manually for their freeness. Jamming indicate the blockage of same they should be removed and start otherwise the diode will burnt out and motor will play foul/ will not work properly.
- ❖ Use vacuum cleaner daily to keep Panel dust free for smoother and trouble- free operation.
- ❖ Always check proper tension of Belt. Also check for the proper Spring of Pan feeder and V. Screen.

Daily maintenance:-

- Tight all nut bolts of the whole plant including F. Bolts, Bracket bolts, Cover bolts etc.
- Greasing of the Jaw Crusher & Vib. Screen

After 30 Days maintenance:-

- check oil of conveyor gearboxes and lubricate if needed

CHECK THE FOLOWING BEFORE YOU STARTING THE PLANT:-

- Carried out the daily maintenance schedule as per instructions.
- Checked the tension of V –belt.
- Check all grease point before the start the plant.
- Checked all guards and covers fitted in the plant complying the safety norms.
- Checked the v- belts for any damage of wear.
- Alignment is correct and belt tension is adequate to avoid any slippage.
- Bearing are properly lubricated.
- No foreign material is inside the crushing chamber.
- The entire fastener is properly tightened.
- The entire unit must be manually rotated to ensure that it rotates freely without any mechanical blockage/ friction or rubbing and the jaw do not touch each other at their closest position.

WARNING

- ❖ The DG set used must be equipped with automatic voltage and frequency regular.
- ❖ Do not switch on the Panel Power before setting and stabilizing the DG set out put (440V +10%, 50 Hz + 3%).In case of any failure in input power source, switch off the panel immediately.
- ❖ Use vacuum cleaner daily to keep panel cabin dust free for smoother and trouble- free operation.
- ❖ Before starting the panel makes sure that AC is working and cooling properly. All the phases from the input power sources are present and are at proper level. See the proper earthling as per IS 3043.
- ❖ Check Oil level in Gear Boxes. Hydraulic oil tanks, Thermo fluid tank and all the lubrication points such as chains, Bearing etc.
- ❖ Oiling and greasing daily is absolutely must for smooth and trouble- free operation of the part.

NOTE:-

- While doing general maintenance, cleaning belt, main nozzles etc., make sure the panel cvt switch off.

PRINCIPLE –(SAFETY PRECAUTION)

- Machine /plant is designed and constructed according to the state of art and the recognized safety rules. Nevertheless, its operation may cause damage to health of user or third persons. Or damage to the machine and other properties.
- The machine /plant shall be used only when in proper technical condition.
- The machine/plant is intended to produce concrete exclusively. Any other use different from or exceeding the purpose of machine /plant is not considered suitable. The manufacturer will not be liable for any damage resulting from the product misuse. The user only accepts the risk.
- Before starting the work, the personal incharge of any activities relating to the use of machine must read the instruction manual and follow the safety rules.
- The personal must not wear long loose hair, or slack clothing or jewelry including rings, because of danger of injury.
- As far as necessary or mandatory by regulations use personal protection suits and other protective equipment.
- Observe and follow the safety and danger signs at the machine/plant.
- In case of safety related modifications to the machine / plant or to the performance of the machine/plant immediately and notify the responsible body / person of the disorder.
- Do not make any modifications, extensions or rebuilding to the machine /plant, which would cause safety, without manufacturer's approval. It also includes the welding and cutting at supporting structure.
- Spare parts must correspond to the manufacturer's technical specifications.
- Do not change / alter machine programs (software) for programmable control systems

QUALIFICATION AND PRINCIPLE RESPONSIBILITY

- Any work at machine /plant must be performed by reliable personnel only, Observe the minimum age admissible.
- Empty trained or instructed personnel only, state clearly personnel competences for operation, set up, service / maintenance and repair.
- Make sure those personnel only in-charge of these responsibilities is working with the machine.
- State clearly the responsibilities of the machine operator and authorize him to refuse safety advice instruction by outsiders
- All the electric work must be performed by trained electrician only.
- Danger may occur if the plant is used with carelessness. It is important that all personnel working in close range to the machine know the safety rules, if safety rules are not respected, you endanger body parts such as fingers and hands or in the worst case a fatal outcome.
- Try to stay away from the moving parts, make sure that all the safety guards and protection covers are provided and properly fitted.
- Carry out all maintenance work under observance of safety regulations.
- Condensed water during the night the cement might harden up. The inlet gate of cement screw conveyer is to be closed after finishing day work.
- Check the “emergency stop” button daily when starting the work. Start the system and the mixer motor, then press emergency stop button, if the mixer stops immediately, everything is OK.
- Please notice that there is still power in the power box even through the emergency stop is active.
- The connection cables should not be shortening anywhere.
- Ensure in your interest regular maintenance and lubrication of the machine.
- For faults which cannot be repaired by you kindly notify the “AKONA Service department.
- The operator of the machine should be trained only under the permanent supervision of an experienced person.
- During training the personal should be well known about the general education and how to operate with machine / plant.
- The personal should be well known about the regular maintenance of the plant.

NOT TO DO

- If any motor /gear box is not working properly do not just replace the same without analyzing the reason & removing the basic fault.
- Do not repair the Jaw when power is on.
- Do not allow unauthorized & untrained person to operate any part of the machine.
- Do not allow any rod or big stone or bolt into the Jaw as it will damage the side plate and jaw plates. Also avoid inappropriate feeding of Stone, it can also cause damage.
- Do not allow Jaw crusher to rotate in reverse direction in normal plant operation.
- Make sure that all the connection of Plant and all the machinery must be disconnected while repairing or during maintenance.
- Do not leave any foreign material between the jaws.
- Do not allow the jaws to touch each other even at their closest position.
- Never over-lubricate the bearings.
- Avoid non-uniformity of feeding of feeding rate. Try to maintain at least 50% of the feeding chamber full.
- Rebuild the jaws well before the teeth are completely flat

NOTE

- In case of repair work or replacement of parts, only use the spare parts prescribed and used by “ABHISHEK ENTERPRISES.”
- Any use of unperceived spare parts or operating, repair and maintenance, without the supervision of any unauthorized or untrained person will dispenses us from our product liability and from our guarantee obligation.

TO DO

- Check that electrical supply is within correct voltage ($415 \pm 5.1\text{v}$) and there is no signal phasing.
- All the connections should be right and tight.
- All phases should be correct, check every day.
- Plant should be properly earthed. Check earthen connections and resistance value every month.
- Clean Jaw Screen Hopper every day after completing work if there is Setting of jaw crusher change do the again set it before start the plant.
- Check the gap in Jaw and adjust the jaw by the use of toggle and vez setting and check toggle plate also
- Check the condition of all conveyor belts and its alignment.
- Check the all v-velt and springs every week.
- Maintain a logbook for machine; this should include information for hours run, any problem & details of repair or maintenance.
- Check the machine is installed correctly.
- Carried out the daily maintenance schedule as per instructions.
- Checked the tension of V –belt.
- Checked all guards and covers fitted in the plant complying the safety norms.
- Checked the v- belts for any damage of wear.
- Alignment is correct and belt tension is adequate to avoid any slippage.
- Check tightness of bolts.
- Check All Lubrication Point.
- Check the direction of rotation.
- Check the drive alignment and belt tension.
- Check the freeness of rotation of the shaft assembly.
- Check that the gap setting is proper.
- Check that feeding should be done well distributed along the width of the crusher.

SEQUENCE OF OPERATION FOR STARTING AND SHUTTING DOWN THE PLANT

The starting and shutting down the plant should be done in chronological order for its smooth running. The sequence for starting various components of plant is as under:

- First start the DG set by the starting key DG panel. The DG starts 2 Minutes. Idle mode.
- Start the Vibrating Screen with all delivery conveyor by the panel and idle run for 2 Minutes
- Along with the screen and delivery conveyor starts the Main Conveyor and Jaw Crusher run idle for 2 Minutes.
- Ideally run the whole plant for 2-3 Minutes.
- Switch on the GRIZZLY Feeder After that Start the Feeding

The Shutting down the plant, the first component to be stopped is the input of stone in hopper. The material trapped inside the Jaw should be then flushed out from the system in the sequence shown below:

- Stop Feeding in Hopper.
- Stop the Grizzly Feeder by the control panel
- After that 6 Minutes once the mouth of jaw is empty stop the jaw crusher.
- Once the material on main conveyor is cleared then stop the main conveyor.
- Once all the material is screened through vibratory screen then stop the Vibratory Screen.
- At the last stop delivery conveyors once all the material is delivered.

MAINTENANCE SCHEDULE OF STONE CRUSHER –AJC-50

DAILY MAINTENANCE SCHEDULE:-

- 1) Check the gear box oil level at least one hour after the shut down the plant, when the oil will settle down and indicate the correct level. If necessary top them up.
- 2) Top up all drip feed lubricators.
- 3) Tighten all bolts after completing day's operation, especially Jaw plates, Side plate fitment, spring of jaw, Liner of pan feeder, tie rod setting and toggle and vez block bolt.
- 4) Check the bearings and ensure that overheating does not occur.
- 5) Check the springs of Vibratory Screen and Pan Feeder.
- 6) Check all conveyor belt alignment it should be in liner and adjustment by the adjusting Screw..
- 7) Be alert for undue noises, which may be due to lose bolts.
- 8) Check oil regularly, making sure it is free of dirt and contaminants.
- 9) Check jaw dies every day, and make sure bolts are fastened securely.
- 10) Maintain crusher backing to ensure proper vibration and impact protection.
- 11) Keep breathers clean.
- 12) Make sure the toggle area is clean, especially prior to any adjustments.
- 13) Wash out seats and plates daily.

WEEKLY MAINTENANCE SCHEDULE:-

- 1) Clean the jaw and remove any stone part if stuck in jaw teeth.
- 2) Check all V-belts drivers and do necessary adjustments accordingly.
- 3) Inspect feeder and conveyor belts for wear and tear and broken fasteners.
- 4) Check all belt conveyor any cut or damage. Ensure they are in good condition and effective. If necessary, replace them.
- 5) Check the conveyor belts in case of holes or cuts repair them immediately by lacing or vulcanizing.
- 6) Clean the Vibratory screen and check wire mesh tightness, if loose bolt then tight it.

MONTHLY MAINTENANCE SCHEDULE:-

- 1) Clean panel and DG set.
- 2) Check all electrical wiring and cables for loss of insulation or corrosion and replace, if required.

- 3) Check the screen meshes and repair/ replace, if required.
- 4) Check the v-belt and replace, if required.
- 5) All fastener check and tight properly.
- 6) Check all wire connection if loose then tight accordingly

QUARTERLY MAINTENANCE SCHEDULE:-

- 1) Drain the oil of gear boxes, flush them and refill to correct level with recommended gear oil.
- 2) Inspect the conveyor stand bolt if bolt cut then replace it
- 3) Check the oil level DG and top up, if required.
- 4) Inspect the liner plates in pan feeder, hopper plate and nut bolt and discharge chute replace if required.
- 5) Check the bearing all visually and during operation by any noise, clean it and repair, if required.
- 6) Clean electric contact and relays in control panel.
- 7) Check all wire must be in good condition if any damage then replaces it.

MAINTENANCE OF ELECTRICAL MOTORS:-

- 1) Isolate the mains supply to prevent unauthorized starting
- 2) Cover all the exposed motor starter panels and controls, with tarpaulin or plastic sheet to prevent their damage during rains.
- 3) Always place the proper size of fuse, while replacing it. Never put a substitute of different size.
- 4) Do earthing of entire electric supply line properly.
- 5) Keep the motors and contacts always clean, by blowing away the dust.
- 6) Test checks no volts coils and over load protection devices for their proper function.
- 7) All the wiring should be placed under insulated cabling and properly covered trench

**IF THE PLANT IS LEFT IN OPEN FOR MORE THAN SIX WEEKS, CERTAIN PRECAUTIONS
SHOULD BE OBSERVED.**

- Isolate the mains supply to electrically driven plant to prevent unauthorized starting.
- Warp all V- belts pulleys with a strong, self-adhesive paper and lubricate exposed chain drives.
- Grease all adjusting screw, Jaw bearing, conveyor rollers, and motor slide rail adjusting screw Jack to prevent rusting.
- Protect the all motor and gearbox.
- Close the window of panel and keep the door
- Cover the All motor panel and DG Set.
-

HOW TO MAINTAIN AND REPLACE JAW PLATES?

There are different jaw plate's materials in the market, and some of them suits for hard stone while other is not. Therefore, you have to choose the right jaw plate for your crusher. For example, generally the jaw plate of single toggle jaw crusher is not good at crushing strongly abrasive and hard stone material with large production.

It is inevitable for crusher to get wear because of long-time crushing work, and all you can do is try your best to maximize its service life by regular check and timely maintenance.

1. Check whether the tooth peak to tooth valley is match with each other.
2. Regularly check whether the bolts and nuts have been tightened so you must ensure that they will not loosen during work.
3. Check whether the jaw surface appears flat, hole, crack, if it does, do some adjustment or change new ones.
4. If more than 80% of the jaw plate is found to be worn during the inspection, you need to replace the jaw plate in time for not affecting the overall performance of the machine.
5. If you don't know whether to replace it, contact the jaw crusher manufacturer, and they will give you the most professional advice according to the real situation of jaw plate.

HOW TO ADJUST THE TOGGLE PLATE OF THE JAW CRUSHER?

The function of toggle plate is to adjust the outlet of the jaw crusher to the desired size. There are two specific methods: one is to replace the support pad between the toggle plate and the body frame, and the other is to adjust the two wedges between the toggle and the body frame.

PITMAN BEARING BROKEN

Although the main crushing process is complemented by jaw plates, the crucial parts that give a motion to the moveable jaw plate are toggle plate, pitman bearing and flywheel.

The pitman drives the moveable jaw dies to push stone material towards stationary jaws, which would create strong pressing forces to both jaw dies. Therefore, if the pitman cannot get lubrication in time, it will be broken under the high pressure of material and interrupt the whole work.

MAINTENANCE SCHEDULE OF STONE CRUSHER
Lubrication point schedule

1. Jaw Crusher: - Full in starting then mix oil Grease in ratio 1:2 respectively –twice a week and regular check every second day skipping one day.
2. Vibration Screen: - full in starting then mix oil grease in ratio 1:2 respectively twice in a week and regular check every second day skipping one day.
3. Gera Box: - Full in starting then check every 3 months gear oil.

RECOMMENDED LUBRICATION
Oil & Lubricant

1. Gear Box Oil No. 460/320 make
2. Engine Oil 20W40
3. Grease AP3 (General Purpose) make Shell

TRANSPORT

- A registered vehicle must be used when plant is transported on the public road and the speed limit must not exceed 40km/hr.
- Jaw crusher And Screen must be empty during transport.
- DG set and control panel must be free from any load during transportation.
- Make sure that nothing sticks out before transporting the Screen and Grizzly feeder make certain that all loose objects are securely fastened.
- Always drive slowly uneven ground and pay attention when turning.
- Only use cranes/elevator and loading equipment having sufficient carrying capacity.
- Determine a competent person to guide the lifting operation.
- Lift machine and parts properly with lifting equipment accessories.
- Use particular slinging point for loading equipment.
- Use suitable transport vehicle having sufficient loading capacity.
- Do not unload the complete machinery at once, please unload one by one.
- Use red signal / red flag, at rear side of trailer, while transporting during right.

SALIENT FEATURES OF STONE CRUSHER MODEL-AJC-50

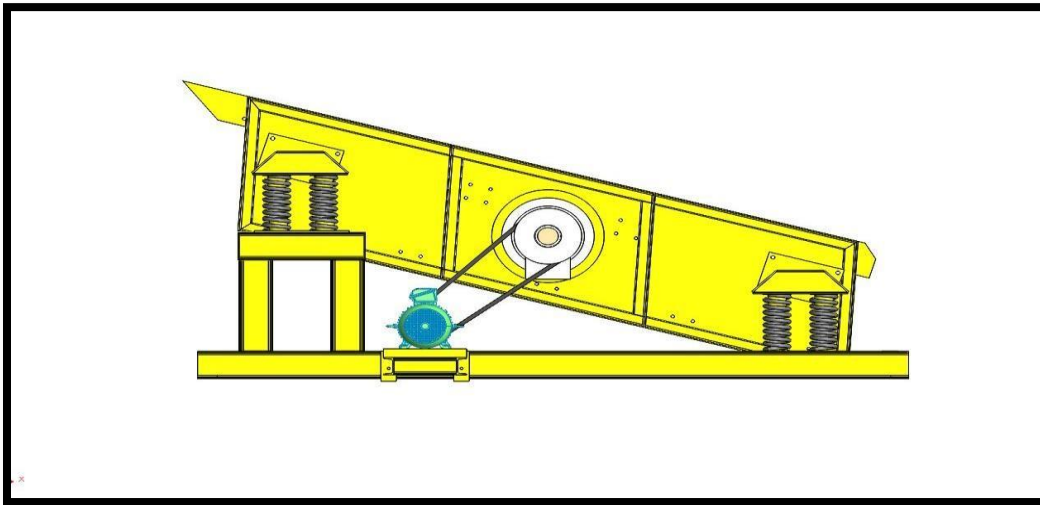
- Modern crushing technology.
- Advanced Crusher Geometry.
- Wide range of setting.
- Produce high quality output.
- High production rate.
- Easy to operate.
- Highly accurate size of stone output
- Modular Design for moving and transport.
- Water cooled Diesel Generator for power.
- Easy to erect and dismantle due to bolted type design.
- Ease of removing major component for servicing and maintenance.



AKONA ENGINEERING PVT LTD.

2

*WORKSHOP MANUAL FOR BOTH ENGINE AND
PLANT
OF
AKONA MAKE
STONE CRUSHER
MODEL:-AJC-50
CAPACITY:-50 TPH*



AKONA ENGINEERING PVT LTD.

H.O.:- A-455, HINDON VIHAR, MEERUT ROAD GHAZIABABD-201001 (U.P) INDIA

MFG. UNIT - :- PLOT NO.-219, VILLAGE -RAIPUR, TEHSIL BHAGWANPUR, ROORKEE-247661 (U.Kh.)

MOB: - +91-9891949701, +91-9958695766

SERVICE MAIL :- as_tender@akonaindia.com

Web: - www.akonaindia.com

TECHNICAL SPECIFICATIONS

- | | |
|--------------------------|--|
| 1. Model | : - AJC-50 |
| 2. Capacity | : 50 TPH |
| 3. Type | : Single Toggle /Stationary type |
| 4. Jaw Machine Size | : 20"X30"-01 NO, 6"X36"-02 NOS |
| 5. Jaw Machine Weight | : 14 Ton .8.5T -approx. |
| 6. Feeding | : Truck by Ramp (Retaining Wall) |
| 7. Pneumatic Wheel | : N.A |
| 8. Draw Bar | : No |
| 9. Prime mover | : Electric Motor separately for all m/c unit |
| 10.D.G SET | : YES |
| 11.Jaw Stock Adjusting | : Manually By Spring and Tie Rod |
| 12. Max. Input Size | : 350mm |
| 13. Output Size of Stone | : 6mm,10mm,20mm,40mm |
| 14. Machine feed Opening | : 250mm |
| 15.RPM | : 325-350 |
| 16.Derive | : V-Belt and pulley |

TECHNICAL DETAILS OF JAW STONE CRUSHER

❖ **STONE CRUSHER**: - Stone crusher is a machine which is used to crush the stone and segregated into various sizes like 40mm, 20mm, 10mm etc for different uses. Crushed stone aggregate are used for construction of roads, bridges, housing, industrial building construction and other cement based products like RCC pipes, PSC poles frames and beams.

The granite stones of various sizes are fed into the jaw crushers for size reduction. Depending on the desired output size of the crushed stone, raw material may be fed to one or two jaw crushers in a sequence. Then these crushed stones are passed on to the vibratory screen for size gradation. Material is handled through a belt conveyor to the different places of the operation i.e. from jaw crusher to the vibratory screen.

A.E.P.L- Make stone crusher 50 TPH Model AJC-50 manufactured with latest technology and used for crushing hard stone/ granites of size of size approximately 350mm. Stone size shall be reduced to final product of size up to 0 to 5mm, 5mm to 10mm, 10mm to 20mm, 20mm to 40mm. The model AJC-50 is portable type and trailer /trailer mounted on pneumatic tires.

❖ **JAW CRUSHER (SINGLE TOGGLE JAW CRUSHER)**: The **single-toggle** crusher is also known as an **overhead eccentric** for its eccentric shaft is up above compared to the Dodge which has its shaft below/under. Here, the eccentric is integrated into the “swing” jaw plate that’s moving up/down as the flywheel rotated by the motor. A single-toggle pivots at the base of the swing plate which is causing the jaw’s arc-like motion. The rock pinching resulting from its flowing/passing between a fixed and a swing moveable plate causes the ore to crush as it is “between a rock and a hard place”. Here also the toggle is kept in place by a compression spring. Large CSS adjustments are made to the jaw crusher by modifying the length of the toggle.

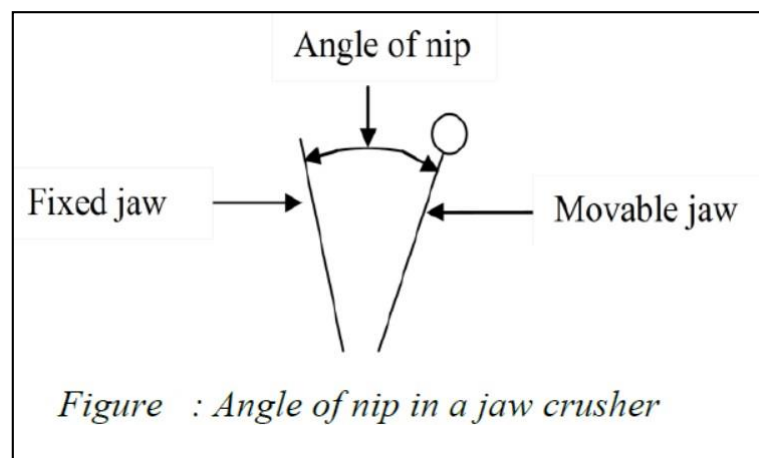
A.E.P.L- make stone crusher is capable producing 50 tons per hours. It produces different sizes of stone. The crusher machine having more setting for obtaining desired output and made by good quality of steel. All joint is stress relieved and bearing housing properly machined for better seating. Stress relieved cast iron toggle plate is provided in the machine. The main frame body is of welded plate’s construction, amply proportioned to take the strain during crushing operation. The design also allows for easy inspection of wearable parts and ample access for service work. All frame

members are accurately positioned and welded together. After welding, the frame is thoroughly stress relieved and accurately machined to allow a precise fit and contact for side plates, main frame bearing housing and toggle block.

