



Vehicle  
Certification  
Agency

# GUIDANCE FOR THE APPLICATION OF EN12972:2007

## INTRODUCTION

This document provides guidance to some of the sections of EN12972:2007 and should be considered by an Appointed Inspection Body (AIB) as a document that must be used once appointed. The guidance provides help in explaining what various clauses in the Standard should achieve. Generally most of the following guidance is the same as those given in the VCA document “Procedures for Inspection Bodies – Testing and Inspection of UK Tanks.

The standard is applicable to:

- All RID/ADR tanks (6.8 and 6.10);
- All portable tanks (6.7 RID/ADR/IMDG Code) and IMO portable tanks (including Offshore portable tanks)
- Dual marked tanks (normally ADR6.8 / IMDG6.7).

This document does not apply to procedures for UK tanks except New UK tanks constructed to EN 12493 Annex C (see note 4.1 in UK procedures).

DfT/VCA requires that this standard is used as a basis for accreditation and appointment of inspection bodies.

It is recognised that:

- some sections of the standard are not appropriate for certain tank types,
- some tank types are not covered either at all or inadequately and
- there are sections where guidance can be usefully given to aid inspections

## THE PURPOSE OF THIS GUIDANCE

The purpose of the standard is to ensure that tanks including their filling / loading and unloading systems are safe to operate

As technology changes and as AIBs find other issues on which guidance is needed the document will be kept under review and revisions issued from time to time

Other regulations may also affect the operation of tanks e.g. for the purposes of loading or discharge and may be taken into account during inspections. These additional requirements may be recorded on the VCA certificate database in the notes field.

Appointed Inspection Bodies AIBs shall have access to and make use of the current edition of RID, ADR or the IMDG Code as may be applicable to the tanks that they inspect.

*Note 1: RID and ADR are available on line at the OTIF and UN websites*

*Note 2 The ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air permit certain portable tanks (6.7) to be carried in aircraft. ICAO requires tanks to comply with 6.7 when they are authorised.*

## APPLICATION OF STANDARD IN RID/ADR AND THE IMDG CODE

### NOTE 1.1.5 of RID/ADR 2015 states:

#### “1.1.5 Application of standards

*Where the application of a standard is required and there is any conflict between the standard and the provisions of RID/ADR, the provisions of RID/ADR take precedence. The requirements of the standard that do not conflict with RID/ADR shall be applied as specified, including the requirements of any other standard, or part of a standard, referenced within that standard as normative.”*

The guidance seeks to avoid any such conflict, but any issues of interpretation not addressed herein must be taken up with VCA DGO

*Note: A similar provision is included in the IMDG Code*

### CERTIFICATES

All certificates issued in accordance with EN12972:2007 will be published from the VCA database. Other documents related to the inspection shall be retained by the AIB

*Note; Copies of certificates and reports shall be retained with the tank record by owners and/or operators of tanks (see 4.1.3 below).*

### GUIDANCE TO 12972:2007

12972 Clause	Guidance
3	<p><b>Supplementary definitions and terms that must be taken into account by UK AIBs</b></p> <p><b>Additional relevant definitions taken from ADR (2015)</b></p> <p><b>Note: Only those definitions which are not in ADR or require clarification are included here</b></p> <p><i>"Fixed tank" means a tank having a <b>capacity greater than 1 000 litres</b> which is permanently attached to a vehicle (which then becomes a tank-vehicle) or is an integral part of the frame of such vehicle;</i></p> <p>Note: An AIB believing they have a fixed tank &lt;1000L (net) must consult VCA DGO before any approval/inspection/testing</p> <p><b>Additional UK definitions relevant to the application of standard</b></p> <p>‘inspector’ Individual employed by and carrying out inspections for an inspection body.</p> <p>‘inspection body’ Body appointed by the competent authorities in accordance with the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 and The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations Northern Ireland</p>

	<p>2010 as amended; also referred to as AIB</p> <p>‘intermediate inspection’ Inspection carried out between the initial inspection and the first periodic inspection or between two periodic inspections</p> <p>‘protective lining or coating’ Lining or coating protecting a metallic tank material against corrosive attack by the substances to be carried</p> <p>NOTE: This does not apply to lining or coating used only to protect the substance to be carried.</p> <p>‘major repair’ The definition is in ADR 1.2 but the note in 4.3.2.1.7 shall be taken into account . Any hot work to or affecting the containment part of the tank (i.e. the shell including its integral openings, neck rings, and closures etc.) shall also be regarded as a major repair, irrespective of its purpose</p> <p>‘tank record’ File containing all the important technical information such as the original design documentation, previous inspection reports and records of repairs and maintenance which shall be retained by the owner or the operator of the tank (NOTE: see 5.2).</p> <p><i>Offshore portable tank</i> Means a portable tank specially designed for repeated use for transport of dangerous goods to, from and between offshore facilities. An offshore portable tank is designed and constructed in accordance with IMO MSC/Circ.860 “Guidelines for the approval of containers handled in open seas”</p>
3.8	Note: The Directive quoted has been superseded by Commission Directive <b>2010/35EC</b>
4.1 & Annex A	<p><b><i>For all type approval certificates</i></b></p> <p>This provides guidance on identifying substances permitted in tanks.</p> <p>A statement that "the tank has been approved for the carriage of..... " shall appear. Then:</p> <ul style="list-style-type: none"> <li>· if the tank is intended for a single substance, the UN number Class, Packing Group (PG) and all relevant tank provisions shall be listed. e.g. UN1744, Bromine, Class 8, PG I, Special Provision(s) TU14, TU33, TC5, TE21, TT2, TM3, TM5.</li> <li>· if the tank is designed for a group of similar substances e.g. fuels (UN1202, 1203, 1223, 1863, ) the UN number Class, PG and all relevant tank provisions of each substance which the Type Approval AIB has approved for carriage in the tank shall be listed.</li> </ul> <p><u><i>Note where fuels are considered as a group of similar substances the addition of ethanol can affect compatibility and this statement should be qualified by AIBs as appropriate.</i></u></p> <ul style="list-style-type: none"> <li>· For general purpose dangerous goods tanks, either:       <ul style="list-style-type: none"> <li>· a list of substances for which the tank has been approved as above, or</li> <li>· the tank code together with a list of substances for which the tank is <b>not</b> suitable (i.e. incompatible) or for which it was not possible to investigate compatibility exhaustively, e.g.</li> </ul> </li> </ul> <p>"All substances for which L4BN is identified in column 12 of table A of part</p>

