

# Machinery and vehicle washdown

*No procedure or work instruction can list all the parts to consider during washdown of a vehicle, machinery or equipment due to factors such as: Numerous models and new models; Different attachments, e.g. different types of blades on dozers; Different modifications, either in the factory or by the previous owner; Varying conditions of the machinery, e.g. rusted parts allowing entry of contaminants into sections usually sealed.*



## General procedure

1. Read vehicle, machinery, or equipment operating manuals prior to cleaning.
2. Examine the item to be cleaning to determine extent of mud, dust and plant material build-up.
3. Identify any points that require specific attention, e.g. behind guards and protective plates, radiators, spare tyres, etc.; these may be difficult to locate and access.
4. Remove necessary guards/belly plates to access areas for cleaning.
5. Identify areas that may require cleaning with compressed air rather than water. Do these first.
6. Clean under guards and underneath machinery/vehicle; then do the cabin, upper body and implements.
7. Tool boxes and storage compartments may also require cleaning.
8. Move vehicle/machine with caution. Avoid re-contamination; wash remaining mud etc. off tyres/tracks.
9. Carry out final inspection to ensure all areas have been cleaned.
10. Replace guards. Belly plates and other guards on heavy machinery may need to be replaced prior to moving the machinery.

## Cars, 4WD, trucks and trailers

1. Ensure that the vehicle is unlocked and you have access to the boot and bonnet.
2. Inspect the interior of the vehicle, especially:
  - Footwells, check carpets and mats for burrs, seeds, mud.
  - Tool boxes.
3. Inspect inside the boot of the vehicle. Remove any contents if required to facilitate the inspection of the following:
  - Carpet (deposits of hay, weed seeds, burrs and/or soil or water).
  - Spare tyre area.
  - Other recesses in the boot/rear of the vehicle.
4. Inspect the engine bay, especially:
  - Radiator.
  - Grill.
  - Top of transmission gearbox.
  - Recess under windscreen wipers.





5. Inspect the underside of the vehicle, especially:
  - Wheel arches and trims, flares, step treads, bumpers.
  - Mud flaps.
  - Tyre rims, particularly the rear side.
  - Axels and diffs.
  - Spare tyres on 4WDs and station wagons are often suspended underneath.  
**Note:** These are potentially a high risk area as contaminants collect inside the horizontally-positioned rim.
6. Inspect boxes and/or cartons present in the vehicle if you cannot ascertain their contents.
7. For utes and trucks, inspect the floor of the tray and channels of tail gates, side guards and under chassis rails. Gaps in the floor welds or boards and bolt holes.
8. Inspect trailers. Check wheels, guards, trays, channels of draw bar and under body.

## Wheeled tractors

The following provides an initial guide.

1. Tyres and rims - inspect all parts, including inner side of rim:
  - Between dual wheels (if fitted).
  - Check wheel-mounted counterweights.
  - Gashes or cuts in tyres.
2. Engine:
  - Check radiator core and grill for residue.
  - Check the void between oil cooler and radiator. Oil cooler may be hinged or on slide.
  - Remove and check air filters/cleaners, pre-cleaners and cyclone-style dust separators. If unable to clean satisfactorily, these may require destruction.
  - Inspect sound-deadening foams and heat shields for soil and trash. Foams become impregnated with dust.
3. Driver's cab (where present):
  - Check externally under and around driver's cab.
  - Check under mats in cab and void space and skirt under suspended seats.
  - Check air conditioner filters (if fitted). Most large tractors will have a false cabin roof housing the air-con unit; remove or open false roof.
  - Check integrity of rubber door and window seals. If torn, trash and dirt will be sucked into them and trapped.
  - Check void space behind consoles and dash for trash and dirt residue.
4. Chassis and vehicle body:
  - Check inside of chassis rail ledges and back axel beam, and undercarriage of this area.
  - Check for hollow sections in front axel tubes.
  - Inspect all tool and battery boxes, often under the cab steps or in engine bay.
  - Check for void spaces in rear brake assemblies.
  - Hollow sections in drawbars and in retractable/extendable-type three-point linkages.
  - Inspect single counterweights. Multiples may need to be removed to facilitate cleaning of void spaces.
  - Inspect mud guards and wheel flares for hollows and crevices.
  - Inspect roll-cages or rollover bars for holes and gaps where attached to the vehicle.
  - If 4WD, check for torque tube (front driveshaft guard) for holes or poor attachment.
  - Inspect Power Take Off (PTO) area: Shaft, universal joints, shaft covers/tubes.
  - Inspect wiring looms in split protective conduit for trash and dirt residue.

