



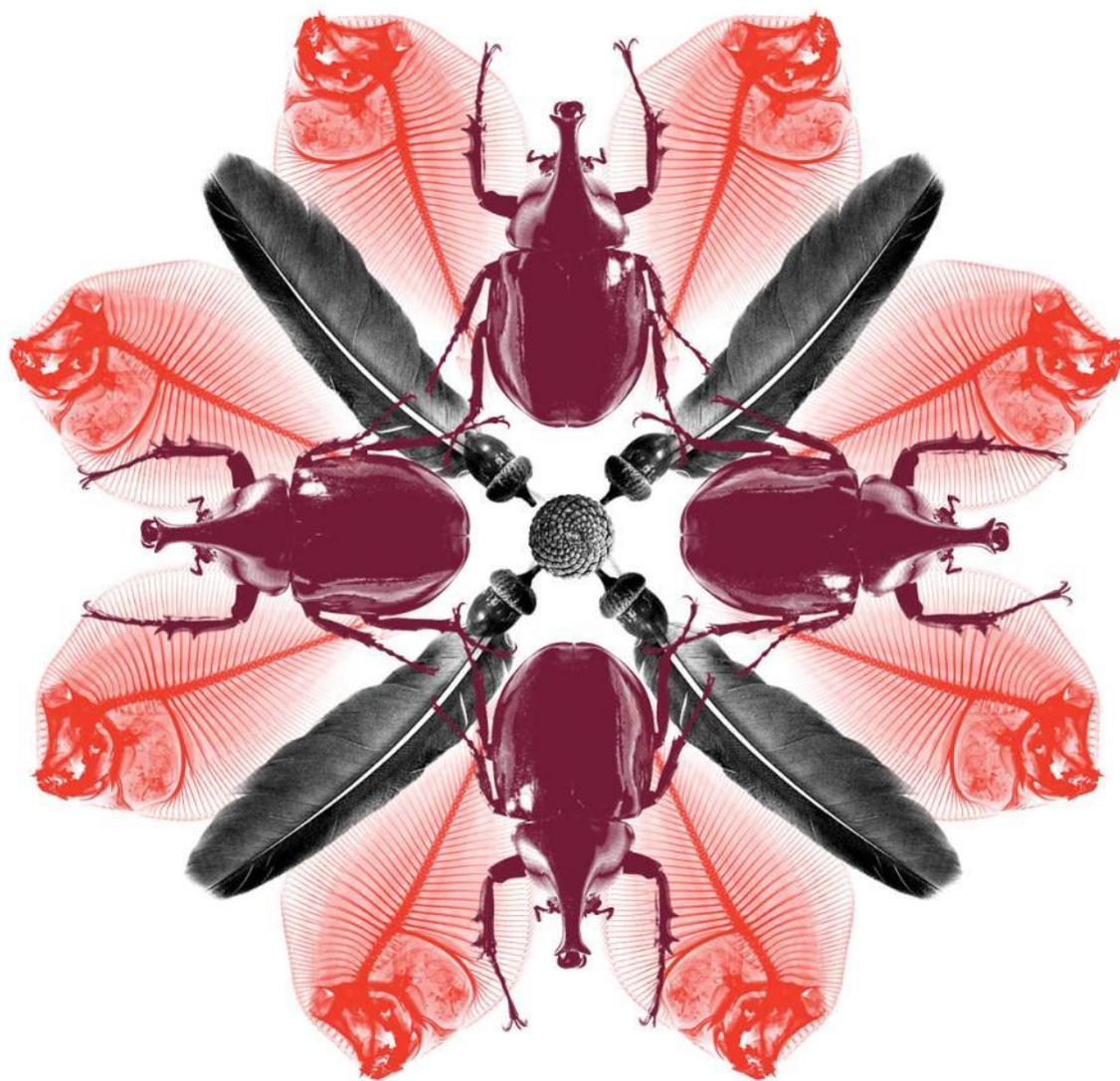
Australian Government
Department of Agriculture
and Water Resources

Machinery Cleaning Guide - Scrapers

Biosecurity

Publication series

April 2016



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Table of Contents

Cleaning guidelines	3
Cabin	3
Front end and drawbar.....	6
Engine and surrounding chassis	Error! Bookmark not defined.
Gooseneck.....	15
Elevator.....	16
The scraper bowl + wear plates and cutting teeth.....	17
Tyres	22
The rear end.....	24
General.....	27



Cleaning guidelines

Cabin

Description	Images
<p>Note that the seat will have to be removed as well as the rubber floor matting, allowing for cleaning and inspection. Inspection access will be required inside the joystick control panels (red arrow). The non-affixed panels inside the cabin have to be removed, allowing access to the air-conditioning, steering unit and some electrical controls. Check for drainage holes under the cabin framework. Any non-affixed floorpans are to be removed for cleaning and inspection.</p>	 A photograph showing the interior of a machine cabin from an open door. A red arrow points to the joystick control panel located on the right side of the operator's seat. The cabin contains a steering wheel, a dashboard with a digital display, and various control levers.
<p>Close up shot of the joystick control panel. Note that access has to be provided to verify internal cleanliness in and around controls. Non affixed panels have been removed (red arrow). Also note that the seat and floor mats have been removed.</p>	 A close-up photograph of the joystick control panel area. Two red arrows point to the gaps where non-affixed panels have been removed, providing access to the internal components like the air conditioning and steering unit. The seat and floor mats are also absent.