	<p>3.2.1 of ADR, with the exception of:  UN1754, Chromic Acid Solution, Class 8, PGII.  UN1757, Chromic Flouride Solution, Class 8, PG II. Etc, Etc.</p> <p>If the type approval covers a range of component options (e.g. gasket materials), not all of which are compatible with every substance the tank is approved to carry, the appropriate component option shall be identified against each substance or group of substances listed on the certificate.</p>
4.1.3	<p><b>NOTE 1: This piece of Guidance applies to all paragraphs referring to documentation (4.2.2, 4.3.2, 4.4.2, 4.5.7, and 5.2) as appropriate</b></p> <p><b>NOTE 2: ADR provides for the owner or the operator to retain the tank records. It must be agreed and recorded which party will retain the records. AIBs should ensure that it is clear who is retaining the records.</b></p> <p>The tank record including the inspection files should be available for the life of the tank. On transfer of ownership, the tank records must be transferred to the new owner. At the end of the tank's working life, the owner disposing of the tank must retain the tank records for at least 15 months</p> <p>Owners /operators of tanks should maintain a file of inspection records and include the Initial Inspection record, a history of at least 6 years for road tanks and 8 years for rail tanks, where the tank is at least 6/8 years old.</p> <p><i>The record should include all maintenance and repairs of the tank shell, its mountings or service equipment (in the case of portable tanks and offshore tanks records concerning repairs to the frames shall be maintained) that take place and the inspector shall review the documents to assess the history of the tank between inspection and ensure that no exceptional inspections have been overlooked.</i></p> <p><b>AIBs should remind owners and operators of tanks of the ADR requirements relating to the retention of the maintenance record so that copies of the record, including all necessary documents issued in accordance with RID/ADR 6.8.2.4.5 or 6.8.3.4.16, shall be made available by the owner or operator to the AIB for tests, inspections and checks on tanks on the occasion of periodic inspections or exceptional checks.(RID/ADR 4.3.2.1.7)</b></p> <p><i>Note1: electronic records are acceptable provided they are complete and readily accessible</i></p> <p><i>Note2: Where no tank records exist and an AIB is asked to undertake:  An Intermediate Inspection they should offer a Periodic Inspection  A Periodic Inspection they should offer an Exceptional Inspection  In either case a detailed set of records shall be prepared</i></p>
4.2.2	See Guidance to 4.1.3 (above)
4.3.2	See Guidance to 4.1.3 (above)
4.4.2	See Guidance to 4.1.3 (above)
4.5	Exceptional checks may only be performed by an AIB that has been accredited and appointed to inspect tanks after accident, alterations or repairs that may have impaired the safety of the tank and / or the service equipment.

	Annex A to this document provides guidance on exceptional checks for certain alterations or repairs.
4.5.2	<p>The “Like for Like” replacement of service equipment namely the equipment for filling and emptying, venting, safety, heating and heat insulating devices and measuring instruments, with equipment of equivalent specification, during normal service and maintenance operations would not normally be considered repair requiring an Exceptional Check “Like for Like” shall be assessed with reference to type approval documentation.</p> <p>Breather valves are not considered part of the RID/ADR/IMDG tank service equipment and tanks are not required to be leakproofness tested following their replacement. For tanks designed for the conveyance of petrol (i.e. bottom loading), to comply with EC Directive 94/63 Article 5 1a and 1c a vapour tightness test at 75% of relief setting should be carried out.</p> <p>Note: When a maintenance organisation performs tasks that could affect the tank’s containment function, e.g. removal and reinstallation or replacement of any items of service equipment, it is good practice to carry out a leakproofness test (or vapour tightness test if appropriate) and this should be noted in the maintenance record</p> <p><i>Note 1: The change of breather valves is not considered to be an exceptional check of 4.5.2 of EN 12972</i></p> <p><i>Note 2: it should not be assumed that service equipment found on a tank is type approved for use with that tank. Reference should always be made to the type approval documents and tank records. Where type approval documents identify a particular make, model and dimensions of a component, fitting a component of identical make, model and dimensions is considered a like-for-like replacement. Alternatively, where a component is identified by reference to a recognised technical specification or code or standard, replacement with a component conforming to the same technical specification or code or standard would be acceptable, subject to its settings and capacities being identical. When the service equipment originally type approved with the tank cannot be identified by model or design standard, an Exceptional Check shall be performed to assess the suitability of any alternative.</i></p>
4.5.4	<p>At the time of modification only those parts affected by the modification shall be reassessed against the provisions of ADR at the time of the modification.</p> <p>NOTE: when tanks are individually modified in service and the modification is assessed as above, the original type approval document would not normally be revised. However, if the modification is to be applied to new build tanks, the type approval shall be revised or a supplementary TA certificate issued.</p>
4.5.5	<p>Repairs or alterations to the structure supporting or protecting the tank, or the means of attachment of the tank to the frame or chassis, which do not directly affect the tank shell or the containment function, shall be inspected by a competent person* using appropriate methods to ensure that the work has been completed to an acceptable standard. This may include NDT inspections as necessary.</p> <p>* a person with similar qualifications for CSC inspections</p> <p>If the repair or replacement of the frame involves hot work likely to affect the</p>

	<p>tank shell, it shall be subject to an Exceptional Check in accordance with 4.5.3.</p> <p><i>Note:</i> When relying on a CSC inspection (Convention on Safe Containers) the AIB shall note when the inspection was carried out and by whom. The CSC certificate reference shall be entered in the appropriate field in the VCA database.</p> <p><i>Note:</i> For offshore containers subject to IMO MSCcirc/860 the frame must be inspected by the AIB inspecting the tank and a record shall be entered in the VCA tanks certification database</p>
4.5.7	See Guidance to 4.1.3 (above)
5.1	<p>Entry to the compartment must only be carried out after suitable risk assessment and implementation of appropriate precautions, as required by the Confined Spaces Regulations 1997(SI1713) ('Safe work in confined spaces' ACoP L101, 3<sup>rd</sup> edition 2014)</p> <p><i>Note AIBs must specify detailed procedures for safe working</i></p>
5.2	See Guidance to 4.1.3 (above)
5.2	<p>Where documentation is missing or not available during an inspection the inspector must consult his supervisor and decide whether the inspection can continue or a certificate can be issued. If a certificate is issued despite the missing document(s) a note must be included on the VCA tanks certification database and a written justification must be retained by the AIB. If in doubt the VCA Dangerous Goods Office must be consulted</p> <p>Examples of critical missing documents are given below, the list is not exhaustive.</p> <p>For type approval Missing specifications and drawings.</p> <p>For initial inspections The type approval certificate and the detailed documentation</p> <p>For periodic and intermediate inspections and exceptional checks</p> <p><i>Note: A Certificate of an Exceptional check shall be available where an AIB Expert identifies evidence of any repair which could have affected the safety of the tank.</i></p> <p>Whenever possible replacements shall be obtained for missing documents, such as the type approval certificates, Replacement type approval or inspection certificates shall be produced by the AIB who originally issued them to confirm the usage of the tank.</p> <p>See Note 2 in 4.1.3 above</p>
5.2.1.2	<p>Generally the dangerous goods transport regulations do not contain information on the compatibility of substances for any type of containment system. The main duty lies with the consignor (ADR 1.4). However in the case of tanks, it is important that AIBs and manufacturers are able to advise on compatibility issues and that a suitable list is available (see Guidance at 4.1.1 above)</p>

5.3.7	This section does not apply to 6.7 tanks
5.3.7.1	<p>This first paragraph of this clause states:  “<del>The non-destructive testing of the welds shall be by radiographic or ultrasonic methods. Welds which cannot be tested by ultrasonic or radiographic methods because of the design or the position of the weld may be tested by dye penetrant or magnetic particle inspection.</del>”</p> <p><b>Note: This second sentence does not comply with ADR and may not be used.</b></p> <p>Where NDT is used, to assess major repairs, the type and extent should be in accordance with the original specifications. Where the original specification is unknown, the inspector may carry out such testing as is appropriate depending on the type of tank and the requirements in force when the tank was manufactured.</p> <p>RID/ADR 2015 permit NDT for routine in-service inspection of fixed tanks only under 6.8.4 TT11. The provision is limited to butane (UN1011) and propane (UN 1078) fixed tanks</p>
5.3.7.4	<p>For tanks conforming to RID/ADR/IMDG Chapter 6.7, weld joint efficiencies shall be in accordance with the adopted Tank pressure vessel design code accepted by the Competent Authority for issuing Type Approval</p> <p>See DfT Notice 27</p>
5.4	<b><i>When tank interiors are inspected adequate records shall be kept to identify findings during the inspection and may be written notes, photos or videos.</i></b>
5.4.1	<p><i>NOTE 1 this section provides general guidance tanks for certain substances may have specific inspection requirements set down in the regulations e.g. Bromine.</i></p> <p><i>NOTE 2 The International Tank Container Organisation (ITCO) produces a guide</i></p> <p><i>“Acceptable Container Condition” which contains guidance on a number of aspects of inspection applicable to all tanks. Copies can be obtained through <a href="http://www.itco.be">www.itco.be</a></i></p> <p>In particular the examination should include</p> <p><i>Corrosion: (examples include)</i></p> <p>Surface: small areas of light surface corrosion are permitted, provided minimum required thickness is maintained and there is no pitting.</p> <p><i>Pitting: (examples include)</i></p> <p>Corrosion craters or pits which may be open or closed, evident by small blisters, must be reported so that remedial action can be taken to ensure the minimum thickness is maintained</p> <p><i>Delamination: (examples include)</i></p> <p>Bulges with or without corrosion beneath paint area. Test by depressing the area to determine weakness. Ensure that the minimum thickness is</p>



