

# Road Safety Authority

## Tractor Testers' Manual

**VERSION 1.0 (MAY 2018)**

**Application:  
Applies to wheeled tractors of Category T.**

These guidelines (also referred to as the “Manual”) are issued by the Road Safety Authority under section 38 of the Road Safety Authority (Commercial Vehicle Roadworthiness) Act 2012 (No. 16 of 2012). The intention behind this Manual is to set out requirements and guidance in relation to the carrying out roadworthiness tests on tractors of category T.

This Manual is to be complied with from 20th May 2018. CVR test operators and CVR testers shall ensure that CVR testing is carried out in accordance with this Manual from that date.

This Manual sets out the testing methods to be employed by those involved in tractor testing. It also provides guidance to CVR test operators and CVR testers in relation to the reasons why a vehicle may fail a CVR test and the categorisation of defects identified in relation to a CVR vehicle.

Owners of vehicles to which this Manual applies may also find the Manual useful in that it provides details of the inspections to which a tractor may be subjected and the reasons why a pass statement may not be issued following a CVR test.



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# INTRODUCTION

## 1. Definitions.

“**CVR**” means Commercial Vehicle Roadworthiness.

“**CVR Tester**” means a person authorised by the Road Safety Authority to be a CVR tester in respect of a particular category of vehicles.

“**CVR Test Operator**” means a person authorised by the Road Safety Authority to conduct CVR tests.

“**CVR Testing Centre**” means a premises specified in a CVR test operator authorisation and complying with current Premises and Equipment Guidelines at which CVR tests may be carried out.

“**CRW**” means a Certificate of Roadworthiness.

The term CVR Test means;

- an initial CVR test;
- a periodic CVR test;
- a partial CVR test;
- an initial or periodic re-test;

An **initial CVR test** is the first roadworthiness test of a tractor of category T that is capable by design and construction of exceeding 40 kilometres per hour. This test is due on the fourth anniversary of its registration as set out in the COMMERCIAL VEHICLE ROADWORTHINESS (VEHICLE TESTING) (AMENDMENT) REGULATIONS 2018, S.I. No. 117 of 2018.

A **periodic CVR test** is a subsequent roadworthiness test of a tractor of category T following its initial CVR test. For tractors of category T, the subsequent roadworthiness test is due biennially (every second year), as set out in the COMMERCIAL VEHICLE ROADWORTHINESS (VEHICLE TESTING) (AMENDMENT) REGULATIONS 2018, S.I. No. 117 of 2018.

An **Enforcement Test** (legally called a **partial CVR test**) is conducted when a vehicle is presented to a CVR Testing Centre on foot of a direction given by a RSA Authorised Officer or CVR Inspector. This test may include one or more test items and may include all test items applicable to that vehicle. Details of the test items to be tested will be available on CoVIS or listed on the copy of the Roadside Check Inspection report as supplied to the driver of the vehicle and all items should be tested as per this manual.

A **re-test** is a test carried out where a vehicle has failed an initial or periodic test, where:

- (a) the re-test is carried out on a day which is not more than 21 calendar days after the day on which the vehicle has failed its initial or periodic test,

A re-test can only be conducted at the CVR testing centre where the original test was failed.

In carrying out a re-test on a vehicle only those items which gave rise to the refusal of the pass statement are to be tested. The items which failed must be re-tested as per the method of testing in the relevant section of the manual.

If during a retest the CVR tester notices any other obvious defects, then the owner shall be notified and these additional items must be tested. Where a reason for failure is issued with respect to these additional test items, then this will be recorded on the test report.

**Visual check** is a visual inspection carried out on a vehicle where only minor defect(s) were identified on its initial or periodic test (the 21 day rule does not apply).

A “**voluntary safety CVR test**” is a roadworthiness test, other than a CVR test, carried out in respect of one or more test items specified in this manual, which is recorded on CoVIS. Any vehicle subject to a voluntary safety CVR test, including vehicles owned by An Garda Síochána or the Defence Forces will only be issued with a “**Test report**” not a pass statement.

The term “**owner**” in the context of applying for a CVR test is taken to include the owner’s agent.

“**CoVIS**” is the CVR computerised information system established by the Road Safety Authority. A CVR tester shall use CoVIS in order to process a CVR test on the lane equipment. CoVIS allows the tester to record defects and other standard inspection data such as mileage. The tester will also be able to record differences to Vehicle Details identified as part of the Test to the Vehicle Details on CoVIS that have come from the Driver and Vehicle Licensing Computer Services Division (DVCS).

“**Method of Testing**” details the ways in which the test of items on a vehicle are to be carried out and the equipment to be used. When carrying out each test, particular attention should be paid to the information given in the “**Notes**” since this gives guidance on the conduct and scope of the test.

“**Reasons for Failure**” gives direction on the type of defects which will result in the vehicle failing. A vehicle should only be assessed against the items and reasons for failure listed in this manual and/or instructions issued by the Authority.

An “**Advisory Notice**” is used to inform the customer of an item that should be rectified but does not prevent the vehicle from achieving a minimum standard of roadworthiness. This will be included on the Test Report or Pass Statement.

“**Design Gross Vehicle Weight (DGWV)**”. The DGWV of a vehicle is its gross weight laden with the heaviest load it can carry according to the design specifications. The manufacturer or their authorised distributor state what the DGWV of a vehicle is. It is also known as the Maximum Authorised Mass (MAM). An automotive engineer may specify the DGWV for vehicles of certain categories provided the report in writing has all the information required as per the report template in this manual.

“**Individual design axle weight**”, means the mass corresponding to the maximum permissible static vertical load transmitted to the ground by the wheels of the axle, on the basis of the construction features of the axle and of the vehicle and their design performances.

“**Manufacturers plate**” means a plate or label, affixed by the manufacturer on a vehicle that provides the main technical characteristics which are necessary for the identification of the vehicle and provides the competent authorities with the relevant information concerning the technically permissible maximum laden masses;

“**First registered**” means the date when the vehicle was first registered with the Revenue Commissioners or the date when first registered in accordance with the laws of another country.

### “Insecure”

The term “insecure” is used throughout this Manual to describe a defective condition. The term should be taken by testers to mean the following:

- (a). that a component on the vehicle has relative movement either at its fixing or in relation to an associated component where there should be none or
- (b). that a component is not safely or completely attached either at its fixing or to an associated component.

### “Worn”

A component will be considered worn where the wear is to such an extent that it is either;

- (a). likely to fail, or
- (b). clearly not functioning effectively as designed, or
- (c). visibly worn beyond manufacturers known permitted limits, or
- (d). likely to affect the operation or condition of another safety related component.

## 2. Scope.

This Manual applies to wheeled tractors of Category T.

## 3. Making a request for a CVR Test Booking.

A request for a CVR test booking must be made to a CVR test operator in person, or by phone / email or by using CoVIS. An application for a booking to a CVR test operator may be made at the test centre before the test commences. Full details of how to make a request for a test booking can be found at [www.cvrt.ie](http://www.cvrt.ie).

## 4. Presentation of ID.

A person who presents a vehicle to be tested is required to produce a valid identification e.g. a driving licence, passport or public services card. Where a valid identification is not presented at the time of the test, the CVR test may be carried out and a test report issued. However, a pass statement will not be issued until such time as the person who presented the vehicle provides the required identification to the CVR test operator. This should be presented within 21 calendar days from the date of the CVR test.

## 5. CoVIS, Test Reports and Pass Statements.

The CVR tester must complete a checklist printed from CoVIS for each test conducted confirming that all required test items have been tested and these must be recorded on CoVIS. The completed checklist must be retained by the CVR Operator either by scanning it into CoVIS and saving (attaching) it to the vehicle test record or by retaining the printed checklist for a period of 3 years. Once a CVR test has been completed, the CVR tester must complete a declaration that he or she has completed the test correctly. Before a vehicle, that has been tested, leaves the test area of the CVR Test Centre, a statement of result must be issued for that vehicle giving details of the captured equipment results and any failed visual items. Where the CVR tester is satisfied that the vehicle has passed all the required test items specified in this manual, then a pass statement is issued (apart from point 4 above) and or in the case of minor only defects. Where a pass statement is not issued, the reasons for refusal will be provided to the owner in the test report. In the case of

a voluntary safety test, a test report will be provided but no pass statement will be issued. If a CVR test is not completed, then the test report issued will contain the words “Not complete”. An Automatic Number Plate Recognition (ANPR) image of the vehicle being tested should be captured on CoVIS for every test apart from non-equipment re-tests.

Where the test lane equipment is not automatically linked to CoVIS, the CVR Tester must print off the equipment results for the smoke meter, decelerometer and or Roller brake tester and manually input the test results on CoVIS. The printouts associated with these tests shall be scanned and attached to the vehicle record on CoVIS.

Any supplementary documentation required as part of the test (such as modification reports) shall be scanned and uploaded onto the CoVIS system. If either the scanner or CoVIS are not operational, the documents shall be retained by the test operator and scanned when the system is back working.

If the CVR Tester needs to stop in the middle of the test they will be able to save results up to that point and resume testing later that day. Only the tester who commenced the test may resume the test. Where a tester has started a test and is not available to complete it for whatever reason, the test must be abandoned and it must be started again on the vehicle by another tester, from the beginning.

## 6. Deficiency Categorisation

Deficiencies found during the test shall be categorised in accordance with Directive 2014/45/EU into one of the following groups:

**Minor defects (MiD);** having no significant effect on the safety of the vehicle or impact on the environment and other minor non-compliances. If only minor defects are identified, the vehicle will be deemed passed “Pending Re-Check”. The pass statement will not issue until the vehicle is represented for a visual inspection with the deficiencies rectified.

**Major defects (MaD);** defects that may prejudice the safety of the vehicle, have an impact on the environment, put other road users at risk or other more significant non-compliances.

**Dangerous defects (DD);** defects constituting a direct and immediate risk to road safety or having an impact on the environment such that the vehicle should not be used on the road under any circumstances

The CVR tester shall use his/her experience and technical expertise when assessing a defect and determining the appropriate severity.

The main criteria to be used when making such an assessment are; where the component has reached the stage where it is obviously likely to affect adversely the roadworthiness of the vehicle (dangerous) or where the condition of the component has clearly reached the stage at which replacement, repair or adjustment is necessary (major).

On completion of a CVR test, voluntary safety test or an enforcement test, and where a vehicle is failed because of a Dangerous Defect, the CVR tester shall affix a “Fail Dangerous” notice to the vehicle. For vehicles with a windscreen, a double-sided “Fail Dangerous” notice shall be affixed on the passenger side of the windscreen so as not to impair the vision of the driver. The template that this double sided notice shall take is set out in Figures 1 and 2 that follow.



Figure 1. “Fail Dangerous” Notice: Windscreen Front



Figure 2. “Fail Dangerous” Notice: Windscreen Back

The driver of the vehicle must be advised not to drive the vehicle if it has dangerous defects and be advised to have it towed away or otherwise carried away.

## 7. Restriction on CVR Testers carrying out certain tests.

During a CVR test, a CVR tester shall not carry out any repairs/work on the vehicle. However, the headlamp aim can be adjusted in the lane if necessary. An exception is also made in the case of a blown headlamp bulbs. In this case the headlamp aim test cannot be completed and therefore CVR testers are permitted to replace blown headlamp bulbs and check the headlamp aim during the test. Where headlight adjustment is carried out, it must be noted on CoVIS. Where the vehicle fails on other items, the test must be completed and a test report issued. It shall be possible for a vehicle to be tested and retested on the same day.

A CVR tester shall not carry out a CVR test on a CVR vehicle where that CVR tester has carried out any repairs or maintenance in respect of that CVR vehicle within 3 weeks of the CVR test

A CVR tester shall not carry out a CVR test on a CVR vehicle where that CVR tester or a connected person has a legal or beneficial interest in the CVR vehicle, unless details of the proposed CVR test has been given to the RSA, using the CoVIS system, at least 2 working days prior to such CVR test being carried out.

A CVR tester can only carry out tests on the categories of vehicles to which he or she is authorised.

## 8. Reasons to Refuse to Carry Out a CVR Test.

A CVR tester may refuse to carry out a CVR test if;

- (a). in his or her opinion;
  - (i) any part of the vehicle or any of its equipment is in such a condition that it would not be safe or practicable to carry out the CVR test or

- (ii) a load on the vehicle is in such condition or is not adequately secured that it would be safe or practicable to carry out the CVR test.

- (iii) The test should be abandoned where a vehicle is presented in such a condition that the tester considers it unsafe to continue because it becomes apparent during the test that certain items cannot be satisfactorily inspected (e.g. dirty).

(b). fee payable in respect of the CVR test has not been paid.

## 9. Postponing the issue of a CRW.

Where a pass statement is issued by a CVR test operator, the CVR tester shall verify with the presenter that the details of the registered owner on the pass statement are correct. Where the details differ, the presenter may request that the issuing of the CRW be postponed for a period of up to 14 days. The CVR tester shall advise the presenter to contact the DVCSO in order to have the ownership details updated as soon as possible. The presenter/owner should be advised that the CRW will issue after 14 days to the registered owner on the National Vehicle Driver File.

## 10. Test Equipment.

The equipment to be used for the purposes of carrying out CVR tests are those specified in The Premises and Equipment Guidelines 2013 (including subsequent updates) issued by the Road Safety Authority. Where specific equipment is designated for a particular test, only this equipment shall be used for the test. Where the brakes cannot be tested on a roller brake tester due to the design of the vehicle, the brake test must be carried out using a decelerometer / slope to evaluate the brake performance.

The specialised equipment used for the test should only be used by trained and experienced personnel. CVR testers should be thoroughly familiar with the manufacturers detailed operating instructions and the procedures which must be followed to ensure the safe operation of this specialised equipment.

## 11. Hourmeter / Odometer.

The CVR tester must record the hourmeter / odometer reading at the time of the test where an odometer is fitted. When the test report or pass statement is being presented to the owner or the presenter of the vehicle, the CVR tester shall point out the odometer reading. The owner or the presenter of the vehicle must verify that the odometer reading is correct, and if not shall immediately advise the CVR Tester. The verification on the odometer reading must be completed before the vehicle departs from the CVR testing centre.

Where an error in the hourmeter / odometer record is detected through the verification procedure mentioned above, the CVR test operator shall immediately record the corrected reading on the pass statement or the test report and arrange that the vehicle owner or presenter and CVR tester sign the document. This document shall be sent via email to the Authority at [cvrtadmin@rsa.ie](mailto:cvrtadmin@rsa.ie) by close of business on the date the test was conducted. These are the only circumstances in which the Authority will amend the hourmeter / odometer reading on the CoVIS system. There will not be any exceptions to these arrangements.

## 12. Role of an assistant

During the course of a test it may be necessary for a CVR tester to require the use of an assistant to adequately check a component. For example, an assistant may be needed to rotate or rock the steering while a CVR tester visually inspects steering components or an assistant could raise the axles on the jack to enable the CVR tester to check wheels bearings/ hubs etc.

However the CVR tester who accepts a test on CoVIS is fully responsible for the testing of that vehicle and must ensure that all items are tested by him / her as per the relevant tester manual and/or instructions issued by the Authority. Where a CVR tester is being assisted by another person during the course of a test, (even if that person is another CVR tester) that person will assume the role of an assistant and must not conduct any elements of the test.

An assistant must not conduct any visual checks on a vehicle or operate any of the test equipment, such as the smoke meter, roller brake tester or headlamp aim tester in relation to a CVR test. These functions are the responsibility of the CVR tester who accepts the test on CoVIS. All input of test results should be completed by the CVR tester, including all visual and equipment test results. Under no circumstances should any test results be entered into CoVIS by an assistant.

## 13. General.

The purpose of this manual is to serve as a reference and guide for CVR testers when they are conducting CVR tests on tractors of category T. While CVR testers and CVR operators are not expected to memorise all of the content in this manual, they should familiarise themselves with the method of testing and the reasons for failure to ensure testing is carried out to a consistently high standard utilising best practice.

The test is essentially a maintenance and condition check and shall be carried out using techniques and equipment currently available without the use of tools to dismantle or remove any part of the vehicle. A detailed assessment of a vehicle's design and construction is not part of the test.

Where the method of testing prescribed is a visual inspection and where this visual inspection is not sufficient to determine the condition of a component, the component should be further examined using one of the following methods;

- a. by using tools such as a mirror, hammer, corrosion assessment tool or wire brush.
- b. by exerting force, with or without the aid of tools

The above shall only apply where there is a clear doubt regarding the condition of a component. Panels (designed for easy removal) covering a component may be removed where it is possible to remove such panels without damaging the paintwork (e.g. attached with hand fasteners). Panels attached by means of pop rivets or other permanent fasteners should not be removed.

Points (a) and (b) above shall only apply where there is a clear doubt regarding the condition of the covered part and removal is possible without damaging the paintwork (e.g. attached with bolts). Side panels attached by means of pop rivets or other permanent fasteners may not be removed.

It should also be noted that the test can only confirm the roadworthiness condition of the vehicle at the time of the test. It is not a prediction of future vehicle roadworthiness. Since it is not practicable to lay down limits of wear and tolerance for all types of components of different models of vehicle, or to define acceptable amounts of damage deterioration and effectiveness; CVR testers are expected to use their experience and judgment in making an assessment of the condition of components. The main criteria to be used when making a defect assessment are; has the component reached the stage where it is obviously likely to affect adversely the roadworthiness of the vehicle (dangerous) or where the condition of the component has clearly reached the state at which replacement, repair, or adjustment is necessary? Where the vehicle manufacturer has provided wear tolerances these should be adhered to.

A CVR tester must not under any circumstances issue a pass statement for a vehicle that is not tested in accordance with this manual or that a pass statement is conditional upon repairs or adjustments to the vehicle being made subsequent to the test. A CVR tester shall conduct a thorough inspection of all of the test items strictly in accordance with this manual.

A tractor test must be conducted on a HCV test lane.

The Methods of Testing detailed in this Manual are designed to comply with normal workshop practice. The Road Safety Authority cannot accept responsibility for any injury to any person or any damage to any property arising from the conduct of any test described in this Manual. Nothing in this Manual may be construed as diminishing in any way the obligations on employers from health and safety regulatory acts in relation to the occupational health and safety at work of their employees.

The CVR test operator is responsible for ensuring that the premises and equipment comply with the relevant Acts, Regulations, Bye-laws, Health, Safety and Welfare requirements, Health and Safety at Work Requirements. CVR testing centres shall be maintained to a standard which is conducive to conducting roadworthiness tests in a proficient manner.

With regard to the parking brake assessment section of this manual, the information provided therein is intended only to outline the configuration of a parking brake test slope to test fast tractors. Safe construction and operation of such a test slope and the potential risks associated with building and using such a test slope are outside the scope of this document. Test centres should take their own expert advice as necessary as regards the safe construction and safe operation in practice of any test slope.

It is the responsibility of the person presenting the vehicle for test to prove exemption from any requirement listed in this manual.

## 14. The testing sequence.

It is essential that headlamp aim tests are carried out with the vehicle on the certified level floor area only. Checks on such items as steering play, linkage wear, leaks or play in braking systems, suspension wear and brake lights may require the use of an assistant. The test sequence will of course vary with different vehicle types.

# Corrosion Assessment

## Introduction

When conducting a corrosion assessment for the purposes of the tractor test, the following inspection and guidance procedures relating to corrosion should be applied in accordance with the methods prescribed within individual sections of this manual. It is the responsibility of tester's to read and fully understand the guidance and procedures set out below before undertaking elements of the tractor test related to corrosion assessment.

## 1. Corrosion

The effect of corrosion on the safety of the vehicle depends on its extent and the location where it has occurred. A small amount of corrosion on an important part of the vehicle structure can make a vehicle unsafe where it destroys the continuity of the load bearing structure. On the other hand, heavy corrosion of unimportant sections may have no effect on the vehicle safety.

## 2. Detecting Corrosion in Vehicles

Since advanced corrosion is almost always associated with an eruption of oxidised metal and pitting or bubbling of paint, a visual inspection is usually adequate to determine its presence. However, this method may not be adequate in all cases. In underbody areas prone to corrosion, such as steering and suspension mounting points and major structural components which include chassis, floor, structural sills and sub frames, the presence of corrosion should be checked using thumb pressure or by tapping with a hammer or other appropriate tools. Corrosion affected heavy gauge metal may be tapped harder than light gauge, but unwarranted force and damage must be avoided. In using this technique, care should be taken to avoid damage to panels or paint work not corrosion affected in any way.

When checking for advanced corrosion, particular attention should be paid to seam welds and spot welds. These frequently corrode through from the interior and can result in the eventual detachment of panels. Any panel which is made insecure by such corrosion must be repaired even if it is an area of the component where corrosion holes are not an immediate danger. For the purposes of this manual reference to "rust" should be interpreted as corrosion.

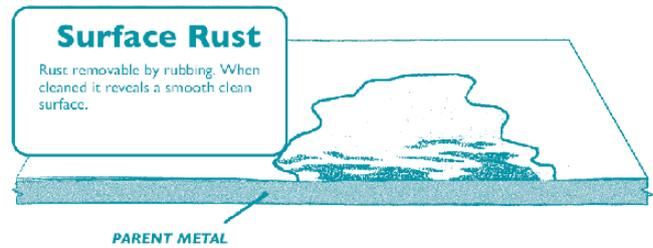
## 3. Classification of Corrosion

The extent of corrosion can range from light surface corrosion to the total breakdown of parent metal. In general, the formation of corrosion and resultant loss of metal occurs in areas which retain moisture, because of a build-up of road dirt and mud etc. The extent of corrosion is classified in three stages.

### Stage 1 – Surface Corrosion

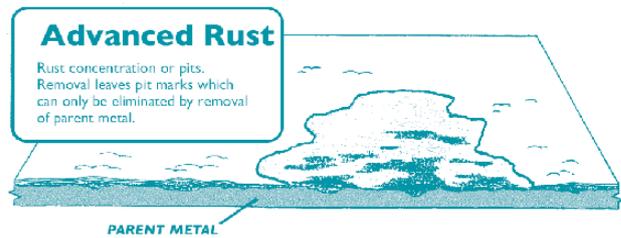
Light, powdery corrosion on the surface of a section of metal is termed surface corrosion.

Surface corrosion can occur on or behind anybody panel, particularly if the protective coating is scratched or damaged.



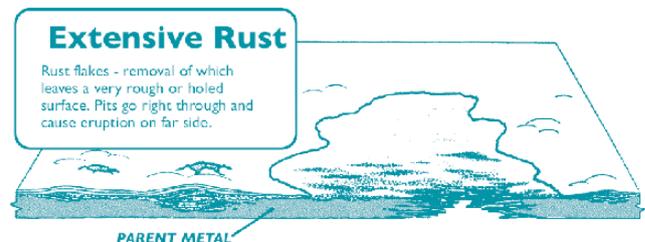
### Stage 2 – Advanced Corrosion

Surface corrosion, if left unattended, will develop into an advanced form of corrosion which can usually be seen as an eruption of oxidised metal, either on bare metal or under paint. This eruption occurs because the corrosion reaction involves an increase in volume which causes pitting or bubbling of paint. An example of a section affected by advanced corrosion is illustrated below.



### Stage 3 – Extensive Corrosion

The final stage of the corrosion process is the formation of a heavy encrustation of oxidised metal which completely replaces the parent metal. This results in a hole or series of holes in the body panel or structural member of the vehicle when the corrosion is removed. This category of corrosion can usually only be rectified by replacement of the affected body panels and parts. The illustration below shows a section affected by extensive corrosion.



## 4. Vehicle Structures

Vehicle structural components can be categorised according to their importance to safety.

### Primary Structure

The primary structure includes any structure or component which, if it collapsed, would render the vehicle uncontrollable or would considerably reduce occupant safety in a crash/collision situation. Only surface corrosion is acceptable in primary structure components. Any part of a load bearing member or load bearing panelling should be considered a reason for failure if it is weakened by corrosion to the extent that:

- By finger and thumb pressure it does not feel rigid, or
- It crumbles to leave a hole, or
- When tapped there is penetration, or it causes the metal to crumble or disintegrate.

## Typical Primary Structure Components

Certain areas of the vehicle structure are particularly important for the safety of a vehicle and particular attention must be paid to these areas during an inspection. These areas are:

- The load bearing parts/primary structure components of the vehicle such as;
  1. Main Structural Members such as sub frames and chassis rails.
  2. Suspension mounting areas.
  3. Steering box mounting point.
  4. Door sills and pillars.
  5. Door hinge mounting areas.
  6. Seat and seat belt anchorage points, where fitted.
  7. All floor panels.
  8. Body Structural Members.
- Any load bearing or supporting structure or supporting panelling within 30cm of the mounting location.

## Secondary Structure

### Categorising Corrosion

By their general construction and design tractors are not as susceptible to corrosion as other traditional commercial vehicles. Testers must apply the criteria in the table below when classifying any corrosion identified on the tractor, be it a primary or secondary structure.

TYPE OF CORROSION	CATEGORY OF STRUCTURE	
	Primary	Secondary
Surface Corrosion	Acceptable	Acceptable
Advanced Corrosion	Not Acceptable	Acceptable*
Extensive Corrosion	Not Acceptable	Not Acceptable**

\* Areas within 100 mm of hinges and locks (e.g. bonnet and doors), are considered primary structures and must be free of advanced and extensive corrosion.

\*\* Extensive corrosion is not acceptable in secondary components, if it renders the component hazardous to persons in or near the vehicle e.g. sharp edges, loose panels, or in the case of exhaust fumes, leakage of exhaust gases into the driver / passenger compartment.

## 6. Repairs

Repairs made to primary structure components solely by using body filling compounds are not acceptable. Repairs should be made by completely welding in new metal of the same gauge as that of the manufactured component. However, plastic filler or fibreglass can be used to cosmetically smooth a non-structural component.

The second category includes any structure or component which, if it collapsed, would not immediately affect a vehicle's controllability. Normally, surface corrosion or advanced corrosion in these structures or components would not make the vehicle unsafe. Extensive corrosion in these components is usually either hazardous to people in or near the vehicle because of its sharp edges or because exhaust fumes may enter the vehicle. In such cases, this type of corrosion would make the vehicle unsafe.

### Typical Secondary Components

Extensive corrosion in these components can be hazardous to vehicle occupants and other road users. Examples of secondary components are;

1. Mud wings, bumpers or roof.
2. Bonnet and doors (areas within 100mm of mounting and locking points are primary structures and must be free of advanced or extensive corrosion).
3. Exhaust system (vehicle may fail to meet noise emission standards if exhaust system is deteriorated due to corrosion).

Extensive corrosion in structural members can only be repaired by replacing the affected member or by completely removing all corrosion affected material and reinforcing it so that the original strength of the affected structural member is re-established.



# 0. IDENTIFICATION OF THE VEHICLE

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## 0. IDENTIFICATION OF THE VEHICLE

### 0.1. Registration Plate

#### 0.1 REGISTRATION PLATE (FRONT & REAR)

##### Method of testing

1. Check the registration number plates for security, location, format, legibility, visibility, correct colour and that the numbers are the same as that on CoVIS. No other marks may appear on the plate. Any additional tabs, etc. outside the dimensions shown for the registration plate are not considered part of the plate.
2. Check the registration plates and letters/numbers are the correct dimensions as shown below.
3. Check that the registration plate is in a prominent location where it can be easily read. A registration plate should be easily legible to a person standing approximately 20m from the front/rear of the tractor.

##### Notes

- **Tractors Registered on or after 1st January, 1987;** Letters and numbers must be black, set against a white background of reflex reflective material and minimum dimensions should be as shown in the sketches below.
- **Tractors Registered prior to 1st January, 1987;**
  - **Reflex Reflecting Registration Plates;** Front registration plates should have black numbers and letters on a white background. Rear registration plates should have black numbers and letters on a red or white background.
  - **Non-Reflex Reflecting Registration Plates;** Front and rear registration plates should have white, silver or light grey numbers and letters on a black background.
  - **Back Lit Registration Numbers and Letters;** where registration numbers and letters are back lit they should appear white in front and either white or red to the rear during lighting up hours. At all other times they should appear white on a black background.
- Owners of tractors registered prior to 31st December, 1990, have the option of converting their registration plates to the new format.
- Tractors Registered on or after 1st January, 1991; Letters and numbers must be black set against a white background of reflex reflective material. The flag of the European Union, the Nationality Symbol, IRL, and the Irish language name of the City/County of registration to be shown. Plate dimensions must be as shown in the sketches below.
- Where the indented space provided for the number plate is not sufficient to accommodate a standard size number plate, the registration plate and registration letters and numbers may be reduced in size relative to the space provided for the number plate.

#### CHECK ITEMS

#### REASONS FOR FAILURE

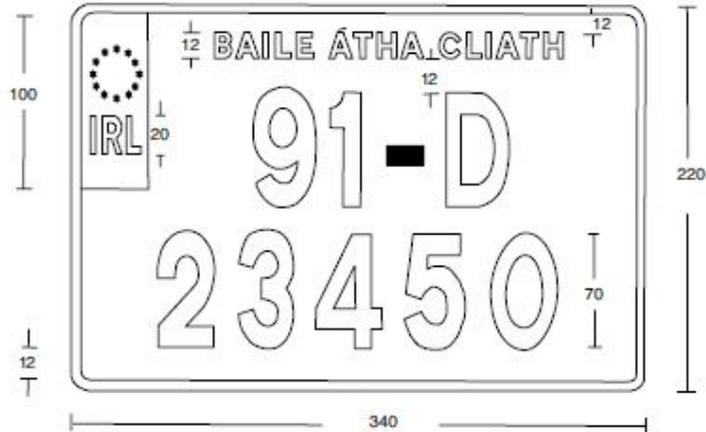
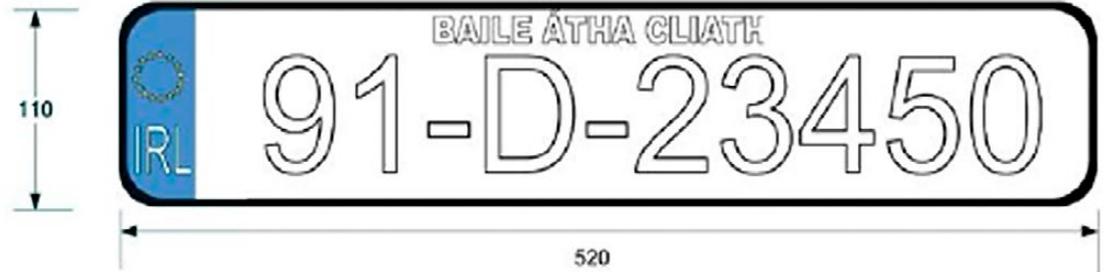
#### SEVERITY

##### Check for:

a. Presence and security.	(a). One or both plates missing, so insecure that they are likely to fall off.	MaD
b. Accuracy.	(b). Numbers or letters missing, illegible or wrong size (see notes).	MaD
c. Correct format.	(c). Numbers, letter or background of incorrect colour (see notes).	MaD
d. Illegal marks.	(d). Marks, other than those prescribed, on the plate within the boundary shown in the diagram.	MaD
e. Compatibility with records.	(e). Not in accordance with vehicle documents or records.	MaD
f. Obstruction and condition.	(f). Number plate obstructed, faded, dirty, delaminated, deteriorated or obscured so that it is likely to be misread or is not easily legible.	MaD

## 0.1. Registration Plate – Example Plates

Either of the example plates below are acceptable. The addition of a tab containing other information is acceptable if all detail within the specification limits meets legislative requirements (S.I. No. 287 of 1990) and no other marks appear within this area (110mm x 520mm). The same criteria should be applied to 220mm x 340mm plates.



## 0.2. VIN (Chassis Number)

### 0.2. VIN (CHASSIS NUMBER)

#### Method of testing

1. Check that the VIN is indelibly marked on the chassis and fully corresponds to the number on CoVIS for the tractor. If not, this is a reason for failure. However where at a minimum the last six digits of the VIN on CoVIS and the VIN indelibly marked on the chassis of the tractor matches a pass advisory shall apply.
2. Check that the tractor meets with the description and EU category assigned to it on CoVIS.

#### Notes

- In the case, where at a minimum, the last six digits of the VIN on CoVIS and the VIN indelibly marked on the chassis of the tractor matches, in this case that the tester may select a pass advisory for this test. The CVR testing centre should still provide the customer with the correct VIN number in writing as marked on the chassis of the tractor; on test centre headed paper using the revised template prepared by the RSA. The customer should be advised to get their vehicle registration certificate amended as per the template provided.
- Where a new VIN plate has been fitted (e.g. conversions/modifications), then the original VIN plate should be retained alongside the new VIN plate.
- **Advisory notice applies where the tractor presented does not match its description on CoVIS.**
- **Advisory notice applies where the VIN on the vehicle registration certificate does not exactly match the VIN indelibly marked on the tractor chassis (but the last six digits of the VIN on the vehicle registration certificate and marked on the chassis match).**
- **Advisory notice applies where the EU category for the tractor does not correspond with the EU category stated on the vehicle registration certificate.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence and condition. b. Legibility and falsification. c. Compatibility with vehicle documents.	(a). Missing or not legible on chassis/frame. (b). Incomplete, illegible, obviously falsified, or does not match the vehicle documents/CoVIS*. (c). Illegible vehicle documents or clerical inaccuracies.	MaD MaD MiD

## 0.4. Manufacturer's Plate

### 0.4. MANUFACTURER'S PLATE

#### Method of testing

1. Check the manufacturer's plate for any alterations. In cases where the details contained on the original manufacturer's plate have been altered, then this alteration must be justified, approved and documented by the manufacturer or their authorised Irish distributor. In the absence of a manufacturers report, then a modifications report in the format as per this manual must be provided.

#### Notes

- In the absence of a manufacturer's plate showing maximum permitted axle weights and design gross vehicle weight (DGWV), the owner / presenter must provide a letter from the manufacturer on headed paper showing the VIN, axle permitted weights and DGWV.
- A sample of a manufacturer's plate is shown in Figure 1 on the next page.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Alterations.	(a). The details on the manufacturers plate have been altered and there is no corresponding documentation from the manufacturer (or his authorised distributor) or a modifications report.	MaD
a. Presence.	(b). Manufacturer's plate missing, illegible or obviously falsified.	MaD

Figure 1 – Sample Manufacturer's plate & common locations of fitment on tractors.