**Note:** Some agricultural tractors will have a rear carry-all mounted on the three-point linkages, or a forward mounted forklift or bucket/scoop attachment. These should be inspected carefully, with particular attention given to the following:

5. Buckets, blades and scoops:
  - Inspect all areas of the blade for holes or double skins.
  - Inspect and remove cutting teeth, adaptors and wear-plates on blades.
  - Inspect hydraulic arms and supports for hollows that may contain soil or trash.
6. All areas: Check if any sections or channels are hollow and determine if there is a possible entry point for contamination. Check if plates are covering a compartment or space that may have collected dirt or trash.



## Mini tractors

The following highlights the main areas of concern for mini tractors.

1. Tyres and rims - inspect all parts, including inner side of rim:
  - Check for gaps in split-type rims.
  - Check wheel-mounted counterweights.
  - Gashes or cuts in tyres.
2. Chassis - check inside of chassis rail ledges:
  - Carefully inspect the chassis for hollow areas, and cover plates that may conceal a void.
  - Void spaces in the area between gearbox and engine. Several models have a large void opening accessible from underneath.
  - Void spaces in counterweights. Multiples may need to be removed to facilitate cleaning.
  - Hollow sections in sub-frame under motor linking the chassis rails.
3. Engine:
  - Remove grill (usually two wing nuts) and clean, inspect and remove wire mesh screen from front of radiator and clean, inspect fan shroud at rear of radiator.
  - Remove and inspect air filter cover, remove dust dish from air filter cover, remove and check air filter/cleaner (if unable to clean satisfactorily, these may require destruction).
  - Check around fuel tank and brackets for dust and trash build ups.
  - Inspect all areas in bonnet and in engine bay for hollows.
4. Other:
  - External rear brake assemblies and common shaft for brake and clutch pedals.
  - Foot plates and mounting brackets.
  - Hollow sections in mud guards, joints between mud flaps and guard, wiring looms under guards.
  - Inspect tool box under seat or under fuel tank, remove contents to allow cleaning.
  - Inspect torn seats and exposed foam at rear of seat (seed and soil can become lodged in the cushioning).
  - Inspect rear axels for track width adjustment pin holes.
  - Inspect the drawbar and mounting.
  - Inspect the three-point linkages and operating levers.

## Implements - PTO rotary hoe

The following highlights some of the main areas of concern on Power Take Off (PTO) driven rotary hoes.

1. Inspect rotary tynes and mounting bolts for soil, tynes may need to be removed or loosened from their adaptors on the horizontal shaft to allow removal of soil from the void.
2. Remove or loosen the skid/wear plate from the vertical gear casing (note that this casing is oil filled, thus remove or loosen only those bolts securing the plate).
3. Inspect the body of the hoe for double skins or void spaces that could contain soil due to inadequate or incomplete weld joints etc.
4. Inspect all areas where mud flaps are attached or plates overlap.
5. Check for hollow section reinforcing ribs.
6. Inspect the three point linkage attachment points and PTO knuckles and tube, universal joints and shafts.
7. Inspect all ground engaging areas of the hoe for signs of wear for the ingress of soil or plant material.
8. Rotate the rotary shaft and probe for plant material that may be caught in the bearing housings at the ends or middle if twin shafted.
9. Inspect the frame and supports and mounts for the trailing wheels; these are often hollow sections.
10. Inspect the trailing wheels for the rotary hoe, these wheels are usually hollow and made from two pieces of metal welded together - with wear the metal and welds crack and the wheels fill with soil.

**Remember:** The key to a successful cleaning is more than just checking the above areas; you must ensure that your inspection is thorough, systematic and consistent.

## Track-type dozers

1. Driver's cab:
  - Check externally under and around driver's cab.
  - Check under mats in cab.
  - Remove/lift seat; remove/lift floor pans to allow checking to top of transmission.
  - Check air conditioner filter (if fitted), shake/tap filter to check if clean.



2. Tracks/track frame:
  - Examine tracks carefully.
  - Ensure inspection cover plates are removed to allow inside track area.
  - Check idler wheels (these support the tracks).
3. Belly plates should be removed to allow inspection and cleaning.
4. Rear plates at back of dozer should be removed to allow inspection and cleaning.
5. Hydraulic cover plates should be removed to allow inspection and cleaning.
6. Engine:
  - Check radiator core and engine area for residues.
  - Remove and check the air filter/cleaner (these often require replacement where they are clogged with contaminants).
  - Check carefully the void space between the oil and radiator cores.
7. Battery box:
  - Lift/remove the battery to check for contamination (battery box may be at side, rear, or under seat).
8. Fuel cells:
  - Are removable, therefore dirt, etc. can pack between the tank and the frame.
9. Blade:
  - Ensure that edge of blade top/bottom is not split; this allows soil to be packed very tightly in the hollow.
  - Check cutter points/wear blades.
  - Check truncation arms.
  - Check carefully the pivot points and adaptors at the rear of the front blade; these allow the blade to change height and angle. Sometimes soil has compacted and is difficult to dislodge.
  - Check all hollow sections.
10. Ripper support frame is usually hollow:
  - Check carefully if any contaminants have entered this section. The tynes may need to be removed.
11. Tynes:
  - Tynes need careful inspection. Contamination may often be removed by water blasting, but tynes may need to be removed in some cases.
12. Ripper points:
  - A pin holds on the ripper points. Dirt can compact under the ripper points.
13. All areas:
  - Check if any sections or channels are hollow and determine if there is a possible entry point for contamination. Check if plates are covering a compartment or space that may have collected dirt/trash.

**Remember:** The key to a successful cleaning is more than just checking the above areas; you must ensure that your inspection is thorough, systematic and consistent.

## Excavators

Check all areas, with special attention to:

1. Hollow section chassis channels.
2. Turret pivot area.
3. Channels for hydraulic hoses from drive motor.
4. Counterweight void spaces.
5. Engine bay floor.
6. Fan shroud and radiator cores.
7. Glacier plate (near radiator).
8. Air filters (shake/tap filters to determine if clean)..
9. Removable track adjuster guards and lubrication points.
10. Tool box.
11. Arms/booms; usually the pivot points are the only area of concern.
12. Bucket/blade:
  - Between teeth of adapters.
  - Wear plates.
13. Rear blade (stabiliser):
  - Wear plates.
  - Hollow section arms.
  - Hollow section blade.



14. Mini excavator:
  - Hydraulics console.
  - False floor.
  - Turn table - running gear/tracks - internal gaps.

## Wheeled loaders and compactors

Check all areas, with particular attention to:

1. Feet of adaptors on compactors.
2. Hydraulic points.
3. Articulation points of hydraulics.
4. Brake assemblies.
5. Blade wear plates.
6. Blade teeth and adaptors.
7. FOPS and ROPS canopy.
  - Hollow channels.
  - Void space between cab and body (bird nests have been found here).
8. Air cleaner and air filters.
9. Internal of cab, floor and mats.
10. Air conditioner unit.
11. Counterweight void spaces.
12. Under and around removable fuel cells.
13. Between dual wheels (where applicable).
14. Check for water filled between wheels or drums.