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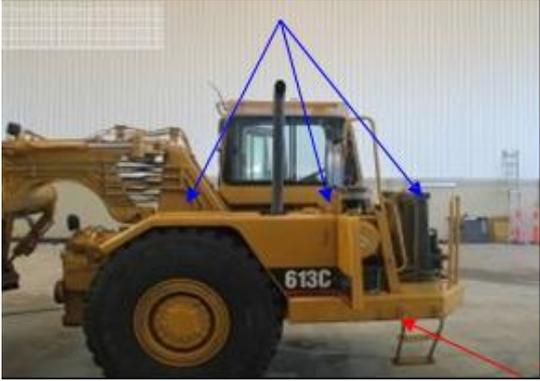
Description	Images
<p>A close up of the air-conditioning vents, which must be cleaned and accessible for inspection (red arrow).</p>	 A close-up photograph of the interior of a yellow machine's cab. A red arrow points to a vertical air-conditioning vent located on the left side of the dashboard area. A green sticker is visible below the vent.
<p>The door rubbers (red arrows) are to be cleaned and inspected, as well as internal door linings (blue arrow).</p>	 An exterior photograph of a yellow machine's door. Two red arrows point to the rubber seals at the top and bottom of the door frame. A blue arrow points to the internal door lining. The machine is parked outdoors under a blue sky with clouds.

Description	Images
<p>Check the ladder to the cabin, particularly under the steps. On this model the ladder (red arrow) is made from wire bundles, which must be free of all biosecurity risk material (BRM).</p>	
<p>The front end, highlighting the non-affixed panels removed from in front of the cabin, exposing the air-conditioning unit for inspection (red arrow). In newer models as photographed, removing these panels allows access to the first set of batteries located at the front of the machine as well as flush points located in the front bumper rail (blue arrow).</p>	
<p>Once the seat has been removed, the internal of the rubber shroud (red arrow) can be easily cleaned and inspected.</p>	

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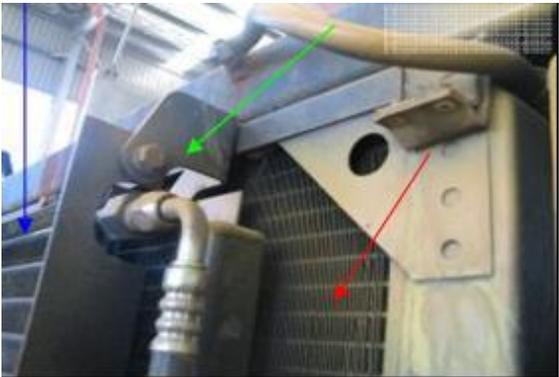
Description	Images
<p>Air-filters in front of the cabin(red arrow). This illustration highlights the amount of BRM that can be found in this area.</p>	 A close-up photograph of three circular air filters mounted in a row. Red arrows point to the filters, highlighting the area where BRM (Biosecurity Risk Material) is likely to accumulate. The filters are surrounded by a mesh screen and are positioned above a yellow metal grate.

