

## CHAPTER 47

### CLEANING INSTRUCTIONS – TRUCK FIRE FIGHTING

- 47.1 This chapter provides basic and specific cleaning requirements for selected vehicles. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this chapter.
- 47.2 This Section deals with the cleaning of the basic fire truck. The section is structured as follows:
- a. external areas,
  - b. cabin,
  - c. electronics,
  - d. suspension,
  - e. engine bay,
  - f. battery box,
  - g. stowage bins and compartments,
  - h. breathing air apparatus, and
  - i. tyres (new, old and spares).
- 47.3 All points may not be specific to all fire trucks.

#### External Areas

- 47.4 The cleaning instructions for the fire truck's external areas include the points detailed in Table 47-1.

**Table 47–1: Cleaning Instructions for the Fire Truck's External Areas**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Remove all CES prior to cleaning.	
2	Individually clean CES. Do not replace until after both the CES and the vehicle has been inspected by DA.	
3	Clean all rubber seals around the windows and doors.	
4	Seals on the bonnet area are to be cleaned in a similar fashion.	
5	Clean the bonnet area including the removal and inspection of any fitted heat blankets.	
6	Clean the snorkel to ensure its freedom from BRM.	
7	Remove any lining to facilitate cleaning and inspection.	
8	Headlights are to be removed to facilitate cleaning behind them	

**UNCONTROLLED IF PRINTED**

47-2

Serial	Comments or Tasks	Technical Time (hours)
9	Lights and mirrors are to be cleaned and damaged items are to be removed to facilitate cleaning.	
10	Remove light covers and flush housing.	
11	Clean out the ventilation blower assembly housing and ensure no dirt, seed or plant material remains.	
12	Raise the heating/ventilation flap and vacuum clean the discharge cavity to remove dust and other foreign material.	
13	Remove the mudflaps and pay attention to cleaning around the attachment points.	
14	Loosen fuel and air tank retaining straps.	
15	The brush guard is to be removed.	
16	Clean and inspect channel tubing at cargo tie down points on cargo tray on the top of the vehicle (if applicable).	
17	Carry racks and apertures are to be cleaned.	
18	Unroll all hoses and clean all oil and grease material to ensure there is no soil, plant or insect matter. Clean hose assembly with a high-pressure water cleaner.	
19	Clean all hose couplings and hose coupling assembly with a high-pressure water cleaner.	
20	The inside of the tank is to be flushed out and treated with chlorinated water.  The water tank is to be sprayed internally with a chlorine solution (400 parts per million) and then allowed to air dry or fill the tank to full and chlorinate the water as above and then drain and air dry.  DA may require the inclusion of a super chlorinated sample to be sealed inside the tank after inspection to test any residual water.	

**Cabin**

47.5 The cleaning instructions for the fire truck's cabin include the point detailed in Table 47–2.

**EXTREME CAUTION**  
**ELECTRICAL COMPONENTS**  
 Do not use water or steam to clean any interiors areas of the Fire Trucks Cabin as it contains sensitive electrical components and equipment – Use air clean only and only under the supervision of a qualified technician

**Table 47–2: Cleaning Instructions for the Fire Truck's Cabin**

Serial	Comments or Tasks	Technical Time (hours)
1	<b>WARNING:</b> Do not use water or steam to clean any interiors areas of the Fire Trucks Cabin as it contains sensitive electrical components and equipment – Use air clean only and only under the supervision of a qualified technician.	
2	The seats and the floor mats are to be removed and the cabin floor	

**UNCONTROLLED IF PRINTED**

47-3

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
	cleaned.	
3	The cabin area is to be vacuumed and air-blown clean.	
4	The velcro around the windscreen is to be brushed clean of all plant, seed and insect matter.	
5	Door trims are to be removed and cleaned.	
6	The ventilation system filter is to be removed and cleaned with high-pressure air. Air ducts are to be reverse pressure air-blown clean.	
7	All floor panels are to be removed to facilitate cleaning inside the vehicle body including the engine bay cover.	
8	Remove the water chiller assembly and ensure the shelf is free of dirt, dust, plant and insect material.	
9	Remove vehicle radio sets (if fitted) and ensure radio cradles are clean and free of foreign material.	
10	All electrical tape is to be removed and destroyed.	
11	Brake and clutch pedal covers are to be removed to facilitate cleaning and then replaced after inspection.	2.0
12	The handbrake dust cover is to be removed.	
13	Remove upper and lower steering column shrouds and clean steering column mount with compressed air.	
14	Inspect mirror sills and mirrors.	

**Electronics**

47.6 The cleaning instructions for a fire truck's electronics include the point detailed in Table 47-3.

**EXTREME CAUTION**  
**ELECTRICAL COMPONENTS**

Do not use water or steam to clean any of the units electronics –  
Use air or hand-wipe clean only and only under the supervision  
of a qualified technician

**Table 47–3: Cleaning Instructions for a Fire Truck's Electronics**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	<b>WARNING:</b> Do not use water or steam to clean any of the unit's electronics – Use air or hand-wipe clean only and only under the supervision of a qualified technician.	

**Suspension**

47.7 The specific cleaning instructions for fire truck's suspension include those points detailed in Table 47-4.

**Table 47-4: Cleaning Instructions for the Fire Truck's Suspension**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Ensure suspension rocker beam mounts on chassis are clean and free of soil, plant and insect material.	
2	Mud and other debris collect in the spring seat, where the spring is mounted to the axle assembly, and are difficult to remove from the base of the springs. Ensure that this area is cleaned well.	
3	Mud and other debris collect in the inside area on the inner side of the wheel. Ensure that this area is cleaned well.	
4	Ensure axles and mounts on chassis are clean and free of soil, plant and insect material.	

**Engine Bay**

47.8 The specific cleaning instructions for fire truck's engine and transmission include those points detailed in Table 47-5.

**Table 47-5: Cleaning Instructions for the Fire Truck's Engine and Transmission Compartment**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Clean the engine compartment and engine to ensure they are free of dust, built-up dirt and grease, insect and plant material.	
2	Ensure any engine openings/breathers are taped or plugged prior to cleaning to stop the ingress of water.	
3	Ensure the starter motor and alternator are covered and taped prior to cleaning to stop the stop ingress of water.	
4	Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components	
5	Grease and oil from the front of the sump and on the back of the flywheel housing is to be removed.	
6	Unlock and tilt the cabin to allow access to engine and chassis for cleaning.	
7	Clean the engine compartment and engine to ensure they are free of dust, built up dirt and grease, insect and plant material.	
8	Ensure any engine openings / breathers are taped or plugged to stop ingress of water.	2.0
9	Ensure the starter motor and alternator are covered and taped to stop ingress of water.	2.0
10	Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components.	0.5
11	Remove the air cleaner flexible line from the air plenum and ensure it is free from insect and plant material.	
12	Remove and dispose of air cleaner element. Replace air cleaner element with a new part.	0.5
13	Remove the battery from the compartment and clean the leads.	

**UNCONTROLLED IF PRINTED**

47-5

14	Remove the grill (if applicable) and high-pressure air or pick clean the radiator to ensure there are no seed or insect debris embedded. Inspect behind number plate and tactical signage.	
15	The radiator cowling may need to be removed to facilitate the cleaning of the radiator.	
16	Flush radiator and oil cooler from both sides to verify fin/core cleanliness.	
17	Loosen radiator shroud to let any loose debris fall through after flushing.	
18	Check either side of radiator for vertical hollow support structures. Flush to verify internal cleanliness if present.	
19	Check all wiring harnesses for internal cleanliness.	
20	All water reservoirs must be emptied (excluding radiator).	

**Battery Box**

47.9 The cleaning instructions for the fire truck's battery box include the point detailed in Table 47-6.

**Table 47-6: Cleaning Instructions for the Fire Truck's Battery Box**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	The battery box support member is to be flushed through using a flexible nozzle until clear water is seen to exit.	
2	Flush support bases and tubing underneath battery box.	

**Stowage Bins and Compartments**

47.10 The cleaning instructions for the fire truck's stowage bins and compartments include the point detailed in Table 47-7.

**Table 47-7: Cleaning Instructions for the Fire Truck's Stowage Bins and Compartments**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Remove all CES to facilitate cleaning of soil, plant and insect debris.	
2	Individually clean all items of CES. Where possible/practical do not replace in the vehicle until inspection has been completed by DA.	
3	All stowage bins and compartments are to be emptied and brushed, air-blown and wiped clean.	
4	Clean all rubber seals around the doors.	
5	Flush support bases and tubing underneath stowage areas.	

**Breathing Air Apparatus**

**EXTREME CAUTION**  
**LIFE SUPPORT COMPONENTS**  
 Clean only under the supervision of a qualified technician

47.11 The cleaning instructions for Breathing Air apparatus include the points detailed in Table 47-8.

**Table 47-8: Cleaning Instructions for Breathing Air Apparatus**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	<b>WARNING:</b> Clean only under the supervision of a qualified technician.	
2	The bag can be subject to a 'wipe clean'; however, bags that have soil embedded into them are to be scrubbed with brushes and water to remove the soil and allowed to air dry.	
3	Attention should be paid to pouch fasteners, belt clips and buckles to ensure that no soil, plant or insect debris is caught in these areas,	
4	Belts are to be disassembled including pad belts to ensure all possible areas of contamination are inspected and cleaned.	
5	Velcro is to be brushed and washed to ensure all seed, plant and soil material is removed.	
6	Packs are to be left disassembled for the DA inspection.	
7	Do not expose any part to aerosol spray, as some aerosol propellants attack or degrade rubber and plastic materials.	
8	Do not use any type of alcohol, solvent or petroleum based substances to clean or lubricate any part.	
9	Do not store equipment near any oil, gasoline, chemicals, or solvents.	
11	Gas bottles are to be removed from compartments and then washed and scrubbed.	
12	Attention is to be given to the bottom of the cylinder to remove soil, plant and insect matter from lip underneath.	
13	The cylinders are to be thoroughly washed. Use cool or warm fresh water only, never hot.	
14	Ensure that moisture does not enter the cylinder. Ensure the cylinder valve is closed prior to cleaning.	
15	Ensure not to drop cylinders during cleaning particularly on the valves.	
16	Always ensure that you lie cylinders down whenever unattended and ensure the cylinders cannot roll.	
17	Ensure that cylinders are kept away from sources of strong heat.	
18	Use a toothbrush to remove sand from Velcro® and other nooks and crannies.	
19	Foam used as packing is to be removed for DA inspection. The use of high density foam is the preferred option as impregnation by seeds etc is reduced.	

**Tyres (New, Old and Spares)**

47.12 The cleaning instructions for Tyres (new, old and spares) include the points detailed in Table 47-9.

**Table 47-9: Cleaning Instructions for Tyres (New, Old and Spares)**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All tyres are to be washed and scrubbed to remove all BRM.	
2	Damaged tyres are to be inspected and their suitability for return to Australia determined. If necessary, damaged tyres (for example, perished, cracked or split) are to be removed and disposed of in accordance with the tyre disposal policy.	
3	Cracked tyres have the risk of containing BRM therefore perished tyres are to be subject to disposal.	
4	All tyres are to be treated with an approved residual insecticide after cleaning.	
5	Fitted tyres that are damaged should be replaced with new tyres.	
6	Used and fitted tyres on rims are to be individually verified that the tyres are on rims, inflated with beading sealed and that the tyres are clean, free of water and other biosecurity risk material.	
7	Tyres that are not fitted to rims are to be stored in such a manner that water cannot collect inside the tyre. The preferred DA solution is that tyres are stored within containers. Tyres not fitted on rims will require fumigation on return to Australia.	
8	DA considers a Non-Commercial consignment of tyres to contain a maximum of 8 tyres (inclusive of the wheels on the vehicle) and may be imported with an accompanying vehicle. If tyres are to be transported back to Australia in containers or crates, please refer to the DA BICON (Biosecurity Import Conditions system) internet site ( <a href="http://www.agriculture.gov.au/import/online-services/bicon">http://www.agriculture.gov.au/import/online-services/bicon</a> ) for the commodity "tyres".	

**ANNEXES:**

- A. Cleaning Instructions – Truck Fire Fighting - Panther





## ANNEX A TO CHAPTER 47

### TRUCK FIRE FIGHTING AIRFIELD – PANTHER

1. This chapter provides basic and specific cleaning requirements for selected vehicles. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this chapter.
2. This Section deals with the cleaning of the basic Panther fire truck.

#### External Areas

3. The cleaning instructions for the Panther's external areas, as illustrated in Figures 47A-1 to 47A-4, include the points detailed in Table 47A-1.



Figure 47A-1: Panther's External Areas



Figure 47A-2: Panther's Hoses Connection and Pump Panel



Figure 47A-3: Panther's Roof Area CES



Figure 47A-4: Panther's front

**Table 47A-1: Cleaning Instructions for the Panther's External Areas**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Remove all CES prior to cleaning including CES located on the roof and exterior of the vehicle (refer Figure 47A-1).	
2	Individually clean CES. Do not replace until after both the CES and the vehicle has been inspected by DA.	1.5
3	Ensure the skid plate is flushed with water and is free of QRM (refer Figure 47A-4 & 5).	
4	Under Chassis Areas including Tail Shaft & Differential (not shown).	0.5
5	Refer to Chapter 47 for detailed cleaning guidelines.	

**Cabin**

4. The cleaning instructions for the fire truck's cabin, as illustrated in Figures 47A-5 to 47A-8, include the points detailed in Table 47A-2.



Figure 47A-5: Panther's Cabin Areas



Figure 47A-6: Panther's Front Seats



Figure 47A-7: Panther's front seats (right) and (left) and rear seat (left)



Figure 47A-8: Panther's Dashboard and Centre Console

**EXTREME CAUTION  
ELECTRICAL COMPONENTS**  
Do not use water or steam to clean any interiors areas of the Fire Trucks Cabin as it contains sensitive electrical components and equipment – Use air clean only and only under the supervision of a qualified technician

Table 47A–2: Cleaning Instructions for the Fire Truck's Cabin

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	<b>WARNING:</b> Do not use water or steam to clean any interiors areas of the Fire Trucks Cabin as it contains sensitive electrical components and equipment – Use air clean only and only under the supervision of a qualified technician.	
2	Refer to Chapter 47 for detailed cleaning guidelines.	

**Electronics**

5. The cleaning instructions for a fire truck’s electronics, as illustrated in Figure 47A-9 and include the points detailed in Table 47A-3



Figure 47A-9: Panther’s electrical boxes

**EXTREME CAUTION  
ELECTRICAL COMPONENTS**

Do not use water or steam to clean any of the units electronics –  
Use air or hand-wipe clean only and only under the supervision  
of a qualified technician

**Table 47A–3: Cleaning Instructions for a Fire Truck’s Electronics**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	<b>WARNING:</b> Do not use water or steam to clean any of the unit's electronics – Use air or hand-wipe clean only and only under the supervision of a qualified technician	
2	Main Computer Console (Not pictured).	
3	Main Computer Wiring from Engine Bay (Not Pictured).	
4	Solenoids (Not Pictured).	
5	Power Connection Board (Not Pictured).	
6	Main Cabin Power Box (Not Pictured).	
7	Refer to Chapter 47 for detailed cleaning guidelines	

**Suspension**

6. The specific cleaning instructions for Panther’s suspension, as illustrated in Figures 47A-10 and 47A-11, include those points detailed in Table 47A-4.



Figure 47A-10 Panther's Rear Suspension



Figure 47A-11: Panther's suspension spring

**Table 47A-4: Cleaning Instructions for the Panther's Suspension**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Ensure suspension mounts on chassis are clean and free of soil, plant and insect material (refer Figures 47A-11 and 12).	
2	Mud and other debris collect in the spring seat, where the spring is mounted to the axle assembly, and maybe difficult to remove from the base of the springs.	
3	Refer to Chapter 47 for detailed cleaning guidelines.	

**Engine and Transmission**

7. The specific cleaning instructions for Panther's engine and transmission, as illustrated in Figures 47A-12 and 47A-13, include those points as detailed in Table 47A-5.



Figure 47A-12: Panther's Engine

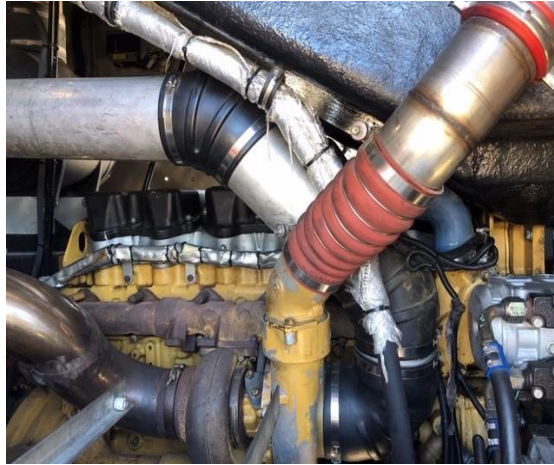


Figure 47A-13: Panther's engine pulleys and belt

**Table 47A-5: Cleaning Instructions for the Panther's Engine and Transmission Compartment**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Clean the engine compartment and engine to ensure they are free of dust, built-up dirt and grease, insect and plant material.	
2	Ensure any engine openings/breathers are taped or plugged to stop ingress of water.	
3	Ensure the starter motor and alternator are covered and taped to stop ingress of water.	
4	Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components	
5	Refer to Chapter 47 for detailed cleaning guidelines.	

**Battery Box**

- The cleaning instructions for the Panther's compartment (not pictured) include the points detailed in Table 47A-6.

**EXTREME CAUTION**  
**ELECTRICAL COMPONENTS**

Do not use water or steam to clean any of the units electronics –  
 Use air or hand-wipe clean only and only under the supervision  
 of a qualified technician

**Table 47A-6: Cleaning Instructions for the Panther's Compartment**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Remove the batteries from the battery bay. Use air or hand-wipe clean only and only under the supervision of a qualified technician	
2	Flush battery box compartment.	
3	Clean battery, cradle, cover and wiring. Do not replace until inspected by DA.	
4	Refer to Chapter 47 for detailed cleaning guidelines.	

**Equipment Storage Compartments**

9. The cleaning instructions for the Panther's stowage bins and compartments, as illustrated in Figures 47A-14 to 47A-16, include the points detailed in Table 47A-6.



Figure 47A-14: Forward and middle passenger side locker compartments and forward passenger side locker



Figure 47A-15: Rear passenger side locker and rear driver's side locker compartments





Figure 47A-16: Driver's passenger side middle and rear hose reel compartments

**Table 47A-6 Cleaning Instructions for the Panther's Stowage Bins and Compartments**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Remove all CES to facilitate cleaning of soil, plant and insect debris.	
2	Individually clean all items of CES. Do not replace in the vehicle until inspection has been completed by DA.	
3	All stowage bins and compartments are to be emptied and brushed, air-blown and wiped clean.	
4	Clean all rubber seals around the doors.	
5	Flush support bases and tubing underneath stowage areas.	
6	Refer to Chapter 47 for detailed cleaning guidelines.	

**Breathing Air Apparatus**

10. The cleaning instructions for Breathing Air Apparatus, as illustrated in Figure 47A-17, include the points detailed in Table 47A-7.



Figure 47A-17: Panther's Breathing Air Cylinder Compartment

**EXTREME CAUTION**  
**LIFE SUPPORT COMPONENTS**  
 Clean only under the supervision of a qualified technician

**Table 47A-7: Cleaning Instructions for Breathing Air apparatus**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	<b>WARNING:</b> Clean only under the supervision of a qualified technician	
2	Refer to Chapter 47 for detailed cleaning guidelines for both the breathing air cylinders and for the compartment.	

**Firefighting Sub-Systems**

11. The cleaning instructions for the Firefighting Sub-Systems (not pictured) include the points detailed in Table 47A-8.

**Table 47A-8: Cleaning Instructions for Firefighting Sub-Systems**

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Water Firefighting System	
2	Drain water tank via water tank drain outlet until empty	
3	Open the four (4) low point drains and pump drain and drain until empty, then close.	
4	Open water tank roof hatch, let "air dry", and close before transport.	
5	Foam Firefighting System	
6	<b>WARNING:</b> Position vehicle in approved foam handling area.	
7	Decant the foam tank into appropriate/approved receptacle for local disposal	
8	Open the foam tank roof hatch, let "air dry", and close before transport.	
9	DCP Firefighting System	
10	Remove Nitrogen cylinders and bleed the DCP nitrogen system completely	
11	Remove the DCP via the DCP transfer machine into an approved receptacle.	
12	Ensure all valves and hopper lid are closed and secured before any other cleaning to avoid any fluid entering the DCP system.	
13	Clean any remnants of DCP from the outside of the system and its surrounds	

12. Other related document for the Truck, Fire Fighting Airfield (Panther) is the Technical Manual/User Handbook NSN: 7610-66-156-1624.