SAFE
LOADING
PASS
SCHEME

Liquid fuels
Inspection Manual

SLPS

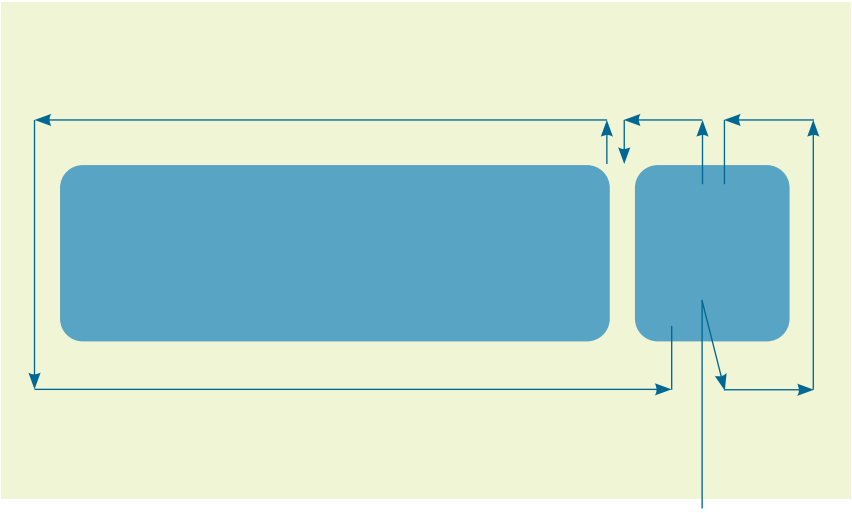
Contents

Acknowledgement

The following text is reproduced with permission from the Energy Institute's publication: Petroleum road tankers: Recommendations for a standard method of inspection for a safe loading pass (first edition).

The principle for the standard method of inspection is based on the following general sequence

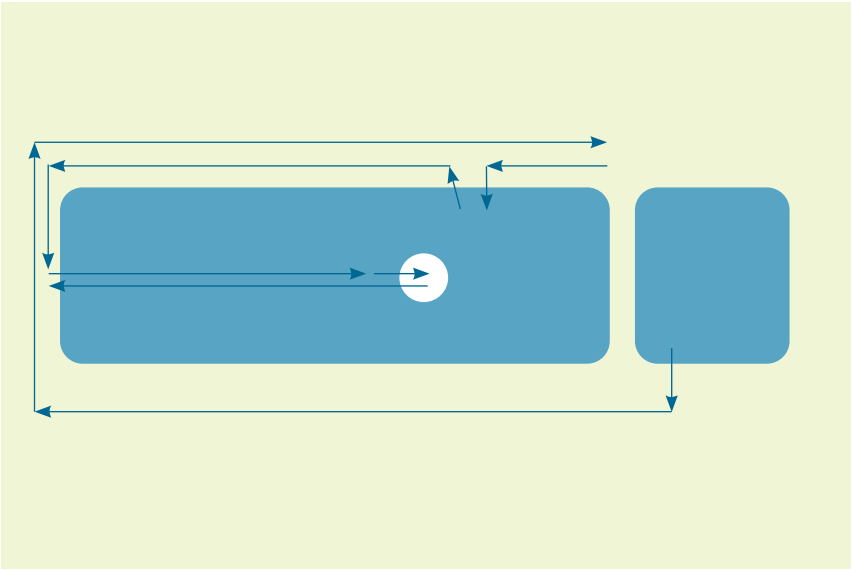
1 Inspect the tanker for sources of ignition and other safety items (sections 2–6)



- Start in the cab
- Exit the cab and work around the front of the cab to the nearside
- Inspect the nearside door area and proceed to the rear of the cab and exhaust system*
- Inspect the batteries*
- Proceed along the nearside and around the rear of the tanker, and complete the inspection when returning to the cab

*The sequence may need adaption to take account of the location of these components

2 Inspect the tanker for product containment and electrical continuity (sections 7–13)



- Exit the cab and proceed down the offside of the vehicle inspecting the cargo tank
- Continue around to the rear of the tanker and descend into the pit if available to inspect the underside pipework and belly of the tank
- Continue to the front nearside of the tank
- Inspect the loading area, control system and loading gantry connections
- Proceed to the top of the tank to inspect it, and then the internal inspection of each compartment

Use of this procedure will avoid any inspection item being missed

The tank certificates

1 Tank certificates (not applicable to tractors)

1.1 Tank certificate – initial/intermediate/periodic

Requirement	Method of inspection	Reason for failure
The most recent statutory tank inspection certificate is valid. • ADR Tank initial certificate for a tank which has not yet had its first intermediate inspection, or ADR Tank intermediate or periodic certificate (most recent) for a tank which has had its first intermediate inspection • VCA Certificate – Old tank (pre-2004 and not ADR), or non-ADR tank • Other recognised certificate for a tank, in special circumstances	Examination.	Certificate expired or otherwise invalid.

1.2 Tank certificate – vapour tightness

Requirement	Method of inspection	Reason for failure
For tankers which carry UN1203 Petrol, a valid vapour tightness test certificate exists.	Examination.	Vapour tightness test certificate not presented or is not valid/expired.

The vehicle

2 Cab interior

2.1 Roof hatch

Requirement	Method of inspection	Reason for failure
If fitted, the roof hatch is: • secured closed and unopenable, or • fitted with seals in accordance Annex A if designed to be used as an emergency exit	Visual inspection.	Roof hatch is: • not secured, or • openable, or • not sealed in accordance with requirements in Annex A

2.2 Fire extinguisher

Requirement	Method of inspection	Reason for failure
The in-cab fire extinguisher: • is readily accessible from the driver's seat when wearing a seat belt	Visual assessment.	Fire extinguisher is: • fitted in passenger foot well, or otherwise not readily accessible
• is secure in its stowage point and readily releasable from it	Removal of the extinguisher(s) from its stowage (and replacement).	• not secure in its stowage position • not readily releasable from its stowage position

Requirement	Method of inspection	Reason for failure
• has a holder/stowage which is itself secure	Manipulation.	• stowage insecure
• is serviceable	Visual inspection.	• container or mechanism damaged • next inspection date passed • security seal damaged or broken • pressure gauge needle not showing in the green section
• shall be dry powder type		• not dry powder type
• is readily accessible from the driver's seat when wearing a seat belt		• fitted in passenger foot well, or otherwise not readily accessible

2.3 Tachograph

Requirement	Method of inspection	Reason for failure
The tachograph is Ex marked.	Visual inspection.	Tachograph not clearly Ex marked.

2.4 Additional in-cab electrical equipment

Requirement	Method of inspection	Reason for failure
Any added in-cab electrical equipment, including any cab phone/ communication system, is secure. Any exposed wiring is secure, with grommets and glands in place as appropriate.	Visual inspection.	Insecurity of any added electrical equipment. Wiring insecure. Grommets and glands not fitted to components or missing.
Where equipment is permanently powered from the vehicle battery, it is: • Ex certified • fed via an Ex fuse • fed by a cable which complies with section 4.5 • provided with a certificate in accordance Annex B	Visual inspection.	Equipment permanently powered and is: • not Ex certified • not fed via an Ex fuse • fed by a cable which does not comply with 4.5 • not provided with a certificate in accordance with Annex B
Where equipment is powered from its own button cell battery and has no electrical socket, no additional requirements apply.	Visual inspection.	–

Requirement	Method of inspection	Reason for failure
Where equipment is powered from its own battery: • which is not a button cell • and/or has an electrical socket (indicating a lithium ion cell is used) The equipment is fitted with an 'on-off' switch or is suitably Ex marked and has a sleep function to blank the screen. Any power or charging connections switch off with the master switch. Note: the vehicle passes if a device is not fitted at the time of inspection.	Visual inspection. Using a multimeter, locate a suitable earth and verify no voltage is present on any connections with the master switch off.	Equipment powered with its own battery other than a button cell: • and/or having an electrical socket • having no 'on-off' switch or the device is not Ex marked and cannot blank the screen • connections live with the master switch off

2.5 Battery master switch control

Requirement	Method of inspection	Reason for failure
Identification The in-cab battery master switch control shall be: • readily accessible The means of operation shall be: • distinctly marked, and • designed to incorporate inadvertent operation protection	Visual inspection.	Battery master switch control is: • not readily accessible The means of operation is: • not distinctly marked • not designed to prevent inadvertent operation
Disconnection The control operates to disconnect the batteries within 10 seconds	Operation of the control to verify that it switches the battery master switch to disconnect the batteries within the required time: observe items of electrical equipment (eg hazard warning lamps) and time the delay taken for them to extinguish.	The delay between operation of the battery master switch control and the disconnection of the batteries exceeds 10 seconds. Any battery master switch control can be operated in any way or sequence to incur a delay in excess of the required limit.
Reconnection (excludes vehicles registered before May 2004) The control operates to reconnect the battery.	Operation.	The control fails to reconnect the batteries.

2.6 Daytime running lights (DRLs) and automatically powered headlights

Requirement	Method of inspection	Reason for failure
Where DRLs or automatically powered headlights are fitted, no other light or light circuit (eg side marker lights) is connected into the DRL/headlight circuit unless it can be disconnected independently. Where other lights are connected into the DRL /headlight circuit: • either a label is fitted which clearly states the means or method of isolating them • or a durable instruction card is present in the cab (All tractors and rigid vehicles built after 01/07/2006)	Operation and visual inspection.	Other lights illuminate with DRLs/ automatically powered headlights which cannot be independently isolated. Independent means or method of isolation not provided with: • either a clear instruction label • or a durable instruction card is not present in the cab

2.7 Night heater (If fitted)

Requirement	Method of inspection	Reason for failure
Any night heater is fitted with an isolation switch. The switch is clearly labelled.	Visual inspection and operation. Visual inspection.	Night heater not fitted with an isolation switch. Switch not clearly labelled.

2.8 Cigarette lighter socket

Requirement	Method of inspection	Reason for failure
No socket is fitted. Sockets other than a cigarette lighter socket are acceptable (eg jack type), they must be wired through the battery master switch.	Visual inspection. Using a multimeter, locate a suitable earth and verify no voltage is present with the master switch off.	A socket is fitted (whether or not disconnected). Sockets other than a cigarette lighter socket, not wired through the battery master switch.

2.9 Electrically operated/heated mirrors

Requirement	Method of inspection	Reason for failure
If electrically adjustable, mirrors adjust correctly. Note: to check the heating function (if fitted), switch on heaters and check glass(es) for temperature when inspecting the doors.	Operation and visual inspection. (The heating function is checked at 3.2).	If fitted, remote adjustment of either mirror does not function.

Note: Switch on all lights and heated mirror elements before leaving the cab. Commence to exit the cab in order to inspect the chassis equipment of the tanker including its electrical system.
Entry to the cab will be required again to test the anti-drive away interlock (see section 8.2).

3 Cab exterior

3.1 Wiring in door apertures

Note: wiring in the driver's door aperture is checked at this point when exiting the cab, and that of the passenger's door aperture is checked in sequence between 3.4 and 3.5.

Requirement	Method of inspection	Reason for failure
Wiring to the door and mirror is secure and free from damage.	Visual inspection.	Evidence of chafing, pinching or other damage to cables. Inadequately secured, protected or routed cables.

3.2 Electrically heated/operated mirrors

Requirement	Method of inspection	Reason for failure
If electrically heated, the mirror heats, is secure and free from damage.	Tactile inspection. Visual inspection and operation.	Mirror glass fails to heat. Mirror assembly/glass/heating element insecure.

Inspection of the cab front

3.3 Cab front top outline marker lamps (or other light(s) used to indicate battery master switch is switched 'on')

Requirement	Method of inspection	Reason for failure
Each cab front top outline marker light (or other light) is illuminated when the battery master switch is switched 'on'.	Operation and visual inspection.	Light(s) fail to illuminate/extinguish as intended.

3.4 Cab front lights

Requirement	Method of inspection	Reason for failure
Each front showing light unit: • is operational • is free from damage and in good condition	Visual inspection.	Light not working. Cracked, broken or insecure lens. If multi-LED light unit, more than 1 in 4 LEDs are not illuminated.

3.5 Rear engine cover and exhaust system

Requirement	Method of inspection	Reason for failure
The rear engine cover is secure and has a minimum number of apertures. It effectively covers all parts of the engine and exhaust system except where the silencer has a surface temperature less than 200°C and carries a manufacturer's label accordingly. Parts of the exhaust system situated directly below the fuel tank (diesel) shall have a clearance of at least 100mm or be protected by a thermal shield.	Visual inspection and manipulation. Visual inspection and measurement.	Rear engine cover insecure/ incomplete/damaged – cracked or broken. Rear engine cover fails to cover rear of engine and exhaust system (except silencer declared to have a maximum surface temperature less than 200°C as attested by a label fitted by its manufacturer). There is not 100mm clearance between the exhaust and the fuel tank, or, there is no shield if the distance is less than 100mm.

3.6 Rear window (if fitted)

Requirement	Method of inspection	Reason for failure
The securing of the glass in any window in the rear of the cab is secure and resistant to fire.	Visual inspection.	Securing of any glass in cab rear window is • not by bonding, or • by rubber seals not fitted with a metal frame or metal clips on both sides if required

4 Batteries, battery master switch and associated equipment

4.1 Battery box and cover

Requirement	Method of inspection	Reason for failure
The battery box completely surrounds the batteries to protect them; if the battery box is directly mounted to the chassis, the protection is provided on at least its front and both sides.	Visual inspection.	Battery not fully surrounded by its box/chassis member.
The battery box is situated: • 'immediately to the rear of the cab rear engine cover (excluding only the exhaust silencer/after treatment system and air cleaner) Note: Battery cable length should be as short as possible. Where the batteries are mounted behind an air cleaner or exhaust silencer/ after treatment system, the components should be adjacent to one another. • with the nearest battery terminal at least 1,000mm from the nearest point of any loading adaptor'.	Visual inspection/measurement.	Battery box not situated: • immediately to the rear of the cab/rear engine cover • with a battery terminal less than 1,000mm away from any loading adaptor.
The battery box is secure and free from cracks and excessive corrosion (externally).	Manipulation. Visual inspection.	Battery box insecure. Battery box suffering from excessive corrosion, cracks or damage.
The battery box cover is free from cracks or other damage.	Visual inspection.	Cover cracked or damaged.

Remove the battery box cover.

Requirement	Method of inspection	Reason for failure
The battery box cover is made of electrically insulating material, or if made of metal it is electrically insulated on its underside. The battery box is free from excessive corrosion (internally).	Visual inspection.	Battery box cover not electrically insulating, or made of metallic material and its underside is not insulated. Evidence of excessive corrosion (internal).

4.2 Batteries

Requirement	Method of inspection	Reason for failure
The batteries are positively secured with clamps which are free from excessive corrosion.	Visual inspection.	Batteries not positively secured with clamps. Any clamp excessively corroded.
All battery posts and cable terminals are free from corrosion.	Visual inspection.	Any battery post/cable terminal shows evidence of corrosion.
The terminals of all battery cables are secured by solder or crimping.	Visual inspection	Cable terminal is: • insecure • secured using screws
The terminals are fitted with insulating covers.		Cover missing or damaged.

4.3 Cables to the battery master switch

Requirement	Method of inspection	Reason for failure
Each cable between the batteries and the battery master switch is: • insulated throughout its entire length • free from chafing or damage • if external to the battery box, double insulated (not using split conduit)	Visual inspection where possible.	Cable not insulated throughout its entire length. Cable damaged. Cable not double insulated (or uses split conduit) if external to the battery box.
Where the battery master switch is located outside the battery box, cable terminals on it are insulated.	Visual inspection where possible.	Battery cable terminal insulation missing, poorly fitting or degraded.

4.4 Battery master switch negative relay

Requirement	Method of inspection	Reason for failure
The battery master switch negative relay functions. Note: the operation of the positive relay has been checked by the operation of the in-cab control.	With the battery master switch isolated: connect a suitable Ohmmeter between the battery –ve post and the chassis and verify there is no continuity.	Continuity exists between battery –ve terminal and chassis.

4.5 Tachograph power cable

Requirement	Method of inspection	Reason for failure
The power supply cable to the tachograph from its Ex-certified fuse is dedicated and distinguishable throughout its length from other cables by its construction or marking.	Visual inspection.	Cable not dedicated. Cable indistinguishable from other cables.

4.6 Battery boost socket (if fitted)

Requirement	Method of inspection	Reason for failure
The boost socket is connected to the switched side of the battery master switch. Its contacts are fitted with an insulating cover or covers.	Visual inspection.	Socket connected to the live side of the battery master switch. Insulating cover(s) cracked, broken or not fitted.

Note: Replace the battery box cover.

4.7 Battery master switch external controls

Requirement	Method of inspection	Reason for failure
The means of operation of the battery master switch shall be: • distinctly marked, and • designed to incorporate inadvertent operation protection	Visual inspection.	The means of operation is: • not distinctly marked, and • not designed to prevent inadvertent operation
A minimum of two external control devices should be installed, one on either side to the rear of the cab: • a green warning light shall be fitted adjacent to each control device, and • it shall be operational	Visual inspection.	External controls not fitted/missing. Light not fitted. Light not working. (If multi-LED light unit, more than one in four LEDs are not illuminated.)

Requirement	Method of inspection	Reason for failure
Each control operates to isolate the batteries within 10 seconds	Operation of each control individually to ensure that it switches the battery master switch to isolate the batteries within the required time. (Observe items of electrical equipment (eg headlamps) and time the delay to extinguish.)	Battery master switch fails to respond to each control. The delay between the operation of a battery master switch control and the isolation of the batteries exceeds 10 seconds. The battery master switch control can be operated in any way or sequence to incur a delay in excess of the required limit.

4.8 Battery main earth point

Requirement	Method of inspection	Reason for failure
The battery main earth connection to the chassis is: • booted • free of corrosion • dedicated to the main battery negative cable (from the battery master switch), and • clearly labelled If not the manufacturer's original connection, the earth point is made in accordance with Annex C.	Visual inspection.	Earth point not: • booted • free of corrosion • dedicated to the main battery cable • clearly labelled If not the manufacturer's original earth point, not made in accordance with Annex C.

5 Electrical system (external to the cab)

5.1 Conductors (wiring)

Requirement	Method of inspection	Reason for failure
Conductors shall be adequately insulated.[1]	Visual inspection.	Conductor not insulated. Degraded or missing insulation boot, seal or gland.
All circuits are wired 'insulated return' to earth points forward of the rear of the cab.	Visual inspection.	Earth points used to the rear of the cab.
All wiring is robustly double insulated in accordance with the examples in Annex D throughout its entire length.	Visual inspection.	Use of secondary insulation which: • is split, abraded, brittle or worn • provides inadequate coverage of wires throughout their length • provides inadequate protection of wires to components

1 ADR 9.2.2.2.1 'Conductors' includes wiring, terminals and contacts

Requirement	Method of inspection	Reason for failure
Joints which pierce the insulation are not used. (Note: this does not apply to an electro-pneumatic control system of tank equipment or any vehicle/trailer constructed before 01/07/2006.)	Visual inspection.	Use of snap-on connectors or those that pierce the insulation.
Junction boxes are secure and free from damage.		Junction box or cover loose, excessively corroded, cracked or broken.
Absence of insulation tape and other unsuitable repair.		Unsatisfactory/temporary repair or use of insulation tape.

5.2 Light units and other electrical components

Requirement	Method of inspection	Reason for failure
All lights and other electrical components function.	Operate lights and verify that all bulbs illuminate.	Bulb fails to illuminate to full brilliance. (If multi-LED light unit, more than 1 in 4 LEDs are not illuminated.)
All lenses and housings are free from damage and evidence of water ingress.	Visual inspection.	Cracked/broken/insecure lens. Insecure/damaged/distorted housing. Evidence of water ingress to any electrical component.

5.3 Additional operation/work lamps

Requirement	Method of inspection	Reason for failure
Any additional operations/work lamp and its switch: • are secure • are in good condition • function	Visual inspection and operation.	Insecure or damaged component. Lamp or switch not functioning.
Note: Energy Institute recommendations are that operations/work lights: • are marked ExN (or better) if within 0.5 metres of a loading/vapour adaptor • are marked IP 65 if more than 0.5 metres and less than 1 metre from a loading/vapour adaptor		

5.4 Permanently powered equipment (if fitted)

Requirement	Method of inspection	Reason for failure
Permanently powered equipment is: • Ex marked, approved for the area in which it is located and is provided with a certificate in accordance Annex B • fed via an Ex marked appropriately rated fuse or barrier unit • fed by a distinguishable or clearly marked dedicated cable	Visual inspection.	Permanently powered equipment is: • not Ex marked appropriately for its location (in or outside the cab) • not provided with a certificate in accordance with Annex B • not fed via a fuse known to be Ex marked • not fed by a distinguishable or clearly marked dedicated cable

6 General equipment external to the cab

6.1 Tyres

Requirement	Method of inspection	Reason for failure
Each tyre is in a roadworthy condition.	Visual inspection.	Tyre damaged. Cord showing. Low tread depth.
Each tyre's inflation appears correct.	Visual inspection.	Obvious under-inflation.

6.2 Mudwings

Tractors (rear)

Requirement	Method of inspection	Reason for failure
Each mudwing (other than that for the front axle): • is present and secure • covers the tyre(s) at least between 3 o'clock and 9 o'clock; and • is free from excessive corrosion, damage or distortion	Visual inspection.	Mudwing is: • missing or insecure • does not cover the tyre between 3 o'clock and 9 o'clock • so badly corroded, damaged or distorted that it does not act as an adequate shield • so damaged that it could be a danger to other road users

Rigid chassis (rear) and trailers

Requirement	Method of inspection	Reason for failure
Each mudwing (other than that for the front axle) is: • secure and complete • in a sound condition • made from steel or aluminium or otherwise is marked as complying with fire test procedure WFR TP 002[2]	Visual inspection.	Mudwing is: • missing or insecure • so badly corroded, damaged or distorted that it does not act as an adequate shield • so damaged that it could be a danger to other road users Mudwing manufactured other than from steel or aluminium and is: • not marked 'Meets WFR TP 002' (if the vehicle was registered after 1.1.2000)

Requirement	Method of inspection	Reason for failure
Each trailer mudwing/each mudwing on the rear axles of a rigid tanker rear is: • secure and complete • in a sound condition • made from steel or aluminium or otherwise is marked as complying with fire test procedure WFR TP 002	Visual inspection.	Mudwing is: • missing or insecure • so badly corroded, damaged or distorted that it does not act as an adequate shield • so damaged that it could be a danger to other road users Mudwing manufactured other than from steel or aluminium and is: • not marked 'Meets WFR TP 002' (or if a trailer the tank has an initial inspection date after 1.1.2000)

6.3 Fire extinguisher(s)

Requirement	Method of inspection	Reason for failure
Each fire extinguisher is: • readily removable from its stowage • is serviceable Each fire extinguisher container is: • accessible and suitably labelled • weather proof with a secure lid/ door • securely mounted and free from damage Note: the minimum capacities for fire extinguishers are: • external – at least one 6kg (minimum) • cab – at least one 2kg (minimum) • total capacity per tractor/trailer or rigid chassis – 12kg (minimum)	Removal of the extinguisher(s) from its stowage and replacement. Visual inspection.	Extinguisher not immediately withdrawable from its stowage with one hand. Extinguisher not immediately replaceable in its stowage without force. Extinguisher container not accessible, suitably labelled, weather proof, secure or free from damage. The combined extinguisher capacities do not meet the minimum total requirements, or do not meet the minimum individual requirements (see note). Container or mechanism damaged. Next inspection date passed. Security seal damaged or broken. Pressure gauge needle not showing in the green section. Damaged or corroded.
Note: where an external fire extinguisher container is fitted to a tractor, trailer or chassis, it should contain a serviceable fire extinguisher of at least 6kg capacity (or equivalent). Where: • a tractor is presented for inspection without a trailer, only the cab requirements are applicable • a trailer is presented for inspection without a tractor, only the external requirements are applicable • a rigid chassis is presented for inspection, both cab and external requirements are applicable		

2 Warrington Fire Research test in accordance with E1 Fire resistatnce of mudwings for petroleum road tankers

6.4 Electrical continuity to fifth wheel coupling and drive axle (tractors)

Requirement	Method of inspection	Reason for failure
There is electrical continuity of less than 10Ω: • between the tractor chassis and the drive axle, and • between the fifth wheel rubbing plate and the tractor chassis	Use of suitable Ohmmeter.	Resistance exceeds 10Ω.
The earth braiding or cable is in good condition.	Visual inspection.	Braiding or cable damaged, detached or degraded to excess.

7 Inspection of the tank plates, tank status, the tank, footvalves and pipework (ground level)

Note: a safe means of access to the underside of the vehicle should be provided, preferably using an inspection pit but otherwise using a crawler board on level ground.

The following items should be inspected from under the tanker as necessary.

7.3 The complete tank shell including its (integral) supports

7.4 The tank mountings

7.6 Footvalves (bodies, flanges and gaskets)

7.7 External product pipework, flanges and gaskets

13.1 Continuity checks – ground level

7.1 Tank plates

Requirement	Method of inspection	Reason for failure
The tank information plate is displayed and carries legibly the correct statutory information including: • manufacturer • tank serial number, and • date of last statutory test (of each relevant type)	Examination.	Plate not displayed. Plate illegible. Plate not stamped or stamped with incorrect information. Interval since last test date exceeds requirements.
For tanks with an initial test date after 1 January 2003, the overfill prevention sensor setting information plate meets the format set out in Annex G and shows setting dimensions for each sensor.	Visual inspection.	Plate not displayed (if required) or illegible. Plate does not meet the format requirements of Annex G.

7.2 Tank status

Requirement	Method of inspection	Reason for failure
The tank/all compartments are empty.	Visual inspection of loading adaptor sight glasses with footvalves open.	Tank/compartments not empty.
If a trailer, the tank is coupled to a vehicle.	Visual inspection.	Trailer not coupled to a vehicle.

Note: as appropriate, the tank shell and its mountings should be inspected from ground level or from under the vehicle using a pit or crawler board.

7.3 The complete tank shell including its (integral) supports

Requirement	Method of inspection	Reason for failure
The tank shell and its supports are free from: • cracks • damage including dents and gouges • excessive corrosion • unsatisfactory repairs • evidence of leaks of liquid or vapour given by staining, peeling paint, damp patches and drips, unusual/distinctive cleanliness	Visual inspection.	Evidence of: • crack or other sign of material distress • any damage across a weld seam • any creasing of the tank shell • gouges which have reduced the tank thickness • repair below the standard of the original construction • excessive corrosion (steel delaminated or pitted) • evidence of any liquid and/or vapour leak
Any tell-tale holes in doubler plates are free from evidence of leaking product.	Visual inspection.	Evidence of any liquid and/or vapour leak.

7.4 The (vehicle mounted) mountings for the tank (if applicable)

Requirement	Method of inspection	Reason for failure
The tank mountings are in sound condition and free from cracks, excessive corrosion and damage. Any intermediate resilient material (eg balata belting or rubber) is in sound condition.	Visual inspection.	Evidence of a crack or cracks. Excessive corrosion (pitting/ delamination). Damage. Balata belting/intermediate resilient mounting material excessively deformed or degraded.

7.5 Tank mounting fasteners (including trailer upper coupler for the 5th wheel and rear subframe (if fitted))

Requirement	Method of inspection	Reason for failure
The tank mounting fasteners and resilient springs are present, in good condition and to the tank manufacturer's recommendations. Springs are compressed but are not coil bound.	Visual inspection.	Loose, missing or distorted fastener. Broken/cracked spring. Loose or coil bound spring.

Note: as appropriate, footvalves and external pipework should be inspected from ground level or from under the vehicle using a pit or crawler board.

7.6 Footvalves

Requirement	Method of inspection	Reason for failure
Footvalve bodies and actuators are in sound condition and leak tight.	Visual inspection.	Evidence of cracking or other material defect. Evidence of product leak around the footvalve actuator.

7.7 External product pipework, flanges and gaskets

Requirement	Method of inspection	Reason for failure
Flanges and their joints between the tank shell, footvalve(s) and pipework are correctly made and leak tight.	Visual inspection.	Cracks or pinholes in flange welds. Nut threads not fully engaged on mating male threads of flange fasteners. Loose fasteners and/or missing washers.
Flange gaskets are correctly installed and in a sound condition.	Visual inspection.	Evidence of gasket: • deterioration or misalignment • swelling or distortion • peeling paint, dampness or product drips
External pipework (footvalve(s) to loading adaptor(s)) is in a sound condition.	Visual inspection. Note: particular attention should be paid to the area around supports and clamps for corrosion, and to compartment 1 run off pipe on semi-trailers for damage caused by impact with the tractor during articulation.	Excessive corrosion or damage. Witness marks of impact/damage. Liquid and/or vapour leak as evidenced by: • staining or unusual cleanliness • peeling paint, dampness or product drips
Pipework supports are in sound condition.	Visual inspection.	Support excessively corroded, damaged or insecure. Loose or missing fasteners.

8 Inspection of the control system, interlocks and guard bar

8.1 Control cabinet

Requirement	Method of inspection	Reason for failure
The cabinet for the pneumatic control system is secure; if mounted alone, its door is secure and secures closed.	Visual inspection.	Insecure or damaged control box. Control box door loose or does not secure firmly closed. Control fails to reset to safe condition when control box door is closed (if intended by design).
Instruction and control labels are visible and legible.	Visual inspection.	Labels missing, concealed, illegible, damaged or faded.
Footvalve controls are clearly identified by number.	Visual inspection.	Footvalve control not identified by number.
All control knobs are fitted and secure.	Visual inspection, manipulation.	Control knob damaged or missing.
The air pressure gauge (if fitted) for the pneumatic control system functions and is free from damage.	Visual inspection.	Gauge broken or otherwise non-operational.
The air line antifreeze-lubricator is functioning.	Visual inspection.	Air line lubricator empty.

8.2 Anti-drive away function

Note: the following describes the requirements for a conventional pneumatic system. Other systems may be used providing the same functionality is provided.

Any of the following systems may be used, or a combination of both of them (eg loading adaptors and vapour adaptor mounted behind the guard bar, overfill prevention socket fitted with a plug detection device).

Requirement	Method of inspection	Reason for failure
1 For all vehicles/trailers with an initial hydraulic test date after 01/01/2009. The connections of a loading coupler, the vapour coupler and overfill prevention plug cannot be achieved without the parking brake having first been applied. or 2 For all vehicles/trailers with an initial hydraulic test date before 01/01/2009. The connections of the vapour coupler and overfill prevention plug cannot be achieved without the parking brake having first been applied by the action of connection.	Visual inspection/attempted connection. Aural test where possible (eg spring brake chambers exhausting).	As is relevant to the design, any loading gantry connection can be made: 1 without the parking brake or brakes having first been applied. or 2 without the brakes being applied by the action of the connections being made. or 3 without the parking brake being applied simultaneously.

Requirement	Method of inspection	Reason for failure
or 3 The guard bar control, when operated, immediately activates the brake interlock ('anti-drive away system'):		
The tanker cannot be driven (or otherwise be moved) more than 150mm with its wheels rotating.	Attempt to drive the tanker with a connection made to: • a loading adaptor • the vapour adaptor and • the overfill prevention socket See Annex E for detailed test procedure.	Tanker can be moved more than 150mm with wheels rotating when any gantry connection (liquid, vapour, overfill prevention system) is made to the tanker's connections.

8.3 Guard bar (or cabinet door) covering the loading adaptors

Requirement	Method of inspection	Reason for failure
The guard bar (or cabinet door): • is secure • effectively covers gantry connections (loading adaptors, vapour recovery adaptor, overfill prevention socket) as intended	Manipulation and operation. Visual inspection.	Guard bar insecure. Guard bar damaged, distorted or fails to cover gantry connections as intended. Note: the vapour adaptor and overfill prevention socket may be fitted with their own device for the detection of a gantry connection.
• positioning, when set, must prevent connection to the loading adaptor • operates freely and smoothly • is secure in both open and 'safe' positions, and where it has a device to hold it open, it is effective • rests on stops when in the safe (running) position and not on the guard bar locking pin(s)	Visual inspection. Manipulation and operation.	When set, the guard bar positioning must prevent connection to the loading adaptor. Excessive effort required to move or control the guard bar. Mechanism worn to excess. Inadequate retention or security of guard bar in open/closed positions. Guard bar rests on guard bar locking pins (not its stops).
The guard bar (or cabinet door) locks: • are securely mounted • register correctly with the guard bar	Visual inspection, manipulation and operation.	Guard bar lock device: • insecurely mounted • not operating correctly (eg sticking) • not engaging correctly or reliably with the guard bar/door • guard bar lock and/or register plate worn or misaligned

8.4 Control system – vapour transfer valves and emergency shut down operators

Requirement	Method of inspection	Reason for failure
The control system functions as intended for loading. When operated by the master control: • any visual indicator (eg visiwink) operates correctly • the vapour transfer valves open and, as far as can be determined, spring-return closed • the emergency shut down controls are primed (see below)	Operation of controls. Operation of relevant (master) control to open and closed positions. Aural test; operation of the control to open and close the vapour transfer valves.	The system does not function as intended. Visual indictor is slow to operate or fails to indicate 'open' and 'closed' status correctly. Any valve fails to open and close smoothly and readily.
The pneumatic control system is free from air leaks. The pneumatic control system tubing is secure and in a serviceable condition.	Visual inspection and/or aural test. Visual inspection and/or aural test.	Air leak from control system component. Tubing brittle, chafed and/or insecure.
Each emergency shut down (ESD) control is clearly and visibly labelled. Each emergency shut down (ESD) control functions correctly. (See also 11.3 for any emergency shut down control fitted to the tank top.)	Visual inspection. Operation of the pneumatic control system to prime the system and the opening (repeatedly as required to test each emergency control) of a footvalve, followed by the operation of each ESD control.	Label missing, faded or illegible. ESD control inoperative, slow to respond or reset. Control system fails to shut down completely within 3 seconds when each ESD control is operated.

8.5 Control system – footvalve operation

Requirement	Method of inspection	Reason for failure
Each footvalve opens and closes smoothly when operated by its control. The visual indicator (eg visiwink) or other means of verifying its setting (open or closed) operates correctly.	Operation of relevant control. Aural test (if possible). Operation and visual inspection.	Footvalve poppet slow or fails to open and close. Visual indictor slow to operate or fails to indicate 'open' and 'closed' status correctly.

9 Inspection of labels and hazard panels

9.1 Notices and labels

Note: The following labels are fitted, visible and legible.

Requirement	Method of inspection	Reason for failure
Compartment capacity and number for each compartment	Visual inspection when in the position of a loader when attaching a loading or discharge coupler to each compartment.	Label(s) for compartment capacity and number obscured or otherwise not clearly visible in the position of a loader when attaching a loading or discharge coupler to each compartment.

Requirement	Method of inspection	Reason for failure
Non pressure balanced footvalves fitted (applicable to all tanks with an initial hydraulic test date after 01/01/2009)	Visual inspection.	Label not fitted. Label indicates pressure balanced footvalves are fitted.
Overfill prevention system type (number of wires)	Visual inspection.	Label not fitted. Label indicates a five wire overfill prevention system is fitted.
Maximum number of compartments that may be loaded simultaneously (for a tanker which carries petrol) (applicable to all vehicles/trailers first used after 01/09/1996)	Visual inspection.	Label not fitted to a tanker which loads petrol.

9.2 Grade/product indicators (if fitted)

Requirement	Method of inspection	Reason for failure
If fitted, each grade/product indicator: • is secure • is legible • operates effectively	Visual inspection and operation.	Grade/product indicator: • is insecure • is not readily visible • has a label which is illegible, damaged, or faded • has a tumbler which is stiff or does not index correctly

9.3 Hazard warning panels

Requirement	Method of inspection	Reason for failure
The mountings of each hazard warning panel are secure. Each hazard panel displays the correct information clearly.	Visual inspection.	Mountings excessively corroded or damaged. Incorrect product being displayed. Board damaged. Colours excessively faded.

10 Inspection of loading connections

10.1 Loading adaptor caps

Requirement	Method of inspection	Reason for failure
Each loading adaptor cap: • is present and retained • does not rotate when attached (indicating questionable leakproofness) • has a reliable securing arrangement (eg cams or peg)	Visual inspection. Manipulation.	Inadequate/deficient retention. Cap rotates freely on adaptor nose (Note: this does not apply to all manufacturers). Securing cam or peg worn to excess.

Requirement	Method of inspection	Reason for failure
• is free of product (indicating a leaking adaptor poppet seal), and • has a seal which is secure and in good condition	Removal of the cap and visual inspection.	For the adaptor poppet seal, evidence of product being present in its cap when removed. Seal insecure, defective or damaged.

10.2 Loading adaptors

Requirement	Method of inspection	Reason for failure
Each adaptor nose is in a serviceable condition.	Use of the industry recognised wear gauge in accordance with manufacturer's instructions.	Failure of wear gauge test.
Each loading adaptor body is in sound condition and securely attached to the pipework/support plate (note particularly around the mounting flange and bolt holes). Flange gaskets are in a sound condition.	Visual inspection.	Adaptor body cracked or damaged. Insecurity. Loose, missing or incorrect fastener. Evidence of gasket deterioration – swelling, distortion, evidence of product.
Each loading adaptor's sight glass (and/or clear spool piece behind its mounting flange) is secure, clear and in a sound condition (where fitted). Floating indicator balls (if used) are visible and are at the bottom of the sight glass (being empty).	Visual inspection.	Sight glass/spool piece: • insecure • cracked • damaged • excessively opaque Ball not sunk, swollen or shedding its coating.
When operated by a mating coupler: • each loading adaptor poppet closes smoothly • each loading adaptor's handle does not foul any component (eg guard bar) which could cause it to lock	Attachment of an opening coupler and test by operation of the coupler's lever.	Poppet fails to return readily and completely to the fully closed position under its spring force alone. Loading adaptor's handle fouls on another component.
Each loading adaptor's operating lever is in a serviceable condition and operates freely with a gloved hand. Each adaptor poppet opens smoothly when operated by its own lever. Each loading adaptor operating lever secures in the open position.	Visual inspection; operation. Operational test with its own lever. Operation to open position and securing the lever.	Handle insecure or damaged. Operation of handle obstructed when using a gloved hand. Poppet stiff to open with operating lever. Lever insecure when locked open.

Requirement	Method of inspection	Reason for failure
The loading adaptor support plate is secure and in a sound condition.	Visual inspection.	Adaptor support plate: • is insecure • is cracked, damaged or excessively corroded

10.3 Vapour adaptor

Requirement	Method of inspection	Reason for failure
The coupler attachment interlock plunger is operational.	Visual inspection; operational test by depressing.	Plunger sticking or worn. Plunger fails to reset (spring return) smoothly.
A cap for the vapour adaptor is present and retained. The cap seal is present, secure and free from distortion and cracks.	Visual inspection. Manipulation.	Cap missing or damaged. Cap seal missing, loose, distorted or cracked.
The groove for a coupler's attachment cams is not worn to excess.	Attachment of new/test cap and manipulation.	Cap free to rotate when attached. Note: use a new cap if necessary to determine whether the existing cap or the groove is worn.
The vapour adaptor body is in a sound condition and is secure.	Visual inspection.	Damaged/cracked body or flange. Defective fasteners.
The vapour adaptor sight glass is free of liquid content.	Visual inspection.	Presence of any liquid in the vapour system either visible through the sight glass or drained out.
The vapour adaptor poppet operates smoothly and effectively.	Visual inspection. Operational test by opening manually.	Juddery movement. Failure to close immediately and completely.

10.4 Overfill prevention socket

Requirement	Method of inspection	Reason for failure
The overfill prevention system components are accepted by the safe loading pass scheme.	Visual inspection.	System components not accepted by the safe loading pass scheme.
A socket protective cap is present, in good condition and retained.	Visual inspection.	Cap missing, damaged or fails to secure. Cap not retained.
The socket contact pins are sufficiently clean to provide a reliable connection with the loading gantry overfill prevention system plug.	Visual inspection (see also 11.5).	Socket pin dirty/oxidised.

Requirement	Method of inspection	Reason for failure
Where fitted, the device (eg pin) fitted to the overfill prevention system socket to detect the attachment of a plug is operational.	Manual depression and release of the interlock device.	Device seized or inoperative. If intended, brakes not applied when interlock device actuated (see 8.2). Interlock arrangement with other control system function (if fitted) not operational.
Any gasket fitted between the socket and its junction box or on the junction box itself is in good condition.	Visual inspection.	Gasket distorted or perished.
The height of the centre line of the earth/overfill prevention socket should be >0.5m laden and <1.4m unladen.	Visual inspection/measurement.	Socket incorrectly positioned.

10.5 Pressure switch

Requirement	Method of inspection	Reason for failure
The pneumatically operated electrical pressure switch operates in the circuit of pin 8: • to 'open circuit' if no air signal is present from the vapour transfer valves and the vapour adaptor's coupler detection device • to 'closed circuit' only if an air signal is present from the vapour transfer valves being open and the vapour adaptor's coupler detection device being depressed	Connection of a proprietary overfill prevention test unit to the overfill prevention system socket, and verifying that: • a non-permissive signal is obtained on pin 8 without a vapour coupler connected to the vapour adaptor • a permissive signal is only obtained on pin 8 when the master control is operated, the vapour transfer valves have all opened (sequentially) and the hose coupler detection device on the vapour adaptor is depressed	Pressure switch not connected to pin 8. Pressure switch is 'closed circuit' without a vapour coupler being attached to the vapour adaptor. Pressure switch is 'closed circuit' even though the vapour transfer valves have not sequentially opened. Pressure switch fails to switch between open and closed circuit immediately on depression/release of the coupler detection device on the vapour adaptor (when the vapour transfer valves are open). Note: the pressure switch may also operate on other channels to which a dummy sensor is connected.

11 Inspection of the tank top (including service equipment)

11.1 Tank top condition

Requirement	Method of inspection	Reason for failure
The tank top is clear of all debris including leaves, twigs, branches etc.	Use of suitable Ohmmeter.	Debris on the tank top.

11.2 Tank top drainage

Requirement	Method of inspection	Reason for failure
Each tank top drain tube is clear and unobstructed.	Use of suitable Ohmmeter.	Drain tube obstructed such that water would not or does not flow freely through it. Drain tube fitted with a valve capable of being closed.

11.3 Pneumatic system on tank top

Requirement	Method of inspection	Reason for failure
Any tank top emergency control, if fitted, functions. (See also 8.4)	Operation of emergency shut down control.	Emergency control fails to shut down control system in 3 seconds. Emergency control fails to re-set.
Pneumatic tubing is in a serviceable condition.	Visual inspection.	Air leaks. Excessive deterioration (leaks, embrittlement) in tubing condition.

11.4 Manhole covers and neckrings (approx 500mm diameter)

Requirement	Method of inspection	Reason for failure
Each manhole cover is secure to its neckring/pad with no evidence of leakage. Each manhole cover is in sound condition. Each manhole cover gasket is in sound condition.	Manipulation of each fastener. Visual inspection. Visual inspection. Visual inspection.	Insecurity of any fastener. Evidence of product/vapour leak (staining/discolouration). Evidence of cracking or other structural distress. Evidence of deterioration or displaced/incorrectly fitted gasket.

11.5 Dip caps and mandrels (where fitted)

Depress the dip cap in order to vent fully the compartment, and thereby assess the degree to which the compartment is leaktight.

Requirement	Method of inspection	Reason for failure
Each dip cap compresses on its spring and secures correctly.	Depression of the cap. Manipulation.	Internal spring broken, corroded or ineffective. Securing pin worn to excess or otherwise defective. Cap fails to re-secure.
Each dip cap is retained and is in good condition.	Visual inspection.	Missing chain or wire. Seal excessively worn or damaged.

Requirement	Method of inspection	Reason for failure
Each dip mandrel is secure and in good condition.	Visual inspection.	Mandrel insecure. Evidence of product or vapour leaks (staining/discolouration or unusual cleanliness). Mandrel sealing face corroded or damaged.

11.6 Vapour transfer valve (VTV) and hose connection to manifold

Requirement	Method of inspection	Reason for failure
Each vapour transfer valve is secure, leaktight and functions correctly (normally closed).	Manipulation and operation.	Valve insecure. Evidence of product/vapour leaks (staining/discolouration). Valve poppet sticks open/does not close smoothly when control closed.
Each vapour transfer hose is secure and leaktight.	Visual inspection.	Torn or dislodged hose. Insecure securing clip. Evidence of product/vapour leaks (staining/discolouration).

Note: Open the fill lid to obtain access to the vapour transfer valve's seal

Requirement	Method of inspection	Reason for failure
Each vapour transfer valve seal is secure and in good condition.	Visual and/or tactile examination (where possible).	Dislodged, distorted or swollen seal.

11.7 Fill lid and emergency pressure relief valve (EPRV)

Requirement	Method of inspection	Reason for failure
A fill lid incorporating an EPRV is fitted to each compartment.	Visual inspection.	EPRV not fitted.
Each fill lid and EPRV should be inspected in accordance with the manufacturer's recommendations but as a guide it should be inspected to verify: • its spring is/springs are compressible and, as far as can be determined, serviceable	Force applied to cover arm.	Cover arm does not deflect (spring broken/coil bound/corroded). Spring distorted or damaged.

Requirement	Method of inspection	Reason for failure
• its hinges (lever arm and cover arm) and catch are lubricated and it opens readily • its hinge pins are not damaged and are correctly retained • its cover arm is in good condition • its cover seal is secure, correctly fitted and in good condition. • it slams shut to the first stage of securing • its adjustment relative to the cover and lever arms is in accordance with the manufacturer's recommendations • the lever arm (over the cover arm) or other device securing is operational and effective and	Visual inspection/manipulation.	Seized or stiff to open; absence of visible evidence of lubrication. Hinge pin insecure or not in correct position; evidence of damage. Cover arm damaged/distorted. Evidence of product/vapour leak (staining/discolouration). Evidence of cracking, hardening, swelling, or shrinking of the seal. Seal incorrectly fitted (localised distortion). Catch not serviceable. Adjustment not in accordance with manufacturer's recommendations. The lever arm (or other device) is stiff to operate, not lubricated or otherwise does not functioning correctly.

Requirement	Method of inspection	Reason for failure
• any optional additional security device, if fitted, is secure and operational	Visual inspection/manipulation.	Security device (if fitted) insecure or inoperable.

12 Tank/compartment internal inspection

12.1 Breather valve (Pressure – vacuum valve)

Requirement	Method of inspection	Reason for failure
Each breather valve is secure.	Visual inspection and manipulation.	Valve insecure or missing. Valve not secured with wire (in accordance with manufacturer's instructions). Evidence of product/vapour leaks (staining/discolouration).
If visible, any seal is in sound condition. If visible, its flame gauze is in sound condition.	Visual inspection and manipulation.	Distorted valve seal (if visible). Missing or insecure flame gauze.

12.2 Compartment internal inspection (freedom from debris and integrity)

Requirement	Method of inspection	Reason for failure
Each compartment is free from debris.	Visual inspection with Ex torch.	Debris or foreign bodies present.
Any internal structure is free from cracks or evidence of structural distress.	Visual inspection with Ex torch.	Evidence of cracks or defects in the tank shell or internal structure.

Requirement	Method of inspection	Reason for failure
Any internal pipework – drain, service and vapour recovery tubes – is free from cracks.	Visual inspection with Ex torch.	Evidence of cracks or defects in the pipework and attachment welds.

12.3 Central conductor (where required)

Requirement	Method of inspection	Reason for failure
A central conductor is fitted to a compartment which is both: • less than 15,000 litres capacity, and • over 1.6 metres in length A central conductor is: • a full height baffle or surge plate, or • a dip tube or • a centrally positioned service or vapour recovery tube, or • a special central conductor A special central conductor, where required, has a diameter of 2mm–10mm, or > 50mm.	Visual inspection (and measurement if necessary).	Where required, no central conductor is fitted. Central conductor not to required design. Special central conductor not to required design.
Any dip tube/central conductor fitted is secure.	Visual inspection and manipulation.	Dip/other tube insecure to its top mounting. Central conductor cable/wire insecure to its top or bottom anchorage or broken.
Electrical continuity of less than 10 ohms exists between an earth pin or the tank shell and any central conductor or dip tube fitted.	Use of suitable Ohmmeter.	Resistance greater than 10 ohms.

12.4 Footvalve installation/deflector plate

Requirement	Method of inspection	Reason for failure
The installation of each footvalve is such that incoming flow of product through it when loading is directed along the tank floor, ie each footvalve is: • either mounted in a sump (with its bonnet protruding though a close-fitting cut out in the floor of the tank shell), or • fitted with a securely attached deflector plate. Note: applies to all tanks with an initial hydraulic test date after 01/01/2009	Visual inspection.	Footvalve neither fitted in a sump nor with a deflector plate. Deflector plate insecure.

12.5 Overfill prevention system sensors

Requirement	Method of inspection	Reason for failure
Each overfill prevention sensor housing is secure to the manhole cover.	Manipulation.	Insecure housing. Securing ring or tube loose.
Each overfill prevention sensor is secure in its housing.	Manipulation where possible.	Sensor loose.
The setting of each overfill prevention sensor is secured by wire and recognised lead seal in accordance with Annex F (applies to all tanks with an initial hydraulic test date after 01/01/2009).	Visual inspection.	Lead seal not identifiable or missing. Wiring insecure or not in accordance with Annex F for the design fitted.
Each overfill prevention sensor functions correctly ('wet test').	Use of a proprietary test kit to carry out a wet test with a beaker of liquid on each sensor. (Use aviation fuel when testing aviation tankers.)	Sensor fails to respond to liquid as intended.

13 Electrical continuity checks – ground level

13.1 Earth pin to tank and service equipment

Requirement	Method of inspection	Reason for failure
Electrical continuity of less than 10 ohms exists between the earth pin fitted and: • any separate earth pins on the tank (if fitted), or the tank itself if only one earth pin is fitted • each run off pipe between the foot valve and loading adaptor • each loading adaptor • pins 9 and 10 of the overfill prevention socket, and its body • for a trailer, the chassis of the attached tractor unit Where any earth continuity cable or braid is fitted, it should be in good condition.	Use of suitable Ohmmeter.	Resistance greater than 10 ohms. Earth continuity cable damaged, detached or corroded.

13.2 Earth pin to axles and wheels

Requirement	Method of inspection	Reason for failure
Electrical continuity of less than 1,000 ohms exists between the earth pin fitted and: • all the trailer wheels, or • all the drive axle wheel positions of a rigid vehicle or tractor Where any earth continuity cable or braid is fitted, it should be in good condition, particularly any connecting to the axles.	Use of suitable Ohmmeter.	Resistance greater than 1000 ohms (The required electrical resistance figure (below 1,000 ohms) may be considered satisfactory even if rotation of the wheel is required to obtain it.) Continuity cable or braiding showing signs of wear or corrosion. Inadequate or unreliable attachment.

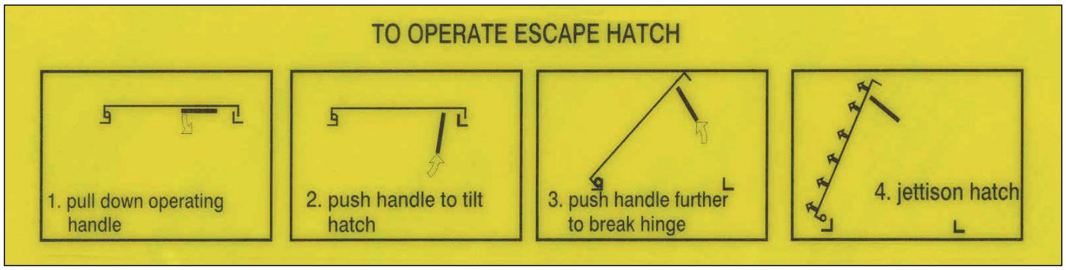
Annex A

(See section 2.1 – Roof hatch)

Roof hatch designed for emergency egress, showing information labels and sealing arrangement

Figure 1

Figure 2



Typical information labels for a roof hatch that may be used for emergency egress

Annex B

(See section 2.4 – Additional in-cab electrical equipment)

Approval certificate for permanently powered electrical equipment

PERMANENTLY POWERED ELECTRICAL SYSTEM – CERTIFICATE/PLATE OF CONFORMITY

Vehicle fleet number	Tank number	Registration mark

The general electrical/electronic wiring and equipment on this road tanker is installed in accordance with EI Petroleum road tanker design and construction. With the exception of the tachograph, and the electrical equipment listed below, the system is totally disabled when the road tanker battery master switch is turned off. There are no energy storage components which remain live 10 seconds after the switch is set to the off position.

The following permanently powered electrical equipment has been installed:

The permanently powered electrical equipment is: (delete as appropriate)

- isolated from the main electrical wiring, and has its own battery

  located. . . . . .

- permanently powered from the live side of the master switch via a barrier/fuse unit

  located. . . . . .

The system complies with the Energy Institute Petroleum road tanker design and construction.

It has been certified by _____ which is a Notified Body.

Certificate number Ex _____.

This installation must not be modified other than with the detailed authorsation of the supplier.

Name	Position
Date	Company

Annex C

(See section 4.8 – Battery main earth point)

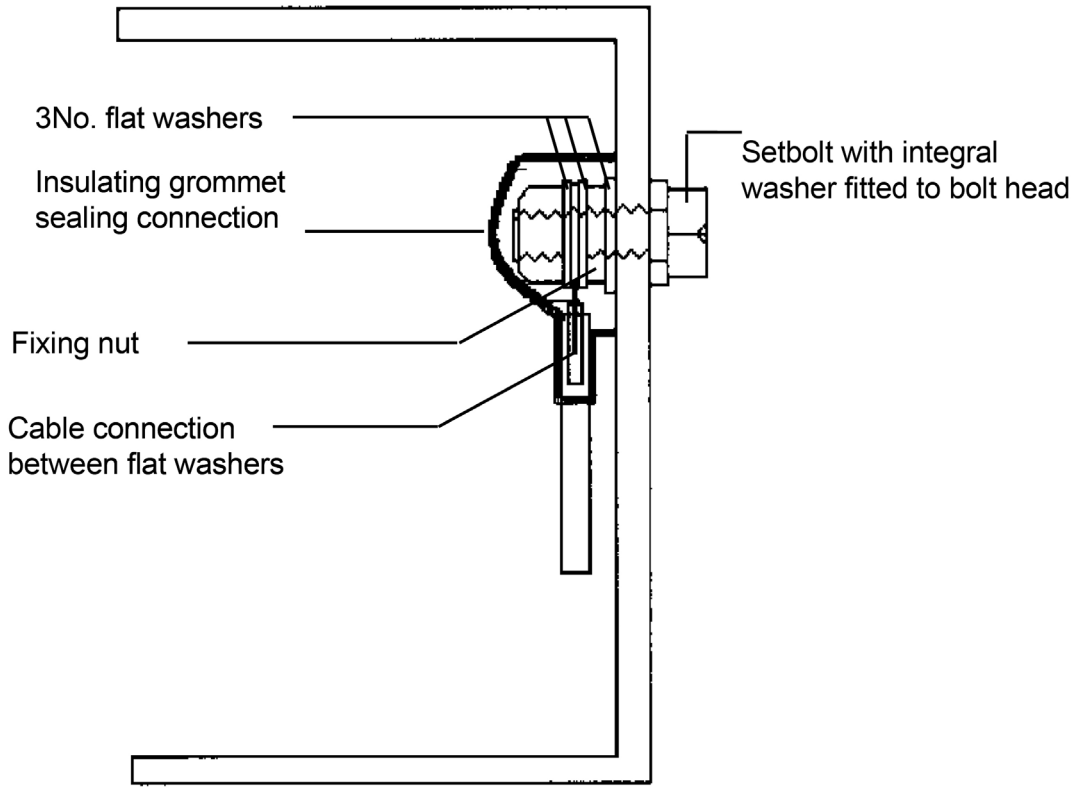
Alternative design for the connection point of the battery negative cable to the chassis

The bolt should be screwed into the chassis and tightened.

With the bolt in position a flat washer should be fitted, followed by a securing nut also tightened.

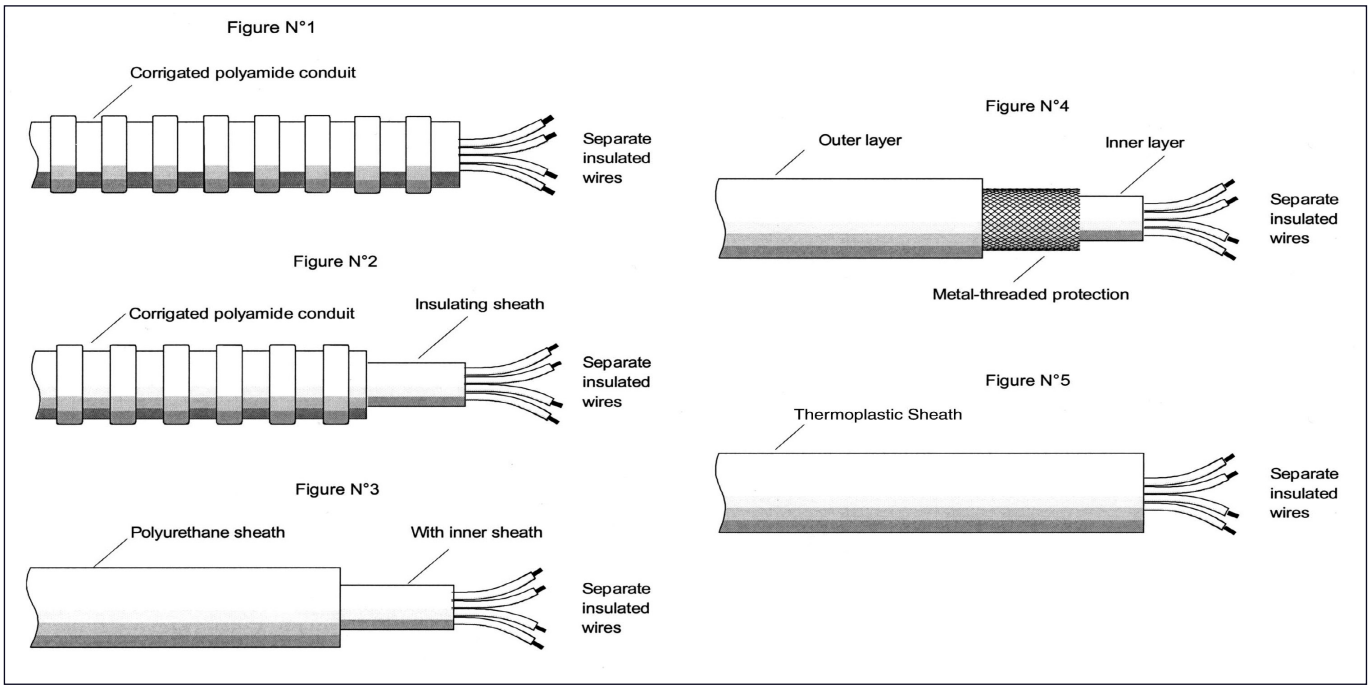
The cable connection should then be made between two further flat washers and secured by a Nyloc nut. When the connection has been completed an insulating boot should be positioned over the assembly to provide weather protection.

Note: all fastenings should be tightened to their appropriate tightening torque.



Annex D

(See section 5 – Electrical system (external to the cab) – examples of secondary insulation)



Note: the outer layer (whether conduit or sheath) may not be split axially unless:

i) it is secured closed and is double wrapped by diametrically opposed 'C' sections with a feature to prevent rotation, or

ii) it provides a third layer of protection to the conductor(s)

Annex E

(See section 8.2 – Anti-drive away function test)

Note: this test procedure has been developed to take account of changes in braking systems of some articulated vehicles where the practice of using the service line to assist the parking brake can result in the interlock being ineffective temporarily as the park brake control is released.

Test procedure

The operation of the interlock arrangement on all rigid vehicles and semi-trailers should be checked as follows.

1 Park the tanker in a suitable place, with at least 5 metres clear space in front.

2 With the vehicle park brake applied, build up the vehicle air system's pressure to its maximum.

3 Lift the interlock bar up so that it is in the fully raised position, or attach a dummy connection to the vapour adaptor and overfill prevention socket in turn if not mounted behind the bar.

   Note: each should be tested separately if not behind the interlock bar.

4 Return to the cab and after checking that there is nothing in the path of the vehicle, quickly release the park brake and attempt to drive forward.

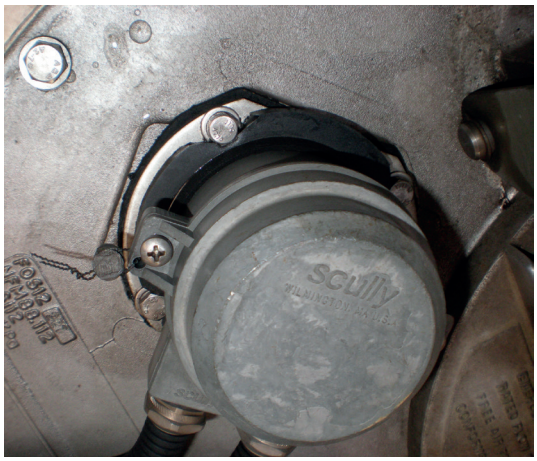
   Note: this needs to be done quickly to replicate a known possible fault condition.

5 If it is possible to move the vehicle more than 150mm (6 inches) forward with the wheels rotating then the vehicle (rigid, tractor or semi-trailer) should not be issued with a Safe Loading Pass.

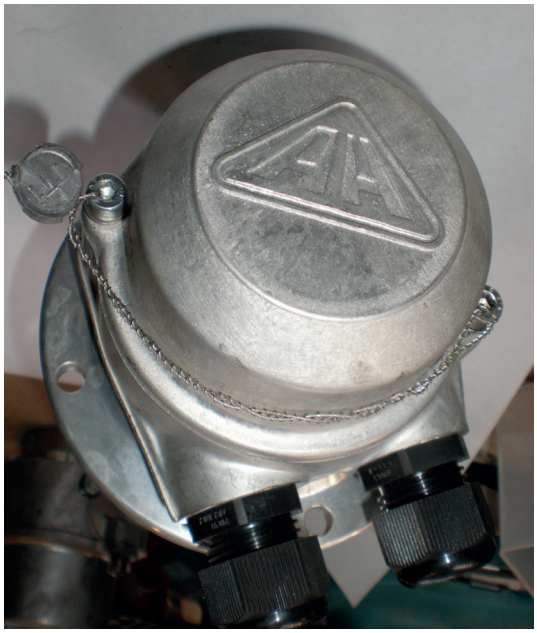
After conducting the test, re-apply the park brake, remove any dummy connections to the vapour adaptor and overfill prevention socket, and lower the interlock bar.

Annex F

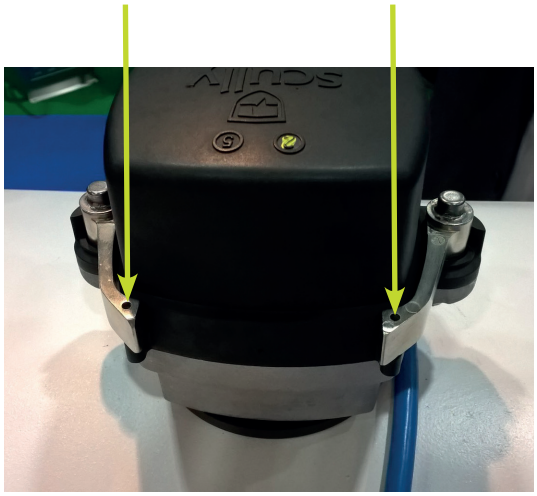
(See section 12.5 – Overfill prevention system sensors – wiring and sealing of sensor housing cap/adjustment screw)



Note: where the adjustment screw is not mounted under the cap, it must be wired and sealed to a cap screw.



Note: cap securing handles must be wired and sealed closed



Annex G

(See section 7.1) Plate for identifying correct setting of overfill preventing probes

Figure F.1 –Setting of overfill prevention probes

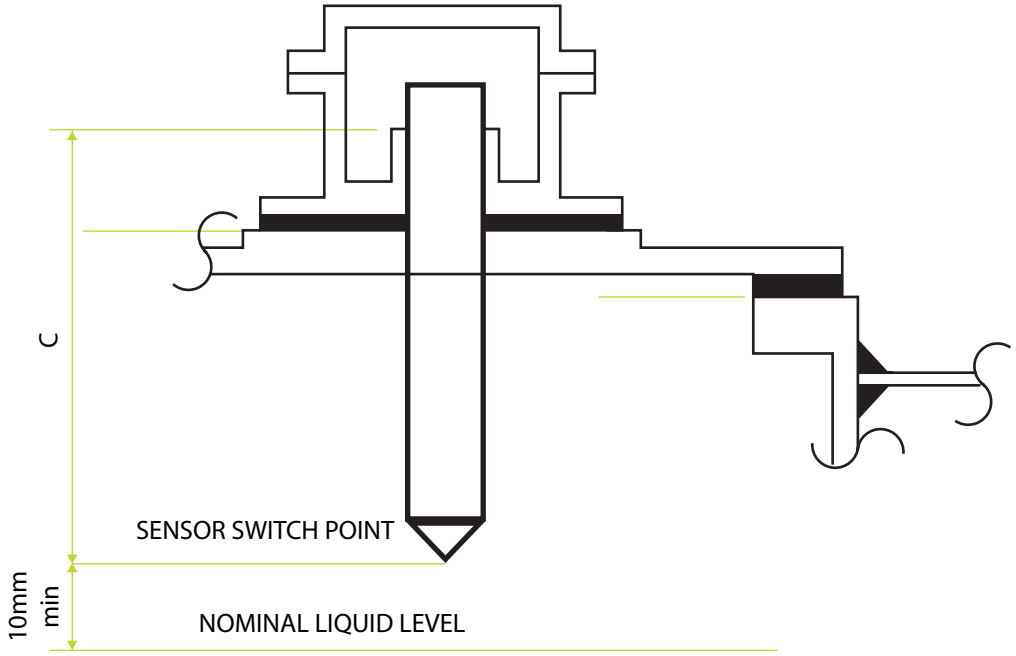


Table F.1: Plate for identifying correct setting of overfill prevention probes

Tank serial number	
Compartment number	Dimension
	C
1	
2	
3	
4	
5	
6	
7	
8	