STELLA TRAKTOR WERKE (Manufacturer's name)	
Type: 846 E {Type of tractor and version if necessary}	
EC number: e * 1 * 1792 {EC type-approval number}	
Identification number: GBS18041947 {Tractor identification number}	
Maximum permitted vehicle mass bearing on each tractor axle, according to the possible types of tyre which may be fitted (information listed in order from front to rear)	Total Permissible mass (*) : 4 832 to 6 310 kg
	Permissible front axle load (*) : 2 390 to 3 200 kg
	Permissible rear axle load (*) : 3 130 to 4 260 kg
	(*) Depending on the tyres.
Technically permissible towable mass(es)	Permissible towable mass:
	- unbraked towable mass: 3 000 kg
	- independently-braked towable mass: 6 000 kg
	- inertia-braked towable mass: 3 000 kg
	- towable mass fitted with an assisted braking system (hydraulic or pneumatic): 12 000kg

Note: The following example in no way prejudices the data which may actually be entered on the manufacturer's plate: it is given solely for information purposes.

**Figure 1. Sample manufacturers plate and common locations of fitment on tractors**


STELLA TRAKTOR WERKE (Manufacturer's name)	
Type: 846 E (Type of tractor and version if necessary)	
EC number: e * 1 * 1792 (EC type-approval number)	
Identification number: GBS18041947 (Tractor identification number)	
Total Permissible mass (*)	: 4 832 to 6 310 kg
Permissible front axle load (*)	: 2 390 to 3 200 kg
Permissible rear axle load (*)	: 3 130 to 4 260 kg
(*) Depending on the tyres.	
Permissible towable mass:	
- unbraked towable mass:	3 000 kg
- independently-braked towable mass:	6 000 kg
- inertia-braked towable mass:	3 000 kg
- towable mass fitted with an assisted braking system (hydraulic or pneumatic):	12 000kg

**REAR OF THE TRACTOR**

- Back window area
- Panel below back window

**STEERING COLUMN**

- Steering column panel
- Driver pedals area

**CAB ENTRANCE**

- Entrance steps
- Door sill area

**FRONT OF THE TRACTOR**

- Left / right hand side of engine block
- Below glass panel of cab
- Under front lights

## 0.5. Modifications Report

### 0.5. MODIFICATIONS REPORT

#### Application

- The tractor's owner (or the presenter on the owner's behalf) shall confirm whether any repairs or modifications have been carried out to a tractor since its last CVR test which may adversely affect the roadworthiness of one or more of the items to be tested.
- In respect of tractors modified since their last CVR Test, a modifications report must be provided in the following cases;
  - (a). Chassis work, including lengthening/shortening the wheel base or the replacement of chassis rails.
  - (b). Modification to the steering system (this includes power steering and steering wheel), modification to the suspension system (including modifications to anti-roll bars), modification to the braking system including changing from disc to drum brakes (or vice versa) and the addition or removal of equipment.
  - (c). Modifications to seat belts (including anchorages), air bags or the addition of seats.
  - (d). Major modifications to the cab or body structures or modifications or repairs which may adversely affect the roadworthiness of one or more of the items to be tested as part of the test including where "unsafe repairs or modifications" is specified in this manual as a reason for failure.
- Where during the CVR test, the CVR tester notices a repair or modification which may adversely affect the roadworthiness of any of the test items including where unsafe "repairs or modifications" are specified in this manual as a reason for failure, the CVR tester shall seek a modifications report in writing substantially in the form outlined in the 'Guidelines for completing Modifications Reports' section of this manual. Where a historic report is provided, the CVR tester shall determine whether this adequately addresses the issue and is in line with the form set out in the guidelines for completing Modifications Reports section of this manual and, if not, shall seek a new modifications report. As the CVR test is essentially a maintenance and condition check, it is acknowledged that a tester will not be removing or dismantling any parts in the course of a normal roadworthiness test and that the finding of any modifications or repairs is based on a visual inspection of the tractor only.
- In the case of tractors requiring a modifications report (as per above), this report shall be one issued by the tractor manufacturer (or his authorised distributor), an authorised representative of an NSAI approved test centre (ATC) or by a Suitably Qualified Individual. This report shall be on headed notepaper and include the details specified as per the template in this manual and must state;
  - (a). Tractor Make, Model, variant and Vehicle Registration Number (VRN) and VIN.
  - (b). Description of body-type (not code) before and after modification (in the case of a modification).
  - (c). The purpose of the report and the list of modifications or repairs made to the tractor.
  - (d). The standard of workmanship and specifications.
  - (e). DGWV, & Gross Combination Weight (the original and new, where changed), Unladen Vehicle Weight (the original and new, where changed)
  - (f). That the tractor is safe to use on the road and that the modification/ repair does not diminish the technical status or integrity of the tractor or other components and safety features.
  - (g). That the tractor meets with the Road Traffic (Construction, Equipment and Use of Vehicles) Regulations (as amended) and the Road Traffic (Lighting of Vehicles) Regulations, as amended and where applicable to the essential technical provisions of the EU Directives to which the modification relates for the year of manufacture and category of vehicle concerned.
- Details of relevant road traffic regulations, a definition of SQI and details of instances where a modifications report is not required can be found in the guidelines for completing modifications reports section of this manual.



## 0.7. Speed Disc

### 0.7. SPEED DISC

#### Method of testing

1. Check for the presence and condition of a speed disc on the rear of the tractor in a prominent location that does not obstruct the driver's field of vision. An example of a suitable position for a speed disc is given in figure 3 below.
2. Check that the disc is of the type shown in figure 2 below and that the maximum speed is displayed in kilometres per hour (Km/h).

#### Notes

- Tractors first registered on or after 1 January 2016, regardless of design speed, must be fitted with a speed disc showing their maximum design speed. Tractors registered prior to 1 January 2016, which are capable by design of being driven at speeds over 40 kilometres per hour, must also be fitted with a speed disc.
- Speed discs must be located in a prominent position on the rear of the tractor.
- Speed discs, if needed, must only be fitted by the original manufacturer or an authorised distributor.
- Where the tester is not sure what the correct speed rating for the tractor is they should seek guidance from the manufacturer and or authorised distributor.
- The technical specifications for speed discs are as follows;
  - The speed disc must be a white disc of non-reflecting material with a diameter of 200 millimetres. The disc has a black border between 3 millimetres and 5 millimetres in width.
  - The disc should have a flat surface and all information on the disc should be in black type and not be handwritten.
  - The font type should be normal, clearly legible and upright. Italic type is not allowed.
  - All digits must be in the same font size and should be no smaller than a 100 millimetres in height and 50 millimetres in width.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence. b. Speed in Km/h. c. Speed rating. d. Specifications. e. Position. f. Obstructed vision. g. Legibility.	(a). Speed disc not fitted / incorrectly fitted where required. (b). Maximum design speed not displayed in kilometres per hour. (c). Speed rating does not equal maximum design speed of the vehicle. (d). Speed disc does not meet the required specifications. (e). Speed disc not displayed in a prominent position on the rear of the vehicle. (f). Speed disc obstructs driver's vision of the road. (g). Speed disc is illegible, split, missing, torn or damaged.	MaD MaD MaD MaD MaD MaD MaD

Figure 2 – Model speed disc for an agricultural tractor showing a maximum design speed of 50 km/h.

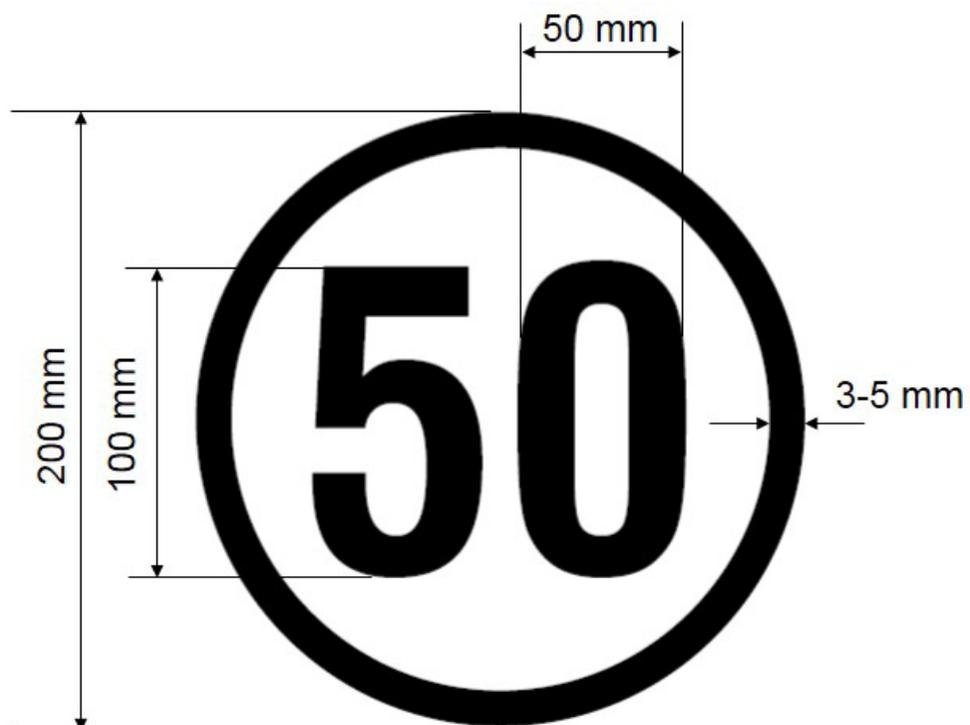
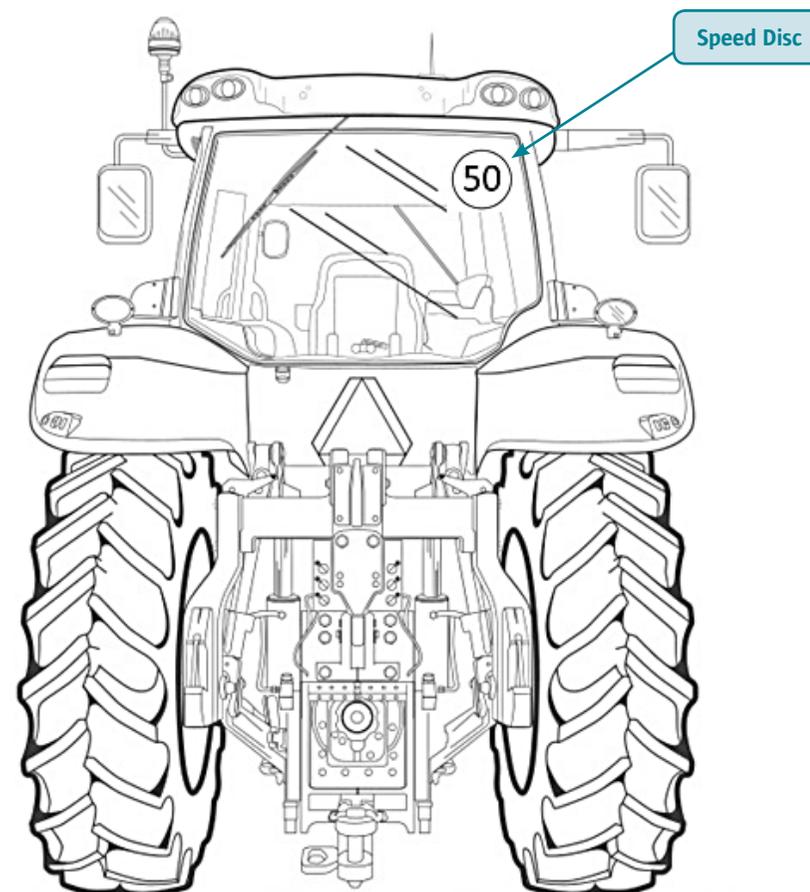


Figure 3 – Example of location of speed disc on the rear of a tractor.



# 1. BRAKING EQUIPMENT

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## 1.1. Mechanical Condition & Operation

### 1.1.1. SERVICE BRAKE PEDAL / HAND LEVER PIVOT

#### Method of testing

1. Check service brake pedal assembly/hand lever pivot for correct pivot operation/excessive side movement and that it releases correctly.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (pivot). b. Wear (mounting/bush).	(a). Pivot too tight so its functionality is affected. (b). Excessive wear or play in mounting/bush.	MaD MaD

### 1.1.2. PEDAL/HAND LEVER CONDITION AND OPERATION

#### Method of testing

**Check the pedal/hand lever for condition and operation by moving it from side to side and depressing it fully.**

1. Check the fixing of the pedal pad to the pedal and the fixing of the pedal to the operating lever.
2. Depress the pedal to check for fouling on parts of the tractor.
3. Release the handbrake, depress the pedal fully and check the position of the back of the pedal relative to the floor.
4. For hydraulic systems, fully depress the pedal and keep it depressed under a steady pressure. Note whether the pedal tends to creep down.
5. For hydraulic systems, release the parking brake and depress the pedal and note whether there is sponginess.
6. On some tractors the action of the brakes is assisted by vacuum from the engine. Note whether this is operating satisfactorily by partially depressing the pedal, starting the engine and noting whether the pedal can be felt to dip.

#### Notes

- Some tractors may have a split service brake assembly, which is capable of operating each side of the tractors brakes independently. The assembly should be locked together when presented for test. Where such assemblies are found to be damaged, missing or inoperative (i.e. pedals not locking together) they should be failed as per reason for failure under (j) below.
- 'Hand lever' in this section refers to the operation of the service brake by hand.
- Brake pedals should not be a reason for failure for not having a pedal rubber if they were not designed to have one.
- The fitment of an air or vacuum gauge is not mandatory on tractors and should not be a reason for failure where it was not originally fitted.

### 1.1.2. PEDAL/HAND LEVER CONDITION AND OPERATION

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Operation (pedal travel). b. Condition (anti-slip provision). c. Operation (brake control). d. Condition & security (mounting). e. Creep or sponginess (hydraulic system). f. Pedal dip (vacuum system). g. Clearance (pedal and floor). h. Gauge (where present). i. Presence and condition j. Split brake assembly (where fitted).	(a). Pedal travel is excessive, obstructed or insufficient reserve travel. (b). Service brake anti-slip provision is missing, loose, worn to the extent that it is no longer effective. (c). Brake control not releasing correctly. (d). Mounting is insecure, badly corroded or worn to the extent that the pedal can be moved from side to side. (e). In hydraulic systems, the pedal tends to creep down, or is felt to be spongy when held depressed. (f). In systems assisted by vacuum from engine, with pedal depressed and the engine started, no dip is felt in brake pedal. (g). Insufficient clearance between the back of the pedal and the floor of the vehicle. (h). When pedal is held depressed air or vacuum gauge reading decreases. (i). Missing or mounting unsatisfactory. (j). Split brake mechanism (where fitted) is damaged, missing or inoperative.	MaD MaD MaD MaD MaD MaD MaD MaD MaD MaD

### 1.1.3. VACUUM PUMP OR COMPRESSOR AND RESERVOIRS (WHERE FITTED).

#### Method of testing

1. Visually inspect the components at normal working pressure. Check time required for vacuum or air pressure to reach safe working value.
2. Deplete the air or vacuum system by applying the foot brake, when the warning device operates there must be four / two further assisted brake applications.
3. Fully deplete the system and run the engine and note the time for the warning device to show minimum effective working condition.
4. Where an air compressor is belt driven, check the fitment of a drive belt/pulley for presence, condition and adjustment.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (4 applications). b. Operation (2 applications). c. Build up time. d. Operation (multi-circuit protection valve). e. Air leaks. f. Condition (external damage). g. Presence and condition (drive belt). h. Presence and condition (drive pulley).	(a). Insufficient pressure/vacuum to give assistance for at least four brake applications after the warning device has operated (or gauge shows an unsafe reading); (b). Insufficient pressure/vacuum to give assistance for at least two brake applications after the warning device has operated (or gauge shows an unsafe reading). (c). Appreciably longer than maximum time allowed by the Manufacturer (in the absence of information on the above, use 3 minutes for compressed air systems, 1 minute for vacuum systems). (d). Multi-circuit protection valve or pressure relief valve not working. (e). Air leak causing a noticeable drop in pressure or audible air leaks. (f). External damage likely to affect the function of the braking system. (g). Drive belt missing, loose or badly deteriorated. (h). Drive pulley missing/loose or cracked.	MaD DD MaD MaD MaD MaD MaD MaD

### 1.1.4. LOW PRESSURE WARNING GAUGE OR INDICATOR (WHERE FITTED)

#### Method of testing

The following checks only applies to air or vacuum assisted brake systems.

1. Check that either a gauge or other visual or audible warning system is fitted. (This check is not necessary where effective braking is possible without the use of stored energy such as vacuum servo or compressed air assistance).
2. By repeated application of the foot-brake (service brake) pedal gradually exhaust the braking system of air or vacuum (with engine stopped).
3. If a gauge is fitted, note that the reading on the gauge falls steadily with each application of the brake and that when the gauge needle has reached the “warning mark” there is still enough vacuum (or air pressure) in the system to allow the brake to be applied at least four more times with vacuum (or air pressure) assistance.
4. If a warning lamp or audible or mechanical warning system is fitted, note that after this has operated there is still enough vacuum (or air pressure) in the system to allow the brake to be applied at least four more applications with vacuum (or air pressure) assistance. Check that the spring brakes do not activate during this process.

#### Notes

- Where a tractor is fitted with more than one warning system they must all be working.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation and malfunction. b. Functionality (visual/audible). c. Presence. d. Operation (spring brake).	(a). Malfunctioning or defective gauge or indicator. (b). Low pressure warning gauge or indicator cannot be seen/ heard when air/vacuum is depleted. (c). Missing. (d). Spring brakes activate before warning signal.	MiD MaD MaD MaD

## 1.1.5. HAND-OPERATED BRAKE CONTROL VALVE (AIR BRAKE SYSTEM)

### Method of testing

This inspection applies to all valves fitted in the cab to control parking brakes, spring brakes or brake actuators.

1. Check all hand-operated brake control valve components while the braking system is operated.

### Notes

- In some cases it may not be possible to check these items completely from the cab position, but only to obtain an indication of their condition. If a defect is suspected which cannot be verified from the cab position, the inspection must be continued from a position underneath the tractor.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition and wear. b. Security (valve). c. Security and leaks (connections). d. Operation. e. Presence and travel. f. Malfunction.	(a). Control cracked, damaged or excessively worn. (b). Control insecure on valve or valve insecure. (c). Loose connections or leaks in system. (d). Unsatisfactory operation. (e). Missing or cannot be moved over its full travel. (f). Malfunction of control valve.	MaD MaD MaD MaD MaD MaD

### 1.1.6. PARKING BRAKE ACTIVATOR, LEVER CONTROL, PARKING BRAKE RATCHET, ELECTRONIC PARKING BRAKE

#### Method of testing

The following inspections are to be completed from inside the tractor.

#### Mechanical Parking Brake

1. Check the condition of the brake lever and its mounting with the brake lever in the 'off' position and note the amount of side play in the lever pivot by moving the lever from side to side.
2. Check the condition of the ratchet pawl mechanism pivots and safety guard.
3. Apply the brake slowly and check the effective operation of the pawl mechanism by listening for definite and regular clicks as the pawl moves over the ratchet teeth.
4. With the brake fully applied knock the top and each side of the lever and check that the lever is held in the 'on' position. Check that the lever is not at the end of its permitted travel and that there is no fouling of adjacent parts.

#### Electronic Parking Brake

5. Visually inspect the electronic parking brake controls while the braking system is operated. For some tractors this will be included as part of the power shuttle assembly or as a separate switch around the drivers controls.

#### Notes

- In some cases it is not possible to check these items completely from inside the tractor, but only to obtain an indication of their condition. If a defect is suspected which cannot be verified from inside the tractor, the inspection must be continued from a position underneath the tractor.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Presence, security and condition.	(a). Ratchet and pawl mechanism (where fitted) is missing, insecure, damaged or sticking, not holding correctly.	MaD
b. Wear (lever pivot or in ratchet mechanism).	(b). Wear at lever pivot or in ratchet mechanism.	MaD
c. Excessive wear (lever pivot or in ratchet mechanism).	(c). Excessive wear at lever pivot or in ratchet mechanism.	MaD
d. Operation ("on" position).	(d). Knocking the top or sides of the lever releases the brake.	MaD
e. Excessive movement/ impeded travel.	(e). Excessive movement of lever indicating incorrect adjustment or movement is obstructed.	MaD
f. Presence, damage and condition (electronic).	(f). Electronic park brake activator missing, damaged or inoperative.	MaD
g. Malfunction/ warning indicator.	(g). Incorrect functioning, warning indicator shows malfunction (where fitted).	MaD
h. Presence, security, damage and condition (lever).	(h). Lever/lever mounting is missing, fractured, badly worn or corroded, insecure or mounting unsatisfactory.	MaD
i. Free movement and obstruction (lever).	(i). Seized, inoperative or obstructed.	MaD

### 1.1.7. BRAKING VALVES (FOOT VALVES, UNLOADERS, GOVERNORS)

#### Method of testing

1. Check for leaks, excessive discharge of oil and damage to valves or components while the braking system is off and applied in turn (air systems must be at normal working pressure).

#### Notes

- When assessing the significance of leaks it should be remembered that certain pneumatic components are subject to some degree of leakage.
- Slight seepage producing a thin film of oil on the component is not a deficiency but any sign of dripping is unacceptable.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Damage and leaks.</li> <li>b. Damage and excessive leaks (functionality affected).</li> <li>c. Oil discharge.</li> <li>d. Security and mounting.</li> <li>e. Hydraulic discharge/ leak.</li> <li>f. Excessive hydraulic discharge/ leak (functionality affected).</li> <li>g. Condition and operation.</li> </ul>	<ul style="list-style-type: none"> <li>(a). Valve damaged or excessive air leak.</li> <li>(b). Valve damaged or excessive air leak that its functionality is affected.</li> <li>(c). Excessive oil discharge.</li> <li>(d). Valve insecure or inadequately mounted.</li> <li>(e). Hydraulic fluid discharge or leak.</li> <li>(f). Excessive hydraulic fluid discharge or leak(s) that its functionality is affected.</li> <li>(g). Seized, inoperative or obstructed.</li> </ul>	<ul style="list-style-type: none"> <li>MaD</li> <li>DD</li> <li>MiD</li> <li>MaD</li> <li>MaD</li> <li>DD</li> <li>MaD</li> </ul>

### 1.1.8. COUPLINGS FOR TRAILER BRAKES (ELECTRICAL, HYDRAULIC & PNEUMATIC)

#### Method of testing

1. With the brakes fully applied check all connections for leaks.
2. If fitted, check ISO7638 connector for correct outputs.
3. Check brake hose couplings for:
  - (a). Leakage and security of mounting,
  - (b). Outlet pressure in line with manufacturers recommendations (use calibrated pressure gauges),
  - (c). The possibility of incorrect coupling e.g. due to the absence of colour (air),
4. Check that an ISO 7638 connector is fitted on a tractor capable of exceeding 60kph first registered after 1st Jan 2016.

#### Notes

- ISO7638 connectors are only mandatory for tractors capable of exceeding 60kph first registered after 1st Jan 2016.
- Palm Couplings are acceptable as suzie connections.
- The pressure at the service suzie brake line connection should be not less than 5.5 bar (c 80 psi) and not greater than 8.5 bar in the absence of manufacturers specifications.
- For hydraulic brake output pressures, manufacturer's specifications apply. Ensure that the engine is switched off before the hydraulic gauge is removed.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Damage, leaks and security. b. Repairs and fittings. c. Pressure. d. Fitment (air). e. Presence (ISO 7638 connector). f. Operation (outputs, ISO 7638). g. Leaks. h. Leaks (functionality affected). i. Operation. j. Operation (safety affected).	(a). Damaged, leaking or insecurely mounted. (b). Inadequate repairs or unsuitable fittings. (c). Pressure at brake line connections not within manufacturers specifications. (d). Possibility of incorrect coupling of brake lines. (e). No ISO 7638 connector fitted on a tractor capable of exceeding 60kph first registered after 1st Jan 2016. (f). Incorrect or no outputs on ISO7638 connector. (g). Excessive leaks. (h). Leaks so excessive that its functionality is affected. (i). Not functioning correctly. (j). Not functioning correctly that operation of the brake is affected.	MaD MaD MaD DD MaD MaD MaD DD MaD DD

### 1.1.9. ENERGY STORAGE RESERVOIR PRESSURE TANK

#### Method of testing

Visually inspect the energy storage reservoir pressure tank and carry out the following checks:

1. Check that the securing straps are free from cracks, fractures, excessive corrosion and do not chafe the reservoir or other fittings.
2. Check the reservoir for damage, corrosion and leaks.
3. With air pressure or vacuum built-up, check the drain device (where fitted) and for leaks in the system.

#### Notes

- Minor damage to reservoir should not be a reason for failure where the reservoir capacity is not unduly reduced by deformation. In cases where there is damage to a tank requiring the replacement / repair by welding of the tank 1.1.9 (b) below should apply.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check:</b></p> <p>a. Damage and condition.</p> <p>b. Excessive damage or leaks.</p> <p>c. Drain device.</p> <p>d. Drain device operation.</p> <p>e. Securing straps presence, damage and condition.</p> <p>f. Oil / water contamination.</p> <p>g. Security.</p>	<p>(a). Tank slightly damaged or slightly corroded.</p> <p>(b). Tank excessively damaged, corroded or leaking.</p> <p>(c). Drain device operation affected.</p> <p>(d). Drain device inoperative.</p> <p>(e). Securing straps broken, damaged or corroded.</p> <p>(f). Obvious evidence of excessive oil or water in air brake system.</p> <p>(g). Tank insecure or inadequately mounted.</p>	<p>MiD</p> <p>MaD</p> <p>MiD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p>

### 1.1.10. BRAKE SERVO UNITS, VALVES, MASTER CYLINDER, (HYDRAULIC SYSTEMS)

#### Method of testing

Carry out the following checks (where possible) on the components while the braking system is applied using the “brake tool”.

1. Check servo(s), valves and master cylinder(s) for presence, operation and condition.
2. Check for the presence of a cap on the master cylinder reservoir and for sufficient brake fluid level.
3. With the front axle jacked up and the engine running, apply the service brake and check that the four wheel drive engages automatically.

#### Notes

- Applied brakes means the braking system is pressurised using either the brake tool or a tester may use an assistant to apply the brakes.
- In the absence of manufacturers guidance, where automatic engagement of the four wheel drive does not occur when the service brake is applied, reason for failure (m) shall apply.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Security and condition. b. Operation (brake performance impaired). c. Operation (brake performance not impaired). d. Defects, operation and leaks. e. Security. f. Security (brake performance impaired). g. Brake fluid level. h. Brake fluid level (significantly low). i. Brake fluid level (not visible). j. Presence and condition of reservoir cap. k. Warning device. l. Warning device function. m. Repair or modification. n. Adjustment.	(a). Servo/valve(s) is insecure or defective, damaged or badly corroded, leaking, brake performance not impaired. (b). It is non-operative, brake performance impaired. (c). Master cylinder/reservoirs defective but brake performance not impaired. (d). Master cylinder/reservoirs defective and non-operative or leaking brake performance impaired. (e). Brake master cylinder/reservoirs are insecurely mounted or mounting panel is cracked but brake performance not impaired. (f). Master cylinder insecure and brake performance impaired. (g). Insufficient brake fluid below MIN mark (less than half full or is below manufacturer’s “minimum” level). (h). Brake fluid significantly below MIN mark. (i). No brake fluid visible. (j). The reservoir cap is leaking or cap missing. (k). Brake fluid warning light illuminated or defective. (l). Incorrect functioning of brake fluid level warning device. (m). Any obviously unsafe repair or modification to brake master cylinder/ servo/valves/connections. (n). Adjusting rod indicates adjustment is required.	MaD DD MaD DD MaD DD MiD MaD DD MiD MiD MiD MaD MaD

### 1.1.11. RIGID BRAKE PIPES

#### Method of testing

Carry out the following checks on all rigid brake pipes while the braking system is applied and the park brake released.

1. Check all accessible rigid brake pipes for general condition and fouling by a moving part.
2. Check all accessible rigid brake pipes, to ensure that they are in serviceable condition, free from chafing and external corrosion and damage.
3. Check that rigid pipes are securely held by clips or other means and examine brake pipes for repair or use of unsuitable fittings.

#### Notes

- When retesting a tractor which required the repair or replacement of any hydraulic brake pipe(s), the items which failed must be re-tested as per method of testing above, under pressure, and a full brake test must be conducted.
- To correctly assess the condition of corroded metal brake pipes, surface dirt might have to be removed. This might require light scraping with the Corrosion Assessment Tool 'spade end'. Care must be taken not to damage any protective coating. Slight surface corrosion should not be considered a reason for failure.
- A missing brake pipe clip is not necessarily a reason for failure provided the brake pipe remains adequately supported.
- Couplings in brake pipes are acceptable provided they have been fitted to a high standard of workmanship. Repairs to hydraulic lines using copper tubing is acceptable provided suitable connectors are used.
- Provided the vacuum is maintained in the servo, the engine may be stopped.
- On tractors with full pneumatic systems, where any brake components have been replaced or dismantled (with the exception of replaced brake lines/hoses), a full brake test is required.
- Where the tester is satisfied that, since the original test, no work was carried out on a tractor that could affect the braking performance, other than above, there is no need to perform a full brake performance test on tractors with full pneumatic brake systems. Full brake test required for all other systems..

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <p>a. Risk of failure / fracture.</p> <p>b. Leaks.</p> <p>c. Condition.</p> <p>d. Mounting / security.</p> <p>e. Fouling.</p> <p>f. Repairs.</p>	<p>(a). Imminent risk of failure or fracture.</p> <p>(b). Leaks are present in pipes or connections.</p> <p>(c). Are perished, kinked, damaged or rusted to the extent that the pipe is pitted.</p> <p>(d). Are unsatisfactorily mounted (or misplaced) with the possibility of failing.</p> <p>(e). A pipe is fouling moving parts.</p> <p>(f). Inadequate repairs have been carried out to pipes or unsuitable fittings are present.</p>	<p>DD</p> <p>DD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p>

### 1.1.12. FLEXIBLE BRAKE HOSES

#### Method of testing

Carry out the following checks on all flexible brake hoses while the braking system is applied and the park brake released.

1. Check all flexible hoses, to ensure that they are not constrained in tight bends, that they have adequate room to move as necessary without fouling any other parts of the tractor, and that they are not chafed, kinked, twisted or deteriorated and that they are in serviceable condition.
2. Check all brake hoses on steered axles when the steering is placed on either full lock ensure that there is adequate length of hose / sufficient clearance of other tractor components.
3. Check that hoses are securely held by clips or other means and examine brake hoses for repair or use of unsuitable fittings.

#### Notes

- When retesting a tractor which required the repair or replacement of any hydraulic brake hose, the items which failed must be re-tested as per method of testing above, under pressure and a full brake test must be conducted.
- A missing brake hose clip is not necessarily a reason for failure provided the brake hose remains adequately supported.
- Provided the vacuum is maintained in the servo, the engine may be stopped.
- A flexible brake hose should only be considered a reason for failure when the reinforcement material / cord is exposed under examination.
- On tractors with full pneumatic systems, where any brake components have been replaced or dismantled a full brake test is required, with the exception of replaced brake lines/hoses.
- Where the tester is satisfied that, since the original test, no work was carried out on a tractor that could affect the braking performance, other than above, there is no need to perform a full brake performance test on tractors with full pneumatic brake systems. Full brake test required for all other systems.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Risk of failure / fracture.	(a). Imminent risk of failure or fracture.	DD
b. Condition.	(b). Hoses perished, kinked, twisted, too short or excessively damaged or chafed.	MaD
c. Leaks.	(c). Leaks are present in hoses or connections.	DD
d. Bulging.	(d). A hose is bulging under pressure.	MaD
e. Mounting.	(e). Are unsatisfactorily mounted (or misplaced) with the possibility of failing.	MaD
f. Fouling.	(f). A hose is fouling moving parts.	MaD
g. Repairs.	(g). Inadequate repairs have been carried out to pipes or hoses or unsuitable fittings are present.	MaD

### 1.1.13. BRAKE LININGS AND PADS

#### Method of testing

1. Visually inspect brake pads and linings which can be seen without dismantling. Check for presence, security of pads/linings, excessive wear and contamination by leaking brake fluid, oil or grease. Also check for correct mounting and adjustment of lining or pad.
2. Check if there has been any repair or modification carried out to any of the mechanical components of the brake system.

#### Notes

- When retesting a tractor which required the repair or replacement of any brake linings or pads, the items which failed must be re-tested as per method of testing above and a full brake test must be conducted.
  - (a). In the absence of wear indicators or manufacturers recommendations regarding brake lining or disc pad wear, a figure of 2.5mm should be taken as a minimum thickness for bonded linings/pads. Where no facility is provided for inspection of brake shoes/pads this will not apply.
- Some tractors have a warning light on the dashboard to indicate that the brake pads are becoming excessively worn. This lamp may be a multi-function lamp which also illuminates for other reasons (e.g. handbrake applied). Before failing brake pads under the reasons for failure below relating to wear (where a lamp is illuminated), testers must first ensure that the lamp is not illuminated for any other reason.
- In the absence of a manufacturer's tolerance insufficient contact means less than three quarters of the central pad surface with the disc.
- An unsafe repair or modification carried out to any of the mechanical components of the brake system, may require a modifications report to be presented as per the template in this manual.
- **Advisory notice applies where the brake pads/ linings on this tractor are close to minimum wear mark.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Wear (minimum mark reached). b. Excessive wear (minimum mark not visible). c. Contamination. d. Excessive contamination (brake performance affected). e. Presence and security. f. Adjustment.	(a). Lining or pad excessively worn (minimum mark reached). (b). Lining or pad excessively worn (minimum mark not visible). (c). Lining or pad contaminated (oil, grease etc.). (d). Lining or pad contaminated that braking performance is affected. (e). Lining or pad missing or wrongly mounted. (f). Brake linings are incorrectly adjusted.	MaD DD MaD DD DD MaD

### 1.1.14. BRAKE DRUMS, BRAKE DISCS

#### Method of testing

1. Visually inspect brake drums / discs and back plates which can be seen without dismantling checking for presence, contamination by leaking brake fluid, oil or grease.
2. Check for fractures, damage, insecurity, misalignment or excessive wear or worn beyond manufacturer's limit.
3. Check for evidence of sufficient contact between brake pad and brake disc.
4. Check dirt shield / dust cover for security and condition.