	<p>maintained.</p> <p><i>Weld defects: (examples include)</i></p> <p>Hairline cracks or fractures in any paintwork along the line of the weld. Stress cracks or fractures emanating from the weld area. Corrosion of the weld or the weld joint area</p> <p><i>Stress fractures (examples include)</i></p> <p>Hairline cracks or fractures tank shell, baffles or supporting structure</p> <p><i>Unsatisfactory or “unofficial” repairs</i> The type(s) and location(s) of unsatisfactory or unofficial repairs should be recorded on inspection documents and an assessment made as to the suitability of the repair(s) and the continued integrity and safety of the vessel and whether it should ordinarily (under these guidelines) have required an exceptional check should be conducted. If so, arrange for an examination by a suitably accredited and appointed body</p> <p><i>General</i> Non-destructive testing methods may be used but the conditions of EN 473 shall be met</p> <p>Internal inspection should be carried out by physical entry into the tank whenever it is practicable to do so. Otherwise, inspection shall be accomplished with suitable remote visual inspection equipment inserted through a manway or other suitable opening. Inspections performed remotely shall be capable of detecting the same level of defect that would otherwise be detected by the close examination made possible by entry into the tank</p> <p>Internal inspection by remote means. Internal inspection by remote means. AIBs may not use remote inspection techniques for internal inspection unless it has been subjected to satisfactory scrutiny by UKAS</p> <p>The choice of remote equipment will be influenced by the environment in which it is to be used and the knowledge and training of the operator</p> <p>Considerations when selecting video systems for remote viewing include:</p> <ul style="list-style-type: none"> <li>• Camera and monitor resolution</li> <li>• Monitor size</li> <li>• Anti-glare Screen (if being operated in sun-light)</li> <li>• Colour imaging with sufficient Contrast / Brightness range</li> <li>• Adequate Illumination</li> <li>• Sufficient manoeuvrability and reach to examine the entire internal surface in detail</li> </ul> <p>Where a video system is used, it should be demonstrably effective. Any recordings should form part of the assessment (see 5.4 above).</p> <p>Note 1 The AIB will require clear systems and procedures to be in place in order to satisfy the requirements for accreditation and appointment to use remote cameras. UKAS shall witness the equipment in operation at the accreditation visit</p>
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	<p>Note 2 the remote inspection equipment must be able to identify pitting, particularly on the "wash lines", near discharge valves and local to welded brackets (some guidance is given in the ITCO guide)</p>
5.5	<p>This section is intended for an inspection of any structural fitting that may affect the tank's integrity but should include</p> <p><b>External Leaks;</b></p> <ul style="list-style-type: none"> <li>• Damp patches.</li> <li>• Discoloured paintwork.</li> <li>• Drips.</li> </ul> <p><b>Corrosion;</b></p> <ul style="list-style-type: none"> <li>• Surface: small areas of light surface corrosion are permitted, provided minimum thickness is maintained and there is no pitting.</li> <li>• Pitting: corrosion craters or pits which may be open or closed, evident by small blisters, must be reported so that remedial action can be taken to ensure that the minimum thickness is maintained.</li> </ul> <p><b>Cracking;</b></p> <ul style="list-style-type: none"> <li>• Any fractures (hairline cracks), of the tank shell and supporting structure</li> </ul> <p><b>Deformations or dents</b></p> <p>Size, depth and location should be recorded on inspection documents and an assessment made as to the continued integrity and safety of the vessel</p> <p><b>Unsatisfactory or "unofficial" repairs</b></p> <p>The types and location should be recorded on inspection documents and an assessment made as to the suitability of the repair and continued integrity and safety of the vessel of whether it should ordinarily (under these guidelines) have required an exceptional check shall be considered. If so, arrange for the examination by a suitably accredited and appointed body</p> <p><b>Grinding operations to remove local corrosion</b></p> <p>Evidence of sanding or grinding operations having been used to remove local corrosion should be assessed with respect to the remaining thickness?.</p> <p>Particular attention is to be taken to the condition of the welds, with emphasis given to areas of concern such things as cracks or corrosion liable to weaken the compartment.</p> <p>Areas to be looked at should include;</p> <ul style="list-style-type: none"> <li>Sole plates to tank longitudinal supporting structure, condition of weld.</li> <li>Doubler supports to tank shell, condition of weld.</li> <li>Condition of welds from doublers to sole plates.</li> <li>The chassis outrigger brackets must be verified to ensure that they are secure and show no signs of defects.</li> </ul>

	<p><b>EXTERNAL INSPECTION OF UNINSULATED TANK</b> To be performed at all Intermediate and Periodic inspections to ensure there is no evidence of:</p> <ul style="list-style-type: none"> <li>- corrosion;</li> <li>- cracks;</li> <li>- Significant deformations or dents;</li> <li>- unsatisfactory or "unofficial" repairs;</li> <li>- grinding operations to remove local corrosion.</li> </ul> <p><b>EXTERNAL INSPECTION OF INSULATED TANK</b> To be performed at all Intermediate and Periodic inspections for UK tanks. Sheathing, thermal or other insulation shall be checked for damage or repairs that may indicate signs of concealed damage. If necessary, remove insulation/cladding to the extent required to achieve a reliable appraisal of the condition of the tank. Ensure there is no evidence of:</p> <ul style="list-style-type: none"> <li>- leaks (product drips from cladding joints);</li> <li>- cracks;</li> <li>- impacts;</li> <li>- holes;</li> <li>- unsatisfactory or unofficial repairs;</li> <li>- any defect that may lead to moisture containment of heat insulation.</li> </ul>
5.5.1	<p>If the tank shows an indication of a reduction in wall thickness, the wall thickness shall be measured using calibrated equipment and compared with the minimum thickness given by the type approval documents. If the material is painted or lined, the equipment must be capable of reading the true metal thickness through the paint. Otherwise the coating is to be removed to ascertain an accurate measurement</p> <p>Note: Some of the standards listed in DfT note 27 may provide guidance on wall thicknesses at inspection (see 5.3.7.4 above).</p>
5.5.4	<p>Shells which are required to be fitted with at least one earth connection shall be clearly marked with the symbol <math>\perp</math> adjacent to the point capable of being electrically connected.</p> <p>The earth connection shall be inspected for conformity with the design requirements. The electrical resistance between the earth connection and the metallic parts of the tank and equipment, including any frame and where applicable between the earth connection and the vehicle chassis shall be measured and, shall not exceed 10 ohms</p>
5.6.1	<p>The ambient water temperature shall be recorded</p> <p>Note 1: Testing with water at 0°C can lead to consequences where the tank cannot be tested adequately in such low temperatures</p> <p>Note 2: Care must be taken when testing stainless steel tanks to limit as is appropriate the chlorine content of water.</p> <p><b>NB:</b> The hydraulic pressure test is not a mandatory requirement for:-</p> <ul style="list-style-type: none"> <li>- the intermediate inspection,</li> <li>- after exceptional inspections where the application of heat has not been applied and with the agreement of the AIB</li> <li>- for vacuum insulated refrigerated liquefied gas tanks when this test</li> </ul>

