

SPECIFICATION
ROLLER BRAKE TESTERS
FOR TESTING
CLASS I & II VEHICLES

Issue Date: 10 December 1999

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1. INTRODUCTION

This Specification details the MINIMUM performance and constructional requirements for Roller Brake Testers (RBTs) intended to be used for the statutory annual MOT brake performance testing of Class I & II vehicles in accordance with the Motor Vehicle (Tests) Regulations 1981, as amended.

The Specification does not rule out additional features supplied with the equipment provided that the features are acceptable on health and safety grounds and do not prevent or make it more difficult to carry out the MOT Test as prescribed.

2. TECHNICAL REQUIREMENTS

The RBT shall consist of a roller set mounted in the ground, or within a raised floor, with a separate display console and a means of measuring the weight on each wheel of the motorcycle or combination. The RBT shall be safe to use, robustly constructed to acceptable engineering standards and suitable for brake testing solo motorcycles or motorcycle combinations with either a left or right mounted sidecar.

2.1 Roller Set

The roller set shall have;

- a. a means of preventing the roller set operating unless a wheel is correctly located in it.

Note: Except following calibration (see Section 3.1 below).

- b. a means of manually stopping the roller set.
- c. an automatic means of stopping the roller set when the tyre to roller slip reaches a pre-set limit in the range 20 to 30%.

To ensure that the slip value remains constant throughout the full range of brake force, and if variations occur in the power supply, the means of stopping the roller set shall include actual measurement of the speed of the sensing roller and the speed of the motor/drive roller train.

Note: A tyre to roller slip of 20% is when the surface speed of the vehicle wheel equals 80% of the surface speed of the RBT rollers.

- d. a design which allows the brake testing of small-wheeled or low ground clearance motorcycles (small scooter, eg Honda Vision) without any part fouling or grounding.
- e. the capability of accepting a wheel load of 750 kg.
- f. a clear, durable marking showing the normal forward 'drive-on' direction of the RBT.
- g. no part protruding more than 50 mm above the floor surface.

2.1.1 Rollers

The rollers shall have;

- a. a surface that is durable and not likely to cause undue tyre damage.
- b. a roller to tyre co-efficient of friction of not less than 0.6μ in wet conditions.
- c. the following dimensions;
 - i) minimum diameter 170 mm
 - ii) minimum length 250 mm
 - iii) maximum length 300 mm
 - iv) not greater than 400 mm between roller centres
- d. (when running) a constant surface speed in the range 2 to 5.5 km/h.

Note: The speed of the rollers shall remain within the specified range throughout the full range of brake force.

2.2 Brake Force Display

The brake force display shall;

- a. indicate in units of kilogram force (kgf)
- b. be analogue and sufficiently sensitive to show the variations in brake force caused by excessive drum ovality or disc runout.
- c. if a VDU is used, include an additional digital display of brake force which shall be of a size that is readable from the motorcycle riding position.

Note: If the brake force is displayed on traditional dials, an additional digital display of brake force is acceptable.

- d. have a maximum brake force display value of not less than 300 kgf.
- e. be marked with graduations of not more than 10 kgf from zero to maximum value.

Note: If a VDU is used, a more relaxed requirement can be applied to the analogue scale provided that the digital scale exceeds the above requirement.

- f. indicate when a wheel lock occurs.
- g. retain the maximum brake force value until either the indication is manually reset or the rollers are re-started.

2.3 Weight Measurement

There shall be a means of measuring the weight on each wheel of the motorcycle, or combination, capable of measuring a minimum of:

250 kg per wheel

The means can be either incorporated into the RBT or separate. If separate, suitable ramps shall be provided and the under-surface of both the weigh scale and the ramps shall be non-slip.

2.4 User Controls

Note: AUTOMATIC operation of a RBT is NOT permitted for MOT testing.

The user controls shall be;

- a. manually operated.
- b. suitably identified in English or with acceptable symbols.
- c. capable of starting and stopping the roller set.
- d. capable of being operated from the motorcycle riding position either manually or by remote control.

If the remote control unit is not hard-wired:

- e. suitable secondary operating controls shall be available on the console, or equivalent.
- f. the unit shall be resistant to spurious signals from other sources.
- g.. a system shall be in place to ensure that each unit is dedicated to operate only one RBT when two or more are used in close proximity.
- h. provision of safe storage shall be provided for the remote control unit when not in use.

In addition, there shall be;

- i. a visual indication for the user on the display console showing;
 - i) when the roller set is in operation, and
 - ii) if the RBT has a bi-directional facility, whether the roller set is operating in 'forward' or 'reverse' direction.
- j. a durable notice stating "RBT shall NOT be used in automatic mode for MOT Testing" if the RBT is equipped with an automatic facility.

2.5 Brake Efficiency

There shall be a satisfactory means available for either the user to calculate or for the RBT to display the value of brake efficiency calculated from the total brake force and expressed as a percentage of the measured weight of the motorcycle and rider combined.

If the RBT is equipped with a means of automatically calculating brake efficiency, the algorithm used shall be in accordance with that specified in the latest version of the relevant MOT Inspection Manual.

3. CALIBRATION

A means of calibrating both the brake force and weight measurement shall be available and for each system the display shall be capable of showing negative numbers close to zero.

The applicant shall provide an assurance that a system is in place to ensure all of its calibration devices used for the subject RBT are checked and certified by an accredited organisation on a regular basis.

3.1 Brake Force Measurement

The calibration equipment shall;

- a. be capable of checking brake force accuracy at the following values;

0, 50, 100, 200 and 300 kgf

Note 1: If the brake force measurement is displayed on traditional dials, the accuracy of the calibration shall be assessed via the dials and not from any secondary means.

Note 2: If the brake force measurement is displayed on a VDU, the accuracy of the brake force measurement shall be judged against the digital values.

- b. have a method and operational accuracy that is traceable to a national physical standard.
- c. be certified by a NAMAS accredited laboratory or an equivalent European laboratory, that the whole calibration device is traceable to a national physical standard.

Note 1: All component parts of the calibration device, including any weights, shall be individually marked with an identity number to enable all parts to be kept together as a set. The certificate shall relate to the set and each calibration device produced shall require its own certificate.

Note 2: If the certificate or any other relevant document produced for the calibration device is not in English, the applicant shall make available a translation into English.

When the static calibration has been completed, to assess the level of torque required to rotate the RBT drive train mechanism, including any unexpected cause of increased friction such as a failing roller bearing, the following test shall be carried out:

With the RBT in 'calibration mode' and with NO vehicle in the rollers, the rollers shall be rotated and the brake force displayed shall not exceed:

3% x 300 kgf (max brake force)

= 9 kgf

3.1.1 Accuracy

The RBT brake force readings shall be accurate to within;

+/- 3 kgf of the true value from zero up to and including 100 kgf.

+/- 3 per cent of the true value for all readings above 100 kgf.

The RBT brake force calibration device shall be accurate to within:

+/- 0.3 kgf of the true value from zero up to and including 100 kgf.

+/- 0.3 per cent of the true value for all readings above 100 kgf.

3.2 Weight Measurement

The accuracy of weight measurement shall be checked at the following values:

0, 50, 100 and 200 kg

Two assessment methods are acceptable;

- i) applied weights, or
- ii) purpose made calibration equipment.

If weights are used they shall be certified. If purpose made equipment is used, the method and operational accuracy shall be certified as traceable to a national physical standard.

3.2.1 Accuracy

The means of weight measurement shall be accurate to within;

+/- 3 per cent

The means of calibrating the weight measurement shall be accurate to within;

+/- 0.3 per cent

4. INSTRUCTION MANUAL

A comprehensive Instruction Manual shall be supplied with each RBT.

The Instruction Manual shall;

- a. be written in English.
- b. explain how to operate the RBT, including the function of each control, and how to interpret the results.
- c. detail how to use the RBT to carry out a brake performance test and make reference to the need to follow the brake test procedure detailed in the latest version of the relevant MOT Inspection Manual when carrying out a statutory MOT test.
- d. detail the procedure for calibrating the RBT.

Note: Inclusion of the calibration procedure in the Instruction Manual is applicable only if calibration equipment is to be offered to the purchaser of the RBT. If not, a separate

Calibration Manual for use by the service engineer shall be available for assessment at the approval stage.

5. IDENTIFICATION

The RBT shall be marked with a durable identification on the exterior of the control console, or equivalent, showing the make, model and serial number.