Front end and drawbar

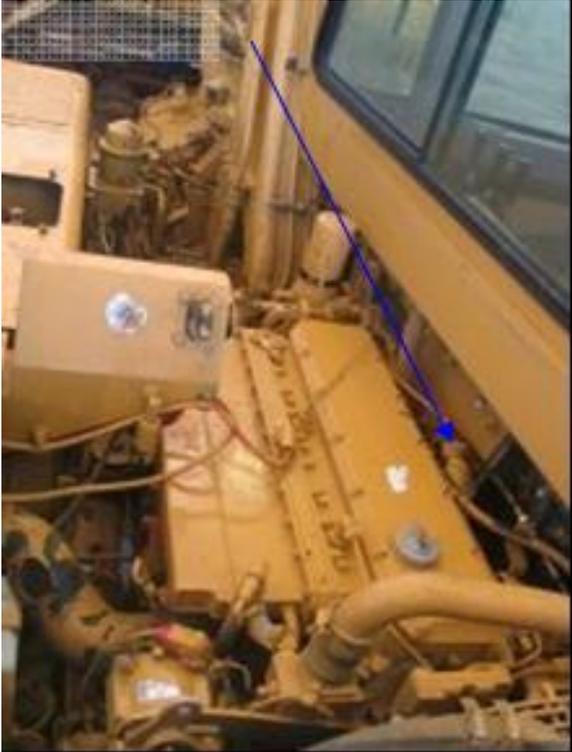
Description	Images
<p>Illustrates the amount of dismantling (a number of non-affixed panels) required to make the engine and front end accessible for cleaning and inspection. The front drawbar (red arrows) is usually hollow, which will be highlighted later.</p>	 A photograph showing the front view of a yellow tractor in a workshop. Red arrows point to the front drawbar, which is a horizontal bar at the front of the tractor. The engine compartment is open, and various components are visible.
<p>All non-affixed engine covers (blue arrow) have been removed, allowing access for cleaning and inspection. The red arrow is highlighting the hollow drawbar.</p>	 A photograph showing the side view of a yellow tractor. Blue arrows point to the engine covers, which have been removed. A red arrow points to the drawbar, which is highlighted as being hollow. The tractor is labeled '613C' on the side.

Engine and surrounding chassis

Description	Images
<p>The front of the block and the harmonic balance (flywheels). These can be concave and harbour BRM inside (red arrow). The internal radiator grill (green arrow) must be removed, allowing cleaning and inspection access inside the radiator shroud (blue arrow). Check all external surfaces of the block, including oil filters, starter motors and between tappet covers.</p>	
<p>The air-filter is to be removed from the housing (red arrow) and verified clean (usually performed with pressurized air).</p>	
<p>The batteries (red arrow) are to be loosened from the tie-down points and inspected underneath. In newer scrapers the batteries are located under the front of the cab, removing the cover to allow access also allows access to the hollow sections of the front draw bar.</p>	

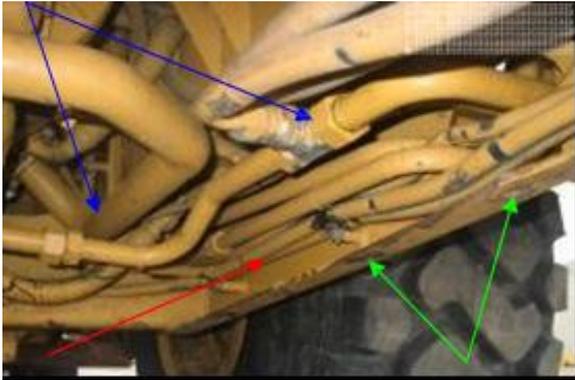
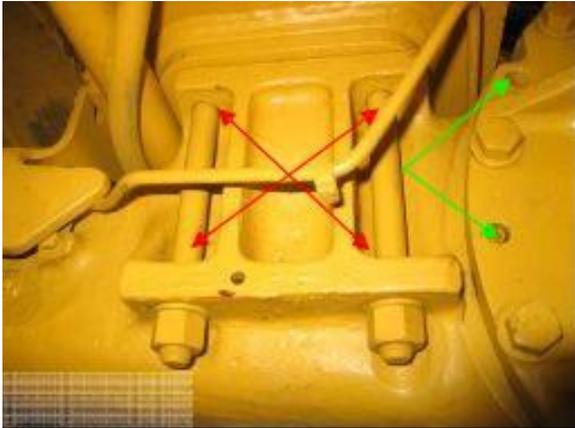
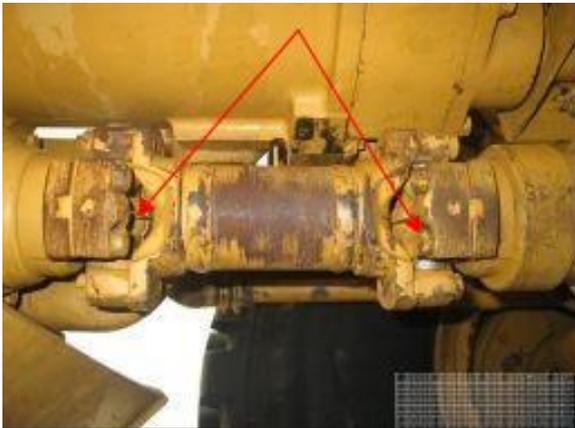
Description	Images
<p>The air-filter pre-cleaner or dust collector (red arrow). The cover must be removed to allow cleaning and inspection.</p>	
<p>This photograph shows the air filter from a modern machine that has been removed to access all areas including the air-filter pre-cleaner or dust collector and air filter itself as they are now designed as a single unit.</p>	
<p>All fins on the radiator (red arrow) and oil cooler (blue arrow) are to be flushed in order to verify cleanliness. Note the small gap between the oil cooler and radiator. On some models, the oil cooler can be unbolted (green arrow), allowing better access for cleaning the fins and inspection.</p>	
<p>The front drawbar as seen from the underside. These support channels can be hollow, as seen above and can be flushed via the drainage holes (red arrows).</p>	

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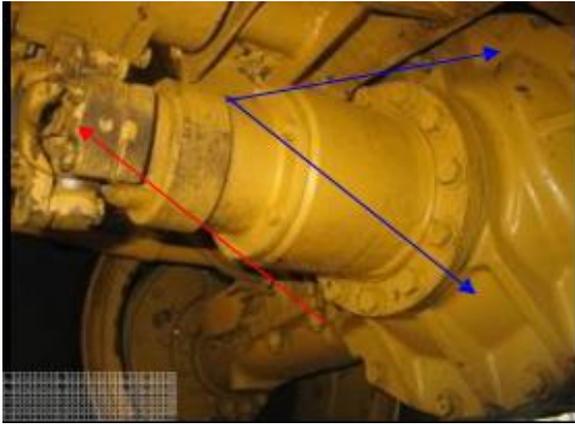
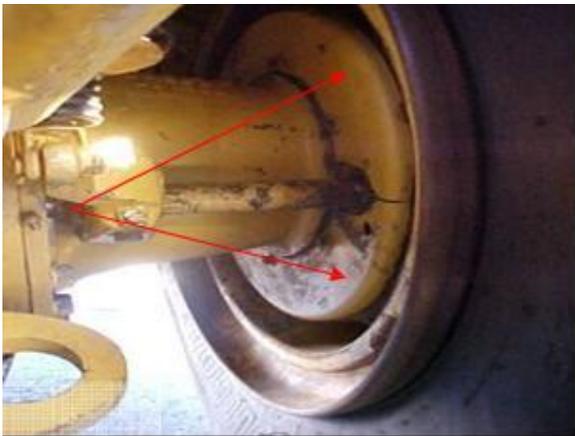
Description	Images
<p>Different models contain different compartments within the front draw bar, these are accessed from under the machine or removing the non-affixed panels, to the front and side of the machine (red arrow).</p>	
<p>There are other hollow support structures (red arrows) under the front end that will require flushing to verify cleanliness.</p>	
<p>The topside of the block is highly visible for cleaning and inspection once all non-affixed engine covers and panels have been removed. The area between the cabin and the block (blue arrow) is very confined and the use of inspection mirrors is recommended. Flushing to verify areas that cannot be seen or felt will be required.</p>	

Description	Images
<p>The rear of the block, below the gooseneck. This area is also characterised by numerous hydraulic and electrical hoses and cables (red arrows), all requiring thorough cleaning and inspection. All checker plates (green arrow) are to be flushed to verify cleanliness. Flushing to verify areas that cannot be seen or felt will be required. The aqua arrow highlights the access point to the hollow chassis rail that is highlighted next.</p>	
<p>The two chassis rails either side of the engine block are hollow (aqua arrow). On most models there will be access points or drainage holes. The one illustrated in this picture is located on the topside of the chassis rail, towards the rear.</p>	
<p>The air tanks that can be located under the front end (red arrows). The topside of these can be difficult to access and may require dismantling for cleaning and inspection.</p>	

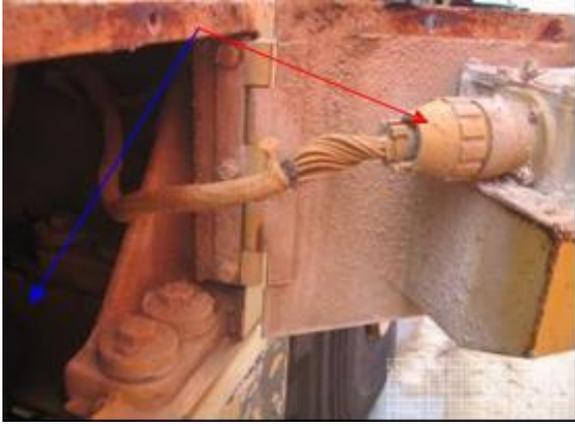
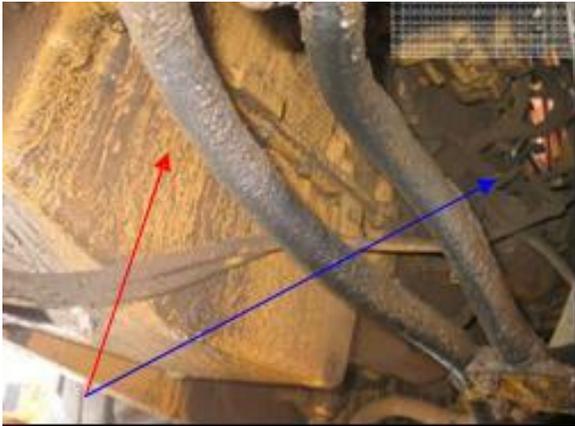
Biosecurity