#### Notes

- When retesting a tractor which required the repair or replacement of any brake drum or disc, the items which failed must be re-tested as per method of testing above and a full brake test must be conducted.
- In the absence of a manufacturer's tolerance insufficient contact means less than three quarters of the central pad surface with the disc.
- In the absence of a manufacturer's tolerance for excessive brake disc wear is 3mm or greater on a 27 mm thick disc.
- Drum / disc ovality should only be considered a reason for failure when it affects the brake performance on a road test i.e. the presence of brake judder or pulling to one side, or the ovality can be felt through movement in the brake pedal.
- Dust covers should not be confused as being the same as back plates on brake assemblies. Where a dust cover is missing this should not be considered a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Wear. b. Excessive wear, condition and security. c. Contamination. d. Excessive contamination (brake performance affected). e. Presence. f. Security and condition. g. Security. h. Sufficient contact.	(a). Drum or disc excessively worn beyond manufacturers limit. (b). Drum or disc, excessively scored, cracked, insecure, fractured that failure is imminent. (c). A brake drum / disc is contaminated (oil, grease, etc.). (d). A brake drum / disc is contaminated that braking performance is affected. (e). Drum, disc or back plate missing. (f). Dirt shield / dust cover loose damaged or insecure. (g). Back plate insecure. (h). Insufficient contact between brake pad and brake disc or lining and drum.	MaD DD MaD DD DD MaD MaD MaD

### 1.1.15. BRAKE CABLES, RODS, LEVERS, LINKAGES

#### Method of testing

1. Visually check the brake cables, rods, levers, linkages which can be seen without dismantling. Check brake rods, clevis joints, linkages, relay levers, pins, pivots or cables for damage, condition and correct adjustment.
2. Check that locking device is effective, secure and present.
3. Check the condition and completeness of brake cables and condition (frayed or seized) of cable guides for chafing rods or levers.

#### Notes

- When retesting a tractor which required the repair or replacement of any brake actuators (callipers / hydraulic cylinders), the items which failed must be re-tested as per method of testing above, under pressure and a full brake test must be conducted.
- The parking brake should be released during this test.
- An unsafe repair or modification carried out to any of the mechanical components of the brake system, may require a modifications report to be presented as per the template in this manual.
- **An advisory notice applies in the case of a dust cover damaged.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Condition. b. Condition (excessive wear). c. Security. d. Cable guide condition. e. Free movement. f. Maladjustment. g. Incorrect fitment. h. Retaining device presence, security and wear. i. Repair or modification.	(a). A brake rod / lever / cable / linkage / pivot is missing, damaged, cracked, corroded, knotted, seized, obstructed or worn. (b). A brake rod / lever / cable / linkage / pivot is missing, damaged, cracked, corroded, knotted, seized, obstructed or worn that braking performance is affected. (c). Cable, rod or joint insecure. (d). Cable guide defective. (e). Restriction to free movement of the braking system. (f). Abnormal movement of the levers/linkage indicating maladjustment or excessive wear. (g). A brake rod / lever / cable / linkage / pivot is incorrectly fitted. (h). A bracket, mounting bolt, split pin or other retaining device is missing, loose or worn. (i). Any obviously unsafe repair or modification.	MaD DD MaD MaD MaD MaD MaD MaD MaD

### 1.1.16. BRAKE ACTUATORS (INCLUDING SPRING BRAKES / CALLIPERS / HYDRAULIC CYLINDERS)

#### Method of testing

1. Visually inspect each brake wheel unit / callipers for security, leaks, corrosion or damage. By applying the brakes check each brake actuator for leaks and, where possible, operation. Check that all appropriate items e.g. fixing nuts, bolts and split pins are secure and locked.
2. Check brake actuators (including spring brakes / callipers / hydraulic cylinders) for fluid discharge, dust cover presence and condition (only applicable to hydraulic brake actuators).
3. Check each brake cylinder/actuator are of the same size (where fitted to the same axle). Check for travel of operating pistons/diaphragms and mechanisms.
4. Check for any unsafe repair or modification.

#### Notes

- When retesting a tractor which required the repair or replacement of any brake actuators (callipers / hydraulic cylinders), the items which failed must be re-tested as per method of testing above, under pressure and a full brake test must be conducted.
- The parking brake should be released during this test.
- An unsafe repair or modification carried out to any of the mechanical components of the brake system, may require a modifications report to be presented as per the template in this manual.
- **An advisory notice applies in the case of a dust cover damaged.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Condition, security and adjustment.	(a). An actuator/lever is damaged, cracked insecure, inadequately mounted or is in need of adjustment.	MaD
b. Condition, security and adjustment (brake performance affected).	(b). An actuator/lever is damaged, cracked insecure, inadequately mounted or is in need of adjustment that braking performance is affected.	DD
c. Leaks.	(c). Actuator leaking.	MaD
d. Excessive leaks.	(d). Actuator leaking that braking performance is affected.	DD
e. Operation.	(e). Sluggish in operation/restricted or seized.	MaD
f. Excessive corrosion.	(f). Actuator excessively corroded.	MaD
g. Actuator compatibility.	(g). Different sized actuators fitted to the same axle.	MaD
h. Travel.	(h). Insufficient or excessive travel of operating piston or diaphragm mechanism.	MaD
i. Free movement (brake performance affected).	(i). Braking performance affected (lack of reserve movement).	DD
j. N/A.	(j). N/A.	
k. Dust cover presence and damage.	(k). Dust cover missing or excessively damaged.	MaD
l. Repair or modification.	(l). Any obviously unsafe repair or modification.	MaD
m. Maladjustment.	(m). Abnormal movement of the levers/linkage indicating maladjustment or excessive wear.	MaD
n. S-cams locking over.	(n). Danger of brakes locking (Vehicles with air brakes: S-cams locking over).	DD

### 1.1.17. LOAD SENSING VALVE

#### Method of testing

1. Check that load sensing / brake proportioning valves are not missing, bypassed, linkage sticking, disconnected, damaged, leaking or inoperative and are correctly adjusted.
2. Visually inspect the load sensing / brake proportioning valves while the braking system is applied for signs of leaks.

#### Notes

- When retesting a tractor which required the repair or replacement of any load sensing/proportioning valve, the items which failed must be re-tested as per method of testing above, under pressure and a full brake test must be conducted.
- An unsafe repair or modification carried out to any of the mechanical components of the brake system, may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Condition (linkage). b. Operation (ABS/EBS functioning). c. Operation. d. Presence or bypassed. e. Data plate. f. Security and leaks. g. Condition and adjustment.	(a). Defective linkage. (b). Seized or inoperative (ABS/EBS functioning). (c). Seized or inoperative. (d). Missing or bypassed (if required). (e). Data plate missing (where originally fitted) or data illegible. (f). A valve insecurely mounted, leaking or defective. (g). The load sensing or brake proportioning valves are damaged, inoperative, obviously incorrectly adjusted or a linkage is sticking.	MaD MaD DD DD MiD MaD MaD

### 1.1.18. SLACK ADJUSTERS AND INDICATORS

#### Method of testing

1. Check for the presence, condition and operation of slack adjusters. Check for excessive wear, defects correct operation and signs that the adjusting nut torque is obviously not within the manufacturer's specification.
2. Check for the fitment of manual slack adjusters fitted in place of original automatic adjusters.

#### Notes

- Slack adjusters may be tested by applying a small torque wrench to the adjusting nut and the value obtained compared to the manufacturers' specification.
- Automatic slack adjusters are mandatory on tractors originally fitted with them. It is not permitted to replace automatic slack adjusters with manual slack adjusters.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Condition and operation (adjuster). b. Condition (adjuster) c. Fitment. d. Presence and condition. e. Manual adjusters in place of automatic adjusters	(a). Adjuster damaged, seized or having abnormal movement, excessive wear or incorrect adjustment. (b). Adjuster defective. (c). Incorrectly installed or replaced. (d). Missing, excessively worn, inoperative, defective, seized or having abnormal movement or adjusting nut torque obviously not within the manufacturer's specification. (e). Manual slack adjusters fitted in place of original automatic adjusters	MaD MaD MaD MaD MaD

### 1.1.21. COMPLETE BRAKING SYSTEM

#### Method of testing

1. Visually check other brake system devices (where fitted) e.g. anti-freeze pump, air dryer, etc. for external damage, excessive corrosion or leakage.
2. Check for any unsafe repair or modification to a braking related component that is not checked under another section of this manual.

#### Notes

- It is inevitable that due to changes in design, or other reasons, from time to time defects may be found which are not described in any of the reasons for failure in the other sections of this manual. Therefore this section is to be used in cases only where a particular braking related component is not checked under another section of this manual.
- An unsafe repair or modification carried out to any of the mechanical components of the brake system, may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Condition. b. Condition (braking performance is affected). c. Leaks. d. Excessive leaks. e. Security. f. Repair or modification. g. Repair or modification (braking performance is affected).	(a). Other system devices damaged externally or excessively corroded in a way that adversely affects the braking system. (b). Other system devices damaged that braking performance is affected. (c). Slight leakage of air or anti-freeze. (d). Excessive leakage of air that system functionality is affected. (e). Any component insecure or inadequately mounted. (f). Unsafe modification to any component. (g). Unsafe modification to any component that braking performance is affected.	MaD DD MaD MaD MaD MaD DD

### 1.1.22. TEST CONNECTIONS (WHERE FITTED OR REQUIRED)

#### Method of testing

1. Visually check test connections are not damaged.
2. Visually inspect the test connections while the braking system is applied for signs of leaks.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Presence. b. Condition and leaks.	(a). Missing. (b). Damaged, unusable or leaking.	MaD MaD

## 1.2. Service Braking Performance & Efficiency (Roller Brake Test)

### 1.2.1. PERFORMANCE (IMBALANCE) & 1.2.2. EFFICIENCY

#### Method of testing

If the tractor is of a type which can be tested on the roller brake tester proceed as follows:

1. Position the tractor so that the wheels of each axle can in turn be properly placed on the roller brake tester.
2. Drive the tractor onto the roller brake tester and following the prompts of the brake tester programme apply the service brake slowly until the road wheel is just at the point of slip relative to the rollers, or until the service brake is fully applied or until sufficient braking effort is obtained whichever occurs first. Check that a minimum efficiency of 50% (of the test weight of the tractor) is achieved. Minimum efficiencies and methods of calculating efficiencies are given in table 1 below.

#### Service Brake Imbalance

3. With the roller brake tester driving the wheels of each axle in turn apply the service brake slowly and note the braking effort indicated from the brake on each roadwheel. Record and store the readings.

#### Notes

- It is not permitted to adjust brakes during a CVR test.
- Ensure that no person or persons are near to the roller brake tester or tractor propeller shaft while they are in motion. No one should attempt to dry tyres during a roller brake test.
- It is compulsory to record and retain brake test readings and relevant axle weight specifications (if brake test results have been automatically captured by CoVIS, there is no requirement to keep a hard copy of the brake test readings).
- Where it is necessary to obtain a higher reading of the braking effort than is possible with the tractor as presented, use the axle load simulator. **Under no circumstances should an axle be subjected to a total load (i.e. simulated load plus axle loading as presented for test) beyond its design axle weight.**
- Generally speaking the total axle load required is considerably less than the design axle weight. It is acceptable that tractor axles are secured using the axle load simulator to “hold” the axle will be in the brake tester during the CVR test.
- Where the wheels of an axle lock up or slip out of the rollers during the brake test resulting in the required overall tractor braking efficiency not being reached, neither a pass or fail decision can be made. The brake test must continue until either the required efficiency has been reached or, with full air pressure and the brake fully applied, the efficiency cannot be reached. Only then can a pass or fail decision be made.
- Tyres must be correctly inflated and the gear selector should be in the neutral position.
- Where it is not practical to have the tractor presented for test laden the load sensing valve may be by-passed following the tractor manufacturer’s instructions. This by-pass operation could be carried out by the CVR Tester when the tractor arrives at the test centre and must be reversed before the tractor leaves the test area. When carrying out this operation the pressure to the load sensing valve must never be more than that stated on the load sensing valve plate for a tractor in the fully laden condition. Under no circumstances should the tractor be driven on the road with the load sensing valve bypassed.
- Tractors having a transmission Park brake must never be roller brake tested with the gear selector in the ‘P’ park position.
- Occasions will arise when the required brake efficiency is just obtained or just exceeded without lock occurring but the tester knows that a higher performance figure is normally obtainable for the type of tractor being tested. In such cases although the tractor has passed the brake performance test, the tester should advise the owner that the braking system appears to be in need of adjustment or repair.
- For tractors with servo assisted or power braking systems, the engine must be running (idling) when the service brake is tested.

## 1.2.1. PERFORMANCE (IMBALANCE) & 1.2.2. EFFICIENCY

### Notes

- In some cases it may be necessary to chock the road wheels of the tractor during a roller brake test.
- Some roller brake testers are fitted with a means of checking ovality. For the purpose of the CVR test this should be ignored.
- In view of the tyre to road grip normally available in service it is not considered necessary to aim for maximum service brake performance figures exceeding 60% of the design gross weight of the tractor being tested.
- Care should be taken to ensure that tyres are free from mud, stones, oil or water and that brake tester rollers are in good condition to ensure that premature wheel slip does not occur.
- Where brake test results have not been automatically captured by CoVIS, it is compulsory to print off the brake test readings and relevant axle weight from the roller brake testing equipment. These print outs shall be scanned and uploaded onto CoVIS and attached to the relevant tractor test record.
- Where a tractor does not achieve the minimum service braking efficiency and the owner can supply proof that the tractor was type approved to a braking efficiency lower than that required at CVT, then an appeal by the owner may be made to the RSA. As well as braking type approval documentation, the RSA will also require the details of the Design Gross Vehicle Weight for the tractor concerned.
- The maximum pressure to be applied to the foot control of the braking device should not exceed 68kgf (150 lbf).
- A CVR tester may refuse to carry out the service brake performance test on a tractor if in his or her opinion the braking system is in such a condition that it would not be safe to carry out the test.
- Each hub must achieve a brake efficiency of 12.5% of its Design Axle Weight (DAW).
- Reasons for failure 1.2.1 (a) and 1.2.2 (d) shall only apply to axles originally designed to be braked.

### 1.2.1. PERFORMANCE (IMBALANCE) & 1.2.2. EFFICIENCY

#### Method of testing

1. If the tractor is of a type (e.g. automatic engagement of 4 wheel drive when brake is applied, braked through the transmission) that cannot be tested on the roller brake tester it should be subjected to a decelerometer test as follows:
2. Set the decelerometer on the tractor in line with the manufacturer's instructions.
3. If a decelerometer test is carried out this should be done in traffic free circumstances, have the tractor driven at a steady speed of approximately 20km/h on level ground. Have the service brake applied firmly and note the reading on the decelerometer. Note whether the tractor pulls to one side when the brakes are applied and if there is any evidence of brake drum / disc ovality.

### 1.2.1. PERFORMANCE (IMBALANCE)

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Brake wheel effort (no braking effort).	(a). No braking effort on one or more wheels.	DD
b. Brake imbalance.	(b). More than 30% difference is present in braking effort between wheels on the same axle (i.e. the braking effort on one side should not be less than 70% of the braking effort on the other side).	MaD
c. Brake imbalance (steered axles).	(c). Braking effort from any wheel is less than 50% of the maximum effort recorded from the other wheel on the same axle in the case of steered axles.	DD
d. Gradual brake effort.	(d). No gradual variation in brake effort (grabbing).	MaD
e. Brake lag.	(e). The brake shows abnormal lag when released.	MaD
f. Brake fluctuation.	(f). On an individual wheel brake effort fluctuates by more than 30%.	MaD
g. Obvious pull to one side (decelerometer test).	(g). Where a decelerometer test is carried out, obvious pull to one side is present when brakes are applied.	MaD
h. Perceptible ovality (decelerometer test).	(h). Where a decelerometer test is carried out, perceptible ovality is present in the service brake.	MaD
i. Progressive operation.	(i). The brake cannot be operated progressively.	MaD

### 1.2.2. EFFICIENCY

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Efficiency (less than 50% of the test weight of the vehicle).	(a). Where the brake performance of the vehicle is less than 50% of the test weight of the vehicle when the brakes are progressively applied up to maximum effort.	MaD
b. Efficiency (less than required).	(b). The brake performance achieved for the vehicle is less than minimum required. (See table 1).	MaD
c. Efficiency (less than 50% of minimum required).	(c). The brake performance achieved for the vehicle is less than 50% of minimum required.	DD
d. Efficiency (each wheel)	(d). The minimum brake performance (12.5%) for the wheel is not achieved (where tested on a RBT).	MaD

## 1.4. Parking Brake Performance

### 1.4.1. PERFORMANCE (IMBALANCE)

#### Method of Testing

##### Roller Brake Tester

1. Normally this test and the service brake test will be carried out concurrently and the same general precautions apply (see “method of testing” and “notes” for service brake performance).

##### Gradient / Slope Test

2. Where tractors are fitted with a Transmission Park brake or a Park brake that is not designed to be tested dynamically complete a gradient test instead to check the parking brake performance.
3. As shown in figure 1 below, both reverse and drive the tractor onto a 16% gradient. With the engine running apply the parking brake and release the service brake. Where the tractor is also fitted with a transmission brake in addition to the parking brake, this should also be checked.

#### Notes

- Care should be taken to avoid any risk of ‘grounding’ the tractor when reversing onto and driving off the test slope.
- When the parking brake is being tested by the gradient test, the service brake (foot-brake) may be used to assist in setting the parking brake.
- When completing a gradient test only the tester should be in the vicinity of the slope facility. The tester shall not get in or out of the tractor whilst parked on the slope and shall ensure that all windows and doors are securely closed before driving or reversing onto the ramp.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Decelerometer test.	(a). Where a decelerometer test is carried out, the vehicle deviates excessively from a straight line.	MaD
b. Brake performance.	(b). More than 50% difference is present in the brake effort between wheels on the same axle (where tested on a roller brake tester).	MaD

### 1.4.2. EFFICIENCY

#### Method of Testing

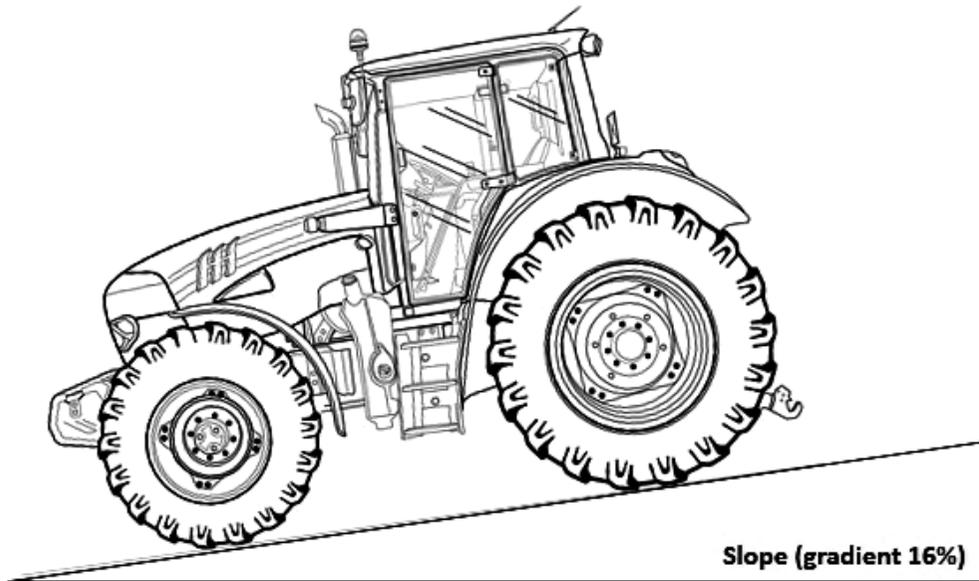
1. With the roller brake tester driving the wheels of each axle in turn apply the parking brake and note the braking effort indicated from the brake at each road wheel.

#### Notes

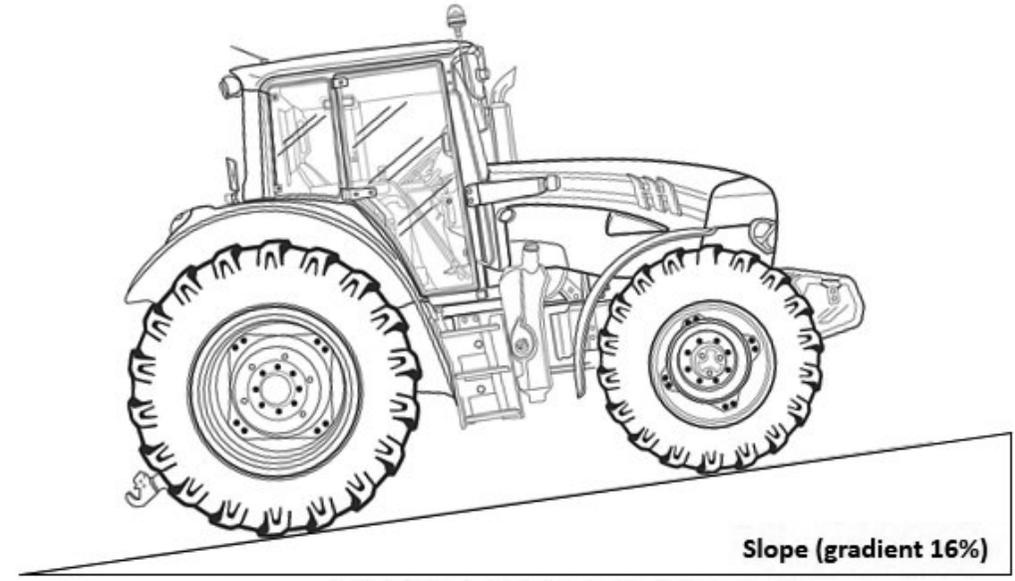
- Normally this test and the parking brake performance test will be carried out concurrently and the same general precautions apply. (This test is not relevant to transmission type parking brakes).

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Efficiency.	(a). The braking effort is less than 16% of the test weight of the vehicle.	MaD
b. Imbalance.	(b). The brake effort achieved for the vehicle is less than 50% of minimum required.	DD
c. Roll on slope (slight roll).	(c). Parking brake demonstrates slight effort (slight roll) but is incapable of holding the vehicle on a 16% gradient (slope test).	MaD
d. Roll on slope (no effort).	(d). Parking brake demonstrates no effort and is incapable of holding the vehicle on a 16% gradient.	DD

Figure 1 - Parking Brake Slope Test.



Note: Not to scale, for illustration purposes only.



Note: Not to scale, for illustration purposes only.

### MINIMUM BRAKING PERFORMANCE REQUIREMENTS FOR TRACTORS

BRAKE TYPE	MINIMUM BRAKE EFFICIENCY	METHOD USED TO CALCULATE EFFICIENCY
Service Brake	50%	Presented weight
Parking Brake	16%	Presented weight

## 1.6. Anti-lock braking system (ABS)

### 1.6. ANTI-LOCK BRAKING SYSTEM (ABS)

#### Method of Testing

1. If the tractor is fitted with an Anti-Lock Braking System (ABS), check that the relevant warning lamp is fitted, and follows the correct sequence of operation (manufacturer's check sequence must be verified).
2. Visually check wheel speed sensors are not damaged or missing.
3. Check wiring or other components are not damaged or missing.

#### Notes

- When retesting a tractor which required the repair or replacement of any ABS component(s) or malfunction indicator, the items which failed must be re-tested as per method of testing above, under pressure on a raised lift or over a pit, and a full brake test must be conducted.
- Where the warning light sequence is not as per the light sequence chart but the owner/ presenter states that the operation is correct but different from the normal sequence, then a tester may request verification for the light sequence for that particular tractor from an authorised dealer or from the tractor manufacturer.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Malfunction indicator. b. Presence and condition (speed sensors). c. Condition (wiring). d. Presence and condition (other components). e. Presence (where mandatory). f. Removal / tampering. g. Malfunction indicator (vehicle interface).	(a). Malfunction indicator not working or not following the correct sequence. (b). Wheel speed sensors missing or damaged. (c). Wiring damaged. (d). Other components missing or damaged. (e). Not fitted where mandatory. (f). Removed or disabled. (g). System indicates failure via the electronic vehicle interface.	MaD MaD MaD MaD MaD MaD MaD



# 1.8. Brake Fluid

## 1.8. BRAKE FLUID

### Method of Testing

1. Visually check the brake fluid reservoir for security and condition of fluid.

- Notes**
- If the brake fluid cannot be easily seen without removing the reservoir cap, then the cap must be removed for inspection.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Contamination.</li> <li>b. Excessive contamination.</li> <li>c. Security (reservoir).</li> </ul>	<ul style="list-style-type: none"> <li>(a). Brake fluid contaminated or sedimented.</li> <li>(b). Brake fluid is excessively contaminated that there is imminent risk of failure.</li> <li>(c). Brake fluid reservoir mounting unsatisfactory</li> </ul>	<ul style="list-style-type: none"> <li>MaD</li> <li>DD</li> <li>MaD</li> </ul>

## 2. STEERING

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## 2. STEERING

### 2.1. Mechanical Condition

#### 2.1.1. STEERING GEAR CONDITION (RACK AND PINION, STEERING BOX, ORBITAL BOX)

##### Method of testing

1. Position the tractor over the pit with the steered axle aligned over the wheel play detector plates with the brakes applied. Using the wheel play detectors, check the steering mechanism from the point it is secured to the chassis, to the point where the steering arms are secured to their fixings. For tractors fitted with power steering it may be necessary to have the engine running.
2. Check for roughness or stiffness in the steering gear operation.
3. Check steering rack gaiter condition and security and check for any leaks in the system.
4. Check if there has been any obvious unsafe repair or modification carried out to any steering components.

##### Notes

- Expand steering rack gaiters for proper examination.
- All steered wheels must be checked.
- An unsafe repair or modification carried out to steering components may require a modifications report to be presented as per the template in this manual.
- Certain tractors have a built-in play in the steering rack mounting bushes and this should be taken into consideration.
- **An advisory notice applies in the case of a slight oil weep.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Operation.	(a). Roughness or stiffness in operation of gears or bearings/bushings.	MaD
b. Condition.	(b). Sector shaft twisted or splines worn or damaged.	MaD
c. Condition (function affected).	(c). Sector shaft twisted or splines so worn or damaged that functionality is affected.	DD
d. Excessive wear (shaft).	(d). Excessive wear or movement in sector shaft.	MaD
e. Excessive wear (function affected).	(e). Excessive wear or movement in sector shaft that functionality is affected.	DD
f. N/A.	(f). N/A.	
g. Continuous oil leaks.	(g). Continuous oil leak is present from steering box/rack/ or steering damper.	DD
h. Condition and security (linkage).	(h). A linkage is damaged or insecure.	MaD
i. Oil leak.	(i). Obvious oil leak (formation of drops).	MaD
j. Excessive wear (bushes).	(j). Bushes/bearings are excessively worn.	MaD
k. End float.	(k). Excessive end float is present in pinion.	MaD
l. Steering gaiter.	(l). Steering rack gaiter is insecure, split or missing.	MaD
m. Condition and security (steering system).	(m). Steering system damaged, insecure or excessively worn.	DD
n. Repairs by welding.	(n). Any steering component has been repaired by welding (other than by the manufacturer).	MaD

### 2.1.2. STEERING GEAR CASING ATTACHMENT

#### Method of testing

1. Position the tractor over the pit with the steered axle aligned over the wheel play detector plates with the brakes applied. Using the wheel play detectors, check the steering gear casing attachment bolts. Visually check for relative movement between casing and chassis/bodywork.
2. Check the steering gear casing attachment bolts. Visually check for relative movement between casing and chassis/bodywork.
3. Check the security of any part fixed to the tractor structure, e.g. steering box, rack housing or intermediate drop arm pivot housing and check for cracks or corrosion around attachment points.

#### Notes

- It may be necessary to open the engine compartment or front grill to examine certain steering components on some tractors.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Attachment. b. Attachment (function affected). c. Condition of fixings. d. Presence of fixings. e. Attachment. f. Steering gear condition. g. Steering gear condition (function affected). h. Corrosion. i. Security and condition. j. Play.	(a). Steering gear casing not properly attached. (b). Steering attachments dangerously loose or relative movement to chassis/bodywork visible. (c). Elongated fixing holes in chassis. (d). A mounting bolt for steering housing is missing, loose or fractured. (e). Steering attachments seriously affected. (f). Steering gear casing/housing is fractured/damaged or worn. (g). Steering gear casing/housing is fractured/damaged or worn that directional stability is impaired, functionality affected, insufficient clearance to other vehicle parts. (h). Cracks or corrosion are present around attachment points for steering box, rack or idler box. (i). Any mounting obviously loose, damaged or deteriorated. (j). Axial or radial play is present in the linkage, splines are worn or a shaft is twisted.	MaD DD MaD MaD DD MaD DD MaD MaD MaD

### 2.1.3. STEERING LINKAGE CONDITION (IDLER ASSEMBLY, TRACK ROD/STEERING ARM)

#### Method of testing

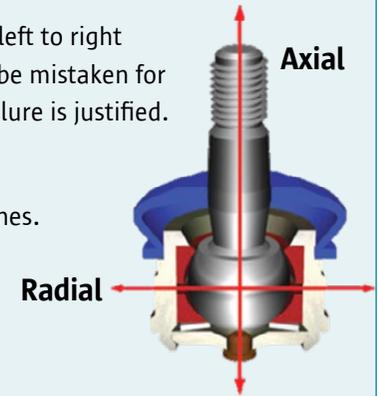
1. Position the tractor over the pit with each steered axle in turn aligned over the wheel play detecting plates. Some models of tractors will have to be jacked slightly and/or the brake applied in order to examine the steering linkage properly. Using the wheel play detectors, examine the steering mechanism from the point it is secured to the chassis, to the point where the steering arms are secured to their fixings. During this inspection check for excessive wear at joints, drop arm, drag link, track rods and track rod ends. Check components for security, fracture and damage. Check condition of rubber gaiters and dust covers.
2. With the engine running and wheels on the ground visually check for obvious axial and lateral movement of all ball joints while the steering is rotated from left to right (approximately one turn of the steering wheel). Where a ball joint is fitted with a spring to take up such movement, the compression of the spring must not be mistaken for excessive wear. Where lateral movement is evident in the ball joint it must be confirmed that axial movement in excess of 2mm exists before a reason for failure is justified.

#### With steered wheels off the ground:

3. Grasp each steered wheel at 3 o'clock and 9 o'clock, and shake vigorously to determine the condition of the outer ball joints and track control arm inner bushes.
4. Check if there has been any obvious unsafe repair or modification carried out to any steering components.

#### Notes

- Relative movement due to excessive wear must be distinguished from relative movement due to built-in clearance or spring loading of a joint
- An unsafe repair or modification carried out to steering components may require a modifications report to be presented as per the template in this manual.





## 2.1.4. STEERING LINKAGE OPERATION

### Method of testing

1. With steered wheels off the ground check for fouling of wheels, tyres and components of the steering linkage with any part of the tractor by rotating the steering wheel through its full working range checking for fouling, presence, security and correct adjustment of lock stops if fitted.
2. Check for play in steering linkage, twisted or worn shafts.
3. Check for welding of steering linkages other than by the manufacturer.

### Notes

- A missing steering lock stop should only be failed where it is known to have been fitted as standard.
- Many modern tractors are fitted with electro hydraulic steering systems, if the wheels are rotated through their full working range without the engine running this may lead to cavitation of the system.
- Welding of steering parts other than by a manufacturer is not acceptable.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <p>a. Fouling.</p> <p>b. Operation and presence (steering stops).</p> <p>c. Repairs by welding.</p> <p>d. Steering operation.</p> <p>e. Play.</p>	<p>(a). Moving steering linkage fouling a fixed part of the chassis.</p> <p>(b). Steering stops not operating or missing.</p> <p>(c). Any steering component has been repaired by welding (other than by the manufacturer).</p> <p>(d). Steering overlocking / underlocking or fouling any other component on the vehicle.</p> <p>(e). Axial or radial play is present in the linkage, splines are worn or a shaft is twisted.</p>	<p>MaD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p>

### 2.1.5. POWER STEERING

#### Method of testing

1. Check that the power steering is operating with the front road wheels on the ground and with the engine running, turn the steering wheel in both directions.
2. Check fluid level and for leaks in the power steering system and fouling of fluid pipes.
3. Check for corrosion and security/damage of power steering components.

#### Notes

- Many modern tractors are fitted with electro hydraulic steering systems, if the wheels are rotated through their full working range without the engine running this may lead to cavitation of the system.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Intermittent operation.	(a). Power assistance is not available consistently smooth over full lock to lock range.	MaD
b. Operation.	(b). Power assistance is not operating, is disconnected or is missing where power steering is a standard fitment by the manufacturer on all vehicles of the type (make and model) of vehicle being tested.	MaD
c. Fluid level.	(c). Power steering fluid level is below minimum level.	MaD
d. Leaks.	(d). Leaks are present in power steering system.	MaD
e. Fouling of pipes.	(e). A power steering fluid pipe is fouling other components.	MaD
f. Fluid pipe condition.	(f). Fluid pipes/hoses or cables damaged, excessively corroded.	MaD
g. Fluid pipe condition (steering affected).	(g). Fluid pipes/hoses so or cables damaged that steering is affected.	DD
h. Security of components.	(h). Any power steering component not working, worn, fractured or insecure.	MaD
i. Security of components (steering affected).	(i). Any power steering component not working, fractured or insecure that steering is affected.	DD
j. Steering fouling.	(j). Steering is over or under locking or is fouling any other component on the vehicle.	MaD
k. Steering pump condition.	(k). Power steering pump is worn, noisy, leaking or has a defective drive.	MaD
l. Modifications.	(l). Unsafe modification to any component.	MaD
m. Modifications (steering affected).	(m).Unsafe modification to any component that steering is affected.	DD
n. Ram condition.	(n). Ram anchorage / bushes / assembly worn, distorted, leaking, misaligned or damaged.	MaD
o. Ram condition (steering affected).	(o). Ram anchorage / bushes / assembly worn, distorted, leaking, misaligned or damaged such that steering is affected.	DD

## 2.2. Steering Wheel & Column

### 2.2.1. STEERING WHEEL CONDITION

#### Method of testing

1. Check the strength and condition (including any modifications) of the steering wheel by applying reasonable force.
2. Push the steering wheel rim in various directions at right angles to the column, while applying light pressure downward and upward.