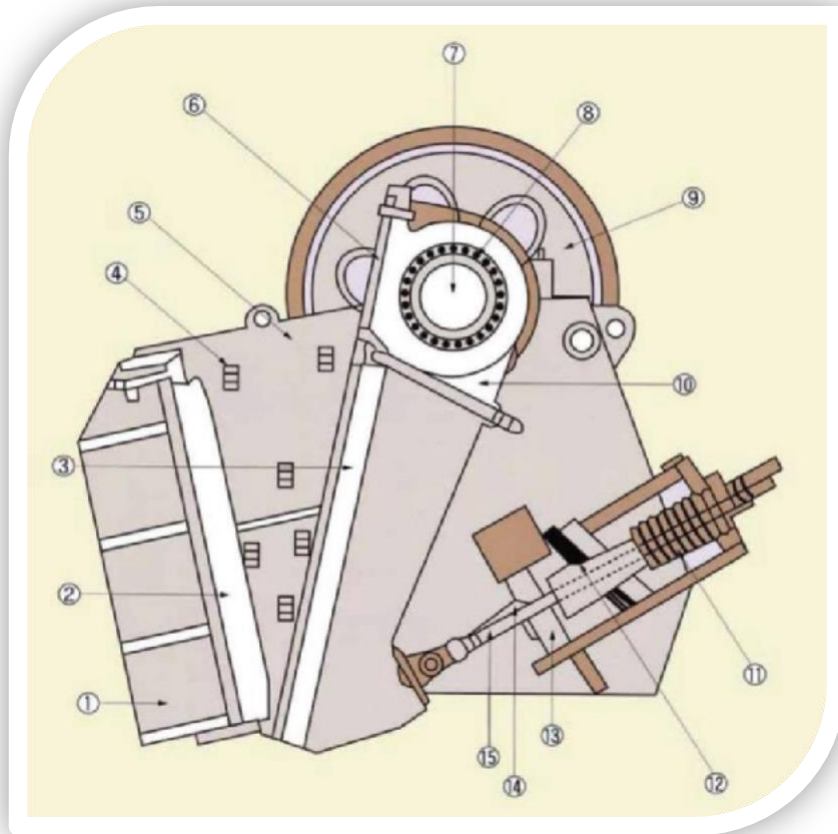
Strength and fracture toughness of the material to be crushed are intrinsic properties that determine the time and energy required to crush the material. Economy of the crushing process is partly dependent on the **angle of nip**. Productivity of the crusher can be improved upon by increasing the eccentricity of the eccentric shaft, use of reversible jaws, bush bearing and easily adjustable toggle plate. Vibrations and fatigue cracks in the crusher frame will be nipped in the bud through structural analysis at design stage. Determination of the optimal angle of inclination of the toggle plate, development of jaws with varying wear rate along the crushing chamber, and development of comminuting energy models that take into cognizance relevant crushing parameters for simulation and optimization of the crushing process are some areas that require close attention.

Angle of Nip

The jaws are set at an acute angle to each other. This angle commonly known as the “angle of nip” is usually less than 26deg. This is due to slipping effect when the angle is larger which reduces capacity. Niemela and Kieranen, stated that a desirable nip angle controls the ability to crush a given type of material at a commercial rate and it preferably falls between 17deg. and 27deg. Exceeding the maximum angle causes regurgitation or slipping from the machine, while operating below the desired range leads to the production of undesirable dust and fines; hence, the machine tends to servemore like a pulverizer. Figure - illustrates the angle of nip in a jaw crusher.



❖ Component of jaw crusher (Construction of a Single Toggle Jaw Crusher):-



1. **Crusher Main Frame:** - Crusher Frame is made of high welding. As a welding structure, it has been designed with every care so as to ensure that it is capable of resistant to bending stress even when crushing material of extremely high.
2. **Fixed Jaw Plate:** - The fixed jaw face is opposite the pitmen face and is statically mounted. It is also covered with the manganese jaw die. Manganese liners which protect the frame from wear; these include the main jaw plates covering the frame opposite the moving jaw, the moving jaw and cheek plates which line the sides of the main frame within the crushing chamber.
3. **Swing Jaw Plate:** - The jaw crusher pitmen is covered on the inward facing side with swing jaw plates made of manganese, an extremely hard metal. These plates often have scalloped faces. The swing jaw plate is usually symmetrical top to bottom and can be flipped over that way. This is handy as most wear occurs at the bottom

(closed side) of the jaw flipping them over provides another equal period of use before they must be replaced.

4. **Cheek plate bolt**:-The cheek plate tight with crusher frame at the crushing chamber with the bolt both side of crushing chamber.
5. **Cheek Plates**: - The sides of the crusher body covered with cheek plates or the cheek plates lining the inside of the jaw crusher cavity are subject to both high stress (during the crushing cycle) and low stress (between crushing cycles) abrasion. This abrasion wears away the material from which the cheek plates are made.
6. **Main shaft (Eccentric Shaft)**:- The pitman is put in motion by the oscillation on a shaft that goes through the pitman's entire length. The movement might total only 1 ½ "but produces Substantial force to crush material. The rotation of the eccentric shaft during operation by the pulley causes the movable jaw to make elliptical movement. The increased eccentricity of the shaft leads to increase in throw; hence, increase in throughput capacity can be achieved without increasing the physical size of the jaw crusher by increasing the stroke of eccentric shaft, decreasing the speed without increasing the crushing force through increased width. Also, increased throw gives the advantages of the retaining the structural design of the crusher and decreasing the machine load. The crusher stroke is displacement of jaw between the widest and narrowest points on an eccentrically gyrating cycle. Alternatively, the throw as the stroke of the swing jaw or the difference between the open side set and the closed side set. The open side set is the maximum discharge aperture, while the closed side set is the minimum discharge aperture. This force is also put on the shaft itself so they are constructed with large dimensions and with hardened steel. The main shaft that rotates has a large flywheel mounted on each end. Its eccentric shape initiates the movement of the moving jaw in and out. The eccentric shaft is made of Alloy Steel Fitted with anti-friction bearings and is in the pitman and dust proof housing.

7. **Bearing:** - There are typically four bearings on the eccentric shaft: two on each side of the jaw frame supporting the shaft and two at each end of the pitman. These bearings are typically roller in style and usually have labyrinth seals and some are lubricated with an oil bath system.

The bearings that support the main shaft normally are spherical tapered roller bearings on an overhead eccentric jaw crusher. Dynamic loads from the pitman, movable jaw, flywheel, pulley, drawback rod, toggle plate and eccentric shaft lead to severe wear in the bearings.

