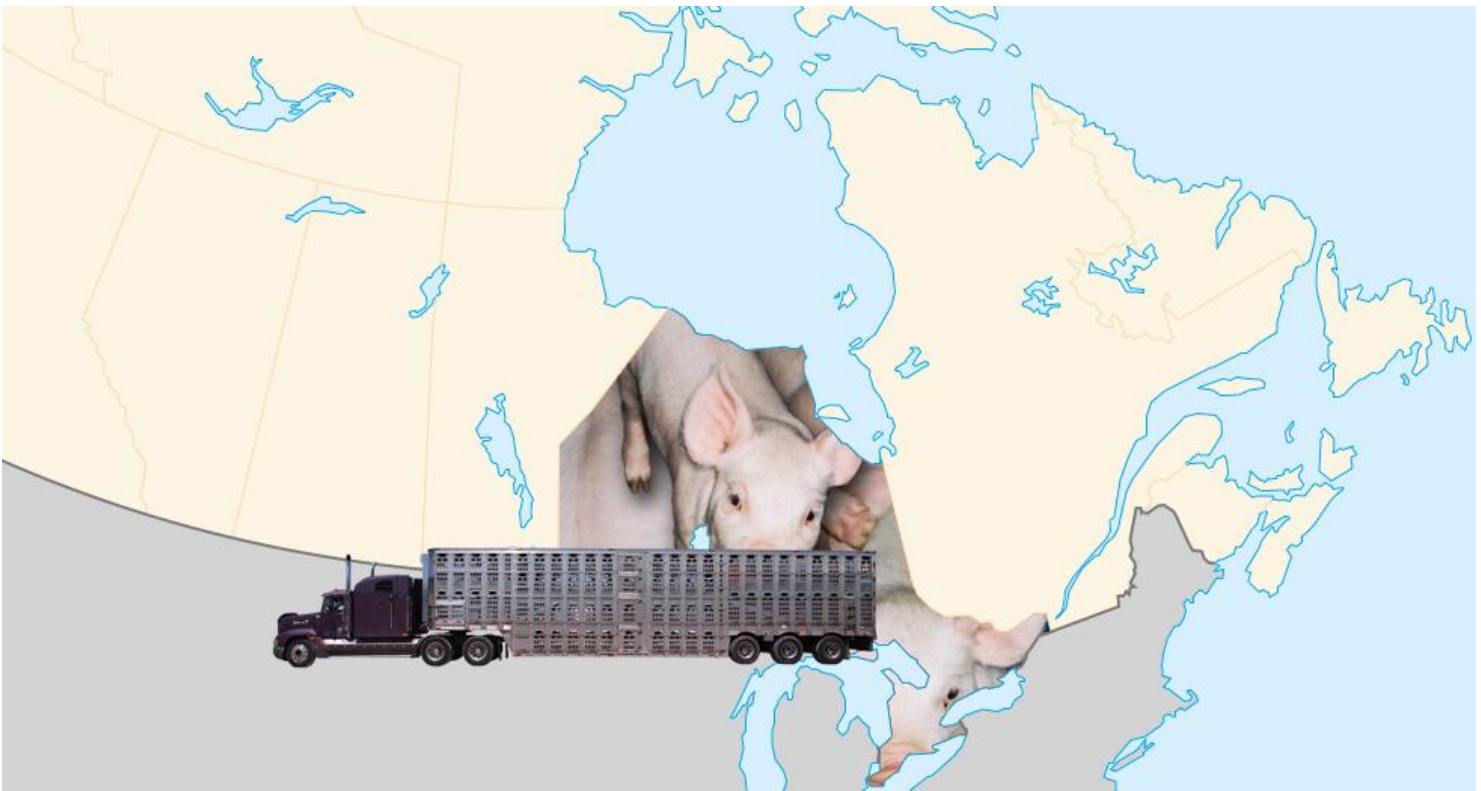


OSHAB TRANSPORT BIOSECURITY HANDBOOK Wash/Disinfect/Dry /Inspect Protocols



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TABLE OF CONTENTS

OBJECTIVE	1
PREPARATION	
Water Quality	3
Safety Equipment.....	4
STEP 1 - Scrape out	5
STEP 2 - Prep the trailer.....	7
STEP 3 - High volume wash	10
STEP 4 - Soap.....	11
STEP 5 - Wash	13
STEP 6 - Inspect	15
STEP 7 - Wash the Wash Bay.....	16
STEP 8 - Reassemble the Trailer	17
STEP 9- - Disinfect	18
STEP 10 - Dry.....	20
STEP 11 - Cab.....	21
STEP 12 - Keep it clean	22
STEP 13 - Check it	23
ACKNOWLEDGEMENTS.....	26
RESOURCES.....	27

