DORM

Light Tanker MK70

Chassis: Toyota Landcruiser VDJ79R

Pump: HATZ 1B50 / GAAM

Version: 2.1

Student Name:

Student ID:

Drive appliance: DOA0001

Operate appliance: DOA0002

GOVERNMENT OF WESTERN AUSTRALIA
DFES Department of Fire & Emergency Services
FOR A SAFER STATE

DOCUMENT CONTROL

Document History

Content Manager File Location		D03871	
Version Number	**Amendments**	**Date Published**	**IIR Number**
1	Initial DORM creation	July 2021	087/20
2	Procedural amendments	Oct 2021	119/21
2.1	Minor amendment – Removal of foam strainer information	July 2022	24/22

Copyright Notice

Disclaimer

Table of Contents

Description and Specifications

Introduction

The Light Tanker is an appliance designed and built to withstand the harshest conditions, yet still provide firefighters the ability to transverse difficult terrains, and operate tight spaces were larger 4x4 appliances are unable to reach. Whilst only holding 500 Liters of water, the Light Tanker is still an important resource in remote/rural and Urban environments.

The Light Tanker is equipped with the latest crew protection capabilities, crew welfare, and ergonomic stowage solutions whilst still maintaining its simplistic operational approach suited to the end user.

In order to be fully competent in the safe operation of this appliance, the firefighter needs to be fully aware of its role, their operational duties and be fully conversant in all aspects of its operation.

Role

The Light Tanker has been designed to provide, a firefighting capability in areas of:

- Open pasture
- Grazing
- Bushland
- And urban environments.

With the capability to transvers terrains where off-road capabilities are required.

Description

- Build on a Toyota VDJ79R, 4x4 single cab chassis, turbo charged 4.5L diesel engine,
- Firefighting Pump System
- Rear bodywork for equipment and kit bag stowage

Specifications

Height:	2080mm
Width:	2250mm (Mirror to Mirror)
Length:	5320mm
Weight:	3,780 kg (4,200 kg GVM) Note: a GVM increase modification has been made to this vehicle
Turning Circle:	14.4m
Engine:	4.5L turbo diesel engine
Fuel:	Diesel, 90L tank
Transmission:	5 Speed Manual
Electrical:	12 Volt system, electrical isolation & charge socket
Tyre Pressure:	Front: 250kPa / Rear: 310kPa
Water Capacity:	500L
Foam Capacity:	20L A Class foam (Drum)
Pump:	Gaam Mk70
Pump Engine:	HATZ 1B50 Air Cooled Diesel Engine
Pump Capacity:	550 L/min @ 5 bar

Controls and Instruments

Introduction

The following information is supplied to assist the driver of this appliance to:

- Understand the functions of the appliance
- Interpret and operate the various instruments, gauges, and controls

Controls and Instruments

The following diagrams primarily illustrate the positions of the controls, instruments and gauges required for the safe operation of the appliance.

Cabin View

Figure 1.1 Cabin View

Cab Centre Console

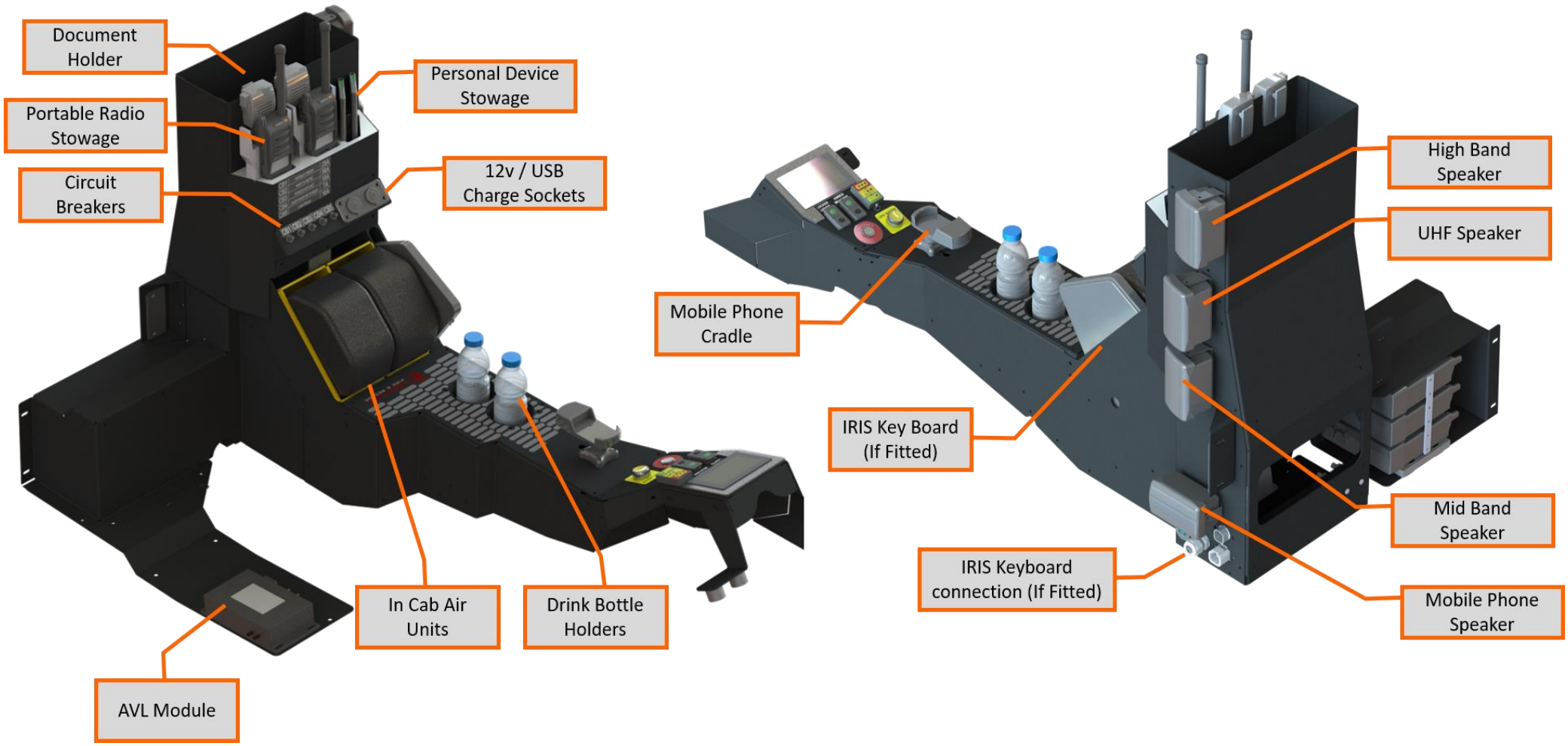


Figure 1.2 - Cab Centre Console

Centre Console Controls (Facia)

Figure 1.3 - Center Console Facia

Centre Console Circuit Breakers

Figure 1.4 - Center Console Circuit Breakers

Cab Pump Controls

Figure 1.5 – Cab Pump Controls

Centre Console Buttons

Siren Control Module

The siren control module will active the emergency warning system, depress RESPOND to activate the emergency lights and siren, depress PARK to activate only the emergency warning lights and depress OFF to deactivate the emergency warning system.

External Speaker Selector

The external speaker selector will allow the selected radio to be aired external of the appliance cab. Push the black button to select the required radio, an indicator light will illuminate which radio is selected.

Automatic Vehicle Location System (AVL)

This button will activate the AVL system in the event of an emergency.

Locker Lights Switch

This switch will activate the locker and underbody lights but can only be activated if the ignition and park lights are on.

Amber Beacon Switch

This switch activates the upper-level amber beacons in conjunction with the OEM hazard switch.

Low Water Alert

This button will acknowledge the low water and will cancel the alert, the indicator light will remain illuminated until the water tank is filled.

Crew Protection Switch

This switch will activate the deluge system, when activated the switch will illuminate yellow.

Locker Open Light

This light will illuminate when a locker door is left open, additionally an audible alert will sound if the door is left open and the park brake is released.

Construction and Component Parts

The Body of the Light Tanker is constructed of a pressed aluminium base frame, guard/rub rails and pressed aluminium lockers, which is fully welded and sealed. These components provide the mounting of all component parts:

- Stowage
- Plumbing
- Pump
- Electric circuitry
- Pump control panels which incorporates all switching, throttle controls, and gauges necessary to the operation of the appliance

Location of Component Parts

The following images show the general component parts of the appliance and layout of all major equipment.

Appliance Front View

Figure 2.1 - Appliance Front View

Appliance – Near Side (Kerb Side)

Figure 2.2 - Appliance Nearside (Kerb Side)

