

HEAVY METAL
MOBILE PLANT SAFETY

PRE-START INSPECTIONS

EXCAVATOR

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Plant pre-start inspections occur once the plant has been introduced to the site and provide an opportunity to check for any indicators that the plant may not operate safely before it is put into use for the day.

The pre-start inspection should involve checks in the following sequence:

1. Before the plant is turned on

Generally, this step considers the operating features of the plant as further detailed in this presentation, e.g., hydraulics, batteries, oils, coolants, fuel, tracks, booms, plant safety features, condition of attachments, etc.

2. Once the plant is turned on

This step checks that all controls used by the operator are functioning correctly, including hand controls, reversing beepers, lights, and park brakes etc.

3. Initial operation of the plant

The final step should be guided by the Original Equipment Manufacturer's (OEM) manual and involves operating the mobile plant for a short distance to confirm there are no indicators of issues.



Note

The following is a **general overview** of key items that need to be regularly checked to ensure an excavator is fit for use.

Pre-start inspections should be completed using pre-start tools developed for that particular type of plant, taking into account:

- The Original Equipment Manufacturer's (OEM) manual
- Results of the plant risk assessment
- Legislative requirements and
- Any site-specific specifications for plant.

Where an item is identified as being defective, faulty or not to a satisfactory standard, it must be reported to your leader.

They must take suitable action(s) to address the identified risk e.g., place it out of service and refer for repair.



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<p>HEAVY METAL</p> <p>PRE-START INSPECTIONS</p> <p>EXCAVATOR</p>	<p>BEFORE COMMENCING ISOLATE MACHINE</p> <p>360° WALKAROUND</p> <p>FUEL AND FLUID LEVELS</p>	<p>INSIDE CABIN SEATBELT</p> <p>360° WALKAROUND</p> <p>PROTECTIVE STRUCTURE</p>	<p>BEFORE COMMENCING ISOLATE MACHINE</p> <p>360° WALKAROUND</p> <p>HANDRAILS AND STEPS</p>	<p>INSIDE CABIN FIRE EXTINGUISHER</p> <p>360° WALKAROUND</p> <p>CYLINDERS AND LINKAGE</p>	<p>INITIAL START UP RADIO</p> <p>360° WALKAROUND</p> <p>ATTACHMENTS</p>
<p>FUNCTIONAL CHECK INSIDE THE CABIN</p> <p>360° WALKAROUND</p> <p>FUEL AND FLUID LEVELS</p>	<p>INSIDE CABIN SEAT</p> <p>360° WALKAROUND</p> <p>PROTECTIVE STRUCTURE</p>	<p>INSIDE CABIN SEATBELT</p> <p>360° WALKAROUND</p> <p>PROTECTIVE STRUCTURE</p>	<p>INSIDE CABIN SAFETY SIGNS AND LABELS</p> <p>360° WALKAROUND</p> <p>HANDRAILS AND STEPS</p>	<p>INSIDE CABIN MIRRORS</p> <p>360° WALKAROUND</p> <p>CYLINDERS AND LINKAGE</p>	<p>INITIAL OPERATION REVERSE ALARM AND FLASHING LIGHT</p> <p>360° WALKAROUND</p> <p>ATTACHMENTS</p>
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HEAVY METAL

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This slide can be printed and used as a 1-page summary.

BEFORE COMMENCING

CHECK FOR HAZARDS

- Visually check around and above the machine for hazards and personnel.
- Check for other plant, vehicles, overhead hazards and any people in the area.
- Exclusion zones and or barriers should be used. Work area should be clear of any pedestrians.
- Plant must be parked on suitable flat ground.
- Ensure the plant is fundamentally stable.
- PPE must be worn during pre-start inspections as per the risk assessment.



BEFORE COMMENCING ISOLATE MACHINE

Before the plant is turned on

This first step in the pre-start inspection considers the operating features of the plant as further detailed in this presentation, e.g. hydraulics, batteries, oils, coolants, fuel, tracks, booms, plant safety features, condition of attachments, etc.

Isolate Machine

Isolate the plant before conducting a 360° walk around to avoid accidental start-up. Ensure all hydraulic, pneumatic and electrical circuits are not operational and any stored energy is dissipated.

Isolate using:

- Lockable battery isolators
- Starter isolators
- Through the back of the E-Stops (on newer models).

How:

- Place a red personal lock/tag on the designated isolation point.
- Lock the cab and place keys in pocket.
- Check plant is secured from any movement.



