

Appendix D

GE_ATLMCA

MOT Class 1&2 roller brake tester

USER MANUAL

Manual testing

Please read the user manual before starting the test procedure!

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1 Introduction

This appendix describes how to safely use the **GE_ATLMCAP adaptor plate** with either a GE4ATL or GE7ATL brake tester for statutory Vehicle Inspection test class 1 and 2 vehicles. The manual is intended for users of this equipment. Another manual for installation, service and calibration is available.

The brake tester with adaptor is designed for testing commercially available class 1 & 2 motor-cycles for road use. The maximum axle load during the test is 3000 kg. The test speed is 2.9 km/h and the brake tester can be operated by one person.

This manual describes how to carry out a brake test according to the GB Department of Transport compulsory schemes. The manual provides the MOT braking measurement requirements and describes a complete test procedure.

The customer should ensure that the installation for testing vehicles under any of the Department of Transport compulsory schemes, is in accordance with the details mentioned in the Department of Transport's requirements.

The motor and control gear of the brake tester are not flameproof and it is the responsibility of the operator to make sure that the proposed site and the aspects of the installation comply with the Petroleum Regulations and that they satisfy the local Petroleum Officer's requirements.

User manual

- 2 General product description (see main manual)**
 - 2.1 The digital display (see main manual)**
 - 2.2 The digital ATL display (see main manual)**
- 3 Safety (see main manual)**
 - 3.1 Important safety rules (see main manual)**
 - 3.2 Safety devices (see main manual)**
 - 3.3 Misuse (see main manual)**

4 MOT regulations

- The efficiency of each system operated by a single brake control is the ratio of the retarding force generated by that system divided by the weight of the machine and the rider.
- Most machines have two controls, one operating the front wheel brake and the other operating the rear wheel brake.
- Where a linked or dual system is operated by one control, the retarding force used in the efficiency calculation is the total from both wheels when operated by that control only. In this case the other control will probably operate on one wheel.
- Efficiency calculation:

$$\text{Efficiency \%} = \frac{\text{Total retarding force for one system}}{\text{Weight of machine plus rider}} \times 100$$

The MOT brake efficiency requirements are specified as:

- Minimum brake efficiency of not less than 30% when one of the brake controls is operated.
- Minimum brake efficiency of not less than 25% when the other brake control is operated.
- Minimum brake efficiency of not less than 30% when only one means of operating the brakes is required for motor-cycles registered before 1 January 1927.

Source: The "MOT Inspection Manual Motor Cycle Testing, 1992 edition"

- The Department of Transport allows the use of an electronic calculator to perform the calculation of brake efficiency.

User manual**5 Manual MOT testing procedure**

Chapter 5 describes the testing procedure on the roller brake tester according to the MOT method of inspection. See *the latest MOT Inspection Manual to check for any recent changes*.

- The brake force is indicated in **kgf**.
- The weight is indicated in **kg**.

The procedure is written for units with the designated single wheel operation on the left roller bed. For units with the designated single wheel operation on the right roller bed replace **Key "LEFT"** with **Key "RIGHT"**.

When the 3-wheel mode is selected, as a safety precaution, the right rollers will not start when the middle roller of the right side is pressed down as well.

5.1 Preparations before starting a brake test

- A. Examine the tyres to ensure they are not under-inflated, if the tyre pattern is in good condition and if the tyres are free from mud and stones.
- B. Remove the left roller cover from the roller tester, fit the adaptor plate and switch the power on.
- C. Determine if the brake control system is single brake controlled or linked/dual brake controlled.
- D. Select 3-wheel mode by pressing Key "MAN" twice.
- E. The machine is now ready to test the front wheel.

NO MOTOR-CYCLE SHOULD BE IN/ON THE BRAKE TESTER WHEN THE MACHINE IS SWITCHED ON !

