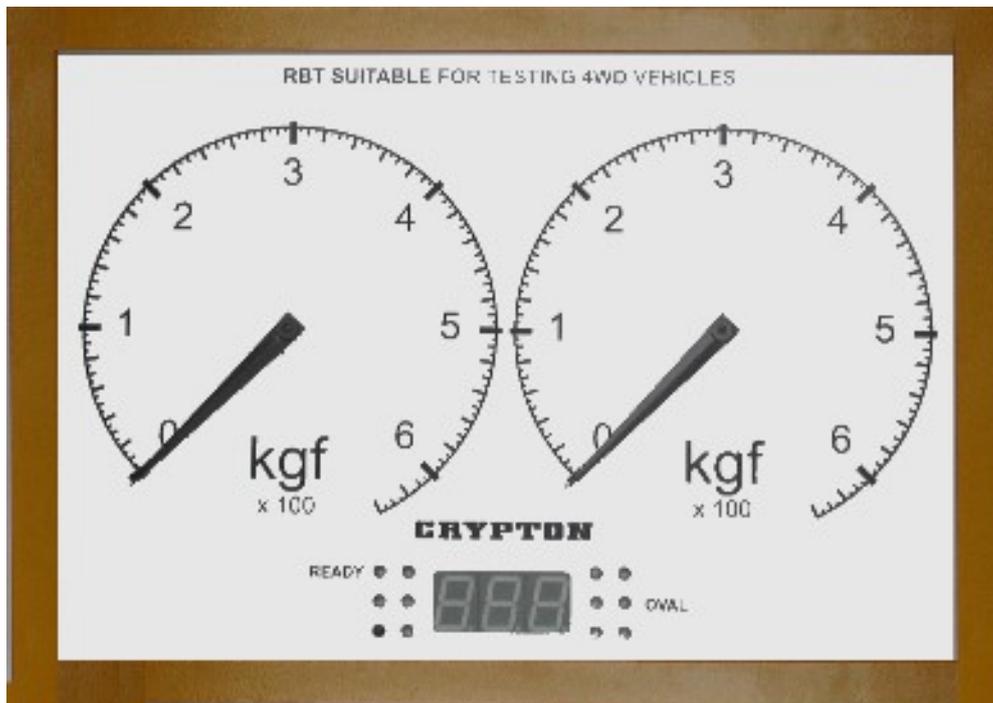




BRAKE TESTER 660-R



OPERATING INSTRUCTIONS

TES1489/A
Dec 2005

IMPORTANT

Every reasonable effort has been made to ensure that information within these Operating Instructions is correct at the time of release, but Crypton 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 Crypton.

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.

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SAFETY PRECAUTIONS

Read these operating instructions carefully and thoroughly before attempting to operate the equipment.

This operating manual should be available at the testing site at all times.

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.

All the national and international safety guidelines and legal regulations are to be followed when operating testing equipment.

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.

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.

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.

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 & TIPS

The brake tester must only be used for its intended purpose.

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.

Only authorised and well-trained personnel should perform the testing.

The work area should be kept clean and dry.

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.

Note the location of the emergency stop switch before starting to use the equipment.

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.

Do NOT use the brake tester to start the engine of a vehicle as this may damage the electric motors.

Drive on and off the tester slowly and in a controlled manner.

Always check the ground clearance of the vehicle is adequate before performing the test.

INTRODUCTION

The 660-R is a roller brake tester designed to perform VOSA MOT tests on Class III and Class IV vehicles.

Control can be performed using the remote handset at the vehicle so one man operation is possible and a printer is available to produce a record of results if fitted.

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:

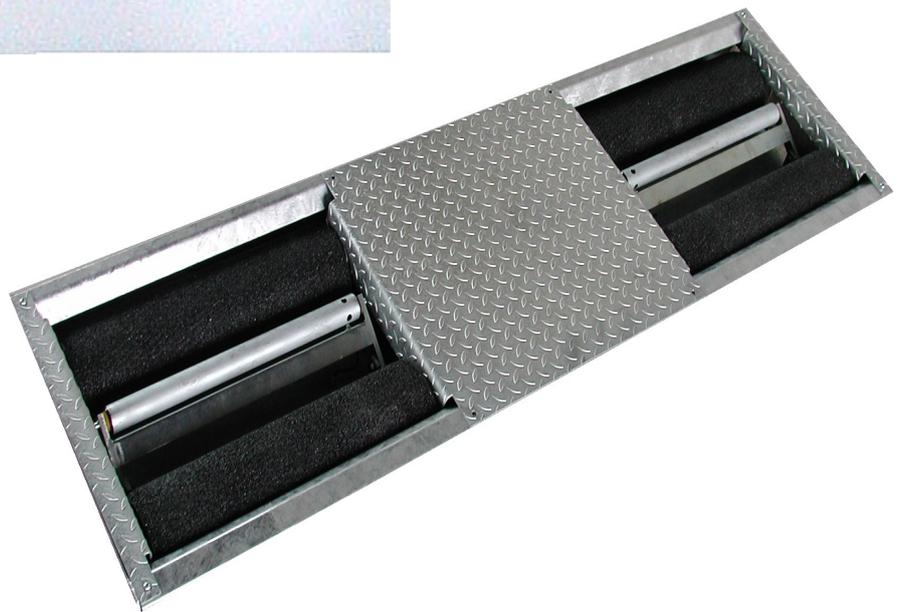
Emergency switch

The brake tester is equipped with an emergency stop switch. Note the location of the emergency stop 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.



660-R MOT Class III and IV Roller Brake Tester

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)

Scale showing brake force:

Pointers: Green for left, red for right

Digital display (DDsp): Imbalance, ovality, pressure, weight

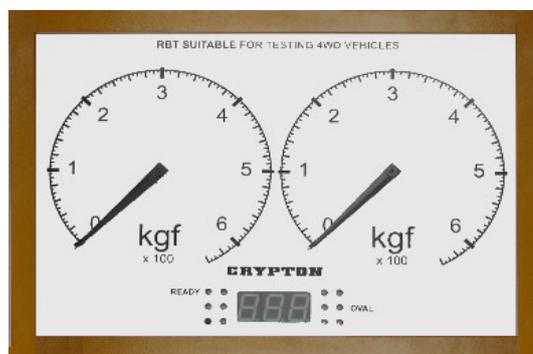
Amber indicator lights: Showing type of information on digital display
(Oval, Pres, Wght)

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

Outside: Main switch, Emergency switch

Alternative display

A twin dial display can be specified when ordering a 660-R and this has two separate dials mounted side by side rather than the co-axial arrangement. All scales and other indicators are identical as shown:



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).

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 or restart during a test.

STOP: Used to stop the rollers, any roller that is running will stop. To stop the test completely, press **OK** while the DDsp = STP

UP ARROW: Used for axle selection.

DOWN ARROW: Used for axle selection

OK: Press to save results 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.

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

AXLE: Used for axle selection



- PRINT:** Used to print test results
- TEST:** Starts both rollers so that vehicle can be driven out
- 2 nd:** This key activates the second function of other keys
- 2 nd STOP:** Will **RESET** the system and clear all previous results so that a new vehicle test is activated.
When the system is RESET the DDsp shows CL4
- 2 nd WGHT:** Allows manual weight entry. **DDsp = 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**
- 2 nd OK:** System internal test, **DDsp = TsT**

Note: The **Fn** key is not currently used on this model.

GUIDE TO TESTING

General guide:

The START key starts the motors or motor 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.

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

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 be stay on.

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

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 or specifically for testing one wheel of motorcycles or three wheel vehicles – see later sections.

TEST DESCRIPTION

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

MOT Brake Test Procedure for Class IV

Enter the car details onto the PC (if connected) or press WGHT key to enter car weight

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).

RESET the system by pressing **2 nd** and then **STOP**, DDsp shows CL4

Front Axle Drive the front axle into the rollers.

CENTRE THE WHEELS: Press **START** key to start both roller sets, DDsp shows both rotating icons then Ctr. Move steering wheel to centre wheels and press STOP when alignment is correct

FRONT LEFT BRAKE: Press **START** key to start only the left roller set. DDsp shows left rotating icon then A1.L Apply footbrake smoothly until the wheel stops or produces its maximum brake effort , then press **STOP**.

(This start, test, stop action can be repeated if necessary)

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

FRONT RIGHT BRAKE: Press **START** key to start only the right roller set. DDsp shows right rotating icon then A1.R Apply footbrake smoothly until the wheel stops or produces its maximum brake effort , then press **STOP**.

