



Brake Tester CVBT7600

OPERATING INSTRUCTIONS

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Important

Every reasonable effort has been made to ensure that information within these Operating Instructions is correct at the time of release, but Dieseltune cannot accept-responsibility for any errors that may occur.

The information in these Operating Instructions is subject to change without notice, and does not represent a commitment on the part of Dieseltune.

Service & Warranty

The reliability of this equipment is fully supported by our service agent. Please refer to the page at the end of this manual for full details.

Note: Your attention is drawn to our Terms & Conditions of Sale. If a service engineer is called out. under service warranty where, upon inspection and test the equipment is found to be in full working order and no fault found, the user is liable to be charged the cost incurred for this call out. Before calling out an engineer, ensure your equipment is faulty by checking its operation, particularly mains supply and fault codes/self test if applicable.

WARNING: Do not attempt to operate this equipment unless you have read and understood these instructions.

Safety Precautions

Safety Precautions

1. Read these operating instructions carefully and thoroughly before attempting to operate the equipment.
2. This operating manual should be available at the testing site at all times.
3. Always follow the procedures and actions defined in this manual, failure to do so may result in personal injury or other damage. The manufacturer cannot be held liable for personal injuries or vehicle damage that occur as a result of misuse of the equipment.
4. All the national and international safety guidelines and legal regulations are to be followed when operating testing equipment.
5. The operator is obliged to adhere to all the regulations applying to the workplace and to ensure his knowledge of such regulations is up to date.
6. Do not allow other personnel near the test vehicle or rollers while a test is in progress. Check that the area is clear before the rollers are started or the vehicle moved EACH TIME this action is taken.
7. Testing often takes place with the engine running, to provide a vacuum supply to the brake servo. Ensure exhaust extraction or adequate ventilation is used to clear the poisonous exhaust gasses.
8. Do not modify the equipment or change any internal settings – this could result in a very dangerous condition where the rollers could be started WITHOUT a vehicle in the rollers!

TESTING STANDARD

When performing statutory MOT tests it is vital to follow the brake test procedure detailed in the latest version of the relevant MOT Inspection Manual.

Hints and Tips

- 1.** The brake tester must only be used for its intended purpose.
- 2.** All the performance limits are to be followed, do not drive excessively heavy vehicles over the pit unit or otherwise abuse the equipment as damage may occur and test result accuracy may be affected.
- 3.** Only authorised and well-trained personnel should perform the testing.
- 4.** The work area should be kept clean and dry.
- 5.** Always keep a safe distance from moving parts. The area must be marked so that vehicle owners are aware of the danger associated with brake testing.
- 6.** Note the location of the emergency stop switch before starting to use the equipment.
- 7.** When driving off the brake tester, the roller motors should be switched on so that the rollers are driven. This limits the speed of the rollers to a safe value. If the vehicle is driven off the rollers without them being powered damage may occur. Use the 'TEST' button on handset to start both rollers.
- 8.** Do NOT use the brake tester to start the engine of a vehicle as this may damage the electric motors.
- 9.** Drive on and off the tester slowly and in a controlled manner.
- 10.** Always check the ground clearance of the vehicle is adequate before performing the test.

Introduction

Introduction

Control can be performed using the remote infra-red handset at the vehicle so one man operation is possible.

Description of system components

The roller brake tester consists essentially two parts: one above ground, the control and display console and one below ground, the road simulation rollers. A brief description of the various features follows:

Emergency switch

The brake tester is equipped with an emergency stop switch or wall mounted isolator. Note the location of the this before starting to use the equipment. The emergency switch is not necessarily positioned in the same place at every installation, check the location before using the equipment.

Pit unit

The rolling road consists of two sets of free roller pairs connected by a chain and indirectly driven by two electric motors through gearboxes. The gearbox is joined to the roller tester frame by a force transducer. During the motor operation when the car is braking, the resultant force is transmitted from the rollers to the brake force transducer. The outputs of the transducers are monitored by the internal circuits and eventually shown on the display as brake effort.