8. **Fly Wheel:** - The rotational energy is fed into the eccentric shaft of the jaw crusher by means of a sheave pulley which usually has multiple V-belt grooves. In addition to turning the pitman, eccentric shaft usually has substantial mass to help maintain rotational inertia as the jaw crushes the material. The weights of these two machine elements need be balanced as any deviation may lead to undesired twisting of the eccentric shaft and increased vibration. They are firmly keyed to the opposite ends of the eccentric shaft. Usually, they are made of gray cast iron because of its good vibration damping, machinability and resistance to sliding wear. The flywheel supplies the moment of inertia of a system, as it serves as a reservoir, which stores energy during the period when the supply is more than the requirement and releases it when the energy requirement is more than the supply. Hence, the inertia required to crush a material in a jaw crusher is provided by the flywheel

9. **Pitmen:** - The pitman is journalled at the upper end to accept the eccentric shaft. This structure houses the eccentric lobe and supports the movable jaw. The lower end of the pitman is guided by the toggle plate and drawback rod attached to it. A pitman with a cross-sectional support in the form of a honeycomb structure reduces or removes bending of the pitman and wear compared with a pitman without such support. The cross-sectional supports eliminate bending and distortion horizontally, with additional advantages including crushing material with smaller stroke count and smaller stroke length, reduction in the amount of energy required from the flywheel, lesser material requirement for producing the pitman, reduced mass of the pitman and avoidance of holes arising from casting, when open structured pitman is used. The pitman usually denotes a connecting rod, but in a jaw crusher it does not connect two things. Here, it refers to the moving jaw in a jaw crusher. It

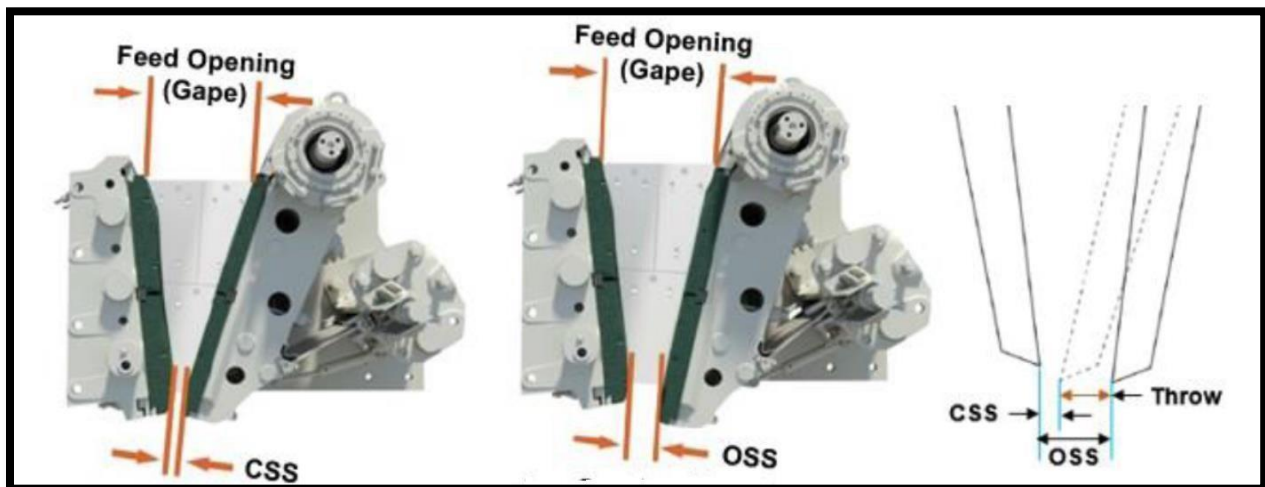
achieves the reciprocating movement through the eccentric motion of the flywheel shaft. This creates enormous force in each stroke. The pitman is fitted with two replaceable high strength steel alloy toggle plate

10. **Tension Spring**: - The rod-spring subassembly retrieves the movable jaw from the furthest end of travel. Here, the spring deflection and the rigidity of the rod are pertinent. This spring-biased rod facilitates the cyclical return of the lower end of the jaw to the base position
11. **Toggle Bearing**: - Toggle Plate Shims are used to prevent toggle plate from abrading the machine directly. If they are worn out, the toggle plate will impact the body of main frame and the body of movable jaw. As a result, the service-life of the two parts will be affected.
12. **Toggle Block**:- A toggle block sliding mechanism for a jaw crusher for adjusting the position of a toggle block quickly and easily, the toggle block sliding mechanism for a toggle block supporting one end of a toggle plate which is connected at the other end thereof to a lower end portion of a swing jaw being characterized in that a toggle block comprising an upper block and a lower block which are connected to each other via an elastic body is sandwiched by upper and lower supporting members which are provided on a machine frame and that the toggle block is caused to slide by applying an external force
13. **Toggle Plate**: - The bottom of the pitman is supported by a curved piece of metal called the toggle plate. It allows the bottom of the pitman to move up and down with the motion of the eccentric shaft, apart from serving as a safety mechanism for the entire jaw. The piece of non-crushable material such as a steel loader tooth (sometimes called "tramp iron") enters the jaw crushing chamber and being larger than the closed side setting it can't be crushed nor can it pass through the jaw. In this case, the toggle plate will bend or break thus preventing further damage.
14. **Tension Rod**: - Without the spring & retraction screw rod, the bottom of the pitman would just flop around as it isn't connected to the toggle plate and is just resting against it in the toggle seat. The retraction screw rod system ensures the pitman is firmly fixed to the toggle plate. It is designed to fail before any damage occurs to the crusher body, pitman or shaft. The toggle seats are fixed points where the toggle plate contacts the pitman and the toggle beam.

❖ **Terminology & Parameter of crusher**

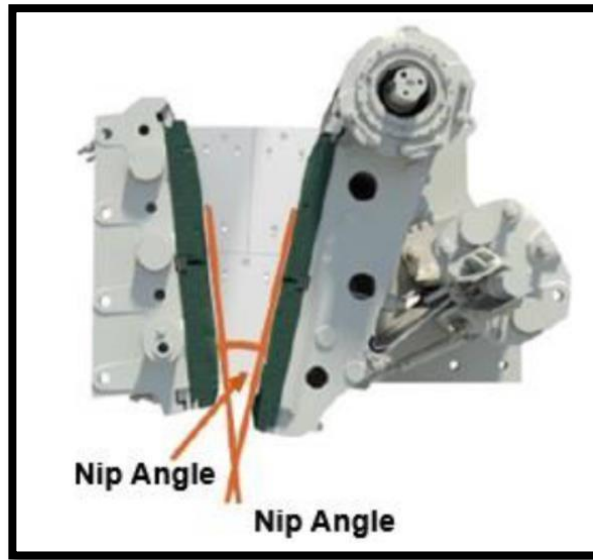
1. **Feed Opening**:-It is the distance between the jaws at the feed opening. The feed opening (gap or depth of the cavity) is measured from the top of the tooth of fixed jaw to the bottom of the tooth of movable jaw in a straight line perpendicular to the centerline of the crushing cavity.

Feed opening define the maximum feed size of the crusher. The maximum feed size is approximately 80% of the feed opening.



2. **Open Side Setting (OSS)**:-The open side setting is measured when the crusher is at rest. The setting is measured either top to top (for closed profile jaw plate, i.e. use of heavy duty jaw plate), or bottom to top (for open profile jaw plates, i.e. jaw plate with tooth), depending on the tooth profile of the jaw plates. It is the maximum discharge opening /gap.
3. **Closed Side Setting (CSS)**:- The closed setting can be calculated by deducting the throw/ stroke from the OSS.CSS is the most important crusher parameter since it defines the maximum product size and has significant bearing on capacity, product gradation, power draw and wear. It is the minimum discharge opening /gap. Check the instruction manual for the permitted minimum CSS.
4. **Throw/Stroke**: - The throw is stroke of the swing jaw. It is the difference between OSS and CSS.

5. **Nip Angle**:-The nip Angle is the angle between the fixed and movable jaw plates. Too large a nip angle reduces the capacity (due to material squirt out like a large ball which might squirt out from under a car tire) and increases the wear as the feed material grinds and gouges the jaw plates in an upwards direction during the compressive stroke.



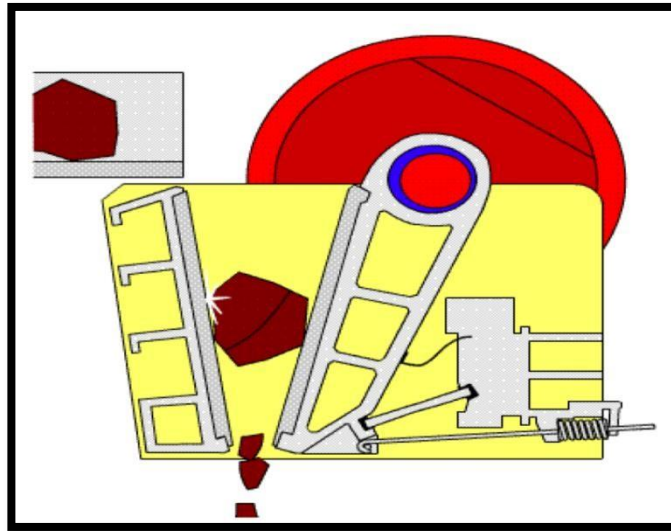
6. **Setting adjustment**: - Varying material output size (discharge) is achieved by adjusting the opening at the bottom of the jaw, commonly referred to as the "closed side setting". This can be done by inserting shim plates, wedge movement and hydraulic system.

Single Toggle Jaw Crusher

A single toggle jaw crusher consists of an eccentric shaft that is placed on the top of the crusher. The rotation of the shaft along with the toggle plate generates the necessary compression force required to break down the substance into smaller particles. A single toggle jaw crusher has a better capacity than a double toggle jaw crusher.

Working Principle of Jaw crusher

The Working Principle of jaw crusher (Single toggle) is based on modern design “Crushing without Rubbing” The machine consists, two jaws, one fixed and the other moving. The opening between them is smaller at the bottom and wider at the top. The pitmen moving on an eccentric shaft on bearing, swing lever (Moving Jaw) swing on center pin. The Rock held in between two Jaws and crushed by mechanical pressure.

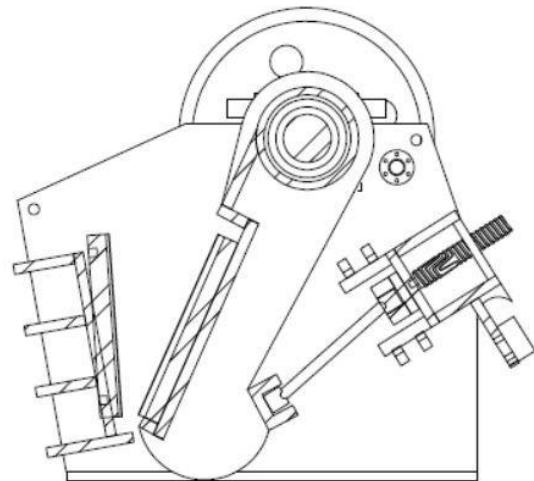
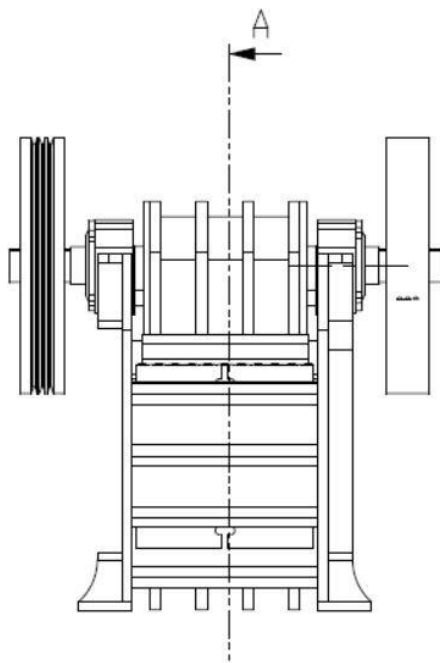


The motor derives the belt pulley drives the eccentric shaft to rotate, and make the moving jaw approach and leave the fixed jaw periodically with respect to eccentric shaft rotation, to crush, rub and grind the materials repeatedly, thus to make the material slower and slower and gradually fall down and finally discharge from the discharge opening as the desired dimension of the crushed product. A fixed jaw mounted in a “V” alignment is the stationary plate.