#### Notes

- Cracks or incompleteness of the covering skin of a steering wheel or hub are not a reason for failure.
- An unsafe repair or modification carried out to the steering wheel may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Attachment.</li> <li>b. Attachment (failure imminent).</li> <li>c. Condition.</li> <li>d. Condition (failure imminent).</li> </ul>	<ul style="list-style-type: none"> <li>(a). Relative movement between steering wheel and column indicating looseness.</li> <li>(b). Excessive movement in the steering wheel that there is a very serious risk of becoming detached.</li> <li>(c). Fracture or looseness of steering wheel hub, rim or spokes or absence of retaining device.</li> <li>(d). Fracture or looseness of steering wheel hub, rim or spokes or absence of retaining device that there is a very serious risk of becoming detached.</li> </ul>	<ul style="list-style-type: none"> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>DD</li> </ul>

## 2.2.2 STEERING COLUMN/STEERING WHEEL

### Method of testing

Before carrying out this inspection, make sure that any mechanism for adjusting the steering column is fully locked.

1. Rock the steering wheel from side to side and note any relative movement between the steering column and wheel. Apply slight downward and upward pressure to the rim of the steering wheel with both hands and note the condition of the steering wheel hub and rim.
2. Attempt to lift the steering wheel in line with the steering column and note any movement at the centre of the steering wheel or of the steering column.
3. Push steering wheel away and pull it towards the body, and note the movement of the steering column radially and its security of mounting.
4. Check the universal joints/flexible couplings for wear security or deterioration.
5. Check the presence and security of retaining and locking devices.
6. Check if there has been any obvious repair or modification carried out to the steering wheel/column/shaft or to the universal joint/clamp.

### Notes

- Where a steering mechanism is fitted with flexible couplings care must be taken to distinguish between play due to wear, and apparent play due to the construction of the mechanism.
- An unsafe repair or modification carried out to the steering wheel/column/shaft or to the universal joint/clamp may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Excessive movement (steering wheel).	(a). Excessive movement of centre of steering wheel up or down.	MaD
b. Excessive movement (column).	(b). Excessive movement of top of column radially from axis of column.	MaD
c. Security.	(c). Steering wheel / column / shaft has excessive end float, is insecure or broken.	MaD
d. Mounting brackets security.	(d). Any bush / bearings / mounting brackets for steering wheel / column / shaft is missing, worn, damaged or insecure.	MaD
e. Joints and couplings.	(e). Any universal joint / clamp/ flexible coupling damaged, worn, insecure or badly deteriorated.	MaD
f. Joints and couplings (failure imminent).	(f). Any universal joint / clamp/ flexible coupling damaged, worn, insecure or badly deteriorated that failure is imminent	DD
g. Shear pin.	(g). Shear pin in telescopic column is broken.	MaD
h. Locking device.	(h). Any retaining or locking device is missing or insecure.	MaD
i. Attachment.	(i). Steering wheel/column attachment is defective.	MaD
j. Attachment (failure imminent).	(j). Steering wheel/column attachment is so defective that there is very serious risk of detachment.	DD
k. Repairs and modifications.	(k). Unsafe repair or modification.	DD

## 2.3. Steering play

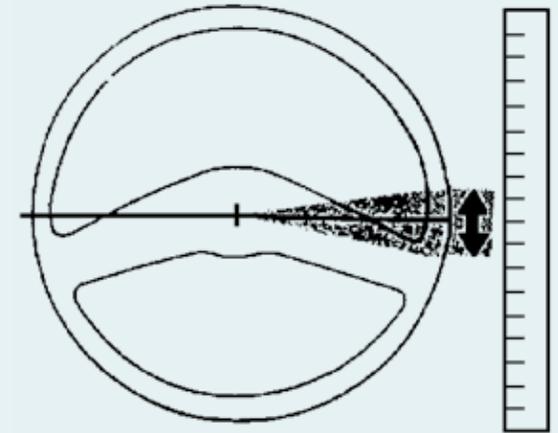
### 2.3 STEERING PLAY

#### Method of testing

1. With the road wheels on the ground and in the straight-ahead position, turn steering wheel until movement can be detected at the front road wheels. Align a reference mark on steering wheel with a mark on a ruler and slowly turn steering wheel in the opposite direction until movement can be detected at the front road wheel. Measure play at steering wheel. (Special play-checking instruments are also available, measuring free play in mm or degrees. Such instruments should always be mounted and used according to the manufacturer's instructions).

#### Notes

- Excessive rotational play (measured at the outer rim of the steering wheel):
  - Steering Box
    - 20° on 15" (381mm) diameter steering wheel = 69mm on rim
    - 20° on 18" (457mm) diameter steering wheel = 83mm on rim
    - 20° on 21" (533mm) diameter steering wheel = 97mm on rim
    - 20° on 24" (610mm) diameter steering wheel = 111mm on rim
  - Rack and Pinion
    - 5° on 15" (381mm) diameter steering wheel = 17mm on rim
    - 5° on 18" (457mm) diameter steering wheel = 20mm on rim
    - 5° on 21" (533mm) diameter steering wheel = 23mm on rim
    - 5° on 24" (610mm) diameter steering wheel = 27mm on rim



#### CHECK ITEMS

##### Check for:

- a. Excessive play (steering affected).
- b. Excessive play (steering box).
- c. Excessive play (rack and pinion).

#### REASONS FOR FAILURE

- (a). Free play in steering is so excessive that safe steering is affected.
- (b). Excessive rotational play (20° or more) is present in the steering box.
- (c). Excessive rotational play (5° or more) is present in the rack and pinion.

#### SEVERITY

- DD  
MaD  
MaD

## 2.6. Electronic Power Steering (If fitted)

### 2.6 ELECTRONIC POWER STEERING (IF FITTED)

#### Method of testing

1. Check that the steered wheels are pointing straight ahead with the steering wheel in the straight ahead position and/or using the electronic vehicle interface.
2. Check that the electronic power steering is operating, by turning the steering wheel from lock to lock with the engine running and the road wheels on the ground.
3. Check the malfunction indicators for the Electronic Power Steering (EPS), Manufacturer's check sequence must be verified.

#### Notes

- Manually switched Electronic Park Assist designed to be activated when parking the tractor is not a reason for failure if the power assistance is inoperative provided the function of the steering is not adversely affected. It may be necessary to verify this by road testing.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. EPS malfunction indicator sequence. b. Steering wheel angle with road wheels in a straight line position. c. Steering wheel angle with road wheels in a straight line position (function impaired). d. Power assistance. e. Malfunction indicators.	(a). EPS malfunction indicator lamp (MIL) indicates any kind of failure of the system. (b). Inconsistency between the angle of the steering wheel and the angle of the wheels. (c). The angle of the steering wheel in relation to the road wheels is so misaligned that the steering is affected. (d). Power assistance not working. (e). System indicates failure via the electronic vehicle interface.	MaD MaD DD MaD MaD



## 3. VISIBILITY

### 3.1. Field of Vision

#### 3.1. FIELD OF VISION

##### Method of testing

1. Check that there is an adequate view from the driving seat of the road and the front tyres or mudguards (where fitted) and that it is not interfered with by objects or stickers.

##### Notes

- Official stickers such as tax, insurance and CVRT discs are not considered a reason for failure provided they do not seriously restrict the drivers view.
- A sun visor fitted to the driver's side, which cannot be stowed in the 'off screen' position and which drops down obstructing the view of the road through the swept area of the windscreen may be considered a reason for failure.
- Wiper blades that automatically park in a position that obscures the view through the windscreen may be considered a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <p>a. Obstruction, objects or stickers (outside cleaning area of windscreen wipers).</p> <p>b. Obstruction, objects or stickers (inside cleaning area of windscreen wipers).</p>	<p>(a). Obstruction, objects or stickers within driver's field of view that materially affects drivers view in front or to the sides (outside cleaning area of windscreen wipers).</p> <p>(b). Obstruction, objects or stickers within driver's field of view that materially affects drivers view in front or to the sides, inside the cleaning area of windscreen wipers affected or outer mirrors not visible.</p>	<p>MiD</p> <p>MaD</p>

## 3.2. Condition of Glass

### 3.2. CONDITION OF GLASS

#### Method of testing

1. Check the presence, condition and security of the windscreen, all side and rear windows, and roof glazing.
2. Check that the windscreen is not damaged or discoloured beyond acceptable limits (within the swept area of the wipers) (see figure 1 below). Where glass lower than the swept area or to the left/right of the steering column is damaged or discoloured, reason for failure (c) below shall apply.
3. Check that where the windscreen and all other glazing is made of glass it is marked as safety glass, e/E-marked or to an automotive standard as per Table 1 below.
4. Check that the rear window operating mechanism(s) are functioning properly.

#### Notes

- Laminated windscreens are not required on tractors, where fitted they must meet the requirements as per the Approved Standard Marks of this section.
- If the glazing presented is not marked or is marked to a standard not listed below, it is the responsibility of the owner/presenter to provide documentary evidence that the glazing material is not likely, if fractured, to produce fragments capable of causing severe cuts.
- If a tester deems that the windscreen or front side windows are excessively tinted, the level of light transmission of the window should be tested using a calibrated light meter capable of measuring the amount of light transmitted through the windscreen and the side windows forward of the B pillar to an accuracy of  $\pm 3\%$ .
- Windscreen repairs are acceptable provided they do not effect the driver's view.
- It is the responsibility of the owner/presenter to provide proof of standards equivalency if a tractor is presented with glass marked to another standard other than one shown in Table 1 below.
- Light scratching which does not obscure the driver's view should be ignored. However, an area of concentrated scratching such as caused by the prolonged use of a defective wiper blade which obscures vision should be considered a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Presence and security (windscreen).	(a). Windscreen missing or insecure.	MaD
b. Visibility (windscreen).	(b). Visibility through inside cleaning area of windscreen wipers heavily affected.	DD
c. Windscreen damage / discolouration (outside cleaning area of windscreen wipers).	(c). Windscreen is damaged or discoloured beyond acceptable limits (outside cleaning area of windscreen wipers).	MiD
d. Windscreen damage / discolouration (inside cleaning area of windscreen wipers).	(d). Windscreen is damaged or discoloured beyond acceptable limits (inside cleaning area) of windscreen wipers affected or outer mirrors not visible.	MaD
e. Automotive safety glass (windscreen).	(e). Windscreen is not marked as automotive safety glass.	MaD
f. Presence and security (side / rear windows).	(f). Side or rear windows missing or insecure.	MaD
g. Operation of opening mechanism (rear window).	(g). Opening mechanism of rear window obviously defective.	MiD
h. Non glass windows (side, rear, roof glazing).	(h). Non-glass side, rear windows and roof glazing (skylights) made of material that, if fractured is likely to produce fragments capable of causing severe cuts to a person.	MaD
i. Side / rear window damage (driver's view obstructed).	(i). Side or rear window so damaged that it obstructs the driver's view.	MaD
j. Light transmission.	(j). Glass in windscreen and front side windows has a light transmission level of less than 65%.	MaD

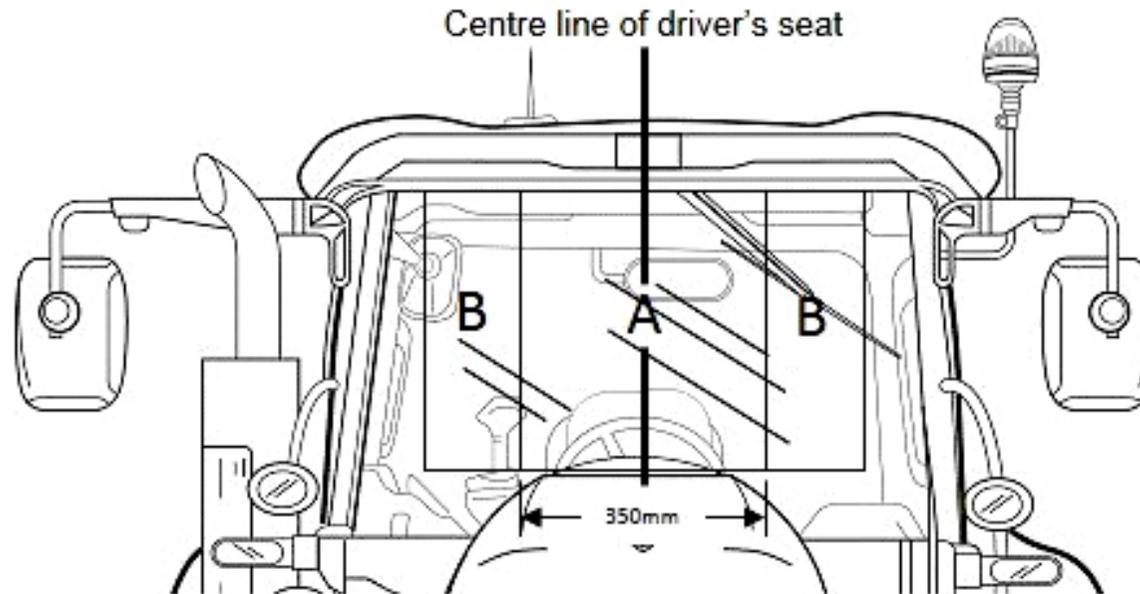
### 3.2. Condition of Glass

**Table 1: Acceptable safety glass standards**

COUNTRY	SAFETY GLASS STANDARD
<b>Australia:</b>	AS/NZS 2080 AS/NZS 2080T
<b>Canada:</b>	CMVSS 205 (C2)
<b>India:</b>	IS2553 (Part 2) 1992 (Note 11)
<b>Japan:</b>	11-4-21 (window glass) JISR 3211
<b>South Africa:</b>	SABS 1191 / SABS 1193
<b>UK:</b>	BS AU 178 / BS 85 7-2 / BS 5282
<b>USA:</b>	FMVSS 205 (U) ANSI/SAE Z26.1-1996 (Section 7)
<b>Germany:</b>	<p>A three-period sine wave followed by the letter D. This is an older German type approval for automotive glazing. (See image below).</p>  <p>Glazing marked Birkholz, Seitz, Roxite, Para Press or Bonoplex. Glazing marked PMMA (polymethylmethacrylate) or PC (polycarbonate).</p>

### 3.2. Condition of Glass

Figure 1 - Windscreen condition (ac



#### ACCEPTABLE LIMITS

- **ZONE A;** Damage that can be contained within a 10mm diameter circle (maximum of two defects provided they are more than 100mm apart).
- **ZONE B;** Damage that can be contained within a 20mm diameter circle or hairline cracks up to 30mm long (maximum of two defects provided they are more than 100mm apart).

#### NOTES;

- (1) The above zones only apply to the wiped area of the windscreen.
- (2) The tractor should be failed where damage is beyond the above limits.
- (3) Light scratching which does not obscure the driver's view should be ignored.

### 3.2. Condition of Glass

COUNTRY IN WHICH MARK ISSUES	APPROVED STANDARD MARKS
<p>Any country which has subscribed to the Agreement of the United Nations Economic Commission for Europe concerning the adopting of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts. Done at Geneva on 20th March, 1958.</p>	<p>II</p> <p> E4*</p> <p>43R-**</p> <p>* This number varies and relates to the country which issued the approval. ** In association with the standard mark a serial number assigned by the issuing country is shown in this position.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>The absence of II or III above or beside the approved standard mark indicates that the glass is not laminated.</li> </ul>
<p>United Kingdom</p>	<p></p> <p>B.S. 857-2 or B.S. 5282 or B.S.AU 178</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>The B.S. must be accompanied by the word laminated or the letter L.WL or WLT. The absence of these will indicate that the glass is not laminated.</li> </ul>

### 3.3. Rear-view Mirrors or Devices

#### 3.3. REAR-VIEW MIRRORS OR DEVICES

##### Method of testing

1. Check the number and position of the mirrors or device(s) which afford the driver a view to the rear.
2. Check the condition of each mirror to see that the reflecting surface is not deteriorated or broken so as to impair the driver's view.
3. Check the security and condition of each mirror or device(s) mounting bracket.
4. Check that the tractor is fitted with an exterior mirror on each side (offside and nearside).

##### Notes

- The test should only be applied to the rear view mirrors fitted externally. There should be one mirror fitted on each side of the tractor.
- Indirect vision devices (cameras) may replace mirrors on some tractors, with the view through to the rear displayed on a screen in the driver's cabin.
- There are two acceptable positions for rear view device(s): an exterior device that provides a view along the offside of the tractor and an exterior device that provides a view along the nearside of the tractor.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence. b. Condition, operation and security. c. Condition of reflecting surface. d. Exteriors mirrors (each side). e. Suitable location / risk of injury. f. Mirror adjustable. g. Field of vision. h. Placement (adequate view to rear).	(a). Mirror or device missing or not fitted (at least two rear-view devices available). (b). Mirror or device inoperative, heavily damaged, loose or insecure. (c). Mirror reflecting surface deteriorated or broken so as to impair the driver's view. (d). Vehicle not fitted with an exterior mirror on each side of the vehicle, except in the case of vehicles not fitted with these mirrors by the manufacturer. (e). Unsuitably placed or so designed that it may cause undue injury in accidents. (f). Mirror not adjustable. (g). Necessary field of vision not covered. (h). Unsuitably placed or not designed to give an adequate view to the rear.	MaD MaD MaD MaD MaD MiD MaD MaD

### 3.4. Windscreen wipers

#### 3.4. WINDSCREEN WIPERS

##### Method of testing

1. Switch on the windscreen wipers and check that the wipers move at an appropriate speed over an arc of the windscreen glass which is sufficient to give the driver an adequate view of the road.
2. Check the condition of any visible components for the operation of the wipers. Check the wiper controls.
3. Check the condition of the wiper arms and blades. Check that the springs are not weak or broken on the wiper arms.
4. Check wiper linkage for wear.

##### Notes

- The above methods of testing only apply to the front windscreen wipers.
- Intermittent wiper speed is not a reason for failure if not operating.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence and condition (wiper arms and blades). b. Effective operation. c. Speed control (normal speed). d. Control operation. e. Linkage condition. f. Effective cleaning.	(a). A wiper arm or blade is missing, worn or defective. (b). Wiper arms and blades are operating such that the wiped area is less than sufficient to give the driver an adequate view. (c). Wipers are not operating at normal speed. (d). Wiper control is not working, defective, insecurely mounted or missing. (e). Wiper linkage is broken, excessively worn or insecure. (f). Not cleaning windscreen effectively.	MaD MaD MiD MaD MaD MaD

### 3.5. Windscreen Washers

#### 3.5. WINDSCREEN WASHERS (WHERE FITTED)

##### Method of testing

1. Switch on the windscreen washers and check for operation and leaks.

##### Notes

- Washers are to be considered as being fitted if there is any part of a washer system fitted.
- The above methods of testing only apply to the front windscreen washers.
- Where a tractor is presented for test and was not originally fitted with windscreen washers it shall not be considered a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Correct operation b. Non operation / leaks	(a). Washers not operating adequately (lack of washing fluid but pump operating or water-jet misaligned). (b). Washers not working or leaking (where fitted).	MiD MaD

# 4. LAMPS, REFLECTORS AND ELECTRICAL EQUIPMENT

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## 4. LAMPS, REFLECTORS AND ELECTRICAL EQUIPMENT

### 4.1. Headlamps

#### 4.1.1. CONDITION & OPERATION

##### Method of testing

1. With the headlamps switched on main and dipped beam in turn, see that they each show as selected a light both of the same colour (white or yellow) of such intensity to illuminate sufficiently the road in front of the tractor.
2. Check the presence, condition, colour and security of the headlamp glass and reflectors.
3. Check for the presence of water / moisture in the headlamp(s).
4. Check that where right hand dipping headlamps are fitted that these are masked/deflected to meet test pass criteria.
5. Check for defective light source(s) (in the case of LED's more than 50% not functioning is a reason for failure).
6. Check that where a High Intensity Discharge (HID) light source is fitted that it is compatible with the headlamp.

##### Notes

- Moisture / condensation in a lamp is not a reason for failure unless it obscures the illuminating surface of the lamp.
- Headlamps should consist of either two or four lamps.
- A HID light source may be recognised by the:
  - light having a bluish tinge and/or taking a few seconds to reach full intensity,
  - headlamp having an igniter module/inverter (ballast) behind the headlamp and/or having "DCR" marked on the lens.
- **Advisory notice applies in the case of LED headlamps where up to 50% are not functioning.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (dipped beams). b. Operation (full beams). c. Operation (main or dipped beams). d. Light intensity. e. Masked lights. f. Presence and condition (glass). g. Presence and condition (reflecting material). h. Presence (headlamp). i. Security (headlamp). j. Water / moisture (headlamp). k. Colour (emitted light). l. Defective light source(s) (working). m. Compatibility (HID bulb and headlamp).	(a). Dipped beams not working simultaneously. (b). Full beams not working simultaneously. (c). Main or dipped beams not working. (d). Light intensity is not acceptable. (e). Right hand dipping headlamps not masked/deflected to meet test pass criteria. (f). Glass badly cracked or missing. (g). Reflecting material damaged/dicoloured or missing. (h). Headlamp missing. (i). A headlamp is insecurely/incorrectly mounted (j). Headlamp contains water/moisture. (k). All lamps not either white or yellow in colour. (l). Single light/light sources; in the case of LED more than 50% not functioning, seriously affected visibility. (m). HID bulb fitted in a non-HID headlamp (HID Light Sources).	MaD MaD MaD MaD MaD MaD MaD MaD MiD MiD MaD MaD

## 4.1.2. ALIGNMENT

**The headlamp aim test must be carried out on the certified level floor area within the test premises.**

### Method of testing

1. Check the tyre pressures and correct them if necessary.
2. Check the alignment of the headlamps by completing the following steps;
  - (a). Align the headlamp aim tester (HAT) perpendicular to the front of the tractor at the recommended distance (as per the HAT manufacturer's specifications).
  - (b). Place the HAT at the centre of the tractor and use the mirrors or laser to align the HAT perpendicular to the tractor by locating two stable common points at opposite sides of the tractor, such as strut mounting points or corners of the bonnet.
  - (c). Rotate the HAT until the fixed points are in line with the guide line.
  - (d). Check if the centre of the headlamp (or the centre of the bulb for headlamps with only one bulb fitted) is greater than or less than 850mm from the ground. The test requirements depend on the distance from the centre of the headlamp to the ground.
  - (e). Switch on dipped headlight and set the headlamp adjuster inside the tractor to its highest setting. Move the HAT in front of each headlamp and take the readings of the gradient % of the highest intensity of the beam image relative to the plane on which the tractor is standing. Send the recorded readings to CoVIS.
3. Check and review the results on CoVIS as the system defaults to 'above 850mm'; if the centre of the headlamps (or the centre of the bulb for headlamps with only one bulb fitted) are less than 850mm from the ground, this option must be selected.

### Notes

- Headlamps fall into three categories as follows:
  - European Type Headlamp - checked on dip beam (see Figure 1 on page for method of test);
  - British-American Type Headlamp - checked on dip beam (see Figure 2 on page for method of test);
  - British-American Type Headlamp - checked on main beam (see Figure 3 on page for method of test).
- Any headlamp levelling device should be in the 'O' position and suspension systems should be set in the normal road position.
- If a tractor is presented with left hand drive headlamps and beam masks, the masks must be installed to ensure they effectively block any light projection above the 0% horizontal reference line. This would then show a pattern similar to a mirror image of Fig. 2 and can be checked as on that guide.

## 4.1.2. ALIGNMENT

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Alignment. b. European type headlamp.  c. British American Type Headlamp (checked on dip beam).  d. Malfunction indicator.	(a). Headlamps are dipping to the right.	MaD
	(b). European type headlamps. <ul style="list-style-type: none"> <li>• For headlamps whose centre is not more than 850mm above the ground the horizontal cut off line does not lie between the -0.5% and -2% horizontal lines.</li> </ul>	MaD
	<ul style="list-style-type: none"> <li>• For headlamps whose centre is more than 850mm above the ground the horizontal cut off line does not lie between the -1.25% and -2.75% horizontal lines.</li> </ul>	MaD
	<ul style="list-style-type: none"> <li>• The junction of the 15 degree cut off and horizontal cut off line does not lie between the 0% and -2% vertical lines.</li> </ul>	MaD
	(c). British American Type Headlamp (checked on dip beam)	MaD
	<ul style="list-style-type: none"> <li>• The upper edge of the hot spot does not lie between the 0% and -2.75% horizontal lines.</li> </ul>	MaD
	<ul style="list-style-type: none"> <li>• The right hand edge of the hot spot does not lie between the 0% and -2% vertical lines.</li> </ul>	MaD
	(d). British American Type Headlamp (checked on main beam) <ul style="list-style-type: none"> <li>• For headlamps whose centre is not more than 850mm above the ground the hot spot centre does not lie between the 0% and -2% horizontal lines.</li> <li>• For headlamps whose centre is more than 850mm above the ground the hot spot centre does not lie between the 0% and - 2.75% horizontal lines.</li> <li>• The centre of the hot spot does not lie between the 0% and -2% vertical lines.</li> </ul>	MaD

Figure 1. European Type Headlamp – checked on Dipped Beam

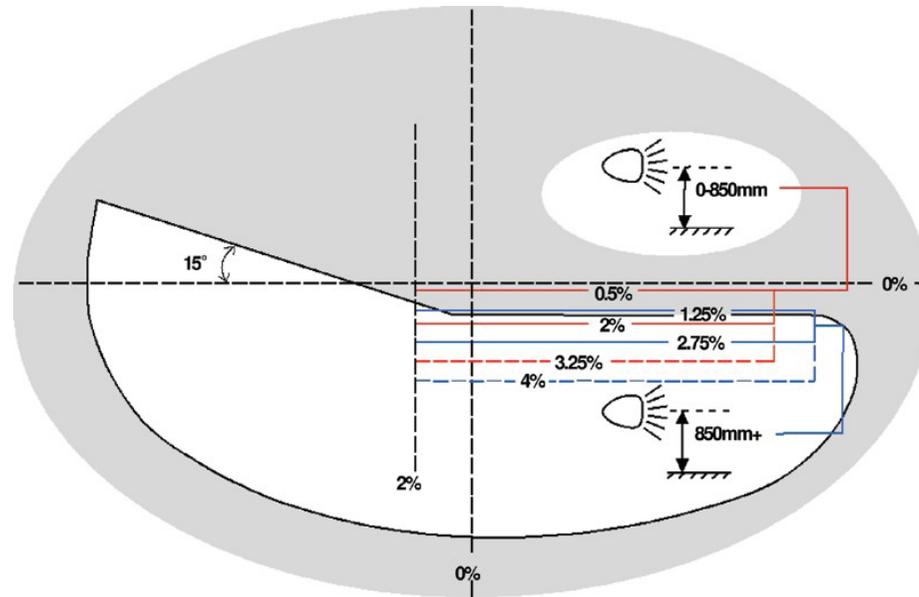


Figure 2. British-American Type Headlamp – checked on Dipped Beam

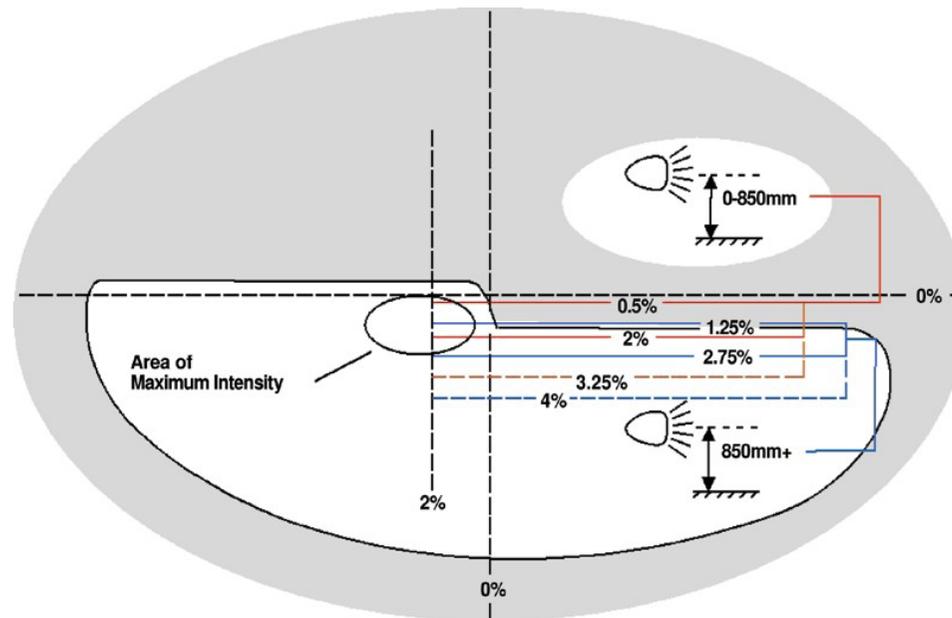
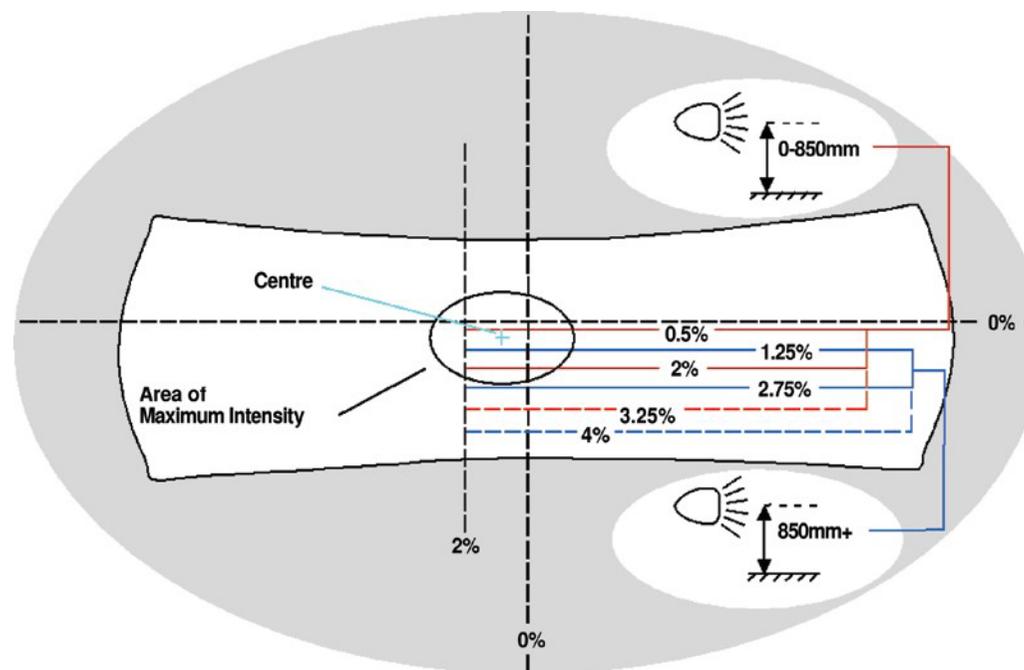


Figure 3. British-American Type Headlamp – checked on Main Beam



### 4.1.3. SWITCHING

#### Method of testing

1. Check the presence, security and operation of the headlamp and dip switch.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (switch). b. Light intensity. c. Operation (device/switch). d. Operation (dip switch). e. Security (switch). f. Malfunction indicator.	(a). Dip or headlamp switch does not operate. (b). Maximum permitted light brightness to the front exceeded (where measured). (c). Function of control device/switch impaired or defective. (d). The dip or headlamp switch defective (e). The dip or headlamp switch is insecurely mounted or missing. (f). System indicates failure via the electronic vehicle interface.	MiD MaD MaD MaD MaD MaD

### 4.1.4. COMPLIANCE WITH REQUIREMENTS

#### Method of testing

1. Check that the tractor is fitted with obligatory headlamps, as follows:
  - a matched pair of main beam headlamps show light of the same emitted colour, position, brightness or marking.
  - a matched pair of dipped-beam headlamp show light of the same emitted colour, position, brightness or marking.
2. Check that there are no products on the lens or light source that reduce light brightness or change the emitted colour.
3. Check that the light source and lamp are compatible with each other.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Consistency (matched pairs). b. Condition (lens / light source). c. Compatibility (light source & lamp).	(a). Lamp of a matched pair does not show a light of the same, emitted colour, position, brightness or marking. (b). Products on lens or light source which obviously reduce light brightness or change emitted colour. (c). Light source and lamp not compatible.	MaD MaD MaD

### 4.1.5. LEVELLING DEVICES

#### Method of testing

1. Check that headlamp levelling devices (where mandatory) are operating correctly and that manual headlamp levelling devices can be operated from the driver's seat.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (levelling). b. Operation (manual levelling). c. Malfunction indicator.	(a). Where mandatory an automatic headlamp levelling device or manual headlamp levelling device not operating. (b). Manual headlamp levelling device cannot be operated from driver's seat. (c). System indicates failure via the electronic vehicle interface.	MaD MaD MaD

### 4.1.6. CLEANING DEVICES

#### Method of testing

1. Check for the presence and correct operation of a headlamp cleaning device where HID dipped beam headlamps are fitted.

#### Notes

- Headlamp cleaning devices are mandatory to be fitted with HID lamps with the exception of retrofitted systems and tractors which were not originally manufactured (type approved) for Europe.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence and operation.	(a). Where a headlamp cleaning device is mandatory (HID), the cleaning device is not present or operating correctly.	MaD

## 4.2. Front and rear position lamps, side marker lamps and daytime running lamps

### 4.2.1. CONDITION & OPERATION

#### Method of testing

The following checks apply to front and rear position lamps, side marker lamps (where fitted), end outline marker lamps (where fitted) and daytime running lamps (where fitted) for use on the road.

1. Check that there are two position lamps (side lamps) showing a white light fitted to the front of the tractor and two position lamps (rear lamps) showing a red light fitted to the rear of the tractor, one on each side of the centre line of the tractor and clearly visible at a reasonable distance when illuminated.
2. Check that no part of the tractor extends laterally more than 406mm beyond the lamp and that they are fitted at the same height and not more than 2100mm from the ground.
3. Check for defective light sources, security of mounting, damage to any lens and for the presence of water/moisture.