Pump Control Panel

Figure 2.3 - Pump Control Panel

Pump Panel Switch Cluster

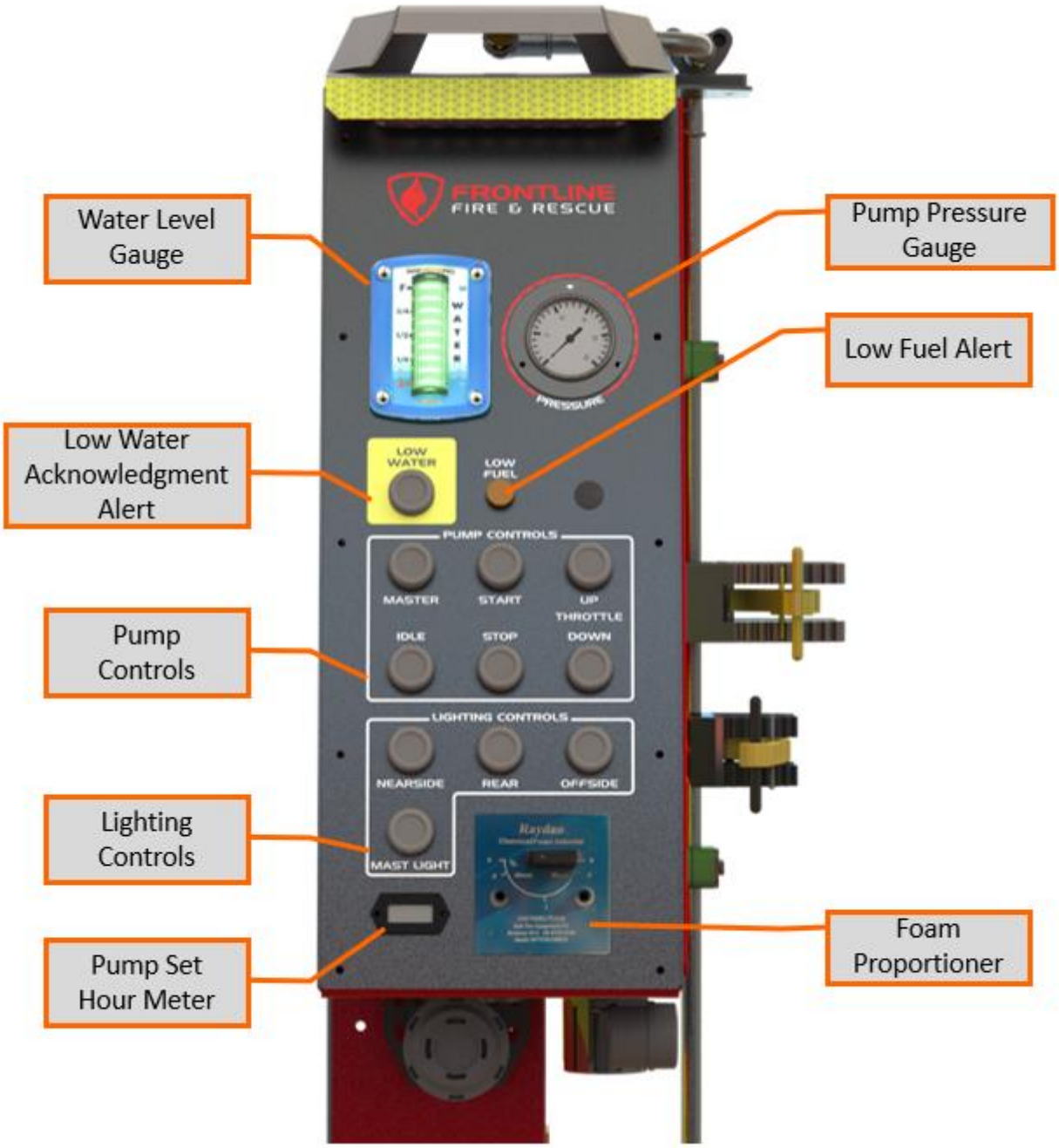


Figure 2.4 - Pump Panel Switch Cluster

Delivery / Tank Fill / Pump to Tank – Nearside

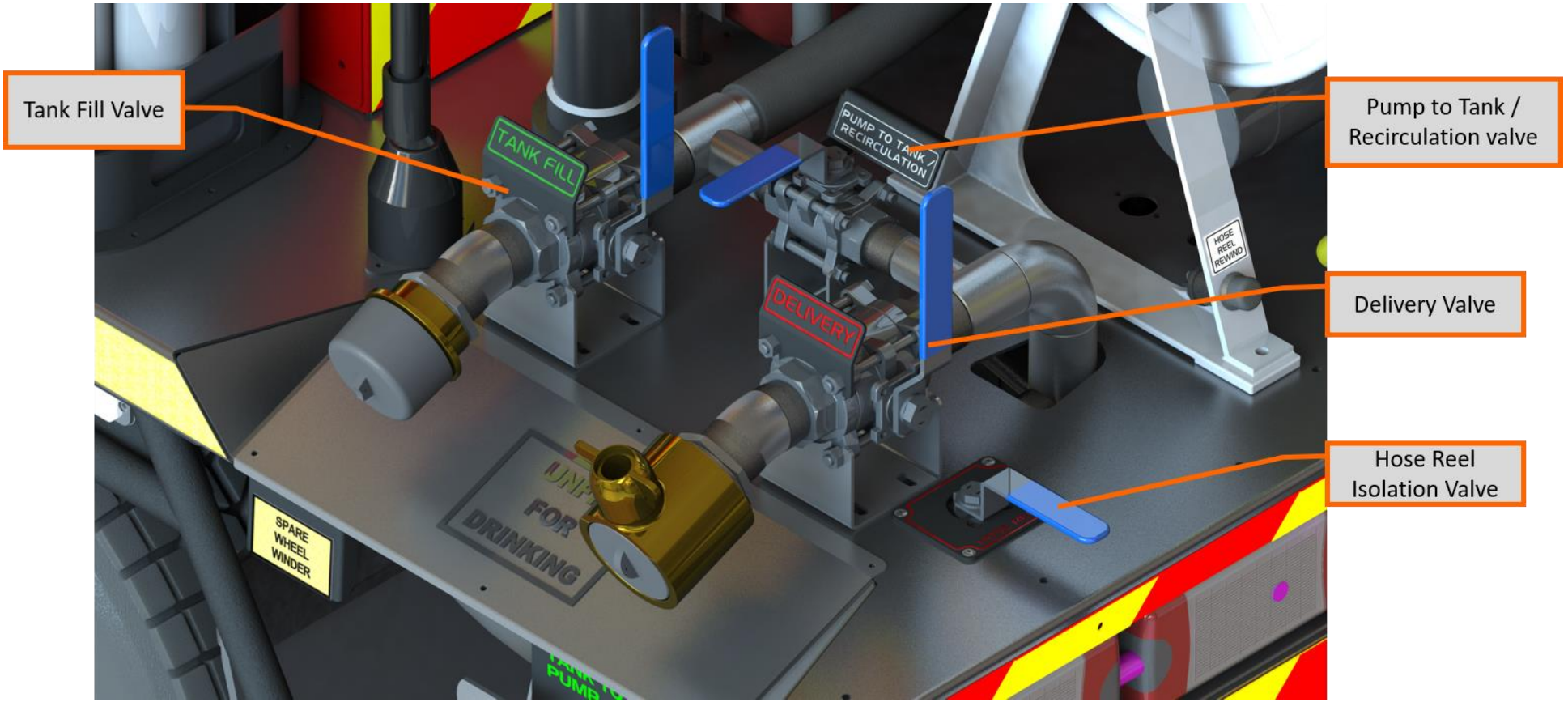


Figure 2.5 - Delivery/Tank fill/Pump to Tank Valves - Nearside

Tank to pump / Hard Suction Valve

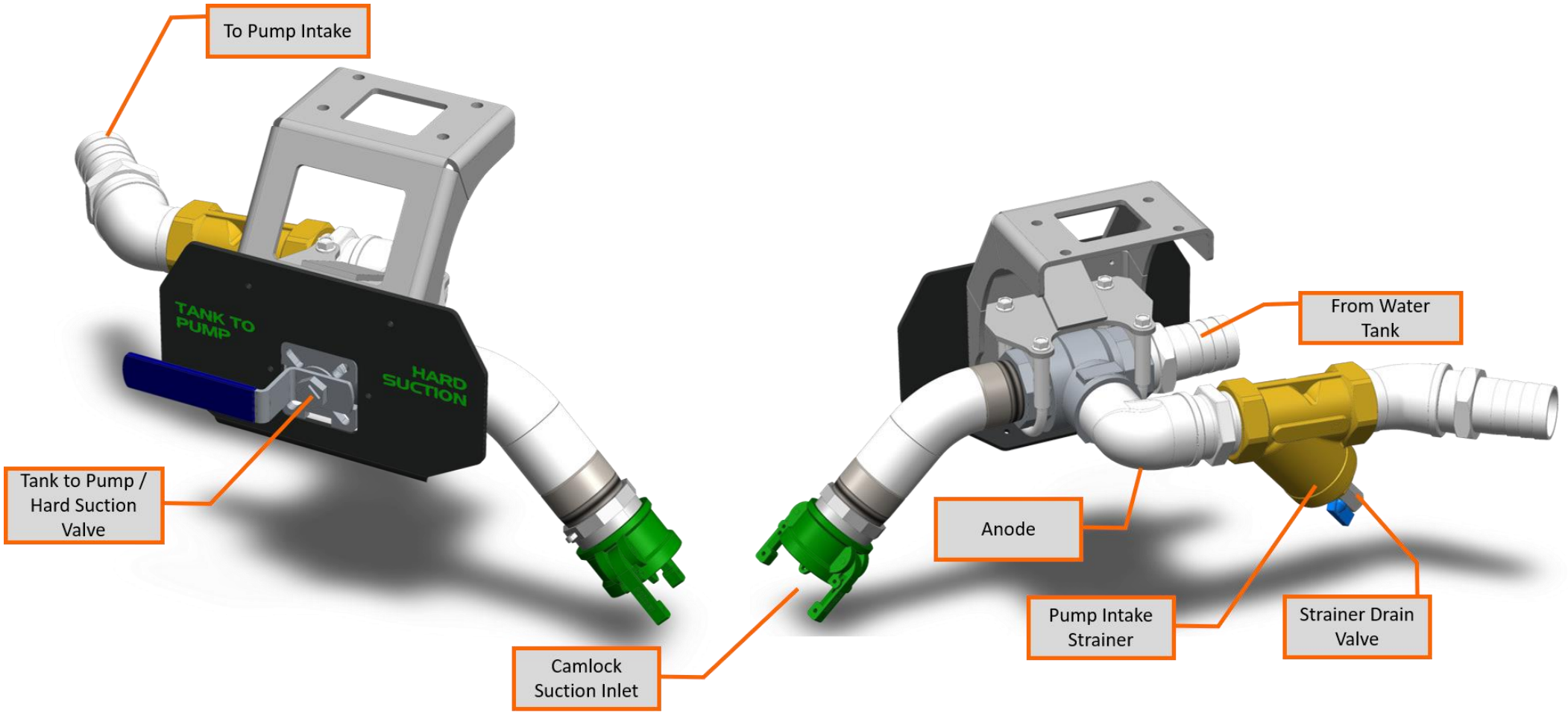


Figure 2.6 - Tank to Pump/Hard Suction Valve

Appliance – Offside

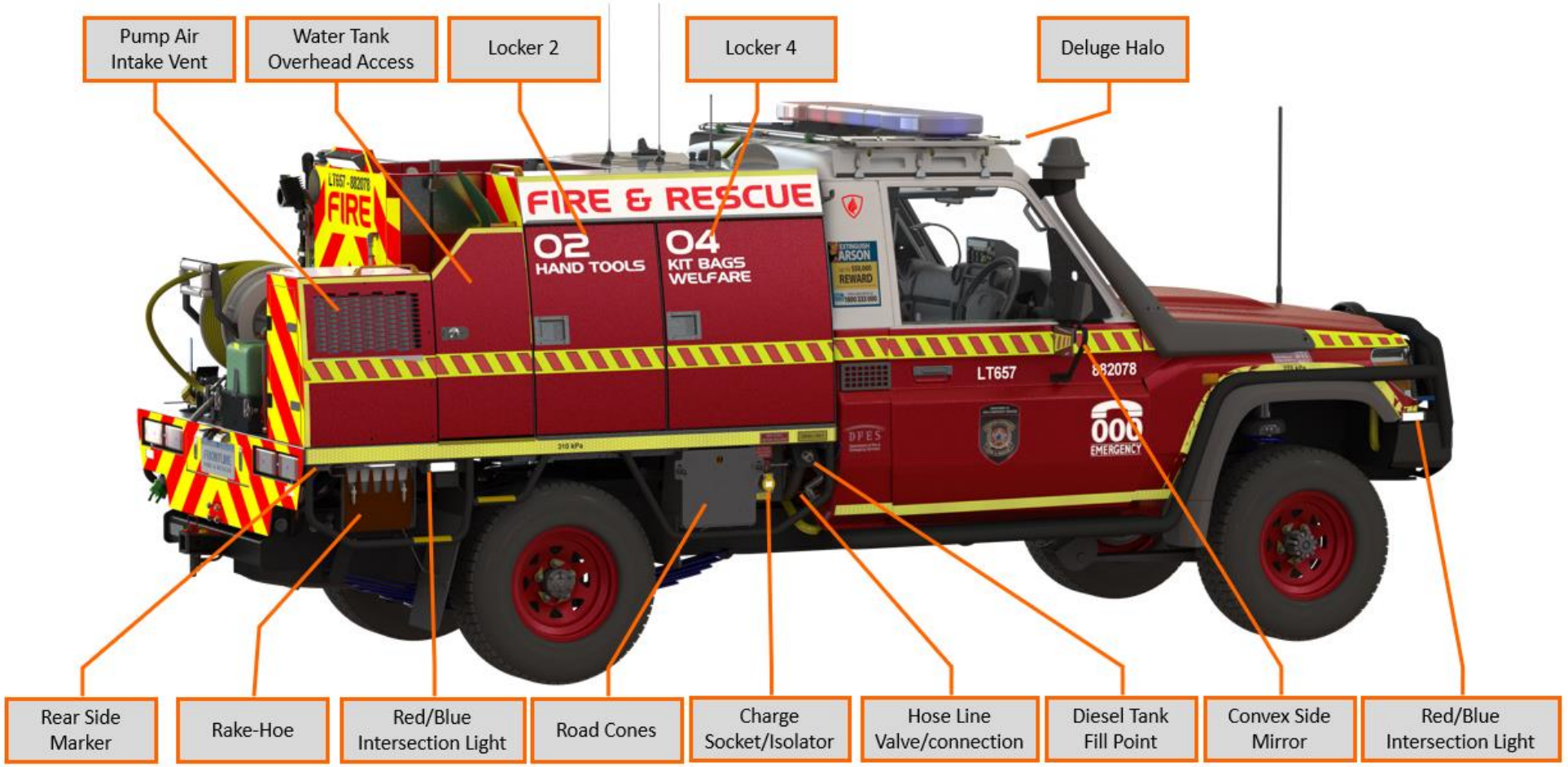


Figure 2.7 - Appliance Offside

Battery Charger/Isolate Switch

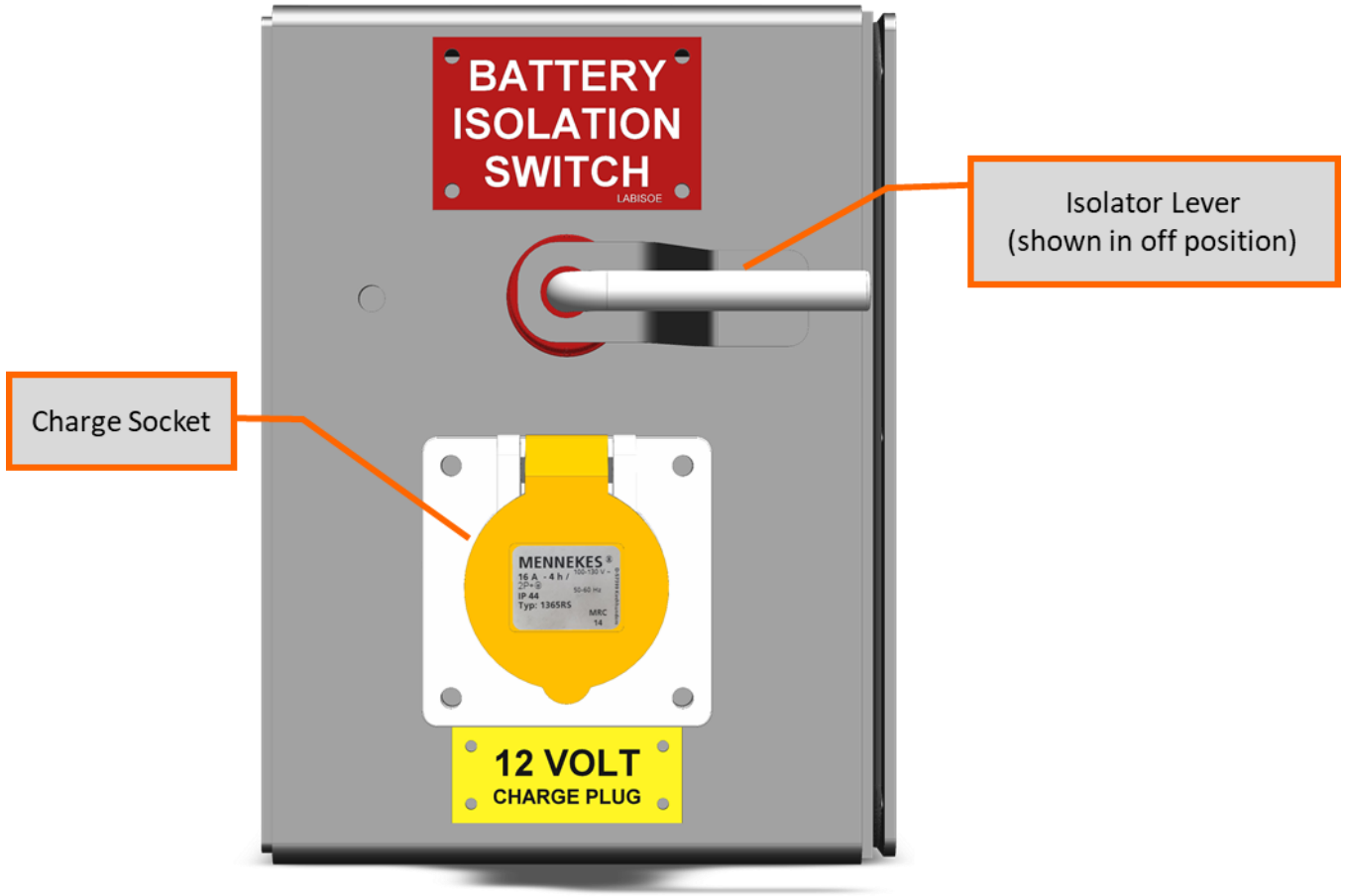


Figure 2.8 - Battery Charger/Isolation Switch

Appliance – Rear

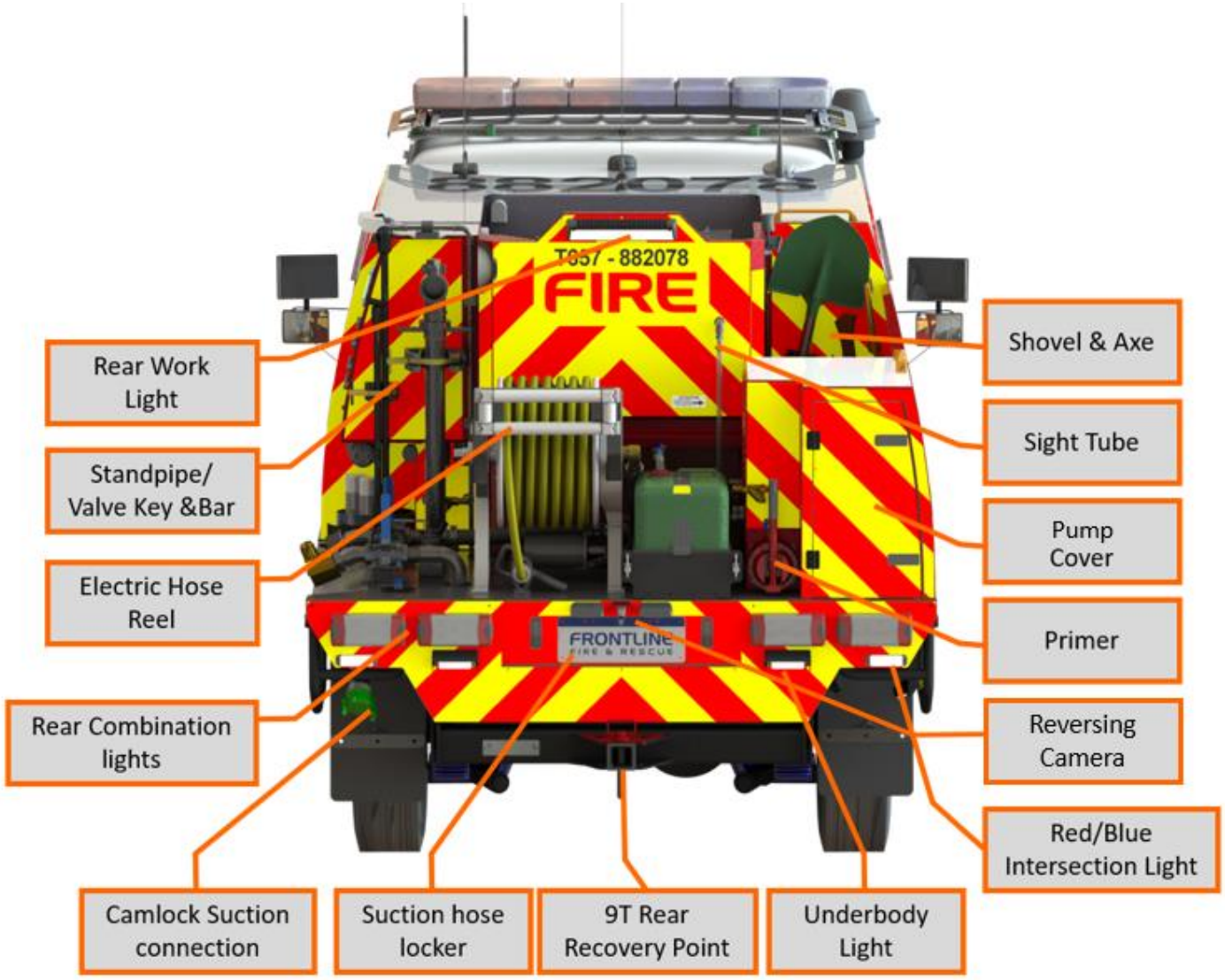


Figure 2.9 - Appliance Rear

Diesel Engine

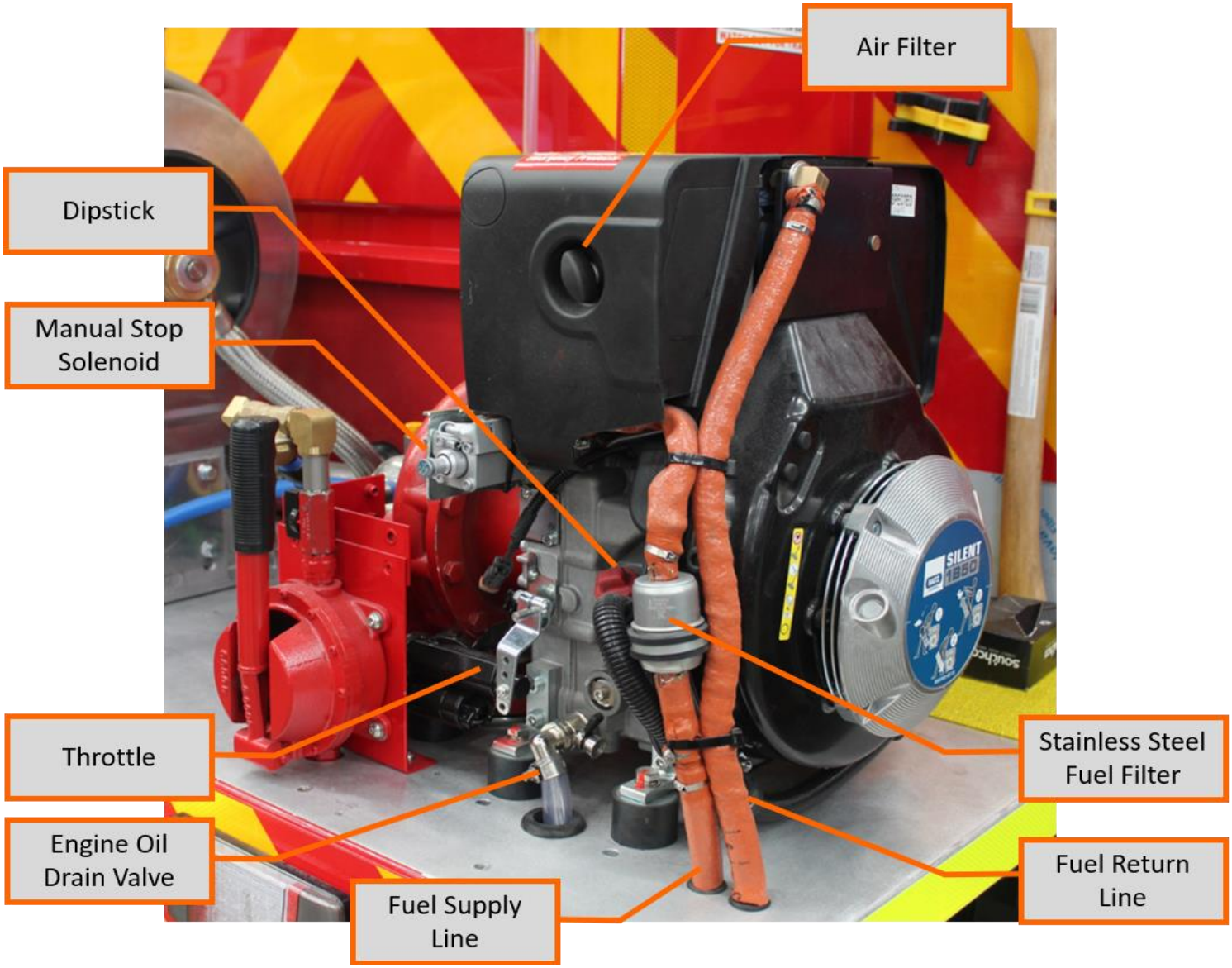


Figure 2.10 - Diesel Engine (cover removed)

Pump

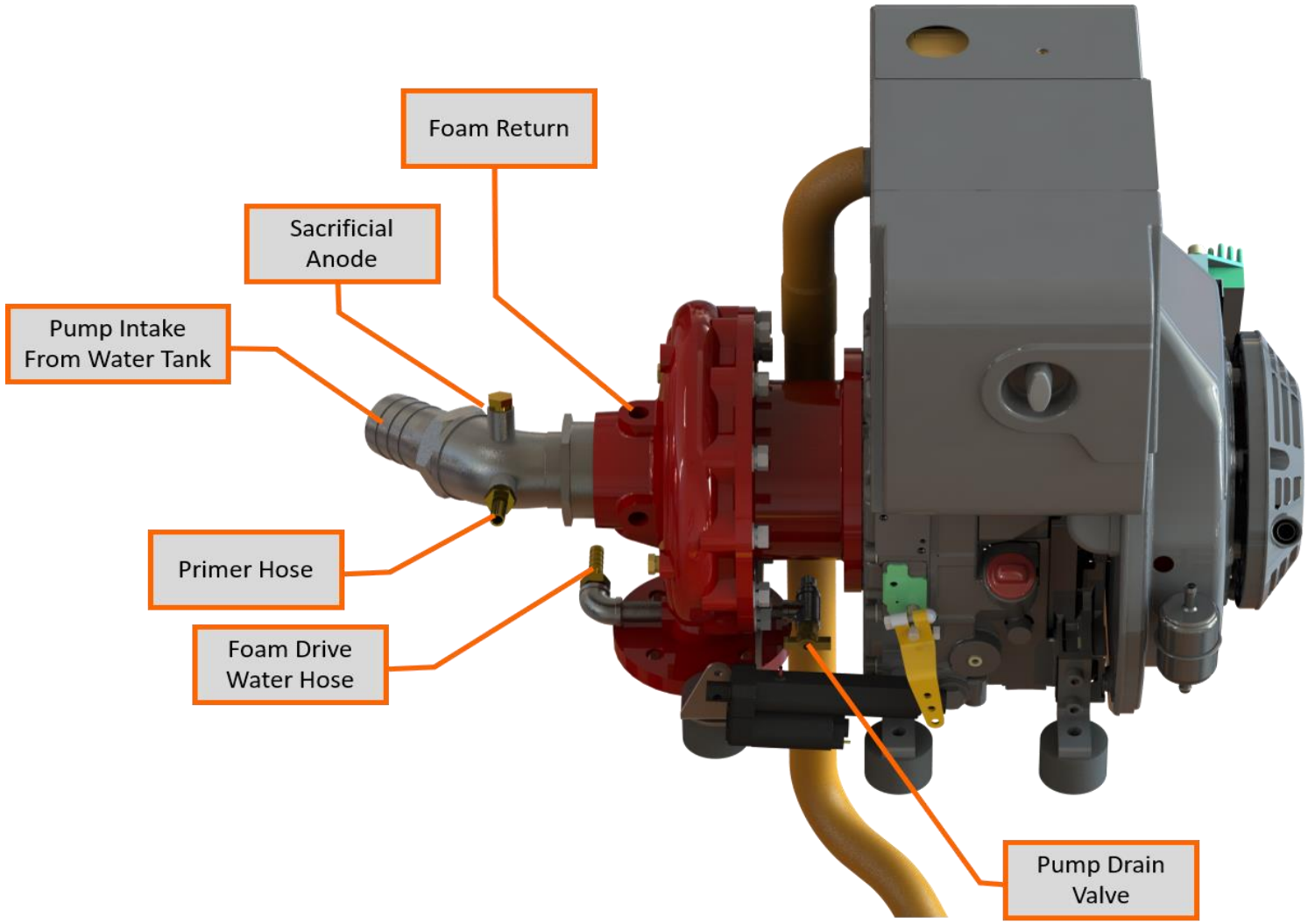


Figure 2.11 - GAAM MK70 Pump

Appliance – Top View

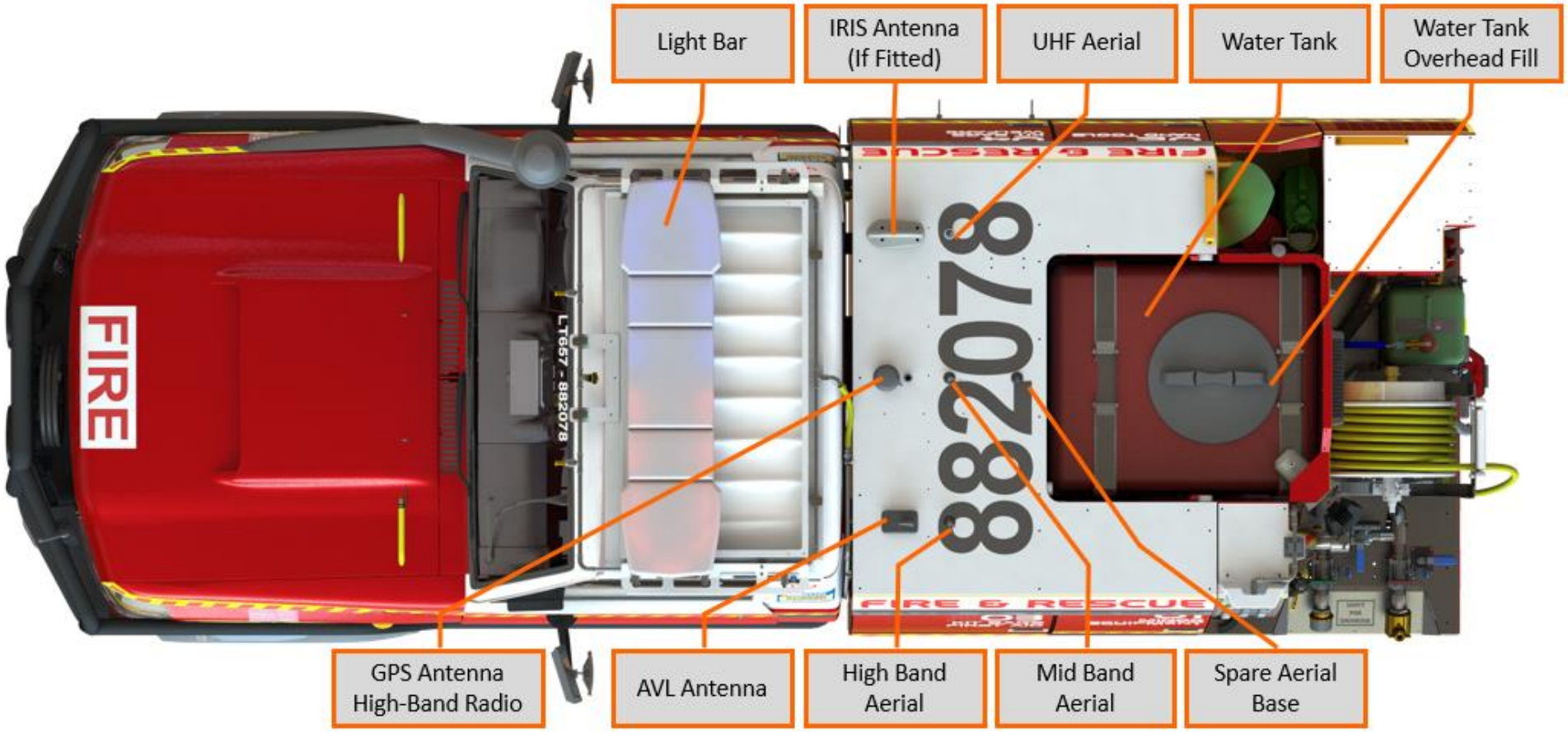


Figure 2.12 - Appliance Top View

Hose Reel

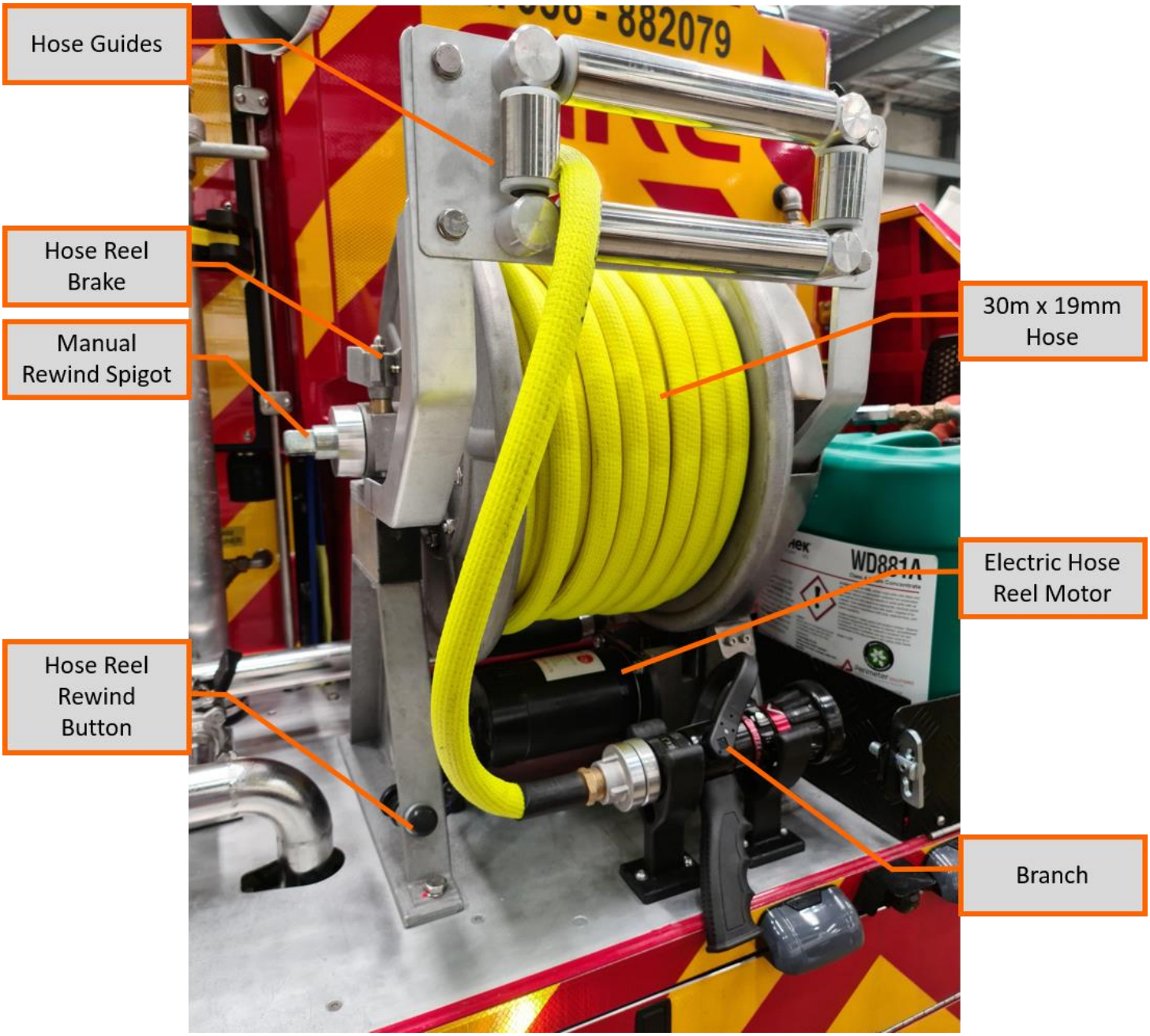


Figure 2.83 - Hose Reel

Lockers

Near Side – Locker 1

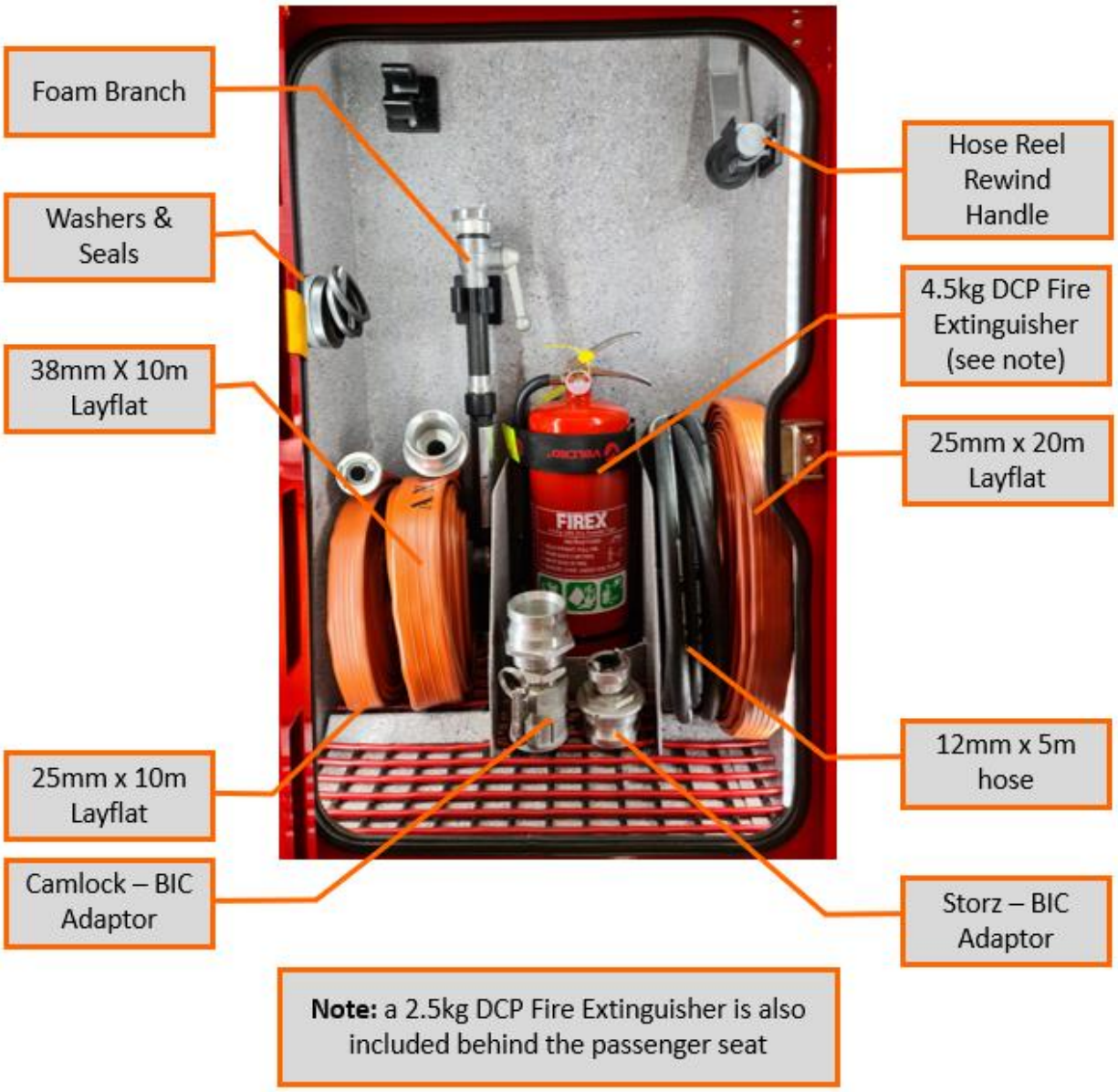


Figure 2.14 - Locker 1

Offside – Locker 2

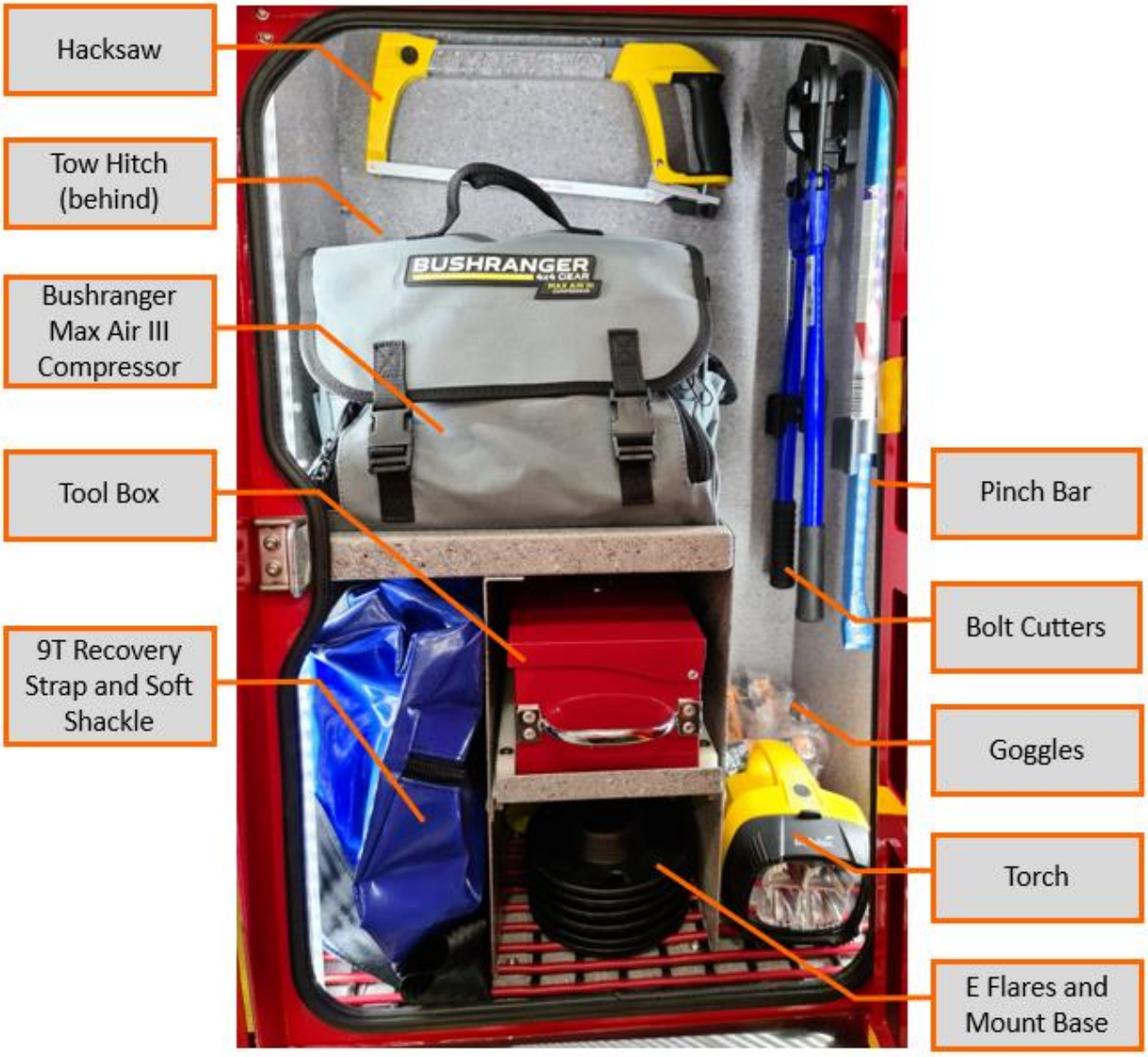


Figure 2.95 - Locker 2

Nearside – Locker 3

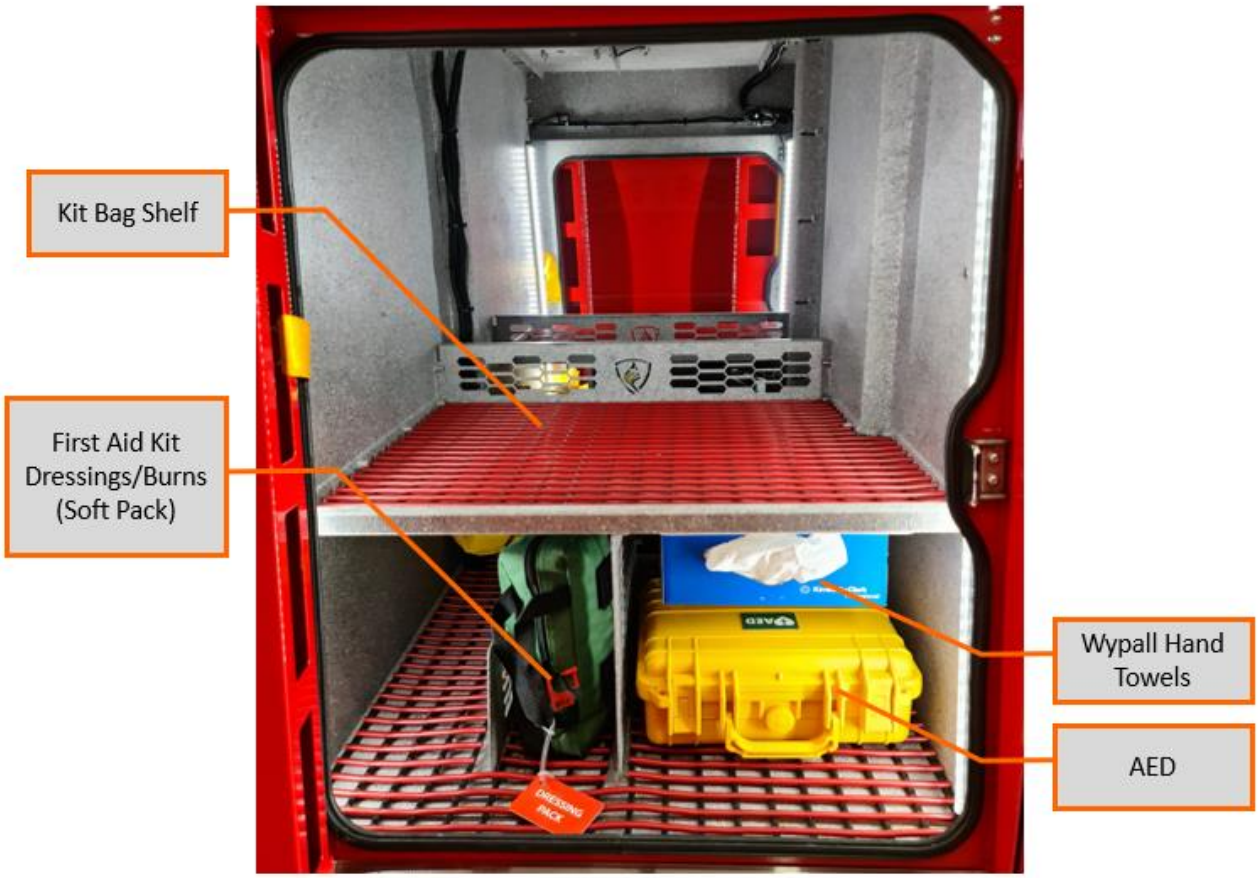


Figure 2.16 - Locker 3

Offside – Locker 4

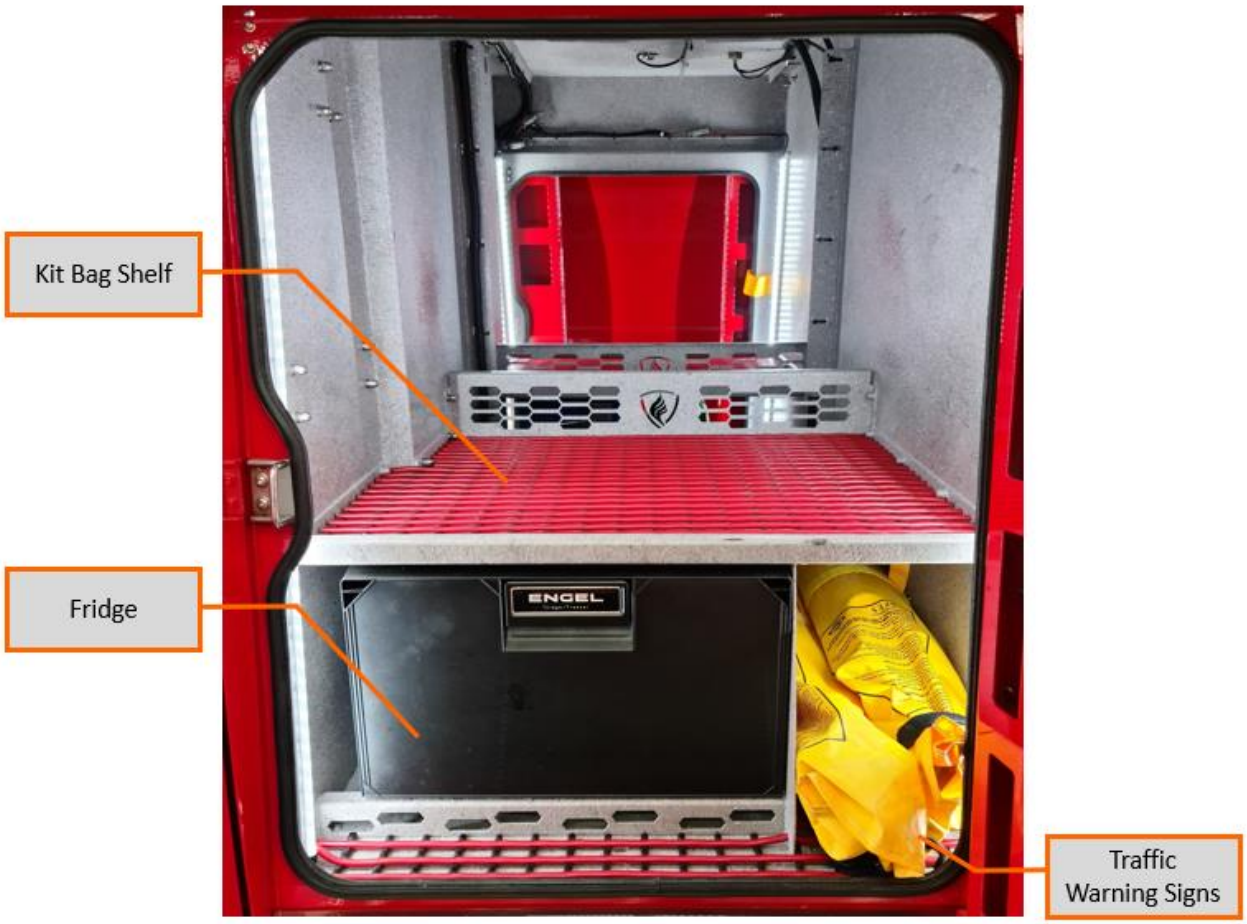


Figure 2.107 - Locker 4

Suction Hose Locker

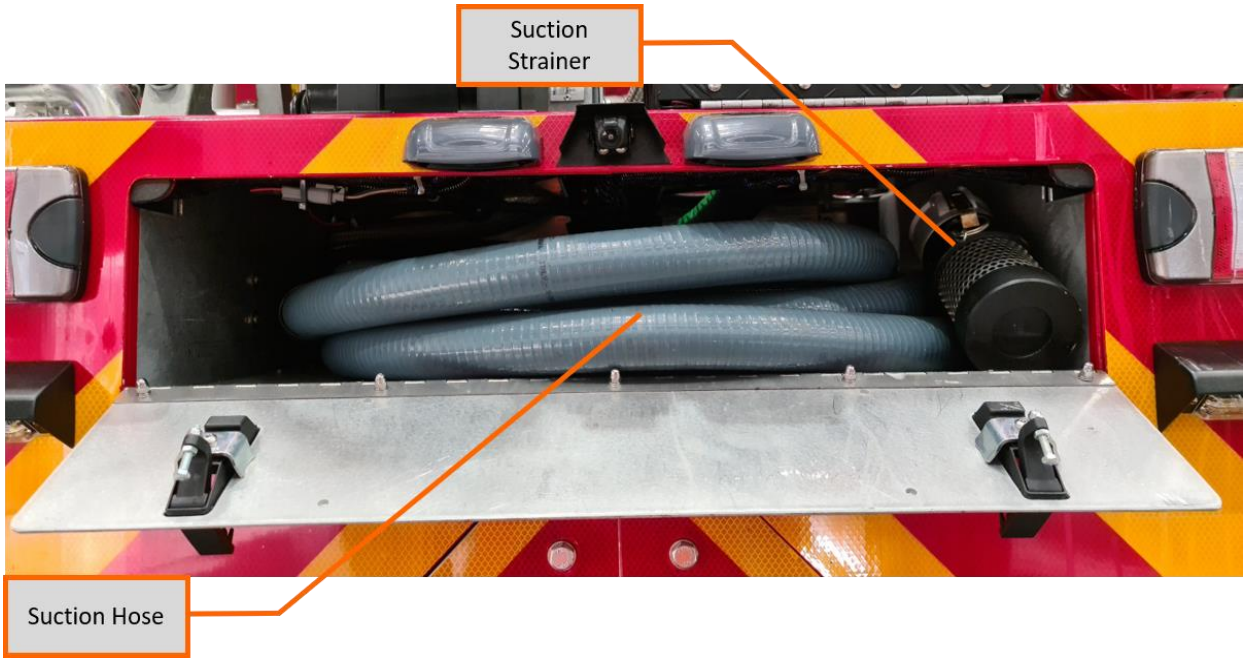


Figure 2.18 - Rear Suction Hose Locker

Tank Access Deck

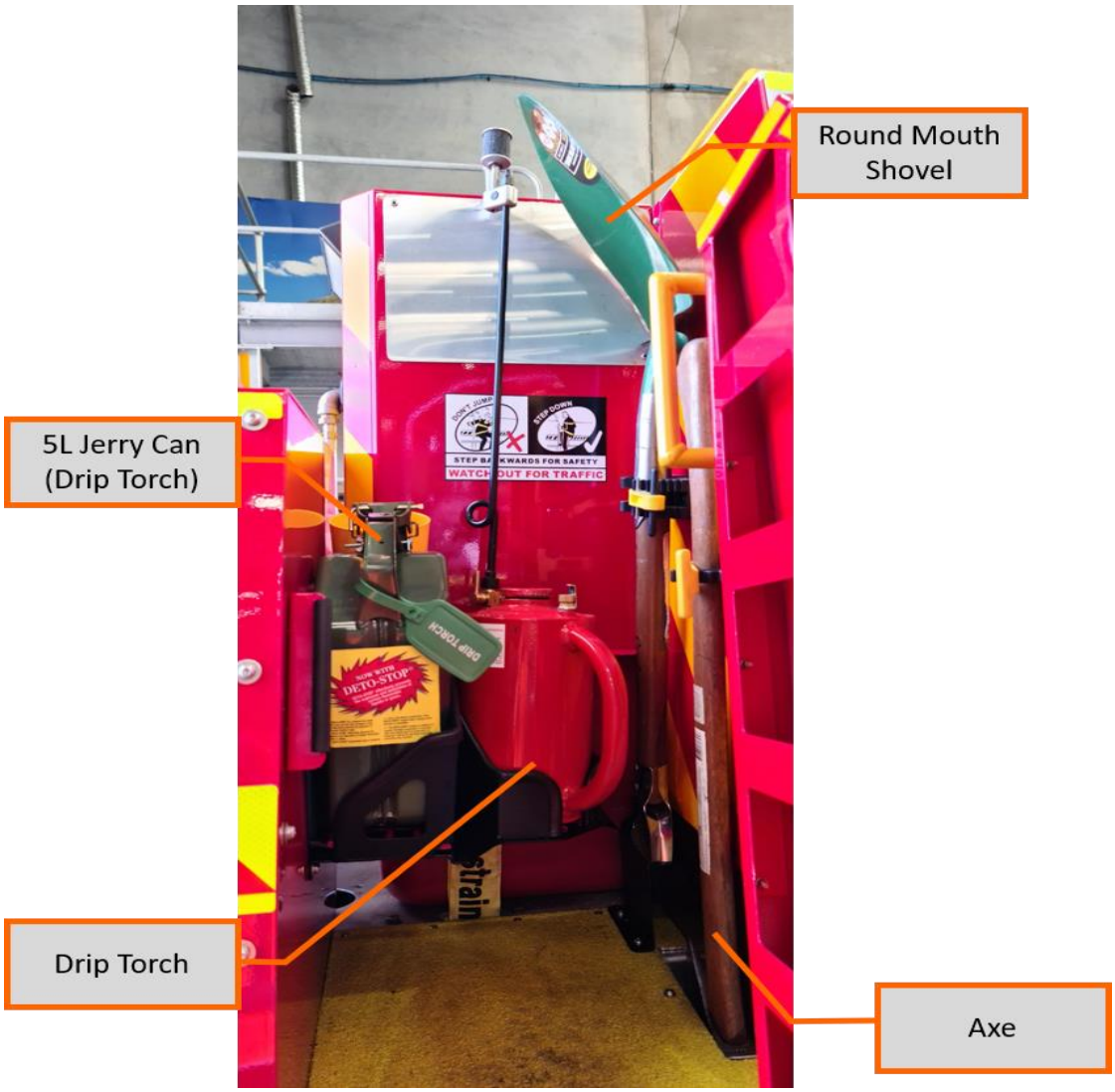


Figure 2.19 – Tank Access Deck

Appliance Routine Checks

Pre-Use Checks (VPOWER)

This chapter will give the firefighter the knowledge to carry out a thorough check of the Light Tanker and the location of some of its controls. Pre-use checks are performed to ensure the vehicle is safe, roadworthy, and ready for operational duties. The VPOWER system should be followed, by the driver and crew, when checking the appliance.

Weekly/Monthly Checks

In conjunction with the pre-use checks, weekly/monthly/Quarterly/Annual checks are required to be completed on the appliance, this will ensure the appliance and all its stowed equipment is operationally ready when required.

To ensure the correct checks are being completed on the appliance please refer to the schedule of checks (Volunteers should see Volunteer Hub > Forms/Documents > Schedule of Checks). And select the schedule of checks appropriate to your Brigade/Group/Unit (BGU).

Please refer to addendum C for the stowed equipment check list, this can be printed out and used to assist in checking the appliance stowage and ensure all the stowage items are in their correct locker locations.

Pump Engine Check

The pump engine should be checked when cold, this will ensure when checking the engine oil level, a correct reading will be visible on the dipstick. (See Figure 5.3)

Foam System Check

The foam system is fitted with a strainer on the pump control box. When checking the foam system, it is important that the strainers are removed and cleaned regularly. This will ensure that there are no blockages or restrictions in the system. A Y strainer spanner is located in the locker 3 toolbox. (See Figure 3.1 & 3.4)

It is also important to remove the foam pickup spear from the foam drum and rinse with fresh water, once rinsed inspect the seal ensuring it is undamaged and there is no foam crystallisation on the spear which would prevent it from operating as it is intended. It is also important to check that the ball bearing is not jammed inside the spear.

Once both checks are complete run the foam system at 0.1% through to 1% and ensure all percentage positions are working. If the foam system is not operating the proportioner could have a blockage commonly caused by foam crystallization or build up. Place the pickup spear in a bucket of warm soapy water. With the pump running, operate the foam system at 1% and open the delivery valve. This will cause a large vacuum and draw the warm water into the proportioner and Liquify any foam build up. In the event none of these measures are effective the foam system will require inspection by a service technician.

Figure 3.1 - Foam System Strainers

Hand Primer

When checking the primer is serviceable it is important to ensure that the diaphragm is completely sealed and does not allow air to be introduced when operating. To check the primer, with the primer valve closed pull gently on the handle, you should feel a vacuum be developed, this will indicate that the primer has a good seal on the diaphragm and is operating correctly.

If when pulling the handle with the primer valve closed, the handle moves freely and there is no resistance this will indicate that the diaphragm is possibly damaged and will require replacement.

Figure 3.2 - Hand Primer

The primer also has a strainer fitted and located on the primer on the rear face of the pump control enclosure (see figure 3.2). It is important to also clean the strainer regularly.

Under Bonnet Checks

Please refer to Addendum A for a quick reference of vehicle inspection points for the location of the below cab chassis inspection points.

Windscreen Washer Reservoir

The windshield reservoir is located under the bonnet on the Passenger side. If fluid level is low top up the reservoir with fresh water.

Brake Fluid

The brake fluid is located on the offside under the bonnet, the reservoir is marked with a Max and Min indicator line, if the brake fluid is below the max indicator line seek assistance from your service provider.

Clutch Fluid

The clutch fluid is located on the offside under the bonnet, the reservoir is marked with a Max and Min indicator line, if the clutch fluid is below the max indicator line seek assistance from your service provider.

Power steering fluid

The power steering fluid is located on the offside under the bonnet, the reservoir is marked with a Max and min indicator line, if the power steering fluid is below the max indicator line seek assistance from your service provider.

Coolant

The coolant reservoir is located at the front of the engine compartment under the bonnet, the reservoir is marked with a Max and Min indicator line, if the coolant level is below the min indicator line seek assistance from your service provider.

Engine Oil

The engine oil dipstick is located on the driver side under the bonnet and is colour coded yellow, checking the oil level when the engine is cold will give the most accurate oil level on the appliance engine. If the engine oil is low, volunteers should seek assistance from their service provider, career personnel should follow the relevant SOP.

Strainers / Deluge Filter

There are several strainers and filters fitted to the appliance, each of these strainers and filters will require regular inspection and cleaning to ensure efficient operation of the appliance.

The strainers and filters are:

- Foam drive water strainer
- Pump intake strainer
- Primer strainer
- Deluge Filter

When checking the strainer and deluge filter:

1. Move Tank to Pump / Hard Suction valve to the Hard-Suction position (This will isolate the appliance water tank)
2. Open the delivery valve to drain all excess water from the pump and plumbing
3. A strainer spanner and filter tools are supplied in locker 2 toolbox to remove the strainers and deluge filter
4. Rinse strainers and deluge filter under fresh water
5. Re fit all filters and strainers
6. Rotate valve back to Tank to Pump position
7. Re prime pump and ensure water flow is established
8. Check for any leaks around the strainer and deluge filter housing
9. Activate the deluge system until the green ‘Crew Sprays Active’ light illuminates to re prime the deluge filter

Figure 3.3 - Deluge Filter

Figure 3.4 - Foam System Strainer

Fault Reporting

If a fault is located, check the Vehicle Fault Report book (VFR) to see if it has already been reported. If it has not, complete the VFR as per *Directive 4.3 – Repair & Recovery*.

For Volunteers, all mechanical and pump repairs or adjustments are to be carried out by the approved local service station or garage. The following procedure is to be followed:

- Check VFR book
- Record fault and sign
- Notify Captain or Apps Officer
- Captain or Apps Officer to contact Zone/Area Manager and FES workshops (O'Connor)
- FES Workshops will advise if repair can be carried out locally or by technician from Perth

In the event that the local garage is unable to affect the necessary repairs, the details of the fault should be referred by the Volunteer brigade by telephone to the Workshops during normal working hours, Monday to Friday 0700 to 1630 hours.

If fault occurs outside normal working hours, a report should be made to the Regional Duty Coordinator (RDC), or the Communications Centre ComCen, DFES Emergency Services Complex (ESC) Cockburn on (08) 9395 9209. The ComCen will notify the relevant departments of the action being taken to rectify the fault.

Career personnel should follow the normal fault reporting procedure.

Operating Procedures

Pre-departure

Remove Battery Charger Connection

The Light Tanker appliance is a 12 Volt vehicle, therefore only a 12v charger can be used.

An isolation switch and charger connection are fitted to the appliance and as a result the system will maintain battery preservation whilst the appliance is on charge but not in use.

The isolator and charge socket are located on the off side of the appliance under locker 4 (see Figure 2.8).

Remove the charge lead and turn the isolator lever to the on position in preparation for departure.

Low Voltage Cut off Solenoid.

The appliance has several auxiliary electrical systems fitted resulting in a large current draw on the battery. Due to this, a low voltage cut off solenoid is fitted into the system to ensure the battery cannot be depleted below 12 Volts, maintaining an adequate voltage to ensure the appliance engine can be started.

If the appliance engine is turned off, all ancillary systems will operate until the battery reaches 12 Volts. At this voltage, the solenoid will isolate, protecting the battery to ensure the engine can be restarted. Once the engine is restarted the solenoid will automatically re-energise at 12.4 Volts (approximately 30 seconds) providing power to all ancillary systems.

NOTE: Ancillary electrical systems include the emergency warning system, Radios, works lights and pump.

Figure 4.1 – Low voltage cut off solenoid

Stowing PPC in the Body

Kit Bag stowage is provided in lockers 2 and 4 on upper shelves.

These shelves have a weight limit of 30kg each and are to be used for kit bags and personal items only.

Towing

The vehicle is fitted with a tow hitch and a 7 pin round socket trailer electrical connection.

The tow hitch is not fitted as standard. It is located in locker 2 behind the air compressor.

Due to the load on the vehicle, maximum of 2.0 tonnes gross mass trailer is permitted.

This limit is determined by the trailer ball weight being added to the vehicle.

Water Tank Level When Towing

The operator is required to lower the water tank level to "water level when towing any trailer" decal prior to towing.

This will ensure that when towing a trailer the vehicle will still remain at a safe operating mass of 95% of the appliance GVM.