OBJECTIVE

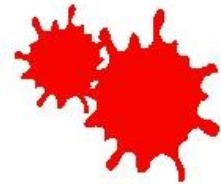
Avoid spreading diseases

Contaminated transport vehicles can quickly spread costly diseases – Porcine Reproductive and Respiratory Syndrome (PRRS) is estimated to cost the Canadian Hog industry \$130,000,000 per year (George Morris Centre, 2011) – using these wash/disinfect/dry protocols will help reduce the spread of PRRS virus, keeping Canadian pig farms healthy and improve the profitability of pork producers and transporters.

**Success = Clean thoroughly +
disinfect +dry + keep it clean**

Thinking about biosecurity

- It is harder for us to recognize dangers that we can't see than those that we can.
- Since **germs** can't be seen, picture the world outside the barn as covered in wet **red paint**. Our job is to move pigs, people and stuff in and out of barns without getting any of that **red paint** on the pigs or inside our facilities.
- **Germ**s are all around us and all surfaces that have not been cleaned, disinfected and dried must be considered contaminated (covered in wet **red paint**).
- The only way to decontaminate surfaces (i.e. wash the paint off) is to clean, disinfect and dry them.



This means that truck washes must be able to accomplish 4 key things. We'll examine each of these four things by talking about the reasons we do what we do.

1. CLEAN

- You CAN'T disinfect DIRTY!
- Germs survive better when they have somewhere to hide so the first step in getting rid of them is to CLEAN the surface.
- Just like washing your hands SCRUBBING with WARM, SOAPY water is the easiest way to get things CLEAN.
- For truck washes:
 - SCRUBBING = HIGH PRESSURE and a ROTARY NOZZLE
 - WARM = WARM WATER
 - SOAPY = DETERGENT AND/OR DEGREASERS

2. DISINFECT

- Even a clean surface still has germs – this is where disinfectants come in.
- Disinfectants work by physically tearing the germs apart
- For truck washes this means you must:
 - a. Have the right CONCENTRATION.
 - b. Use the right AMOUNT.
 - c. Have sufficient CONTACT TIME with the surface.

3. DRY

- Science has proven that many disinfectants can't kill PRRS virus without drying.
- Many germs are destroyed by drying and this makes drying a useful addition to trailer disinfection and biosecurity.
- It's important to be able to get trailers dry in all weathers and in a reasonable period of time.
- For truck washes this means:
 - a. INSIDE – You can't dry a trailer in the rain.
 - b. HEAT – Frozen trailers don't dry and many germs like being frozen.

4. KEEP CLEAN

- Once you get a trailer clean keep it that way.
- Only clean people, pigs and equipment go in.
- Bedding that goes into our CLEAN trailer must similarly be kept clean.
- Since we're worried about germs that come from pigs - store trailers away from live pigs.



**is used throughout this manual to indicate
BEST MANAGEMENT PRACTICES**

**These practices will result in the desired outcome
– a clean, germ free truck and are recommended
whenever possible.**

PREPARATION

Water Quality

Check water quality



- **Drinking water must** contain no chemical or biological contaminants.
- **Hard water** can reduce the effectiveness of soap and disinfectant.
 - Check manufacturers' recommendations for more information.

Test once a year for deep wells.

Test four times a year for surface wells.

BMP

Each employee is trained on:

- **The importance and methods to effectively wash, disinfect and dry a trailer.**
- **Safety.**
- **Equipment and product use.**

Safety Equipment

The following is essential safety equipment



Remember to read the manufacturers labels and MSDS safety sheets for the products you are using to ensure you are wearing the correct safety equipment

STEP 1 – SCRAPE OUT

RATIONALE – ‘DIRTY’ trailers must be considered to be contaminated with disease causing organisms.

Decreasing the amount of germ containing materials arriving at the Wash Bay decreases the risk of recontaminating washed trailers.