#### Notes

- Two front position lamps must be fitted, one on each side and show a steady white light to the front (or yellow if incorporated in a yellow headlamp).
- Two rear position lamps must also be fitted, one on each side, showing a steady red light to the rear.
- When a side lamp is incorporated in a yellow headlamp, effectively producing a yellow side lamp, this is acceptable. In this case, the lamps on both sides of the tractor must be the same colour.
- Moisture in a lamp is not a reason for failure unless it obscures the illuminating surface of the lamp.
- Where there are more than two rear position lamps, each must be in working order.
- For LED matrix lamps fitted, fail for reason 4.2.1 (a) or (k) as appropriate if less than 50% of LEDs are working in any single unit matrix.
- Daytime running lamps are not testable unless they replace the front position lamps. Where this is the case, they should dim when the position lamps are switched on and may extinguish when the headlamps are switched on.
- Where fitted the front and rear end outline marker lamps may be combined into one lamp.
- Repairs to lenses (e.g. lens repair tape etc.) must be assessed on their merits, considering security, colour, light output and durability.
- **Advisory notice applies in the case of an LED or multi-bulb lamp where up to 50% of the LED's or bulbs are not functioning.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation. b. Presence and condition. c. Position and security. d. Security (detachment likely). e. Presence and visibility. f. Dimensions and intensity. g. Symmetrical fitment. h. Water / moisture. i. Intensity (side lamps). j. Colour (side lamps). k. Defective light source(s) (working).	(a). Not working or defective light source. (b). Lens is missing, broken or badly cracked. (c). A lamp is incorrectly positioned or insecurely mounted. (d). A lamp so insecurely mounted that there is a very serious risk of falling off. (e). A lamp is missing or is not clearly visible. (f). Lamps are not of the same dimensions and intensity. (g). Lamps are not fitted symmetrically. (h). Contains water/moisture. (i). For any side lamp the power exceeds 7 watts. (j). Side marker lamp not correct colour. (k). For rear lamps – less than 50% of LED's operating on any lamp unit.	MaD MaD MiD MaD MaD MaD MaD MiD MiD MaD MaD

### 4.2.2. SWITCHING

#### Method of testing

The following checks apply to front and rear position lamps, side marker lamps (where fitted), end outline marker lamps (where fitted) and daytime running lamps (where fitted).

1. Check the presence and security of the switch.
2. Check that the front and rear position lamps and side marker lamps (where fitted) illuminate with a single operation of the switch.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Operation.	(a). For lights other than daytime running lights, switch does not operate correctly.	MaD
b. Correct operation.	(b). Rear position lamps and side marker lamps can be switched off when headlamps are on.	MaD
c. Function (device/switch).	(c). Function of control device/switch impaired or defective.	MaD
d. Presence and security.	(d). Switch insecurely mounted or missing.	MaD

### 4.2.3. COMPLIANCE WITH REQUIREMENTS

#### Method of testing

1. Check that forward facing lamps do not emit a colour other than white and that a rearward facing lamp does not emit a colour other than red.
2. Check for products on lenses or the light source itself that reduce light, brightness or change the emitted colour.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Colour (lamps).	(a). A front lamp(s) showing a colour other than white or a rear lamp(s) showing a colour other than red.	MaD
b. Condition (lens / light source).	(b). Products on lens or light source which reduce light, brightness or change emitted colour.	MiD
c. Colour (front and rear).	(c). Red light to the front or white light to the rear; heavily reduced light brightness.	MaD

## 4.3. Stop lamps

### 4.3.1. CONDITION & OPERATION

#### Method of testing

With the ignition and rear lights switched on and the service brake applied, complete the following checks;

1. Check that the stop lamps are correctly positioned and secure.
2. Check that the lamps are working correctly, are not obscured, emit a steady red light and are not adversely affected by the operation of any other lamp.

#### Notes

- Moisture/ condensation in a lamp is not a reason for failure unless it obscures the illuminating surface of the lamp.
- For the third (high) brake lamp, reason for failure 4.3.1 (k) does not apply.
- Additional stop lamps (other than those fitted by the tractor manufacturer) are not part of the test.
- LED matrix lamps should incur a fail for reason 4.3.1 (j) if less than 50% of LEDs are working in any single unit matrix.
- The precise position of obligatory lamps is not part of the test, but check visually that the lamps are at about the same height and the same distance from each side of the tractor.
- Repairs to lenses (e.g. lens repair tape etc.) must be assessed on their merits, considering security, colour, light output and durability.
- **Advisory notice applies in the case of an LED lamp where up to 50% of the LED's are not functioning.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (all lamps). b. Condition (lens). c. Security. d. Security (detachment likely). e. Presence and visibility. f. Operation. g. Presence and condition. h. Water / moisture. i. Defective light source(s) (working). j. Defective light source(s) (single). k. Dimensions and power. l. Symmetrical fitment.	(a). All stop lamps or light sources not functioning. (b). Slightly defective lens (no influence on emitted light). (c). Any lamp is insecurely mounted. (d). A lamp so insecurely mounted that there is a very serious risk of falling off. (e). Any lamp is missing or not clearly visible. (f). A stop lamp is not working or defective but at least one is still functioning. (g). Any lens missing or broken. (h). Contains water/moisture. (i). Defective light source. (j). Single light sources; in the case of LED less than 50% functioning. (k). Not of the same dimensions and power. (l). Incorrectly positioned, not symmetrically located.	DD MiD MiD MaD MaD MaD MaD MiD MaD MaD MaD

### 4.3.2. SWITCHING

#### Method of testing

1. With the ignition and rear lights switched on and the brake pedal applied, check that the stop lamps illuminate.
2. Check that the stop lamps extinguish without delay once the brake pedal is released.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation. b. Operation (device/switch).	(a). Delay in the operation of stop lamps. (b). Function of control device/switch impaired or defective or missing.	MaD MaD

### 4.3.3. COMPLIANCE WITH REQUIREMENTS

#### Method of testing

With the ignition and rear lights switched on and the brake pedal applied, complete the following checks;

1. Check that the stop lamps are brighter than the rear position lamps when illuminated and are red in colour.
2. Check that both stop lamps are of the same dimensions and light intensity.

#### Notes

- Requirements relating to dimensions and intensity do not apply to the third (high) brake lamp.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Intensity. b. Colour. c. Dimensions and intensity d. Colour (stop lamps).	(a). Any lamp is not brighter than tail lights. (b). Any lamp is not red in colour. (c). All lamps are not of same dimensions and intensity (this does not apply to third (high) brake lamp). (d). White light showing to the rear.	MaD MaD MaD MaD

## 4.4. Direction indicator and hazard warning lamps

### 4.4.1. CONDITION & OPERATION

#### Method of testing

Operate the left and right direction indicators and hazard warning lamps in turn and complete the following checks;

1. Check that each indicator is working correctly, is clearly visible, is in good condition, is the correct colour and is securely mounted.
2. Check that hazard warning lights are working correctly by checking that they operate all the direction indicators simultaneously with the ignition switched both on and off.

#### Notes

- Checking the operation of hazard warning lights alone is not a substitute for checking the operation of directional indicators operation.
- Where “repeater” indicators are fitted these must be working.
- **Advisory notice applies in the case of LED’s where up to 50% of the LED’s are not functioning.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Defective lens (slightly defective). b. Defective lens (heavily defective). c. Security. d. Security (risk of falling off). e. Water / moisture. f. Presence and visibility. g. Operation. h. Presence and condition (lens). i. Defective light source. j. Defective light source (LED source).	(a). Slightly defective lens (no influence on emitted light). (b). Heavily defective lens (emitted light affected). (c). Any indicator lamp is insecurely mounted. (d). An indicator lamp so insecurely mounted that there is a very serious risk of falling off. (e). Contains water or moisture. (f). Any indicator lamp is missing, not fitted symmetrically or is not clearly visible. (g). Any indicator lamp is not working or is faulty. (h). A lens is broken or is missing. (i). Defective light source. (j). Single light sources; in the case of LED less than 50% functioning.	MiD MaD MiD MaD MiD MaD MaD MiD MaD MaD

#### 4.4.2. SWITCHING

##### Method of testing

1. Check the presence, security and operation of the selector switch by operating the left and right direction indicators and hazard warning lamps in turn.

##### Notes

- An indicator switch that does not self-cancel is not a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (switch). b. Presence and condition.	(a). Indicator switch is faulty. (b). Indicator switch not working or missing.	MiD MaD

#### 4.4.3. COMPLIANCE WITH REQUIREMENTS

##### Method of testing

1. Check visually that every direction indicator emits amber light.
2. Check visually that every direction indicator is of the same dimensions and power and are positioned correctly, symmetrically located and securely mounted.

##### Notes

- An indicator lamp may not be amber in colour, this is not a reason for failure provided the emitted light is amber in colour.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Dimensions and intensity. b. Position and security. c. Colour	(a). Not of the same dimensions and power. (b). Incorrectly positioned, not symmetrically located or insecurely mounted (Note that there is no specified lateral clearance for indicators.) (c). Not amber in colour.	MaD MaD MaD

#### 4.4.4. FLASHING FREQUENCY

##### Method of testing

1. Check that the indicators fitted to the tractor flashing constantly between 60 and 120 flashes per minute (flashing type).

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Flashing frequency	(a). Any indicator is not flashing constantly between 60 and 120 flashes per minute (flashing type).	MiD

## 4.4.5. BEACON / FLASHING AMBER LIGHT

### Method of testing

1. Check that a flashing amber beacon / light is present, working correctly and free from defects (e.g. damage to lens).
2. Check that the flashing amber beacon / light is securely fitted to the tractor in a prominent position.

### Note

- It is only a requirement that one flashing amber beacon / light be fitted to and working on the tractor. In cases where the operator has fitted more than one flashing amber beacon / light to the tractor, these should be tested as per above. However tractors shall not be failed if at least one amber beacon / flashing amber light is working.
- Where a flashing amber beacon / light is fitted in such a manner that it is not visible to other road users, then it should be regarded as not present and failed as per reason for failure (a) below.
- **Advisory notice applies where there is a defective lamp (In the case of LED, up to 50% not functioning).**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Presence.	(a). Not fitted	MaD
b. Security.	(b). Insecurely mounted	MaD
c. Security (likely to fall off).	(c). So insecurely mounted that it is liable to fall off	MaD
d. Operation.	(d). Not working or defective	MaD
e. Condition (lens).	(e). Lens missing, broken or badly cracked.	MaD
f. Colour (amber).	(f). Light / Beacon(s) not amber in colour	MaD
g. Defective light source.	(g). Defective light source	MiD
h. Defective light source (LED source)	(h). Single light sources; in the case of LED less than 50% functioning.	MaD

## 4.5. Front and Rear Fog Lamps

### 4.5.1. CONDITION & OPERATION (WHERE FITTED)

#### Method of testing

1. With the rear fog lamp(s) and front fog lamp(s) switched on check that the lamp(s); are securely fitted to the tractor.
2. Check that the fog lamp(s) are working, are not obscured, are in good condition and are not adversely affected by the operation of any other lamp.
3. Check the presence and operation of the rear 'tell-tale'.

#### Notes

- Moisture / condensation in a lamp is not a reason for failure unless it obscures the illuminating surface of the lamp.
- Where a tractor is originally fitted with only one fog lamp (to the centre or offside of the tractor) this is acceptable i.e. it should not be failed for not having two rear fog lamps.
- Where front fog lamps are fitted they must be in working order and be tested as per the applicable methods of testing above.
- Some 'tell-tales' may be in the form of a coloured tag on a switch.
- Repairs to lenses (e.g. lens repair tape etc.) must be assessed on their merits, considering security, colour, light output and durability.
- **Advisory notice applies in the case of LED lamps, where up to 50% of the LED's are not functioning.**

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Condition.	(a). Slightly defective lens (no influence on emitted light).	MiD
b. Condition (light affected).	(b). Heavily defective lens (emitted light affected).	MaD
c. Security.	(c). Fog lamp not securely attached.	MiD
d. Security (detachment likely).	(d). Fog lamp so insecurely mounted that there is a very serious risk of falling off or dazzling oncoming traffic.	MaD
e. Position (front fog lamp).	(e). Front fog lamp is incorrectly positioned.	MaD
f. Presence and visibility (rear fog lamp).	(f). Rear fog lamp missing or not clearly visible.	MaD
g. Condition (rear lens).	(g). Rear fog lamp lens broken or missing.	MaD
h. Water / moisture.	(h). Front or rear fog lamp contains water/moisture.	MiD
i. Indicator (rear fog lamp).	(i). Rear fog lamp indicator not working correctly.	MaD
j. Defective light source (working).	(j). Defective light source.	MiD
k. Defective light source (single).	(k). Single light sources; in the case of LED less than 50% functioning.	MaD

### 4.5.3. SWITCHING

#### Method of testing

With dipped head lamps and the ignition switched on:

1. Check that the front fog lamp(s) (where fitted) can be operated independently of the side lights.
2. Check that the rear fog lamp(s) switch works correctly.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (front lamp). b. Operation (rear lamp).	(a). Front fog lamp switch is defective or does not operate independently of side light. (b). Rear fog lamp switch is not working or defective.	MaD MaD

### 4.5.4. COMPLIANCE WITH REQUIREMENTS

#### Method of testing

With the rear and front fog lamps (where fitted) turned on.

1. Check that:
  - (a). Front fog lamps (where fitted) are white or yellow in colour.
  - (b). Rear fog lamps (where fitted) are red in colour.
  - (c). The lamps are correctly positioned and are of constant intensity.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Colour (front fog lamp). b. Colour (rear fog lamp). c. Position, intensity and markings.	(a). Front fog lamp is not showing white or yellow light. (b). Rear fog lamp not red in colour. (c). Position, brightness or marking incorrect.	MaD MaD MaD

## 4.6. Reversing lamps (where fitted)

### 4.6.1. CONDITION & OPERATION (WHERE FITTED)

#### Method of testing

1. Check the presence, condition and security of the reverse lamp and lens.
2. With the ignition on and reverse gear engaged check that lamp is white in colour when operational.

#### Notes

- Moisture/ condensation in a lamp is not a reason for failure unless it obscures the illuminating surface of the lamp.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition and security (lamp). b. Presence and condition (lens). c. Security (detachment likely). d. Operation. e. Presence and visibility (lamp). f. Water / moisture. g. Colour.	(a). Defective light source/lens or lamp insecurely mounted. (b). Lens broken or missing. (c). Lamp so insecurely mounted that there is a very serious risk of it falling off. (d). Not working or faulty. (e). Lamp missing or not clearly visible. (f). Contains water or moisture. (g). Lamp not white in colour when operational.	MiD MaD MaD MaD MaD MiD MaD

### 4.6.3. SWITCHING

#### Method of testing

1. With the ignition switched on engage and disengage reverse gear in turn to check the operation of the reverse switch.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation. b. Correct operation (gear disengaged).	(a). Reversing lamp can be switched on with gear not in reverse position. (b). Reversing lamp remains illuminated after reversing gear has been disengaged.	MaD MaD

## 4.7. Rear registration plate lamp

### 4.7.1. CONDITION & OPERATION

#### Method of testing

1. With the rear registration lamp(s) illuminated check that the lamp(s); are securely fitted to the tractor, are not obscured and are in good condition.
2. Check that the rear registration lamp(s) are working, do not throw direct white light to the rear, and are not adversely affected by the operation of any other lamp.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (direct white light to the rear). b. Defective light source (working). c. Defective light source (single). d. Presence and security. e. Security (detachment likely).	(a). Lamp showing direct (not reflected) white light to rear. (b). Defective light source. (Multiple light source). (c). Defective light source. (Single light source). (d). Lamp is missing or is not securely attached. (e). Lamp is so insecurely mounted that there is a very serious risk of it falling off.	MiD MiD MaD MiD MaD

### 4.7.2. COMPLIANCE WITH REQUIREMENTS

#### Method of testing

1. With the rear registration lamp(s) illuminated check that the lamp(s) is white in colour when operational.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Colour.	(a). Lamp is not white in colour when operational.	MiD

## 4.8. Retro-reflectors

### 4.8.1. CONDITION

#### Method of testing

##### Rear Reflectors (required on all tractors)

1. Check that two red reflectors are fitted and correctly positioned to the rear of the tractor with one on each side of the centre line of the tractor.
2. Check that the reflector is not more than 762mm (2' 6") from the extreme rear of the tractor.
3. Check that no part of the reflecting area of one reflector is less than 533mm (21") from any part of the reflecting area of the other reflector and that it is at the same height as the reflector on the other side of the tractor.

##### Side Reflectors (if fitted)

4. Check that side reflectors are amber in colour.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition (rear reflector). b. Security (rear reflector). c. Presence (rear reflector). d. Size and appearance (rear reflector). e. Symmetrical fitment (rear reflector).	(a). A rear reflector is so damaged that effectiveness is seriously reduced. (b). A rear reflector is insecurely or incorrectly mounted. (c). One or both rear reflectors are missing. (d). Rear reflectors are not matching in size and appearance. (e). Rear reflectors are not fitted symmetrically.	MaD MiD MaD MaD MiD

### 4.8.2 COMPLIANCE WITH REQUIREMENTS

#### Method of testing

1. Check that a rear reflector is red in colour and that a side reflector (where fitted) is amber in colour.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Colour (rear). b. Colour (side).	(a). A rear reflector is not red in colour. (b). A side reflector is not amber in colour.	MaD MaD

## 4.9 Tell Tales

### 4.9.1. CONDITION AND OPERATION

#### Method of testing

1. Switch on the main beam headlamp and check that the main beam warning light is working correctly.
2. Turn on the direction indicators (left and right) and rear fog lamps in turn, checking that the tell tales for each function correctly.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (indicator). b. Operation (main beam and rear fog warning lights).	(a). Indicator tell-tale is not working or is faulty. (b). Tell-tale not operating for main beam headlamp or rear fog lamp.	MaD MaD

### 4.9.2 COMPLIANCE WITH REQUIREMENTS

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence	(a). Tell-tale is missing	MaD

## 4.10. Electrical Connections between towing tractors and trailers

### 4.10. ELECTRICAL CONNECTIONS BETWEEN TOWING TRACTORS AND TRAILERS / IMPLEMENTS

#### Method of testing

In cases where a towing coupling is fitted to a tractor carry out the following checks:

1. Check electrical sockets for security, damage or deteriorated insulation.
2. Check the outputs from the socket . Using a specialised tool or lighting board, check that the socket is wired to correctly operate the trailer:
  - Position lamps
  - Stop lamps
  - Direction indicators.

#### Notes

- This check applies to both 7 pin (12N) and 13 pin electrical sockets where fitted.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Security. b. Security (detachment likely). c. Condition. d. Condition (failure imminent). e. Operation (electrical connections).	(a). Socket missing or components not securely attached. (b). Socket/components so insecurely mounted that it is likely to fall off. (c). Damaged or deteriorated insulation. (d). Damaged or deteriorated insulation that it's likely to cause a short-circuit fault. (e). Trailer or towing vehicle electrical connections not functioning correctly.	MiD MaD MiD MaD MaD

## 4.11. Electrical wiring

### 4.11. ELECTRICAL WIRING

#### Method of testing

1. Visually check all visible electrical wiring connections and components for condition, security and position.
2. Check for damage to insulation or deterioration to the extent that bare wiring or connectors are exposed.
3. Check the positioning of wires and connections so that they are unlikely to be chafed or damaged by heat or fouled by moving parts.
4. Check for the use of unsuitable wiring/electrical connections e.g. household wiring/bell wiring etc.
5. Check (where possible) that after-market items, with the exceptions of anti-theft systems and light failure indicators, are wired through the ignition switch or a fuse.
6. Check for the presence and condition of the ignition switch.

#### Notes

- This test is limited to the wiring which can be seen without dismantling any panels or components.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition. b. Condition (safety critical). c. Position (control affected). d. Security (electrical wiring). e. Security (connections). f. Fouling. g. After market items. h. Suitability (Connections / wiring). i. Ignition switch.	(a). Wiring/insulation deteriorated. (b). Wiring extremely deteriorated (relevant parts for braking, steering). (c). Wiring is liable to interfere with the driver's control of the vehicle. (d). Dislocated or insecure electrical wiring. (e). Fixings loose, touching sharp edges, connectors likely to be disconnected. (f). Wiring likely to touch hot parts, rotating parts or the ground, connectors disconnected (relevant parts for braking, steering). (g). After-market items with the exceptions of anti-theft systems and light failure indicators not being wired through ignition switch or a fuse. (h). Use of unsuitable wiring/electrical connections, e.g. household wiring/bell wiring etc. (i). Ignition switch is missing or faulty.	MaD DD MaD MaD MaD DD MaD MaD MaD

## 4.12. Non obligatory lamps and retro-reflectors (AUXILIARY LAMPS)

### 4.12. NON OBLIGATORY LAMPS AND RETRO-REFLECTORS (AUXILIARY LAMPS)

#### Method of testing

1. Check that each auxiliary lamp fitted is securely fixed to the tractor.
2. Check that the switching mechanism is functioning correctly and where auxiliary lamps are set in the head lamp main beam position, they are extinguished when the headlamp dipped beams are brought into operation.
3. Check that any auxiliary lamp fitted is showing white or yellow light to the front and red light to the rear.

#### Notes

- Where auxiliary lamps are found to be inoperative, this should not be considered a reason for failure.
- For the purposes of this manual auxiliary lamps would include work lamps or plough lamps.
- Where rear auxiliary lamps are fitted, which operate independently of side lights, and are designed to be used as work / plough lamps off the road, reason for failure 4.12 (f) below does not apply.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Position. b. Security. c. Security (detachment likely). d. Operation (independent of side light). e. Colour. f. Colour (white light to the rear). g. Operation (with main beam). h. Intensity.	(a). An auxiliary lamp is incorrectly positioned (b). An auxiliary lamp is insecurely mounted. (c). An auxiliary lamp is so insecurely mounted that there is a very serious risk of falling off. (d). An auxiliary lamp switch is defective or does not operate independently of side light. (e). An auxiliary lamp is not showing white or yellow light to the front. (f). An auxiliary lamp is showing white light to the rear. (g). An auxiliary lamp is set in main beam position and does not extinguish when dipped beams are brought into operation. (h). Number of headlights simultaneously operating exceeding permitted light brightness (where measured).	MaD MiD MaD MaD MaD MaD MaD

## 4.13. Battery(ies)

### 4.13. BATTERY(IES)

#### Method of testing

1. Check the condition and security of the battery and carrier and check for security and leaks.
2. Check for risks of short circuiting with other components.
3. Check that where switches and or fuses are present that these are in good condition.

#### Notes

- If the battery is only held in place by the cables and by a lip on the carrier this cannot be considered to be secure.
- Where it is not possible to inspect batteries for condition and leaks every effort should be made to inspect the area where the batteries are installed to confirm there are no signs of leakage.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Security. b. Risk of short circuiting. c. Leaks. d. Condition (switch). e. Condition (fuses). f. Ventilation (if required).	(a). Battery mounting insecure or not properly attached. (b). Risk of battery short-circuiting with other components. (c). Leakages of hazardous substances from battery are evident. (d). Switch (if required) defective. (e). Fuses (if required) defective. (f). Inappropriate (if required) ventilation.	MiD MaD MaD MaD MaD MaD

# 5. AXLES, WHEELS, TYRES AND SUSPENSION

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## 5. AXLES, WHEELS, TYRES AND SUSPENSION

### 5.1. Axles

#### 5.1.1. AXLES

##### Method of testing

Carry out the following checks on each axle. Wheel play detectors must be used with the brakes applied, operate the plates and observe axle(s) attachment points.

1. Check axle beams for damage, distortion or excessive corrosion.
2. Check condition of mounting bushings/joints and attachments for security.
3. Examine if there has been any repair or modification carried out. An unsafe repair or modification carried out may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Axle for cracks or deformation. b. Axle security. c. Axle security. d. Axle positioning. e. Modifications. f. Modifications. g. Axle mounting for wear and security.	(a). Axle fractured or deformed. (b). Axle fixing to vehicle insecure. (c). Axle stability impaired, functionality affected: Extensive movement relative to its fixtures. (d). Axle is obviously out of line. (e). Unsafe modification. (f). Unsafe modification that stability is impaired, functionality affected, insufficient clearance to other vehicle parts or to the ground. (g). Mounting bushes, bearing or bearing carrier, shafts, ball joints, obviously loose, worn or insecure.	DD MaD DD MaD MaD DD MaD

### 5.1.2. STUB AXLES

#### Method of testing

**With steered wheels off the ground (using the tractor manufacturer's recommended jacking points):**

1. Check for excessive wear between the axle beam and the stub axle/kingpin whilst each wheel in turn is rocked with a bar, (approximately one metre long) one end inserted in the wheel disc and the other end lifted.
2. Check for excessive upward movement of the stub axle, whilst each wheel in turn is lifted with a bar placed underneath it. If play is noted it should be measured with wheels on the ground.
3. Examine visible parts of the stub axle for condition and security.

#### Notes

- In the absence of manufacturer's wear tolerance kingpin(s) should be considered excessively worn where there is 5mm (or greater) play on 20" wheel rim, others pro-rata.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Stub axles for cracks or deformation.</li> <li>b. Swivel pin and/or bushes/bearings for wear.</li> <li>c. Security of stub axle components.</li> <li>d. Lift between stub axle and axle beam.</li> <li>e. Lift between stub axle and axle beam (stability impaired).</li> <li>f. N/A.</li> <li>g. Stub axle pin security.</li> <li>h. Retaining device for presence, wear and fractures.</li> <li>i. Kingpin / Bushes / Bearings for wear.</li> </ul>	<ul style="list-style-type: none"> <li>(a). Stub axle fractured/damaged or bent.</li> <li>(b). Excessive wear in the swivel pin and/or bushes/bearings.</li> <li>(c). A component is insecure - Likelihood of loosening; directional stability impaired</li> <li>(d). Excessive lift between stub axle and axle beam.</li> <li>(e). Excessive lift between stub axle and axle beam that directional stability is impaired.</li> <li>(f). N/A.</li> <li>(g). Stub axle pin so loose in axle that directional stability is impaired</li> <li>(h). Retaining or locking device absent, insecure, worn or broken</li> <li>(i). i. Kingpin / Bushes / Bearings: excessively worn – 5mm play (3/16") at wheel rim on 20" wheel, others pro-rata.</li> </ul>	<ul style="list-style-type: none"> <li>DD</li> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>DD</li> <li></li> <li>DD</li> <li>MaD</li> <li>MaD</li> </ul>

### 5.1.3. WHEEL BEARINGS

#### Method of testing

**With wheels off the ground (using the tractor manufacturer's recommended jacking points):**

1. Check the steered wheels. Raise the axle(s) of the wheels being examined so that they clear the ground and note the movement of the wheel relative to the axle or stub axle in order to assess the play in the wheel bearings, whilst each wheel in turn is rocked with a bar.
2. Spin each wheel rapidly and listen for any roughness or harshness in the bearings, if a distinctive rumble or growl is heard that indicates the bearing is damaged this should be considered a reason for failure.

#### Notes

- It may be necessary where a tractor is fitted with ABS/EBS that the wheel bearings should not be checked while the ignition switch is turned on as this can affect the ABS/EBS warning light.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Wheel bearing(s) for play. b. Wheel bearing(s) for play. c. Wheel bearing(s) condition. d. Wheel bearing(s) condition.	(a). Excessive play in a wheel bearing. (b). Excessive play in a wheel bearing that directional stability is impaired. (c). Wheel bearing is so tight that there is a danger of overheating or seizing. (d). Bearing(s) or hub are worn or damaged.	MaD DD DD MaD

## 5.2. Wheels and Tyres

### 5.2.1. ROAD WHEEL HUB

(This inspection applies to all road wheels and hubs).

#### Method of testing

1. Check that the hub is not worn or damaged and that the hub spigot make sufficient contact with the wheel rim.
2. Check where twin wheels are fitted that the spigots extend to the outer wheel.
3. Check for the presence, security and condition of wheel nuts/studs and for elongated holes.

#### Notes

- It is not always possible to see the complete road wheels on a tractor from ground level, especially where the mudguards shrouds part of the wheels. In such cases the tractor should be moved to expose the hidden parts of wheels or the examination should be completed from a position under the tractor.
- Some wheel nut studs do not protrude all the way through the wheel nut this is acceptable provided there is no sign of insecurity.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Studs or nuts for presence and security. b. Studs and nuts condition. c. Stud hole for elongation. d. Studs or nuts for damage. e. Stud or nut fitment. f. Studs or nuts compatibility. g. Hub for damage and wear. h. Hub damage and wear. i. Hub spigot contact with wheel rim.	(a). Any wheel nuts or studs missing or loose. (b). Any stud or nut is in such a condition that there is an obvious danger that the wheel(s) will come loose. (c). Any stud hole is elongated or damaged. (d). Any studs or nuts are damaged or threads stripped or crossed. (e). Any wheel nut is incorrectly fitted. (f). An incorrect wheel nut is fitted. (g). Hub worn or damaged. (h). Hub worn or damaged in such a way that secure fixing of wheels is affected. (i). Hub Spigot does not make sufficient contact with wheel rim.	MaD DD MaD MaD MaD MaD MaD DD MaD

## 5.2. Wheels and Tyres

### 5.2.2. WHEELS

#### Method of testing

1. Check each part of the road wheel, paying particular attention to whether there is any: fractures, distortion, wear, defective weld/repairs or incompatibility.
2. Check the condition and security of tyre retaining rings.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Cracks, fractures and defective weld/repair.</li> <li>b. Distortion.</li> <li>c. Distortion (fixing affected).</li> <li>d. Fitment/compatibility.</li> <li>e. Damage.</li> <li>f. The nominal size of the wheel to another on the same axle.</li> <li>g. Spoke / disc damage.</li> </ul>	<ul style="list-style-type: none"> <li>(a). Any crack, fractures or defective weld present in a wheel.</li> <li>(b). Wheel badly distorted (more than 13mm (1/2") askew or buckled) on a 20" wheel rim (others pro rata).</li> <li>(c). Wheel so badly distorted that secure fixing to hub is affected or the secure fixing of the tyre is affected.</li> <li>(d). A wheel is incorrectly fitted - wheel size, technical design, compatibility or type not in accordance with the requirements and affecting road safety.</li> <li>(e). A wheel is damaged such that tyre damage or seal damage can occur.</li> <li>(f). Different size wheels are fitted on the same axle.</li> <li>(g). Any spoke or other wheel component is in such a condition that there is a danger of failure.</li> </ul>	<ul style="list-style-type: none"> <li>DD</li> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> </ul>

## 5.2. Wheels and Tyres

### 5.2.3. TYRES

(This inspection applies to all tyres fitted to the tractor).

#### Tyre Condition

##### Method of testing

##### Check each tyre fitted to the tractor:

1. Check visually each tyre is not seriously underinflated and that it is correctly seated on the rim.
2. Check tyres on twin wheels for wall contact. Side wall contact is unacceptable if caused by under-inflation, incorrect wheel or tyre fitment.
3. Check each tyre for perished rubber, cracks or breaks in the fabric, any lumps or bulges, any exposure of the ply or cord structure. A tyre that has any cut greater than 25 mm in length or 10% of section width, deep enough to reach the ply or cords is a reason for failure.
4. Check each valve stem for damage, distortion or chafing.
5. Check for any inappropriate tyre repairs.
6. Check each tyre for fouling on any part of the tractor or protruding beyond bodywork.

##### Notes

- It will not always be possible to see the complete tyre from ground level, especially on twin wheels and on tractors where the mudguards shrouds part of the tyres. In such cases the vehicle should be moved to expose the hidden parts of wheels or the examination should be completed from a position under the tractor. Any tyre or wheel examination must be performed with the tractor raised to ensure that all parts of the wheel and tyre can be examined thoroughly.
- The fitment of a plug to the side wall of a tyre is considered an inappropriate repair.
- Vulcanised repairs to tyre side walls shall meet the relevant British Standard, BS AU 159 or equivalent.
- For method of testing 6, provided that at least 75% of the tyre is covered by the mudguard (i.e. bodywork), this is not a reason for failure. Method of testing 6 shall not apply to front tyres or in the case of twin wheel fitments.
- **An advisory notice applies where the tyre(s) fitted is older than six years.**

## 5.2. Wheels and Tyres

### 5.2.3. TYRES

#### Tyre Specification

##### Method of testing

1. Check each tyre to ensure that its speed rating is appropriate for the maximum legal speed permitted for the tractor (see figure 1 below).
2. Check each tyre to ensure that the tyre load index rating for a single fitment tyre is not less than 50% (or for a twin fitment tyre is not less than 25%) of the design axle weight\*.
3. Check all the tyres fitted and note the type of structure (radial or cross-ply) and the nominal size of tyres.
4. Check all tyres on the same axle are of the same structure and nominal size.
5. Check that each tyre fitted to the tractor has an E-mark or e-mark.
6. Check that any tyre is not incorrectly matched with the wheel.
7. Check each tyre to ensure that the tyre use marking is appropriate for the type of axle or tractor to which it is fitted. For example tyres marked “TRAILER USE ONLY” or “NOT FOR HIGHWAY USE” should not be fitted.
8. Check in the case of a tyre which has been retreaded that it bears the marking ‘Retread’ on its sidewall and is additionally marked with “106 R” or “109” in the vicinity of the E-mark.

##### Notes

- \*The tractor design gross vehicle weight should not exceed the total of the total tyre load capacities (sum of front and rear capacities).

### 5.2.3. TYRES

#### Tyre Tread

##### Method of testing

1. Check all tyres with a tyre tread depth gauge, that the central three-quarters of the tread pattern has a depth of not less than 1.6 millimetres around the full circumference of the tyre. It will be necessary to move the tractor to ensure the full circumference of each tyre is checked.