A small third roller is fitted between each pair of main rollers. These perform two vital functions. Firstly to monitor the presence of a wheel in the rollers so that motors can only be energised when a vehicle is present and secondly to measure speed of the wheel that is being braked. This ensures that the motors are automatically switched off when the tyre starts to slip on the roller surface.

CVBT7600 Roller Brake Tester



System Components

Control unit

The control unit contains front panel with:

Green indicator light:	Car on rollers / Rollers drive direction / 4WD (Arrows Lup, LDn, Rup, RDn)
Red indicator lights:	Wheel locks (Lock left & Right)
Green indicator light:	Ready for test (Ready)
Orange indicator lights:	Show which scale range is being used
Pointers:	Green for left, red for right
Digital display (DDsp):	Imbalance, ovality, pressure, weight
Amber indicator lights:	Showing type of information on digital display (Oval, Pres, Wght)

Inside: Power supply board for control computer, front panel, amplifiers and motor control

Outside: Main switch, Motor reversing switches and Wall mounted isolator

Printer

The printer is an optional device that can be specified at the time of purchase or fitted later. Follow the instructions in the printer handbook for loading paper and fitting ink cartridges (if applicable).

System Components

Remote control

Remote control consists of 16 keys, some of which have dual function which are activated through the 2nd key.



START:	Used to start the rollers when the system is ready for a test.
STOP:	Used to stop the rollers, any roller that is running will stop. To stop the test completely, press OK while Digital Display= STP
UP ARROW:	Used for axle selection.
DOWN ARROW:	Used for axle selection
OK:	Press to save result from the last test step.
LEFT ARROW:	Used for wheel selection
RIGHT ARROW:	Used for wheel selection
DIFF:	Selects imbalance when both wheels are running
AIR:	Selects air pressure display when both wheels are running
4WD:	Used to switch test procedure into a special mode that rotates wheels in opposite directions during all test steps so that prop shaft does not rotate.
SEC:	Used to initiate secondary brake test.
PARK:	Used to initiate parking brake test
OVAL:	Used to initiate ovality measurement
WGHT:	Used for weight input. With vehicle in rollers, press WGHT . Press STOP to cancel weighing or OK to confirm and save axle weight.
AXLE:	Used for axle selection
DISP:	Not used in this application

System Components

PRINT:	Used to print test results
TEST:	Starts both rollers so that the vehicle can be driven out.
2nd:	This key activates the second function of other keys
2nd STOP:	Will RESET the system and clear all previous results so that a new vehicle test is activated. When the system is RESET the Digital Display= CL5.
2nd WGHT:	This key sequence allows manual weight entry. Digital Display= At Respond by pressing AXLE for individual axle weight entry or TEST for gross vehicle weight. Enter the weight in 100kg units i.e. 100 = 10 Tonnes. Then press OK .
Fn	This key is currently not used.

Note: The CL5 legend indicates the roller brake tester is suitable for use with vehicles up to Class V.

Guide to Testing

General guide:

At first switch on all the LED indicators will be illuminated so that functionality can be checked.

The **START** key starts the motor or motors as appropriate. This will only happen with a car in the rollers as shown by the green Ready indicator lamp being illuminated

After **START** is pressed and while the motor(s) is getting up to testing speed, the digital display will show rotating icon(s) to confirm which wheel(s) is being started. Once this icon disappears, test actions or brake force measurements can be taken.

Three actions will stop the rollers; if the **STOP** key is pressed, the car leaves (even temporarily) one of rollers sets or wheel slip is detected.

With a car on the rollers and the rollers not running, one (or two) of the green indicator lights **LUp, LDn, RUp, RDn** will flash to show the direction in which the wheel(s) will be driven. Once the motor is started, the flashing light will stay on.

As the brakes are applied and a wheel approaches the pre-set slip limit, the respective red **Lock** indicator will flash.

The orange indicator lights will show which of the two scale ranges is in use for any particular reading.

Any measured value will remain on the scale display (or DDsp) until the **OK** button is pressed to accept the result. The pointer(s) will then be returned to zero.

If the brakes are cold or wet, take the opportunity to apply brake several times to warm up and/or dry brakes while the wheels are being centred.

Individual sections of the MOT procedure can be repeated if unrepresentative readings have been obtained or the process is interrupted for some reason. Simply press the **START** key again and repeat the test section. Only the results taken during the last sequence will be stored when the OK key is pressed.

The normal testing method follows the MOT tester's manual sequence but the rollers can be used in Manual mode – see later sections. Chock all wheels not on rollers.

Once testing is complete, start the rollers to assist with driving the vehicle out of the rollers by pressing **TEST**.

Test procedure

Test Description

Use the following section as a prompt list when performing MOT Procedure. This section gives a more detailed description and should be studied by new users before any attempt is made to follow the simple prompt list.

MOT Brake Test Procedure

Note: For Class IV and VII vehicles, use the secondary brake test when checking the Parking Brake. DO NOT apply the locked parking brake test on these vehicles.

If the vehicle braking system is fitted with a servo, ensure the engine is running at idle throughout the test (use exhaust extraction or adequate ventilation).

WARNING: Before driving the vehicle into the rollers: RESET the system by pressing 2nd and then STOP, Digital Display will show A1 then Ctr. This starts a new test.

Axle Weight

If required for the test:

1. Press **2nd WGHT**: For manual weight entry. The digital display now shows At.
2. Respond by pressing **AXLE** for individual axle weight entry or **TEST** for gross vehicle weight.
3. Enter the weight in 100Kg units i.e. 100 = 10 Tonne.
4. Press **OK** to accept and store entry.

First Axle

Centre the wheels:

1. Drive the first axle into the rollers:
2. Press **START** key to start both roller sets. Digital Display will show both rotating icons, then Ctr.
3. Allow the wheels to centre and press **STOP** when alignment is correct.
4. Digital Display shows A1.L

Left Footbrake:

1. Press **START** key to start only the left roller set. Digital Display shows left rotating icon then A1.L.
2. Apply footbrake smoothly until the wheel stops or maximum brake effort is displayed.
3. If maximum brake effort does not cause slip and switch off the rollers, press **STOP** now to end this measurement.

Note: The start, test, stop action can be repeated if necessary.

4. Once an acceptable reading has been obtained press **OK** to store the result.
5. Digital Display shows A1.r.

Right Footbrake:

1. Press **START** key to start only the right roller set. Digital Display shows right rotating icon then A1.r.
2. Apply footbrake smoothly until the wheel stops or maximum brake effort is displayed.
3. If maximum brake effort does not cause slip and switch off the rollers, press **STOP** now to end this measurement.

Note: The start, test, stop action can be repeated if necessary.

4. Once an acceptable reading has been obtained press **OK** to store the result.
5. Digital Display shows A1 after a small delay.

Bind, Ovality and Imbalance test:

1. Press the **START** key to start both roller sets.
2. Do not apply any brake force. Digital Display shows both rotating icons then A1.b for a few seconds. It will then show either the bind value or symbol "--" if bind is below 20kgf.
3. Apply a brake force of about 500 kgf and hold pedal steady.
4. Press **OVAL** key to measure the ovality. Digital Display shows to, after 6 seconds the Digital Display shows BAL, the ovality measurement is complete, apply footbrake smoothly up to about 90% of maximum force measured above and the imbalance will be measured. Slowly release the pedal observing the force readings.
5. Press the **STOP** key to end the test.

Note: This whole section can be repeated if necessary.

6. Press **OK** key twice to save the results.

Note: If there is a Secondary brake on this axle, test it now before proceeding to next axle.