The machine will go through its self-test and through its warm-up stage. When the horizontal bar diagrams are going back slowly from right to left, by pressing RESET, the tester will be in its test mode. The first dot of digital LED display (1), (2) and (3) are at zero. This is the indication the unit is ready for testing.

- Pressing any **KEY** on the remote control can always stop the motor and abort a test.
- In the event of an emergency, these procedures must be followed:
 - (1) Press any **KEY** on the remote control. This will stop the rollers or
 - (2) Press the manual start/stop button on the side of the cabinet or
 - (3) Push the **red emergency stop switch**, to isolate the electrical supply to the roller bed and stop the rollers.

**The described KEYS correspond with the KEYS on the infra-red remote control.
(see chapter 2.1.1 of the main manual)**

Press "RESET" to reset the system and clear the memory from any previous results!

5.2 Testing motor-cycles with single brake control systems

Weight and brake force will be displayed, however, these values can not be assigned and stored into the computer's memory and therefore automatic calculation of the brake efficiencies is not possible.

TESTING THE FRONT WHEEL

Press RESET to clear the system's memory from any previous results.

- ➡ Drive the front wheel in the rollers. Make sure that the motor-cycle is positioned on the rollers in a straight line and that it is not in gear. The driver should sit on the motor-cycle as in a normal driving situation.

STEP 1: Measure weight of front wheel and brake force

- A. Press **Key "LEFT"** to start the measurement.
The weight of the front wheel is measured and displayed on the ATL display.
The weight value will be replaced with the brake force measurement and therefore should be noted at this point.
The **"C (left)"** lamp flashes as an indication that the left rollers are running.

A moment after the weight measurement is taken; the rollers will start.

- B. Slowly increase the brake force on the first brake control system (hand brake) until maximum effort is achieved, or until the wheel locks and slips on the rollers. The real time brake force is displayed on the LED display.

At the slip limit the motor will be cut out immediately (to avoid unnecessary wear of the tyre) and the **"lock"** lamp will light to indicate this wheel lock. If slip does not occur while the maximum brake force is achieved, the rollers can be stopped by pressing **Key "LEFT"**.

For an accurate measurement, the brake force has to be built up slowly!

After the rollers have stopped, the weight, and maximum brake force (for that particular measurement) will be displayed on the ATL and LED displays. The values will remain displayed until either the tester is manually reset or the rollers are re-started for the next measurement.

- C. The operator has to *observe and note* the weight and brake force for manual brake efficiency calculation. The brake test can be repeated if necessary.

User manual**STEP 2: Observe brake force fluctuations front wheel**

- ➡ After the brake force measurement, the front wheel is tested for brake force fluctuations.
- D. Press **Key "LEFT"** to start the measurement.
A moment after the weight measurement is taken (irrelevant for measuring ovality), the rollers will start.
Slowly increase the brake force and hold it steady at a constant value of approximately half the maximum value measured in **STEP 1**. Visually check the brake force fluctuations on that wheel.

The operator should note and interpret the irregularities in the brake force behaviour. Release the brake quickly and observe the way in which the braking effort reduces.

Press **Key "LEFT"** to stop the rollers.

TESTING THE REAR WHEEL

- ➡ Drive the rear wheel in the rollers. Make sure that the motor-cycle is positioned on the rollers in a straight line and that it is not in gear. The driver should sit on the motor-cycle as in a normal situation.

STEP 3: Measure weight rear wheel and brake force

- E. Press **Key "LEFT"** (*start/stop*) to start the measurement. The "**⬅ (left)**" lamp flashes as an indication that the left rollers are running. The weight of the rear wheel is measured as described in **STEP 1**.

A moment after the weight measurement is taken, the rollers of the will start.

- F. Slowly increase the brake force on the second brake control system (foot brake) until maximum effort is achieved, or until the wheel locks and slips on the rollers. The real time brake force is displayed on the LED display (2).