##### Notes

- The tread pattern means the combination of plain surfaces and groves extending across the breadth of the tread but excludes any tread wear indicators. Where the pattern is interrupted by tread wear indicators but has at least 1.6 mm overall tread depth the tyre concerned should not be failed for inadequate tread-depth.
- **An advisory notice applies where tyre tread depth is less than 3 mm (but more than 1.6 mm).**

## 5.2.3. TYRES

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Load capacity</li> <li>b. The nominal size of the tyre to another on the same axle.</li> <li>c. Speed rating.</li> <li>d. Fouling and protrusion.</li> <li>e. Wall contact.</li> <li>f. Compatibility.</li> <li>g. Directional and asymmetric.</li> <li>h. Tyre marking.</li> <li>i. Cut(s) and damage.</li> <li>j. Exposed ply or cords.</li> <li>k. Rubber condition.</li> <li>l. Tread depth.</li> <li>m. Fouling on any part of the vehicle.</li> <li>n. Fouling on any part of the vehicle.</li> <li>o. N/A.</li> <li>p. Re-grooving (cord protection layer).</li> <li>q. Inflation.</li> <li>r. Correct seating.</li> </ul>	<ul style="list-style-type: none"> <li>(a). Insufficient load capacity.</li> <li>(b). Tyres fitted to the same axle are not of the same size or aspect ratio</li> <li>(c). Speed rating of tyres cannot be determined on inspection or is insufficient for maximum legal speed limit.</li> <li>(d). Tyre protrudes beyond bodywork or touches other fixed vehicle parts impairing safe driving (see note).</li> <li>(e). Evidence of wall contact on twin wheel fitment.</li> <li>(f). Tyre is not fit for purpose.</li> <li>(g). Any tyre fitted in the incorrect direction (directional tyres) or wrong side out (asymmetrical tyres).</li> <li>(h). An E or e mark is not visible on the tyre.</li> <li>(i). Any serious damage to the tyre or a cut in tyre that is longer than 25mm or 10% of section width (whichever is the shorter).</li> <li>(j). If tyre is damaged that cord is visible or damaged.</li> <li>(k). Rubber badly cracked or “perished”.</li> <li>(l). Tyre tread depth is less than 1.6mm in the centre three-quarters of the tread pattern.</li> <li>(m). Tyre rubbing against other components (flexible anti spray devices).</li> <li>(n). Tyre rubbing against other components (safe driving not impaired)</li> <li>(o). N/A</li> <li>(p). Tyre is re grooved so that cord protection layer is affected.</li> <li>(q). Tyre(s) obviously underinflated or cannot be inflated.</li> <li>(r). A tyre is incorrectly seated on wheel rim.</li> </ul>	<ul style="list-style-type: none"> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>DD</li> <li>MiD</li> <li>MaD</li> <li>DD</li> <li>MiD</li> <li>MaD</li> </ul>

### 5.2.3. TYRES

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> s. Lumps, bulges or tears.	(s). The ply or cord structure is ruptured or exposed, tread is lifting, a lump or bulge has been caused by separation of rubber from cords or weakness in cord structure, or tread distorted or damaged.	DD
t. Valve stem damage.	(t). Obvious damage or distortion of a valve stem is present.	MaD
u. Valve stem chafing.	(u). A valve stem is chafing against valve hole.	MaD
v. Unacceptable repairs.	(v). The sidewall of a tyre has been repaired with the use of a plug.	MaD
w. Compatibility.	(w). Are incorrectly matched with the wheels.	MaD
x. The structure on a steerable axle is of the same structure as any other tyre on any steerable axle.	(x). A tyre on a steerable axle which is not of the same structure as any other tyre on any steerable axle.	MaD
y. N/A.	(y). N/A	
z. Load index rating.	(z). Tyre load index rating for a single tyre is less than 50% of the design axle weight	MaD
aa. Tyre use marking.	(aa). Tyre use marking is not appropriate for the type of axle or vehicle to which it is fitted.	MaD
bb. "Re-tread" marking.	(bb). A tyre which has been retreaded but which does not bear the word 'Retread' on its sidewall "ψ".	MaD
cc. "Re-tread" marking.	(cc). A tyre which has been retreaded but which is not marked accordingly (This marking will be located in close to the location of the E-mark).	MaD
dd. Condition.	(dd). Any tyre having a "flat spot" where the tread is worn through to the fabric.	DD

Figure 1 Tyre Speed Rating

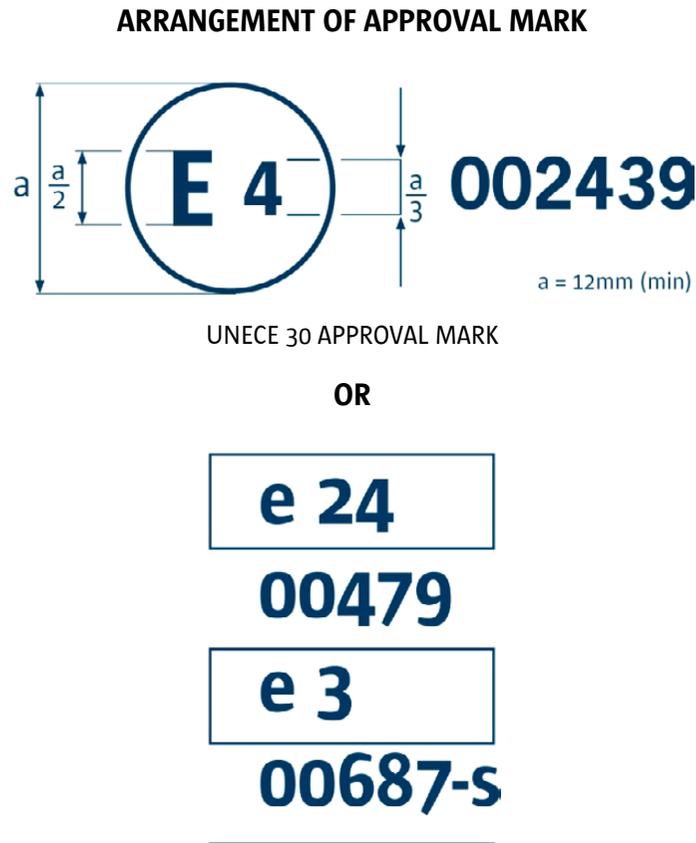
CODE	KM/H	CODE	KM/H
<b>A1</b>	5	<b>L</b>	120
<b>A2</b>	10	<b>M</b>	130
<b>A3</b>	15	<b>N</b>	140
<b>A4</b>	20	<b>P</b>	150
<b>A5</b>	25	<b>Q</b>	160
<b>A6</b>	30	<b>R</b>	170
<b>A7</b>	35	<b>S</b>	180
<b>A8</b>	40	<b>T</b>	190
<b>B</b>	50	<b>U</b>	200
<b>C</b>	60	<b>H</b>	210
<b>D</b>	65	<b>V</b>	240
<b>E</b>	70	<b>Z</b>	over 240
<b>F</b>	80	<b>W</b>	270
<b>G</b>	90	<b>(W)</b>	over 270
<b>J</b>	100	<b>Y</b>	300
<b>K</b>	110	<b>(Y)</b>	over 300

The speed rating of a tyre indicated by speed symbol which is made up of a single letter or an A with one number. It indicates the maximum speed at which the tyre can carry a load corresponding to its Load Index.

## 5.2 Wheels and Tyres

### E-mark

All tyres sold for road use in the EU after July 1997 must carry an e/E-mark. The mark itself is either an upper case “E” or lower case “e” - followed by a number in a circle or rectangle, followed by a further number. An (upper case) “E” indicates that the tyre is certified to comply with the dimensional, performance and marking requirements of ECE Regulation 106 (retreaded tyres for (power-driven vehicles in category T). A (lower case) “e” indicates that the tyre is certified to comply with the dimensional, performance and marking requirements of Directive 92/23/EEC. The number in the circle or rectangle denotes the country code of the government that granted the type approval. The last number outside the circle or rectangle is the number of the type approval certificate issued for that particular tyre size and type.

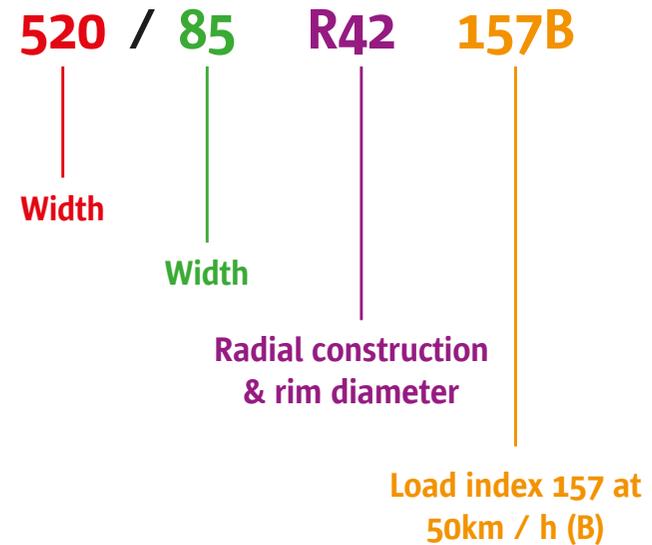


The maximum permissible axle Load for normal use can be found in the tyre load data tables made available by the

RSA. The Load Index (LI) may consist of one or two numbers e.g. 154 or 146/143. Where two numbers are displayed the first refers to the use of the tyre in single formation and the second in twin formation. Reference to the table shows that the maximum loads for this tyre are 6000kg in single formation and 10900kg in twin formation.

The additional load-speed index may also be used when making this determination. (Refer to Table 1).

### Tyre-Sidewall Markings



**TYRE LOAD DATA TABLES**

LOAD INDEX	MASS (KG)
60	250
61	257
62	265
63	272
64	280
65	290
66	300
67	307
68	315
69	325
70	335
71	345
72	355
73	365
74	375
75	387
76	400
77	412
78	425
79	437
80	450
81	462
82	475
83	487
84	500
85	515
86	530
87	545
88	560

LOAD INDEX	MASS (KG)
89	580
90	600
91	615
92	630
93	650
94	670
95	690
96	710
97	730
98	750
99	775
100	800
101	825
102	850
103	875
104	900
105	925
106	950
107	975
108	1 000
109	1 030
110	1 060
111	1 090
112	1 120
113	1 150
114	1 180
115	1 215
116	1 250
117	1 285

LOAD INDEX	MASS (KG)
118	1 320
119	1 360
120	1 400
121	1 450
122	1 500
123	1 550
124	1 600
125	1 650
126	1 700
127	1 750
128	1 800
129	1 850
130	1 900
131	1 950
132	2 000
133	2 060
134	2 120
135	2 180
136	2 240
137	2 300
138	2 360
139	2 430
140	2 500
141	2 575
142	2 650
143	2 725
144	2 800
145	2 900
146	3 000

LOAD INDEX	MASS (KG)
147	3 075
148	3 150
149	3 250
150	3 350
151	3 450
152	3 550
153	3 650
154	3 750
155	3 875
156	4 000
157	4 125
158	4 250
159	4 375
160	4 500
161	4 625
162	4 750
163	4 875
164	5 000
165	5 150
166	5 300
167	5 450
168	5 600
169	5 800
170	6 000
171	6 150
172	6 300
173	6 500
174	6 700
175	6 900

LOAD INDEX	MASS (KG)
176	7 100
177	7 300
178	7 500
179	7 750
180	8 000
181	8 250
182	8 500
183	8 750
184	9 000
185	9 250
186	9 500
187	9 750
188	10 000
189	10 300
190	10 600
191	10 900
192	11 200
193	11 500
194	11 800
195	12 150
196	12 500
197	12 850
198	13 200
199	13 600
200	14 000

The load index is a numerical code associated with the maximum load a tyre can carry at the speed indicated by its speed symbol. The following load data table is extracted from UNECE Regulation 54.

## 5.3. Suspension System

### 5.3.1. SPRING (COIL/LEAF), STABILISER AND TORSION BAR

#### Method of testing

1. Position the tractor over the pit with its front wheels aligned over the wheel play detector plates with the brakes applied, operate the plates and observe suspension/ spring attachment points. Check spring (coil/leaf), stabiliser and torsion bar for presence, condition, security, any unsafe repair or modification. Check for the presence and condition of bump stops.

#### Leaf springs

2. Examine each spring for its general condition and in particular for fractures in the leaves, especially in the vicinity of the anchor eye of the main leaf.
3. Note whether any spring is so weak that is not holding the body sufficiently far away from the wheels.
4. Examine condition of spring eyes/bushes.
5. Examine spring clamps to see that none is missing or insecure, thus allowing leaves to splay.
6. Check that the springs on each axle are symmetrically located.
7. Check that there is no movement of spring leaves denoting a fractured centre bolt.
8. Check that the attachments of the shackle/anchor brackets to the chassis are secure, looking for signs of movement of rivets or bolts, and elongated holes.
9. Examine the bolts and/or nuts securing the spring to the axle for tightness, and examine the spring and axle for evidence that these have been moving relative to each other.

#### Coil Springs

10. Examine each spring for its general condition and in particular that it is not broken, fractured or cut.
11. Note whether any spring is so weak that it is not holding the body sufficiently far away from the wheels.
12. Examine the attachment of the coil springs for security.

## 5.3. Suspension System

### 5.3.1. SPRING (COIL/LEAF), STABILISER AND TORSION BAR

#### Method of testing

##### Torsion Bars

13. Check torsion bars for fracture or damage.
14. Examine the attachment of the torsion bars.

##### Spring Pins and Bushes

15. Examine the amount of play due to wear at spring anchor brackets and pins of the spring shackles.
16. Examine the condition and security of any slipper brackets.
17. Check that the anchor/shackle pins are fully in place, that they are secure and that the locking devices are in position and secure.
18. Examine the spring mountings for excessive side play.

#### Notes

- A bush and/or pin would be considered excessively worn if wear exceeded 2mm for 13mm diameter pins, 3mm for 25mm diameter pins and 1/8th of diameter for pins over 25mm diameter.
- For side play in spring mountings 6mm is to be considered excessive for normal suspension although this does not apply to single spring bogie suspensions. Caution should be exercised in the case of springs and suspensions with rubber/compliant mountings where the amount of free movement in new components might well exceed the above limit. In such cases the manufacturer's tolerances should be sought. Observation of the tractor attitude when stationary can often reveal the effect of exhausted or broken springs, e.g. tractor "sitting down" at front.
- A suspension bump stop should not be confused with rubber/synthetic suspension spring assistors.
- Front, side and rear observation of the tractor when stationary can often reveal the effect of exhausted or broken springs.
- An unsafe repair or modification carried out to the spring (coil/leaf)/torsion bar may require a modifications report to be presented.

## 5.3. Suspension System

### 5.3.1. SPRING (COIL/LEAF), STABILISER AND TORSION BAR

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Security (spring mounting).	(a). Spring mounting is obviously loose.	MaD
b. Excessive movement.	(b). Relative movement visible fixings very seriously loose.	DD
c. Condition & wear (spring).	(c). A damaged, cracked, fractured, worn or exhausted spring component.	MaD
d. Condition (road safety affected).	(d). Main spring (leaf), or additional leafs very seriously affected.	DD
e. Presence (spring(s)).	(e). Spring missing.	DD
f. Repairs/Modifications.	(f). Any obviously unsafe modification or repair.	MaD
g. Clearance.	(g). Insufficient clearance to other vehicle parts; spring system inoperative.	DD
h. Correct fitment (spring).	(h). Spring (coil/leaf) or torsion bar fitted incorrectly.	MaD
i. Condition / repairs.	(i). Any Leaf spring is broken or repaired by welding.	MaD
j. Presence & security (U-bolt).	(j). A U-bolt is loose or missing.	MaD
k. Condition (coil spring / torsion bar).	(k). A coil spring or torsion bar is broken/cut.	MaD
l. N/A	(l). N/A	
m. Presence & security (locking device).	(m). A locking device is missing or insecurely fitted.	MaD
n. Condition (spring eye-bolts/shackle pins).	(n). Spring eye-bolts/shackle pins are worn, incorrectly positioned, are of an incorrect type or are missing.	MaD
o. Security (spring eye-bolts/shackle pins).	(o). A spring eye-bolt/shackle pin is obviously loose in its bush.	MaD
p. Presence & condition (bushings or slipper pads).	(p). Spring or shackle bushes or slipper pads: are worn, missing, perished or cracked.	MaD
q. Presence & condition (centre bolt).	(q). A spring centre bolt missing, damaged or broken.	MaD
r. Presence & condition (bump stop).	(r). A bump stop missing or ineffective.	MaD
s. Presence & condition (spring clamp).	(s). Spring clamp loose or missing.	MaD
t. Condition (leaf type spring).	(t). Spring (leaf type) contains leaves that are non-standard.	MaD
u. Presence & security (spring / torsion bar).	(u). Spring / torsion bar mounting bolts / rivets missing or loose.	MaD
v. Presence & security (slipper brackets).	(v). Slipper bracket / pin missing, damaged or insecure.	MaD

## 5.3. Suspension System

### 5.3.2. SHOCK ABSORBER(S) (WHERE FITTED)

#### Method of testing

1. Check each shock absorber and mounting bracket to see that they are correctly connected and in good condition.
2. Check for damage or excessive corrosion of any suspension strut mounting, wear in the shaft and the condition of the bonding between the metal and flexible material in the strut support bearing.
3. Check the condition of any pivots.
4. Check each shock absorber for damage, corrosion and security of attachment.
5. Check each shock absorber for fluid leaks.

#### Notes

- A slight oil film on the piston rod of a shock absorber is not a reason for failure. Whereas an oil film that runs down the shock absorber indicates a leak and is a reason for failure.
- Damage or corrosion to the outer sleeve of a shock absorber is not a reason for failure unless detachment is imminent. Surface corrosion on a shock absorber casing is not a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Presence & condition (shock mounting). b. Condition (shock absorber). c. Presence & condition (shock absorber).	(a). A shock mounting bracket or bush is missing, loose, worn or damaged. (b). Shock absorber loose or not working. (c). A shock absorber is missing or damaged, showing signs of obvious leakage.	MaD MaD MaD

## 5.3.3. TORQUE TUBES, RADIUS ARMS, WISHBONES AND SUSPENSION ARMS & 5.3.4. SUSPENSION JOINTS

(This inspection applies to front and rear suspensions)

### Method of testing

1. Position the tractor over the pit with each axle in turn aligned over the wheel play detector plates and with the brakes applied, operate the plates and observe suspension/ spring attachment points where they are secured to the chassis or to the point where they are secured to their fixings. Certain tractors will have to be jacked slightly in order to examine the suspension properly.
2. With each steered axle raised in turn carry out the following checks whichever are relevant to the suspension type fitted by using a suitable bar under each wheel in turn and levering upwards and observe relative vertical movement between components.
3. When jacking tractors with front suspension types that have the torsion bar or spring force acting on the lower suspension arm, they must be jacked under the lower suspension arm so that the suspension spring force is removed from the ball joints. Beam axles should be jacked under the beam.
4. All other suspension types must be jacked so the suspension hangs freely.

### For all suspension types (front and rear)

5. Check the condition of wishbones and their inner bearings, ball joints, rubber gaiters, swivel joints, retaining devices, track control arms, anti-roll bars, radius rods and their mounting bushes or washers, leading arms and swinging arms for damage or distortion.
6. Check the condition of the chassis frame and body shell structure in the vicinity of suspension mounting points and suspension sub frame mounting points for fractures, excessive corrosion or distortion.
7. Check if there has been any repair or modification carried out to the suspension. An unsafe repair or modification carried out to the suspension system may require a modifications report to be presented as per the template in this manual.

### Notes

- The main criteria to be used when selecting the appropriate reason for failure are; where the component has reached the stage where it is obviously likely to affect adversely the roadworthiness of the tractor (dangerous) or where the condition of the component has clearly reached the stage at which replacement, repair or adjustment is necessary (major).

## 5.3.3. TORQUE TUBES, RADIUS ARMS, WISHBONES AND SUSPENSION ARMS

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Condition & security (wishbones, swinging arm, track control arm and suspension strut).	(a) I. Wishbones, swinging arm, track control arm, suspension strut: attachment of component to chassis or axle is insecure or worn.	MaD
	(a) II. Wishbones, swinging arm, track control arm, suspension strut: attachment of component so insecure that directional stability of the vehicle is impaired.	DD
	(a) III. Wishbones, swinging arm, track control arm, suspension strut: a component or mounting is cracked, corroded, damaged or deformed.	MaD
b. Condition & security (anti-roll bar, torque arm/rod and radius rod/link).	(b) I. Anti-roll bar, torque arm/rod, radius rod/link: a component is missing or broken.	MaD
	(b) II. Anti-roll bar, torque arm/rod, radius rod/link: a mounting is loose or worn.	MaD
	(b) III. Anti-roll bar, torque arm/rod, radius rod/link: a component is cracked, damaged or deformed.	MaD
c. Condition & security (suspension mounting area).	(c). Suspension mounting area deformed or corroded to such an extent that the security or alignment of the suspension component is affected.	DD
d. Suspension geometry.	(d). Geometry obviously incorrect.	MaD
e. Repairs/modifications.	(e). Any obviously unsafe repair or modification to the suspension system.	MaD
f. Clearance.	(f). Insufficient clearance to other vehicle parts; system inoperative.	DD

## 5.3.4. SUSPENSION JOINTS

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b> a. Condition & security (swivel pin and/or bushes).	(a). Excessive wear in swivel pin and/or bushes or at suspension joints or a component is insecure or worn.	MaD
b. Excessive wear (stability affected).	(b). A component is so excessively worn or loose that directional stability of the vehicle is impaired.	DD
c. Presence & condition (retaining/locking device).	(c). Retaining or locking devices missing, insecure, worn or broken.	MaD
d. Presence & condition (dust covers/gaiters).	(d). Dust covers/gaiter split, damaged/ displaced, missing or severely deteriorated.	MaD
e. Play.	(e). Play exceeds manufacturer's specified tolerance.	MaD

### 5.3.5. AIR SUSPENSION (HYDROLASTIC, HYDROGAS, HYDRO PNEUMATIC SUSPENSION & BONDED SUSPENSION UNITS)

(This inspection applies to front and rear suspensions)

#### Method of testing

##### Air Suspension

1. Check for any leaks; check the condition of the supply lines and suspension bellows.
2. Check the condition of levelling valve linkages.
3. Check the attachment of the suspension bellows for security.
4. Check the attachments for security to frame and axle.

##### Bonded Suspension Units

5. Check the bonding of the flexible element to its associated metal fixings.
6. Check the condition of the flexible element by applying pressure.
7. Check the attachments for security to frame and axle.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check:</b>		
a. Operation.	(a). System inoperable, vehicle sitting on bump stops.	DD
b. Condition / modifications.	(b). Any component damaged, modified or deteriorated in a way that would adversely affect the functioning of the system.	MaD
c. Condition / modifications (stability affected).	(c). Any component damaged, modified or deteriorated in a way that functioning of the system is seriously affected.	DD
d. Air leaks.	(d). Leaks.	MaD
e. Condition (linkage to levelling valve).	(e). Linkage to levelling valve defective.	MaD
f. Movement (suspension bellows).	(f). Suspension bellows giving inadequate movement (risk of wheel fouling).	MaD
g. Condition (pipe).	(g). Pipe damaged to the extent it is likely to fail.	MaD
h. Condition & security (valve(s)).	(h). Valve(s) insecure or defective.	MaD
i. Condition (air bellows).	(i). Air bellows deteriorated or damaged to such an extent that it is likely to fail.	MaD
j. Condition (bonded suspension units, rubber/metal attachment).	(j). Bonded Suspension: Failure of rubber/metal attachment.	MaD
k. Condition (bonded suspension unit).	(k). Bonded Suspension Units: deterioration of suspension medium (soft and sticky).	MaD

# 6. CHASSIS, CAB AND BODYWORK

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## 6. CHASSIS, CAB AND BODYWORK

### 6.1. Chassis or Frame and Attachments

#### 6.1.1. GENERAL CONDITION

##### Method of testing

##### With the tractor over a pit carry out the following checks:

1. Check the chassis frame and cross members for deformation and/or fractures and/or corrosion. Pay particular attention to a chassis or underbody which is encrusted with dirt. There may be cracks or fractures in high stress areas obscured by this dirt (see note).
2. Check the welding and/or securing bolts/rivets for soundness and security. Pay particular attention to areas around spring and running gear mountings.
3. Check the frame/cross member junctions for indications of movement.
4. Check if there has been any repair or modification carried out to the chassis or underbody.

##### Notes

- The test should be abandoned where a tractor is presented in such a condition that the tester considers it unsafe to continue because it becomes apparent during the test that certain items cannot be satisfactorily inspected (e.g. excessively dirty).
- The extent of this inspection is limited to that part of the chassis or underbody which can readily be seen without dismantling any part of the tractor.
- See examples of Surface, Advanced, and Extensive rust in the corrosion assessment section of this manual.
- An unsafe repair or modification carried out to the chassis or underbody may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition (cross-member). b. Condition (cross-member, failure imminent). c. Condition and security (chassis member). d. Welds (chassis member/brackets). e. Condition (attachments and fasteners). f. Condition (attachments, failure imminent). g. Chassis strength. h. Advanced corrosion. i. Extensive corrosion. j. Repairs and modifications.	(a). Slight fracture or deformation of any side or cross-member. (b). Serious fracture or deformation of any side or cross-member. (c). Chassis members are cracked, insecure or pronounced misalignment is present. (d). Chassis members or cross member/bracket weld is breaking away. (e). Insecurity of strengthening plates or fastenings including rivets or bolts (up to 50%). (f). Majority of fastenings loose; broken or missing (50% or more) insufficient strength of parts. (g). The chassis/underbody is considerably weakened by holes. (h). Advanced corrosion or other equivalent damage is present. (i). Extensive corrosion that the chassis or frame is seriously weakened (insufficient strength of parts). (j). Repairs or modifications are obviously not in line with manufacturer's recommendations.	MaD DD MaD MaD MaD DD MaD MaD DD MaD

## 6.1. Chassis or Frame and Attachments

### 6.1.2. EXHAUST PIPES AND SILENCERS

#### Method of testing

##### Carry out the following checks:

1. Check the condition of the exhaust pipes and silencers for security, leaks, fire risk and position (so that fumes are unlikely to enter the driver's compartment.)
2. Check if there has been any obvious unsafe repair or modification carried out to the exhaust system. An unsafe repair or modification carried out to the exhaust system may require a modifications report to be presented as per the template in this manual.

#### Notes

- The overall security of the exhaust system should be assessed; one or more exhaust mountings missing may not justify rejection.
- Exhaust noise is assessed under Section 8.
- The presence of catalytic converters and diesel particulate filters is assessed under Section 8.

#### CHECK ITEMS

#### REASONS FOR FAILURE

#### SEVERITY

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Security.	(a). Any exhaust component is insecurely mounted	MaD
b. Security (Liable to fall off).	(b). Any exhaust component is so insecurely mounted that it is liable to fall off.	DD
c. Condition, fitment and presence.	(c). Any exhaust component is damaged, incorrectly fitted or missing.	MaD
d. Leaks.	(d). Leaks present in exhaust system.	MaD
e. Fire risk.	(e). A risk of fire is present because of leaks or broken components in exhaust assembly.	MaD
f. Fumes.	(f). Fumes entering passenger cab or passenger compartment.	MaD
g. Excessive fumes.	(g). Excessive fumes entering cab or passenger compartment danger to health of persons on board.	DD
h. Repair or modification.	(h). Obviously unsafe repair or modification.	MaD

## 6.1. Chassis or Frame and Attachments

### 6.1.3. FUEL TANK AND PIPES/SYSTEM

#### Method of testing

1. Check that a fuel tank cap is present and of the correct type. Check for evidence of leaking at the fuel cap.
2. Check fuel pipes to see they are securely clipped to prevent damage by vibration, chafing or cracking.
3. Check that pipelines/hoses are not damaged or deteriorated (e.g. kinked or flattened) and are not in a position to be fouled by moving parts or the road surface.
4. Check that all components of the fuel system are securely mounted.
5. Check the fuel tanks to see that they are suitable, free from advanced rust and are firmly held and secure on their mountings and in the case of Liquid Petroleum Gas/ Compressed Natural Gas that the fuel tank is not damaged.
6. Check that the excess fuel device on diesel engine vehicles cannot be readily operated from within the cab if it is of a type which, with the engine running, will cause an increase in smoke.
7. Check that the engine stop control is working satisfactorily on diesel engine vehicles. Where LPG/CNG is fitted, check that the engine fuel supply solenoids (usually in engine compartment for each fuel used) can be heard to open and close when each fuel system is selected on the dash switch.
8. Check that the air filter assembly is present and secure.
9. Check fuel tank straps or supports and mounting brackets to see that they are secure and free from fracture and that none is missing.
10. While seated in the driving position, check that the throttle control is functionally complete, not cracked, fractured, excessively worn, corroded, not obstructed or impeded in its travel.
11. On tractors fitted with LPG or CNG, check (when required) that the retest date of the fuel tank has not passed.

#### Notes

- The extent of this inspection is limited to those parts which can be seen and which are readily accessible without dismantling.
- All fuel tanks on the tractor are included in the inspection.
- If a fuel tank is seen to be holed, or the filler neck is seen to split it should be considered to be leaking even though a leak may not be evident because the defect is above the fuel line.

## 6.1. Chassis or Frame and Attachments

### 6.1.3. FUEL TANK AND PIPES (INCLUDING HEATING FUEL TANK AND PIPES)/SYSTEM

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Condition and security (fuel tanks and brackets).	(a). A component is incorrectly or loosely mounted or damaged.	MaD
b. Corrosion (fuel tank).	(b). Advanced rust is present in fuel tank.	MaD
c. Leaks.	(c). Leaks in system are evident.	MaD
d. Tank compatibility.	(d). Unsuitable fuel tank has been fitted.	MaD
e. N/A.	(e). N/A.	MaD
f. N/A.	(f). N/A.	MaD
g. N/A.	(g). N/A.	MaD
h. Fuel tank location (external).	(h). Fuel tank is fitted to roof of vehicle.	MaD
i. Valve operation.	(i). Manual or solenoid valve is not operating.	MaD
j. Security and condition (Fuel lines).	(j). Possibility exists of fuel lines being crushed, chafed, ruptured or subject to excessive vibration.	MaD
k. Condition and presence (Fuel cap).	(k). Fuel cap or fuel cap seal is damaged or missing.	MaD
l. Stopcock operation.	(l). Fuel cut off (if required) missing, not operating, not accessible from outside the vehicle or position not clearly marked outside the vehicle.	MaD
m. Risk of fire.	(m). i. Fire risk due to leaking fuel	DD
	ii. Fire risk due to fuel tank or exhaust not properly shielded	DD
	iii. Fire risk due to engine compartment condition	DD
	iv. Fire risk due to insecure tank or pipes	DD
n. Throttle control.	(n). i. Throttle control is sticking, binding or excessively worn.	MaD
	ii. Throttle control a link pin, retaining device or safety device is missing.	MaD
	iii. Throttle control mounting bracket or panel is cracked or fractured.	MaD
	iv. Throttle control: excess fuel device gives off excessive smoke if operated from within the passenger compartment after the engine has been started.	MaD
	v. Throttle control: engine stop control (on diesel vehicles) is not working or is missing.	MaD
o. Air filter assembly.	(o). Air filter assembly is insecure, missing or incomplete.	MaD

## 6.1. Chassis or Frame and Attachments

### 6.1.6. MECHANICAL COUPLING AND TOWING DEVICES

#### Method of testing

1. Check all couplings / towing devices for any repairs or modifications. An unsafe repair or modification carried out may require a modifications report to be presented as per the template in this manual. Record the type of coupling fitted to the tractor and whether a three point linkage is present or not.
2. Check the coupling pin/hook/eye/ball/drawbar. Note the condition of these components and ensure that they are free from distortion and/or fracture.
3. Check the hook/ball or pin/bushes for wear using a gauge where appropriate.
4. Check the body of the coupling and related components (e.g. latching blocks and springs) for excessive wear, distortion or cracks.
5. Check the cross member to which the coupling is mounted paying particular attention to the inner face of the cross member for security and cracks.
6. Check that the coupling assembly is securely attached to the tractor and that all locking or safety devices are in position and working correctly and are not excessively worn.
7. Check any rubber components for deterioration (e.g. wear/cracks or swelling).
8. Check that the coupling is correctly positioned.
9. Check for excessive clearance between coupling and keeper plate with test dummy coupling/pin fitted (see note).
10. Where a second coupling is carried on the tractor (e.g. hook fitted and a drawbar is being carried), check that the second coupling is properly secured in its bracket and that fastening bolts / securing devices for same are not loose or missing.

#### Three point linkage

11. Examine all primary components of the three point linkage illustrated in figure 1 below for cracks, excessive wear, evidence of a weld breaking away, components loose or insufficient strength of parts. Place linkage balls of the relevant category in each lift arm and ensure that these are securely held in place once the lever and clamp mechanism are in the 'closed position'.
12. Examine three point linkage for slight fractures or deformation of any component, damage in such a manner that would render it ineffective or endanger other road users and any other obvious unsafe repairs or modifications.

#### Fifth wheel coupling (where fitted)

13. Check the attachment of the fifth wheel assembly to the chassis/flinch plate and check the coupling plate for security, cracks and wear.
14. Check the jaw of the fifth wheel coupling for wear and check the safety locking device for presence and operation.
15. Check the articulating brackets of the fifth wheel assembly for cracks or damage and check any adjustable mechanism (e.g. sliding mechanism) for wear and security.
16. Unlock the coupling jaw by pulling the release handle to fully out position. Using an unworn dummy kingpin check that the coupling mechanism operates satisfactorily. With the dummy kingpin locked in position measure the amount of wear in the mechanism by moving the kingpin backwards and forwards.
17. Check the location of the fifth wheel assembly that is not obviously outside tractor manufacturers parameters (e.g. behind the rear axle centreline).

### 6.1.6. MECHANICAL COUPLING AND TOWING DEVICES

#### Notes

- ‘Mechanical couplings’, as referred to in this section of the manual, means all coupling / towing devices fitted to the tractor that are associated with the attachment of both fully mounted and trailed equipment.
- When accessing coupling related components or coupling wear (e.g. wear to hook or ball) the hitch must be in the ‘normally closed’ position.
- The type of towing coupling fitted to the tractor should be noted on the test report as should the presence or absence of a three point linkage.
- Where no towing coupling is fitted at the time of test or because it is detachable, has been unbolted or otherwise removed, but the attachment brackets are still in place, these brackets should still be assessed unless they have been deliberately rendered unfit for further use .RFF (a) shall apply in such instances.
- In the absence of manufacturer’s guidance, ‘worn’ shall mean 3mm of wear to a typical 50mm eye, hook, ball or pin. For other dimensions of eye, hook, ball or pin, wear beyond 1/20 of the original thickness of the metal would be a reason for failure. In terms of the lift arms of a three point linkage, these should only be deemed excessively worn if they can no longer securely hold the relevant category lift arm ball in place.
- In the absence of manufacturer’s guidance, excessive clearance between coupling and keeper plate shall be taken as 15mm as measured from the tip of the coupling to keeper plate (see figure 1 below).