Note: If the Parking brake is fitted to this axle, test it now before proceeding to next axle test.

Test procedure

Secondary Brake Test

1. Press **SEC** key to select secondary brake test, Digital Display shows S1.L

Left Secondary Brake:

1. Press **START** key to start only the left roller set. Digital Display shows left rotating icon then S1.L.
2. Apply the secondary brake smoothly until the wheel stops or maximum effort is displayed.
3. If maximum brake effort does not cause slip and switch off the rollers, press **STOP** now to end this measurement.

Note: This start, test, stop action can be repeated if necessary.

4. Once an acceptable reading has been obtained press **OK** to store the result.
5. Digital Display shows S1.r.

Right Secondary Brake:

1. Press **START** key to start only the right roller set. Digital Display shows right rotating icon then S1.r
2. Apply the secondary brake smoothly until the wheel stops or maximum brake effort is displayed.
3. If maximum brake effort does not cause slip and switch off the rollers, press **STOP** now to end this measurement.

Note: This start, test, stop action can be repeated if necessary.

4. Once an acceptable reading has been obtained press **OK** to store the result.

Parking Brake

WARNING: This is a LOCKED BRAKE TEST and MUST NOT be applied to vehicles in MOT Class IV or Class VII.

Left Parking Brake:

1. Apply the parking brake and chock the other wheels.
2. Press **PARK** key to start the test, Digital Display shows P1.L.
3. Press **START** key to start only the left roller set. Digital Display shows left rotating icon then P.1L.

4. Test will automatically stop after three seconds.

Note: This start, test, stop action can be repeated if necessary.

5. Once acceptable reading has been obtained press **OK** to store the result.
6. Digital Display shows P1.r.

Right Parking Brake:

1. Apply the parking brake and chock the other wheels.
2. Press **PARK** key to start the test, Digital Display shows P1.r.
3. Press **START** key to start only the right roller set. Digital Display shows right rotating icon then P1.r.
4. Test will automatically stop after three seconds.

Note: This start, test, stop action can be repeated if necessary.

5. Once acceptable reading has been obtained press **OK** to store the result.

Driving Out:

Note: It is safer to drive 'driven' axles out of the rollers with the brake tester motors running. This eliminates any problems of over-speeding the rollers and drive motors, particularly when the vehicle under test has an automatic gearbox.

1. Press **TEST** to power both motors as if the wheels were being centralised and drive the wheels out of the rollers.
2. The brake tester motors will stop once the wheels leave the rollers.

Next Axle:

1. Press the **DOWN ARROW** key to switch to the next axle, Digital Display shows A2, A3, A4 etc.
2. Drive the next axle into the rollers and perform Footbrake, Secondary Brake and Parking Brake tests as applicable.
3. Repeat until all axles are tested.

Print results (If Optional Printer Fitted)

When all axles have been tested, press **PRINT** key to print the test results.

Brake forces are printed if no vehicle weight has been entered. If Gross Vehicle Weight has been manually entered the brake performance is calculated and printed.

Manual Testing

Simple Test

This allows operation of the rollers, either individually or together for a completely manual brake evaluation.

1. Reset by pressing **2nd** and then **STOP**.
2. The digital display will show A1 and then CTR.
3. Drive onto the rollers, centre the wheels and press **STOP**.
4. To enter the SIMPLE mode, press the **LEFT arrow** key, the digital display will now show SIM.
5. Pressing the **LEFT arrow** key again will start the LEFT roller. Press **STOP** to stop the roller.
6. Pressing the **RIGHT arrow** key will start the RIGHT roller. Press **STOP** to stop the roller.
7. Pressing the **UP arrow** key will start both the rollers. Press **STOP** to stop the rollers.
8. SIM will be cancelled when the next axle enters the rollers.

Manual mode - 4WD

In this mode, the roller direction can be selected. This enables the testing of 4WD vehicles.