Description	Images
<p>The underside of the front end and hollow chassis rail (red arrow). The belly plates have been removed, allowing access for flushing both channels via the vacant belly plate bolt-holes (green arrows). All hydraulic hoses require thorough cleaning and inspection (blue arrows - especially the non-visible surfaces).</p>	
<p>Each axle on either side of the differential has supports (red arrows) for the housing above. Each of these areas requires thorough cleaning and inspection. Check all countersunk recesses (green arrows).</p>	
<p>All universal joints must be free of contaminated grease.</p>	

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Description	Images
<p>All universal joints must be free of contaminated grease (red arrow). The bell housing (blue arrow) has many nooks, ledges, countersunk holes and hydraulic hoses, all of which require careful cleaning and inspection.</p>	 A close-up photograph of a yellow universal joint and bell housing. A red arrow points to a joint area, and a blue arrow points to the bell housing. The image shows various mechanical components, including bolts and hydraulic hoses.
<p>All non-affixed internal wheel rims (red arrows) must be removed for cleaning and inspection.</p>	 A close-up photograph of a wheel rim. Two red arrows point to non-affixed internal components, likely brake shoes or pads, which need to be removed for cleaning and inspection.
<p>Thoroughly inspect all internal wheel rim surfaces. A mirror is recommended to inspect the backside of the brake drum (blue arrow).</p>	 A close-up photograph of a brake drum. A blue arrow points to the backside of the brake drum, which should be inspected thoroughly. The image shows the internal surfaces and components of the brake drum.

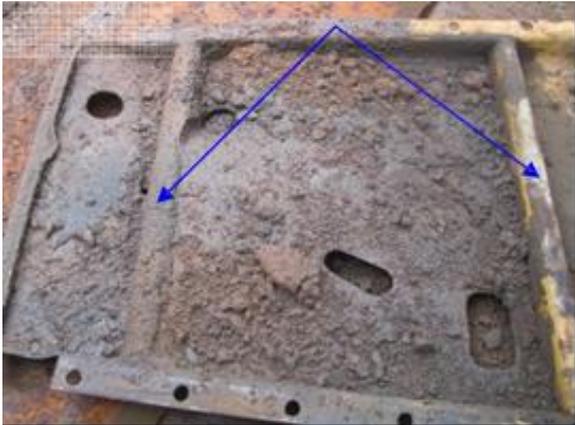
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Description	Images
<p>A non-affixed panel removed from under the cabin floor (red arrow). This illustration highlights the amount of BRM that can be found in these areas.</p>	
<p>A small door below the cabin, which also provides access to the BRM seen in the last illustration (red and blue arrow).</p>	
<p>The side of the sump (red arrow), which can only be accessed once all belly plates have been removed. Note the amount of BRM (blue arrow) that can be seen in the surrounding area. This whole area must be thoroughly cleaned and inspected.</p>	

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Description	Images
<p>The inside chassis rails (red arrow), visible once the belly plates have been removed. All hydraulic hoses (blue arrow) must be thoroughly cleaned and inspected.</p>	 A photograph showing the underside of a vehicle chassis. A red arrow points to a horizontal metal rail, and a blue arrow points to a hydraulic hose. The area is cluttered with various mechanical parts and hoses.
<p>Another view of how contaminated the underside of the engine block and sump can be (red arrow). All belly plates and non-affixed panels must be removed for cleaning and inspection.</p>	 A close-up photograph of the underside of an engine block and sump. A red arrow points to a heavily contaminated, dark, and greasy surface. The surrounding area shows various mechanical components.
<p>BRM seen around hydraulic hoses (blue arrows). All surfaces of these hoses must be thoroughly cleaned, including the removal of contaminated grease.</p>	 A close-up photograph of hydraulic hoses. Two blue arrows point to areas where BRM (Biosafety Residue Material) is visible on the hoses. The hoses are surrounded by other mechanical parts and grease.

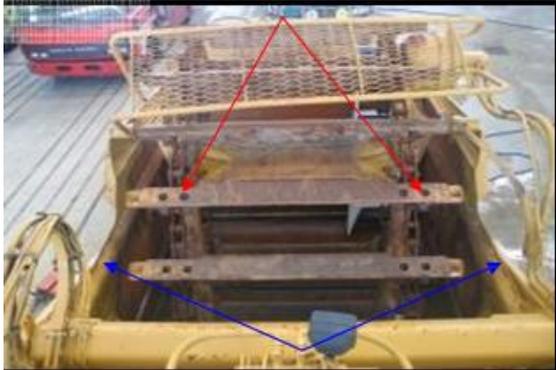
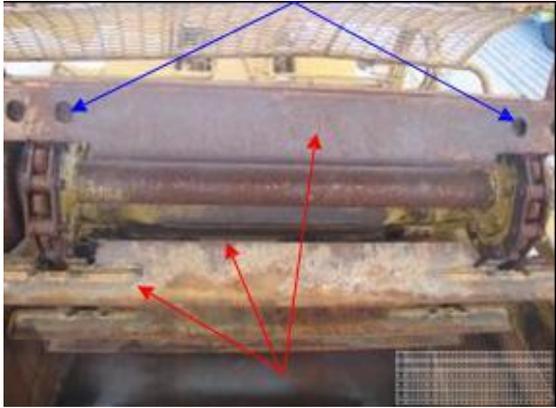
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Description	Images
<p>Belly plates must be removed and thoroughly cleaned. Check for openings along the framework (blue arrows). If open, these will require flushing to verify cleanliness.</p>	

Gooseneck

Description	Images
<p>The gooseneck found on all scrapers. Check all surfaces of the gooseneck for any openings or drainage holes. On some models the opening may be topside (red arrow). All hydraulic hoses and lines must be thoroughly cleaned and inspected. Remove all contaminated grease from pivot points and rams.</p>	
<p>Check all surfaces of the gooseneck for any openings or drainage holes. On some models the opening may be at the bottom (red arrow).</p>	

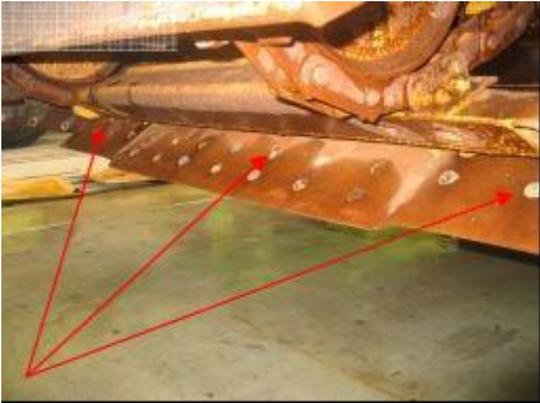
Elevator

Description	Images
<p>The elevator as seen from the gooseneck. This area consists of a series of blades (red arrows) on a chain, used to push the load to the rear of the bowl. The blue arrows highlight the side of the bowl, which will be highlighted later.</p>	 <p>A photograph showing the elevator mechanism from a rear perspective. Red arrows point to the blades on the chain, and blue arrows point to the sides of the bowl.</p>
<p>The elevator blades (red arrows) are hollow and need to be flushed via the entrance holes (blue arrows) to verify cleanliness.</p>	 <p>A close-up photograph of the elevator blades. Red arrows point to the blades, and blue arrows point to the entrance holes used for flushing.</p>
<p>Another view of the Elevator blades, highlighting the flushing entrance holes (red arrows).</p>	 <p>A close-up photograph of the elevator blades, focusing on the flushing entrance holes. Red arrows point to these holes.</p>

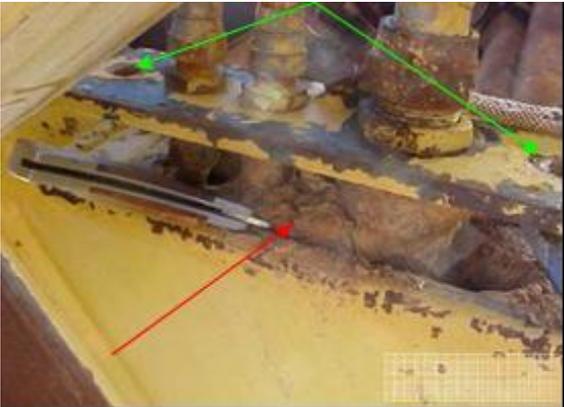
Description	Images
<p>An illustration of the cylinder, located just behind the gooseneck (red arrow). This area is hollow and can harbour significant amounts of BRM. Generally a sealed unit as illustrated however check for cracks, splits or evidence of repair. On this model the ends are completely welded, sealing the unit, but on other models this plate may only be spot-welded. If only spot-welded, flush inside to verify cleanliness.</p>	