The ore or rock is fed into the crusher where the jaw are furtherest apart, i.e. at the maximum opening or gape. When the jaws come together the ore is crushed into smaller sizes and slip down in the crushing chamber. In the return stroke, further reduction of size is experienced and the ore moves down further. The process is repeated till particles having size less than the bottom opening or set pass through as product. The function of the toggle (s) is to move the pivoted jaw. The retrieving action of the jaw from its furthest end of travel is by springs for small crushers or by a pitman for larger crushers. For a smooth reciprocating action of the moving jaws, heavy flywheels are used in both types of crushers mounted on each side of the eccentric shaft.

ADJUSTMENT OF DISCHARGE GAP OR STOCK

- ❖ Loosen the drawbar spring so that the jaw stock is free.
- ❖ Loosen ROTATION SCREW toggle block bolts so that the toggle block is free to move.
- ❖ Loosen also the toggle plate setting and is free to move.
- ❖ Do the manually tight of toggle block by the tighten the screw rotation direction the toggle block assembly with pitmen or jaw stock also push till the required gap is achieved. This is applying to reduce the gap.
- ❖ After achieving the required gap place the adjusting shims behind the toggle block and tight both screw toggle block.
- ❖ In case the gap is to be increased then, similarly toggle block bolt and draw bar spring assembly to be loosened. Then the toggle block is to be push ahead with the manually with help of rotation screw.
- ❖ Again tighten the toggle block bolt and drawbar spring assembly and toggle block and rotation screw.



TIGHTENING UP OF JAW

A Jaw Crusher is fully effective only when the jaws of the machine are rigidly fixed on the holding members. If they are not properly fixed, the jaws may fall down from their setting position that may damage the various parts like shaft, bearing etc. For tightening up the jaws first have to see the gap between the jaw stock and Distance plate. The gap must be 6mm or more, otherwise the jaws cannot be tightening properly. The distant plate along with its bolt heads has to be hammered from the front and nut of the distant plate to be fastened from the back simultaneously. Regarding fixed Jaw, reducer side plate drive end and reducer side plate non driven end the same have to be hammered down first and the distant plate bolts have to be tightened afterwards.

Tightness of the jaws of their bases should be checked up before running the machine and also at intervals of four hours when the machine is opening for long hours.

Although crusher jaws are made of manganese steel, the teeth wear out after consideration period. The wear is more in the lower half, i.e the discharge end of the jaw. The upper half of the jaws should be fully used by fitting the jaws upside down. New jaws should be fit only when both the halves have been used to capacity.

To change fixed jaw, remove its distant plate along with its bolts, pull out Reducer side plate drive end and reducer side plate non drive end, lift up the jaw and refit it upside down. Replace reducer side drive end and reducer. Side plate non drive end and hammer it down. The swing jaw is reversed by taking out swing jaw distant plate and its bolt. After fitting the swing jaw upside down swing jaw bolts are tightened.

To remove the jaw first takes out the distant plate bolts and the distant plates. Jaws are now free to be dislodged and can be removed manually. Jaw can be inverted to obtain maximum life.

REBUILDING OF JAWS PLATES

The Jaws are made of manganese steel as per IS: 276. The initial wear out of the jaws should be watched & rebuilding is necessary before the teeth become totally flat. The rebuilding of the teeth of jaws should be made by process of welding with manganese steel or any hard facing electrodes. Jaws must be kept in horizontal position partially submerged inside the cold water bath to avoid distortion, cracking and bending. A continuous flow of water to be maintained so that the water temperature is ambient.

The life of jaw depends on the character of materials crushed. To rebuild the jaws by welding recommended electrode are, TERROWELDMN or DUROMANGAN, followed by ok. SELECTRO 8340 of ESAB India as well as MAC Trade E6 130 of Indomac welding alloys.

REPLACEMENT OF TOGGLE PLATES

To remove the toggle plate, loosen the drawbar bolts & toggle block bolts. Push the swing jaw towards the fixed jaw thus creating the room for the toggle plate to be free. Take out the toggle plate from its position.

Major component

TOGGLE PLATE:-

A toggle plate is used in the crusher unit for maintaining the gap between jaws but its other function is to break whenever the Crusher machine becomes overloaded with some unbreakable materials such as metal, Wood etc. and to save further damage to the plant. Toggle Plates has to be replaced as its length becomes shorter after prolonged use. Both ends of the toggle plate which rubs against liners are specially treated for less wear and longer life. Similarly the toggle liners attached to the jaw stock and Toggle Blocks are specially treated for less wear and longer life.

JAWS:-

Jaws are constructed of grade Mn. Steel which is sufficiently capable to withstand heavy shock loads. The corrugated surface profile result in efficient crushing and shaping of stones but need replacement when excessively worn out.

SIDE PLATE:-

Akona Crusher has two manganese steel side plates. They have dual function. One is to hold the fix jaw in position and the other is to act as protection lining of the main crusher body to prevent sever abrasion. They should be replaced with new ones whenever they are sufficiently worn out, which of course take a very long time. The side plates are also fixed with the side plates of the main cage with bolts to avoid upward thrust.

DRAW BAR SPRING:-

The strength of the drawbar spring, as supplied with A.E crusher, is sufficient to hold the toggle plate in its position, as set for operation. While any change is made in the gap between the jaws, the spring compression should also be changed suitably. The spring may lose its flexibility tension and become useless if it is subjected to the undue heavy compression for a considerable length of the time. The general gap between the two coils of the spring is around 6mm while under compression.