At the slip limit the motor will be cut out immediately (to avoid unnecessary wear of the tyre) and the "**lock**" lamp will light to indicate this wheel lock. If slip does not occur while the maximum brake force is achieved, the rollers can be stopped by pressing **Key "LEFT"** (*start/stop normal direction*).

After the rollers have stopped, the weight, the maximum brake force and the efficiency (for that particular measurement) will be displayed on the ATL and LED. The values will remain displayed until either the tester is manually reset or the rollers are re-started for the next measurement.

- G. The operator has to observe *and note* the weight and brake force measurement for manual brake efficiency calculation. This brake test can also be repeated if necessary (see point C).

User manual**STEP 4: Observe brake force fluctuations rear wheel**

- H. After the brake force measurement, the rear wheel is tested for brake force fluctuations. Follow the procedure as described in **STEP 2**.

5.3 Test results

After the complete test, or after testing one of the brake control systems, it is not possible to display the calculated brake efficiency by means of the infra red remote control. For motor-cycles with two controls, one operating the front wheel brake and the other the rear wheel brake, the calculation of the brake efficiency is as follows.

Test results first braking control system (hand brake)

$$\text{Efficiency \%} = \frac{\text{Kgf front}}{\text{SUM kg front, rear, rider}} \times 100$$

Test results second braking control system (foot brake)

$$\text{Efficiency \%} = \frac{\text{Kgf rear}}{\text{SUM kg front, rear, rider}} \times 100$$

5.4 Testing procedure without remote control

It is possible to perform a test without the remote control, however, you must consider that this test has its limitations. This test procedure requires two persons to operate the *brake tester*. One person to do the test, while the other person pushes the start/stop button on the display.

A push button has been installed on the display. If you want to start the rollers, press the button for 1 second. The rollers will start in the *normal* (forward) direction. Press the button again to stop the rollers. The test starts and the procedure is the same as described in paragraph 5.2. The manual button functions as **Key "LEFT"** on the remote control.

5.5 Testing motor-cycles with linked (dual) brake systems and/or sidecars

5.5.1 Testing linked (dual) brake systems

If the first brake control system (hand brake) also operates the rear wheel, **STEP 3** needs to be repeated for handbrake when the rear wheel is still in the rollers.

If the second brake control system (foot brake) also operates the front wheel, **STEP 1** needs to be repeated for foot brake when the front wheel is still in the rollers.

5.5.2 Testing sidecars

If the motor-cycle is equipped with a sidecar, both the weight, and any brake force produced by one of the two brake control systems needs to be measured.

Drive the sidecar into the rollers. Make sure that the sidecar wheel is positioned on the rollers in a straight line and that the motor-cycle it is not in gear.

Press **Key "LEFT"** (start/stop) to start the measurement.

The weight of the sidecar is measured as described in **STEP 1** (chapter 5.2).

A moment after the weight measurement is taken; the rollers will start.

There are 4 possibilities to operate the brake of a sidecar.

- A. It is controlled by hand brake.
- B. It is controlled by foot brake.
- C. It is controlled independently.
- D. There is no brake control operating the sidecar.

Slowly increase the brake force until maximum effort is achieved, or until the wheel locks and slips on the rollers as described in **STEP 1** (chapter 5.2).

After the brake force measurement, the sidecar wheel is tested for brake force fluctuations. Follow the procedure as described in **STEP 2** (chapter 5.2).

5.5.3 Test results

The calculation of the test results of more complex motor-cycles is similar to the method described in chapter 5.3.

Test results first braking control system (hand brake)

$$\text{Efficiency \%} = \frac{\text{SUM kgf front, rear, sidecar for hand brake}}{\text{SUM kg front, rear, sidecar, rider}} \times 100$$

Test results second braking control system (foot brake)

$$\text{Efficiency \%} = \frac{\text{SUM kgf front, rear, sidecar for foot brake}}{\text{SUM kg front, rear, sidecar, rider}} \times 100$$