The decal has been fitted to the rear of the appliance at the sight tube. (See Figure 4.2 & 2.9)

Figure 4.1 - Water level when towing trailer - Decal

Mobilisation

Emergency and Hazard Warning System

The Emergency Warning System (Code 3 Pursuit) has the inclusion of the rumbler, and the dual siren overlay and as a result a second siren is fitted to the appliance. A Hazard Systems MR-3 Siren is being used on the Light Tanker with the control head located on the centre console panel. (See Figure 1.3)

Respond (three dots)

The respond button activates all warning devices including the alternating headlights. Pressing this button again will allow you to cycle between the wail or yelp tones of the siren. Additionally, activating the respond and changing between the wail/yelp and rumbler will change the flash patterns of the emergency warning beacons.

Park (two dots)

The park button activates all the warning lights, except the alternating headlights.

Also, pressing this button terminates the siren and flashing headlights. The roof beacons and strobe / Winkie lights will remain ON.

Push this button again the achieve the down grade function and ONLY the upper-level warning beacons will remain ON.

OFF (one dot)

This button terminates all warning devices.

Operating instructions

When turning out or responding, press the RESPOND button or PARK button depending on the type of response. I.e. lights and siren or lights only.

- On arrival press the PARK button
- When departing the incident press the OFF button

Hazard Lighting (Amber Beacons)

The emergency warning system also includes upper-level amber hazard lights to enhance the vehicle's hazard lights (indicators).

Where the vehicle is situated in a hazardous location when not responding to an incident (e.g. training or maintenance), then the hazard lighting should be used.

The hazard lights are activated by the vehicle's hazard light switch, located on the cab centre console, when interlocked with the vehicle's hazard lights by pressing the 'amber beacons' switch on the lower cab centre console (see Figure 1.3).

Pressing the respond button on the MR-3 siren control will override the amber lights and will change the display back to red and blue emergency warning lights.

NOTE: this does not cancel the hazard lights, so be sure to deactivate them by pressing the hazard switch prior to responding to an incident.

Air Horns

The emergency warning system incorporates an electronic air horn tone which is programmed into the controlling node. To operate the air horns, depress the horn on the steering wheel whilst the emergency warning system is in the response mode the electronic air horn tone will sound prior to latching on the rumbler tone.

Rumbler

The emergency warning system incorporates a rumbler low frequency tone which is an additional frequency programmed into the controlling node. The rumble tone is a low frequency tone which is designed to further alert road users of the presence of the responding appliance. To operate the rumble tone, depress and hold the horn on the steering wheel for 3 seconds, once activated the rumble tone will latch on for 8 seconds. Whilst the rumbler is latched on, the emergency warning light bar will change flash pattern to further gain the attention of other road users to visually alert them of the approaching appliance.

Safety Message: Do not activate the siren indoors or close to pedestrians

Public address system (PA)

The PA system works through the emergency warning system.

The PA system does not need the ignition to be on before it is used. Simply pick up the PA microphone, depress the PTT button on the side and speak.

The PA microphone is located at the rear of the cab between the seats.

Driving Considerations

The Toyota Landcruiser Manual provides clear instruction on driving this vehicle.

The vehicle includes the following features which each driver should familiarise themselves with:

- Cab Layout
- Dash panel instruments and Controls
- Stability/Traction Controls
- Diesel Particulate Filter (DPF)

Introductory information is provided below on some of the vehicle features, but for further information refer to the vehicle owner's manual.

Vehicle Clearance

The driver must be aware that the clearance under both the front and rear differentials is **230mm**. Therefore, the driver must ensure the terrain is suitable for the safe movement of the appliance. In soft sand, this vehicle **WILL** bottom out in deep ruts. Drivers must drive with the appropriate momentum to ensure they are able to negotiate these areas. If the vehicle becomes bogged at a bushfire, serious consequences could result. The driver must also be aware of side and overhead clearance to prevent damage to body panels and warning light bar.

High Centre of Gravity

This appliance has a higher centre of gravity and consequently requires more caution when cornering in both dry and wet weather conditions. Therefore, the system of vehicle control plays a crucial role in driving this appliance.

Weight and height

Although the light tanker appliance is considerably smaller than other appliance builds, the vehicle is still heavy for its size. The appliance weighs approximately 3.78 tonnes and as a result braking distances will need to be taken into consideration.

The height of this appliance is. 2080mm to the top of the light bar, overhead clearance must be taken into consideration due to the additional height from the aerials, such as overhanging trees, when traversing thought tight areas etc.

Side winds

Be aware of the effect strong side winds can have on this appliance. The wind will affect the steering and the road handling characteristics of the appliance.

Exhaust Ignition Risk

The exhaust of vehicles can heat up enough to become an ignition risk. The driver must be aware of this hazard when driving in long grass or parking on combustible material.

When conducting off and on road checks ensure there is no flammable material caught up around the exhaust system.

Stability/Traction Control

The vehicle includes electronic stability control and traction control. This is automatically turned off as four-wheel drive low range is selected. When conducting On-Road to Off-Road checks, prior to travelling off-road in sand, this control should be turned OFF. To disable the traction control, press and hold the VSC OFF switch, located on the right side of the steering wheel, for more than three (3) seconds. (See figure 4.3 below) The TRC OFF indicator light and VSC OFF indicator light will illuminate. If the vehicle loses forward momentum and is stalled out, these systems will re-enable. Before continuing in high range, the switch must be pressed for more than three (3) seconds every time the vehicle is started.

To enable the systems, after driving in sand terrain or when travelling in other conditions, press the switch again. For more information on these systems, see the vehicle owner's manual.

Stability control should not be turned off when driving On-Road or on hard packed surfaces.

Figure 4.2 – Stability Control Off Symbol

Figure 4.4 – Traction/Stability Control Switch

Diesel Particulate Filter (DPF)

The VDJ79R series land Cruiser is now fitted with a Diesel Particulate Filter (DPF).

DPF systems are designed to reduce the emission of hydrocarbons (HC), carbon monoxide (CO) and particulate matter (PM) from the vehicle exhaust. They do this by filtering exhaust gas and intermittently regenerating to clear PM and prevent blockage. During the regeneration process, the exhaust becomes hot so that the PM can be burnt.

For bushfire operations, the DPF should be managed in accordance with *SOP 3.5.2* to prevent ignition risk or blockage causing the vehicle to be immobilised.

A PM indicator level is displayed on the dash and will provide a level indicator from Level 1 though to level 10 (See Figure 4.5). This is in the odometer display and is one of four information displays selected with the toggle button (odometer, trip A and trip B are the other displays).

Figure 4.5 - DPF Level Indicator

Automatic Regeneration Operation

The DPF regeneration process normally happens automatically. During the regeneration process the engine injects a small quantity of fuel into the exhaust after combustion, increasing the temperature within the exhaust system and creates an environment where it is possible to burn off the accumulated PM.

In some cases, the automatic regeneration process may not occur or may be interrupted by certain operating conditions such as low speed, prolonged idling, and engine start/stop. If the process does not occur or is interrupted, the engine is programmed to recommence the regeneration process again when the vehicle is in motion or the engine is re started, and the required engine temperature has been reached. If the engine fails to complete or re start the automatic regeneration process, then manual intervention may be required using the DPF switch.

NOTE: The Automatic DPF Regeneration will normally commence at PM level 4

Manual Regeneration Operation

The appliance is equipped with a manual regeneration switch, when activated will force the regeneration process of the DPF. Providing there is enough PM in the DPF (level 2 or above), manual regeneration can be activated when the driver chooses to do so. It is recommended that the PM level is checked during the appliance weekly checks and at every shift change on station or on the fire ground. This will reduce the risk of the appliance completing a DPF regeneration whilst on the fire ground.

If for in any case the appliance requires a DPF regeneration whilst on the fire ground the appliance will be required to return to clear open ground free of grass and vegetation such as a roadway or clear track. This is to ensure the safety of the crew and the appliance.

To complete a manual DPF regeneration

- Ensure the DPF PM indicator Level is 2 or higher
- Park the vehicle in a well-ventilated open space free from any flammable material including long grass and vegetation.
- Return the gears to neutral and leave the engine running
- Press the DPF switch to start the DPF regeneration

The DPF indicator will flash while regeneration is occurring.

Whilst the DPF regeneration is in operation the following characteristics may be observed

- Engine RPM increased to 750RPM
- A Noticeable different smell compared to a conventional diesel smell
- A small amount of white smoke may be emitted, however this does not indicate a malfunction
- It is possible a small amount of smoke may be emitted from the underside of the appliance due to small amounts of trapped grass/vegetation

Depressing the accelerator or clutch pedal will stop regeneration.

NOTE: It is important to ensure the operator completes an on road and off-road check prior and immediately after the appliance has been off road to ensure vegetation is not collected around the DPF.

DPF Warning Notification Matrix

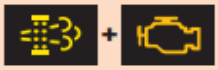
		Instrument Cluster Type	Warning Description	Warning Notification Image	Driver Action If Required
Driver Intervention Required	DPF Filter Partially Full – Requires Driver Intervention	All	DPF Light will illuminate. DPF level meter = 7		Drive vehicle at over 60 km/h for approx 30 min until DPF lamp or notification in Multi Information Display extinguishes (if equipped)
	DPF Filter Full – Requires Driver Intervention Urgently		DPF Light will flash. DPF level meter = 9		STOP in a safe location and perform a manual regeneration
Dealer Intervention Required ASAP	DPF Filter Full Requires Dealer	All	DPF Light and MIL will illuminate. DPF level meter = 10		Driver action is not possible and vehicle will need to be inspected by the nearest Toyota Dealer

Figure 4.6 - DPF Warning Notification Matrix

Driving Off-Road

Refer to the Off-Road Driving Manual

Freewheeling Hubs

It is DFES policy that freewheeling hubs always remain in the ‘lock’ position. However, when travelling over long distances, crews may opt to leave the hubs in the ‘Auto’ position.

It should be noted that if the hubs are put into the “Auto” position, the vehicle must be stopped before selecting H4. The hubs will then engage automatically when the vehicle is put into motion. The hubs will disengage when the vehicle is stopped. It is for this reason that it is recommended that drivers select the “Lock” position before engaging in firefighting duties, as per SOP’s.

In order to make these changes, the driver will need to utilise the wheel nut spanner, located behind the passenger’s seat.

For information on the freewheeling hubs and their operation please refer to the Manufacturer’s Owner’s Manual.

Recovery Points

The vehicle is fitted with front and rear recovery points for assisted recovery.

Vehicle recovery can be achieved by towing or snatching. A recovery strap and soft shackle is located in locker 2 and can be used for either tow or snatch recovery.

The appliance rear recovery point is incorporated in the tow hitch. It is rated for a 9 tonne snatch recovery and is painted Red. (See Figure 4.7).

The appliance front recovery point is rated for an 8 tonne snatch recovery and is also colour coded red (See Figure 4.8).

For instruction on the soft shackle, please refer to the NUCOM.

Safety Message: Only SOFT SHACKLES may be used to attach to the front recovery point.

Figure 4.7 - Rear Recovery Point

Figure 4.8 - Front Recovery Point

Reversing Camera

The appliance has a rear-view camera fitted to the rear bumper of the appliance. The rear-view camera provides the driver of the appliance awareness of anything at the rear of the appliance when reversing. The camera vision is displayed on the media system screen. The reverse camera will automatically activate when the reverse gear is selected. The camera should be used in conjunction with the side mirrors and does not replace the need for a guide.

Tyre Change

A spare wheel is located underneath the tray at the rear.

A lowering system is used to bring the wheel to the ground. The bottle jack extension and handle are used to operate the lowering system. The lowering point is on the nearside of the vehicle beneath the pump panel. A ‘spare wheel winder’ sticker is included as a reminder for this location. Yellow reflective tape surrounds the lowering point where the jack extension is inserted to engage the lowering screw.

Turn the handle anti-clockwise to lower the wheel, clockwise to raise.

The vehicle bottle jack and tools are located behind the passenger seat. The jack extension bar is located in locker 2.

Follow the instructions in the User Manual for jacking and wheel change.

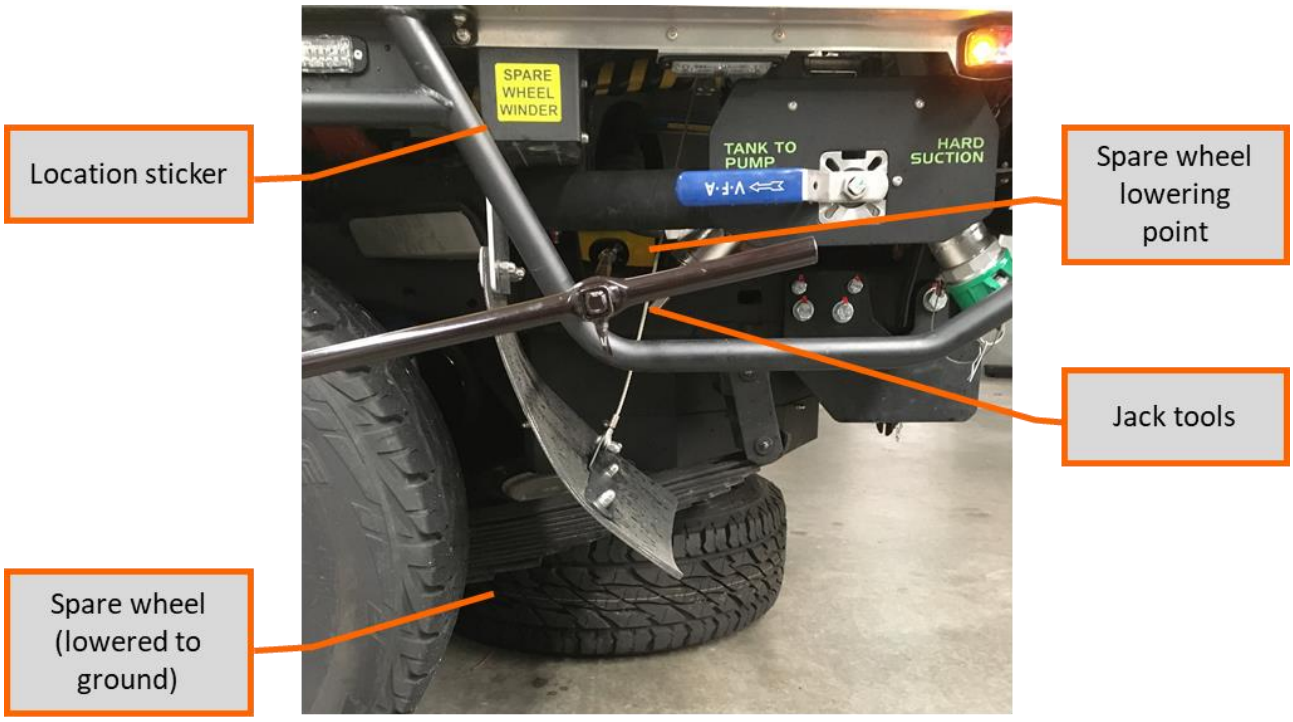


Figure 4.9 – Spare wheel details

Lighting

The Light Tanker has a number of different lighting functions that crews can utilise during night time or low light operations. The following information is supplied to give the operators a better understanding of the lighting, where they are located and how to operate them.

Scene lighting

The Light Tanker has 4 scene lights fitted.

The rear scene light is fitted to the rear of the appliance body producing 1850 lumens and has a 180-degree spread, approximately 10m from the vehicle lighting up the immediate working area. (See Figure 4.10) The rear scene light is interlocked with reverse, when reverse gear is selected the rear scene light will illuminate.

Both the nearside and offside scene lights are incorporated into the emergency warning light bar on the appliance roof.

A rear Mast light is also fitted to the appliance to provide an adjustable light option.

The switches to activate the scene lighting are located on the pump panel.

To operate the scene lights:

- Turn ignition on
- Turn park lights on
- Press the appropriate switch on the pump panel to turn the light on

Figure 4.10 - Scene Lighting

Driving Lights (Spot Lights)

The vehicle is fitted with driving lights. These will operate with the vehicle head lights once the activation switch is pressed.

Figure 4.11 – Driving Lights activation switch

Underbody Lights

6x Underbody lights are fitted to the perimeter of the appliance. The underbody lights will aid the driver of the appliance to navigate terrain in low light operations and further increase the lighting capabilities whilst moving around the appliance. The underbody lights are activated from the cab centre console using the underbody/ locker lights switch. (See Figure 1.3)

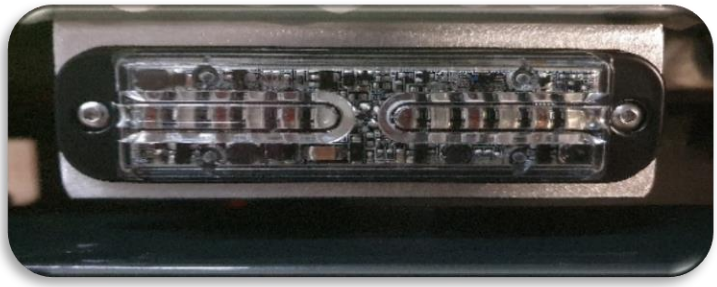


Figure 4.32 - Under Body Light

Locker Lights

Locker lights are fitted in all four lockers to further increase the lighting capabilities. The locker lights are activated from the cab centre console using the underbody/ locker lights switch.

Figure 4.43 - Locker Lights

(See Figure 1.3)

Pump Panel Lighting

A pump panel light is fitted onto the rear pump panel. The light at the rear console will illuminate with the pump panel master switch. (See Figure 2.3 & 2.4)

Figure 4.54 - Pump Panel Lighting

Fire Fighting System

Appliance Pump Operating Procedure

The pump motor used on the appliance is a HATZ 1B50 and the pump is a GAAM MK70 single stage pump. The pump is located on the rear deck of the appliance and can be operated from two locations. In both locations the follow controls are provided: (See Figure 1.5 & 2.3)

- Master panel switch
- Pump start
- Pump stop
- Throttle UP/DOWN
- Return to Idle (only the rear pump panel)

The HATZ engines fuel supply is from the vehicle fuel tank, through a separate fuel pick up spear. The fuel pick up spear is located in the centre of the fuel tank and extends ¾ down the side of the fuel tank leaving the remaining ¼ of the fuel tank for the vehicle only. The fuel is supplied to the pump set via an electronic lift pump, which is also located under the appliance body.

The pump is also wired in a way that the engine requires power to stop. When the stop button is depressed in either of the two locations power is provided to the stop solenoid, stopping the engine. This safety feature has been built into the appliance to ensure in the event any part of the electrics fail the engine will continue to run and provide water to all outlets, with reference to the deluge system.

Emergency Shutdown

In the unlikely event where the pump needs to be shut down immediately and the Pump Stop buttons are not working, depress and hold the pump stop solenoid button until the engine has stopped. The stop solenoid button is located on the pump motor at the rear of the appliance, behind the locker door. (See Figure 4.15 & 2.10)

Figure 4.65 - Pump Stop solenoid Button

Pump Recirculation Valve

To protect the pump from overheating when running with no water being delivered, the Pump to Tank valve should be manually opened to permit water recirculation back to the tank.

The valve is located on the nearside rear deck in between the tank fill valve and the delivery valve. (See Figure 4.16 & 2.5).

When working with foam ensure this valve is closed. Only re-open once the system has been flushed.

Additionally, this valve is also used as the Pump to Tank valve and will allow the water tank to be filled when working from hard suction.

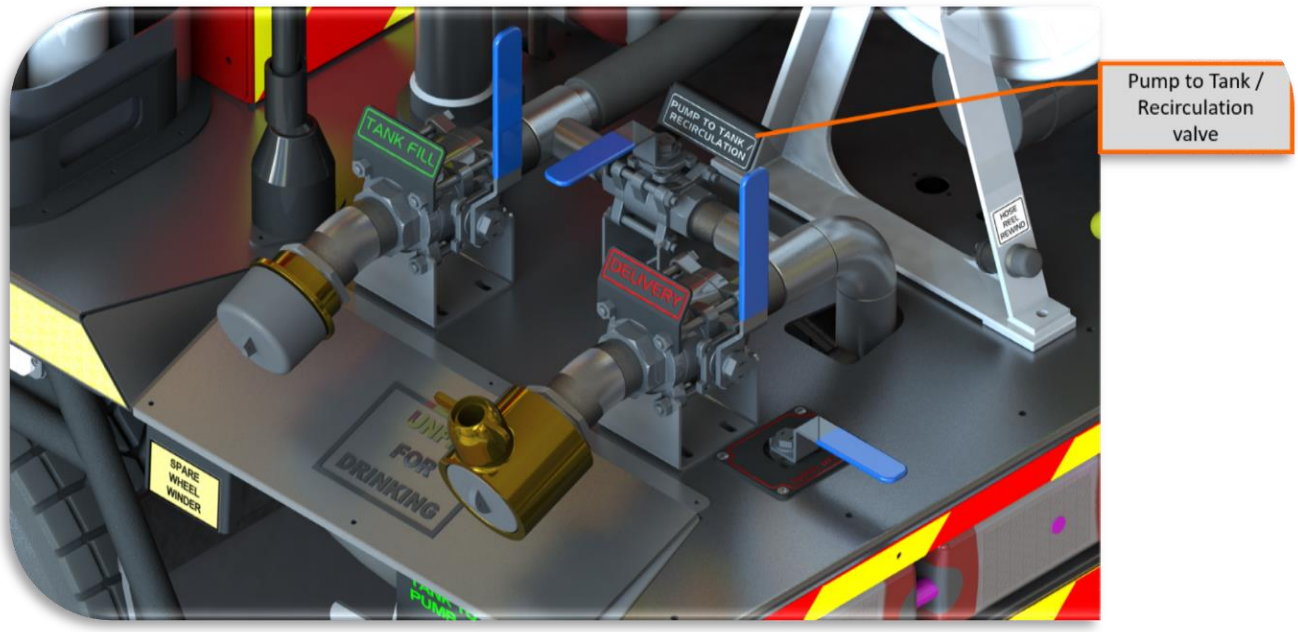


Figure 4.76 – Pump to Tank / Recirculation Valve

Priming

The primer fitted to the appliance is a manual hand primer type. To operate the primer, rotate the isolation valve handle and operate the primer handle back and forth until a steady stream of water is visible. It is important to ensure the primer valve is isolated prior to starting the appliance pump set.

Figure 4.87 - Hand Primer

Working from the On-Board Water Tank

Working from the on-board water tank is commonly referred to as “Tank to Pump”. Supply from the water tank is taken from the underside of the water tank and has a direct pathway into the pump, via the tank to pump valve / Hard Suction valve. (See Figure 2.6) Pumping schematic

When working from tank to pump:

1. Turn ON pump panel master switch
2. Start pump
3. Ensure the pump is primed
4. Increase throttle to the required pump pressure
5. Operate required delivery

Hose Reel

The appliance is fitted with an electric re-wind hose reels at the rear of the appliance. The hose reel also has a backup manual rewind function in case the electric motor fails. The hose reel has a (1”) supply line with an isolation valve. (See Figure 2.13).

The hose reel is fitted with 30m of ¾” hose

To operate the hose reels

1. Turn ON pump panel master switch
2. Start pump
3. Ensure the pump is primed
4. Increase throttle to the required pump pressure
5. Turn on the hose reel isolation valve (if required)
6. Run off required length of hose and lock off reel

Delivery valve

The appliance has 1 delivery on the nearside. The nearside delivery is fitted with a ball valve and a 64mm BIC coupling (See Figure 2.5). Pressure for the delivery valves is taken from the main pump pressure gauge on the rear control panel.

1. Turn ON pump panel master switch
2. Start pump
3. Ensure the pump is primed
4. Increase throttle to the required pump pressure
5. Connect layflat hose and branch
6. Open delivery valve

Front and rear hoses

A Hose is fitted to the front of the appliance and located at the bullbar. A second hose is located on the off side of the appliance between the body and the rear of the cab. A basket is fitted to the bullbar which incorporates the hose isolation valve and Storz connection. (See Figure 2.1). The offside hose is stowed in locker 1, an isolation valve and Storz connection is also located on the offside. Additionally, a hook is fitted to the top of the offside body to hang the excess hose when being utilised by the driver. (See Figure 2.7).

Firefighting when the vehicle is moving

It is important, when working with hose reels to work as a team and maintain constant communication while firefighting near a moving vehicle.

When firefighting with the vehicle moving, the driver is to select low range first gear. The driver should control the speed and progress of the appliance to ensure the branch operator is not subject to a rapid acceleration of the appliance.

To operate in pump and roll:

Crew Person:

1. Ensure master pump panel master switch is ON
2. Ensure Tank to Pump valve is OPEN
3. Start pump set
4. Operate Increase throttle to required pressure
5. Deploy required amount of hose and lock off (if working with hose reels)
6. Operate hose reel branch or static line
7. Communicate with driver
8. Give the commands to move off and stop as required

Driver:

1. Ensure engine speed is at idle with foot on footbrake
2. Release the park brake
3. Select 1st gear and low range
4. Drive at a suitable speed
5. Communicate with crew person by portable radio

Low Fuel Alert

The Pump fuel system is fitted with a low fuel warning system. This system will provide the operator with an audible and visual alert both at the pump panel and within the appliance cab. (See Figures 1.3 & 2.3)

When the low fuel alert activates, the pump will have 1 hour of operating time at full RPM, prior to it stalling out.

The alert will activate for a period of 20 seconds and then time out.

Water tank Level Indicator – Appliance Pump panel

The water tank contents gauge is an LED gauge that will indicate the level of the water tank. When the tank is full the LED lights will be green and show full. As the water level drops, the LED lights will go out and the LED's will change Colour from a green to blue illuminated LED until the ¾ water tank level has been reached. As the water level continues to drop below ½ tank capacity the LED will change from a blue to a yellow illuminated LED. As the water tank lowers below ¼ contents on the tank contents gauge, the LED lights will turn red and start flashing. (See Figure 4.18).

Figure 4.98 - Water tank level indicator – Pump panel

Water tank Level Indicator – Appliance Cab

A water tank level indicator is also fitted inside of the appliance cab. The indicator light is designed for in cab purposes producing a soft light not to cause glare to the driver. The indicator light has five stages (see figure 4.19).

Figure 4.19 - Water tank level indicator - cab

Water Level Indicator – Mechanical Sight Tube

A sight tube has been installed into the water tank at the rear of the appliance to allow a mechanical method of checking the water level. A small valve has been installed to the base of the sight tube giving the ability to isolate the sight tube if it was to be damaged (See Figure 4.20).

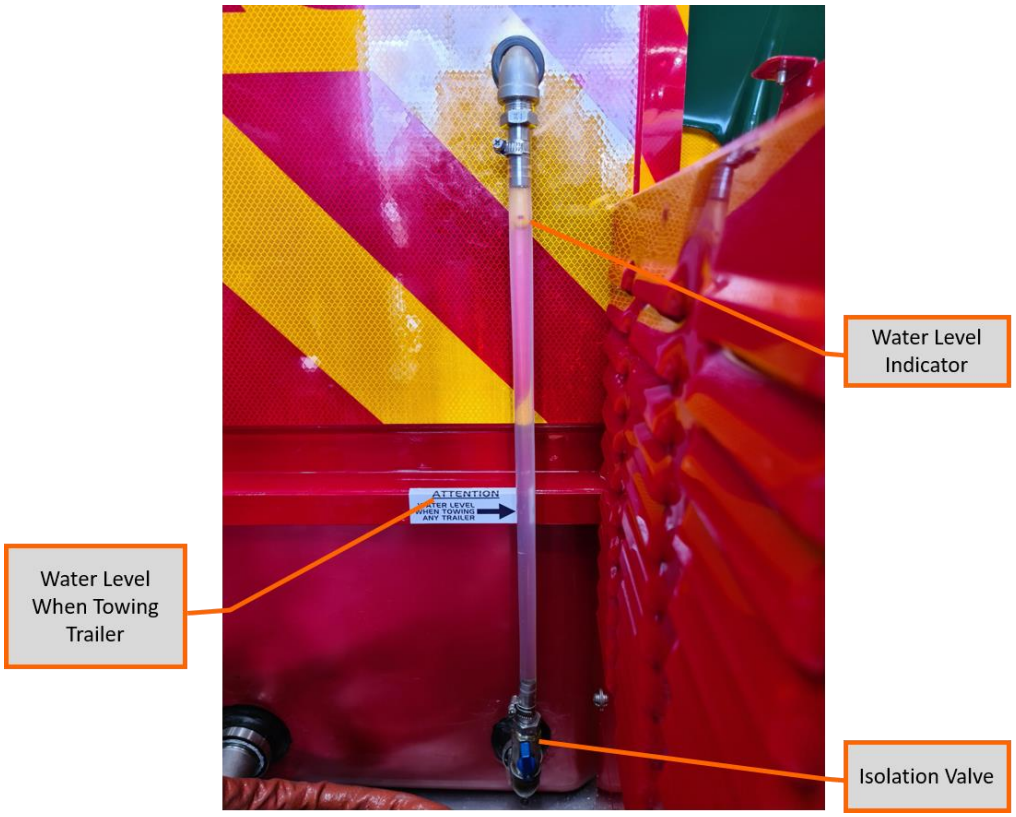


Figure 4.20 - Water tank level sight tube

Low Water Level Alert

The Low water level warning system is designed to alert firefighters that there is only a ¼ of operational water left in the water tank and to make preparations to leave the fire ground.

When the low water mark is reached a visual and audible alert will activate both internally in the cab and externally at the pump panel.

The ‘low water’ visual alert is a button that will light up yellow (see figure 4.21). This button should be pressed to acknowledge the alert and stop the audible alert sounding. The visual alert light will stay illuminated. The light will stay on until the water tank is re-filled. The alert will automatically reset on refilling and will activate again.

Figure 4.101 Low water acknowledgment button

Fill water tank

The Light Tanker has been designed to maintain the capability of filling the appliance water tank by multiple methods. By doing so allows the operator to fill the appliance in the format that best suits their operational requirements.

Tank fill valve

1. Site the appliance in appropriate position
2. Ensure the park brake is engaged
3. Establish water from a reticulated supply
4. Connect filler hose to the tank fill valve
5. OPEN tank fill valve
6. CLOSE tank fill when tank overflows

Filling tank from a static water supply

Filling tank from a static water supply can be achieved by first following the steps for drafting then using one of the following two options.

1. Open pump to tank valve (over temperature bypass valve)

Or

1. Connect the collector hose to the delivery
2. Connect the other end of the collector hose to the tank fill valve
3. Open both the delivery and the tank fill valve
4. Operate the throttle to increase flow

Overhead fill direct into the water tank

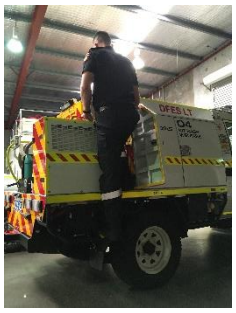
1. Site the appliance in appropriate position under the overhead fill point
2. Ensure the park brake is engaged
3. Make entry to the tank access deck on the offside (refer deck access process below)
4. Open water tank lid
5. Fill water tank until full
6. Close the water tank lid
7. Dismount appliance (reverse deck access process – **look down to locate step**)

Deck Access Process

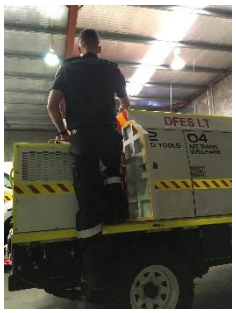
Use the following steps to maintain three points of contact to access the deck:

Open the deck access door and hold

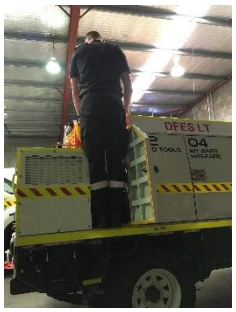
Raise left foot to step



Step up with right foot to deck



Move right hand to upper grab



Raise left foot to deck, release left hand grip and stand up

Draughting Water (Suction)

1. Site the appliance in appropriate position
2. Ensure park brake is engaged
3. Rotate tank to pump/hard suction valve to the hard-suction position
4. Close the pump to tank recirculation valve
5. Remove hard suction blanking cap
6. Connect suction hoses to hard suction fitting
7. Lower suction hoses into water (where possible strainer to be at least half a meter below surface to prevent vortex)
8. Turn on Pump Panel Master Switch
9. Start the Pump motor and run at idle
10. Open the hand primer valve
11. Operate the hand primer until a steady stream of water is visible
12. Operate throttle to increase pump pressure as required
13. Open any delivery valve to expel any excess air locks and establish water flow

Flushing after draughting

If draughting water from a contaminated water source, ensure the water tank, pump, plumbing and all hoses are flushed with fresh water. It is also important to ensure the deluge filter and pump intake strainers are also flushed.

1. Connect hydrant to tank fill valve
2. Start pump motor
3. Open all delivery valves, static lines and hose reel,
4. Pump out water tank contents
5. Close all water outlets and re fill water tank
6. Activate the deluge system for 30 seconds inspect spray nozzle patterns
7. Re-fill water tank
8. Stop pump motor
9. Disconnect hydrant

Plumbing Diagram

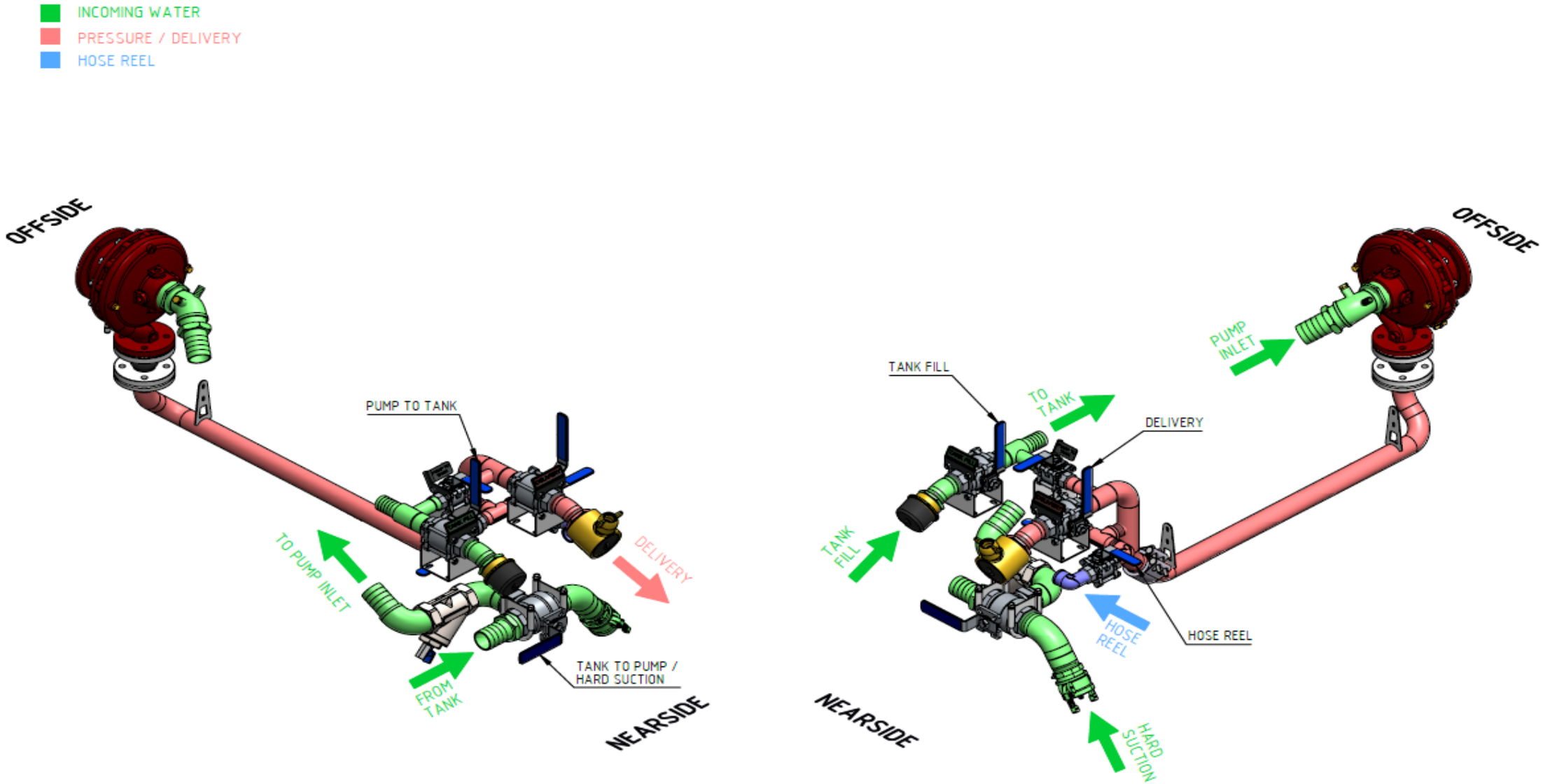


Figure 4.112 - Colour Coded Plumbing Diagram

Foam Production

This section should be read in conjunction with - *SOP 3.5.5 – Use of A Class Foam at Incidents*

The Light Tanker carries 'A' Class foam and utilizes a Rayden venturi style foam proportioning system (See Figure 4.23) which will accurately deliver finished foam to all water deliveries on the appliance from 0.1% to 1%. A 20L 'A' class foam drum is stowed on rear deck of the appliance and retained in place by means of a velcro strap.

Figure 4.123 - Raydan foam proportioner

Personal Protection Regarding Foam

When using or handling foam concentrate it is important to ensure the correct PPC and the following points are adhered to.

- Wear eye protection (safety goggles)
- Wear waterproof gloves
- Wash any concentrate off skin
- Wash any concentrate off clothing
- Wipe up any spilt concentrate
- Decant concentrates in fresh air

‘A’ Class foam operating procedure

For ‘A’ Class foam production

1. Establish water to the required delivery i.e. hose reel
2. Set required pump pressure
3. Close the Pump to tank/Recirculation valve (See Figure 4.16)
4. Open foam spear isolation valve (See Figure 4.24)
5. Set the proportioner to the required percentage

When the foam is no longer required

1. Return proportioner to 0%
2. Close the foam spear isolation valve
3. Flush all deliveries, pump and plumbing until clean water is observed
4. Slightly open the Pump to tank/Recirculation valve

‘A’ Class Foam Flushing Procedure

It is essential to ensure after the use of foam, the pump and plumbing is flushed prior to the Pump to tank/Recirculation valve being returned to a slightly open position. This is the only pathway foam can return to the water tank when the pump to tank valve is used as a recirculation valve.

