

# Testing Directive

## Changes to vehicle testing: BRAKES

### Introduction

It was clear from the outset that implementation of the Directive would lead to an additional burden upon testing stations, vehicle operators and the motorist. It was therefore important that we establish a number of prime objectives in delivering the change:

- ▶ Ensure compliance with the Directive across all test schemes
- ▶ Minimum increase in time to complete the test
- ▶ Minimal additional test equipment
- ▶ Perceived road safety value
- ▶ Which vehicles type each testable item applies to
- ▶ The interpretation of a Directive originally written in another language and translated into English



Initially, our existing test schemes were compared with the requirements of the Directive to identify the additional test items. We then put forward a series of proposals to DfT in respect of implementing the changes, including the proposals for additional test equipment.

We began a series of negotiations between DfT, the European Commission and VOSA, on what was in / out and what test items applied to which types of vehicle. We agreed that some test items were of higher risk to heavy vehicles rather than private cars/vans, so debated the need to put these items in the MOT scheme.

We believed that the risk factor is proportionate to vehicle mileage and volume and having considered the available information for 30 million cars/vans and 500k trucks and buses - the risk data for inclusion of some items simply did not stack up. Therefore, we could report to the Commission that we were satisfied that we met their standard.

In other areas it was clear that we did not comply with the Directive and therefore we had to introduce new test items into Schemes. This was perceived to be the 'minimum cost' of compliance.

Taking into account these factors leaves us with a Scheme that remains relatively low change and DfT have the honour of reporting back to European Commission that we comply with the requirements of the Directive.

# MOT Changes to Inspection Manual

## - Section 3 (Brakes)

This Technical Pen Picture gives an overview of the MOT test changes in respect of braking checks and performance requirements brought about by an amendment to Annex II to Directive 2009/40/EC and introduced by Commission Directive 2010/48/EU.

Unless otherwise stated, these changes will take effect from 1 January 2012.



### Section 3.1 – Parking Brake Lever Mechanism and Associated Mountings

This Section has been renamed 'Parking Brake Control' as we have added Electronic Parking Brake (EPB) controls as testable items. Regardless of the type of control fitted, the checks now include that the control is present and accessible from the driver's seat. Also, that the control has not been 'inappropriately repaired or modified'. These terms are used throughout the braking section and we have defined this as 'when the repair is obviously likely to adversely affect the roadworthiness of the vehicle or if any modification has seriously weakened the component'. If the vehicle is fitted with an EPB, there is an additional check that the EPB warning lamp does not indicate a malfunction.

### Section 3.3 – Service Brake Control

This Section has one additional check, which is that the control has not been inappropriately repaired or modified. We have used the same terminology and standards for this test item throughout the Inspection Manual.

### Section 3.4 – Anti-Lock Braking Systems

Added to this Section are checks on any electronic stability control system fitted (regardless of what the vehicle manufacturer calls it; e.g. ESC, ESP, DSC etc.). To take account of the additional item, the Section has been renamed 'Anti-Lock Braking and Electronic Stability Control Systems'.

Previously, the checks of the ABS system only involved the warning lamp and its operating sequence. However, checks will now also include the condition of ABS/ESC components (which are generally common to both systems), electrical wiring, the ESC switch and the presence and operation of the ESC malfunction indicator lamp (MIL).

Vehicles will fail if any ABS/ESC components are obviously missing, excessively damaged or inappropriately repaired or modified. Excessively damaged electrical wiring or an ESC switch missing, insecure or faulty are also Reasons for Rejection.

## Electronic Stability Control (ESC) in brief

- ▶ ESC is a safety feature which can help drivers avoid accidents.
- ▶ The Department for Transport has carried out research into ESC which indicates that ESC equipped vehicles are involved in 25% fewer fatal road accidents.
- ▶ ESC appears to also offer benefits in adverse road conditions, such as wet or snowy conditions, and especially in reducing the number or severity of crashes which lead to skidding and/ or overturning.
- ▶ This is a relatively new safety feature which is available as standard on some new cars and as an option on many others.