	<p>can be replaced by a leakproofness test and a measurement of the vacuum space which confirms that the vacuum is not lost as a result of the test.</p> <ul style="list-style-type: none"> <li>- tanks for the dedicated carriage of powdery or granular substances - unless subject to an exceptional inspection which includes the application of heat.</li> <li>- portable tanks (6.7) designed and used for the carriage of a single substance</li> </ul> <p>. This hydraulic test can be replaced by a leakproofness test at an effective internal pressure at least equal to the maximum working pressure.</p> <p>Where a test is not carried out for one of the reasons stated above a note shall be recorded in the certificate on the VCA database</p>
5.6.3.1	<p>When a hydraulic pressure test is performed as part of an Exceptional Check following repair or alteration, only the compartment(s) affected and the compartment(s) immediately adjacent to it/them need be tested. Each compartment shall be tested individually with the adjacent compartments empty</p> <p>Note: In the case of tanks where the test pressure is 2 times the static pressure of the heaviest goods to be carried (or 2 times the static pressure of water if greater) the required test pressure shall be measured at the highest point of the tank or compartment. There shall be no reduction in pressure to compensate for the mass of liquid in the tank under test .</p>
5.6.4	<p>Water is normally to be used as the test fluid.</p> <p>The footnote to RID / ADR paragraph 6.8.2.4.2 states:</p> <p>‘In special cases and with the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a pressure test using another liquid or gas, where such an operation does not present any danger.’</p> <p>Such “special cases” include but are not limited to circumstances where filling of the tank with water or another liquid is incompatible with the normal product fill, e.g. water is forbidden MOD fuel tanks sodium tankers may also present safety issues.</p> <p>Where an inspection body intends to undertake a pressure test with another fluid, a detailed procedure shall be developed, based on the procedure for water. The procedure shall include a risk assessment to show that testing with the alternative fluid is carried out in such a manner that risks are minimised to the fullest extent practicable and that any remaining are appropriately managed. The procedure shall take account of factors such as differences in viscosity, density and surface tension and shall demonstrate the technical equivalence of the proposed method i.e. whether the method delivers the same or better result to that of testing with water.</p> <p>The procedure shall be assessed by UKAS and identified in the accreditation schedule of the inspection body.</p> <p>Where alternative fluids are used, a different decay rate may be appropriate</p>

	<p>and shall be defined in the inspection bodies' accredited procedures</p> <p>Where pneumatic pressure testing is undertaken inspection bodies should take account of the following publication:</p> <p>HSE – Safety in Pressure testing GS4 published by the HSE</p>
5.6.8	<p>Caution must be exercised when filling lagged vessels as traces of water on the ground may/could be caused by overfilling the tank before testing, allowing water to penetrate the insulation or indicate leakage through the heat insulation, or may be a leak in the vessel.</p> <p>When leakage through the insulation is detected during testing, with a corresponding pressure drop, the insulation shall be removed and further inspection carried out.</p>
5.7	<p>It may be necessary to take account of the corrosion and temperature fluctuations when specifying the vacuum pressure requirements.</p>
5.8.7	<p>EN12266 is a Valve Testing Standard; that can be used to determine the leak-rate for Service Equipment but is not applicable to vessels More suitable methods may be found in:</p> <p>BS EN 1779 Leak Testing – Criteria for Method and Technique Selection</p> <p>BS EN 13184 Leak Testing – Pressure Change Method</p>
5.10	
5.11	<p>Inspect and report on:</p> <ul style="list-style-type: none"> <li>- cracks;</li> <li>- holes;</li> <li>- impacts and deformations;</li> <li>- excessive corrosion;</li> <li>- unsuitable and unacceptable repairs;</li> <li>- cracks in welds.</li> </ul> <p>Any inspection and repair of the frame shall ensure it complies with the relevant guidance of the:</p> <p><b>Institute of International Container Lessors (IICL)</b>  1120 Connecticut Ave NW  Suite 440  Washington DC 20036-3946  USA</p> <p>Telephone: (1) 202 223-9800  Fax: (1) 202 223-9810</p>
5.12.3	<p>Tank plates shall be marked with the maximum gross capacity shown on the certificate issued by the AIB</p>

## Annex A PETROLEUM TANKER SERVICE EQUIPMENT INSPECTION & TESTS

	Item	EN / TR	ADR Service Equipment	TEST / INSPECTION REGIME		
		Standard		Visual	Functional	Pressure
	<b><u>Tank Top Equipment</u></b>					
T1	Manhole Cover	13314 / 13317	Yes	√	√	√
T1	Breather Device	14595	Yes	√	√	√
T1	EPRV	14596	Yes	√	√	√
T2	Vapour Transfer Valve	13082	Yes	√	√	√
T2	Vapour Transfer Hose		Yes	√		√
T3	Coaming Dump Vent	13082	Yes	√	√	√
T4	Vapour Manifold		Yes	√		√
T5	Diptube		Yes	√		√
T5	Diptube and mandrel		Yes	√	√	√
T6	Central Conductor	15120	Yes	√	Continuity	
T7	Overfill Prevention Housing		Yes	√		√
T7	Overfill Prevention Probe	13922 / 16657	Yes	√	Wet Test	

	<b><u>Bottom Equipment</u></b>					
B1	Footvalve	13308 / 13316 / 16257	Yes	√	√	√
B2	Run-Off Pipework		Yes	√		√
B2	Sample Line		Yes	√		√
B3	Loading Adaptor	13083	Yes	√	√	√
B3	Loading Adaptor Cap	16249	Yes	√	√	√
B4	Outlet Valve (Faucet / Ball Valve)		Yes	√	√	√
B4	Outlet Valve Cap		Yes	√	√	√
B5	Manifold Body		Yes	√		
B5	Manifold Body Poppet Valve		Yes	√	√	√
B6	Product Return Valve		Yes	√	√	√
B6	Product Return Cap		Yes	√	√	√
B7	Vapour Transfer Pipe		Yes	√		√
B7	Vapour Adaptor Valve	13081	Yes	√	√	√
B7	Vapour Adaptor Cap	13081	Yes	√	√	

	<b><u>Ancillary Equipment</u></b>					
A1	Earthing Pins and Bonding Straps		Yes	√	√	
A2	Control Cabinet		No	√	√	
A3	Emergency Knock Out System		No	√	√	
A4	Interlock System	15120	Yes	√	√	
A5	Additive Injection System	ADR 1.2.1	Yes	√		

	<b><u>Discharge Equipment</u></b>					
D1	Pump		No	√		
D2	Flex Joint / Hose		No	√		
D3	Bulk Diverter Valve		No	√		
D4	Meter		No	√		
D4	Air Eliminator / Gas		No	√		

	Extractor					
<b>D5</b>	Hosereel		No	√		
<b>D5</b>	Reeling Hose		No	√		
<b>D5</b>	Nozzle		No	√		
<b>D5</b>	Nozzle Cap		No	√		

## Annex A-2 GUIDANCE ON EXCEPTIONAL INSPECTIONS OF PETROLEUM TANKS

**Checks Undertaken by Trained Workshop Technicians, or Appointed Inspection Bodies, of the Service Equipment on Tanks used for the Carriage of Flammable Liquids of Class 3, Packing Group II and III with no Subsidiary Risk**

<b>A</b>	<b>Group 1 &amp; Group 2</b>	<b>Repairing Workshop- Inspection and Pressure Test</b>
<b>B</b>	<b>Group 1 &amp; Group 2</b>	<b>Repairing Workshop-Function Test</b>
<b>C</b>	<b>Reserved</b>	
<b>D</b>	<b>Group 3 &amp; Group 4</b>	<b>Inspection Body, Authorised to carryout Exceptional Testing</b>

<b>Group 1</b>	<b>Repairs which may not have impaired safety.</b>	Replacement with OEM or equivalent specification Component (s)
<b>Group 2</b>	<b>Alterations which may not have impaired safety</b>	Alteration(s) by Change (s) to Component (s) That Do Not Require Hot-work
<b>Group 3</b>	<b>Repairs which may have impaired safety</b>	Repairs or replacement with non-OEM or different specification component (s)
<b>Group 4</b>	<b>Alterations which may have impaired safety</b>	Alterations by change (s) to component (s) that require welding or hot work

	<b>Component</b>	<b>Task</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<b>T1</b>	<b>Manhole Covers</b>	Replacement of baseplate gasket	A	N/A	D	N/A
		Renewal of EPRV <sup>1</sup> / fill cover assembly complete	A	N/A	D	D
		Renew EPRV springs / spacers	A	N/A	D	N/A
		Renew buna seal	A	N/A	D	D
		Fill lid locking & hinge devices	B	N/A	D	D
<b>T1</b>	<b>Breather device (PVV<sup>2</sup> VALVES)</b>	Replacement	A	N/A	D	D

<sup>1</sup> Emergency pressure relief valve

<sup>2</sup> Pressure vacuum vent

<b>T2</b>	<b>Vapour Transfer Valve</b>	Renew gasket	A	N/A	D	N/A
		Replace internal sealing	A	N/A	D	N/A
		Renew complete valve	A	N/A	D	D
		Renew inter-connecting hose	A	N/A	D	N/A
	<b>Component</b>	<b>Task</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<b>T3</b>	<b>Vapour dump valve (CONVENTIONAL OR SMART VENT)</b>	Renew gasket	A	N/A	D	N/A
		Replace internal sealing	A	N/A	D	N/A
		Renew complete valve	A	N/A	D	D
		Replace blanking plate gasket	A	N/A	N/A	N/A
		Replace valve with blanking plate & gasket	A	N/A	N/A	N/A
<b>T5</b>	<b>Dip tube mandrels</b>	Renew gaskets	A	N/A	D	N/A
		Renew dip cap	A	N/A	D	N/A
		Renew assembly	A	N/A	D	D
		Renew flame-trap gauze	A	N/A	D	N/A
		Renew diptube interlock assembly	A	N/A	D	D
<b>T6</b>	<b>Central Conductor (IF REQUIRED)</b>	Reconnect cable (Check continuity)	A	N/A	D	N/A
		Renew cable (Check continuity)	A	N/A	D	N/A
<b>T7</b>	<b>Overfill Protection System</b>	Replace probe	B	B	D	N/A
		Replace probe housing interface gasket / 'O' ring	A	N/A	D	N/A
		Replace socket switches (interlock; pressure switch & dummy's)	B	B	D	N/A
		Replace complete socket	B	B	D	N/A



<b>B1</b>	<b>Foot Valve</b>	Replace valve	A	N/A	D	D
		Repair to internal air operated piston (where it interfaces with the product)	A	N/A	D	N/A
		Repair to internal air operated piston (not interfacing with product)	B	N/A	D	N/A
		Replacement of valve internal sealing	A	N/A	D	N/A
		Replacement of gasket	A	N/A	D	N/A
<b>B2</b>	<b>Product Pipe Work</b>	Replacement gaskets / 'O' rings	A	N/A	D	N/A
		Repairs to pipe work (hot work)	N/A	N/A	D	D
		Replace In-Line Sight Glass complete	A	N/A	D	N/A
	<b>Component</b>	<b>Task</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<b>B2</b>	<b>Sample Line Pipework</b>	Replacement gaskets / 'O' rings	A	N/A	D	N/A
		Repairs to pipe work (hot work)	N/A	N/A	D	D
<b>B3</b>	<b>Fill Pipe Valve: Self Sealing, loading adaptor or Manually Closing Valve</b>	Renew valve	A	N/A	D	D
		Repair to spindle/seals	A	N/A	D	N/A
		Replace internal sealing	A	N/A	D	N/A
		Replace loading adaptor nose cone wear ring (exchangeable ring)	B	N/A	N/A	N/A
		Replace loading adaptor wear ring (part of nose cone)	A	N/A	N/A	N/A
		Replace loading adaptor I cap seal	A	N/A	N/A	N/A
		Replace loading adaptor cap camloc assemble	A	N/A	N/A	N/A
		Replace loading adaptor cap	A	N/A	N/A	N/A
		Replace SDS display with manual sight glass	A	N/A	N/A	N/A

<b>B4</b>	<b>Outlet Valve (Faucet / Ball Valve)</b>	Renew valve	A	N/A	D	D
		Repair to spindle/seals	A	N/A	D	N/A
		Replace internal sealing	A	N/A	D	N/A
		Replace outlet nose (BSP <sup>3</sup> / quick release)	B	N/A	N/A	N/A
		Replace cap	A	N/A	N/A	N/A
		Replace cap seal	A	N/A	N/A	N/A
<b>B5</b>	<b>Manifold System (where poppet assembly is installed inline)</b>	Replacement of poppet assembly	A	N/A	N/A	N/A
		Replacement of internal sealing	A	N/A	D	N/A
<b>B6</b>	<b>Product Return Valve</b>	Renew valve	A	N/A	D	D
		Repair to spindle/seals	A	N/A	D	N/A
		Replace non-return valve	A	N/A	D	N/A
		Replace non-return valve seals	A	N/A	D	N/A
		Replace internal sealing	A	N/A	D	N/A
		Replace outlet nose (bsp / holdloc)	B	N/A	N/A	N/A
		Replace cap	A	N/A	N/A	N/A
		Replace cap seal	A	N/A	N/A	N/A
		Replace blow-down non-return valve seals	A	N/A	D	N/A
	<b>Component</b>	<b>Task</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<b>B7</b>	<b>Vapour Adaptor Valve</b>	Renew cap seal/lock device (in the case of quick release design)	A	N/A	D	D
		Renew cap	A	N/A	D	N/A
		Renew gasket	A	N/A	D	N/A
		Renew complete valve	A	N/A	D	D
		Renew proximity switch	A	N/A	N/A	N/A

<sup>3</sup> BSP British Standard pipe

<b>A1</b>	<b>Bonding</b>	Repair to internal bonding apparatus	A	N/A	D	D
		Repair to external bonding equipment	B	B	D	D
<b>A2</b>	<b>System Controls (Pneumatic / Manual valve controls)</b>	Repair to system components (Visiwinks etc.)	B	B	N/A	N/A
		Replacement of system components	B	B	N/A	N/A
<b>A3</b>	<b>Emergency Shutdown</b>	Repair to system components	B	N/A	D	N/A
		Replacement of system components	B	B	N/A	N/A
<b>A4</b>	<b>Interlock / Anti-Drive Away</b>	Repair to system	B	N/A	Possibly DVSA	N/A
		Replacement of component.	B	B	Possibly DVSA	N/A

**Testing requirements code:**

<b>FT:</b>	System/component function test
<b>IPT:</b>	Pressure test and inspection
<b>C:</b>	work procedure and testing protocols under the instruction/control of C; where items are identified as 'failures' during an Intermediate or Periodic test they must be re-inspected by an AIB
<b>D:</b>	work procedure, witnessing and testing protocols under instruction/control of D
<b>N/A:</b>	Not applicable due to the highlighted group not being qualified to effect the alteration and or, a modification / alteration is not possible.
<b>DVSA:</b>	Driver/Vehicle Standards Agency (where the task involves braking system components or their function to be altered)
<b>Reference must be made to company and regulatory procedures, protocols and maintenance requirements prior to the commencement, then during and on completion of any task</b>	

## Annex A - 3 GENERIC GUIDE TO EXCEPTIONAL CHECKS / TESTING OF PETROLEUM TANKS

<b>General Comment</b>	<p>The purpose of the attached guidance document is to provide information for inspection bodies and personnel on the application of ADR 6.8.2.3.4, ADR 6.8.2.4.4 and EN 12972 Section 4.5 in relation to <b>Exceptional Checks</b> in the performance of an inspection after Repair / Modification / Alteration to the vessel.</p> <p>The guidance is generic and therefore the extent and content of any exceptional check remains at the discretion of the Appointed Inspection Body and their personnel, dependant on the nature and cause of the examination. However, generally the Exceptional Check / Testing will include, as a minimum, the inspection requirements detailed within this document.</p>
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- 1 The description of when an Exceptional check is MS / RP is detailed in:
 

**ADR:** After Modification / Alteration to a vessel with a valid, expired or withdrawn type approval, the testing, inspection and approval are limited to the parts of the tank that have been modified. The modification shall meet the provisions of ADR applicable at the time of the modification. For all parts of the tank not affected by the modification, the documentation of the initial type approval remains valid. (ADR 6.8.2.3.4)

Repair after an alteration or accident to the vessel when the safety of the tank may have been impaired as a result of repairs (ADR 6.8.2.4.4)
- 2 The general principles of an Exceptional Checks and/or Inspection are:
  - all Exceptional checks are to be undertaken by Inspection Bodies and personnel who are competent, authorised and appointed to do so by the Competent Authority
  - a detailed Method Statement, including a Repair Procedure for Exceptional work, is to be provided where requested by the AIB
  - welding shall be undertaken by a qualified welder using a qualified welding process to an Approved Welding Procedure Specification and subjected to NDT examination as applicable
  - hot work generally shall be undertaken by a competent person
  - all NDT examination is to be undertaken by personnel who are Certified in this area of speciality (Radiography, Ultrasonic, Dye Penetrant, etc.)
  - the extent and type of NDT examination to be agreed between the manufacturer and AIB and detailed in the Repair Procedure within the Method Statement (**NB:** at the discretion of the Appointed Inspection Body or their personnel, dependant on the nature and cause of the examination, these requirements may be increased)
- 3 This Generic Guide provides a quick and easy reference of the test / inspection requirements after Repair / Modification / Alterations. It does not however address linings or coatings that protect the tank material against corrosion and specialist advice should be sought in such circumstances.

**Annex A – 4    GENERIC METHOD STATEMENTS AND REPAIR PROCEDURES FOR  
EXCEPTIONAL CHECKS / TESTING OF PETROLEUM TANKS**

(Informative)

Details of generic methods and procedures to be added at next revision

**QUICK REFERENCE GUIDE  
TO EXCEPTIONAL CHECK / TESTING & INSPECTION – ADR 6.8.2.4.4**

**A After EXTENSIVE damage or repair**

**C After EXTENSIVE alteration**

**B After LOCALIZED damage or repair**

**D After MINIMAL structural alteration or equipment repair (WHERE PRODUCT CONTAINMENT ASPECTS ARE NOT AFFECTED)**

<b>PF</b>	Periodic (Full Test) <b>4.3</b>	<b>LF</b>	-Leakproof (Full Test) <b>4.4</b>	<b>Visual</b>	-	I – Internal <b>5.4</b> E – External <b>5.5</b>	<b>NDT</b>	R – Radiography <b>5.3.7.1</b> U – Ultrasonic <b>5.3.7.1</b> D – Dye Penetrant <b>5.3.7.1</b>
<b>HC</b>	Hydraulic (Compt only) <b>5.6</b>	<b>LC</b>	-Leakproof (Compt only) <b>5.5</b>	<b>DR</b>	-	Drawing Review <b>5.3</b>		
<b>WP</b>	Weld Procedure <b>5.2.1.1</b>	<b>PW</b>	-Pipework (Hydraulic) <b>5.6</b>	<b>C</b>	-	VCA Exceptional Certificate <b>4.5.7</b>		* also consider DVSA re-Certification
<b>MS</b>	- Method Statement	<b>RP</b>	-Repair Procedure <b>5.2.2.1</b>					

**EN 12972:2007 Reference**

Group	Description	EN Reference	Hydraulic	Leakproof	NDT	Visual	Review	Pipework Hydraulic	Repair Procedure	Drawing Review	VCA Certificate
<b>A.1</b>	Major Structural damage and/or major containment breach	<b>4.5.1</b>	<b>PF</b>	<b>LF</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	<b>C</b>
<b>A.2</b>	Severe Creases	<b>4.5.1</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>		<b>C</b>
<b>A.3</b>	Major Patches	<b>4.5.1</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	<b>C</b>
<b>A.4</b>	Major Gouges	<b>4.5.1</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>		<b>C</b>
<b>A.5</b>	Roll-over protection repairs (Roll-over bar – EN 13094 6.14.2.5)	<b>4.5.1</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>		<b>C</b>
<b>B.1</b>	Minor containment breach (dripping product)	<b>4.5.1</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>		<b>C</b>

<b>B.2</b>	Smooth Transition Deformations	4.5.1		HC	LC		I E			RP		C
<b>B.3</b>	Minor Patches	4.5.1		HC	LC	as MS and RP	I E	WP		RP	DR	C
<b>B.4</b>	Minor Gouges	4.5.1		HC	LC	as MS and RP	I E	WP		RP		C
<b>B.5</b>	Inter-compartment Leaks	4.5.1		HC	LC	as MS and RP	I E	WP		RP		C
<b>B.6</b>	Roll-over protection repairs (Longitudinal Coaming / Transverse supports)	4.5.1		HC	LC (Optional)	as MS and RP	E	WP		RP		C
<b>B.7</b>	Roll-over protection repairs (Longitudinal)	4.5.1			LC (Optional)	as MS and RP	E	WP		RP		C
<b>B.8</b>	Service / Drain tubes and Vapour Recovery pipe	4.5.1		HC	LC	as MS and RP	I E	WP		RP		C
<b>B.9</b>	Gravity pipework leaks / weeps	4.5.1			LC	as MS and RP		WP	PW	RP		C
<b>B.10</b>	Leaks / weeps from Service Equipment tank mounting pads	4.5.2		HC	LC	as MS and RP	E	WP		RP		C
<b>B.11</b>	Leaks / weeps from pipework joints / gaskets	4.5.2			LC							C
<b>B.12</b>	Leaks from Service Equipment body	4.5.2 3.4 Note1			LC							C

Group	Description	EN Reference	Hydraulic	Leakproof	NDT	Visual	Review	Pipework Hydraulic	Repair Procedure	Drawing Review	VCA Certificate
<b>C.1</b>	Shortening vessel	<b>4.5.4</b>	<b>PF</b>	<b>LF</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>	<b>PW</b>	<b>RP</b>	<b>DR</b>	<b>C *</b>
<b>C.2</b>	Lengthening vessel	<b>4.5.4</b>	<b>PF</b>	<b>LF</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>	<b>PW</b>	<b>RP</b>	<b>DR</b>	<b>C *</b>
<b>C.3</b>	Reducing number of compartments by major modification of surge plates	<b>4.5.4</b>	<b>PF</b>	<b>LF</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>	<b>PW</b>	<b>RP</b>	<b>DR</b>	<b>C *</b>
<b>C.4</b>	Additional or modification to existing openings	<b>4.5.4</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>	<b>PW</b>	<b>RP</b>	<b>DR</b>	<b>C</b>
<b>C.5</b>	Conversion of tank and equipment from Top Loading to Bottom Loading (BLVR)	<b>4.5.4</b>	<b>PF</b>	<b>LF</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>	<b>PW</b>	<b>RP</b>	<b>DR</b>	<b>C *</b>



Group	Description	EN Reference	Hydraulic	Leakproof	NDT	Visual	Review	Pipework Hydraulic	Repair Procedure	Drawing Review	VCA Certificate
<b>D.1</b>	Reducing number of compartments by minor modification of surge plates	<b>4.5.4</b>	<b>PF</b>	<b>LF</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	<b>C</b>
<b>D.2</b>	Remount of a vessel to another chassis	<b>4.5.4</b>	<b>HC (optional)</b>	<b>LC (optional)</b>		<b>I E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	<b>C</b>
<b>D.3</b>	Repairs / Modifications to a vessel's sole plates	<b>4.5.5</b>				<b>E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	
<b>D.4</b>	Repairs / Modifications to structures supporting the tank (longitudinal support main runner)	<b>4.5.5</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	<b>C</b>
<b>D.5</b>	Repairs / Modifications to the means of attachments to frame or chassis (outriggers)	<b>4.5.5</b>			<b>as MS and RP</b>	<b>E</b>	<b>WP</b>		<b>RP</b>	<b>DR</b>	<b>C</b>
<b>D.6</b>	Modification or repair to attachment welded to the tank shell (5 <sup>th</sup> Wheel support or tank support webs / horns)	<b>4.5.5</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I (opt) E</b>	<b>WP</b>		<b>RP</b>		
<b>D.7</b>	Additional or modification to existing attachment welded to the tank shell (e.g. doubler plates)	<b>4.5.4</b>	<b>HC</b>	<b>LC</b>	<b>as MS and RP</b>	<b>I E</b>	<b>WP</b>		<b>RP</b>		<b>C</b>

## Group A

### After EXTENSIVE damage or repair EN 12972 - 4.5.1 (examples)

	Description	Example	Inspection / Test Requirement	Certification
<b>A.1</b>	Major Structural damage and/or major containment breach	Impact damage resulting in structural failure or product loss	Full Periodic including NDT (Radiography, Ultrasonic and/ or Dye-Penetrant as MS / RP)	Review of Design Characteristics and repair drawing Review of weld procedures VCA Exception record and re-set Inspection date
<b>A.2</b>	Severe Creases	Showing signs of fracture or hairline cracks and which cannot be removed by planishing. Remove affected area and patch	Hydraulic and Leakproof test of compartment plus adjacent compartments Internal / External visual examination NDT (as MS / RP) (Dye-Penetrant for patches $\leq 600$ mm on the major dimension only) (Radiography or Ultrasonic for patches $> 600$ mm or where longitudinal or circumferential seams are re-welded)	VCA Exception record Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test
<b>A.3</b>	Major Patches	Which extend over more than one compartment or over a partition / surge plate	Drawing of repair proposal and weld procedures to be provided Hydraulic and Leakproof test of compartment plus adjacent compartments Internal / External visual examination NDT (as MS / RP) (Dye-Penetrant for patches $\leq 600$ mm on the major dimension only) (Radiography or Ultrasonic for patches $> 600$ mm or where longitudinal or circumferential seams are re-welded)	Review of Design Characteristics and repair drawing Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test

**Group A**

**After EXTENSIVE damage or repair EN 12972 - 4.5.1 (examples cont.)**

	Description	Example	Inspection / Test Requirement	Certification
<b>A.4</b>	Major Gouges	Where the depth of the gouge is > 25% of parent material thickness or which an internal visual inspection indicates deformation	Detailed repair and weld procedures to be provided Hydraulic and Leakproof test of compartment plus adjacent compartments Internal / External visual examination NDT (as MS / RP) (Dye-Penetrant, pre-repair to check to cracks to shell) (Radiography or Ultrasonic post-repair to check for full penetration of weld repair and / or where longitudinal or circumferential seams are re-welded)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>A.5</b>	Roll-over protection repairs (Roll-over bars – EN 13094 6.14.2.5)	Where weld repair is directly to the tank shell	Detailed repair and weld procedures to be provided Hydraulic test of compartments local to weld area (Leakproof optional) Internal / External visual examination NDT (Radiography, Ultrasonic and/ or Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test

## Group B

### After LOCALIZED damage or repair EN 12972 - 4.5.1 (examples)

	Description	Example	Inspection / Test Requirement	Certification
<b>B.1</b>	Minor containment breach (dripping product)	Pin-hole in weld; weld crack or defect (including sumps and Service Equipment mounting pads)	Detailed repair and weld procedures to be provided Hydraulic and Leakproof test of compartment Internal / External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.2</b>	Smooth Transition Deformations	Impact damage that can be removed by 'planishing' Bulges and dents shall be smooth and their depth, measured as a deviation from the normal curvature or from the line of the cylindrical shell, shall be not greater than 2 % of their length or width (EN 13094 7.5.2).	Detailed repair procedures to be provided Hydraulic and Leakproof test of compartment Internal / External visual examination	Review of repair procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.3</b>	Minor Patches	Which are confined to single compartment of a multi compartment vessel (i.e. not extending over a divisional baffle) or between two anti-surge plates in a single compartment vessel (i.e. not extending over an anti-surge plate) (Maximum size of patch $\leq 600$ mm over major or minor axis)	Drawing of repair proposal (if required) and weld procedures to be provided Hydraulic and Leakproof test of compartment Internal / External visual examination NDT (as MS / RP) (Dye-Penetrant for patches $\leq 600$ mm on the major dimension only)	Review of weld procedures Review of Design Characteristics and repair drawing VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.4</b>	Minor Gouges	Where the depth of the gouge is $\leq 25\%$ of parent material thickness and which an internal visual inspection indicates there is no deformation or indications of stress or fracture	Detailed repair and weld procedures to be provided Hydraulic and Leakproof test of compartment Internal / External visual examination NDT (as MS / RP) (Dye-Penetrant, pre-repair to check to cracks to shell)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test

**Group B****After LOCALIZED damage or repair EN 12972 - 4.5.1 (examples cont.)**

	<b>Description</b>	<b>Example</b>	<b>Inspection / Test Requirement</b>	<b>Certification</b>
<b>B.5</b>	Inter-compartment Leaks or cracked internal anti-surge plates		Detailed repair and weld procedures to be provided Hydraulic and Leakproof test of both compartments Internal / External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.6</b>	Roll-over protection repairs (Longitudinal Coaming and Transverse supports – EN 13094 6.14.2.2)	Where weld repair is directly to the tank shell	Detailed repair and weld procedures to be provided Hydraulic test of compartments local to weld area (Leakproof optional) Internal / External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.7</b>	Roll-over protection repairs (Longitudinal)	Where weld repair is not to the tank shell	Detailed repair and weld procedures to be provided Leakproof test of coaming Leakproof test of compartments local to weld area (optional) External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.8</b>	Service / Drain tubes and Vapour Recovery pipe	Where weld repair is to the tank shell	Detailed repair and weld procedures to be provided Hydraulic and Leakproof test of compartments local to weld area Internal / External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test

