



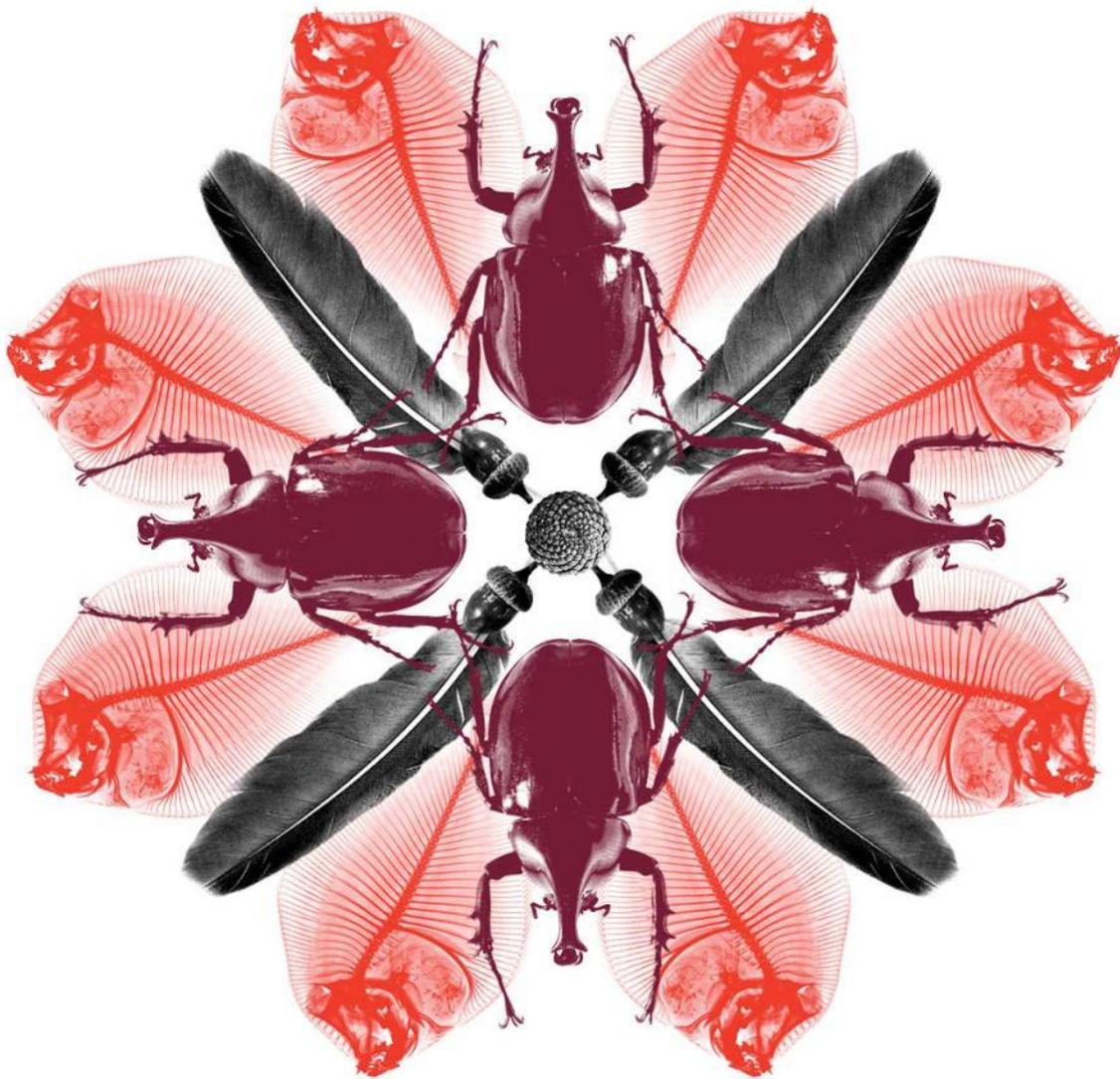
Australian Government  
Department of Agriculture  
and Water Resources

# Machinery Cleaning Guide - Mini Excavators

**Biosecurity**

Publication series

April 2016



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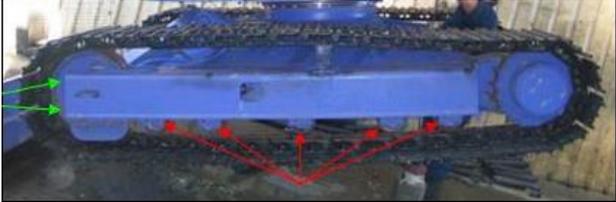
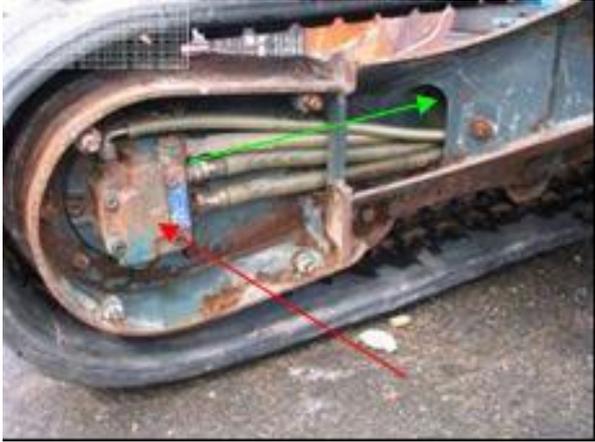
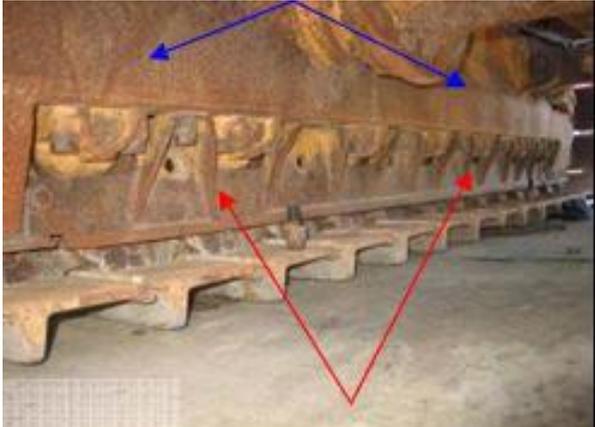
# Table of Contents

<b>Cleaning guidelines .....</b>	<b>3</b>
Tracks .....	3
Turret/slew ring.....	7
Boom stick and bucket.....	14
Cabin .....	17
Blade .....	21
General.....	22

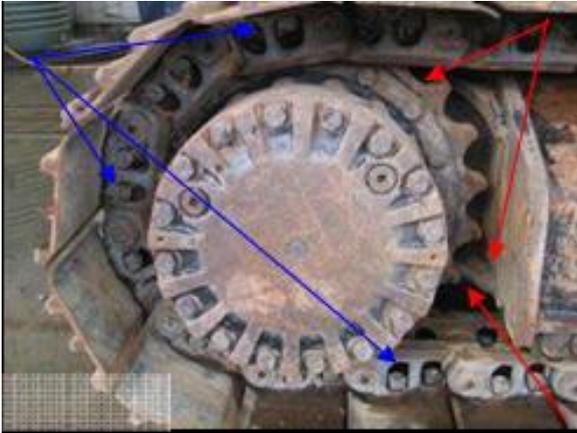
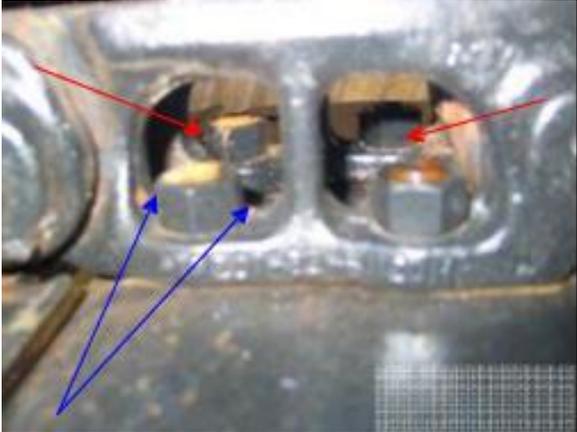


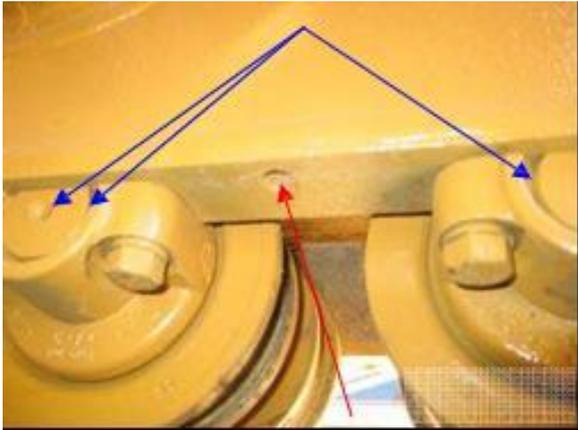
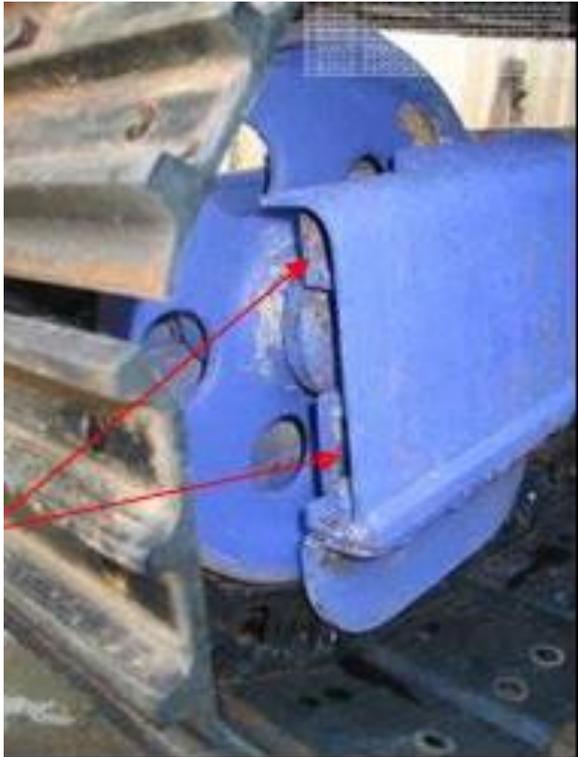
# Cleaning guidelines

## Tracks

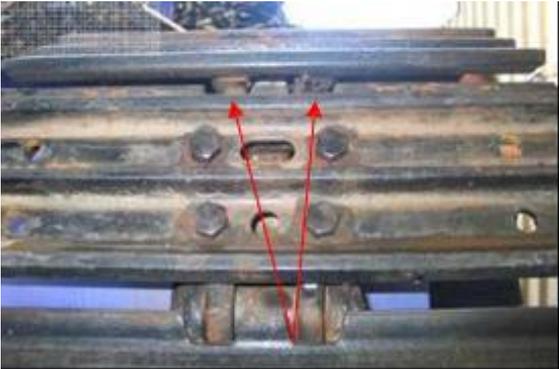
Description	Images
<p>The tracks on any excavator are the main area that comes into contact with soil and other biosecurity risk material. Thorough cleaning and inspection techniques are required. In order to facilitate the cleaning and inspection process, all non-affixed panels, rock guards and motor covers must be dismantled. The red arrows indicate the rollers and the green arrows highlight the hollow channels on the idler wheel frame.</p>	
<p>Red arrow indicates that the motor cover has been removed, allowing access to the drive motor. The green arrow indicates the hollow channel, which extends up through the frame into the turret or slew ring. These hollow areas on each side need to be thoroughly flushed to ensure cleanliness.</p>	
<p>Rock guards would be rare on mini excavators however if present, these must be removed to allow cleaning and inspection access to the inside track frame. The blue arrows highlighting the frame above the rock guards may be a hollow channel or at least an internal ledge, which requires inspection.</p>	

## Biosecurity

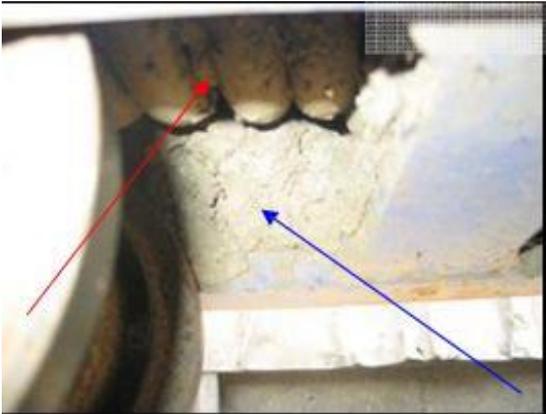
Description	Images
<p>This picture highlights some of the internal ledges found inside track frames. All ledges and small recesses either side of each roller (blue arrow) must be thoroughly cleaned and inspected. The drainage hole under the slew ring (green arrow) requires flushing to verify internal cleanliness.</p>	 A photograph showing the interior of a track frame. Several rollers are visible, with blue arrows pointing to the ledges on either side of each roller. A green arrow points to a drainage hole located under a slew ring. The background is a blue-painted metal structure.
<p>This picture indicates the outside of the drive motor. The red arrows highlight the rear of the motor cover and the blue arrows highlight each track nut.</p>	 A photograph of the exterior of a drive motor. The motor cover is visible, with red arrows pointing to its rear edge. Blue arrows point to the track nuts that are part of the drive mechanism. The motor is mounted on a metal frame.
<p>The blue arrows highlight the small gaps either side of each nut where biosecurity risk material is commonly found. Inspect the rear of the inside nuts (red arrows) from the outside and vice versa.</p>	 A close-up photograph of track nuts. Blue arrows point to the small gaps between the nuts, which are common locations for biosecurity risk material. Red arrows point to the rear of the inside nuts, indicating inspection points from both sides.

Description	Images
<p>This picture highlights the roller and the bolt hole (red arrow) where rock guards may be attached. The channel may be hollow and will require flushing to verify cleanliness. The small recesses (blue arrows) on the outside of the rollers may become compacted with biosecurity risk material.</p>	
<p>Indicates the top roller above the track frame. The red arrow highlights the small gap at the rear, which must be flushed while the blue highlights the small gap at the rear of the roller.</p>	
<p>The red arrows show the hollow framework that requires thorough cleaning and inspection. All tracked machines must undergo one full revolution to ensure track pad cleanliness.</p>	

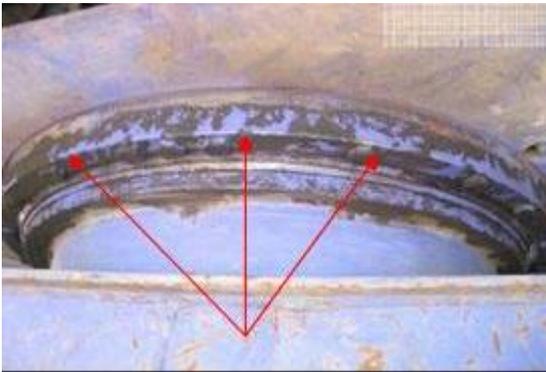
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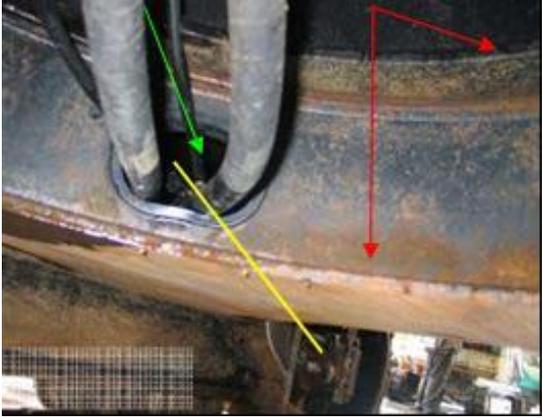
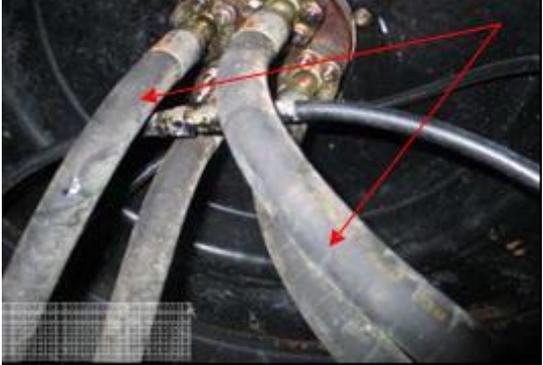
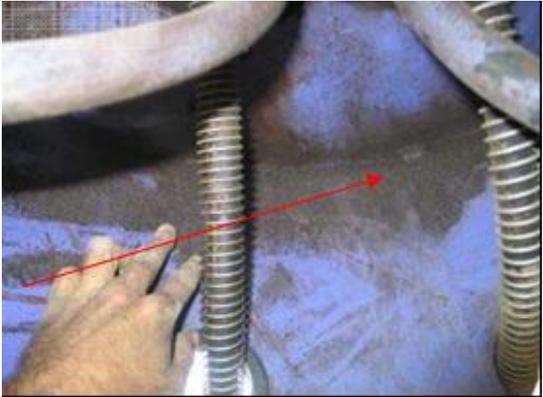
Description	Images
<p>As the tracks revolve, they open slightly (red arrows) allowing cleaning and inspection.</p>	 A close-up photograph of several horizontal metal track links. Two red arrows point upwards from the bottom of the links to the small gaps between them, indicating where they open slightly during rotation.
<p>Each individual rubber track pad has been removed, allowing access to the small recesses that can be compacted with biosecurity risk material. Each track pad must be verified clean.</p>	 A close-up photograph of two parallel metal track links. Two red arrows point downwards from the top of the links to the small circular recesses between them, showing where biosecurity risk material can be compacted.
<p>Examples of biosecurity risk material found inside motor covers. Access will be required to verify the cleanliness inside the drive motors.</p>	 Two photographs showing the interior of a motor cover. The top photo shows a hand reaching into a motor housing where a pile of light-colored, fibrous material is visible. The bottom photo shows a similar scene with a hand reaching into a motor housing containing a pile of light-colored, chunky material.

## Biosecurity

Description	Images
<p>The inside of the track frame, just highlighting the track adjuster spring (red arrow) and biosecurity risk material (blue arrow) on one of the internal ledges that must be removed.</p>	
<p>At the opposite end to the drive motor is the idler wheel (red arrow). Ensure that all surfaces either side of the idler wheel are clean as well as any ledges behind (green arrow).</p>	

## Turret/slew ring

Description	Images
<p>All contaminated grease (red arrows) must be removed from the outer slew ring during the cleaning process.</p>	

Description	Images
<p>The red arrows highlight the various ledges that can be found inside the turret/slew ring, each ledge requires thorough cleaning. The green arrow points to the hollow channel where the hydraulic hoses run down through the turret housing to the drive motors (yellow line demonstrates the path of the hydraulic hoses). This area must be flushed in the presence of the inspecting officer to verify cleanliness.</p>	
<p>The hydraulic hoses inside the turret/slew ring. Each hose must be individually cleaned.</p>	
<p>All contaminated grease (red arrow) must be removed from the inside surfaces of the slew ring during the cleaning process.</p>	

## Engine bay

Description	Images
<p>Dismantle all non-affixed panels (red arrows) from the underside of the mini excavator body for cleaning and inspection.</p>	
<p>All non-affixed engine covers and shrouds have been removed, allowing for cleaning and inspection.</p>	
<p>Example of the amount of dismantling required to facilitate the cleaning and inspection process.</p>	

Biosecurity

Description	Images
The underside non-affixed panels have been removed, allowing cleaning and inspection access to the sump.	
The topside of the fuel cell, accessible for cleaning and inspection after the engine covers are removed.	
The side of the fuel cell, accessible for cleaning and inspection after the engine covers are removed.	

## Biosecurity

Description	Images
<p>On some models, a small recess (red arrow) can be found between tanks. To access this recess for cleaning and inspection, dismantling may be required.</p>	
<p>All biosecurity risk material, including dirty grease must be removed during the cleaning process.</p>	
<p>The radiator grill (red arrow) must be removed to allow cleaning and inspection access to the inside of the radiator shroud. Remove the air filter (green arrow) and check for cleanliness (pressurised air).</p>	

Description	Images
<p>Another example of dismantling to allow access to the engine block (red arrow) and radiator (blue arrow)</p>	
<p>The red arrow highlights the radiator grill that is currently preventing access to the inside of the shroud, whilst the aqua arrow is highlighting the topside of the engine block.</p>	
<p>The radiator (green arrow) and oil cooler (red arrow) must be flushed in the presence of the inspecting officer to verify cleanliness of the fins.</p>	
<p>Once the engine covers have been removed, areas like the one highlighted become accessible for cleaning and inspection.</p>	

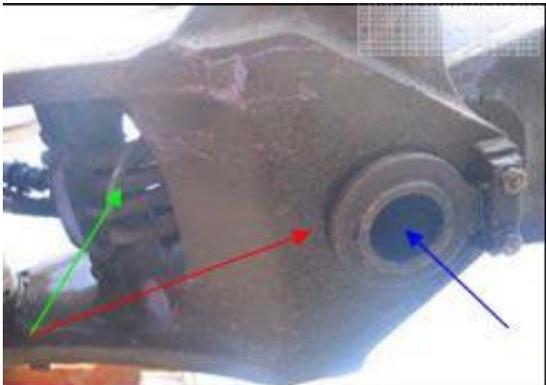
Biosecurity

Description	Images
<p>All hoses (red arrows) must be thoroughly cleaned and inspected. These were only accessible for cleaning and inspection after dismantling of the engine covers.</p>	 A close-up photograph of the engine compartment of a mini excavator. A person's hand is visible on the left, holding a metal component. Two red arrows point to hoses within the engine area. The background shows a pinkish metal panel.
<p>Another view of the underside of the block, now accessible for cleaning after all non-affixed panels have been removed.</p>	 A photograph showing the underside of the engine block. A red arrow points to a hose or component. The surrounding area is metallic and appears to be the interior of the engine compartment after some panels have been removed.
<p>Evidence of dismantling on another model of excavator. All shrouds (red arrow) and engine covers (green arrow) have been removed to facilitate the cleaning and inspection process.</p>	 A photograph of a blue mini excavator with its engine compartment open. A red arrow points to a shroud on the left side, and a green arrow points to an engine cover on the right side. The excavator is parked on a paved surface.

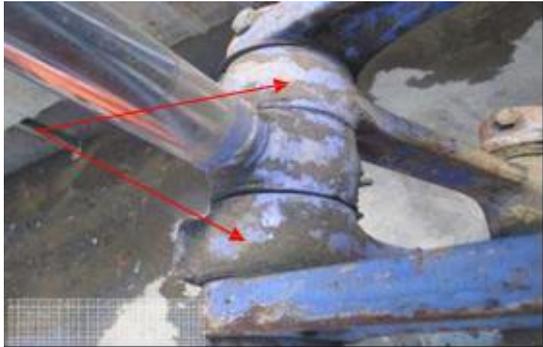
## Biosecurity

Description	Images
Remove the air-filter and check for cleanliness.	
The batteries must be loosened from the tie-down points to allow for cleaning and inspection of the underside.	

## Boom stick and bucket

Description	Images
All biosecurity risk material, including dirty grease must be removed from the boom stick (red arrow) and hydraulic hoses (green arrow). Verify hollow areas are free of all biosecurity risk material.	

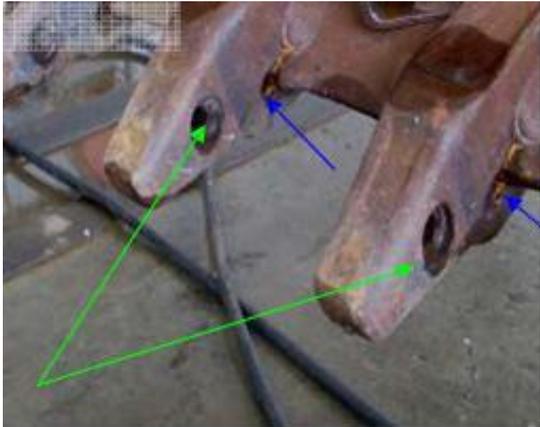
## Biosecurity

Description	Images
<p>All contaminated grease (red arrows) must be removed from all pivot points along the boom stick.</p>	 A close-up photograph of a pivot point on a blue boom stick. Two red arrows point to areas of dark, greasy residue on the metal surfaces.
<p>Ensure all hollow cavities where hydraulics run through the boom stick (green arrow) are flushed to verify internal cleanliness.</p>	 A close-up photograph of a hollow cavity in a blue boom stick. A green arrow points to the opening of the cavity, and a red arrow points to the interior surface.
<p>Remove all non-affixed boom stick panels (red arrow), clean and check all hydraulic hoses (green arrow). Clean inside all protective plates (aqua arrow)</p>	 A close-up photograph of a boom stick with several components. A red arrow points to a non-affixed panel, a green arrow points to a hydraulic hose, and an aqua arrow points to a protective plate.

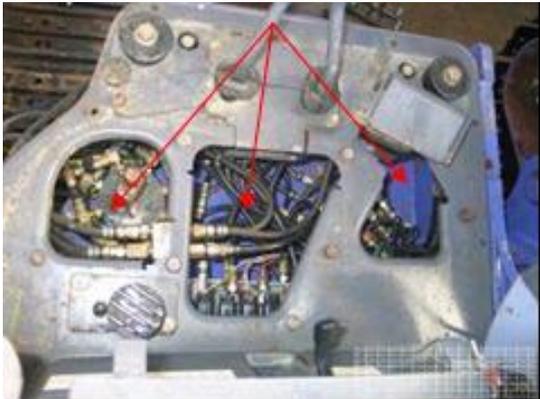
## Biosecurity

Description	Images
<p>Check all wear plates on the bottom of the bucket. If only spot-welded, these will have to be flushed to verify cleanliness. Check all surfaces of the bucket for any cracks, splits or evidence of repair.</p>	 A large, rusted metal bucket is shown from a side-on perspective. Three red arrows point to the bottom edge of the bucket, highlighting the area where wear plates are located. The bucket is outdoors, and a black plastic crate is visible in the background.
<p>All cutting teeth (green arrow) on the bucket must be removed for internal cleaning and inspection.</p>	 A close-up view of a sharp, pointed cutting tooth on the bucket. A green arrow points to the tip of the tooth. The background shows a dark, textured surface, likely the ground or a workbench.
<p>An example of flushing the spot-welded wear plates (green arrow) on the bottom of the bucket. All side wear plates (blue arrow) must be loosened off and flushed.</p>	 A person is using a high-pressure water hose to flush the bucket. A green arrow points to a spot-welded wear plate on the bottom of the bucket, and a blue arrow points to a side wear plate. The bucket is orange, and the water spray is visible.

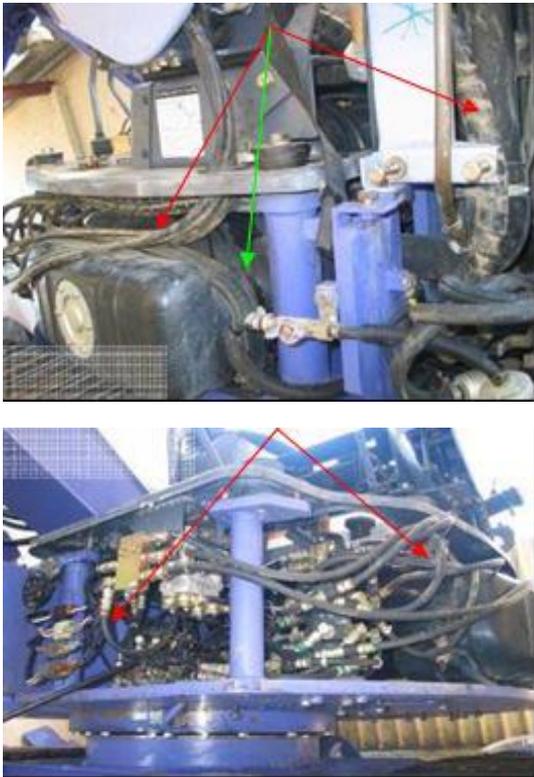
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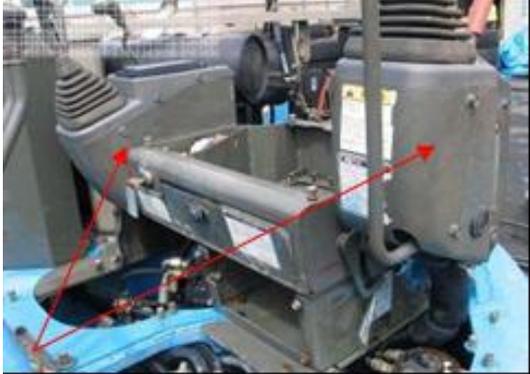
Description	Images
<p>A close up of the boots where the cutting teeth are mounted. Ensure around each pinhole is clean. The blue arrows highlight a narrow opening that tends to become compacted with risk material and can be overlooked if the cutting teeth are still attached.</p>	 A close-up photograph of the metal boots of an excavator. Two blue arrows point to narrow, V-shaped openings between the boots. Two green arrows point to circular pinholes on the boots. The metal shows signs of wear and some rust.

## Cabin

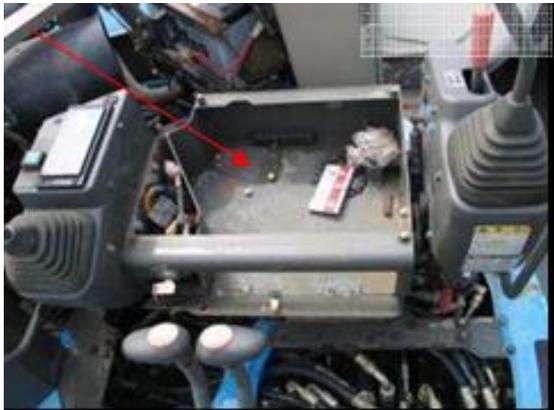
Description	Images
<p>Some mini excavators may have a cabin as illustrated. Check the framework for drainage holes on the underside (red arrows) and the underside shroud (green arrow) has been removed to allow cleaning and inspection access to the myriad of hydraulics under the floorpan. On some models, the cabin may need to be unbolted and lifted to allow cleaning and inspection of the fuel cell and hydraulic hoses under the seat.</p>	 A photograph of a mini excavator with its cabin removed. Red arrows point to drainage holes on the underside of the chassis. A green arrow points to the underside shroud. The hydraulic system and other components are visible under the floorpan.
<p>An illustration of the floorpans removed from under the rubber floor matting, exposing the hydraulic hoses underneath.</p>	 A close-up photograph of the hydraulic system under the floorpan. Red arrows point to various components, including hoses and fittings. The system is complex and shows signs of use.

Biosecurity

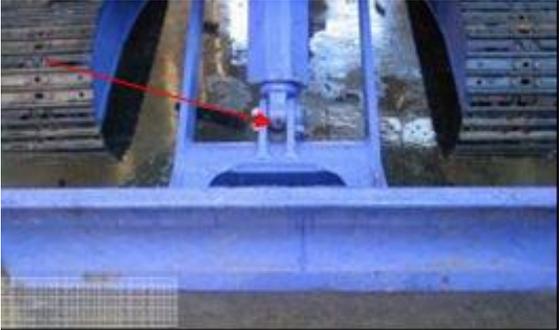
Description	Images
<p>An example of the biosecurity risk material found after the rubber floor mats and floorpans have been removed. Cabin door rubbers (green arrow) can be contaminated and are therefore an area of concern to the Department.</p>	 A close-up photograph of the engine compartment of a mini excavator. A green arrow points to a rubber seal on the left side of the engine housing. Two red arrows point to dark, oily residue on the engine components and a circular opening on the right side.
<p>An illustration of the fuel cell under the seat. In some instances, the cabin will require unbolting and lifting to allow cleaning and inspection access to the topside of the fuel cell and hydraulic hoses (currently not in view). The bands around the tank (red arrows) need to be loosened off and flushed to remove any contaminants.</p>	 A photograph showing a large, cylindrical metal fuel cell tank. Two red arrows point to metal bands or straps that are wrapped around the tank, indicating they need to be loosened for access.
<p>These pictures illustrate the access provided for cleaning and inspection, once the shrouds around the underside of the cabin have been removed. All hydraulic hoses and looming (red arrows) require thorough cleaning and inspection. The bands around the fuel cell (green arrow) also need to be loosened and flushed to remove any contaminants.</p>	 Two photographs showing the underside of the excavator cabin. The top photograph shows a complex arrangement of hydraulic hoses and metal components, with red arrows pointing to various hoses and a green arrow pointing to a band on a blue cylindrical component. The bottom photograph shows a similar view from a slightly different angle, with red arrows pointing to hoses and a green arrow pointing to a band on a blue component.

Description	Images
<p>On this model, the air-conditioning system (green arrow) is located under the seat. This area has been opened to allow cleaning and inspection. The plate below (red arrow), is covering the fuel cell and will require dismantling.</p>	
<p>Access will be required to verify the internal cleanliness of the joystick control housing (red arrows).</p>	
<p>On some models, a hollow section below the foot pedals (red arrow) will require internal cleaning and inspection. Each foot pedal cover requires cleaning (green arrow) - see next illustration.</p>	

Biosecurity

Description	Images
Each individual foot pedal has been removed for cleaning and inspection.	 A close-up photograph showing a person's hand holding a black, rectangular foot pedal. A green arrow points from the top-left corner of the pedal towards the center. The pedal is being held in front of a blue metal component of the excavator's chassis.
The seat (red arrow) has been removed from this model to allow cleaning and inspection underneath.	 A photograph of the interior of the excavator's operator's compartment. The seat area is open, revealing the underlying mechanical and electrical components. A red arrow points to the seat's mounting area. The surrounding structure is blue.
All foam insulation (red arrow) around electrical cabling must be internally cleaned and inspected.	 A close-up photograph of a hand holding a piece of grey, rectangular foam insulation. A red arrow points to the foam. The background shows the blue metal interior of the excavator, with some electrical components visible.

## Blade

Description	Images
<p>Check all surfaces of the blade to verify free of any cracks, splits or evidence of repair. All contaminated grease must be removed from all pivot points (red arrow).</p>	 A close-up photograph of a blue metal blade assembly. A red arrow points to a small red grease nipple located at a pivot point where the blade meets the frame.
<p>On this blade a cutting blade has been spot welded to the face (red arrow). All recesses (green arrows) along the blade must be flushed to verify cleanliness.</p>	 A close-up photograph of a rusty, weathered metal blade. A red arrow points to a small, dark spot weld on the blade's surface. Three green arrows point to various recessed areas along the length of the blade, indicating areas that need to be flushed for cleanliness.

## General

Description	Images
All wiring harnesses must be thoroughly cleaned and inspected.	
Ensure that all looming around hydraulic hoses is clean and free of all biosecurity risk material.	
An example of the amount of dismantling required for cleaning and inspection.	