GOAL - Remove the bulk of organic matter to ease and speed the cleaning process. Manure is easier to remove when it isn't frozen or baked on.

PRINCIPLES

- Don't try to get the trailer completely clean with this step just get the 'worst' of the dirt removed and loosen the rest so it is easier to take off later
- Remove bedding and manure from the trailer

**Follow the pattern:
Outside to inside
Top to bottom
Front to back**

Trailer exterior

Remove accumulated dirt and snow (wheels, mud flaps, chassis)



Trailer interior

Remove the deck planks and bang them off.



Trailer interior

Scrape off as much bedding and manure as possible from inside the trailer with a shovel, rake or brush. Put the deck planks back in the holding racks of the scraped out trailer to return to wash site.



Scrape out should be carried out in a location away from where vehicles are washed. Dirty bedding should be stored far from clean vehicles and livestock.

STEP 2 – PREPARE TRAILER FOR WASHING

RATIONALE – The pre-wash preparation focuses on taking apart all of the pieces and equipment that are washed independently of the main trailer.

GOAL –All parts of the trailer and equipment will be effectively washed, dried and disinfected.

PRINCIPLES

- Make sure all equipment and panels are removed and are washed, disinfected and dried separately
- If anything is missed, it may make all of the hard work a waste of time

Trailer exterior

Remove all objects from the trailer (clothing, boots, crates, tools) and wash, disinfect and dry separately.

Don't forget the storage areas



Trailer exterior

Remove winter panels.
Wash separately, they will be disinfected and dried in place with the trailer.



Trailer Interior

Unload deck planks into the wash bay and wash separately, they will be disinfected and dried in place with the trailer. Remove all equipment (shovels, boards, rattles and slappers) and wash, disinfect and dry separately.



Check the condition of equipment when washing – replace damaged boards that may hold manure and germs.

STEP 3 – HIGH VOLUME RINSE

RATIONALE – The focus in this step is to get rid of the bulk of organic matter and soak all surfaces.

GOAL – Cut down high pressure wash time.

PRINCIPLES

- Rinse with lots of water to remove as much visible debris as possible
- Use a high volume of water at moderate pressure (50-100 PSI)
- Use cold or lukewarm water
-



**Follow the pattern:
Outside to inside
Top to bottom
Front to back**

STEP 4 - SOAP

RATIONALE - Using a detergent can significantly speed up wash times and provide a “cleaner” clean. Even after all visible organic material has been washed off a surface a biofilm can still be there.

GOAL - Loosen up organic matter to make cleaning easier and remove biofilm.

PRINCIPLES

- Use a foam gun
- Ensure your equipment is calibrated properly
- Apply the recommended amount
- Use lukewarm water
 - 30 – 40 °C, max. 55 °C
- Low or medium pressure
- Allow sufficient contact time
 - (ie 10 minutes)
- Do not allow foam to dry



What is a Biofilm?

A layer of oily residue or mineral build-up that can protect the germs from disinfectant

Why use Soap?

Also called **degreaser, detergent or demineralizer**

Washing alone will not always remove the biofilm (and associated germs)

Which soap is best?

- Neutral or alkaline
 - Fights grease more effectively
 - Recommended in most cases
- Acidic maybe recommended for mineral build-up
- Non-corrosive
- Compatible with the disinfectant selected



Use a detergent wash



**Read product label or check with manufacturer before using the product.
Apply detergent on every surface**



Don't forget deck planks and winter panels

**Follow the pattern:
Outside to inside
Top to bottom
Front to back**

STEP 5 – WASH

RATIONALE - Surfaces must be clean for disinfectant to be effective.

GOAL - Remove ALL organic matter.

PRINCIPLES

- Rinse off all organic materials and detergent
- Using a high pressure washer and rotary nozzle
- Cold or lukewarm water
- At the end of the wash, remove any standing water to get ready for the disinfectant step using:
 - Squeegee, Leaf blower or Shop Vac



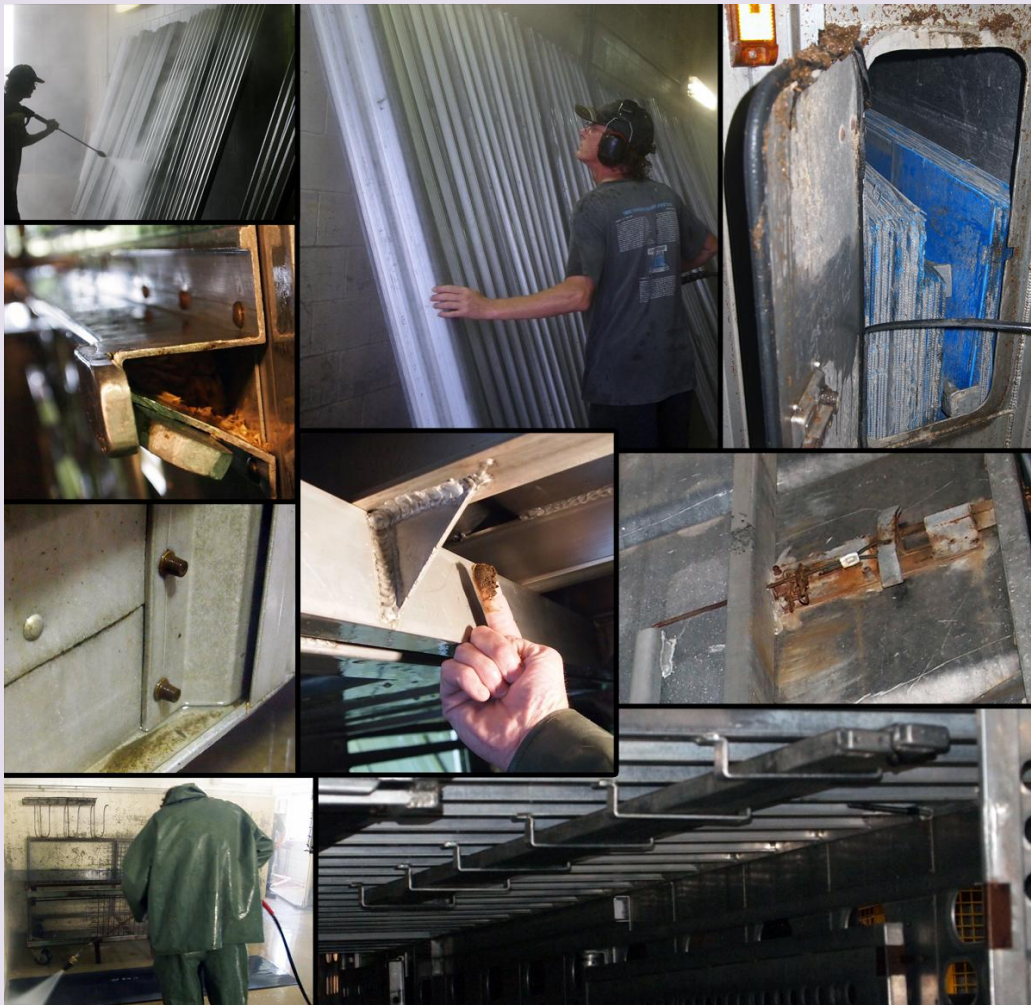
Manure encrusted areas and corners may need to be scrubbed with a brush to remove dirt and biofilms



**Follow the pattern:
Outside to inside
Top to bottom
Front to back**

Don't forget:

- corners
- behind roll-up doors
- back of door surfaces
- hinges
- inside any open tubes
- storage compartments
- winter panels (wash on a rack, wash both sides)
- deck planks (place in a rack or stand against wall, wash both sides and ends)



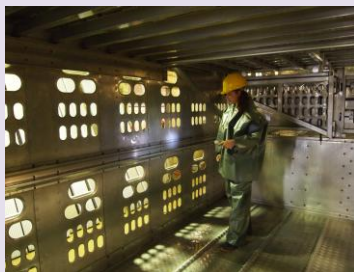
STEP 6 – INSPECT

RATIONALE – Everybody makes mistakes! Check your work at this stage before applying an expensive disinfectant.

GOAL - Ensure surfaces are clean before moving to the next step.

PRINCIPLES

- Good light is essential - use a flashlight.
- Person inspecting the trailer should be wearing clean boots and outerwear
- Work systematically so that you don't miss anything
- No visible contaminated material
- If still contaminated , **REWASH**
- No accumulated water



**Follow the pattern:
Outside to inside
Top to bottom
Front to back**

STEP 7 – WASH THE WASH BAY

RATIONALE – Washing moves dirt off the trailer and into the wash bay.

GOAL – Avoid recontaminating the trailer with the material that has been washed off and out of it.

PRINCIPLES

- Use low pressure
- Work from FRONT TO BACK moving material towards the drain
- Start with a squeegee and push any solids to the drain
- Rinse the wash bay floor with high volume and low pressure
- Clear the drains before moving on to the next step



STEP 8 – REASSEMBLE THE TRAILER

RATIONALE – To avoid handling and possibly contaminating deck planks and equipment they need to be in place before they are disinfected.

GOAL – Assemble the trailer so that is ‘ready to roll’ once disinfectant is applied.

PRINCIPLES

- Person re-assembling the trailer should be wearing clean boots and outerwear
- Replace deck planks and winter panels before disinfecting and drying the trailer



STEP 9 DISINFECT

RATIONALE: Even a 'clean' surface can still be contaminated by germs.

GOAL: Eliminate germs

PRINCIPLES

- Use a foam gun
- Ensure your equipment is calibrated properly
- Apply the recommended amount
- Use lukewarm water
 - 30 – 40 °C, max. 55 °C
- Low or medium pressure
- Allow sufficient contact time
 - 10 minutes minimum
- The person applying the disinfectant should wear clean boots and outerwear and appropriate safety equipment

CONCENTRATION = CALIBRATION

The equipment and the protocol used to apply disinfectant must be properly calibrated to ensure the right:

- **CONCENTRATION = AMOUNT OF DISINFECTANT/L OF WATER**

If the solution is too dilute (too much water and not enough disinfectant) there isn't enough disinfectant for it to do its' job.

If the solution is too concentrated (too much disinfectant and not enough water) this adds expense

- **AMOUNT OF DISINFECTANT/TRAILER**

Enough disinfectant must go onto to the trailer to make sure that the surfaces stay wet with the disinfectant for long enough to do their job.

Read the manufacturer's label



Don't let DIRTY touch CLEAN areas

Which disinfectant is best?

- Efficient against a wide range of microbes (bacteria, viruses, fungi)
- Compatible with the detergent selected
- Non corrosive
- As little harm as possible to:
 - humans
 - animals
 - the environment

CAUTION!

**Disinfectants can be highly toxic.
Read the label and safety instructions before use.**



Winter

- **Do not allow disinfectant to freeze because its effectiveness is reduced.**
- **Vehicles must remain indoors for the duration of the contact period.**

**Follow the pattern:
Outside to inside
Top to bottom
Front to back**

STEP 10 DRY

RATIONALE: Some germs can survive wet disinfection – especially bacteria. Drying generally improves disinfectant activity.

GOAL– Make sure that there are no germs left.

PRINCIPLES

- Drying in some cases may be as important as disinfecting
- Dry means dry – no puddles.
- Don't forget storage boxes – they must be dry too



Why **dry**?

Humidity encourages bacterial survival and multiplication.

Drying is key to eliminate viruses, including PRRS virus.

Dry completely and as quickly as possible.

Ventilate the vehicle: - open the doors.

Best methods

Dripping

(grade) MINIMUM 2%

Active drying

Ventilation + heat (32 °C or more to eliminate several viruses)

Sunlight helps destroy bacteria.

In winter, dry indoors to avoid freezing.

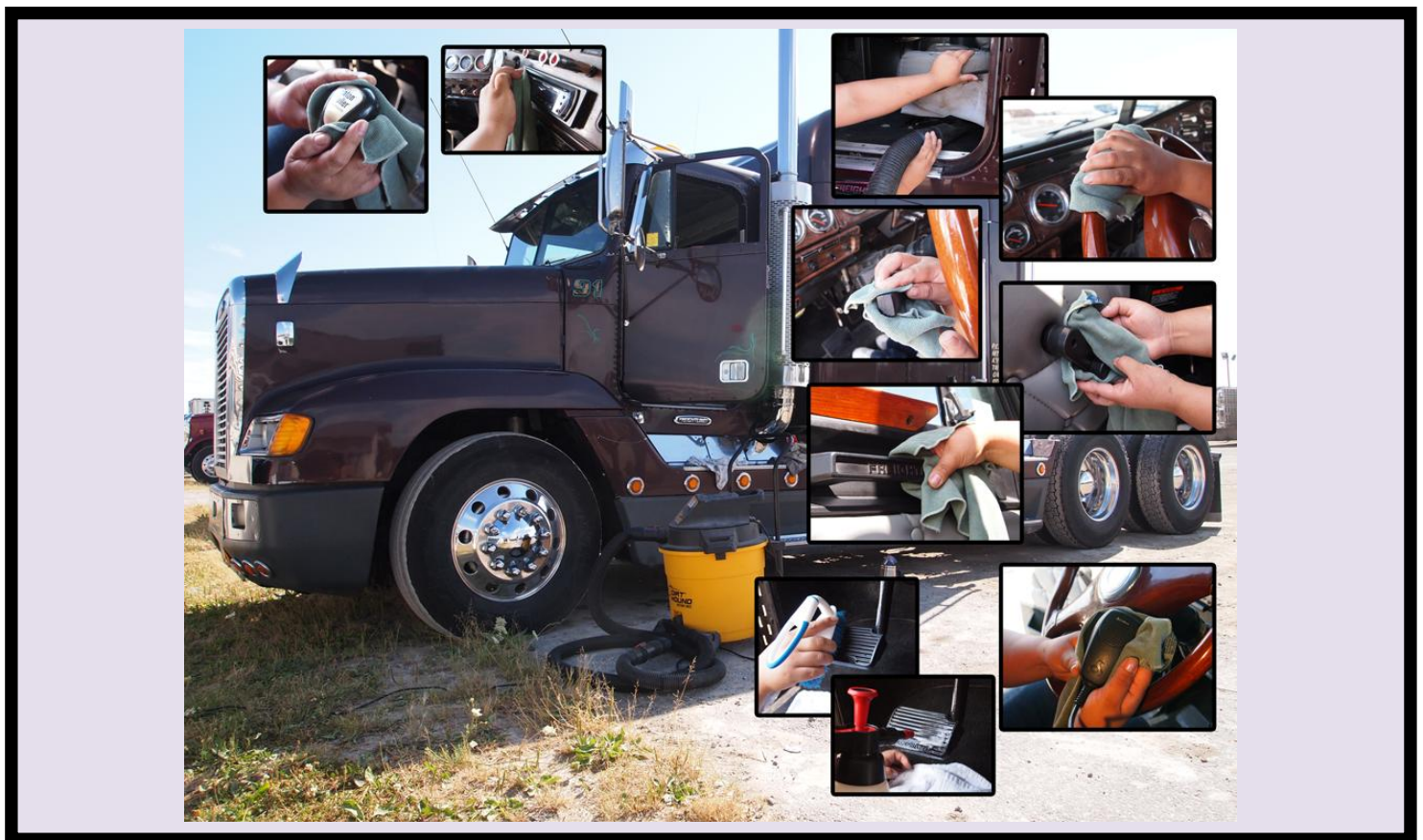
STEP 11 CAB

RATIONALE: The cab can harbour germs which can get on the driver's boots, hands and clothing.

GOAL– Wash, disinfect and dry the cab interior.

PRINCIPLES

- Remove all objects and vacuum.
- Remove mats.
- Soap, brush, disinfect and dry all removable objects, mats and floors.
- A household **disinfectant** may be used.
- Wash, disinfect and dry any surface or object the driver has touched or handled.



STEP 12 KEEP IT CLEAN

RATIONALE: Germs can recontaminate a clean trailer unless proper precautions are taken.

GOAL– Avoid recontaminating disinfected trailers.

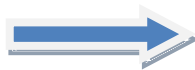
PRINCIPLES

Clean vehicles:

- Only allow entry of clean materials (ie shavings, boards etc) and people
- Must not use the same route as soiled vehicles
- Must be parked far from soiled vehicles
- Must remain inaccessible to animals.



CLEAN VEHICLE PARKING



SOILED VEHICLE PARKING

PREVAILING WINDS

Caution! Wind can spread germs!

STEP 13 CHECK IT

GOAL– Avoid the risk of transmitting disease to the next load of pigs – and avoid the frustration and expense of a failed trailer.