**Group B After LOCALIZED damage or repair EN 12972 - 4.5.1 (examples cont.)**

	Description	Example	Inspection / Test Requirement	Certification
<b>B.9</b>	Gravity pipework weeps or leaks	Fractures or corrosion	Detailed repair and weld procedures to be provided Ultrasonic thickness test of corroded areas Hydraulic test pipework off tank Re-assemble Leakproof test of compartments NDT (Dye-Penetrant as MS / RP)	Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test
<b>B.10</b>	Leaks / weeps from Service Equipment shell mounting pads / flanges	Fractures or corrosion	Detailed repair procedures to be provided Ultrasonic thickness test of corroded areas Hydraulic test of compartment Re-assemble Leakproof test of compartments NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>B.11</b>	Leaks / weeps from pipework joints / gaskets	Gasket failures	Leakproof test of compartment(s) local to repaired service equipment Check compatibility of gasket materials with products given on the Type Approval document	Does not re-set Inspection date unless operator request full Periodic test
<b>B.12</b>	Leaks / weeps from Service Equipment body	Crack or flaw in casting	Replace Service item with OEM or equivalent specification component Leakproof test of the compartment Check compatibility of gasket materials with products given on the Type Approval document	VCA Exception record Does not re-set Inspection date unless operator request full Periodic test

## Group C

### After EXTENSIVE alteration EN 12972 - 4.5.4 (examples)

	Description	Example	Inspection / Test Requirement	Certification
<b>C.1</b>	Shortening vessel	Cut and shut	Detailed repair and weld procedures to be provided Full Periodic including NDT (Radiography, Ultrasonic or Dye-Penetrant as MS / RP) Approval of calculation (EN 13094) or Stress and dynamic analysis	Review of weld procedures VCA Exception record and re-set Inspection date Also consider DVSA re-Certification
<b>C.2</b>	Lengthening vessel	Stretching vessel capacity	Detailed repair and weld procedures to be provided Full Periodic including NDT (Radiography, Ultrasonic or Dye-Penetrant as MS / RP) Approval of calculation (EN 13094) or Stress and dynamic analysis	Review of weld procedures VCA Exception record and re-set Inspection date Also consider DVSA re-Certification
<b>C.3</b>	Reducing number of compartments by major modification of surge plates	Where major sections of the internal divisions are removed (removed section must not exceed 30% of cross-sectional area – ADR 6.8.2.1.22)	Review design characteristics in accordance with EN 13094 Detailed repair and weld procedures to be provided Full Periodic including NDT (Radiography, Ultrasonic or Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record and re-set Inspection date Also consider DVSA re-Certification
<b>C.4</b>	Additional or modification to existing openings	Cutting additional, or increasing the size of existing, apertures in to the vessel for the fitment of Service Equipment	Review design characteristics in accordance with EN 13094 Detailed repair and weld procedures to be provided Hydraulic and Leakproof test of compartments local to weld area Internal / External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record Does not re-set Inspection date unless operator request full Periodic test

## Group C

### After EXTENSIVE alteration EN 12972 - 4.5.4 (examples cont.)

	Description	Example	Inspection / Test Requirement	Certification
<b>C.5</b>	Conversion of tank and equipment from Top Loading to Bottom Loading (BLVR)	May include some or all of the following: - fitment of new flange pads; Vapour Transfer pipework (internal / external) - fitment of new 4" run-off pipework - fitment of BLVR equipment (Loading adaptors / Vapour Transfer / Diptube Interlocks etc.)	Detailed modification and weld procedures to be provided Full Periodic (Hydraulic / Leakproof) test of all compartments Internal / External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures VCA Exception record and re-set Inspection periodicity Also consider DVSA re-Certification



**Group D After MINIMAL alteration or structural equipment repair EN 12972 - 4.5.4 and 4.5.5 (examples)**  
**(WHERE PRODUCT CONTAINMENT ASPECTS ARE NOT AFFECTED)**

	Description	Example	Inspection / Test Requirement	Certification
<b>D.1</b>	Reducing number of compartments by minor modification of surge plates	Where only minor sections of the internal divisions are removed (example 75mm holes) which are suitably reinforced	Review design characteristics in accordance with EN 13094 Drawing of repair proposal and weld procedures to be provided Full Periodic including NDT (Dye-Penetrant as MS / RP) Must meet the requirements of provisions of ADR at time of modification. Existing Type Approval remains valid (6.8.2.3.4)	Review of weld procedures Review of Design Characteristics and repair drawing VCA Exception record and re-set Inspection date
<b>D.2</b>	Remount of a vessel another chassis	Without modifying the original tank including the support structure (excluding length and width of sole plates to meet chassis manufacturers mounting recommendations)	Drawing of remount proposal to be provided (axle / weight loadings, centre of gravity, etc.) Hydraulic and Leakproof test of compartments - optional Existing Type Approval remains valid (6.8.2.3.4)	Review of Design Characteristics and remount drawing Review of weld procedures (if applicable) VCA Exception record Does not re-set Inspection date unless operator request full Periodic test
<b>D.3</b>	Repairs / Modifications to a vessel's sole plates	Length of sole plates to meet chassis manufacturers mounting recommendations	Drawing of repair / modification proposal and weld procedures to be provided External visual examination	Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test
<b>D.4</b>	Repairs / Modifications to structures supporting the tank ( longitudinal support /main runner)	Repairs to cracks (which may or may not include welding to the doubler attached to the tank shell)	Drawing of repair / modification proposal and weld procedures to be provided External visual examination Hydraulic and Leakproof test of compartments local to weld area NDT (Dye-Penetrant as MS / RP)	Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test

**Group D After MINIMAL alteration or structural equipment repair EN 12972 - 4.5.4 and 4.5.5 (examples cont.)  
(WHERE PRODUCT CONTAINMENT ASPECTS ARE NOT AFFECTED)**

	<b>Description</b>	<b>Example</b>	<b>Inspection / Test Requirement</b>	<b>Certification</b>
<b>D.5</b>	Repairs / Modifications to the means of attachments to the frame or chassis (outriggers)	Modifications to meet chassis manufacturers mounting recommendations	Drawing of repair / modification proposal and weld procedures to be provided External visual examination NDT (Dye-Penetrant as MS / RP)	Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test
<b>D.6</b>	Modification or repair to attachment welded indirectly to the tank shell (5 <sup>th</sup> Wheel support or tank support webs / horns)	Modifying or repair existing support to the vessel (5 <sup>th</sup> Wheel support or tank doubler support for webs / horns) The means by which attachments are fixed to the shell shall be designed to take into account the purpose of the attachment and the risk of damage to the shell when the attachment is subjected to additional forces. (EN 13094 – 6.12.2) Materials used for temporary attachments shall be known to be compatible with the material of the shell, i.e. capable of being welded without producing defects. (EN 13094 – 7.4.3.1)	Detailed weld procedures to be provided Internal visual examination (optional) External visual examination NDT (Dye-Penetrant as MS / RP) Hydraulic and Leakproof test of compartments local to weld area	Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test
<b>D.7</b>	Additional or modification to existing attachment welded directly to the tank shell (e.g. doubler plates; brackets or supports without doubler plates)	Additional or modifying existing support or doubler plates to the vessel for the fitment of miscellaneous items (Hazchem Panels etc.) The means by which attachments are fixed to the shell shall be designed to take into account the purpose of the attachment and the risk of damage to the shell when the attachment is subjected to additional forces. (EN 13094 – 6.12.2) Materials used for temporary attachments shall be known to be compatible with the material of the shell, i.e. capable of being welded without producing defects. (EN 13094 – 7.4.3.1)	Detailed weld procedures to be provided Internal / External visual examination NDT (Dye-Penetrant as MS / RP) Hydraulic and Leakproof test of compartments local to weld area	Review of weld procedures Does not re-set Inspection date unless operator request full Periodic test