Check the DfT Safety area about ESC, alternative names for ESC and frequently asked questions: <http://www.dft.gov.uk/pgr/roads/vehicles/vssafety/esc>

## Section 3.5 – Mechanical Brake Components

This Section sees the addition of checks on the security of brake cables, rods and joints. Any mechanical brake component will also be failed if it has been inappropriately repaired or modified.

Also added is a check on the condition and operation of brake slack adjusters, which are usually only fitted to very large vehicles with air braking systems.

## Section 3.6 – Braking Systems and Additional Braking Devices

The title of sub-section 'A' has been changed from 'Leaks' to 'All Braking Systems'. This allows us to avoid the repetition of certain checks that apply to a number of sub-sections. Leaks will still be part of this sub-section, but checks on the security, condition and operation of braking system components have also been added.

As in the previous braking sections, the check for inappropriate repairs or modifications to braking system components is added.

Sub-section 'E' covers brake valves and has additional checks relating to load sensing valves (LSV). We will be checking if the LSV is:

- ▶ seized or inoperative
- ▶ defective so that its function is impaired, or
- ▶ incorrectly adjusted.

These checks previously only applied to the LSV linkage.

We already check if the brake fluid level is satisfactory and there will be an additional Reason for Rejection for the brake fluid warning lamp being illuminated or inoperative.

Air brake systems are not often encountered in the MOT scheme, but we have added additional Reasons for Rejection for a brake actuator dust cover missing, insecure or damaged so that it no longer prevents the ingress of dirt.

For Class 5 vehicles we have added checks of Electronic Braking Systems where one is fitted. The checks are restricted to the systems warning device for its presence; operation and if a fault is indicated.

### Section 3.7 – Brake Performance

We have added a Reason for Rejection that if, during a decelerometer test, the vehicle swerves excessively from a straight line when the parking brake is applied, the vehicle will fail.

Further changes to brake performance testing and the efficiency requirements will be introduced in the autumn of 2013 and will only apply to vehicles first registered on or after 25 July 2010. Look out for further pen pictures in 2012 that will update you.

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## HGV and PSV Changes to Brake System Inspection

**This Technical Pen Picture gives an overview of the HGV and PSV test changes in respect of braking checks and performance requirements brought about by an amendment to Annex II to Directive 2009/40/EC and introduced by Commission Directive 2010/48/EU.**

**Unless otherwise stated, these changes will take effect from 1 January 2012.**



### IM Section 36 – Hand Lever Operating Mechanical Brakes

This section has changed by adding a reference to brake pivot(s) free movement in relation to the mechanical lever correct operation.

## IM Section 37 – Service Brake Pedal

We have introduced a check on this item to make sure that there is free movement of the brake pedal pivot.

## IM Section 38 – Service Brake Operation

We have included in this Section operation of the electronic braking system (EBS) where one is fitted. You will not be required to carry out enhanced checks above what would normally be done in relation to ABS. The check will be to make sure that the EBS MIL operates correctly where possible and that an ISO 7638 is fitted when required.

The ISO 7638 is associated with braking systems only and provides connections for ABS/EBS, warning lamp and CAN (Controlled Area Network) data lines. This data line is used when both the vehicle and the trailer of a combination are fitted with EBS and it allows the two systems to communicate. This communication delivers improved response times (via the demand value signal regulated by the amount of braking required by the driver) and has the ability to indicate specified and non-specified faults. The data line can also be used for vehicles without EBS, for example, to indicate a warning for brake lining wear.



The ISO7638 socket (left) can be fitted to either the motor vehicle or trailer. They are connected by a cable with two male plugs. Alternatively the socket on an articulated motor vehicle can be removed and the cable permanently wired into the vehicle and trailer. In the case of a drawbar trailer, the legislation requires a socket to be fitted.