(This start, test, stop action can be repeated if necessary)

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

BIND, OVALITY and IMBALANCE TEST Press **START** key to start both roller sets. Do not apply any brake force. DDsp shows both rotating icons then Fr.b for a few seconds. It will then show either the bind value or symbol "--" if bind is below 20kgf.

Apply a brake force of about 100 kgf and hold pedal steady

Press **OVAL** key to measure the ovality, DDsp shows **to**, wait 6 second approx.

When DDsp shows BAL, the ovality measurement is complete, apply footbrake smoothly up to about 90% of maximum force where imbalance will be measured and then slowly release the pedal observing the force readings. Press the **STOP** key to end the test. (This whole section can be repeated if necessary).

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

If the Parking brake is fitted to the front axle, test it now before proceeding to Rear axle test.

Rear Axle: Press **DOWN ARROW** key to switch to the rear axle, DDsp = rE

Drive the rear axle into the rollers.

CENTRE THE WHEELS: Press **START** key to start both roller sets, DDsp shows both rotating icons then Ctr. Wait for the wheels to centre and press STOP when alignment is correct

REAR LEFT BRAKE: Press **START** key to start only the left roller set. DDsp shows left rotating icon then rE.L Apply footbrake smoothly until the wheel stops or produces its maximum brake effort , then press **STOP**.

(This start, test, stop action can be repeated if necessary)

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

REAR RIGHT BRAKE: Press **START** key to start only the right roller set. DDsp shows right rotating icon then rE.r Apply footbrake smoothly until the wheel stops or produces its maximum brake effort , then press **STOP**.

(This start, test, stop action can be repeated if necessary)

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

BIND, OVALITY and IMBALANCE TEST Press **START** key to start both roller sets. Do not apply any brake force. DDsp shows both rotating icons then rE.b for a few seconds. It will then show either the bind value or symbol "--" if bind is below 20kgf.

Apply a brake force of about 100 kgf and hold pedal steady

Press **OVAL** key to measure the ovality, DDsp shows **to**, wait 6 second approx.

When DDsp shows BAL, the ovality measurement is complete, apply footbrake smoothly up to about 90% of maximum force where imbalance will be measured and then slowly release the pedal observing the force readings. Press the **STOP** key to end the test.

(This whole section can be repeated if necessary).

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

If the Parking brake is fitted to the rear axle, continue with the Parking Brake Test.

Parking brake (applicable after both front and rear axles)

Press **PARK** key, DDsp = Pb.L

LEFT PARKING BRAKE: Press **START** key to start only the left roller set. DDsp shows left rotating icon then Pb.L Apply handbrake smoothly until the wheel stops or produces its maximum brake effort , then press **STOP**.

(This start, test, stop action can be repeated if necessary)

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

RIGHT PARKING BRAKE: Press **START** key to start only the left roller set. DDsp shows left rotating icon then Pb.r Apply handbrake smoothly until the wheel stops or produces its maximum brake effort , then press **STOP**.

(This start, test, stop action can be repeated if necessary)

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

The test is now complete

Print results (if 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 the Gross Vehicle weight has been entered, brake performance is calculated and printed.

MANUAL TESTING

Class IV – Manual mode

In this mode, the roller direction can be selected. This enables a 'quick check' following a brake repair or testing of 4WD vehicles.

N.B. Not all 4WD vehicles are suitable for roller brake testing. Check manufacturers' data before testing and if in doubt use a decellerometer on a road test.

RESET the system in the normal way by pressing **2 nd** then **STOP** keys and show CL4 on the DDsp.

Drive the vehicle into the rollers.

Pressing the **2 nd** and then **4WD** keys puts the unit into Manual Mode which is indicated by DDsp showing **MAN**.

Next select the wheel(s) that is to be tested and the direction of rotation by using the following buttons:

Repeatedly press the **LEFT ARROW** key to cycle through, no direction (off), forward rotation and reverse rotation for the LEFT rollers.

Repeatedly press the **RIGHT ARROW** key to cycle through, no direction (off), forward rotation and reverse rotation for the RIGHT rollers.

The direction of rotation for each roller set is shown by the indicator lamps on the display .