1. Remove pick up spear and place in a bucket of fresh water
2. Establish water supply to tank filler and open valve
3. Turn on Master switch
4. Start pump motor
5. Close the Pump to tank/Recirculation valve
6. Operate foam proportioner as per ‘A’ class foam operating procedure
7. Flush with fresh water until all traces of foam is expelled
8. Close all foam valves
9. Stop pump motor
10. Slightly open the Pump to Tank Recirculation valve
11. Ensure water tank is re filled
12. Stow all equipment
13. Place foam spear back into foam drum

Foam pickup spear

Due to the foam system being a venturi or (Round the Pump) type it has been found that with an empty foam drum the system has the ability to draw air into the system cavitating the pump and causing an air lock. This is particularly of concern with relation to the deluge system. If the pump was subjected to an airlock while the deluge system is in operation the efficiency of the system could be compromised and, in some cases, operation could cease as the total flow of the deluge is not high enough to expel the air lock.

To rectify this risk a new pick-up spear has been designed. The spear has a round foot with elongated slots to draw in the foam concentrate, at the base of the foot is a ball bearing followed by the spear, sealing float, Y strainer and isolation valve. (See Figure 4.24).

When the foam is being drawn up through the spear to the proportioner the draw of the foam has enough vacuum to lift the ball bearing allowing foam to pass through. The ball bearing also acts as a check valve to ensure water does not back feed into the foam drum when the system is not in use. (See Figure 4.25).

As the drum contents depletes the float will slide down the spear until there is no contents left in the drum, once the drum is empty the sealing face of the float will seal on the elongated intake slots, additionally the ball bearing will also locate in the bottom of the spear reducing the introduction of air into the system

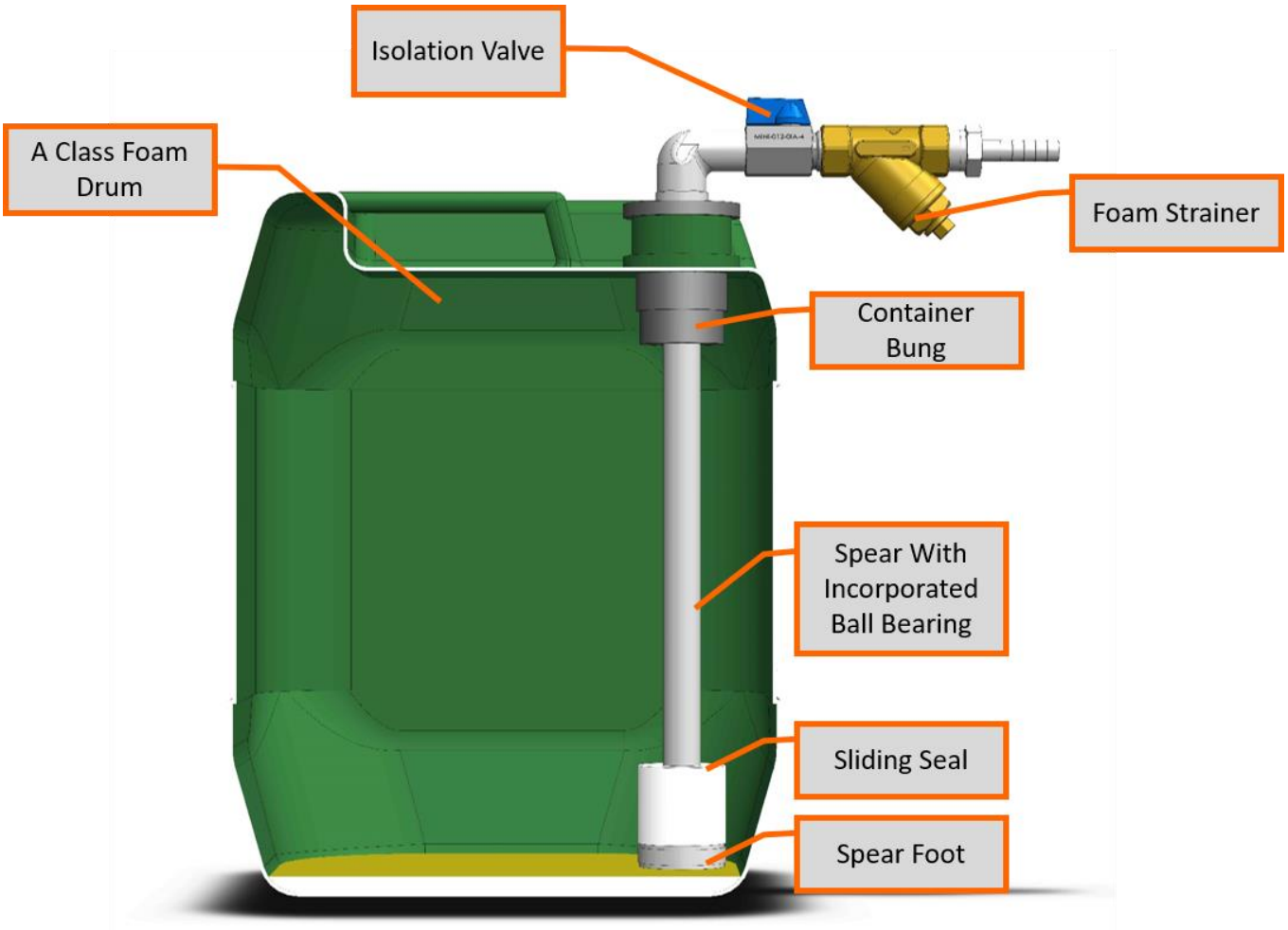


Figure 4.134 - Foam drum Assembly

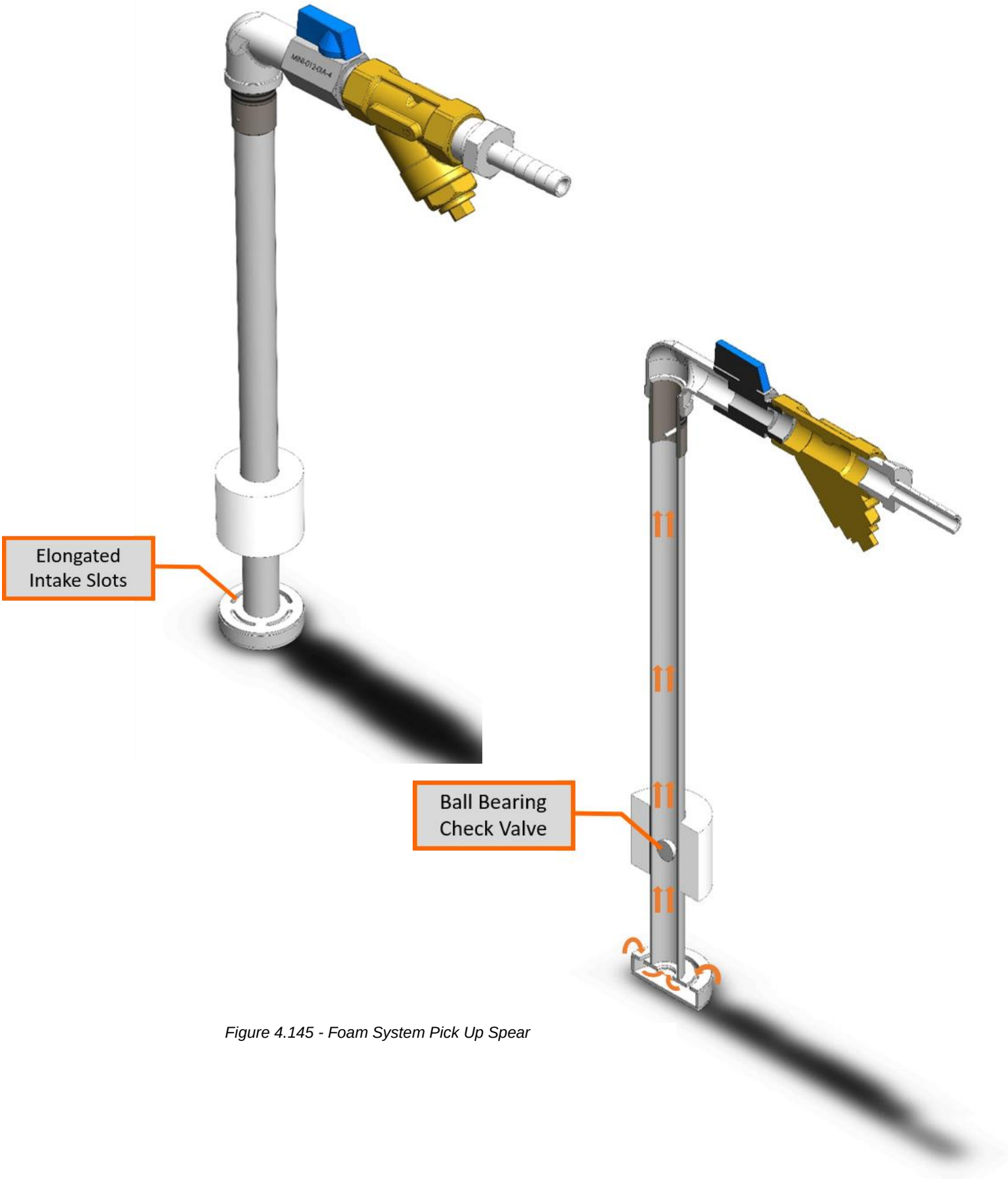


Figure 4.145 - Foam System Pick Up Spear

Crew Protection Systems

This section should be read in conjunction with - *SOP 3.5.11 – Entrapment and Burnovers at Bushfires*

To ensure the safety and welfare of the operators the Light Tanker appliance is equipped with the latest crew protection capabilities. Situated internal and external of the appliance cab are located all the key requirements of the crew protection systems. It is important the operator is fully aware of the location of these items and how they are to be deployed. The crew protection systems are to be checked monthly. Please refer back to appliance routine checks.

checks (see Volunteer Hub > Forms/Documents > Crew protection Equipment Check)

Radiant Heat Shields

Radiant heat shields are fitted into the appliance cab and situated above the cabin windows secured in place by Velcro strapping which has a reflective tab. (See Figure 4.26)

To deploy the radiant heat shields

- Pull the reflective tab on the Velcro strap (this should happen in a one pull action)
- The heat shield will deploy in a downwards fashion
- Firmly push edges of the heat shield and ensure there are no gaps around the edges of the heat shield

To Stow

- UN secure the Velcro edges on the heat shields
- Role the heat shields from bottom to top
- Once rolled retain the shields using the Velcro tabs

Figure 4.2615 - Radiant heat shields - Deployed.

In Cab Air

This appliance is also fitted In-Cab Air units, 2 in total, one for each member. They are housed in yellow cradles retained by a Velcro strap and located in the centre cab console. This will ensure each crew member has quick unobstructed access to the units if required. (See figure 4.27)

Each unit has an indicator ring located on the unit, Brown indicates the unit is serviceable, Turquoise indicates moisture in the unit and is un-serviceable requiring immediate replacement.

NOTE: The In-cab air units are single use only, once opened they cannot be resealed and will require replacement

Figure 4.27 - In Cab Air Units

Burn Over Blankets

Burn over blankets are fitted in the appliance cab, 2 in total, one for each crew member. The blankets are positioned within the cabin to ensure each crew member has quick unobstructed access if required. The two blankets are located behind the drive and passenger seat headrest and retained in place with a Velcro strap. (See figure 4.28)

NOTE: The Burn Over blankets are single use only, once opened they cannot be resealed and will require replacement

Figure 4.168 - Burnover Blankets - Stowed

Deluge System

Safety Message: The deluge system on the Light Tanker appliance is not a direct equivalent to those fitted to heavier tanker appliances as it does not include a deluge water reserve.

The Deluge system fitted to the appliance is designed to produce a continuous water stream over the cabin, crew deck, lockers, water tank and tyres. Providing the operators an enhanced crew protection capability in the event of a burn over.

It is not possible to carry a deluge water reserve for this appliance due to limited load capacity. The deluge has been included so that where water is available it can be used in crew protection.

The Light Tanker deluge system delivers water around the appliance at a rate of 50 L/min at pump operating pressure of 3 bar (when the deluge switch is activated the throttle will automatically return to the 3-bar idle setting).

250L of water (half a tank) is required to produce an equivalent operating time of 5 minutes as is delivered with the 600L deluge reserve on the heavier tankers.

Operating the Deluge System

As the deluge system is the last crew protection measure to be deployed before the fire impacts the appliance the system has been designed to be as simple to operate as possible.

To activate the deluge system:

- Ensure the pump is running
- Rotate the yellow deluge activation switch clockwise – light will illuminate (See Figure 4.29)
- The pump motor will automatically return to idle
- Ensure the “Crew Sprays Activated” green indicator light activates (See Figure 4.29)

Note: With the deluge switch activated the pump stop and throttle up/down switches will be isolated

Flushing the Deluge Filter

Due to the system having fine spray nozzles to deliver the water around the appliance a canister filter is fitted on the nearside of the appliance and secured to the underside of the tray. It is recommended to flush the deluge filter during weekly/monthly appliance checks and in addition to this each time the appliance has drafted from an open water source.

To flush the filter:

- Start the pump and run at Idle
- Remove the drain valve handle isolation screw
- Open the flush valve until the water runs clean

Once the filter flushed:

- Close the filter flush valve
- Re fitted isolation screw

Figure 4.179 - Deluge Activation and Pressure Indicators

Figure 4.30 - Deluge System in Operation

Crew Welfare

Appliance Fridge

A draw fridge is fitted into the appliance and located in locker 4 to provide the crew cold water refreshments. The fridge is wired in such a way that even when the appliance is isolated the fridge will continue to operate. With this in mind the appliance should be plugged into the charger when not in use for an extended period.