360° WALK AROUND

ATTACHMENTS

Excavators are designed to perform a wide range of tasks and therefore have a variety of attachments. Always refer to the Plant Risk Assessment and Manufacturer's Instructions when checking the attachments. For example, look for excessive wear, damage, cracks on the bucket.

Why:

Over time metal on the bucket can become weakened or cracked causing the bucket to break apart while it is operational.

What:

- Regular inspections for any signs of damage including looking for cracks, dents, or other types of wear and tear.
- Check hitch and pins suitably greased.
- No leaks from hydraulic hoses.
- Tipping link is connected to the quick hitch.
- Review cutting blades on the side of the bucket.

Note:

If hard metal parts such as pins, bucket teeth, cutting edges or bearings are hit with a hammer, pieces may scatter and cause serious personal injury or death.



360° WALK AROUND

CYLINDERS AND LINKAGE

Check attachments, cylinders and linkages for excessive wear, damage, cracks and functionality.

Why:

To maintain the integrity of the excavator and avoid structure failure.

What:

- Check cracks on arms.
- Inspect linkage pins for grease and lubrication.
- Inspect for fluid and oil leaks.
- Check cylinders for seepage.
- Look for damage, wear and any abnormalities.
- Check correct lubrication and maintenance (can be found in the operating manual).
- Check pins and bolts for broken or missing parts.



360° WALK AROUND TRACKS

Check tracks and sprockets for damage, wear and tension.

What:

- Check idler is not damaged or bent.
- Track rollers are intact, no debris in them.
- Clean and free from clogged mud and material build up.
- Drive sprocket teeth are in good working order.
- Tracks have no loose plates, well tensioned, not damaged.
- Track chains on the inside of the track are not damaged.



360° WALK AROUND

PROTECTIVE STRUCTURE

Check protective structures (ROPS/FOPS) for damage.

Note: ROPS and FOPS are sometimes located in the cabin. They should be checked from the inside of the cabin.

Why:

- Protective structures keep operators safe from plant roll overs, falling objects and cabin impact damage.
- If the structure's integrity is compromised, the cabin may be damaged or crushed in an incident, and occupants harmed.

What:

- Check corrosion from age or moisture.
- Metal fatigue.
- General damage.
- Confirm that any ROPS or FOPS on site includes an appropriate manufacturer's compliance plate on the machine that is visible and legible.

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360° WALK AROUND

HANDRAILS AND STEPS

Check condition, cleanliness and slip resistance of steps and the condition and suitability of handrails and edge protection.

Why:

- To avoid hazards such as slips, trips and falls.
- To improve access to awkward areas.
- To maintain 3 points of contact.

What:

- Check steps and walkway is free from dirt, dust and mud.
- Check the handrail and steps for any oil or grease.
- Tighten any loose bolts on handrails and steps.

Action:

If the handrails and steps are damaged or deformed, they must be repaired immediately.