PRINCIPLES

- Ensure quality and thorough work
- Visual inspection following each wash, disinfection and drying
- Done by a person who has not washed the trailer
- Inspector must wear clean boots and outerwear
- Lighting is important - use a flashlight
- Inspect exterior and interior, everywhere
- If dirt or standing water found – TRAILER FAILS

Vehicle Exterior

- Exterior panels
- Wheels
- Mud flaps
- Fenders
- Chassis
- Electrical cables
- Winter panels
- Storage areas
- Loading ramps



Vehicle Interior

- Ramps
- Ceiling
- Floors
- Slide rails
- Gates (both sides and top)
- Doors
- Hinges and joints
- Corners
- Holes, wall cavities
- Tools



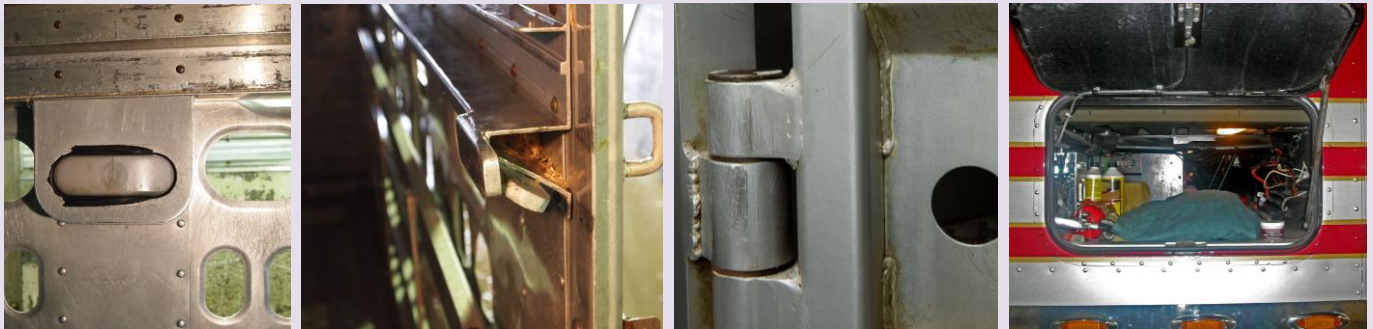
Use a standard form such as the OSHAB Trailer Inspection Form, take pictures of the problem areas and mark on a schematic.

Pictures can be useful for training staff.

Cab

- Pedals
- Floor mats
- Door handles
- Steering wheel
- Gear stick
- Seat
- Radio
- Cellular phone

Common Fail Spots - Check these areas carefully



Conduct microbiological quality control testing twice per year. For more information, consult the CSHB Quality Control of Wash/Disinfect/Dry Protocols for Live-Hog Transport Vehicles.

Environmental testing for PRRSV can also be conducted.

ACKNOWLEDGEMENTS

This information was adapted from the handbooks:

**Live Hog Transport Vehicle Wash/Disinfect/Dry Protocols, March 2011
prepared for The Canadian Swine Health Board by LaboratoireM2**

and

**Quality Control of Wash/Disinfect/Dry Protocols for Live-Hog Transport
Vehicles, March 2011 prepared for The Canadian Swine Health Board by
LaboratoireM2**

<http://biosecurity.swinehealth.ca/biosecurity-user-guide/4-best-management-practices-for-farm-biosecurity-for-pig-production/4-3-transport-vehicles-onto-the-farm/>

**www.swinehealth.ca
www.laboratoirem2.com/en/x**

Thank you to the truck wash facilities and employees that helped in the creation of this handbook for their time, patience and assistance.

Thank you to South West Ontario Veterinary Services for their technical guidance in the development of these materials.

RESOURCES

American Association of Swine Veterinarians

PRRSV Biosecurity Manual

<http://www.aasv.org/aasv/publications.htm>

Canadian Swine Health Board

National Swine Farm-Level Biosecurity Standard (2011)

www.swinehealth.ca

How to collect environmental samples from livestock transport vehicles to detect the presence of PRRS virus (Swiffer Testing)

Training course –Area Solutions TeamBoehringer Ingelheim Vetmedica Inc,
Dec 2010 (this information can be found at www.prrsarce.ca)

OSHAB Transport Biosecurity Video Series

www.prrsarce.ca

OSHAB Truck Wash Audit Form

www.prrsarce.ca

OSHAB Trailer Inspection Form

www.prrsarce.ca

OSHAB Pressure Washer Calibration Protocol

www.prrsarce.ca

**OSHAB Amount of Disinfectant Required for Different Pig Transport Vehicles
Poster**

www.prrsarce.ca