Figure 4.181 - Fridge

Addendum A – Vehicle Inspection Point Quick Reference - Nearside

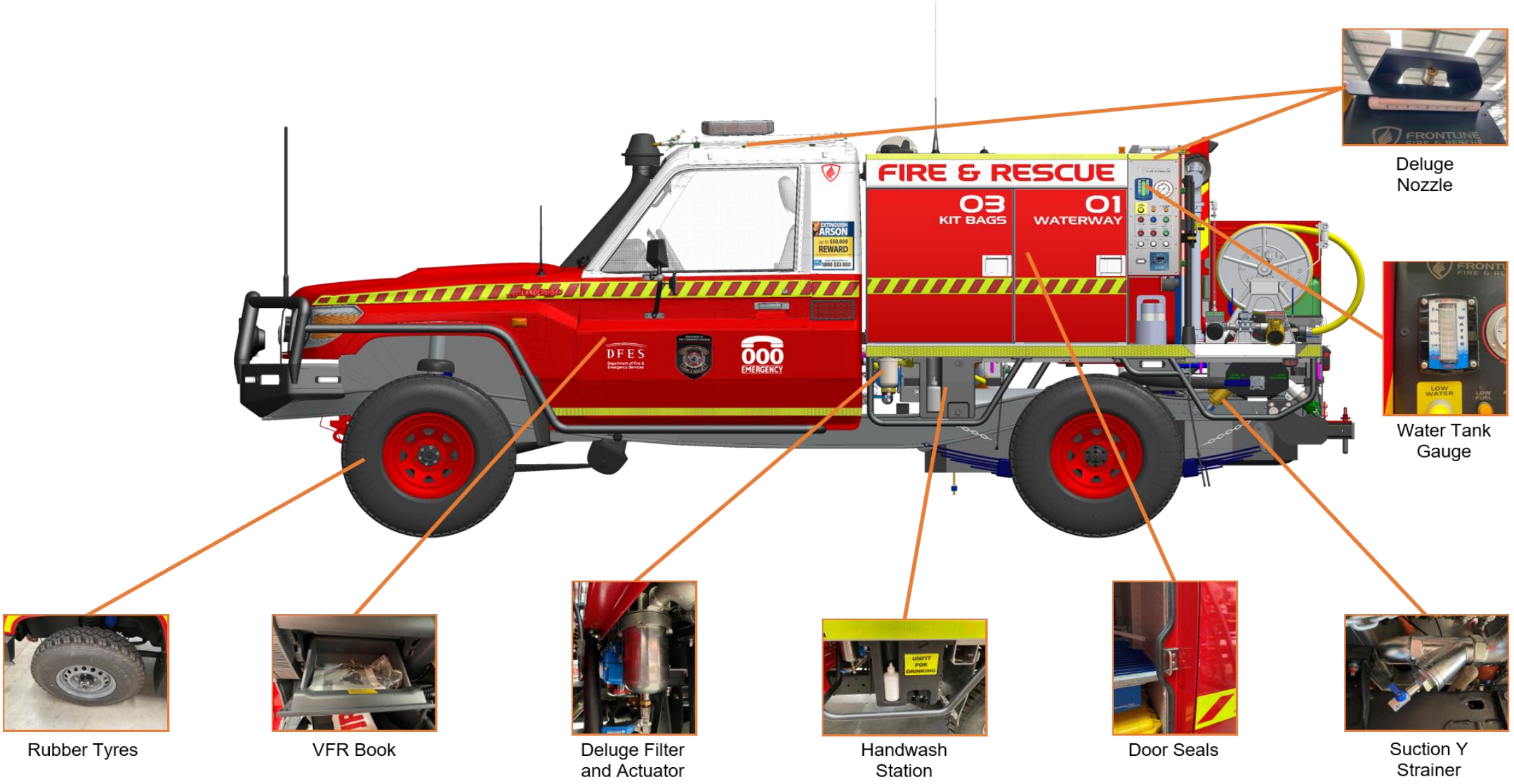


Figure 5.1 - Vehicle Inspection Point Quick Reference - Nearside

Vehicle Inspection Point Quick Reference – Offside

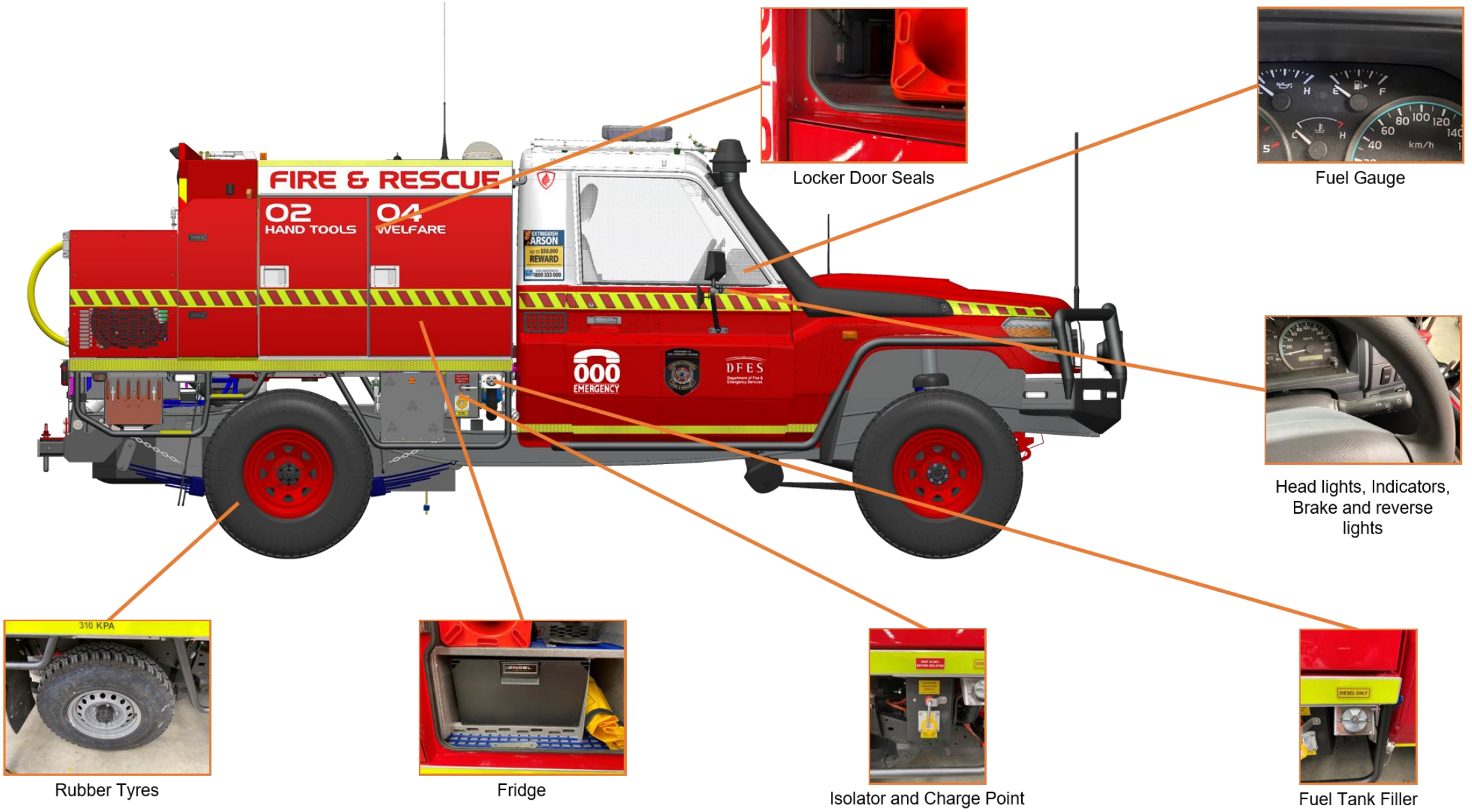


Figure 5.2 - Inspection Point Quick Reference – Offside

Vehicle Inspection Point Quick Reference – Under Bonnet

Figure 5.3 - Inspection Point Quick Reference – Under Bonnet

Vehicle Inspection Point Quick Reference – Rear

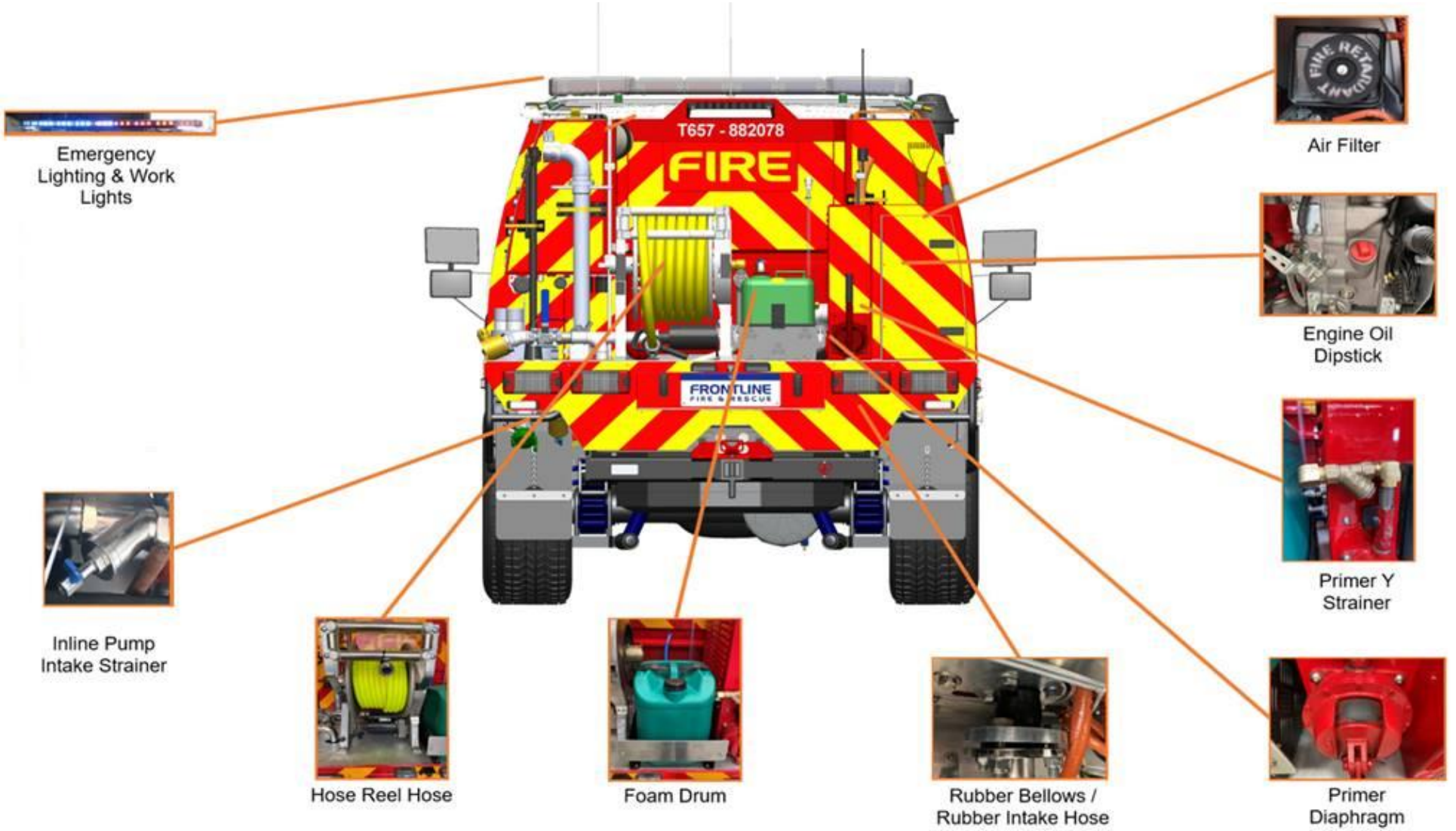


Figure 5.4 - Inspection Point Quick Reference – Rear

Addendum B – Stowed Equipment Checklist

DESCRIPTION	QTY	LOCATION	CHECK
Burnover blankets	2	Cab	
In cab air units	2	Cab	
2.5kg DCP Fire Extinguisher	1	Cab	
5m ½ static hose line with 25mm storz fittings	1	Front Basket	
Strahman pistol grip branch with 25mm storz fitting	1	Front Basket	
4.5kg DCP Fire Extinguisher	1	Locker 1	
12mm x 5m hose line with 25mm storz fittings	1	Locker 1	
Strahman pistol grip branch with 25mm storz fitting	1	Locker 1	
25mm 10m layflat hose with 25mm storz fitting	1	Locker 1	
25mm 20m layflat hose with 25mm storz fitting	1	Locker 1	
38mm 10m layflat hose with BIC coupling	1	Locker 1	
Foam lite foam branch with 25mm storz fitting	1	Locker 1	
50mm Camlock (F) x 64mm BIC (M)	1	Locker 1	
64mm BIC (M) x 25mm Storz	1	Locker 1	
Hose reel rewind handle	1	Locker 1	
50mm camlock seals	2	Locker 1	
64mm BIC seals	4	Locker 1	
25mm Storz seals	4	Locker 1	
Polyurethane standpipe washer	2	Locker 1	
Hacksaw	1	Locker 2	
Bolt Cutters 600mm	1	Locker 2	

DESCRIPTION	QTY	LOCATION	CHECK
Pinch Bar 600mm	1	Locker 2	
9000kg Snatch strap 9m long	1	Locker 2	
Soft Shackle	1	Locker 2	
Canvas bag to fit recovery strap	1	Locker 2	
Eflares – Red	3	Locker 2	
Eflares – Blue	3	Locker 2	
Eflares – Bases	6	Locker 2	
Goggles	2	Locker 2	
Portable compressor kit	1	Locker 2	
Tyre deflation kit	1	Locker 2	
Trailer ball mount	1	Locker 2	
Red toolbox	1	Locker 2	
Screwdriver set of 6	6	Locker 2	
Fencing pliers 10”	1	Locker 2	
Combination pliers 250mm	1	Locker 2	
Hacksaw blades 300mm	6	Locker 2	
Tyre pressure gauge	1	Locker 2	
Adjustable wrench 300mm	1	Locker 2	
Adjustable wrench 200mm	1	Locker 2	
Pipe wrench 350mm	1	Locker 2	
Cold chisel, flat, 230mm	1	Locker 2	
Claw hammer 560g	1	Locker 2	
Locking pliers (multigrips) 300mm	1	Locker 2	
Spare battery to suit Dolphin Lantern	1	Locker 2	

DESCRIPTION	QTY	LOCATION	CHECK
Leather gloves	2 Pair	Locker 2	
AED	1	Locker 3	
First aid kit – Dressings	1	Locker 3	
First aid kit – Burns	1	Locker 3	
Wypall dispenser	1	Locker 3	
Wypall wipes	1	Locker 3	
Safety tripod sign	2	Locker 4	
Standpipe	1	Rear Deck	
Valve key and Bar	1	Rear Deck	
Foam Drum – 20L	1	Rear Deck	
Protek 360	1	Rear Deck	
Round mouth shovel	1	Rear Deck	
Axe 2kg, high carbon	1	Rear Deck	
5L Jerry can (Green)	1	Rear Deck	
Fuel tag – Drip torch	1	Rear Deck	
Flexible fuel pourer	1	Rear Deck	
Drip torch 4L	1	Rear Deck	
38mm x 5m suction hose	1	Rear locker	
50mm camlock foot valve Suction strainer	1	Rear locker	
450mm road cone with reflective band	6	Offside	
Rake-hoe	1	Offside	

Assessment Tasks – DOA0002 – Light Tanker

All students undertaking this assessment must complete the following:

- Practical Assessment
- Knowledge Assessment

Where a student completes all the assessment activities satisfactorily, then their results are recorded on the Assessment Summary Sheet. If a student requires further evidence to complete their assessment, then an individual assessment sheet and competency outcome must be completed.

Assessment Results Summary – DOA0002 – Light Tanker (Gaam 70)

Student Name	1		2		3		4		5		6		
Student ID Number													

The performance requirements for each practical assessment are detailed in the Practical Assessment tasks attached. Where a student has satisfactorily demonstrated all the performance evidence for each task they are to be marked as Satisfactory (S) on the table below. Where a student has not satisfactorily demonstrated all the performance evidence for each task they shall be marked as Further Evidence Required (FER) in the table below and an individual observation checklist completed, indicated where the satisfactory performance was or was not demonstrated. Confidentiality must be maintained at all times.

Assessment		**S**	**FER**	**S**	**FER**	**S**	**FER**	**S**	**FER**	**S**	**FER**	**S**	**FER**
1	Practical Assessment												
2	Knowledge Assessment												

DFES OUTCOMES: The student has completed all required training & assessment tasks and has been assessed as Satisfactory/Further Evidence Required in the following DFES Outcomes:

Competency Attained	**C**	**NC**	**C**	**NC**	**C**	**NC**	**C**	**NC**	**C**	**NC**	**C**	**NC**
DFES Competency – DOA0002												

STUDENTS SIGN OFF: All assessment requirements were clearly outlined to me before commencing the assessment process. I have been informed of my assessment results and the reasons for assessment decisions. I have been provided with, or been offered, feedback on my performance. I have been advised of the DFES mechanism for lodging an appeal or complaint.						
Student Signature						

ASSESSOR SIGN OFF: The above assessments have been conducted in accordance with the principles of assessment and rules of evidence & the outcomes above can now be issued							
Assessor Name:		**Signature:**		**ID No:**		**Date:**	
Assessor Name:		**Signature:**		**ID No:**		**Date:**	
Data Entered in eAcademy by:		**Date:**		**Course File Number:**			
Course Coordinator Name:							

Practical Assessment – Light Tanker (Gaam 70)

DOA Code	DOA0002		
Student Name:		**DFES ID Number**	
Location of Assessment:		**Date**	
Instructions to Assessor:	Student must complete all elements of all assessments correctly to be deemed satisfactory. Any tasks not successfully completed on the first attempt, may be re-attempted at the discretion of the Assessor. You are to ask a set of questions related to the operation of an appliance. Once all assessments have been successfully completed, the student can be assessed as competent on the appliance. Unless otherwise stated in the assessment, there are no time limits for these tasks. The assessments are designed to be completed as “stand alone” individual tasks, and do not have to be completed all at one time. This decision should be based on the needs of the assessor and the crew, and operational duties at the time.		
Instructions to Students:	Student must complete all elements of all assessments correctly to be deemed satisfactory. Any tasks not successfully completed on the first attempt, may be re-attempted at the discretion of the Assessor. There are also a number of knowledge questions that will require answering. All tasks must be demonstrated and questions answered correctly in order to be deemed as satisfactory by your assessor. Unless otherwise stated in the assessment, there are no time limits for these tasks.		
Conditions for Assessment:	Tasks may be conducted at the Student’s workplace however; it should be noted that open water supplies may be required for some tasks. A fully operational appliance of the type appropriate for the assessment will be required along with additional firefighters to act as crew.		
Assessment Activity Instructions:	The assessor will ask you to complete various tasks. You must complete them in a timely fashion in a realistic scenario. Once you have completed the task, your assessor will give you further instructions.		
Resources:	Fully operational appliance. Light Tanker (Gaam 70) DORM. Additional crew to assist with tasks.		

Observation Checklist

During the demonstration of skills, the student:				
Task	**Observable performance indicators**	**S**	**FER**	**Comment**
1. Demonstrate access to the tank overhead fill	1.1. Follow the deck access process (tank fill section), using 3 points of contact at all times			
2. Demonstrate Operation of the Hazard Lighting (Amber Beacons)	2.1. Pressing the 'amber beacons' switch on the lower cab centre console (see Figure 1.3)			
	2.2. Press vehicle's hazard light switch, located on the cab centre console			
3. Demonstrate Operation of Pump including delivery of water from hose reel from water tank	3.1. Turn ON master pump panel switch			
	3.2. Open 'tank to pump' valve			
	3.3. Ensure the pump is primed			
	3.4. Start pump set			
	3.5. Increase throttle to the required pump pressure			
	3.6. Open 'Pump to tank / recirculation' valve slightly to prevent pump overheating			
	3.7. Turn on the hose reel isolation valve			
	3.8. Run off required length of hose and lock off reel			
4. Demonstrate A Class Foam Use (with pump running following above)	4.1. Close 'pump to tank / recirculation' valve			
	4.2. Set required pump pressure			
	4.3. Open foam spear valve			
	4.4. Set the foam proportioner to the required percentage			
	4.5. When foam is no longer required, return foam proportioner to 0%			
	4.6. Close foam spear isolation valve			
	4.7. Flush all deliveries, pump and plumbing until clean water is observed			

During the demonstration of skills, the student:				
Task	**Observable performance indicators**	**S**	**FER**	**Comment**
	4.8. Open 'Pump to tank / recirculation' valve slightly			
5. Demonstrate filling tank from static water supply "drafting" (from pump stopped)	5.1. Turn ON master pump panel switch			
	5.2. Rotate 'tank to pump / hard suction' valve to the hard suction position			
	5.3. Close the 'pump to tank' valve			
	5.4. Remove hard suction blanking cap			
	5.5. Lay out suction hose, connect and attach suction line			
	5.6. Connect suction hoses to hard suction fitting			
	5.7. Lower suction hose into water (where possible strainer to be at least half a meter below surface to prevent vertexing			
	5.8. Open the hand primer valve			
	5.9. Operate the hand primer until a steady stream of water is visible			
	5.10. Start the pump set			
	5.11. Operate throttle to increase pump pressure as required			
	5.12. Open any delivery valve to expel any excess air locks and establish water flow			
6. Demonstrate Operation of Deluge System	6.1. Ensure the pump set is running (speed does not need adjusting as the pump set engine will automatically return to idle)			
	6.2. Enter the cab. Rotate the yellow deluge activation switch clockwise – light will illuminate. Ensure the "Crew Sprays Activated" green indicator light activates			

7. List and locate the 5 strainers and filters that require regular inspection and cleaning	7.1. Foam drive water strainer			
	7.2. Pump intake strainer			
	7.3. Primer strainer			
	7.4. Deluge filter			
8. Demonstrate flushing the Deluge Filter	8.1. Start Pump and run at idle			
	8.2. Remove the drain valve handle isolation screw			
	8.3. Open the flush valve until the water runs clean			
	8.4. Once flushed close the filter flush valve and re-fit isolation screw			

The student's skills were:

Satisfactory ☐ Further Evidence Required ☐

Overall Comments:

Assessors Signature		**Date**	
Assessor's Name		**DFES ID**	

Knowledge Assessment

The student is to answer the following questions:		Assessor Use Only	
Question	**Student Response**	**S**	**FER**
1. Describe the limitations of the Kit Bag storage.			
2. Explain the Low voltage cut off solenoid function			
3. When towing what is the trailer mass limit and what other action needs to be completed?			
4. Explain the procedure to turn off the traction control system			
5. What is the ground clearance of this vehicle?			
6. Explain how to operate the ‘rumbler’ emergency alert tone.			

The student is to answer the following questions:		**Assessor Use Only**	
Question	**Student Response**	**S**	**FER**
7. Explain the Low Water Alert			
8. Explain the pump fuel system and low fuel alert			
9. Explain Diesel Particulate Filter (DPF) Including PM level display and Manual Regeneration Operation			
10. What is used to connect the recovery strap to the front recovery point and briefly explain its use.			
The student's knowledge was: ☐ Satisfactory ☐ Further Evidence Required			

The student is to answer the following questions:		Assessor Use Only	
Question	**Student Response**	**S**	**FER**
Overall Comments:			

Assessors Signature		**Date**	
Assessor's Name		**DFES ID**	
Co-Assessors Signature		**Date**	
Co-Assessor's Name		**DFES ID**	

Competency Decision

DOA Code	DOA0002			
Student Name		**DFES ID Number**		
Assessment Tasks		**Outcome**		**Date:**
		S	**FER**	
Practical Assessment 1				
Knowledge Assessment 1				
Attempt Number				
Overall Competency Result	❑ **Competent** ❑ **Not Competent**			
Assessor Feedback:				
Assessor Name		**Date**		
Assessor Signature		**DFES ID**		