## Dump trucks

Check all areas, with particular attention to:

1. Internal of cab, floor and mats, behind and under seats.
2. Air cleaner.
3. Air conditioner unit.
4. Hollow channels in tray frame.
5. Between dual wheels (where applicable).
6. Body and tipper.

## Cars, trucks and 4WDs

1. Inspect the interior of the vehicle, especially:
    - Footwells, check carpets and mats for burrs, seeds, mud, water, etc.
  2. Inspect inside the boot of the vehicle.
    - Carpet (deposits of hay, weed seeds, burrs and/or soil or water).
    - Spare-tyre area.
    - Other recesses in the boot/rear of the vehicle.
  3. Inspect the engine bay, especially:
    - Radiator.
    - Grill.
    - Top of transmission gearbox.
    - Recess under windscreen wipers.
    - Air filters.
  4. Inspect the underside of the vehicle, especially:
    - Wheel arches, wheel trims, flares, step treads, bumpers.
    - Mud flaps.
    - Tyre rims (particularly the rear side).
    - Axels and diffs.
    - Spare tyres on 4WDs and station wagons are often suspended underneath.
- Note:** These are potentially a high risk area as contaminants collect inside the horizontally-positioned rim.



5. Inspect tool boxes, ladders, and storage compartments.
6. Inspect the back/tray of trucks and 4WDs for soil, seed, and plant material.

## Boats and trailers

1. Examples of boat equipment that require cleaning protocols:
  - Outboard motor.
  - Propeller.
  - Field equipment.
  - Hull surfaces.
  - Waders foot pump.
  - Buoyancy vest.
  - Interior nooks and crannies.
2. General hygiene procedure:
  - Decontamination must include:
    - The hull.
    - Decks.
    - Interior areas.
    - Cockpit.
    - Bilge.
    - Buoyancy chambers.
    - Anchor locker.
    - Anchor.
    - Rope and chain.
    - Engine.
    - Trailer.
    - Vehicle.
    - Field equipment.
  - Where necessary, also drain equipment and parts of the boat where water can collect (e.g. carpets, ropes, bilge and buoyancy chambers, anchor lockers, box sections of trailers).
  - Drain the bilge and buoyancy chambers, and then re-secure bungs.
  - Run clear water or disinfectant solution through the bilge pump.
  - Fill the deck sump with clear water and run the bilge pump for at least one minute.
  - Fill the anchor locker with clear water and soak the anchor, chain, and line.
  - Use a brush to scrub any absorbent or rough materials such as ropes, chains, carpeting, mats, nets, leather, and neoprene items.
  - Check the box sections of the trailer to ensure they are clean. If necessary clean:
    - Trailer frame.
    - Tyres.
    - Wheel arches.
    - Guards.
3. Outboard engines:
  - Allow the cooling system to drain at the ramp before leaving the waterway.
  - Flush the engine with clear water or disinfectant solution for five minutes. After disinfection, ideally it should also be flushed again with clean fresh water from a treated town water supply.
  - Use clear water or disinfectant solution to clean external surfaces of the engines.
  - Clean all material from around the prop.
4. **On return to base:**
  - Check boat and trailer for moisture, mud and debris.
  - Where necessary, thoroughly clean the boat, trailer, vehicle and equipment. Allow to thoroughly dry.
  - Use a designated area for washing down and disinfecting the boat and trailer to ensure wastewater is disposed of safely away from stormwater drains and waterways.
  - Allow adequate drying time.
  - The boat skipper or fieldwork leader should ensure that the field washdown equipment is fully replenished at the conclusion of fieldwork.

### For further information contact:

Rous County Council | 02 6623 3800 | [www.rous.nsw.gov.au](http://www.rous.nsw.gov.au)

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