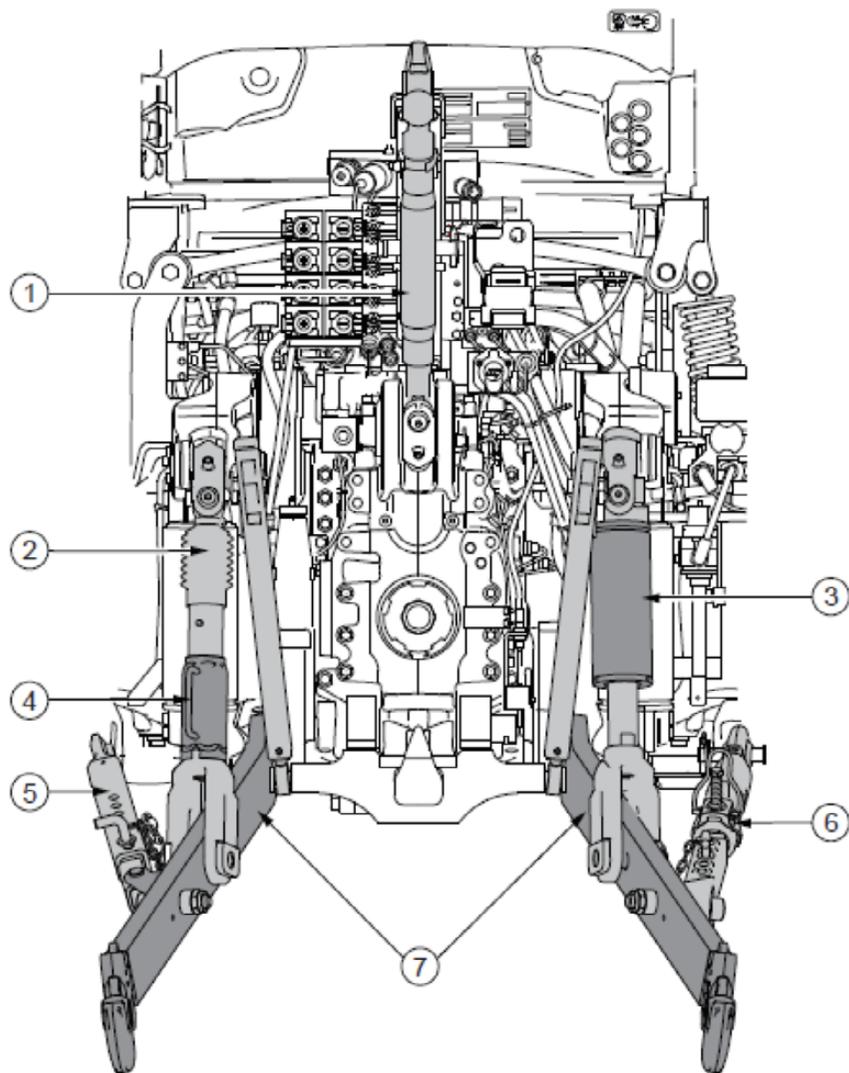
CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Condition/ presence (coupling).</li> <li>b. Wear (coupling).</li> <li>c. Fasteners and securing devices.</li> <li>d. Security (attachment failure, imminent).</li> <li>e. Presence (safety device).</li> <li>f. Coupling indicator.</li> <li>g. Registration plate (obscured).</li> <li>h. Repair or modification.</li> <li>i. Coupling strength.</li> <li>j. Condition (fifth wheel assembly).</li> <li>k. Lock &amp; blocking devices.</li> <li>l. Cracks (coupling or bar).</li>   <li>m. Cracks (coupling or bar, safety impaired).</li> <li>n. Defective welding.</li> <li>o. Coupling springs.</li> <li>p. Release handle / cable.</li> <li>q. Fifth wheel assembly.</li> </ul>	<ul style="list-style-type: none"> <li>(a). Towing coupling is missing, excessively worn, deformed or damaged.</li> <li>(b). Towing coupling is excessively worn beyond limits (see note).</li> <li>(c). Fastening bolts / securing devices are loose or missing.</li> <li>(d). Any coupling attachment(s) loose with a very serious risk of falling off.</li> <li>(e). Safety device /lock or blocking device is missing or not operating correctly.</li> <li>(f). Coupling indicator not working (e.g. warning light).</li> <li>(g). Excessive clearance between coupling and keeper plate with test dummy coupling/pin fitted (see note).</li> <li>(h). Obvious unsafe repair or modification.</li> <li>(i). Coupling too weak.</li> <li>(j). Fifth wheel assembly mounting position obviously outside vehicle manufacturer’s parameters.</li> <li>(k). Unsafe lock and blocking devices.</li> <li>(l). Cracks are present in the main parts of the coupling (e.g. hinge pin(s), latching hooks / blocks, liftlink(s), coupling pin(s), cassette / sliding base, frame, coupler / keeper plate)</li> <li>(m). Cracks in the main parts of the coupling such that the safety of the coupling is impaired.</li> <li>(n). Any defective welding associated with coupling.</li> <li>(o). Weak or broken springs in coupling (e.g. return spring).</li> <li>(p). Where fitted coupling release cable / handle obviously defective, worn or missing.</li> <li>(q). Fifth wheel assembly insecurely mounted, bolts loose</li> </ul>	<ul style="list-style-type: none"> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>MaD</li> <li>DD</li> <li>MaD</li> <li>MaD</li> <li>DD</li> <li>DD</li> <li>MaD</li>   <li>DD</li> <li>MaD</li> <li>MaD</li> <li>MaD</li> <li>DD</li> </ul>

### 6.1.6. MECHANICAL COUPLING AND TOWING DEVICES

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
r. Cracks / gouging (coupler plate).	(r). Cracks or severe gouging on the coupler plate.	DD
s. Excessive wear (fifth wheel jaw).	(s). Excessively worn jaw in fifth wheel coupling.	DD
t. Excessive wear (bracket / bush).	(t). An insecure or excessively worn articulating bracket/bush on a fifth wheel coupling.	MaD
u. Play (kingpin).	(u). More than 3mm of play with dummy kingpin in locked position.	MaD
v. Condition (rubber blocks).	(v). Rubber blocks badly deteriorated.	MaD
w. Three point linkage.	(w).i. Three point linkage: cracks / excessive wear present in main component of three point linkage (e.g. lift arm (including quick release latches), stabilisers, top link mounting, levelling assembly)	MaD
	ii. Three point linkage: a weld is breaking away.	MaD
	iii. Three point linkage: components loose; insufficient strength of parts.	MaD
	iv. Three point linkage: slight fracture or deformation of any component.	MaD
	v. Three point linkage: component(s) damaged in such a manner that would render it ineffective or endanger other road users.	MaD
	vi. Three point linkage: obvious unsafe repair or modification.	MaD

## 6.1. Chassis or Frame and Attachments

Figure 1 - Towing couplings & three point linkage systems

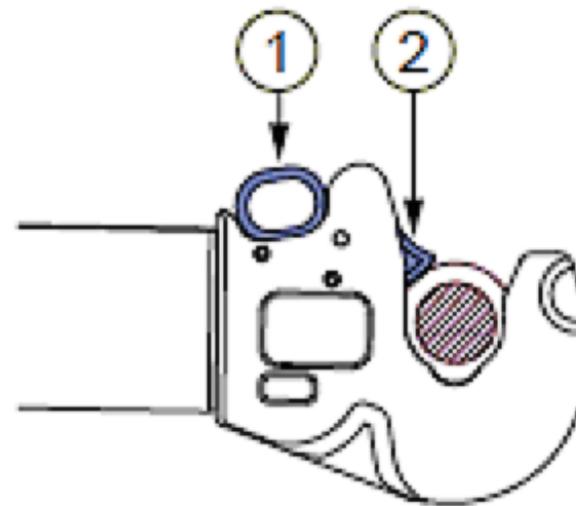


1. Top link.
2. Lift link.
3. Hydraulic self-levelling link.
4. Levelling screw.

5. Stabiliser / Side limiter.
6. Automatic side limiter.
7. Lift arms.

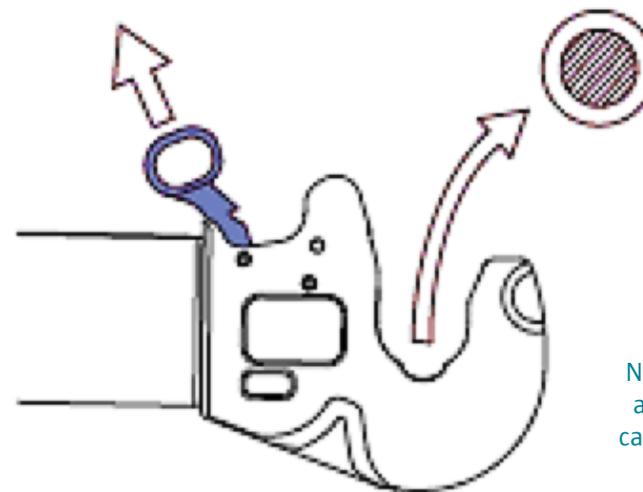
### Lift arm links

A. Lever with implement attached.



1. Lever
2. Clamp

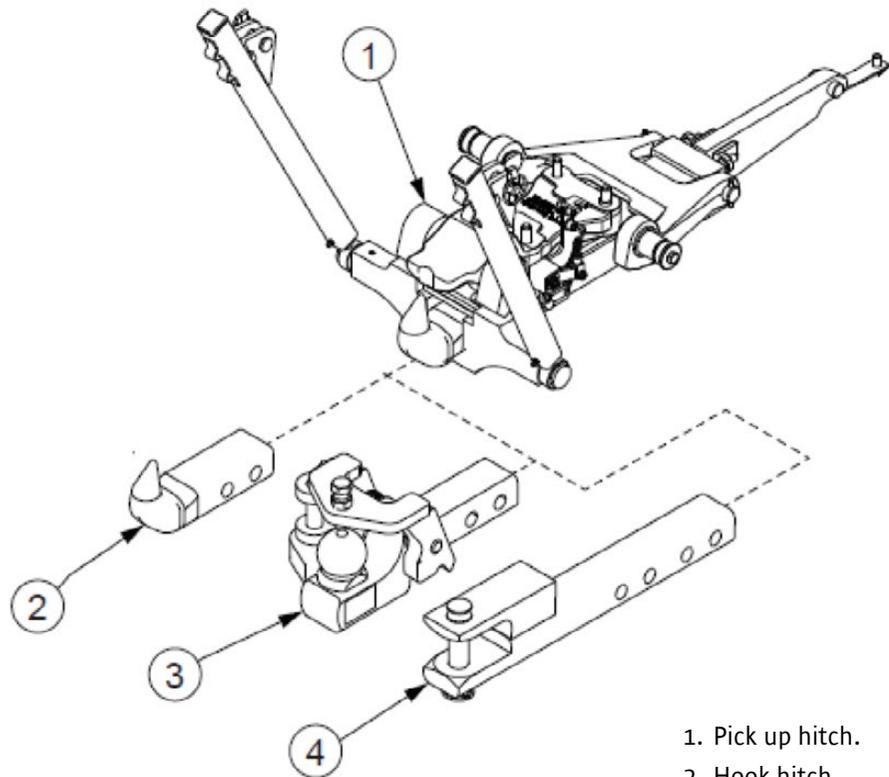
B. Lever pulled to release implement.



Note: Operation of lift arm link mechanisms can vary depending on manufacturer.

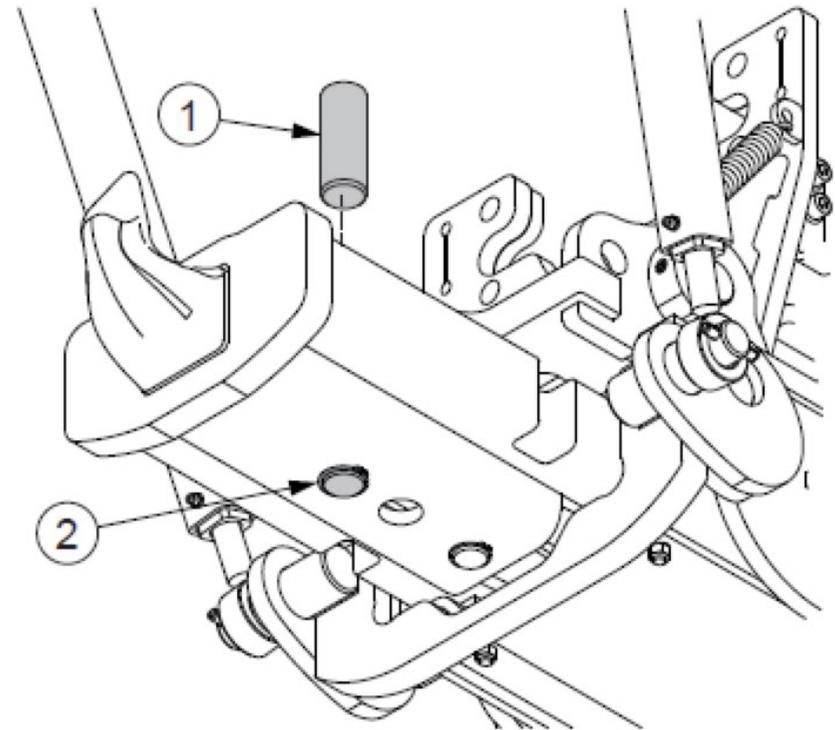
## 6.1. Chassis or Frame and Attachments

### Hitch types



1. Pick up hitch.
2. Hook hitch.
3. 80mm ball hitch.
4. Drawbar.

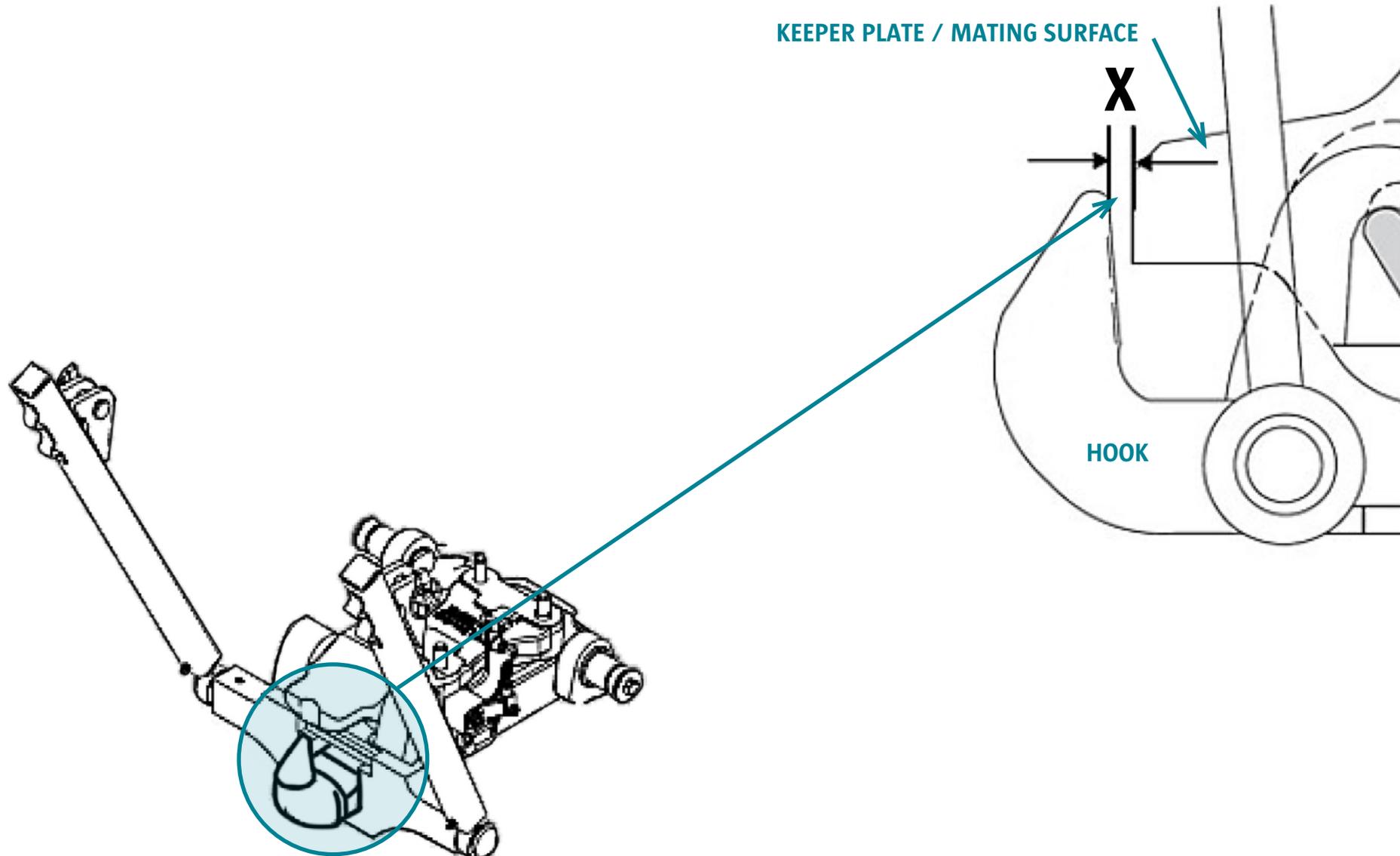
### Euro Hitch – Locking pins assembly



1. Locking pin.
2. Locking ring.

## 6.1. Chassis or Frame and Attachments

When checking the wear in the hitch (hook type shown) the distance between the hitch and keeper plate / mating surface (marked dimension "X" below) should not be more than 15mm (in the absence of manufacturer's tolerances)



## 6.1. Chassis or Frame and Attachments

### 6.1.7. TRANSMISSION

#### Method of testing

**With the tractor over a pit carry out the following checks on the transmission and drive train.**

1. Check clutch linkage, clutch pedal anti-slip provision and clutch operation.
2. Check drive shafts (both propeller shafts and half shafts), drive shaft flanges, universal joints bolts/nuts, drive shaft bearings where fitted and the security and condition of the bearing housing. Check presence and condition of PTO cover (see figure 2 below).
3. Check universal joints and CV joints for wear, condition and security.
4. Check for excessive oil leaks.
5. Check if there has been any repair or modification carried out to the engine or power train. An unsafe repair or modification carried out to the engine/powertrain may require a modifications report to be presented as per the template in this manual.

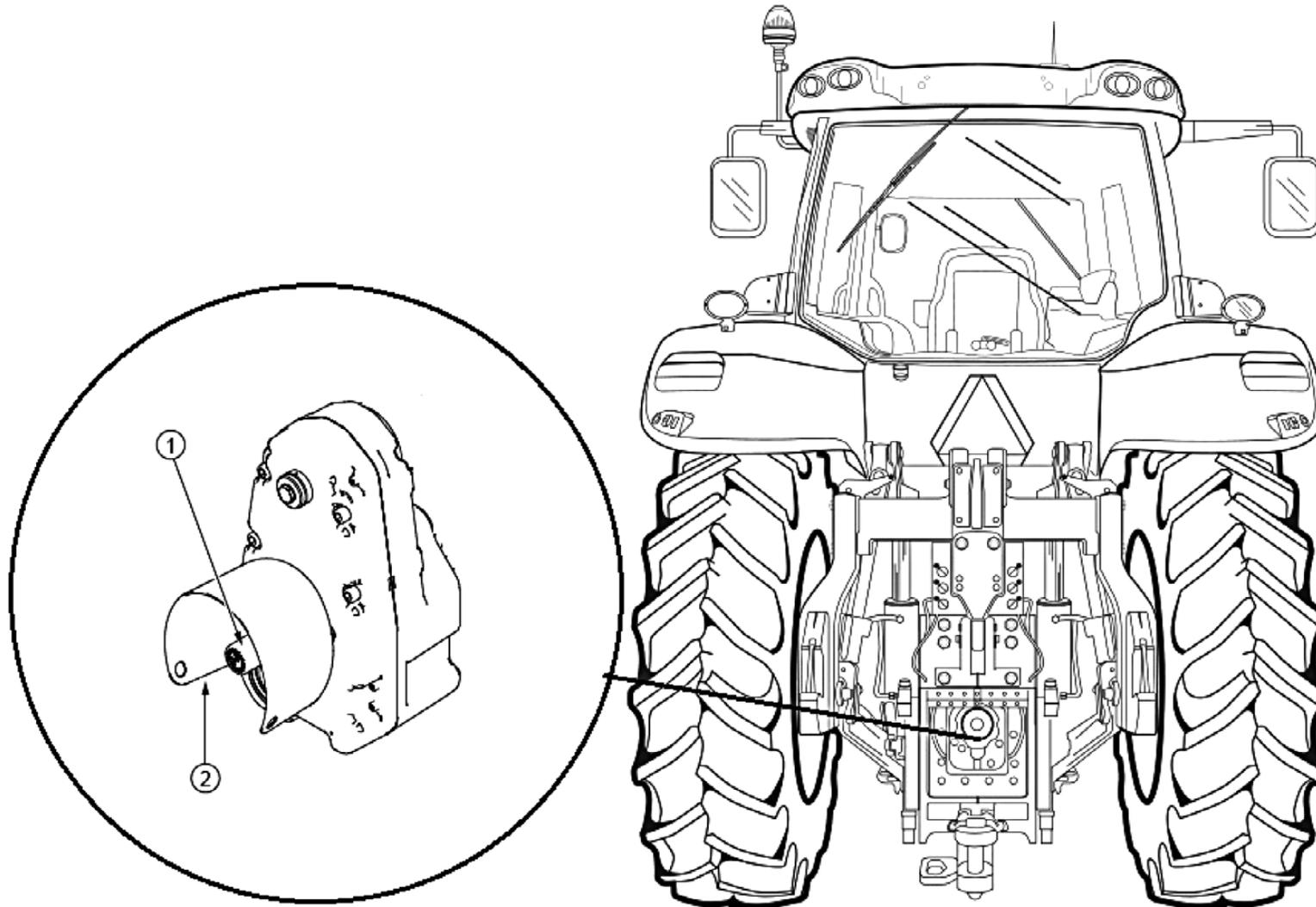
#### Notes

- Defects found in gearbox, differential or hub reduction gears can only be those noted when driving the tractor at low speed in the test area.
- Drive train includes engine, gearbox, drive shafts, and final drive.
- Excessive oil is any oil leak from any assembly which can deposit oil at a rate of a 75mm diameter pool in 5 minutes or a number of leaks which collectively would deposit oil at the same rate.
- **When carrying out this inspection it is important that the tractor is in neutral gear and that, if a transmission brake is fitted, it is released. Wheels should be chocked.**



## 6.1. Chassis or Frame and Attachments

Figure 2 - Tractor PTO Cover.



1. PTO Shaft
2. PTO Cover

### 6.1.8. ENGINE/GEARBOX MOUNTINGS

#### Method of testing

1. Check engine/gearbox mountings for condition and security and their installation to the chassis or underframe.
2. Check for cracks or fractures and signs of deterioration.

#### Notes

- There will only be a failure under this item if a mounting is no longer capable of performing its function of location and support.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition and security (mounting). b. Condition and security (mounting, detachment likely).	(a). Mountings loose, worn or damaged. (b). Mounting so deteriorated damaged or Loose that detachment is likely.	MaD DD

## 6.2. Cab and Bodywork

### 6.2.1. GENERAL CONDITION (CAB)

#### Method of testing

#### Carry out the following checks:

1. Check the general condition of the tractor structure for any fractures, damage, corrosion (refer to the corrosion assessment section of this manual) or inessential projections which might cause injury.
2. Check for security and condition of the cab by pushing and rocking the cab by hand where practical and check from both sides of the tractor that the body is sitting squarely on the chassis. On tilt cabs check the retention and/or for locking devices and security.
3. Check that the bonnet main lock and safety catch operate correctly.
4. Check the cab and mountings for damage and excessive corrosion to a load bearing member which seriously reduces its strength near the cab mountings.
5. Check that water or fumes are unlikely to enter the cab e.g. gear lever rubber boot should not be torn and check from both sides of the tractor that the body is sitting squarely on the chassis.
6. Check the following items for security, freedom from fracture or distortion, serious structural corrosion, excessive wear or damage, and check that none is missing:
  - (a). fixings (e.g. brackets) securing the body to the cross members or chassis and securing cross or longitudinal members to the chassis;
  - (c). securing bolts or rivets for the above fixings;
  - (d). parts of the body designed to carry or contain the load including the floor and main support pillars;
7. Check panels and other similar devices to see that they are in position and that they are:
  - (a). Securely fixed and not badly affected by corrosion.
  - (b). Free from tears and jagged edges and check that there is sufficient clearance to rotating or moving parts and the road.
8. Check wind deflectors and other cab mounted accessories for security.
9. Check if there has been an unsafe repair or modification carried out to the cab or body work. An unsafe repair or modification carried out may require a modifications report to be presented as per the template in this manual.

#### Notes

- Typical Primary Structure Components are listed in Table 1 below.
- Secondary Structures include any structure or component which, if it collapsed, would not immediately affect a tractor's controllability. Normally, surface rust or advanced rust in these structures or components would not make the tractor unsafe. Extensive rust in these components is usually either hazardous to people in or near the tractor because of its sharp edges or because exhaust fumes may escape into the tractor. In such cases, this type of rust would make the tractor unsafe.
- The term "other similar devices" has a wide interpretation. The criterion to be used is that the road wheels must have associated with them equipment or part of the body which catches, so far as is practicable, mud or water thrown up by the rotation of the road wheels.
- Typical Secondary Components are listed in the corrosion assessment section of this manual.
- Having regard to the purpose for which they are used, the bodies of tractors are often subjected to rough treatment and harsh operating environments. Any superficial damage which does not affect the strength of the component, and is not likely to injure other road users should not be regarded as a defect.

## 6.2. Cab and Bodywork

6.2.1 GENERAL CONDITION (CAB/BODY)		
CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Security and condition.	(a). Loose or damaged panel or part likely to cause injury.	MaD
b. Security and condition (likely to fall off).	(b). Loose or damaged panel or part that it is likely to fall off.	DD
c. Condition (primary structural components).	(c). Primary structural components broken, cracked, insecure, damaged or rusted to an advanced stage that stability is impaired.	DD
d. Condition (secondary structural components).	(d). Secondary structural components missing, insecure, rusted or damaged to such an extent as to leave sharp edges.	MaD
e. Cab squareness / distortion.	(e). Cab not sitting squarely due to distortion.	MaD
f. Presence and condition (bonnet / boot catches).	(f). Bonnet or boot catches defective or bonnet safety catch missing or defective.	MaD
g. Exhaust fumes in cab.	(g). Bodywork so deteriorated or damaged that engine or exhaust fumes are entering the cab. Danger to health of persons on board.	DD
h. Repairs and modifications.	(h). Obviously unsafe repair or modification.	MaD
i. Sufficient clearance.	(i). Insufficient clearance to rotating or moving parts and road.	DD
j. Advanced rust, cracks and condition.	(j). Advanced rust, cracked, damage or insecure.	MaD
k. Advanced rust, damage (bracing and support spars).	(k). Advanced rust or damage in bracing and support spars.	DD
l. Advanced rust, damage (body panels or floor).	(l). Advanced rust or damage in the body panels or floor.	MaD
m. Condition (panel / pillar / floor).	(m). Body panels, pillars or floor deteriorated or damaged to such an extent that it can no longer adequately perform its function	DD
n. Condition (Cross / longitudinal member).	(n). Cross or longitudinal members in such condition that the integrity of the body is seriously affected.	MaD
o. Condition (retaining device(s)).	(o). Defective twist locks or retaining devices.	MaD
p. Presence, security and condition (body fixings).	(p). Body fixings (e.g. brackets) missing, or loose, worn or damaged	MaD
q. Condition (Cross / longitudinal member).	(q). Cross or longitudinal members so deteriorated or damaged to such an extent that it can no longer adequately perform its function	DD
r. Leaks Cab).	(r). Leaks permitting the entry of water or fumes into the driver or passenger compartment (other than open deck vehicles).	MaD
s. Advanced rust (door(s), pillars, floor, mounting area).	(s). Advanced rust or damage in door(s), pillars, floor or mounting area.	MaD
t. Cab mountings.	(t). Cab mountings, worn, insecure or interfering with control functions.	MaD
u. Presence and condition (Retention / locking device).	(u). A retention and/or locking device on a tilt cab defective or missing.	DD

## 6.2. Cab and Bodywork

**Table 1 Primary Structure Components**

**Typical Primary Structure Components include:**

- (1) Main Structural Members such as sub frames and chassis rails.
- (2) Suspension mounting areas.
- (3) Steering box mounting point.
- (4) Door sills and pillars.
- (5) Door hinge mounting areas.
- (6) Seat and seat belt anchorage points.
- (7) All floor panels.
- (8) Body Structural Members.

## 6.2. Cab and Bodywork

### 6.2.2. MOUNTING (CAB TO CHASSIS)

#### Method of testing

##### Visually inspect the tractor over a pit

1. Check the mounting of the cab and body (where applicable) to the chassis. Particular attention should be paid to the general security and any displacement of either the cab relative to the chassis. The inspection should cover all fixings securing the body to the chassis or to a sub-frame or supporting members.
2. Check lifting gear (where fitted) for security, serious leaks or obvious defects in valves.
3. Check for advanced and excessive corrosion, cracks, or damage to a load bearing member (e.g. cross or longitudinal members) such that the integrity of the body is affected.

#### Notes

- All means of securing the cab and body to the chassis are to be inspected where practical. Movement which is designed into mountings should not be confused with insecurity or excessive wear.
- Corrosion Assessment – Before carrying out the assessment, testers should familiarise themselves the corrosion assessment section of this manual. The inspection should determine whether advanced corrosion exists first by visual inspection and then by finger and thumb pressure. If necessary careful scraping or light tapping of the area is permitted. Corrosion affected heavy gauge metal may be tapped harder than light gauge, but unwarranted force and damage must be avoided.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Security. b. Security (stability affected). c. Body squareness. d. Presence and condition (fixing(s)). e. Presence and condition of (fixing(s), detachment likely). f. Advanced corrosion (body integrity is affected). g. Extensive corrosion (body integrity is affected).	(a). Body insecure. (b). Body so insecure that stability is affected. (c). Body obviously not located squarely on chassis. (d). Insecure or missing fixing of body/cab to chassis or cross-members. (e). Insecure or missing fixing of body/cab to chassis or cross-members to such an extent that detachment is likely. (f). Advanced corrosion on cross or longitudinal members in such condition that the integrity of the body is affected. (g). Extensive corrosion on cross or longitudinal members in such condition that the integrity of the body is seriously affected.	MaD DD MaD MaD DD MaD DD



## 6.2. Cab and Bodywork

### 6.2.4. FLOOR

#### Method of testing

Visually inspect the tractor over a pit.

1. Check the condition of the floor (including areas around the internal wheel arches) for advanced corrosion or damage.
2. Check for signs of deterioration or insecurity that could affect the driver's stability or impair the driver's control of the tractor.

#### Notes

- This inspection applies to the floor in driver and passenger compartments.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Condition and security.	(a). Floor insecure or badly deteriorated.	MaD
b. Deterioration (drivers stability affected).	(b). Floor insecure or badly deteriorated that the stability of driver's seat is affected.	DD

### 6.2.5. DRIVER'S SEAT

#### Method of testing

Visually inspect the condition and operation of the driver's seat.

1. Check the driver's seat and seat mountings for security and condition noting any movement of the seat relative to the tractor body and check the condition of the seat back and seat cushion.
2. Check for collapsed or damaged framework and damage to seat cushion / support foam such that the driver's support or stability may be impaired.
3. Check that the driver's seat position adjusting mechanism is functioning properly (i.e. can be secured in the selected forward / backward positions) and that the backrest can be secured in its normal upright position.

#### Notes

- A seat should fail when it is so loose that detachment from the runners or sliding backwards or forwards is likely. The driver's seat should be failed where the seat support foam cannot be contained, e.g. keeps falling out. This does not mean the seat fails if the upholstery is torn or worn. A seat cover is an acceptable means of containing the foam.
- When inspecting the driver's seat adjustment mechanism it is not necessary to check that the seat can be secured in all possible positions.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Security.	(a). Loose on runners or insecurely mounted that the stability is affected.	DD
b. Framework damage.	(b). Collapsed or framework damaged.	MaD
c. Condition (seat and cushion).	(c). Driver's seat so damaged that driver's support is impaired or interior foam is protruding beyond the seat trim.	MaD
d. Operation (adjustment controls).	(d). Driver's seat adjustment mechanism not functioning correctly.	MaD
e. Operation (backrest controls).	(e). Seat backrest not fixable.	MaD

## 6.2.6. OTHER SEATS (PASSENGER SEATS)

### Method of testing

Visually inspect the condition and operation of seats other than the driver's seat (i.e. passenger seats).

1. Check the seat and seat mountings for security and condition noting any movement of the seat relative to the cab and check the condition of the seat back and seat cushion. Check for collapsed or damaged framework and damage to seat cushion or support foam.

### Notes

- A seat should fail when it is so loose that detachment is likely.
- A seat shall not fail for slight tears or wear to the upholstery. A seat cover is an acceptable means of containing the foam.
- The above checks apply only to seats that are designed for use when the tractor is travelling on the road.
- Main parts includes components such as; seat frames while secondary parts include; seat cushion, back rest etc.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <p>a. Condition and security (secondary parts).</p> <p>b. Condition and security (main parts).</p> <p>c. Seating number.</p>	<p>(a). Seats in defective condition or insecure (secondary parts).</p> <p>(b). Seats in defective condition or insecure (main parts).</p> <p>(c). Permitted number of seats exceeded.</p>	<p>MiD</p> <p>MaD</p> <p>MaD</p>

## 6.2. Cab and Bodywork

### 6.2.7. DRIVING CONTROLS

#### Method of testing

This inspection applies to driving controls that are not covered in other sections of this manual, for example adaptations for disabled drivers.

1. Visually check that any control necessary for the safe operation of the tractor is functioning correctly.
2. While sitting in the driver's seat, by operating the driving controls, where appropriate, check that they are:
  - (a). Functioning correctly and not obstructed or impeded in their travel.
  - (b). Positioned so that they can be satisfactorily operated without impairing proper control of the tractor.
  - (c). Not worn, insecure, sticking, fouling or likely to fail.
  - (d). In the case of a tractor fitted with adaptations for disabled drivers that a servo or electrical device is not obviously defective.
  - (e). In the case of a tractor fitted with adaptations for disabled drivers that wiring is secure, insulation is not damaged or is likely to short circuit or fail.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <p>a. Safe Operation.</p> <p>b. Safe operation (safety affected).</p> <p>c. Condition and operation (adaptations for disabled drivers).</p>	<p>(a). Any control necessary for the safe operation of the vehicle not functioning correctly.</p> <p>(b). Any control necessary for the safe operation of the vehicle not functioning correctly such that safe operation affected.</p> <p>(c). Adaptations for disabled drivers</p> <ol style="list-style-type: none"> <li>i. Adaptations for disabled drivers: any adaptation is worn, insecure, sticking, fouling or likely to fail.</li> <li>ii. Adaptations for disabled drivers: a servo or electrical device is defective.</li> <li>iii. Adaptations for disabled drivers: wiring is insecure, insulation is damaged or is likely to short circuit or fail.</li> </ol>	<p>MaD</p> <p>DD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p>

## 6.2. Cab and Bodywork

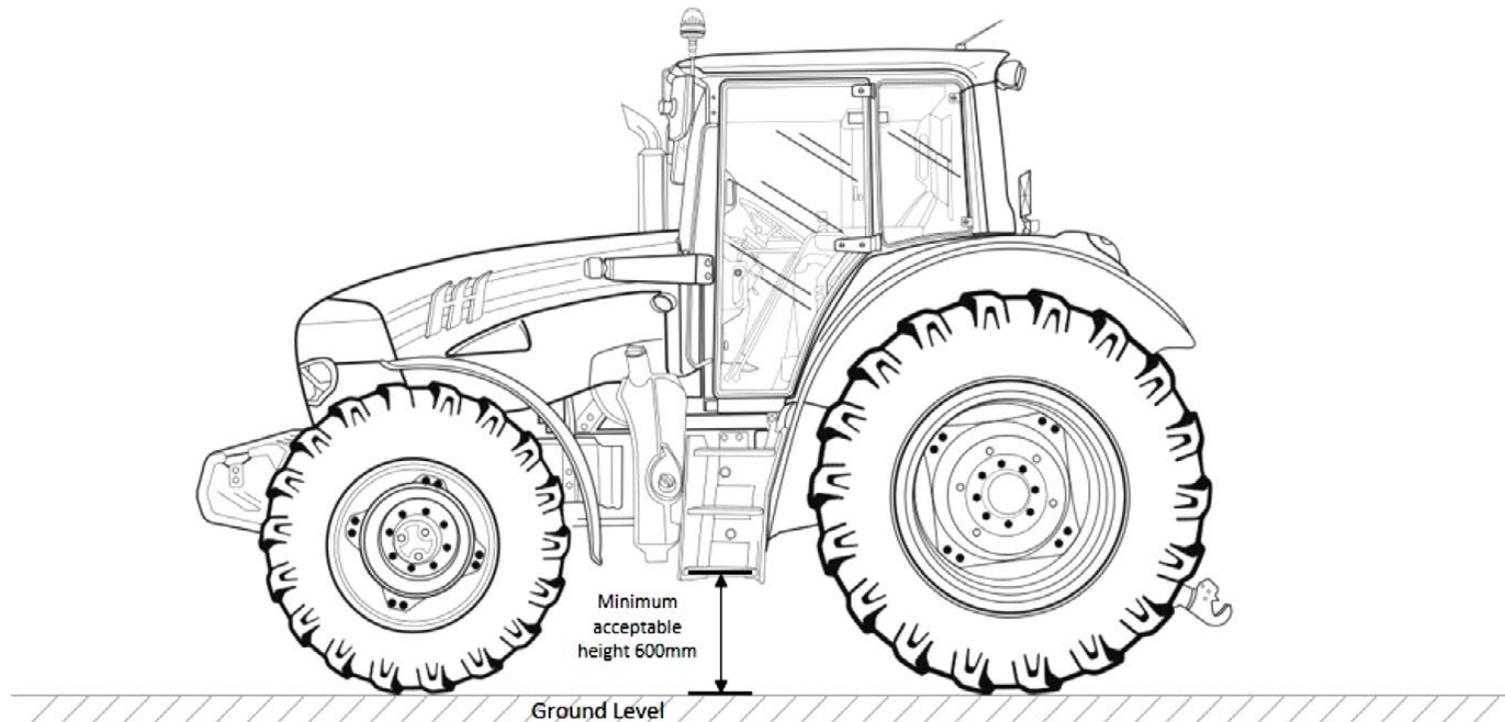
### 6.2.8. CAB STEPS

#### Method of testing

1. Visually inspect the presence, condition and security of steps and running boards (where fitted) such that injury is likely to be caused to users (see figure 3 below). Check that the distance from the bottom step to the ground is not in excess of 600mm.
2. Where any retractable steps are fitted to a tractor, check that these operate correctly and do not pose any hazard of injury to users.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Security. b. Condition and security (main parts). c. Presence and condition.	(a). Step or step rung insecure. (b). Insufficient stability. (c). Missing/unsafe more than 600mm from bottom step to the ground likely to cause injury to users.	MaD MaD MaD

Figure 3 – Minimum step height



### 6.2.9. OTHER INTERIOR AND EXTERIOR FITTINGS AND EQUIPMENT

#### Method of testing

1. This inspection applies to internal and external fittings and equipment that are not covered in other sections of this manual, for example; printers, computers, hydraulic valve chests and hoses etc.
2. Check the condition and safe operation of qualifying parts and ensure there are no leaks or loss of hazardous material.

#### Notes

- It is inevitable that due to changes in design, or other reasons, from time to time defects may be found which are not described in any of the reasons for failure in the other sections of this manual. Therefore this section is to be used in cases only where a particular component is not checked under another section of this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Condition.	(a). Attachment of other fitting or equipment defective.	MaD
b. Safe operation.	(b). Parts fitted likely to cause injuries; safe operation affected.	MaD
c. Leaks (hydraulic equipment).	(c). Leaking hydraulic equipment.	MiD
d. Loss of hazardous material.	(d). Extensive loss of hazardous material.	MaD

### 6.2.10. MUDGUARDS (WINGS), SPRAY SUPPRESSION DEVICES (WHERE FITTED)

#### Method of testing

1. Visually inspect the presence, condition and security of mudguards and wings.
2. Check that devices are free from tears and jagged edges that may interfere with the safe operation of adjacent tractor components or pose a danger to road users.
3. Check that devices are not rubbing on a tyre.

#### Notes

- A missing or damaged mud flap is not a reason for failure if it is an extension to a wing or other similar fitting.
- Where a mud flap is fitted in place of a mudguard/wing these must meet the requirements of mudguards.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b>		
a. Presence, condition and security.	(a). Missing, insecurely mounted or badly corroded.	MiD
b. Fouling other components.	(b). Likely to foul other vehicle components, endanger road users or cause injuries; likely to fall off.	MaD
c. Clearance to tyre (spray suppression).	(c). Insufficient clearance to tyre/wheel (spray suppression).	MiD
d. Clearance to tyre (mudguard).	(d). Insufficient clearance to tyre/wheel (mudguards).	MaD
e. Coverage of tread.	(e). Insufficient coverage of tread.	MaD

# 7. SAFETY RESTRAINTS, LOCKS, HORN, SPEEDOMETER, ESC

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## 7. OTHER EQUIPMENT

### 7.1. Safety-Belts/Buckles and Restraint Systems

(This section only applies where safety belts are fitted)

#### 7.1.1. SECURITY OF SAFETY-BELTS/BUCKLES MOUNTING

##### Method of testing

1. Pull each safety belt webbing against its anchorage and see that it is properly secured to the tractor structure.
2. Check the condition of the attachment and adjustment fittings on each belt for distortion or fracture.
3. As far as is practicable without dismantling, check the condition of the cab structure in the vicinity of the safety belt anchorage points. The condition of floor mounted anchorage points may best be inspected from underneath the tractor.
4. Check for any unsafe repairs or modifications to seatbelts or anchorage points.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Condition and security (mounting).</li> <li>b. Repairs or modifications.</li> <li>c. Condition (anchorage points).</li> </ul>	<ul style="list-style-type: none"> <li>(a). Any belt mounting is loose or unsatisfactory, for example incorrect bolts fitted.</li> <li>(b). Any belt mounting is obviously unsafely repaired or modified.</li> <li>(c). Any load bearing member of the vehicle structure or panelling within 30 cm of a safety belt anchorage point is cracked, corroded or is in otherwise weakened condition. This applies to the seat mounting if the belt is anchored to the seat.</li> </ul>	<p>MaD</p> <p>MaD</p> <p>DD</p>

## 7.1. Safety-Belts/Buckles and Restraint Systems

### 7.1.2. CONDITION OF SAFETY-BELTS/BUCKLES

#### Method of testing

1. Check the condition of all safety belt webbing for cuts or obvious signs of deterioration. In the case of the retractable type safety belt ensure that the belt is fully extended during this examination. Pull each safety belt webbing against its anchorage and see that it is properly secured to the cab structure.
2. With the seat unoccupied fasten the safety belt buckle and check that the adjustment mechanism functions properly. In the case of retractable belts ensure that all the slack is removed and by pulling the belt quickly check that the locking mechanism operates. Attempt to separate the fastened belt at the buckle and check that the belt can be released when required.
3. Check that the seatbelt malfunction indicator (if fitted) does not indicate a fault in the system.

#### Notes

- If safety belts are fitted to any seat of any tractor, they must be tested per Methods of Testing 1, 2 and 3 above.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Condition (seatbelts). b. Condition (buckle). c. Condition (seatbelt retractor). d. N/A. e. Malfunction indicator.	(a). Seat-belt damaged: Any belt, including any for a child seat attached to the vehicle. Any cut, sign of overstretching, badly frayed or obviously unsafely repaired or modified. (b). Safety-belt/buckle, including any for a child seat attached to the vehicle, is not operating properly or is damaged. (c). Safety-belt retractor, including any for a child seat attached to the vehicle, is not operating properly or is damaged. (d). N/A. (e). The safety belt warning system, where fitted, is not operating correctly.	MaD MaD MaD MaD

### 7.1.3. SAFETY BELT LOAD LIMITER (WHERE FITTED).

#### Method of testing

1. Visually inspect any safety belt load limiter for deployment.
2. Check that the seatbelt malfunction indicator does not indicate a fault in the load limiter.

#### Notes

- Some tractor seatbelt systems may use load limiters to minimise belt-inflicted injury. The basic idea of a load limiter is to release a little more excess belt webbing when a great deal of force is applied to the belt. The simplest load limiter is a fold sewn into the belt webbing. The stitches holding the fold in place are designed to break when a certain amount of force is applied to the belt. When the stitches come apart, the webbing unfolds, allowing the belt to extend a little bit more.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence and condition. b. Malfunction indicator (vehicle interface).	(a). Signs that load limiter obviously missing or not suitable with the vehicle. (b). System indicates failure via the electronic vehicle interface.	MaD DD

### 7.1.4. SAFETY BELT PRE-TENSIONERS

**Method of testing**

1. Check for any obvious defect of seatbelt pre-tensioners.
2. Check that the seatbelt malfunction indicator does not indicate a fault in a seatbelt pre-tensioner.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence and condition. b. Malfunction indicator (vehicle interface).	(a). Pre-tensioner obviously missing or not suitable with the vehicle. (b). System indicates failure via the electronic vehicle interface.	MaD DD

## 7.1.6. SRS SYSTEMS

### Method of testing

1. Check that the SRS malfunction indicator (where fitted) does not indicate a fault in the system.

### Notes

- The SRS malfunction indicator lamp (MIL) may display a symbol similar to that shown below, or one depicting a person wearing a seat belt. The SRS (MIL) may indicate that there is a fault in the seatbelt load limiter, pre-tensioners or airbags.



CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Malfunction indicator. b. Malfunction indicator (vehicle interface).	(a). Malfunction indicator for Supplemental Restraint System (SRS) – indicates any kind of failure of the system. (b). System indicates failure via the electronic vehicle interface.	MaD DD

## 7.3. Locks and Anti-Theft Devices

### 7.3. LOCKS AND ANTI-THEFT DEVICES

#### Method of testing

1. Check anti-theft devices (steering door locks and ignition key only).
2. Check that the steering lock is not fouling the steering mechanism when the ignition is switched on.
3. Check steering lock where fitted.

#### Notes

- The fitment of a steering lock is not mandatory on a tractor. An ignition key if the doors can be locked is sufficient.
- It is acceptable for a steering lock to be missing or inoperative provided the tractor has an engine immobiliser, or a permanently installed immobilisation device which acts on either the steering, brakes or the transmission.
- If there is doubt as to whether a steering lock was originally fitted, the benefit of the doubt should be given.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (device). b. Wear (steering lock). c. Presence and operation (steering lock).	(a). Device not functioning to prevent vehicle being driven. (b). Steering lock, where fitted as original equipment by manufacturer, has excessive wear or is subject to jamming of the lock/barrel/key mechanism. (c). Steering lock missing or not working.	MaD DD MaD

## 7.7. Horn (Audible Warning Device)

### 7.7. HORN (AUDIBLE WARNING DEVICE)

#### Method of testing

1. Check that the horn control is accessible to the driver when seated.
2. Check the security of the horn and control.
3. Operate the horn control and note that the horn sounds correctly (e.g. cannot be confused with official sirens).

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Operation (horn). b. Operation. c. Security (control / horn). d. Sound (confusion with official sirens).	(a). Not working correctly. (b). Not working at all or is not fitted. (c). Control insecure or horn insecurely mounted. (d). Emitted sound likely to be confused with official sirens.	MiD MaD MaD MaD

## 7.8. Speedometer

### 7.8. SPEEDOMETER

#### Method of testing

1. Check that a speedometer is fitted, working and can be easily seen from the driving seat.
2. Check that the speedometer can be illuminated.
3. Record the odometer / hour meter reading at the time of the test where an odometer is fitted. After completion of the CVR test, the owner / presenter must verify odometer / hour meter reading (see Introduction).

#### Notes

- The speedometer functions check is limited to the movement of the tractor within the test area.
- A Tachograph is an acceptable alternative to a speedometer providing it satisfies the requirements of this inspection.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Visibility to driver. b. Presence. c. Correct operation. d. Operation. e. Illumination.	(a). Speedometer cannot be seen from the driver's seat. (b). Speedometer is missing. (c). Speedometer is not working correctly. (d). Speedometer is not working at all. (e). Illumination of speedometer not working or defective.	MaD MaD MiD MaD MaD

## 7.9. EC Approved Tachograph (if required).

### 7.9. EC APPROVED TACHOGRAPH (IF REQUIRED).

#### Method of testing

1. Give the tractor driver/owner/operator the option of completing the tachograph declaration form. If this form is satisfactorily completed and signed, carry out the test only on the speedometer, otherwise proceed as per the methods of testing below.
2. Check that the tachograph is of an EC-approved type by identifying the approval mark on the descriptive plaque. This mark consists of a rectangle within which is the letter “e” followed by a number.
3. Check that the tachograph is positioned so that the driver when seated has a clear view of the speedometer, distance recorder and clock.
4. Check that the tachograph is positioned so that all parts are protected against accidental damage.
5. Check that the tachograph is in working order i.e. that time, speed and distance travelled are being recorded on the chart in the tachograph head, that it can be illuminated, and that speed is being indicated to the driver.
6. On a digital tachograph, check that the vehicle registration number is recorded in the tractor.
7. Check that there is a current installation plaque affixed to the tractor near the tachograph or on the instrument itself.
8. Check that the installation plaque shows the registration number or VIN (VIN required for digital tachograph), name and address or trade name of an approved tachograph fitter or workshop, the characteristic coefficient (“w”) of the tractor, the effective circumference (“l”) of the wheel in millimetres, and the date on which these measurements were made. On the evidence of this date, the installation plaque should be no more than six years old.
9. Check that a current two-year inspection plaque (required every two years after installation or calibration) is affixed to the tractor near the tachograph or on the instrument itself, showing the date the inspection was carried out and the seal number of the tachograph centre which carried out the inspection. The two-year plaque shall be fitted as well as and not in place of the installation plaque.
10. Check where possible the integrity of the seals at all connecting points in the overall installation which comprises the tachograph head, the adaptor at or near the tractor’s gearbox and the connecting cable(s).
11. Check that the following points are sealed:
  - (a). Each end of all connecting cables.
  - (b). The adaptor and its connection to the gearbox.
  - (c). The inner casing of the tachograph head which protects the internal parts of the instrument.
  - (d). The installation plaque and the two year plaque unless it is attached in such a way that it cannot be removed without the markings thereon being defaced.
12. Check that the speedometer can be illuminated.

## 7.9. EC APPROVED TACHOGRAPH (IF REQUIRED).

### Notes

- Any tractor that requires a tachograph to be fitted and is first registered on or after 1st May 2006, must be equipped with a digital tachograph (unless a tachograph declaration form is completed).
- If a speed limiter is NOT required, or where the speed limiter does not receive the speed signal from the tachograph head, it is only necessary to check the seals inside the tachograph head. Where a seal within the tachograph head is missing, broken, or where a clearly “non- mandatory” seal has been fitted in place of an “official” seal, it is a reason for failure. There is no requirement for the gearbox sender unit to be sealed in this case but the tachograph must have a calibration cert/plaque matching the VIN and VRN (digital) of the vehicle.
- Where a category of vehicle requiring a speed limiter (which is sensed from the tachograph head) is presented for test and is fitted with a tachograph but the owner has signed a tachograph declaration form, a reason for failure will apply for any seal missing, broken or where a clearly “non-mandatory” seal has been fitted in place of an “official seal”. The tachograph must have a calibration cert/plaque matching the VIN and VRN (digital) of the vehicle.
- Modular tachographs using encrypted sender units (there are two types and these are easily identified as they are shaped like a car radio: VDO Keinzell 1324 and Stoneridge) do not require the cable end connections to be sealed. However, in these cases the sender unit itself is still required to be sealed to the gearbox.
- Where a digital tachograph is fitted, an over speed printout must be printed from the vehicle unit, scanned and attached to the vehicle record on CoVIS for each test. Where a vehicle is failed on over speed, a calibration of the speed limiter is required and a new speed limiter plaque should be affixed to the vehicle on re-test. A new printout must also be printed on re-test, scanned and attached to the vehicle record on CoVIS.



## 7.12. Electronic Stability Control (ESC)

### 7.12. ELECTRONIC STABILITY CONTROL (ESC) (WHERE FITTED).

#### Method of testing

1. Visually inspect the Electronic Stability Control (ESC) systems for presence and condition of wheel speed sensors, wiring, switches and other components.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<p><b>Check for:</b></p> <ul style="list-style-type: none"> <li>a. Presence and condition (wheel speed sensors).</li> <li>b. Condition (wiring).</li> <li>c. Presence and condition (other components).</li> <li>d. Operation and condition (switch).</li> <li>e. Malfunction indicator.</li> </ul>	<ul style="list-style-type: none"> <li>(a). Wheel speed sensors missing or damaged.</li> <li>(b). Wirings damaged.</li> <li>(c). Other components missing or damaged.</li> <li>(d). Switch damaged or not functioning correctly.</li> <li>(e). ESC MIL indicates any kind of failure of the system.</li> </ul>	<p>MaD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p> <p>MaD</p>



# 8. EMISSIONS/NOISE

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## 8. EMISSIONS/NOISE

### 8.1. Noise

#### 8.1. NOISE

##### Method of testing

1. Check the condition of the exhaust pipe and silencer for security and leaks.
2. Check the effectiveness of the silencer in reducing, as far as is reasonable, the noise caused by the exhaust from the engine.
3. Check if there has been any obvious unsafe repair or modification carried out to the exhaust system.

##### Notes

- An unsafe repair or modification carried out to the exhaust system may require a modifications report to be presented as per the template in this manual.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Excessive noise b. Presence, condition and security.	(a). Exhaust noise excessive. (b). Any part of the noise suppression system (including silencer and exhaust pipe) is loose, damaged, incorrectly fitted, missing or obviously modified in a way that would adversely affect the noise levels.	MaD MaD

## 8.3. Diesel Engine Emissions

### 8.3.1. EXHAUST EMISSIONS CONTROL EQUIPMENT

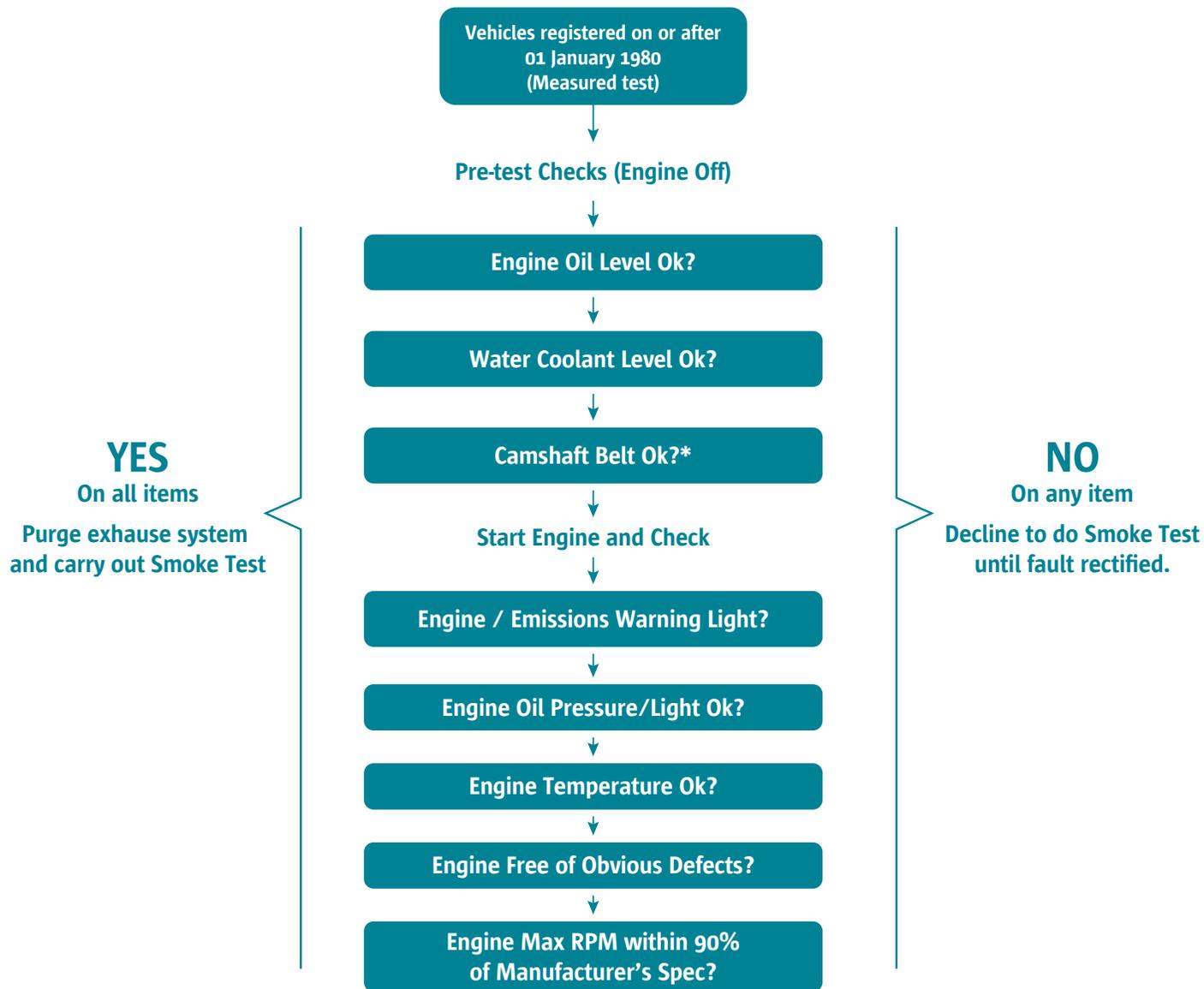
#### Method of testing

1. Check visually that the emission control system is present, complete, properly connected and has not been bypassed.
2. Check if there has been any obvious unsafe repairs or modifications carried out to the exhaust system.
3. Check that the emission control system is not leaking, incomplete or incorrectly assembled, which would affect emission measurements.
4. Check for excessive exhaust smoke likely to affect other road users.

#### Notes

- The above checks are limited to those parts which can be seen without dismantling.
- A missing diesel particulate filter (DPF), exhaust gas recirculation (EGR) valve where either were fitted when the tractor was originally manufactured, is subject to a failure under reason for failure 8.3.1 (a).
- An unsafe repair or modification carried out to the exhaust system may require a modifications report to be presented as per the template in this manual.
- A durable repair to an exhaust system which effectively prevents leaks is acceptable providing the system is structurally sound.
- A minor exhaust leak (e.g. a connection joint or a pin hole) is not a reason for failure.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Presence, modifications and condition. b. Leaks (emission measurements affected).	(a). The emission control system fitted by the manufacturer is absent, incomplete, incorrectly assembled or obviously defective. (b). Leaks which would affect emission measurements.	MaD MaD



**NOTE**

Check with the tractor owner/presenter that the camshaft belt has been changed at the manufacturer's specified interval. Removing the camshaft belt cover is not part of the roadworthiness test.

## 8.3.2. OPACITY

### Pre checks

These pre checks should be carried out before the smoke test is conducted. Where any of the following is noted the tester should not conduct a smoke test and the relevant reasons for failure under section 8.3.2 shall be applied.

- The engine warning lamp indicates a defect in the system.
- The oil level is below the manufacturer's minimum level.
- The coolant level is below the manufacturer's minimum level.
- The oil warning light remains on with the engine running.
- The oil level is above the manufacturer's maximum level.
- There are obvious engine defects.

### Method of testing

1. With the engine at normal operating temperature, raise the engine speed slowly to 1250 rpm or half the engine manufacturer's recommended governed speed whichever is less and hold for 20 seconds in order to purge the exhaust system. If the engine emits any unusual noises the test should be abandoned. Slowly raise the engine speed to its maximum rpm and note if the governor operates within the tractor manufacturers recommended rpm setting. If not the test should be discontinued. Do not hold the engine at maximum rpm for any length of time.
2. Connect the diesel smoke meter to the tractor following the manufacturer's instructions. Depress the accelerator pedal firmly from the idling position to the maximum fuel delivery position following the prompts of the smoke meter. The smoke meter is programmed to repeat this operation a minimum of 2 and a maximum of 5 times.

### Notes

**Where exhausts (or tail pipes) are fitted vertically, testers must ensure that adequate health and safety precautions are put in place and fully adhered to.**

- Where a tractor's engine speed is limited when the tractor is stationary, the smoke test may be carried out at the restricted rpm.
- All diesel engine tests must be performed according to EU Directives.
- DPF regeneration can sometimes cause diesel to be dumped into the oil, resulting in the maximum oil level (for servicing) being exceeded. The level of oil dilution which different manufacturers allow varies. Most tractors use sensors and where there is excessive fuel in the oil a warning light will illuminate. Others have an "X" marked on the dipstick which is above the "max" level. It should not be a reason for failure for tractors fitted with DPF where the oil level indicated on the dipstick is above the "max" unless the "X" mark is exceeded or the dashboard display indicates excessive fuel in oil.
- If the fuel pump seal is missing and the maximum rpm achievable is less than 90% of the manufacturer's stated maximum rpm with the tractor stationary, it may be the case that the fuel pump has been adjusted to pass the test and the tractor should be failed on this test.
- It is absolutely essential that the engine is at normal operating temperature before carrying out a smoke test. Engines should not be warmed up by being left idling or at half throttle. They should be warmed up by normal driving.
- When carrying out the test the throttle must not be "blipped".
- Where a tractor is producing black smoke to such an extent that the smoke meter might be damaged, the tractor should be failed without carrying out the normal smoke test (see Test for tractor registered prior to 1980).
- Unless test results are captured automatically by CoVIS, a print out of the smoke test results showing the tractor registration number, the maximum R.P.M, the engine idle speed, the engine temperature and the opacity value for each acceleration should be attached to each inspection report form.
- For each initial/periodic CVR test carried out, a diesel smoke test is required.

### 8.3.2. OPACITY

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Oil and coolant levels, oil warning light. b. Engine defects c. Engine idle speed. d. Smoke meter readings (1 January 1980 and 1 January 2018 (inclusive of both dates)). e. Emissions not in accordance with manufacturer's specifications.	(a). Engine oil level too high or too low, coolant level too low, or oil warning light remains on with the engine running. (b). Obvious engine defects. (c). Engine idle speed is incorrect. (d). For vehicles first registered between 1 January 1980 and 1 January 2018 (inclusive of both dates), the average smoke meter reading is higher than 2.5m <sup>-1</sup> in the case of naturally aspirated compression ignition engines, or the average smoke meter reading is higher than 3.0m <sup>-1</sup> in the case of turbo charged compression ignition engines. (e). The result of the test on exhaust smoke emission is not in accordance with the standard for exhaust smoke emission as specified by the manufacturer of the vehicle (recorded on the manufacturer's plate on the vehicle).	MaD MaD MaD MaD MaD

### 8.4. Fluid Leaks

#### 8.4. FLUID LEAKS

##### Method of testing

1. Check for any excessive fluid leak, other than water or other fluids referred to in this manual, likely to harm the environment or to pose a safety risk to other road users.

CHECK ITEMS	REASONS FOR FAILURE	SEVERITY
<b>Check for:</b> a. Excessive fluid leaks. b. Excessive fluid leaks (serious risk to road users).	(a). Any excessive fluid leak, other than water, likely to harm the environment or to pose a safety risk to other road users. (b). Steady formation of drops that constitutes a very serious risk.	MaD DD

# GUIDELINES FOR COMPLETING MODIFICATIONS REPORTS

Individuals must first read and fully understand the following important information before completing a modifications report (as per the attached template) in respect of a tractor presented for CVR testing.

## 1. Road Traffic (Construction, Equipment and Use of Vehicles) Regulations, S.I. 190 No. of 1963 (as amended)

In accordance with the Road Traffic (Construction, Equipment and Use of Vehicles) Regulations, S.I. 190 No. of 1963 (as amended), all vehicles on public roads must conform to the general principles set down in these Regulations in relation to the condition and maintenance of vehicles. All parts and equipment of every vehicle shall be in good and efficient working order. It is each vehicle owner's responsibility to ensure his or her vehicle is in compliance with the law and maintained in a roadworthy condition at all times.

## 2. Suitably qualified individual (SQI)

A "suitably qualified individual" (SQI) must have:

- An Engineering/Technical Qualification (Level 7 or higher accredited courses<sup>1</sup>) or appropriate accreditation with Engineers Ireland<sup>2</sup> or the Institute of Automobile Engineer Assessors<sup>3</sup>.
- A minimum of 5 years' experience of working in a suitable technical environment (preferably Automotive or Engineering Environment).
- Access to adequate facilities to carry out a thorough vehicle examination and appropriate professional indemnity insurance.

## 3. A modifications report is not required where:

- a vehicle has been subject to a post registration modification scheme in another Member State prior to being registered in Ireland and documentation (in English) is provided from the competent authority in the Member State concerned, giving details of the nature of the modifications carried out and the VIN of the vehicle. However, where such documentation has been provided but does not correspond to modifications identified and which may adversely affect the roadworthiness of the vehicle then a modifications report for the relevant modifications shall be required.
- a vehicle has been type approved and has one of the following certificates of approval corresponding to the vehicle presented;
  - ♦ An EC Certificate of Conformity (EC CoC) for a complete or completed vehicle,
  - ♦ National Small Series Type Approval Certificate of Conformity (Irish NSSTA CoC) for a complete or completed vehicle,
  - ♦ Individual Vehicle Approval Certificate (Irish IVA Certificate)
- However, where such documentation has been provided but does not correspond to modifications identified and which may adversely affect the roadworthiness of the vehicle then a modifications report for the relevant modifications shall be required.



**The following table must be completed for any vehicle modifications**

		Original		Modified	
EU Category <sup>1</sup>					
EU Bodywork Code <sup>1</sup>					
No. of seats (excluding driver)					
wheel configuration (e.g. 4x2, 6x4)					
Un-laden Vehicle Weight (kg)					
DGWV (Design Gross Vehicle Weight) (kg)					
Gross Combination Weight (N1, N2 or N3 only) (kg)					
		Design weight	Suspension type	Design weight	Suspension type
Design Axle Weights (kg) and suspension type (air/leaf)	Axle 1				
	Axle 2				
	Axle 3				
	Axle 4				
	Axle 5				
Maximum kingpin load (semi-trailers only) (kg)					
Wheelbase Length (mm)					

I declare the information provided in relation to the vehicle referred to in this report:

- Is true and correct.
- That the modifications/ repairs detailed above have been carried out to the vehicle such that the technical status and integrity of the vehicle and its other components and safety features have not been compromised and that the vehicle is safe to be used on the road and does not present a danger to the vehicle occupants or other road users.
- That the vehicle meets with the Road Traffic (Construction, Equipment and Use of Vehicles) Regulations (as amended), the Road Traffic (Lighting of Vehicles) Regulations (as amended) and the Road Traffic (Construction and Use of Vehicles) Regulations (as amended).
- That the vehicle meets with the essential technical provisions of the EU Directives to which the modification relates for the year and category of vehicle concerned.

**I declare that (tick  one of the following 3 boxes and complete all of the information necessary):**

• I am a “suitably qualified individual” (as per Note 2). The following details must be provided:  
 Engineering/Technical Qualification (must be Level 7 or higher accredited course):  
 Level \_\_\_\_\_ University / Institute \_\_\_\_\_ Programme \_\_\_\_\_  
 Or  
 Membership Grade with Engineers Ireland:  Associate  Chartered  Fellow  
 Or  
 Membership Grade with Institute of Automobile Engineer Assessors:  
 Associate  Member  Fellow  Honorary Fellow  
 Number of year’s experience (minimum 5) \_\_\_\_\_  
 Details of professional indemnity insurance (include company name (not broker), type of policy, expiry date)  
 \_\_\_\_\_

• I am an authorised representative of an Approved Test Centre (ATC) as appointed by the National Standards Authority for Ireland.

ATC Number (Unique identifier issued by NSAI)

• I am the manufacturer/ authorised distributor/ convertor of the vehicle (delete as appropriate)

**Complete ALL of the following IN BLOCK LETTERS and sign the declaration below;**

Name of Certifying Person:

Signature of Certifying Person: \_\_\_\_\_

Company name:

Position within company:

Company address:



Email:

Phone:

Date of certification:

Place of certification:



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