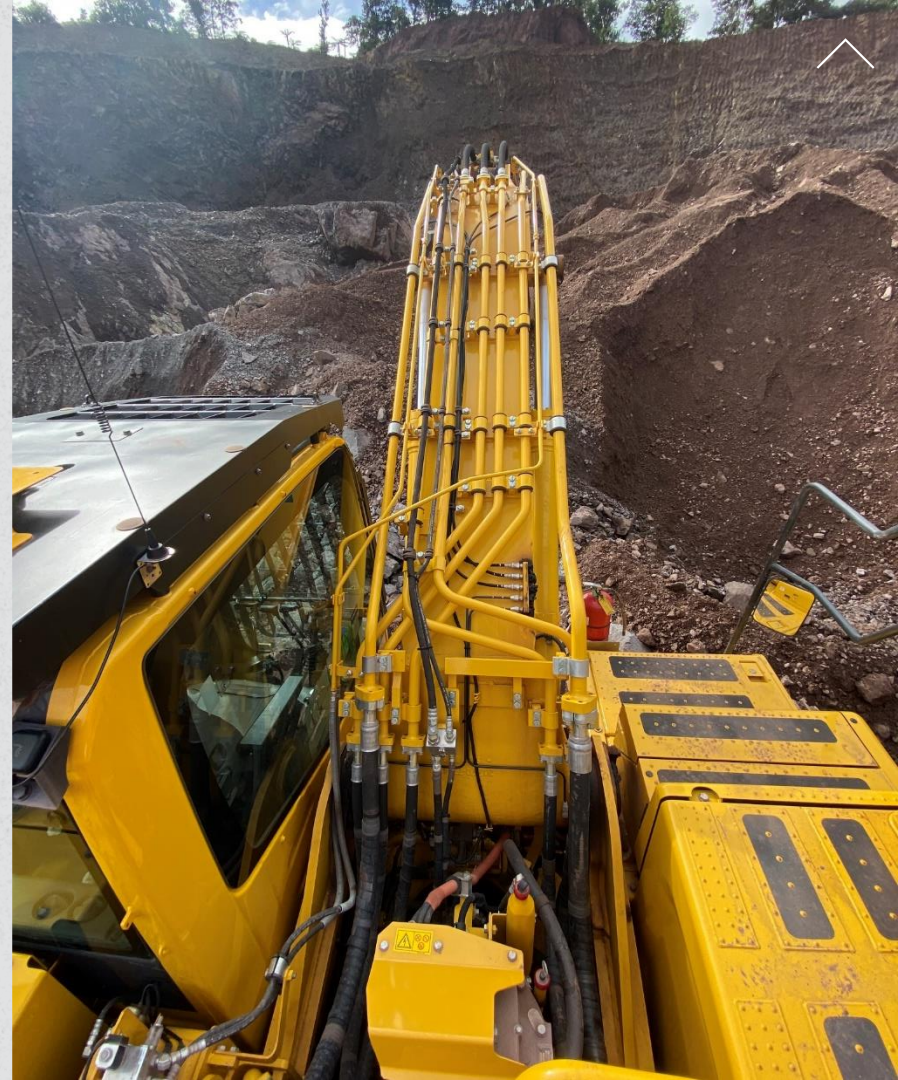
360° WALK AROUND

BOOMS AND HOSES

Check boom and hoses for damage, cracks and leaks.

What:

- Check for visible stains.
- Check hoses and couplings.
- Check for any damage and secure connections.



360° WALK AROUND

ENGINE BAY AND COMPONENTS

Check the engine bay is free from leaks and dirt build up.

What:

- Visual check on diesel pump, filter and oil filter.
- Check belts and hoses for cracks, wear spots, leaks, damage and secure connections.
- Check oil for slew ring using dipstick.
- Take cap off and check air filter.
- Check oil levels with dipstick.
- Check battery is secure.



360° WALK AROUND

FUEL AND FLUID LEVELS

Check fuel and fluid levels, leaks and damage.

Why:

- If oil or fuel leaks from high-pressure hoses or piping, it may cause a fire or defective operation, and can cause injuries if released under high pressure.
- Serious crush injuries can result when the hydraulic systems fail, from falling loads or unexpected moving parts.
- Plant arms or equipment can cause injury through rapid movement.

What:

- Look at the underside of chassis for any leakage before starting the engine.
- Check oil levels in hydraulic tank.
- Inspect the boom, cylinders, hoses for leaks.
- Check the ground for any obvious sign of leakage.
- Check for sufficient lubrication and no evidence of damage.



FUNCTIONAL CHECK

INSIDE THE CABIN

After conducting pre-start inspections on the outside, functional checks are required.

This second step in the process allows the operator to check that all the controls are functioning correctly, including hand controls, reversing beepers, lights, and park brakes etc.

Check:

- The isolation has been removed.
- The door is unlocked with the key.
- Three points of contact are maintained.
- The cabin is free from any rubbish and that there is nothing under the pedals.



INSIDE CABIN

OPERATING MANUAL, MACHINE HOURS

Check that the Original Equipment Manufacturer (OEM) or Operating and Maintenance Manual (O&M) is in the cabin.

Why:

- Provides instructional material by the manufacturer to correctly operate and maintain the plant.
- Highlights the safety hazards within the plant.

Check:

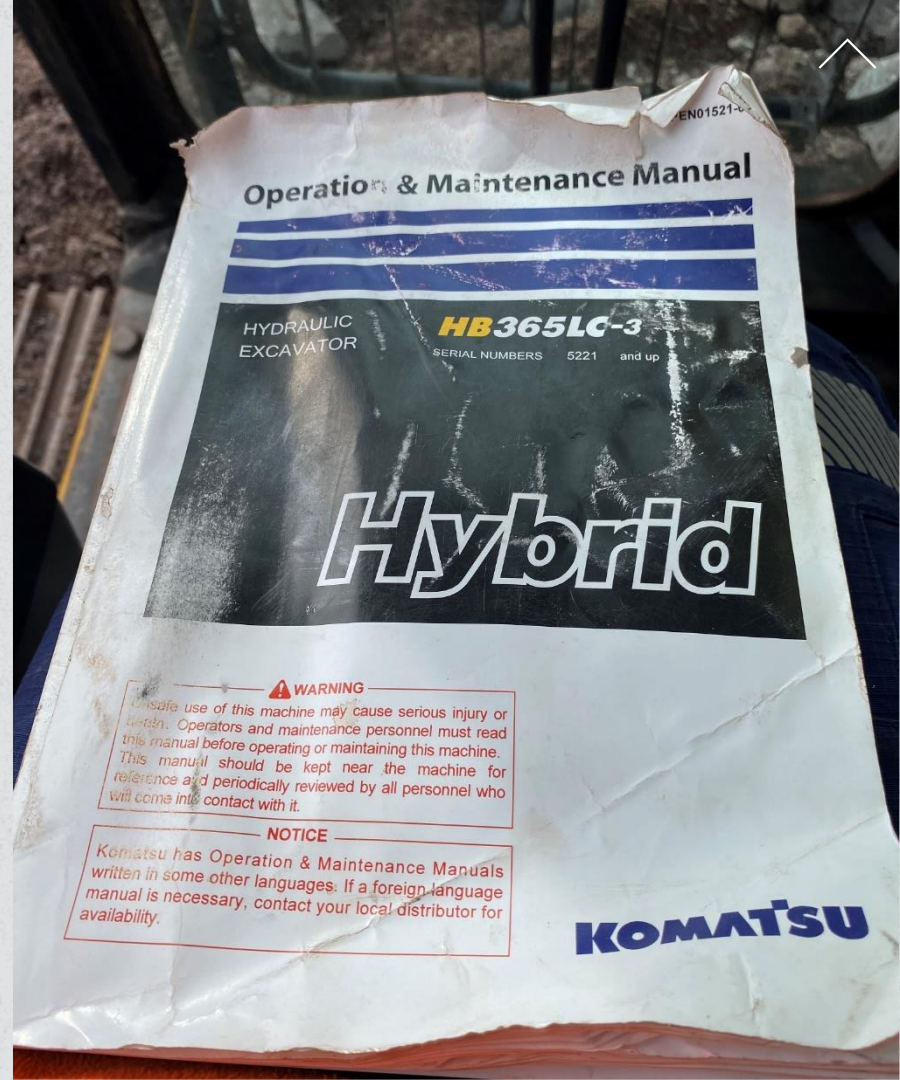
- O&M is understood before operating the plant.
- Periodically reviewed by operators to stay informed of the safety hazards and operational requirements.

Action:

If the manual is missing or cannot be read, a new copy can be downloaded and printed from the supplier's website.

NOTE: Check the machine hours to confirm that the excavator is not due or overdue for any service or maintenance requirements.

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INSIDE CABIN

SEATBELT

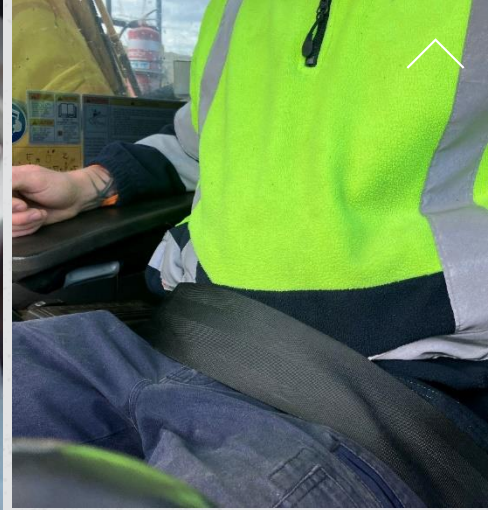
Check seatbelt and mounting for damage, wear and adjustment.

Why:

Operator restraint systems, when used properly, hold the operator in the seat and help contain the operator inside the Roll Over Protection Structure (ROPS) in the event of a collision or tip-over.

Check:

- Belt is retractable and in good condition.
- Webbing material is not shredded, torn or twisted.
- Mounting hardware and bolts.
- Tongue latch and ensure it engages securely.
- Seat belt labelled with installation date. Recommendation is to replace after three years of service life.
- Refer to OEM for life span and replacement requirements.



INSIDE CABIN

SEAT

Check the seat is operational and in good condition to avoid musculoskeletal injuries.

Why:

The seat protects the operator from harmful levels of whole-body vibration which can lead to fatigue and strain on body.

Check:

- Seat is adjusted to the operator.
- Air seat suspension or air reservoir tank is operational and comfortable to reduce vibrational impacts.
- Seat height and angle is adjusted to meet the operator's physical requirements.
- Electric wiring is connected and protected (if applicable).
- Adequate seat padding (i.e., free from rips and tears).



INSIDE CABIN

MIRRORS

Check mirrors for cracked glass, cleanliness, functionality and visibility.

Why:

Mirrors improve the operator's visibility around the machine and help prevent contact with other people and/or plant.

What:

- Check mirrors are clean.
- Glass is not cracked.
- Adjusted so that the area at the rear can be seen from the operator's seat.

Action:

Before moving, look around and check mirrors. Monitor to confirm that no one is around the machine.

Where it is assessed as safe to do so, use a spotter if the view is obstructed.



INSIDE CABIN

WINDOWS

Check windshield, windows and doors for cracked glass, cleanliness, functionality.

Why:

- The glass installed in heavy equipment protects the operator from flying debris.
- A shattered or broken windscreen or door is not safe. Damaged glass can obstruct the operator's view.
- Because the excavator is exposed to rocks, metal and stones, it is more likely to sustain damages over time.

Check:

- Identify the potential hazards from falling or flying objects.
- Assess the risk.
- Consult with original equipment manufacturers (OEMs) for operator cabin protection and glass options.
- Consider laminated glass and external structural protection requirements (e.g., grizzly bar).

Operators should consider the task being performed and attachments used when risk assessing whether the glass/protective equipment is adequate.



INSIDE CABIN

SAFETY SIGNS AND LABELS

Check safety signs and labels are in place and legible, including compliance and load charts.

Why:

Safety signs and labels serve as a visual reminder of potential dangers such as electrical hazards, moving parts, hot surfaces and chemical exposure.

Check:

- Labels and signs comply to AS/NZ Standards.
- Not damaged and clearly legible.
- Labels are located in an area that can be easily seen and do not impede the operator's visibility.

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INSIDE CABIN

FIRE EXTINGUISHER

Check there is a fire extinguisher, its location and that it is ready for use.

- Fire extinguishers should be easily accessible.
- fire extinguishers can be located inside the cabin or mounted outside near the engine (or both).

Check:

- Correct class of extinguisher
- Pressure gauge
- Locking pin is intact and tamper seal not broken
- No visible damage to cylinder, handle, nozzle and hose
- Date stamp on yellow inspection tag is less than 6 months
- Extinguisher is suitably mounted.

Action:

If the fire extinguisher is out of date or cannot be located, report it to your supervisor or leader and locate an alternative.



INITIAL START-UP

START-UP MACHINE

Put the key in the ignition and let the machine warm up as per the OEM requirements. This allows the oil to get to the right temperature before the excavator operates effectively.

Ensure the deadman lock lever is still engaged (lever up).

Check:

- Horn is working.
- Gauges and lights on the control panel.
- Lights are on and working.
- Wipers are functional.
- Check reverse cameras are operational and visible.

Note:

Refer to the OEM for additional start-up checks before commencing the next step in the process that involves operating the plant for a short distance to confirm there are no indicators or issues.



INITIAL START-UP

RADIO

Check the radio is functional prior to commencing excavator operations.

What:

- Test the radio by contacting someone.
- Recognise that multiple users may also be using the radio.

How:

- Turn the radio to correct channel and call up supervisor.
- Hold the handpiece approximately 25mm from your mouth.
- Press the Press To Talk (PTT) button.
- Wait two seconds with the button depressed before speaking.
- Talk across the handpiece to prevent distortion (hold at a right angle to mouth).
- Release PTT button and listen for a response.
- Acknowledge the response.

Action:

If the radio is defective the excavator should be stood down. The supervisor should be notified and an alternative radio sourced before operations can commence.



INITIAL START-UP

INITIAL OPERATION

This final step in the pre-start inspection process should be guided by the Original Equipment Manufacturers (OEM) manual.

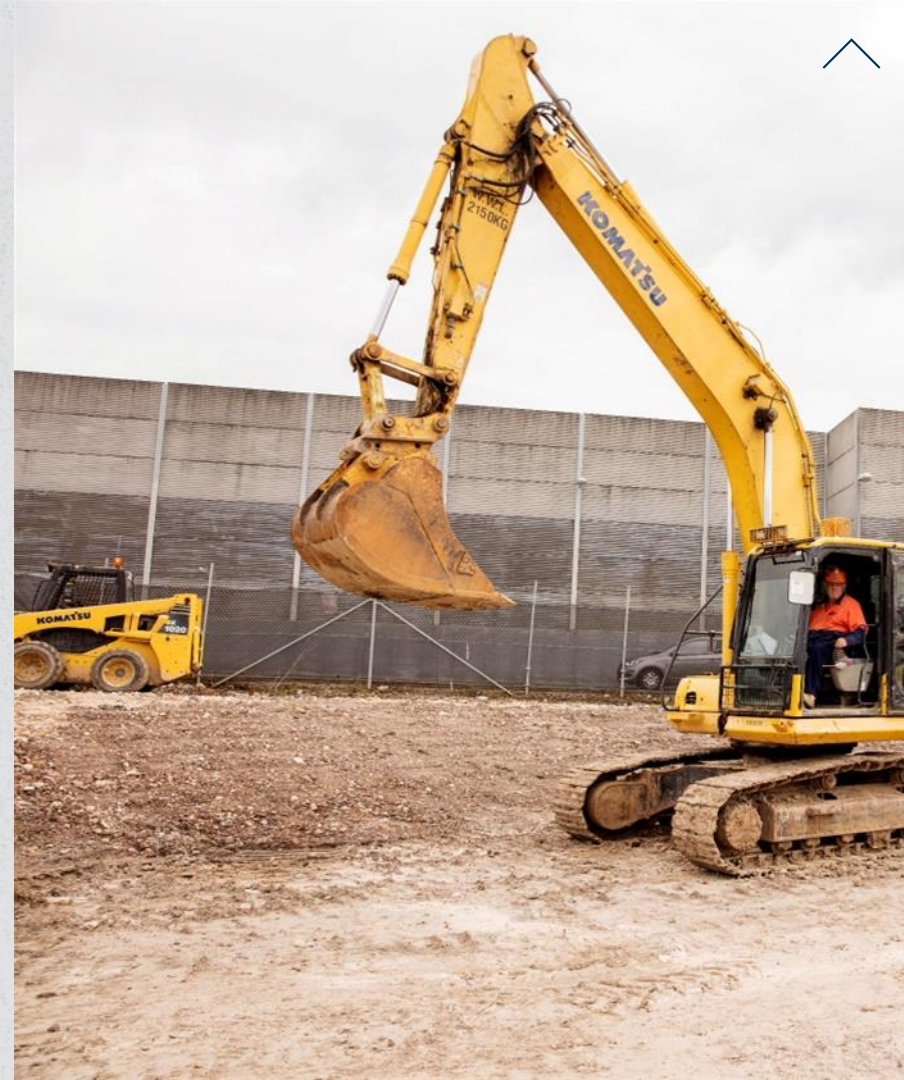
It involves operating the mobile plant for a short distance to confirm there are no indicators of issues.

Before operating the plant, check to confirm that plant, vehicles, overhead hazards and any people in the area are controlled.

Check:

- Deadman lock lever is lowered.
- Machine's arm can move up and down and, in and out.
- The attachments are operational (i.e. crowd and uncrowd the bucket).
- Move slowly backwards to ensure tracks are moving.
- Listen for any sounds that are not normal, squeaking or banging.
- Check E-Stop (stop button) to ensure it is operational.

If any defects are found, the excavator should be stood down and the supervisor notified before operations can re-commence.



INITIAL OPERATION

REVERSE ALARM AND FLASHING LIGHT

Check reversing alarm is audible and flashing light is working as the plant is moving.

Why:

A reversing alarm can effectively warn pedestrians of the excavator's forward or reversing movement.

Flashing lights provide a visual warning to help ensure that other plant, vehicles or pedestrians are aware of its forward or reversing movements, minimising the risk of a collision.

Check:

- Light is operational and in good working order.
- Light is bright enough to be visible from required distance.
- Reverse alarm is audible as excavator is moving.

Note:

Managing the risks of plant in the workplace code of practice refers to forward or reversing movements.



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Information and resources

Scan the QR code to learn about our Heavy Metal Mobile Plant Safety Campaign.