WARNING: Not all 4WD vehicles are suitable for roller brake testing. YOU MUST check the manufacturers' data before testing. If in doubt, use a decelerometer on a road test.

1. RESET the system in the normal way by pressing **2nd** then **STOP** keys, and show CL5 on the Digital Display.
2. Drive the vehicle into the rollers.
3. Pressing the **2nd** and **4WD** keys puts the unit into Manual Mode which is indicated on the Digital Display showing MAN.
4. Select the roller direction by using the two rotary switches on the side of the control box. The roller direction will be indicated by the green LEDs adjacent to the direction arrows on the analogue display.
5. Press the **START** key to start the selected wheel(s) and after the rotating icon display a live reading of brake effort is shown on the pointer(s).
6. The test is stopped when the wheel slips, the wheel leaves the rollers, the **STOP** button is pressed.
7. After the roller stops, the system will reset into auto mode.
8. The pointer will then show the maximum brake effort recorded during the test.
9. If the **PRINT** key is pressed this maximum reading will be recorded on the printout.
10. To exit the manual mode, RESET the system by pressing **2nd** and then **STOP** keys and the Digital Display will show CL5 indicating a return to normal operation.

Calculations

A rotary slide-rule type calculator is supplied with the unit and this should be used to calculate the brake efficiency.

Alternatively a manual method can be used as follows:

Efficiency Note the maximum brake force from each wheel in kgf, add these numbers together and divide the result by the vehicle weight in kg then multiply by 100.
This gives percentage brake efficiency.

Efficiency = $\frac{A + B + C + D}{\text{(Vehicle weight)}} \times 100\%$

Imbalance: If brake forces on a particular axle are A kgf and B kgf
Assuming A is greater than B then

Imbalance = $\frac{A - B}{A} \times 100\%$

Guide to Testing

Prompt Sheet

Photocopy this page and use as a guide when testing.

1. RESET the system by pressing **2nd** and the **STOP** keys.

First Axle

1. Drive the first axle into the rollers when CTR displayed

Foot Brake:

1. Press **START** key to start both roller sets. Allow the wheels to centre and press **STOP**.
2. Press **START** key to start only the left roller set. Apply footbrake smoothly until the wheel stops or maximum effort is displayed. Press **STOP** if rollers don't stop automatically.
3. Once acceptable reading has been obtained press **OK** to store.
4. Press **START** key to start only the right roller set. Apply footbrake smoothly until the wheel stops or maximum effort is displayed. Press **STOP** if rollers don't stop automatically.
5. Once acceptable reading has been obtained press **OK** to store.
6. Press **START** key to start both roller sets. Do not apply any brake force. Wait for display to show either the bind value or symbol "--".
7. Apply a brake force of about 500 kgf and hold pedal steady.
8. Press **OVAL** key, wait 6 second approx. When Digital Display shows BAL, apply footbrake to about 90% of maximum force measured above hold and slowly release. Press **STOP** if rollers don't stop automatically.
9. Press **OK** key to save the results.

Secondary Brake test

1. Press **SEC** key.
2. Press **START** key to start only the left roller set. Apply secondary brake smoothly until the wheel stops.
3. Once an acceptable reading has been obtained press **OK** to store.
4. Press **START** key to start only the right roller set. Apply secondary brake smoothly until the wheel stops.
5. Once an acceptable reading has been obtained press **OK** to store.

Parking brake - Only Class V

1. Apply the Parking Brake and press **PARK** key to start the test.
2. Press **START** key to start only the left roller set, rollers will start and stop automatically.
3. Press **OK** when test complete.
4. Press **START** key to start only the right roller set, rollers will start and stop automatically.
5. press **OK** when test complete.

Next Axle:

1. Press **AXLE** followed by **DOWN ARROW** key to switch to next.

Print Results:

1. Press **PRINT** key to print the test results.

Maintenance

Maintenance

Before all the repairs, service work and adjustments always lock the main switch of the device.