## IM Section 58 – Additional Braking Devices

This is a new Section. Additional braking devices, sometimes called ‘retarders’ or ‘endurance brakes’ have been fitted to goods vehicles for some time. For testing purposes these do not include engine retarders or exhaust brakes such as ‘Jake’ or ‘Jacobs’ brakes or Voith integral gearbox retarders, simply those fitted externally that are visible during the inspection and are fitted or required.

A retarder is an assembly of electro magnetic coils which, when activated by an electrical current, creates eddy (Foucault) currents between two rotors and a stator and retards the movement of the rotor. Fitted into the driveline of a vehicle, the retarder acts directly on the

driven wheels and reduces the speed of a vehicle. Retarders are frictionless, virtually maintenance free and mainly manufactured in France. In most European countries, retarders are mandatory fitment for buses, coaches and some heavy transport vehicles because they significantly improve the safety of these vehicles.

The energy created in the operation of a retarder is sometimes converted into heat. Correctly applied, however, this temperature build up will be dissipated through efficient heat sinks on the retarder and no loss of efficiency will occur.

The retarder can be activated by switches fitted to the accelerator and the clutch and by a hand-operated lever mounted to the steering column or the dashboard. Retarders can be retrofitted to a vehicle; however, fitment is simpler if carried out before bodywork is fitted.

We have kept the test on these items in line with the Directive standards and we will require that examiners check if the device is fitted where required. The device is only mandatory on ADR vehicles of the following category:

- a) A motor vehicle first registered after 30 June 1993 with a maximum mass exceeding 16 tonnes.
- b) A motor vehicle first registered after 30 June 1995 authorised to draw a trailer exceeding 10 tonnes.
- c) A motor vehicle exceeding a maximum mass of 16 tonnes, a motor vehicle capable of drawing a trailer exceeding 10 tonnes or a trailer with a maximum mass exceeding 10 tonnes, first registered and presented for approval on or after the 1st April, 2002.

#### **Three checks will be made:-**

Fitted where the device is mandatory – Only the three criteria above will be used and only those vehicles presented where we can establish that a valid ADR certificate is applicable. If the device is fitted in any circumstances, we will check the security and condition of components. There will be no operational checks.

## **IM Section 59 – Brake Systems and Components**

There have been a number of changes to this Section.

The first is the addition of a test item that relates to a brake cable guide. Next the brake fluid level where this is visible without removing the reservoir cap. Most trucks will have this visible at the side of the vehicle but sometimes examiners will be required to open access panels in the same way we currently do to view other components. Inside the cab manufacturers sometimes fit brake fluid level warning lights and we will need to make sure the light operates and extinguishes when the test conditions have been met.

An additional Reason for Rejection has been added for a brake actuator dust cover missing, insecure or damaged so that it no longer prevents the ingress of dirt.

Lastly, a check will be required to make sure that the load sensing valve data plate is fitted and legible. This will be required ONLY on vehicles and trailers in 2013 and 2014 – but earlier on PSV's – Vehicles registered after 29th October 2011 and therefore subject to Whole Vehicle Type Approval.

## IM Sections 71, 72 and 73 – Service, Secondary and Park Brake Efficiency

We plan to make one fundamental change to the way we test brakes. This change may be later than the January 1st 2012 implementation date if we have issues in relation to equipment requirements. We currently test performance values in relation to the **Design** Gross Vehicle Weight. We plan to test brakes to the EU Classification known as **Maximum Authorised Mass** (MAM) This is also known in the UK as the Gross vehicle Weight and is the maximum weight used in the UK.

**Remember:** we will not be changing the values of our performance checks and for trailers where we use the total axle weight; this will not change – we simply replace the **DESIGN** total axle weight with the maximum total axle weight applicable for UK use.

We will be looking at how this change can be effected in a later pen picture but we are confident that we shall not be carrying out large changes to the brake machine software or the test database.



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