SAFE
LOADING
PASS
SCHEME

LPG Inspection Manual

This manual is to be used for the inspection of vehicles which carry UN1011, UN1965 and UN1978 gases

SLPS

Contents

Acknowledgement

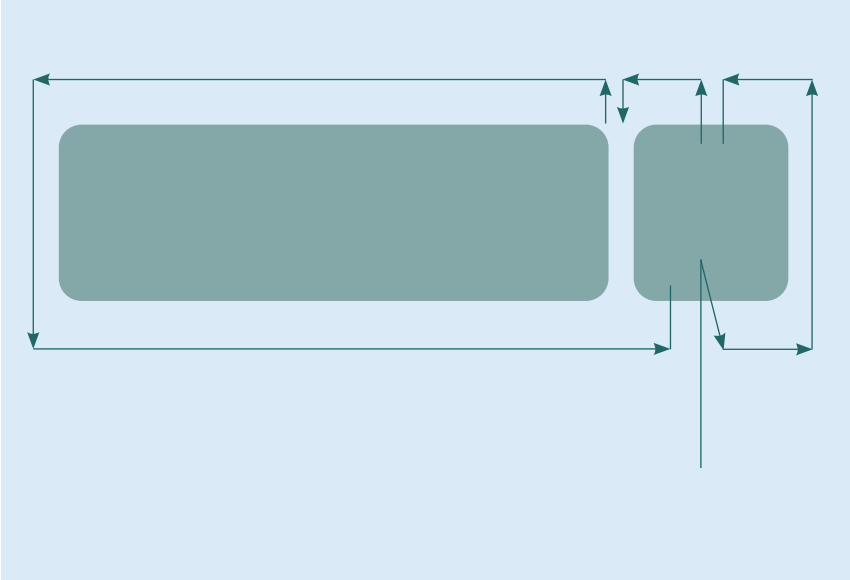
The following text is reproduced with permission from the Energy Institute's publication: Petroleum road tankers: Recommendations for a standard method of inspection for a safe loading pass (first edition).

Before beginning inspection, providers must have suitable measures in place for the prevention and control of environmental contamination, fire and explosion.

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

Warning: An LPG tanker has a number of valves where flammable gas will be discharged if opened. NEVER OPEN OR OPERATE ANY VALVES DURING THE INSPECTION PROCESS.

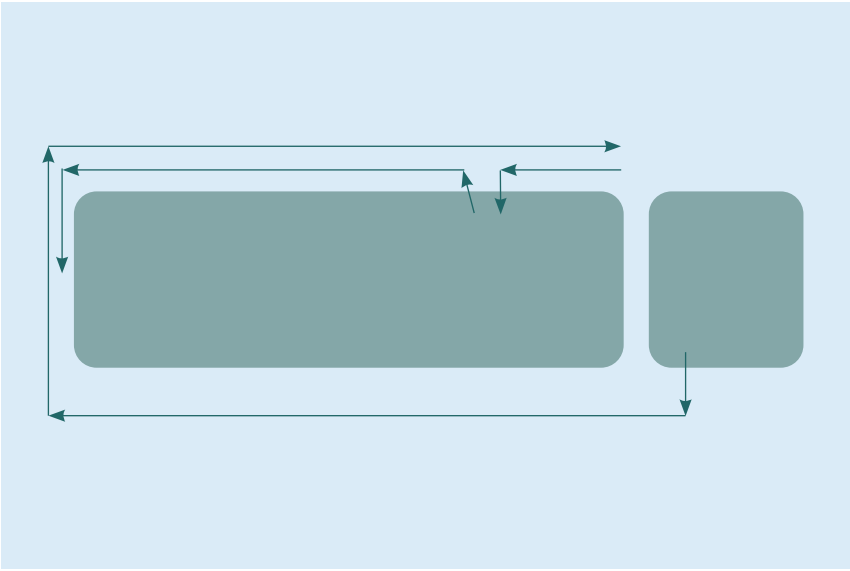
1 Inspect the tanker for sources of ignition and other safety items (sections 2–6)



- 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
- Verify that all outlet valves on the vehicle are secured closed or a sign is attached to the valve stating "Do not open valve"

*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

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 TC2 Tank initial certificate for a tank which has not yet had its first intermediate inspection, or ADR TC3 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 • Most recent PRV test certificate (within previous 3 years and indicates set pressure >238psi) *Note:* check for certificates relating to Burst Disc *Note:* for LPG tankers marked as constructed before 10 May 2004 or at any time to EN12493 Annex C, ADR certification is not required.	Verification.	Statutory tank certificate expired or otherwise invalid. PRV certificate has expired, or if the certificate will expire within the next 6 months, the SLPS pass shall not exceed this date. Tankers in receipt of a derogation for extended PRV replacement intervals are acceptable, indicated by a note from the inspection body attached to the certification stating the tanker has been exempt from a 3 year PRV exchange. PRV certificate indicates a set pressure <238psi. LPG tanks fitted with a Burst Disc, which is not proceeded by a PRV, shall not be issued a SLPS pass.

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: • shall be at least 2kg capacity and dry powder type • is readily accessible from the driver's seat when wearing a seat belt	Visual assessment.	Fire extinguisher is: • not at least 2kg capacity and dry powder type • fitted in passenger foot well, or otherwise not readily accessible

Requirement	Method of inspection	Reason for failure
• 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
• 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

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 (maximum 2 button cells) and *has no electrical socket*, no additional requirements apply.	Visual inspection.	–
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.	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

Requirement	Method of inspection	Reason for failure
Any Radio Frequency Identification (RFID) tag/s must be: • secure • free from damage • mounted where there is no risk of an individual brushing past • marked adjacently to indicate: *WARNING* – POTENTIAL ELECTROSTATIC CHARGING HAZARD	Visual inspection.	An RFID tag: • insecure • damaged • mounted where there is a risk of an individual brushing past • not marked

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	Check 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.	Visual inspection and operation.	Night heater not fitted with an isolation switch.
The switch is clearly labelled with the method of isolation.	Visual inspection.	Switch not clearly labelled with the method of isolation.

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 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 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.	Visual inspection and manipulation.	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).
Note: 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 measurement	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.	Window glass not secure or retained by fire resistant materials. *Note:* Metal frame or clips on the inside and outside of the cab are normally required, bonded window glass larger than the cab window aperture may only require a retention device on one side (where the aperture will retain the other side). Bonded window glass must meet the same fire resistant properties of rubber sealed glass.

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.)
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 and F throughout its entire length. *Note:* Annex F type insulation only applicable for Volvo Group vehicles manufactured after 1 June 2019.	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
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.) Junction boxes are secure and free from damage. Absence of insulation tape and other unsuitable repair.	Visual inspection.	Use of snap-on connectors or those that pierce the insulation. Junction box or cover loose, excessively corroded, cracked or broken. Unsatisfactory/temporary repair or use of insulation tape.

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

5.2 Light units and other electrical components

Requirement	Method of inspection	Reason for failure
All lights and other electrical components: • function • are marked ExM (or better) if mounted inside a cabinet containing loading/discharge equipment • are marked ExN (or better) if within 0.5 metres of a loading/vapour adaptor, breather device or safety relief valves • are marked IP 65 if more than 0.5 metres and less than 1 metre from a loading/vapour adaptor, breather device or safety relief valves *Note:* see 'Electrical Zone Summary' for further information.	Operate lights and verify that all bulbs illuminate. Visual inspection.	Bulb fails to illuminate to full brilliance. (If multi-LED light unit, more than 1 in 4 LEDs are not illuminated.) Not suitably marked.
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.
Any Radio Frequency Identification (RFID) tag/s must be: • secure • free from damage • mounted where there is no risk of an individual brushing past • mounted >1m from any point of vapour discharge • marked adjacently to indicate: *WARNING* – POTENTIAL ELECTROSTATIC CHARGING HAZARD	Visual inspection.	An RFID tag: • insecure • damaged • mounted where there is a risk of an individual brushing past • mounted <1m from a point of vapour discharge • not marked

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 • are marked ExM (or better) if mounted inside a cabinet containing loading/discharge equipment • are marked ExN (or better) if within 0.5 metres of a loading/vapour adaptor, breather device or safety relief valves • are marked IP 65 if more than 0.5 metres and less than 1 metre from a loading/vapour adaptor, breather device or safety relief valves *Note:* see 'Electrical Zone Summary' for further information.	Visual inspection and operation.	Insecure or damaged component. Lamp or switch: • not functioning, or • not suitably marked

5.4 Permanently powered equipment (if fitted)

Requirement	Method of inspection	Reason for failure
Permanently powered equipment is: • marked ExM (or better) when mounted outside of the cab • marked ExN (or better) when mounted inside the cab • provided with a certificate in accordance with 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	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
Each trailer mudwing/each mudwing on the rear axles of a rigid tanker rear is: • secure and complete • in a sound condition	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

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. 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. 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).
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		

6.4 Electrical continuity to chassis

Requirement	Method of inspection	Reason for failure
There is electrical continuity of less than 10Ω: • between the chassis and the drive axle (tractors only) • between the vehicle fuel tank and chassis (all vehicles) • between the fifth wheel rubbing plate and the chassis (tractors only)	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 (ground level) of the tank status, tank plates, the tank, gauges, valves and pipework

Note: this is not an exhaustive list

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 Tank and all tank connections and gauges

7.7 External product pipework, flanges and gaskets

11.1 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.

7.2 Tank status

Requirement	Method of inspection	Reason for failure
The tank is empty unclean and with a minimum pressure of 1.5 barg.	Visual inspection of tank content and tank pressure gauges.	Tank is not empty unclean with a minimum pressure of 1.5 barg.
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. Empty unclean means that the tank may contain hazardous vapour.

7.3 The complete tank shell including its (integral) supports (including trailer upper coupler for the 5th wheel and rear subframe (if fitted))

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 liquid or vapour leaks *Note:* frosting could be present without a leak.	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) • liquid or vapour leaks highlighted by staining, peeling paint, damp patches, frosting and drips, unusual/distinctive cleanliness
Any tell-tale holes in doubler plates are free from evidence of leaking product.	Visual inspection.	Evidence of any liquid and/or vapour leak.
Trailer upper coupler for the 5th wheel and rear subframe (if fitted) are free from: • cracks • damage • unsatisfactory repairs • excessive corrosion	Visual inspection.	Evidence of: • cracks or other sign of material distress • damage across a weld seam • repair below the standard of the original construction • excessive corrosion (steel delaminated or excessively pitted)

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

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, discharge/fill lines and external pipework should be inspected from ground level or from under the vehicle using a pit or crawler board.

7.6 Tank and all tank connections and gauges

Requirement	Method of inspection	Reason for failure
Tank connections and gauges and actuators are in sound condition and leak tight. *Note:* safety relief valves are not required to be inspected	Visual inspection.	Evidence of cracking, product leak or other material defect with tank connections, gauges or actuators.

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, product drips or frosting
External pipework (footvalve(s) to loading connector(s)) is in a sound condition.	Visual inspection.	Excessive corrosion or damage. Witness marks of impact/damage. Liquid and/or vapour leak as evidenced by: • staining or unusual cleanliness • peeling paint, dampness, product drips or frosting
Pipework supports are in sound condition.	Visual inspection.	Support excessively corroded, damaged or insecure. Loose or missing fasteners.

7.8 Tank access cover

Requirement	Method of inspection	Reason for failure
The bolted access plate shall be inspected for: • security • bolt condition • indications of leaks	Visual inspection.	Evidence of: • insecurity • corrosions or stress • leaks

7.9 Pipework and hydrostatic relief valves (HRVs)

Requirement	Method of inspection	Reason for failure
The pipework and HRVs: • are secure • are free from leaks • are fitted with dust caps The HRV discharge must not point towards the tank.	Visual inspection	Evidence of: • insecurity • leaks • dust caps missing HRV discharge pointing towards tank.

7.10 Tank content gauge

Requirement	Method of inspection	Reason for failure
The tank content gauge is: • secure • in good condition	Visual inspection: • condition of glass • dial markings • content indication needle • glycerine filled gauges	• Insecurity • Glass is cracked/ damaged • Dial markings are not clear and easily read • The content indication needle is bent or not at zero • Damage/signs of leaking (glycerine)

7.11 Tank pressure gauge

Requirement	Method of inspection	Reason for failure
The tank pressure gauge is: • secure • in good condition	Visual inspection: • condition of glass • dial markings • content indication needle • glycerine filled gauges	• Insecurity • Glass is cracked/ damaged • Dial markings are not clear and easily read • The pressure gauge needle is bent • The pressure gauge reading does not match the expected pressure of the product on board • Damage/signs of leaking (glycerine)

7.12 Blanked connections

Requirement	Method of inspection	Reason for failure
If fitted, controls shall be checked for: • bolts tightened • studs and nuts secure • good condition • free from leaks	Visual inspection.	• Bolts loose • Missing or insecure studs and nuts • Insecurity • Is cracked/damaged • Damage/signs of leaking/frosting

8 Inspection of the control system, interlocks and loading connectors

8.1 Control systems

Requirement	Method of inspection	Reason for failure
If loading control cabinet is fitted, the cabinet for the pneumatic control system is secure; if mounted alone, its door is secure and secures closed.	Visual inspection.	Control cabinet insecure or damaged. Control cabinet door loose or does not secure firmly closed. Control fails to reset to safe condition when door is closed (if intended by design).
Instruction and control labels are visible and legible.	Visual inspection.	Labels missing, concealed, illegible, damaged or faded.
Controls are clearly identified.	Visual inspection.	Control not identified.
All controls are fitted and secure.	Visual inspection, manipulation.	Control missing, damaged or not secure.
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.
Where fitted, the air line antifreeze-lubricator is functioning.	Visual inspection.	Where fitted, air line lubricator empty or not functioning.

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.

Requirement	Method of inspection	Reason for failure
The cabinet/guard bar/release interlock cover devices, when operated, immediately activates the brake interlock ('anti-drive away system').	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 without the brakes being applied by the action of the connections being made.

Requirement	Method of inspection	Reason for failure
The tanker cannot be driven (or otherwise be moved) more than 150mm with its wheels rotating when the cabinet, guard bar or release interlock cover device is in an open position.	Attempt to drive the tanker with a connection made to: • a loading connector • the vapour connector See Annex E for detailed test procedure.	Tanker can be moved more than 150mm with wheels rotating when any gantry connection (liquid, vapour) is made to the tanker's connections.

8.3 Loading connectors

Requirement	Method of inspection	Reason for failure
The cabinet door (or guard bar): • is present and secure • effectively covers gantry connections as intended	Manipulation and operation. Visual inspection.	The cabinet door (or guard bar): • missing or insecure • damaged, distorted or fails to cover gantry connections as intended
• positioning, when set, must prevent joining to the loading connector • 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 cabinet door positioning must prevent joining to the loading connector • excessive effort required to move or control • mechanism worn to excess • inadequate retention or security in open/closed positions • guard bar rests on guard bar locking pins (not its stops)
The cabinet door (or guard bar) locks: • are securely mounted • register correctly with the cabinet frame	Visual inspection, manipulation and operation.	The cabinet door (or guard bar) lock device: • insecurely mounted • not operating correctly (eg sticking) • not engaging correctly or reliably with the door/guard bar • cabinet door lock and/or register plate worn or misaligned

8.4 Control system – emergency shut down operators

Requirement	Method of inspection	Reason for failure
Each emergency shut down (ESD) control is clearly and visibly labelled. Each emergency shut down (ESD) control is accessible and functions correctly.	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 not accessible, inoperative, slow to respond or reset. Control system fails to shut down completely within 15 seconds when each ESD control is operated.

8.5 Control system – fill footvalve operation

Requirement	Method of inspection	Reason for failure
The fill 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 operation 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 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 ACME tank connections and caps

Requirement	Method of inspection	Reason for failure
Each ACME seal connection is present and in good condition. Each connection and cap blanking is free from damage and retained. Each connection has a seal and cap secures reliably.	Visual inspection.	An ACME seal connection is not present and in good condition. A connection or cap blanking is not free from damage and retained. A connection does not have a seal or cap does not secure reliably.

10.2 ACME connectors

Requirement	Method of inspection	Reason for failure
All connections pass the ACME wear gauge test. See Annex G for wear gauge instructions.	Check with ACME thread wear gauges. The gauge should be offered square to the axis of the thread to be checked, this will prevent the gauge from attempting to cross thread. *Note:* The gauges have a line marked at the start of the thread to help determine the number of turns.	No seal in connection. Failure of wear gauge test. If the ACME thread to be checked accepts the gauge for more than one turn, ie the gauge screws on for more than one turn.

10.3 Fill line check valves

Requirement	Method of inspection	Reason for failure
Check valve to be incorporated in the fill line between the fill isolation valve and the blanking cap.	Visual inspection *Note:* Do not look directly into the fill line, use an alternative method of inspection such as a mirror.	Check valve missing/not fitted

10.4 Dry coupling

Requirement	Method of inspection	Reason for failure
The tank unit dry gas coupling (DGC) is: • in good condition • free from leaks • fitted with a dust cap	Visual inspection.	Evidence of: • damage • leaks • dust cap missing
Note: All the above inspections MUST be carried out where a tanker uses a dry disconnect coupling. Additionally the dry disconnect coupling, adaptor and ACME coupling must be connected together and inspected.[1]		

11 Electrical continuity checks – ground level

11.1 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 loading connector • loading/discharge and vapour pipework • 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 a suitable Ohmmeter.	Resistance greater than 10 ohms. Earth continuity cable damaged, detached or corroded.

11.2 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 a 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.

1 This wording is under consultation– R Hakeem

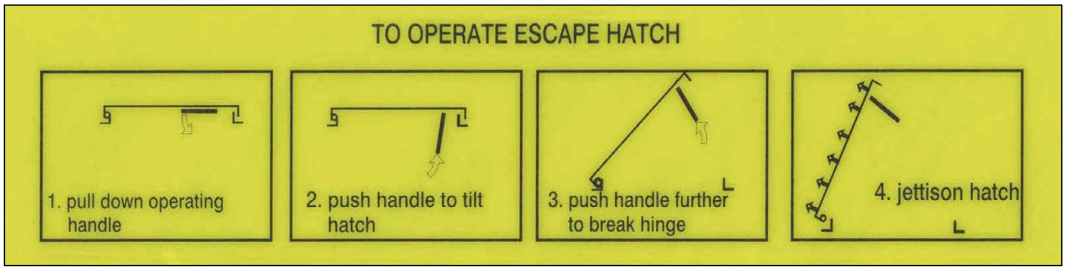
Annex A

(See section 2.1 – Roof hatch)

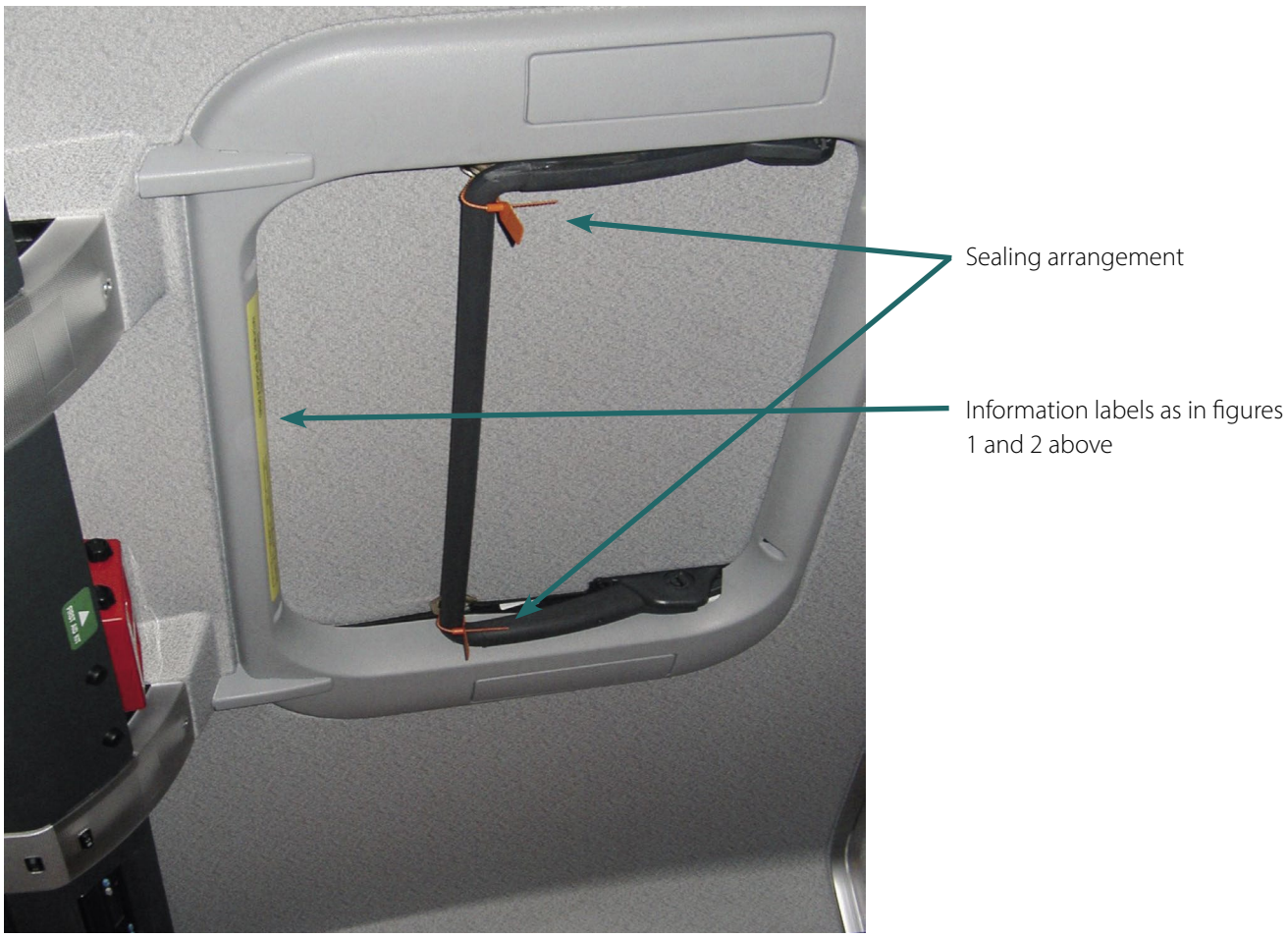
Roof hatch designed for emergency egress, showing information labels and sealing arrangement

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)

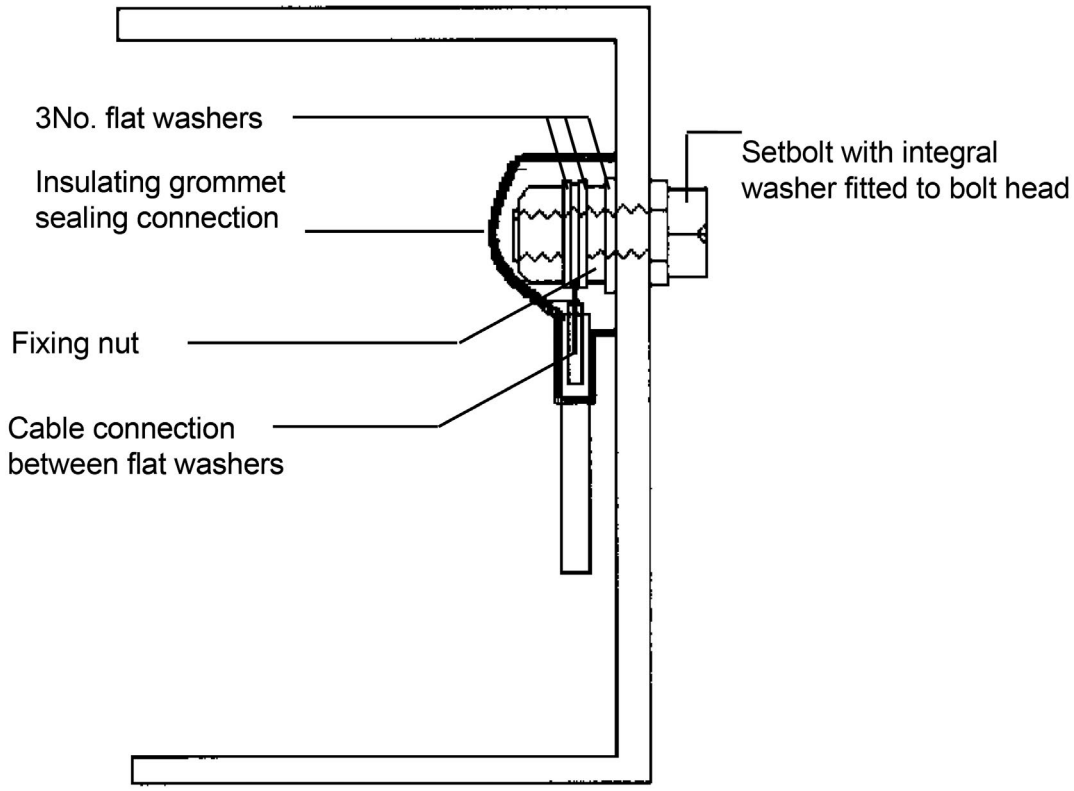
Alternative design for the connection point of the battery negative cable to the chassis

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.

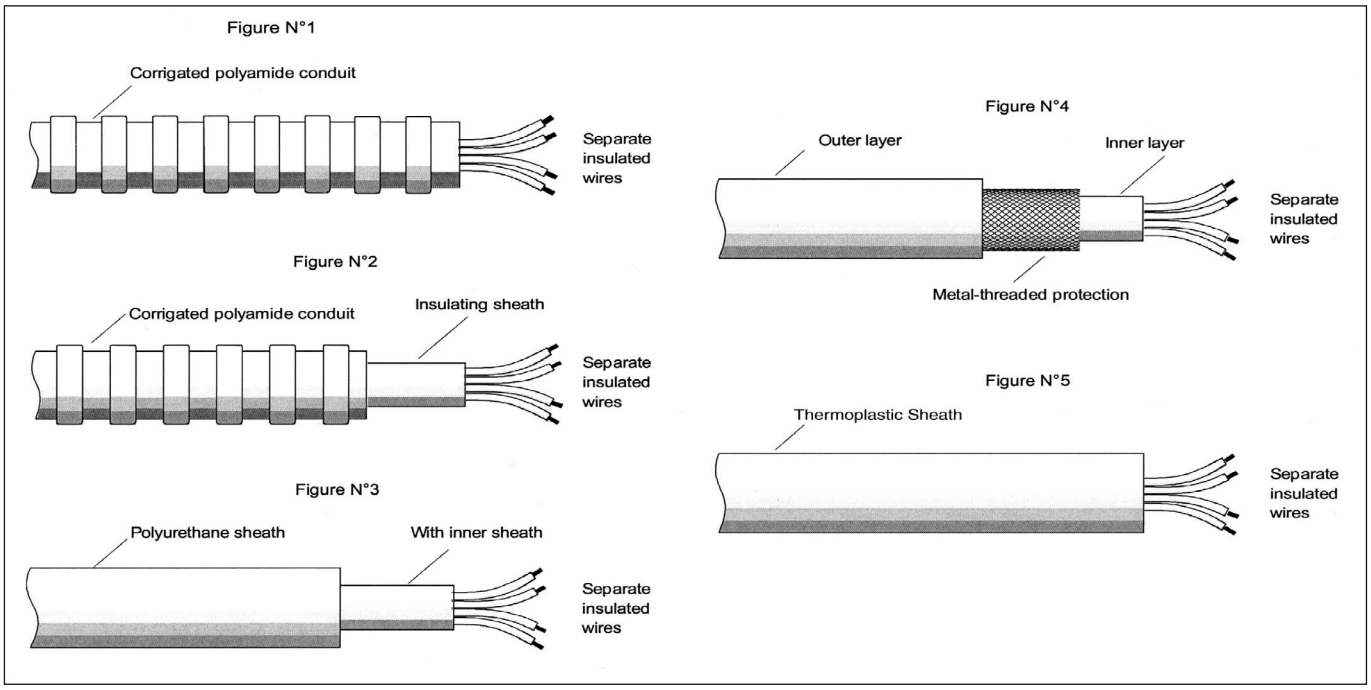
The cable connection should then be made between two further flat washers and secured by a Nyloc nut. When the connection has been completed an insulating boot should be positioned over the assembly to provide weather protection.

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 Open the cabinet/raise guard bar/release interlock cover devices – which prevent the loading gantry interface with Fill Valve and Vapour Valve connections. This test procedure should be by way of a theoretical connection only for the purpose of checking the brake interlock function. It is common for the trailer parking brake to have to be set in order to open cabinets, access guard bars or release valve interlock covers.

   Note: There may be a requirement to repeat the Function Test where Fill Valves and Vapour Valve connections are independently interlocked.

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 in a low gear.

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

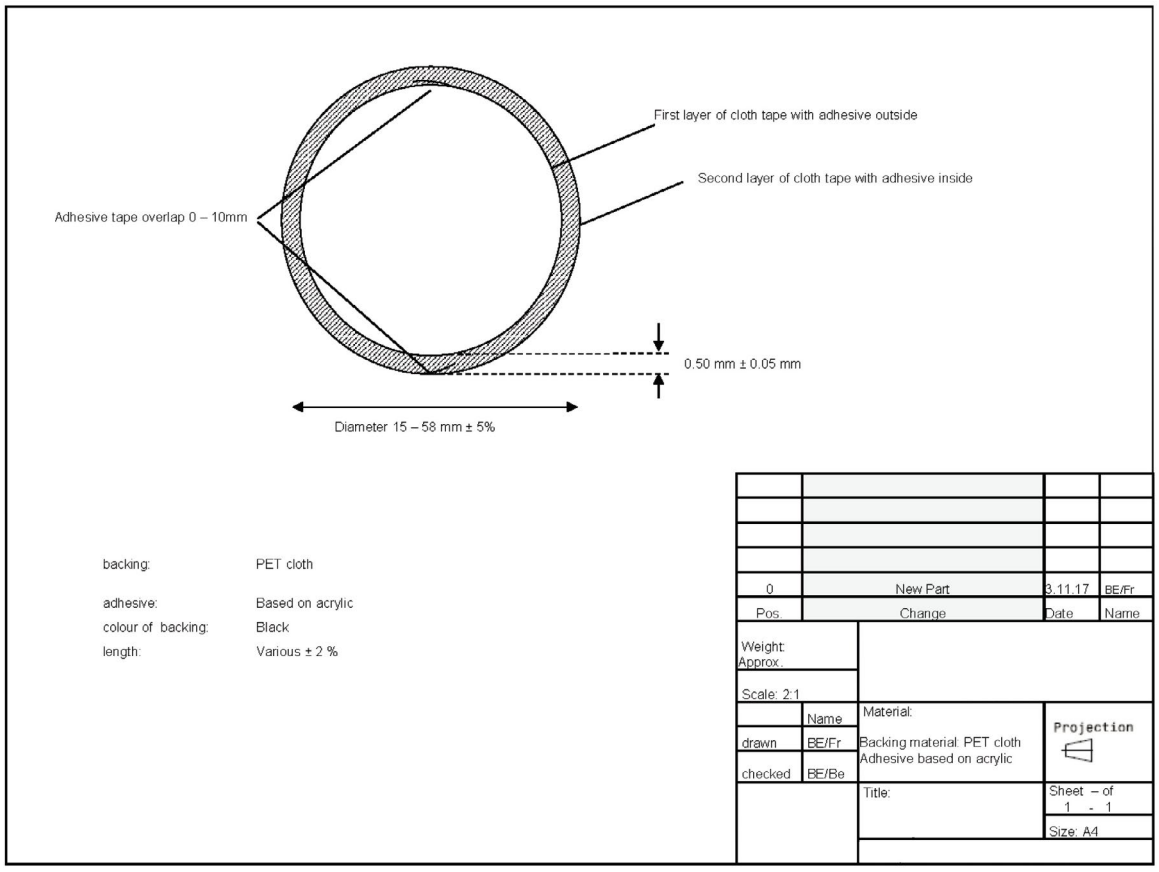
5 If it is possible to move the vehicle more than 150mm (6 inches) forward with the wheels rotating then the vehicle (rigid, tractor or semi-trailer) should not be issued with a Safe Loading Pass.

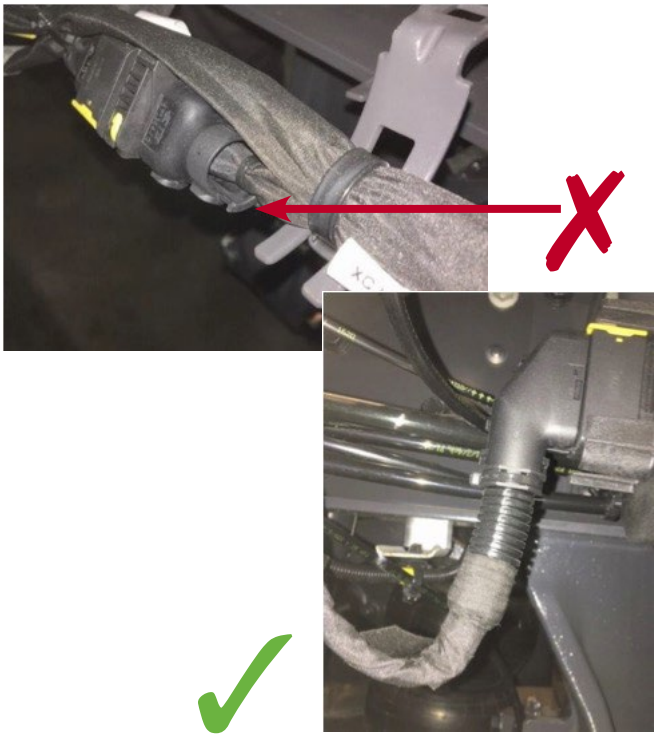
6 Ensure the vehicle parking brake is re applied. De activate the brake interlocks by closing cabinet doors / resetting and locking guard bars or closing Valve Interlock cover devices.

29

Annex F

See section 5 – Electrical system (external to the cab) – secondary insulation type only applicable for Volvo Group vehicles manufactured after 1 June 2019.





Annex G

ACME wear gauge instructions

KC ProSupply
The one-stop shop for gas components

ACME THREAD WEAR GAUGES (6TPI Class 2G)

Excessively worn ACME connectors may lead to coupling failure during the transfer of gas. KC ProSupply's wear gauges were developed to help reducing the risk by accurately measuring the degree of wear on ACME couplings.

The gauges measure the level of wear on the coupling thread flanks so that worn couplings can be replaced before they reach an unsafe state.

Guidelines for testing of ACME couplings

- Before using the ACME wear gauges, perform a visual inspection of the coupling for concentricity. If the thread is distorted or damaged, the coupling will not take the wear gauge even if past the wear limit and should be replaced
- If the wear gauge engages up to one turn, the coupling is getting close to the point of rejection
- If the wear gauge engages more than one turn, the coupling is worn and should be replaced
- Sealing washer condition should be checked before reuse of a coupling

Handling and care

Care in handling is essential, as any damage to the gauge faces will affect their application. With frequent use, wear may occur on the gauge itself. However, a worn gauge is fail safe as it will simply reject worn couplings before they have reached the limit. If wear on the gauge is evident, it should be replaced.

Specifications

- Designed for use with LPG fittings 6TPI Class 2G
- Right hand sizes: 1 3/4", 2 1/4" and 3 1/4"
- Left hand sizes: 1 3/4" and 2 1/4"
- Made in the UK by KC ProSupply UK Limited (member of the Kosan Crisplant Group)

The gauges are supplied as an aid to detecting wear on the threads of standard LPG ACME couplings. This is, however, only one aspect of the checking procedure.

KC ProSupply does not accept responsibility for any outcome resulting from the use of the gauges.