The construction of the equipment is simple and thus does not require costly maintenance. It is necessary to keep it clean, draw up loose bolts, regularly check the wear of the anti-skid surface of the rollers and in the case of larger wear, to replace this material or replace the set of rollers.

Lubrication

The oil in the gearboxes does not have to be replaced until after 10.000 hours of service. The used gearbox lubricant is synthetic oil AGIP TELIUM VSF320. Flange and ball bearings have to be refilled annually using a lubricant grease (for example SKF LGMT2 or LKMT3).

If you are changing the lubricant, following instructions apply:

1. Remove the cover plates, chain tension assemblies and motors.
2. Lubricate the bearings of the rollers by pumping the grease through into the bearings.
3. Lubricate bearings of the motors once a year. Lifting the rollers allows a better access to the bearings.
4. Lubricate the chain with a suitable oil or a special grease at least once a year.
5. Check the oil level in the gearbox.
6. Bolt the cover plates on.

WARNING: The lubricating oils and greases are oil based products and to protect the environment leakage into the pit should be avoided.

A skin reaction to the lubricants is unlikely but during their use the chemical ingredients increase their concentration. We recommend using protective gloves and barrier creams to prevent skin contact when dealing with the lubricants.

Chain tension adjustment

It is necessary to watch the wear of the chain and after its elongation to replace it for a new one before the chain wheels are damaged. The chains are pre-stretched and need very little adjustment. They are adjusted by moving the front or rear roller or the motor.

1. Remove both cover plates of the roller units.
2. Check the chain tension, it should not deflect by more than 5 mm.
3. Tighten the chain by moving one of the rollers away from the other. Loosen the bolts holding the bearing. Tighten the chain by turning the adjustment bolts, and re-tighten the bolts.
4. Bolt the cover plates back on.

Other periodical maintenance

Due to a small number of movable parts it is not necessary, except for tensioning the chain and inductive switch triggering control, to do any adjustments on the equipment.

Daily:

- Clean the cover plates of the roller units
- Inspect and clean the rollers

Weekly:

- Check the proximity of the middle metal rollers one at the time. The display will show the respective Lup and Rup green indicating lights on when this roller is pressed down. The roller brake tester cannot start unless the middle metal roller is triggered pressed down.

Twice per year:

- Remove all cover plates from the roller units.
- Clean the pits from oil and dirt.
- Check that the adjustment bolts support the main bearings properly.
- Check the motors for oil leakage.
- Check that the chain deflection does not exceed 10 mm when pressing by hand.
- Replace the battery in the remote control.
- Clean the surfaces of the remote control and the control unit.
- Bolt the cover plates back in place.
- Perform a full check of all functions.

Yearly:

- At least once per year the service organisation should perform the transducer and amplifier calibration adjustment.

After Sales Service

After Sales Service

Apart from the routine maintenance and adjustments stipulated in this manual the equipment must not be tampered with in any way. All further servicing must be carried out only by an engineer from our Authorised Agents. Failure to observe these conditions will invalidate the Guarantee.

On-Site Service / Overhaul / Spare Parts

If you require a Service Engineer to attend ON SITE, either due to an equipment fault, or for machine calibration, or if the equipment covered by this manual requires to be sent back for factory overhaul, or if you need spare parts, please contact our Product Support Helpline at the following number:

Tel: 01278 436225 Fax: 01278 450567.

Overseas

Service abroad is provided by the agent from whom your equipment was purchased.

Crypton

Crypton provide information and contracts covering:

Car Data, Fault Code Information, Diagnostic Information, Technical Topics, Software Support Contracts, Software Updates & Accessories.

Helplines

Crypton run an Equipment Helpline during normal office hours:

Tel: 01278 436225

Fax: 01278 436567

email: support@CryptonTechnology.com

Product Support

A fully comprehensive Product Support Contract is also available which provides additional assistance with equipment / technical support. Please contact Product Support on the above Helpline number for further details.

Notes: