



NESANS

MAINTENANCE TIPS

Mobile Jaw Crusher Daily Maintenance: Complete Operator Checklist

Daily maintenance checklist for mobile jaw crushers. Pre-start inspections, lubrication points, and critical checks for maximum uptime.

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A mobile jaw crusher represents a capital investment of ₹1.5-4 crore, yet its operational lifespan and productivity depend entirely on daily maintenance discipline. Plants that implement rigorous daily inspection protocols experience 40% fewer unplanned breakdowns, 25% longer component life, and 15% higher throughput consistency compared to reactive maintenance approaches. This comprehensive operator checklist transforms daily maintenance from a cursory walk-around into a systematic predictive maintenance program that catches problems before they become catastrophic failures.

Mobile jaw crushers operate in the harshest conditions imaginable—dust, vibration, impact loading, and variable feed materials. Every component experiences stress cycles numbering in the hundreds of thousands daily. The difference between a crusher that delivers 8,000 productive hours between major overhauls versus one requiring constant repair lies not in manufacturing quality alone, but in the daily attention operators give to critical checkpoints.

This guide provides a comprehensive daily maintenance protocol covering pre-start checks, running inspections, and shutdown procedures. Each checkpoint includes specific parameters, warning thresholds, and corrective actions—transforming operators from machine monitors into predictive maintenance specialists.

Understanding Mobile Jaw Crusher Systems

Before diving into maintenance procedures, operators must understand the integrated systems that make mobile jaw crushers function. Each system has specific failure modes, warning signs, and maintenance requirements.

Primary Systems Overview

SYSTEM	FUNCTION	CRITICAL COMPONENTS	PRIMARY FAILURE MODES	INSPECTION FREQUENCY
Crushing Chamber	Size reduction through compression	Fixed jaw, swing jaw, toggle plate, bearings	Wear, fatigue, overload damage	Every shift
Drive System	Power transmission from engine to crusher	Diesel engine, hydraulic pumps, V-belts, flywheel	Wear, misalignment, contamination	Every shift
Hydraulic System	CSS adjustment, fold-out operations, jaw relief	Pump, cylinders, valves, filters, reservoir	Leaks, contamination, pressure loss	Daily + running
Feed System	Material delivery to crushing chamber	Hopper, grizzly feeder, feed chute	Wear, blockage, misalignment	Every shift
Discharge System	Crushed material evacuation	Under-crusher conveyor, discharge chute	Spillage, belt damage, blockage	Continuous
Undercarriage	Mobility and stability	Tracks, track frames, final drives, rollers	Wear, tension loss, seal failure	Daily
Electrical System	Control, monitoring, safety interlocks	PLC, sensors, wiring, displays	Corrosion, vibration damage, sensor drift	Daily

Daily Operating Parameters

Understanding normal operating parameters allows operators to identify deviations before they indicate serious problems:

PARAMETER	NORMAL RANGE	WARNING THRESHOLD	CRITICAL/ SHUTDOWN	PROBABLE CAUSE IF ABNORMAL
Engine Oil Pressure	40-65 psi (running)	<35 psi	<25 psi	Low oil level, pump wear, filter restriction
Engine Coolant Temp	82-95°C	>100°C	>105°C	Low coolant, radiator blockage, fan issue
Hydraulic Oil Temp	40-65°C	>75°C	>82°C	Low oil, cooler blockage, relief valve bypass
Hydraulic System Pressure	180-220 bar (working)	<170 bar or >230 bar	<150 bar or >250 bar	Pump wear, relief valve, internal leakage
Eccentric Shaft Bearing Temp	40-70°C	>80°C	>90°C	Lubrication failure, bearing damage
Toggle Seat Bearing Temp	35-55°C	>65°C	>75°C	Insufficient grease, wear
Main Frame Oil Level	Sight glass 1/2-3/4	<1/4 or >full	Empty or overflow	Seal failure, overfilling
V-Belt Tension	10-15mm deflection at center	>20mm or <8mm	Slipping or snapping	Stretch, wear, incorrect adjustment

Pre-Start Inspection Checklist (30-45 Minutes)

The pre-start inspection is the most critical maintenance opportunity of the day. Performed before the engine starts, it allows thorough examination of all systems without time pressure or safety concerns from moving components.

1. Safety and Perimeter Check (5 minutes)

Before approaching the machine:

- **Area Clear:** Verify no personnel, vehicles, or obstacles within the swing radius and discharge zone
- **Ground Conditions:** Check for soft spots, erosion, or water accumulation that could affect stability
- **Warning Signs:** Ensure all safety signage is visible and intact
- **Fire Extinguisher:** Verify presence, full charge (green zone), inspection tag current
- **First Aid Kit:** Confirm presence and completeness
- **Lockout/Tagout:** Remove any lockouts from previous shift, verify no ongoing maintenance tags

Action if Failed: Do not start machine until safety deficiencies are corrected. Document in shift log.

2. Walk-Around Visual Inspection (10 minutes)

Perform a complete circuit of the machine, checking:

Crushing Chamber Area:

- **Jaw Die Condition:** Visually inspect through inspection doors for wear pattern, cracks, loose bolts. Jaw dies should show even wear. Localized deep wear indicates feed distribution problems.
- **Toggle Plate:** Check for cracks, especially at pivot points. Toggle plates are designed to fail before main frame damage—they're a critical safety device.
- **Cheek Plates:** Look for excessive wear, loose fasteners, or missing sections.
- **Wedge Adjustment System:** Verify wedges are secure, no signs of movement during previous operation.
- **Accumulation:** Check for material buildup in chamber. Overnight moisture can cause bridging on startup.

COMPONENT	ACCEPTABLE CONDITION	REPLACE WHEN	CHECK METHOD
Fixed Jaw Die	Even wear, teeth visible	<50% of original thickness, cracks, breaking teeth	Visual + measurement with gauge
Swing Jaw Die	Even wear pattern	<50% thickness, uneven wear >15mm difference	Visual + measurement
Toggle Plate	No visible cracks	Any crack, deformation, pitting	Visual inspection with flashlight
Cheek Plates	Surface intact, bolts tight	Worn through, loose or missing bolts	Visual + bolt check

Frame and Structure:

- **Main Frame:** Inspect for cracks, particularly around bearing housings and toggle seat areas
- **Mounting Bolts:** Verify all visible bolts are present and appear tight
- **Weld Integrity:** Look for crack propagation from existing welds
- **Rubber Mounting Pads:** Check for deterioration, separation, or excessive compression

Hydraulic System:

- **Reservoir Level:** Check sight glass—should be 3/4 full when cold
- **Leaks:** Inspect all hose connections, cylinder seals, valve blocks. Note: A single drop per hour is acceptable; continuous dripping requires attention.
- **Hose Condition:** Look for abrasion, cuts, bulging, or hardening
- **Cylinder Rods:** Check for scoring, pitting, or coating damage

Drive System:

- **V-Belts:** Check tension (10-15mm deflection at midpoint under 10kg force), wear, cracking, alignment
- **Belt Guards:** Verify all guards are in place and secure
- **Flywheel:** Visual check for cracks, balance weights secure
- **Sheave Alignment:** Belts should run true, not climbing sides of sheaves

Feed and Discharge System:

- **Grizzly Feeder:** Check for bent bars, loose fasteners, worn liners
- **Feed Hopper:** Inspect liner condition, buildup accumulation
- **Discharge Conveyor:** Belt tracking, splice condition, scraper effectiveness
- **Skirting:** Check for wear, proper contact with belt

3. Undercarriage Inspection (10 minutes)

The undercarriage is often neglected but critical for mobile operations:

COMPONENT	CHECK POINT	ACCEPTABLE	ACTION REQUIRED
Track Tension	Sag between rollers	40-60mm sag for steel tracks	Adjust if outside range—loose tracks accelerate wear, tight tracks increase drive loads
Track Pads	Shoe height measurement	>50% original height	Plan replacement, rotate if uneven wear
Rollers	Spin by hand, listen	Free rotation, smooth	Grinding = bearing failure imminent
Idler Wheels	Visual + rotation	No flat spots, free rotation	Replace if seized or worn flat
Final Drive	Oil level check, leak inspection	Correct level, no leaks	Top up or investigate leak source
Track Frame	Cracks, distortion	No visible damage	Immediate repair if cracked
Sprocket	Tooth wear, cracking	Teeth >50% height, no cracks	Replace when hooked or cracked

4. Fluid Level Checks (10 minutes)

Check all fluid levels with the machine on level ground, engine cold:

FLUID	CHECK LOCATION	CORRECT LEVEL	IF LOW	SPECIFICATION
Engine Oil	Dipstick	Between marks	Top up to upper mark	15W-40 CI-4 or manufacturer spec

FLUID	CHECK LOCATION	CORRECT LEVEL	IF LOW	SPECIFICATION
Engine Coolant	Expansion tank	Between MIN-MAX cold	Add 50/50 coolant mix	Type as specified, typically OAT
Hydraulic Oil	Reservoir sight glass	3/4 full cold	Add ISO VG 46 or 68	As specified, typically anti-wear AW
Diesel Fuel	Tank gauge	Plan for full shift	Refuel before starting	Ultra-low sulfur diesel
DEF (if equipped)	DEF tank gauge	>1/4 tank	Top up—engine derates without DEF	ISO 22241 specification
Crusher Bearing Oil	Main frame sight glass	1/2 to 3/4	Add specified oil	ISO VG 150 or 220 typically

Important: Document any fluid additions. Increasing consumption indicates developing problems requiring investigation.

5. Lubrication System Check (5 minutes)

Most mobile jaw crushers use automatic lubrication systems. Daily checks:

- **Grease Reservoir Level:** Check sight glass or open reservoir—should be >1/4 full
- **Grease Type:** Verify correct grease is installed (NLGI 2 EP typically)
- **Pump Operation:** Activate manual cycle if equipped, verify pressure builds
- **Distribution Lines:** Check all lines for damage, disconnection, or kinking
- **Grease at Bearing Points:** Fresh grease should be visible at bearing seals after recent cycling

LUBRICATION POINT	GREASE TYPE	MANUAL INTERVAL IF AUTO-LUBE FAILED	QUANTITY PER POINT
Eccentric Shaft Bearings	Oil bath—NOT grease	N/A—oil level check only	Maintain sight glass level
Toggle Plate Seats	EP2 Lithium Complex	Every 2 hours	3-5 pumps per side
Tension Rod Bushings	EP2 Lithium Complex	Every 4 hours	2-3 pumps each

LUBRICATION POINT	GREASE TYPE	MANUAL INTERVAL IF AUTO-LUBE FAILED	QUANTITY PER POINT
Pitman Bearing (if greasable)	EP2 Lithium Complex	Every 2 hours	5-10 pumps
Flywheel Bearing (if greasable)	EP2 Lithium Complex	Every 4 hours	3-5 pumps per side

6. Electrical and Control System Check (5 minutes)

- **Battery:** Check terminals for corrosion, connections tight, electrolyte level if serviceable
- **Wiring:** Look for chafing, rodent damage, loose connections
- **Control Panel:** All displays functional, no warning lights illuminated before start
- **Emergency Stops:** Verify all E-stops are in "run" position, test function weekly
- **Level Sensors:** Clean if dusty, verify not blocked
- **Proximity Sensors:** Clean and verify alignment

Startup Procedure and Running Checks

Controlled Startup Sequence

Proper startup sequence prevents damage and allows system self-diagnosis:

1. **Final Visual Check:** Ensure all personnel clear, guards in place, chamber empty or clear of tramp material
2. **Turn Key to "On":** Wait for all systems to initialize (10-30 seconds depending on model)
3. **Verify No Alarm Codes:** Address any startup alarms before proceeding
4. **Start Engine:** Allow immediate idle for 30 seconds, then let engine warm at low idle for 3-5 minutes (longer in cold weather)
5. **Check Gauges:** Oil pressure should rise immediately. Coolant temperature should begin climbing after 2-3 minutes.
6. **Hydraulic Warm-Up:** Cycle hydraulic functions slowly (feeder gates, CSS adjustment) to circulate and warm hydraulic oil

7. **Start Crusher:** With engine at operating speed, engage crusher. Let it run empty for 2 minutes to stabilize.
8. **Start Conveyors:** Engage discharge conveyor, verify belt tracking
9. **Start Feeder:** Begin feeding material at reduced rate initially

First 30 Minutes Running Checks

The first 30 minutes of operation reveal developing problems:

TIME AFTER START	CHECK POINT	EXPECTED	ACTION IF ABNORMAL
5 minutes	Engine oil pressure	40-65 psi stable	Shutdown if <35 psi, investigate
5 minutes	Hydraulic pressure	Building to working pressure	Check pump if pressure doesn't build
10 minutes	Engine coolant temp	Rising toward 82-95°C	Investigate if not warming or overheating
10 minutes	Hydraulic oil temp	Rising but <65°C	Normal warmup—watch for rapid rise
15 minutes	Crusher bearing temps	Stabilizing <70°C	Rising trend above 80°C indicates problem
15 minutes	Unusual sounds	Smooth operation	Investigate any new knocking, grinding, squealing
30 minutes	All temps stabilized	Within normal operating range	Continuing rise indicates problem

Continuous Running Monitoring

During operation, operators should monitor:

Visual Monitoring:

- Feed rate consistency—avoid surge feeding
- Product size—sudden changes indicate wear or CSS drift
- Dust generation—excessive dust may indicate worn seals or material issues
- Belt tracking on discharge conveyor

- Material spillage—indicates overfeeding, belt issues, or skirting problems

Audible Monitoring:

- Crushing chamber sound—should be rhythmic, consistent
- Bearing noise—high-pitched whine indicates lubrication issues or bearing distress
- Belt squeal—indicates slippage, tension, or alignment problems
- Hydraulic whine—pump cavitation or low fluid
- Engine sound—knocking or unusual exhaust note indicates problems

Instrument Monitoring:

- Check all gauges/displays hourly minimum
- Record readings at fixed intervals (start, 2 hours, 4 hours, etc.)
- Note any trends—gradual temperature increases often indicate developing issues

Mid-Shift Inspection (Every 4 Hours)

During natural production breaks or shift changes:

Quick Inspection Points (15 minutes):

1. **Visual Leak Check:** Walk around looking for new fluid leaks
2. **Belt and Drive Check:** Verify V-belts not excessively hot or squealing
3. **Bearing Temperature:** Use infrared thermometer on accessible bearing housings—compare to startup baseline
4. **Grease System:** Verify auto-lube cycling, reservoir level adequate
5. **Filter Indicators:** Check hydraulic filter bypass indicator, air filter restriction indicator
6. **Coolant Level:** Top up if needed (carefully—pressurized when hot)
7. **Fuel Level:** Ensure adequate fuel for remaining operation

Documentation Requirements:

Record in shift log:

- Time and operating hours
- All temperature readings
- Any fluid additions (type and quantity)
- Unusual observations
- Production figures (tonnes processed if metered)

Shutdown Procedure

Proper shutdown extends component life and sets up for easy restart:

Controlled Shutdown Sequence:

1. **Stop Feeder:** Cease material input
2. **Run Crusher Clear:** Allow chamber to empty completely (2-5 minutes depending on size)
3. **Stop Crusher:** Only after chamber is empty—never stop under load
4. **Run Conveyor Clear:** Allow all material to discharge
5. **Stop Conveyors:** Once clear of material
6. **Engine Cool-Down:** Let engine idle 3-5 minutes to allow turbocharger to cool
7. **Shutdown Engine:** Turn key off
8. **Post-Shutdown Check:** Walk around looking for leaks, loose components, unusual wear

Post-Shutdown Documentation:

- Record final operating hours
- Note any issues observed during operation
- Document any maintenance performed
- List any parts needed or work required for next shift
- Sign and date shift log

Common Problems and Troubleshooting

Problem: Crusher Running Hot

SYMPTOM	PROBABLE CAUSE	IMMEDIATE ACTION	ROOT CAUSE FIX
Bearing temp rising >80°C	Insufficient lubrication	Reduce load, check oil level	Investigate oil pump, lines, filters
Hydraulic temp >75°C	Cooler blocked, low oil	Reduce operations, check level	Clean cooler, check relief valve
Engine overheating	Radiator blocked, coolant low	Shutdown if >105°C	Clean radiator, check fan operation
V-belts hot	Slipping from low tension	Reduce load	Adjust tension, check sheave wear

Problem: Unusual Noise

SOUND TYPE	PROBABLE SOURCE	SEVERITY	ACTION
Metallic knocking	Toggle plate, loose jaw dies	High—stop and inspect	Check toggle, die bolts, bearing clearance
Continuous grinding	Bearing failure	Critical—stop immediately	Identify bearing, plan replacement
Belt squeal	Slippage from tension or load	Medium	Adjust tension, check for overload
Hydraulic whine	Pump cavitation, air in system	Medium to High	Check oil level, suction filter, air leaks
Irregular thumping	Toggle plate or pitman bearing	High	Stop and inspect toggle assembly

Problem: Reduced Production

OBSERVATION	PROBABLE CAUSE	CHECK	RESOLUTION
Lower throughput	CSS opened, worn jaws	Measure CSS, inspect jaws	Reset CSS, replace jaws if worn

OBSERVATION	PROBABLE CAUSE	CHECK	RESOLUTION
Coarser product	CSS opened	Measure CSS	Adjust CSS to specification
Frequent stalling	Overfeeding, CSS too tight, wet sticky material	Feed rate, CSS, material	Adjust feed, open CSS, manage moisture
Uneven jaw wear	Uncentered feeding	Feed distribution pattern	Adjust feed point, check hopper wear

Weekly Maintenance Tasks

In addition to daily checks, weekly maintenance ensures longer-term reliability:

TASK	PROCEDURE	TIME REQUIRED	TOOLS NEEDED
Jaw Die Measurement	Measure thickness at 3 points, record wear rate	20 min	Caliper or wear gauge
CSS Measurement	Measure at 3 points minimum	15 min	CSS gauge, flashlight
V-Belt Inspection	Check for cracks, glazing, cord exposure	15 min	Visual, flashlight
Track Tension Check	Measure sag, adjust if needed	30 min	Tape measure, grease gun for tensioner
Emergency Stop Test	Test all E-stops for function	10 min	None
Air Filter Inspection	Clean or replace pre-filter, check main element	20 min	Compressed air, replacement filter
Hydraulic Filter Check	Check indicator, replace if showing bypass	30 min if replacing	Replacement filter, drain pan
Battery Maintenance	Clean terminals, check connections, test voltage	15 min	Wire brush, multimeter
Grease Line Inspection	Check all auto-lube lines for damage	15 min	Visual

Documentation and Tracking

Effective maintenance requires consistent documentation:

Daily Log Entries Should Include:

- Date and shift
- Operating hours (start and end)
- Pre-start checklist completion confirmation
- All fluid levels and any additions
- Operating temperatures at set intervals
- Any abnormalities observed
- Maintenance performed
- Parts used or needed
- Operator name and signature

Tracking Metrics for Predictive Maintenance:

METRIC	WHAT IT INDICATES	TRACK HOW	WARNING SIGN
Oil Consumption	Seal condition, combustion health	Weekly additions	>0.5L/100 operating hours
Coolant Consumption	Seal/gasket condition	Weekly additions	Any consistent loss
Hydraulic Oil Consumption	Seal condition	Weekly level	>0.5L/week
Jaw Die Wear Rate	Material abrasiveness, CSS	Weekly measurement	>2mm/1000 tonnes indicates CSS too tight
Fuel Consumption	Engine efficiency, load	Daily fill records	Increase without production increase
Bearing Temperatures	Bearing and lube condition	Hourly during operation	Rising trend

Safety Reminders

Mobile jaw crusher maintenance carries inherent risks. Daily safety practices:

Personal Protective Equipment Required:

- **Always:** Hard hat, safety glasses, steel-toe boots, high-visibility vest, hearing protection
- **During Inspection:** Add work gloves
- **During Fluid Handling:** Add chemical-resistant gloves, face shield if handling hot fluids
- **During Welding/Grinding:** Appropriate welding PPE, fire watch

Lockout/Tagout Procedures:

Before entering any danger zone (crushing chamber, under conveyor, drive areas):

1. Shutdown all systems completely
2. Turn master switch to "Off"
3. Remove key and retain personally
4. Apply personal lock and tag to lockout point
5. Attempt restart to verify lockout effective
6. Block moving components if working under suspended parts

Never:

- Reach into crushing chamber while machine is running or capable of running
- Work under raised components without proper blocking
- Bypass safety interlocks
- Operate with guards removed
- Work alone on maintenance tasks
- Ignore unusual sounds, temperatures, or vibrations

Conclusion

Daily maintenance of a mobile jaw crusher is not merely a checklist exercise—it's a systematic approach to preserving capital investment, maximizing productivity, and ensuring operator safety. The 60-90 minutes invested daily in proper pre-start inspection, running checks, and shutdown procedures returns dividends through extended component life, reduced unplanned downtime, and consistent production quality.

Operators who follow this comprehensive checklist develop an intimate understanding of their machine's normal operation, allowing them to detect subtle changes that indicate developing problems. This predictive capability transforms maintenance from reactive repair to proactive optimization—the hallmark of professional aggregate production.

The most successful operations treat their mobile crushers as precision equipment worthy of precision maintenance. That mindset, combined with disciplined execution of daily procedures, distinguishes plants that achieve 8,000+ hours between major overhauls from those requiring constant intervention. Every shift begins with an opportunity to protect the investment and set up for productive operation—this checklist ensures that opportunity is never wasted.

Topics:

#Jaw Crusher

#Maintenance

#Mobile Crushing