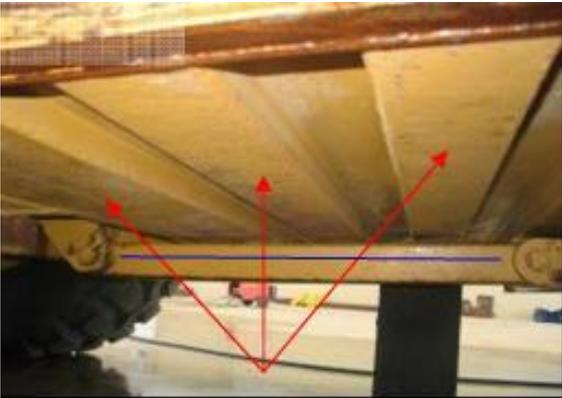
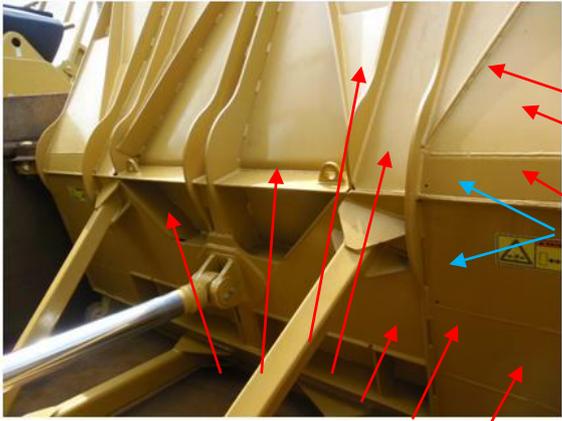
The scraper bowl + wear plates and cutting teeth

Description	Images
<p>An illustration of the side of a typical scraper bowl. The sides, rear and underside of most scraper bowls are hollow structures and can potentially harbour hundreds of litres of BRM. The red arrows highlight that there may be separate compartments and the blue arrow shows where the wear plates have been removed.</p>	
<p>The front of the scraper bowl (blue arrow), also showing the elevator and cylinder (red arrow).</p>	

Description	Images
<p>All cutting teeth (red arrows) along the front of the bowl are to be loosened and flushed behind to verify cleanliness.</p>	
<p>The underside of the cutting teeth. Ensure around each bolt head (red arrows) is clean as well as looking for any cracks, splits or evidence of repair on the underside. The bowl will have to be supported by chocks at the time of inspection.</p>	
<p>The internal wall of the scraper bowl may have protective plates, covering the hydraulic hoses as they run from front to back. This area is hollow and may only be spot welded (as highlighted by the red arrows), or open-ended and will require flushing to verify cleanliness. The blue line indicates the hollow channel.</p>	

Description	Images
<p>Another example of a protective plate, covering the hydraulic hoses.</p>	
<p>The ends of the protective covers, which were highlighted in the last few illustrations. In this picture the open-end (red arrow) can be seen behind the rear of the bowl (green arrow) and this channel (blue line) will require flushing to verify cleanliness.</p>	
<p>This illustration highlights the exit of the hydraulic hoses from the inside of the bowl, just behind the rear. This is a natural opening on some models, allowing hundreds of litres of BRM to enter the sides. The knife is supported by the amount of BRM inside (the red arrow highlights the area full of BRM).</p>	
<p>On some models these natural openings can be found on each side of the bowl, behind the rear face. This side is also full of contaminants (red arrow).</p>	

Description	Images
<p>The inside face of a typical scraper bowl. Check all surfaces carefully for any cracks, splits or evidence of repair. If detected, these areas will need to be investigated to be verified clean (red arrows).</p>	
<p>This illustrates the hydraulic lines entering the sides of the bowl at the front end. Several bolts have been removed, allowing access for inspection. This area has been illustrated to show that these sides can be full of BRM.</p>	
<p>A close view of where the hydraulics enter the side of the bowl. Once again, several bolts (green arrows) have been removed to allow for cleaning and inspection. This area has been illustrated to show that these sides can be full of BRM (red arrows).</p>	
<p>Another illustration to highlight an area where repairs were detected. The area was examined and the inside of the bowl was contaminated.</p>	

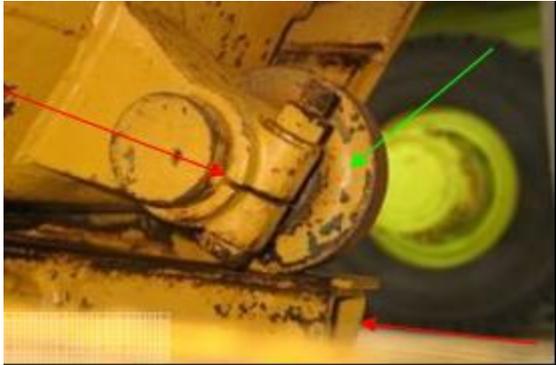
Description	Images
	
<p>The underside of the scraper bowl, showing individual gussets that can each harbour BRM (red arrows). Check all surfaces for cracks, splits or evidence of repair. The beam highlighted by the blue line may also be hollow and require flushing.</p>	
<p>More modern models have a number of hollow sections in the back of the ejector of the scraper bowl (red arrows). Some of these areas have flush holes that are easily accessible. Whilst other compartments are spot welded. Care should be taken to inspect for damage and that access has been granted to all hollow (blue arrows)</p>	

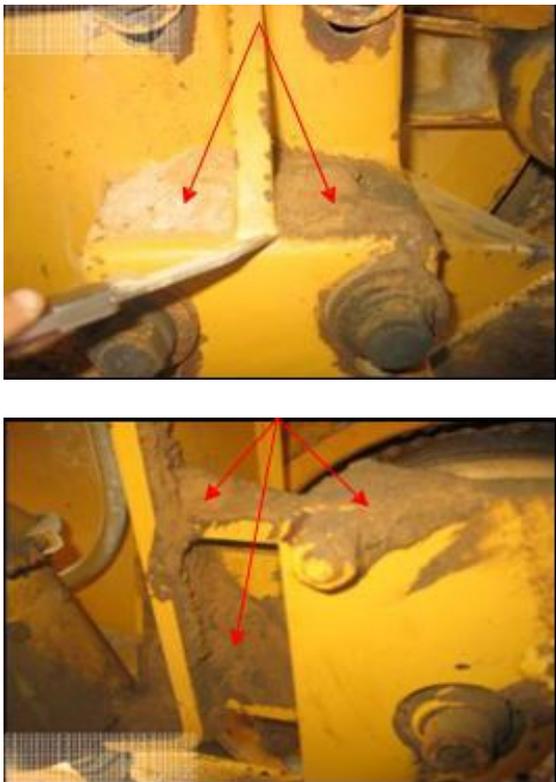
Tyres

Description	Images
<p>All cracks and splits in tyres must be verified to ensure that all are free of BRM.</p>	

Description	Images
<p>Newer models now have plastic wheel guards over the front wheels. These guards are held in place with hollow metal support rails (red arrow). The plastic guards should be loosened off to allow access between the plastic and metal supports where BRM is easily caught up as the plastic is warped and damaged (green arrows). Also bends are formed in the plastic from manufacture where the supports are housed allowing little to no access for cleaning (blue arrow). Care should be taken to ensure the plastic guards are not damaged or breached, allowing risk material to build up inside.</p>	
<p>The metal guards over the rear wheels of the newer models have a hollow section inside the guard which can harbor large amounts of BRM (red arrow).</p>	

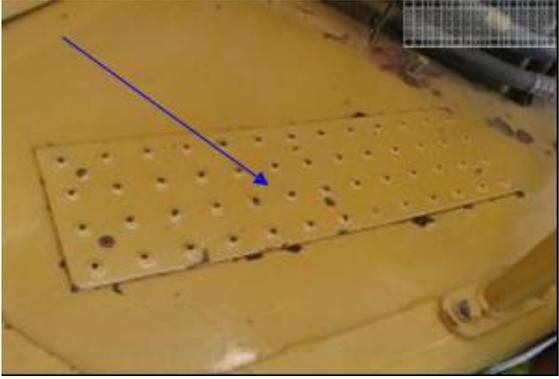
The rear end

Description	Images
<p>The rear end of the scraper with all non-affixed panels removed, allowing access for cleaning and inspection. The red arrows highlight the rails under the rear, which will be seen later (red arrow).</p>	
<p>At the back of the bowl and under the rear, check the small bowl pulley wheels (green arrow) and flush small recesses (red arrow).</p>	
<p>Hollow cavities (red arrows) such as these are common under the rear of scrapers. All must be accessible at inspection.</p>	

Description	Images
<p>The rails (red arrows) as seen under the rear of the scraper, behind the bowl. These areas can hold significant amounts of BRM.</p>	
<p>An example of the different nooks and ledges that can be found under the rear of the scraper, harbouring BRM.</p>	
<p>More examples of the different nooks and ledges that can be found under the rear of the scraper, harbouring BRM.</p>	

Description	Images
<p>Examples of the rear drawbars on scrapers. In each, a crack in the drawbar (red arrows) can be seen, which will require further investigation in order to verify the internal cleanliness. Remove the pins (blue arrows), as sometimes the access point to these areas maybe via this entrance (or drainage holes below).</p>	
<p>Modern models now have a plastic fuel tank mounted to the rear of the scraper. Care is required to verify no risk material has lodged under the fuel tank as the fuel tank has been moulded to fit in place access is difficult. The fuel tank also sits on hollow sections that require flushing (red arrow).</p>	

General

Description	Images
<p>All non-slip checker plates must be flushed to verify cleanliness underneath.</p>	
<p>Check all engine covers for hollow support framework and flush to verify cleanliness if required (blue arrows).</p>	
<p>Check all wiring harnesses for internal cleanliness.</p>	

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Description	Images
Check all looming around hydraulic hoses for internal cleanliness.	