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).

The test is stopped when the wheel slips, the wheel leaves the rollers, the STOP button is pressed or the emergency switch is operated.

The pointer will then show the maximum brake effort recorded during the test.

If the PRINT key is pressed this maximum reading will be recorded on the printout.

To exit the manual mode, RESET the system by pressing **2 nd** and then **STOP** keys and the DDsp shows CL4 to show return to normal operation.

Class III - TESTING ONE WHEEL ONLY

When testing three wheel vehicles or motorcycles is necessary to use one roller set only, the left side roller set. There is a safety lockout that prevents the unused roller from being driven even if the third roller is depressed.

RESET the system in the normal way by pressing **2 nd** then **STOP** keys and show CL4 on the DDsp.

Pressing the **2 nd** and then **LEFT ARROW** keys puts the unit into One wheel or Motorcycle Mode which is indicated by DDsp showing **Mot.**

Position the wheel in the LEFT roller and then press **START**. After the rotating icon, a live brake test display will be shown on the pointer.

Rollers will stop when the STOP key is pressed, the wheel leaves the rollers, the wheel slips or the emergency stop is pressed.

The pointer will then show the maximum brake effort recorded during the test.

If the PRINT key is pressed this maximum reading will be recorded on the printout.

To exit the One Wheel mode, RESET the system by pressing **2 nd** and then **STOP** keys and the DDsp will show CL4 indicating a return to normal operation.

PROMPT SHEET – photocopy this page and use as a guide when testing. Enter details onto the PC (if connected) or press WGHT to enter car weight. Run engine if servo fitted. **RESET** the system by pressing **2 nd** and then **STOP**

Front Axle Drive the front axle into the rollers.

Press **START** key to start both roller sets, centre wheels, press **STOP**

Press **START** key to start only the left roller set. Apply footbrake to maximum and then press **STOP**. Press **OK** to store the result.

Press **START** key to start only the right roller set. Apply footbrake to maximum and then press **STOP**. Press **OK** to store the result.

Press **START** key to start both roller sets. Wait until DDsp shows either the bind value or symbol "--" Apply about 100 kgf and hold pedal steady. Press **OVAL** key, DDsp shows **to**, wait 6 second approx. When DDsp shows BAL, apply footbrake to about 90% of max and then slowly release the pedal observing the force readings. Press the **STOP** . Press **OK** key to save the results.

Test parking brake now if fitted to front Axle.

Rear Axle: Press **DOWN ARROW** key to switch to the rear axle,

Drive the rear axle into the rollers and repeat Centre, left, right, bal tests as above.

Parking brake (applicable after both front and rear axles)

Press **PARK** key, DDsp = Pb.L

Press **START** key to start only the left roller set. Apply handbrake until the wheel stops or produces its maximum brake effort, press **STOP**. Press **OK** to store the result.

Press **START** key to start only the right roller set. Apply handbrake until the wheel stops or produces its maximum brake effort, press **STOP**. Press **OK** to store the result.

The test is now complete. Press **PRINT** key to print the test results.

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.

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

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

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

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 control 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 grease are all oil base products and to protect the environment it is important to prevent them leakage into the pit. To avoid any possible adverse skin reaction, always use protective gloves or barrier creams when working with oils and greases.

Consult the lubricant supplier/manufacturer if in doubt.

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.

TECHNICAL SPECIFICATION of 660-R

Maximum axle load		4,000	kg
Maximum brake force		600	kgf
Maximum pedal force		1,000	N
Roller surface speed		3.8	kph
Roller Diameter		204	mm
Roller length		700	mm
Distance between roller centres		390	mm
Roller project by		25	mm
Minimum wheel diameter		450	mm
Maximum wheel diameter		1,100	mm
Measuring system		Strain Gauge Transducers	
Dimensions:			
Roller assembly	Width	2,340	mm
	Depth	680	mm
	Height	340	mm
Control Unit	Width	590	mm
	Depth	480	mm
	Height	1,750	mm
Weights			
Roller assembly		360	kg
Control Unit		70	kg
Electrical supply:			
Total load		12	VA
Electrical connection		3NPE~50Hz 415V / TN-S	

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 436238

Overseas

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

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 436238
email: support@CryptonTechnology.com

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 no. for further details.

Notes:

