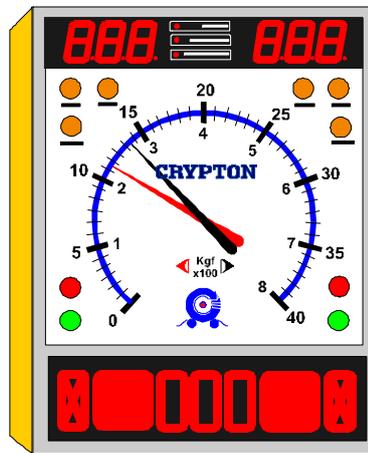


CRYPTON

In tune with the future



Commercial Vehicle Roller Brake Tester.

CVBT 9000

OPERATING INSTRUCTIONS

TES1349/A
Sept 2001

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 agents, with repair workshops and field service engineers to provide a full range of After-Sales Care, including installation, contract maintenance, factory overhaul and emergency repairs on site. 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, particularly paragraph 2. 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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Introduction:

Designation

The brake tester is supplied by Crypton and has type number CVBT9000, always quote this and the serial number when requesting spares or service.

Uses.

CVBT 9000 is an electronic brake tester for commercial vehicles, busses coaches vans and cars.

This user's manual must be read and understood, before any person should attempt to operate the brake tester, in order to operate it correctly and safely and to be able to take advantage of all the facilities available.

Limitations.

This brake tester must not be used for non brake testing purposes.

The brake tester is not to be used for testing brakes on motorcycles. The rotating rollers constitutes a potential risk for catching the rider's feet.

Dangerous situations can occur out of sight of the operator. Therefore no person must be present in the pit or anywhere else near the vehicle during the operation of the brake tester. Rotating drive shaft present a potential danger.

When using the load simulation, it is the responsibility of the operator to ensure that the vehicle can withstand the forces asserted when lifting the wheel set. Crypton does not accept any responsibility for damage or injury which may occurs during the operation of the brake tester.

Safety procedures for brake testing procedures.

- ! Notice the location of the emergency stop. The switch is located in the immediate vicinity of the brake tester.
- ! Read this user's manual thoroughly before attempting to operate the brake tester.
- ! Keep this user's manual in an easily accessible place.
- ! Never touch the rollers when the tester is in operation.
- ! Do not press the third roller down with your hand, foot or any kind of tool.
- ! Unless authorised, do not remove or make any alteration to any part of the tester. Contact the supplier.
- ! Do not use the brake tester for any other purpose than for which it is intended.
- ! The brake tester must not be used in environments susceptible to explosions.
- ! Keep un-authorised persons away from the rollers and the wheels of the vehicle during operation of the tester.
- ! During service and repair of the tester: Switch the tester off and lock the switch.
- ! The brake tester will always stop when pressing STOP.
After having pressed STOP, the brake tester can only be restarted by pressing START or by driving a wheel set onto the roller unit.
- ! Pressing the emergency stop will stop the brake tester immediately. To restart: pull the emergency stop back and press the reset key.
- ! For brake testers fitted with emergency light beam circuit breaker in the pit: Braking the light beam will stop the brake tester. Reset by pressing the reset key.

Description:

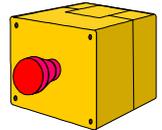
Main components

1. Display console.
2. High voltage control unit.
3. Roller unit.
4. Base station for wireless air pressure transducers (accessory)
5. Air pressure transducers - wireless (accessory)
6. Air pressure transducers - cable connected (accessory)
7. PC with brake diagnose program (accessory)
8. Printer (accessory)
9. Remote control (accessory)

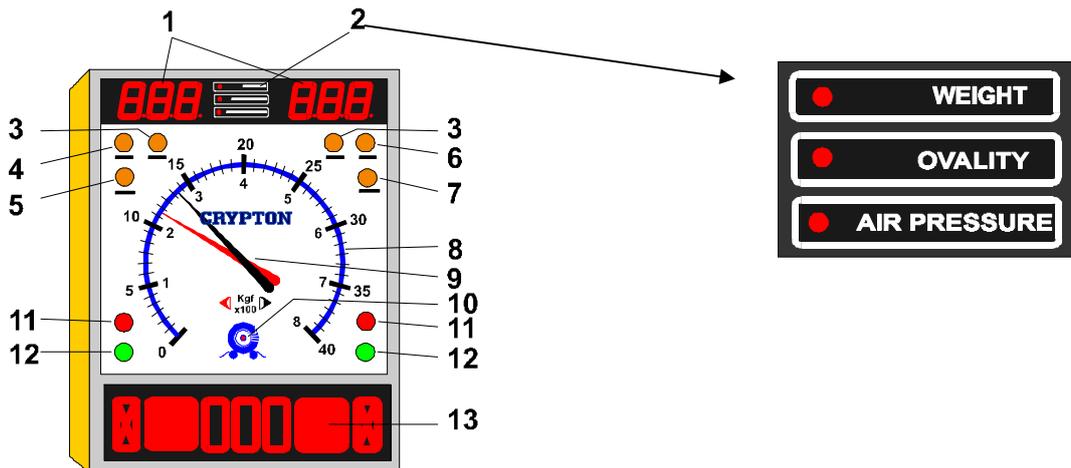
Emergency stop

1. Press for emergency stop.

Notice: Notice the location of the emergency stop before starting the brake tester. The emergency stop is not necessarily positioned in the same place at every installation, however it will always be installed in the immediate vicinity of the brake tester.

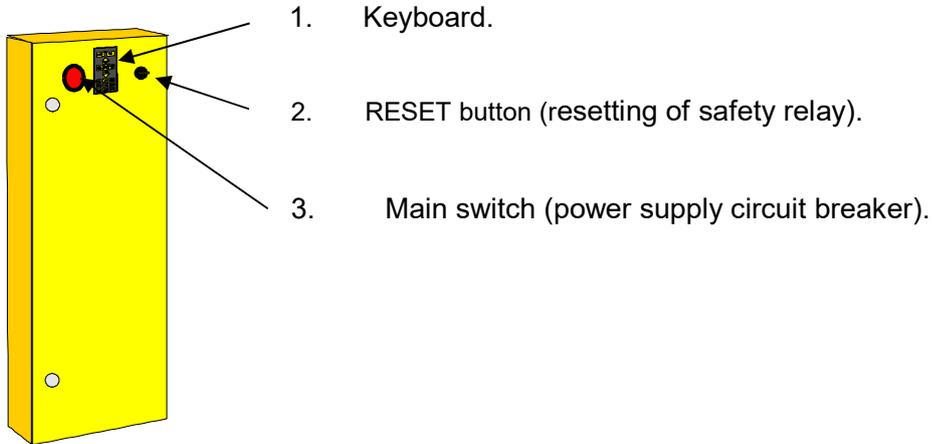


Display console

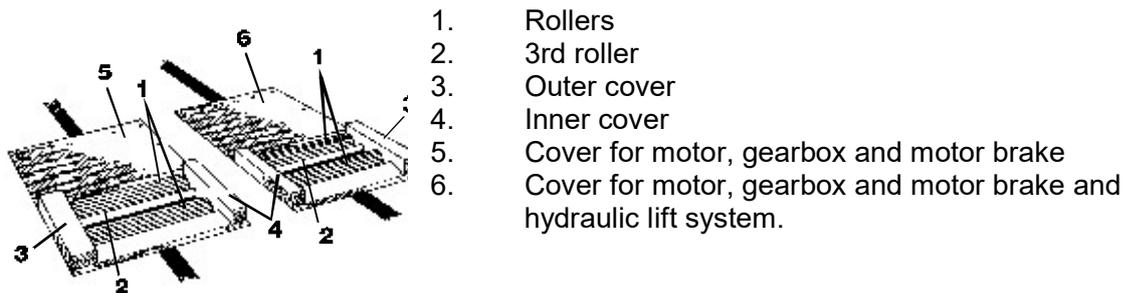


1. Top digital display - air pressure, ovality and weight
2. Indicator showing type of information on top display
3. Indicator light - 4WD (accessory) or bi-directional operation (accessory)
4. Indicator light - automatic operation
5. Indicator light - manual operation
6. Indicator light - scale range or 0-800 kgf
7. Indicator light - scale range 0-4000 kgf
8. Dial with an inner scale: 0-8000 kgf. And an outer scale: 0-4000 kgf. The dial is very large and thus easy to see even at great distances.
9. Pointers; red = left, black = right. The dual pointers have the advantage that it is for example easy to read the imbalance when testing both wheels at the same time.
10. Amber light - zeroing and fault indicator
11. Red lights - wheel locking
12. Green lights - ready for testing
13. Bottom digital display - imbalance, ovality, air pressure in the brake system, weight in connection with axle weight simulation system as well as indicating various functions.

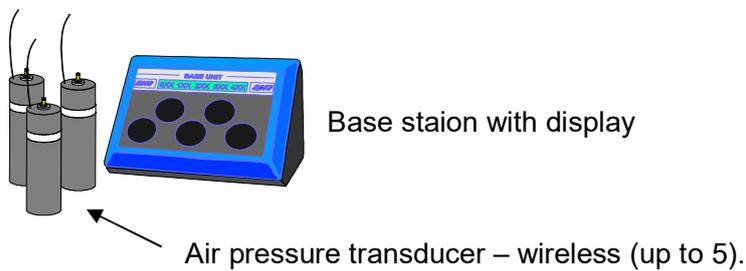
High voltage control console.

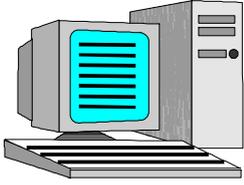


Roller unit.

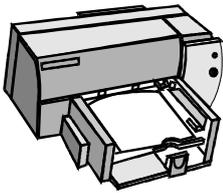


Air transducers.

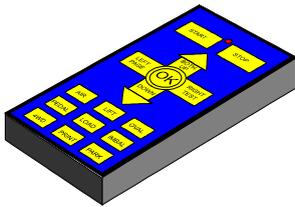




PC with diagnostic program



Printer



Remote control

Functions & Facilities:

The functions and facilities of the brake tester in alphabetical order.

Automatic operation (NOT to be used for MOT testing)

In automatic operational mode, the brake tester will start automatically when a wheel set is driven onto the rollers and stop either when the wheels lock, when stop is pressed or when driving out of the rollers.

When the brake tester is turned on it is in automatic operational mode.

It changes to manual operational mode when registering a vehicle on the PC.

It returns to automatic operational mode after having concluded a test or after having pressed PRINT.

If STOP has been pressed so that the AUT and MAN lights are lit. The brake tester will not start up automatically when driving a wheel set onto the rollers. Then press STOP again before driving onto the rollers.

Axle Load Simulation.

By loading the axle during the test, the brake force is increased at the point of locking, thus facilitating a more accurate analysis of the braking performance.

Load simulation can be performed in two ways: Either by a standard 5 metric tonnes or by a pre-set load (keyed-in on the remote control) with a maximum of 12 tonnes. If the vehicle is not heavy enough, straps must be applied to hold down the axle.

A load of 5 tonnes is applied simply by pressing LIFT and UP on the remote control. The roller units start lifting and will stop when a load of 5 tonnes has been reached. Press LIFT and DOWN to lower the roller units again.

To key-in a load other than 5 tonnes: Press LOAD on the remote control. The display for tonnes flashes. Choose the desired number of tonnes by pressing UP or DOWN. Press OK. The display for kilos (x 100) flashes. Choose the desired kilos (x 100) and press OK. The roller units start lifting. After the weight has been keyed-in, the actual axle load will show on the display. When the desired axle load has been reached the lifting action stops.

Notice that axle load simulation and keying-in the wanted load can only be done when a wheel set is placed on the rollers.

Imbalance

In manual operational mode: Press DIFF after having started the rollers. The difference of braking effect between the left and right wheel is indicated by the positions of the pointers. The result is shown at the bottom display, as a percentage.

In automatic operational mode: The imbalance is shown when the brake force exceeds 50 kgf. You toggle between imbalance and air pressure by pressing AIR and DIFF.

One-wheel operation (accessory).

In one-wheel operation one wheel is rotating whilst the other is stationary.

Press TEST and START. Choose the wheel by using UP for the left wheel and DOWN for the right one. The display shows which one has been chosen. Press START to start the chosen wheel.

One wheel operation is used for example to test damaged vehicles.

Four-wheel operation. (accessory).

The brake tester can be fitted with a facility to test four-wheel drive vehicles. This makes it possible to test one wheel whilst the other wheel on the same axle is reversing to avoid that the torque is transmitted to other axles during the test.

Brake force is measured only on the non-reversing wheel.

Press 4WD. Drive the first set of wheels onto the rollers and press START. The green light lights up on the side of the wheel to be tested and the relevant pointer shows the brake force. Press OK to store the result. Press START to test the other wheel and press OK to store the result.

Choose which wheel to be tested first before starting the test: Press 4WD once to choose the left wheel (indicated by the left light). Press 4WD again to choose the right wheel to be tested first. Press a third time to return to normal operation.

Air pressure.

The brake tester must be in manual operation mode to measure the brake air pressure, and after having driven the first set of wheels onto the rollers the transducer of the relevant axle (PC) must be shown on the display. Press START and choose the transducer by pressing the UP and DOWN keys. The top display shows the number of the chosen transducer and the actual air pressure.

The air pressure can also be tested in automatic operation or without driving the vehicle onto the rollers. Fit the transducers and press AIR. Choose the axle with the UP and DOWN keys. The top display shows the chosen transducer (PC) and the air pressure. The bottom display shows the air pressure on the main line (PM). To return to normal operation press AIR again.

The procedure for testing air pressure is the same for both the wireless and the cable connected system.

The wireless air pressure measuring system consists of a base station with docks to hold and charge up to five transducers. A display on the base station shows the condition of the battery and the radio contact of the individual transducers.

Air pressure can be measured by using the base station. By pressing the button on the side of the docking station the display will show the air pressure for each transducer consecutively for each press on the button. After pressing the button several times the display will return to showing the status of the transducers again.

Remember to place the transducers in the base station after use. The charging of the battery is automatically stopped when it is fully charged. Do not turn the power to the base station off, if this is done the batteries in the transducers will discharge.

Five LEDs are placed on the bottom display each indicating a transducer (PM and PC1 to PC4). If a transducer loose contact with the system the indicator will flash for awhile and thereafter be turned off. The display shows "OUT" for the transducer in question.

The status of the transducers can be seen on the displays of the cabinet.

LOB = low battery charge.
OUT = Lost radio contact.
Chr = Transducer charging in the base station.

Lift of roller units.

The rollers can be lifted hydraulically. This facility is used to simulate axle load on vehicles with more than two axles. It is, in most cases, sufficient to lift an axle to assert enough pressure on the axle. It is only necessary to apply straps to hold down the axle to obtain enough axle load when the vehicle is too light. The lift will only operate when a set of wheel is placed on the rollers.

Manual operation.

Operating the brake tester manually give access to all the installed facilities.

The brake tester is automatically in the manual operational mode when a vehicle has been registered on the computer.

The test in this mode is started by pressing START. The test is terminated when the wheels block, by pressing STOP or when driving out of the rollers. Remember to store the results by pressing OK after testing each axle. After all axles have been tested: Press PRINT. This terminates the test of the vehicle.

The brake tester must be in manual mode to print the report with the calculations of the individual axles, the parking brakes and brake air pressure, and also to show the results graphically on the monitor.

Measuring ovality.

When in manual operation mode and in the process of testing a vehicle: Apply gentle pressure on the brake pedal until the pointers show between 1 and 5 kN. Keep a constant pressure and press OVAL to start the test. During the test the bottom display shows the pressure "PC". The arrows on the same display indicate the wheel showing the most ovality.

The top display shows the ovality of both wheels in kgf.

In automatic mode the bottom display shows the ovality in %, instead of pressure.

When the test has been completed the ovality is shown on the top display whilst the bottom display shows imbalance. Press AIR to return to air pressure testing.

Parking brake.

The parking brake is tested in the same way as the foot brake. It is therefore not necessary to make special concessions for testing the parking brake.

However in manual mode it is necessary to indicate when the parking brake is to be tested. The reason is that special calculations are used for the parking brakes.

With an wheel set on the rollers press START and choose the transducer using the UP and DOWN keys. Press START again to start the rollers. Press PARK to indicate the test of the parking brake. The bottom display shows momentarily the number of the relevant parking brake, for example P1. Then the bottom display shows the pressure PM. The top display shows the chosen pressure Pc.

Printed report.

A report can be printed after a test in manual operational mode. Press the PRINT key after the last axle has been tested and accepted.

The report shows all relevant calculations both of each individual axle and of the whole vehicle. The report can also contain relevant graphs.

The content and layout of the report is set up in the program on the PC.

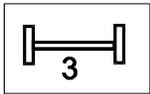
Weighing.

The roller units are fitted with weighing cells which indicated the weight of both the right and left side (top display) as well as the total weight of the axle (bottom display). After having keyed in the desired simulated load the bottom display will again show the total axle weight.

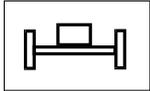
Holding the result on the display.

in both manual and automatic mode the pointers and the LED displays will remain showing the results after locking the wheels until either restarting the tester, pressing OK or after 5 minutes have elapsed. Symbols.

The following symbols will appear on the LED display:



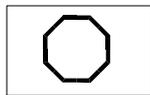
Number of the axle currently being tested



Axle with simulated load: The weight in tonnes.



Parking brake and number.



Accept of signal from remote control



Emergency stop activated



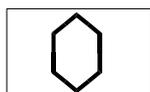
The brake tester is locked and does not communicate with PC



The brake tester transmits signal to printer



Imbalance in %



Ovality in %



Testing left secondary brake



Testing right secondary brake



Testing left parking brake.



Testing right parking brake

PC Brake Diagnostic Program

With the diagnostic program, the performance of the brakes of a vehicle can be analysed in details. The results can be analysed graphically in many ways and stored for later comparison. The program is very user friendly and supported by a comprehensive help system. Pressing F1 will provide the answers to most questions. The text in the help program are dependant upon the content on the screen and provide clear and relevant answers.

The program is easy to use. Choose menu items and buttons on the screen with the arrow keys and press ENTER. Fill in the cell on the screen with the specifications you are asked for by the program (You will find the instructions on the bottom line of the screen). This insures correct and easy use.

Registration of a vehicle.

For manual testing of a vehicle it must be registered on the PC. If the vehicle has not been tested on the brake tester before, it is necessary to key in some specifications. If it has been tested before a lot of the specifications are stored in the program and can easily be transferred to the new test.

Choose BRAKE TEST on the menu. If the vehicle has been registered before on the tester, choose OPEN VEHICLE DATA and find the registration number on the list.

If the vehicle has not been registered before:

Choose "ENTER VEHICLE DATA"

Fill in the form on the window:

Name:	(name of owner of vehicle)	optional
Address:	(address of owner)	optional
Address:	(address of owner)	optional
Zip Code:	(postal code)	optional
City:	(town)	optional
Telephone no.:	(Customers Phone no.)	optional
Job no.:	(Internal job no.)	optional
Tested by:	(Initial/name of operator)	optional

If the key-in data are satisfactory, choose OK.

Choose the relevant type of vehicle.

Choose "Other brake type"

Choose whether or not a trailer is hitched.

A new window appears:

Make:	(Make of vehicle)	Obligatory
Reg. No.	(Registration no)	Obligatory
Man. year	(Year of manufacture)	Obligatory
Gross vehicle weight	(maximum allowed weight)	Obligatory
Actual vehicle weight	(Weight at time of test)	Optional
No. of axles:	(Number of axles to be tested)	Obligatory
Milage:	(Milage at day of testing)	Optional
Remarks	(Any relevant remark)	Optional

When the data of the vehicle has been opened or keyed in they must be transferred to the brake tester. Choose START BRAKE TESTING from the main menu. Perform the brake test as described in the chapter "Brake testing, manual mode"

After the completion of the test, the results can be printed out on a colour printer and/or processed graphically on the PC - see below.

Printouts

A series of printouts can be performed on the colour printer.
You can choose between a:

Graphical processing of the results.

The results can be studied in details by using the graphical facilities in the PC program. The results can be analysed immediately after the test, or data from an earlier test can be called from the memory of the PC.

After the completion of the test you can choose between the before mentioned user designed standard printout setup or a specially designed printout. The user designed printout is described in menu point CONFIGURATION - STANDARD PRINTOUT. The special designed printout is described in a similar menu. Choose the desired specifications by marking them with " " using the space key for setting or removing the tick.

You can choose from different types of graphs, tables and calculations in the PC program:

Brake force - PC graph

For each axle the brake force is shown as PC . The graph shows the relation between the brake force and the pressure in the cylinder on each axle. This will for example detect defective valves.

Time graph.

For each axle the graph shows the brake force and air pressure as they are developing with time elapsed. If the brake pedal was released whilst the display showed "U" the thick line shows increasing brake force whereas the thin line shows the brake force when releasing the brake pedal.

PC - PM graph.

The graph shows the development of the air pressure in the cylinder in comparison with the pressure in the main line. The pressure in the cylinder is shown on the Y-axis and the main line pressure on the X-axis. -the graph is used for analysing the function of the reduction valve.

Retardation graph.

The retardation graph show the main line pressure on the X-axis and the retardation on the Y-axis

Result as table.

The table shows all recorded values of brake force and air pressure. The results are projected on line with the values recorded simultaneously on the same line.

Results summery.

The results summary shows the braking performance of the vehicle and forces at the point of locking together with the calculated ovality, imbalance and retardation.

The theory of brake testing.

Brake testing on roller brake tester.

Measuring the brake force is done as described in the following: An asynchronous motor turns the wheels of the vehicle. The brake force of a wheel affects the rollers with a torque which is measured electronically. The torque is in proportion with the brake force, which therefore can be shown on the dial display with a high degree of accuracy.

Brake test on rollers offer several advantages.

Imbalance.

Imbalance is the difference in brake force between the right and the left wheel on the same axle. The imbalance is measured progressively during the test and is converted into % before it is shown on the display.

The imbalance in % is calculated as the difference in % of the highest actual brake force. For example:

Class IV and Class VII:

If, in a given time the brake force on the right side is 200 kgf and on the left side is 220 kgf. The difference is $220 - 200 = 20$ kgf. Must not exceed 25%

The highest brake force is 220 kgf. The imbalance is then:
$$\frac{220 - 200 \times 100}{220} = 9\%$$

Commercial vehicles:

On commercial vehicles the imbalance is the difference between the brake force measured at the time of locking of the wheel on the same axle. It is only obligatory to measure imbalance on the steering axles (MOT regulations).

The imbalance on the steering axle on commercial vehicles must not exceed 30%.

If the imbalance is too great, the vehicle will have a tendency to be drawn to the side with the highest brake force when applying the brakes. In critical situations a sideslip is eminent.

Ovality.

Ovality is pulsing brake force at a constant brake pressure. Ovality is caused by oval, uneven or defective brake drums.

Ovality is a description of varying brake force measured during one revolution of a wheel at a constant brake pressure. Often this is caused by oval drums or uneven brake discs. Ovality can also indicate broken or rusty drums or discs. The values is, like brake force, measured as kgf. However it can also be shown as a percentage of the actual brake force.

MOT does not stipulate a legal maximum of ovality but suggest a maximum of no more than 70%.

Brake Pedal Pressure.

The pressure asserted by the foot on the brake pedal is called the brake pedal pressure. Especially interesting is the highest brake pedal pressure measured at the moment the wheels lock. The highest brake pedal pressure must be less than 50 - 70 kilos depending on the type of vehicle. Greater brake pedal pressure can be caused by worn brake pads or for example defective brake booster or reduction valves.

Rolling Resistance.

The rolling resistance is the brake force measured during a test without activating the brake pedal. This can be caused by dragging brakes, maladjusted brakes or defective valves. A high rolling resistance can cause considerably wear of the tyres, and on the brake pads and can result in a higher fuel consumption.

Calculated brake force.

It may not always be possible to measure the maximum brake force on a roller brake tester. The reason for this is that the point of locking of the wheels will be reached sooner if the vehicle is not fully laden. It is therefore necessary to calculate the brake force at a higher pressure. The calculation is done using the measured maximum brake force, the measured maximum pressure and the allowed total weight of the vehicle. This calculation will reveal how the vehicle's brakes will perform during an emergency stop.

Gross vehicle weight.

This is the allowed maximum weight of the vehicle and payload according to the law. The maximum weight is noted in the vehicle's registration papers. This weight is being used for the calculation of the braking ability of the vehicle.

Guaranteed pressure.

The guaranteed pressure is the lowest legal level of the highest attained pressure at maximum braking action. This pressure is also used for calculating the braking ability of the fully laden vehicle.

PC-pressure.

The pressure measured in a brake cylinder when being tested.

PC-start pressure.

The pressure measured in a brake cylinder at the moment braking effect begins.

PM-pressure.

The pressure measured in the main air line leading to the trailer. For vehicles with Duomatic valve this pressure is called the duomatic pressure.

Preparing for a brake test.

Turn the power on at the main switch of the brake tester and press RESET.

Turn the power on by turning the switch to "I". Press the RESET button which is lit up. This turns on the safety system.

Do not drive the vehicle onto rollers until the amber zero indicator is turned off. The brake tester cannot operate as long as this light is lit.

During this procedure the brake tester checks the electronic system and zero the settings, this takes one to two minutes. When the tester is not in use the zeroing is performed at regular intervals with only seconds apart.

When the amber light is turned off the brake tester is ready for use.

By default the brake tester is in automatic mode for a quick test.

The brake tester changes to manual mode, When registering the vehicle on the PC before driving it onto the rollers.

Brake Testing Procedure - Automatic operation.

(This procedure must not be used for MOT testing.)

Automatic operation provides the following advantages:

The brake tester starts automatically when a wheel set is driven onto the rollers and is stopped either when the wheels lock or when the wheel set is driven out of the rollers, or manually by pressing STOP.

The brake tester will start up in the automatic mode and remain here if no vehicle is registered on the PC. The tester is always left in automatic mode after conclusion of a test.

Note. Automatic mode does not provide many facilities such as registering the vehicle, measuring air pressure nor is the analytic facility available.

Automatic operation is a way of performing a quick and simple test on all types of vehicles, and recommended when that is all which is required.

Testing Procedure:

1 Drive the first axle onto the rollers.

2 Lift the rollers.

3 Wait for start and green light.

4 Measure ovality at 100 - 500 kgf.

5 Slowly increase the brake force.

6 The brake tester stops automatically when the wheels lock.

7 Tests the parking brakes.

8 Lower the rollers.

9 Repeat the test on the remaining axles.

1 Drive the first axle onto the rollers.

The bottom display shows "U" for each wheel placed on the rollers. Both wheels must be on the rollers before the brake tester will start.

2 Lift the rollers.

If necessary, axle load simulation can be applied, by lifting the rollers. If the rollers have already started, press stop. The rollers can be raised by pressing: LIFT, UP. Press START to restart the rollers. When testing cars it serves no purpose to raise the rollers.

3 Wait for start and green light.

A moment after the wheels have been placed on the rollers, the brake tester will start automatically. When the tester is ready the red lights will turn off and the green lights will turn on. Do not assert pressure on the brake pedal until the green lights are turned on.

Before pressing the brake pedal the pointers show the rolling resistance. When applying the brakes the pointers show the brake force, whereas the bottom display shows the imbalance when the brake force exceeds 50 kgf on both wheels.

- 4 Measure ovality at 100 - 500 kgf.
To measure ovality takes approximately three seconds. Press gently on the brake pedal until the pointers are at 500 kgf (100 kgf for cars). Keep the pressure steady and press OVAL to start the test.

The ovality symbol "()" is showing on the bottom display together with the largest ovality in %. The arrows show which side has the largest ovality. The top display shows the ovality of the individual side as kgf.

Keep a constant pressure on the pedal until the imbalance symbol "<>" appears on the bottom display, this indicates that the ovality test has been completed. Now the top display shows the ovality on both the right and the left wheel and the bottom display shows the imbalance between the wheels again as a percentage.
- 5 Slowly increase the brake force.
Press the brake pedal slowly down and notice the movements of the pointers, they must follow each other without too much difference.
- 6 The brake tester stops automatically when the wheels lock.
The brake tester stop automatically just before the wheels skid on the rollers. This is to avoid unnecessary wear to the tyres.
The pointers will remain at the position they had just before the wheels locked. They will keep the position until the brake tester is restarted. The display will show the greatest imbalance measured during test. If ovality was measured, the top display will show ovality of both wheels. If locking of the wheels has not been reached, the tester can be stopped by pressing STOP on the remote control or on the keyboard. The pointers will remain in the brake force they showed at that moment and the display will show the greatest imbalance measured during the test. The brake tester will attempt to restart after approximately 2 seconds. If it has been stopped by pressing STOP it will only start again by pressing the START button
- 7 Tests the parking brakes.
On axles on which the parking brake is fitted, test it after having tested the foot brakes. When the wheels have locked the brake tester will stop for 2 seconds and will then restart. Now slowly apply the parking brake until the wheels lock.
- 8 Lower the rollers.
If axle load simulation has been used (by lifting the rollers) you must lower them in order to drive out of them. Press STOP. Lower the rollers by using the remote control keys: LIFT, and DOWN. Remember to press start again when the next wheel set has been placed on the rollers.
- 9 Repeat the test on the remaining axles.
After having tested an axle, drive the vehicle forward to place the next wheel set on the rollers. Remember that the two "U"s must appear on the display to indicate that both wheels are in place before you can start the test.

Procedure for MOT testing commercial vehicles.

(Manual Brake Test Procedure - without air brake system.)

The brake tester starts up in manual operational mode when you register the vehicle on the PC. This facilitates the use of the analytic facilities which aids the identification of faults in the brake system. Manual operational mode is used for all vehicles with mechanical, hydraulic and air brake systems, for MOT inspection and when a thorough and detailed analysis is wanted.

Procedure:

Follow the brake test procedure detailed in the latest version of the relevant MOT inspection manual.

Register the vehicle on the PC

Front axle.

- 1 Drive the front axle onto the rollers.**
- 2 Key in the axle load and lift the rollers - if applicable.**
- 3 Press START to start the test. (Both wheels start) Align the wheels on the rollers.**
- 4 Measure ovality. - if applicable.**
- 5 Press STOP**
- 6 Press OK.**
- 7 Press START. (Left wheel starts)**
- 8 Measure brake force.**
- 9 Press OK**
- 10 Press START. (Right wheel starts).**
- 11 Measure brake force.**
- 12 Press OK.**

Secondary brake - if applicable.

- 13 Press PARK and then START (Left wheels start).**
- 14 Measure brake force.**
- 15 Press OK.**
- 16 Press START. (Right wheel starts)**
- 17 Measure brake force.**
- 18 Press OK.**

Parking brake - if applicable.

- 19 Apply hand brake.**
- 20 Press START (Left wheel).**
- 21 When brake force has been measured, press OK.**

- 22 Press START (Right wheel).**
- 23 When brake force has been measured, press OK.**

Lower the rollers - if applicable

Drive front wheels out of the rollers.

Rear axles

- 1 Drive the (first) rear axle onto the rollers.**
- 2 Key in the axle load and lift the rollers - if applicable**
- 3 Press START to start the test. (Both wheels start) Align the wheels on the rollers.**
- 4 Measure ovality. If applicable.**
- 5 Press STOP.**
- 6 Press OK.**
- 7 Press START. (Left wheel starts)**
- 8 Measure brake force.**
- 9 Press OK.**
- 10 Press START. (Right wheel starts).**
- 11 Measure brake force.**
- 12 Press OK**

Secondary brake - if applicable.

- 13 Press PARK and then START (Left wheels start).**
- 14 Measure brake force.**
- 15 Press OK.**
- 16 Press START. (Right wheel starts)**
- 17 Measure brake force.**
- 18 Press OK.**

Parking brake - if applicable

- 19 Apply hand brake.**
- 20 Press START (Left wheel).**
- 21 When brake force has been measured, press OK.**

- 22 Press START (Right wheel).**
- 23 When brake force has been measured, press OK.**

Lower the rollers - if applicable

Drive next axle onto the rollers and repeat Rear Axle procedure.

To print: When all axles have been tested:

Press PRINT after the "Lock and Key" symbol is turned off.

During manual operation the cycle from two wheel - to left wheel - to right wheel operation takes place when pressing OK. The cycle can be started at another point by pressing PAGE (left of the arrows on IR control) or TEST (right of the arrows on IR control). Watch the green indicators lights on the display console.

Procedure in more details:

Register the vehicle on the PC:

Key in the relevant data on the PC. (For details see the chapter "PC Diagnostic Program") page 15. The data are used for printouts and calculating and analysing the results.

Front axle.

- 1 Drive the front axle onto the rollers.
The bottom display shows a "U" for each of the wheels when placed properly on the rollers. The brake tester will not start if this is not the case. The display shows the weight and the number of the axle.
- 2 Key in the axle load and lift the rollers - if applicable
If the axle load is not sufficient you can increase the load by lifting the rollers. This will in most cases be sufficient when testing the rear axle of tractor units and trailer with multiple rear axles. When testing lorries/trailers with single axles it will be necessary to apply straps to hold down the axle and then to apply extra load by lifting the rollers against the strapped down axle. To apply load press LOAD and select the desired load with the arrow keys UP and DOWN and confirm by pressing OK.
If a load has not been keyed in, the roller units will assert 5 tonnes axle load.
The roller should not be lifted when testing cars.
Warning: Do not load the axle to its maximum as the load might increase when the rollers turn and the brakes are applied.
- 3 Press START to start the test. (Both wheels start)
When both wheels are correctly placed on the rollers indicated by two "U"s on the display console, the test is started by pressing START. The green lights will be turned on and the red lights will be turned off when the rollers have reached the correct speed. The brake pedal must not be activated until the green lights are on. The test can now begin. The two pointers will show the rolling resistance, whereas the bottom display will show the imbalance in percent when the brake force exceeds 50 kgf on both wheels. If the brakes of the vehicle are cold or wet, take this opportunity apply the brake to warm/dry the brakes.

- 4 Measure ovality.
To measure ovality takes approximately 6 seconds. Apply gentle pressure on the brake pedal until the pointers show 500 kgf (100 kgf for cars). Keep the pressure on the pedal steady and press OVAL on the remote control.
During the test the bottom display shows the symbol "O" for ovality and the largest measured value. The top display shows the ovality for each wheel as kgf
Keep the pedal pressure constant until the bottom display shows the Imbalance symbol "<>". This indicates the end of the test. The top display will keep showing the ovality on both the left and right wheel. The bottom display will show the imbalance as percentage.
- 5 Press STOP.
Press STOP to stop the rollers.
- 6 Press OK.
Press OK to store the result. The test can be performed several time and will only be stored when OK has been pressed. Pressing OK will bring the brake tester to the next step.
- 7 Press START. (Left wheel starts).
Pressing START will start the left wheel, (leaving the right wheel stationary).
- 8 Measure brake force.
Measure the brake force as described in point 5.
- 9 Press OK.
Press OK to store the result and to go to the next step.
- 10 Press START. (Right wheel starts).
Pressing START will start the right wheel, (leaving the left wheel stationary).
- 11 Measure brake force.
See point 5.
- 12 Press OK.
This completes the test of the front axle.

Lower the rollers - if applicable.

When applicable lower the rollers by pressing LIFT and DOWN. If straps have been applied, remember to remove them before attempting to drive out of the rollers.

Drive front wheels out of the rollers.

Drive the next axle onto the rollers and repeat the procedure described above.

Secondary brake - if applicable.

The procedure is the same as for the service brakes

- 13 Press PARK and then START (Left wheels start).
- 14 Measure brake force.
- 15 Press OK.
- 16 Press START. (Right wheel starts)

- 17 Measure brake force.
- 18 Press OK.

Parking brake - if applicable

The rollers are stationary at the start of this test.

After having tested the secondary brake the brake tester is ready to perform the applied parking brake test.

If you want to skip the test of the secondary brake, Press PARK twice and perform the applied parking brake test as described below.

- 19 Apply hand brake.
- 20 Press START (Left wheel)
The left will attempt to start (by-passing the "delta" starting procedure). This test takes a fraction of a second.
- 21 When brake force has been measured, press OK.
This stores the result.
- 22 Press START (Right wheel).
Same as point 20
- 23 When brake force has been measured, press OK.

Press Print to generate the report.

When all axles have been tested press PRINT to print the report. Choose the wanted type of report from the menu on the screen.

Brake Testing – Manual Operation with air brake system.

The brake tester starts up in manual operational mode when you register the vehicle on the PC. This facilitates the use of the analytic facilities which aids the identification of faults in the brake system. Manual operational mode is used for commercial vehicles with air brake systems. The results provides information about the functions of the air system in correlation to the function of the brakes.

Procedure:

Make sure that the brake tester is on and ready for use (see user's manual).

Register the vehicle on the PC

Mount the air transducer on the air lines on the vehicle.

Front axle.

- 1 Drive the front axle onto the rollers.**
- 2 Key in the axle load and lift the rollers - if applicable**
- 3 Press START to start the test. (Both wheels start)**
- 3a Choose the relevant transducer with the up/down arrow keys.**
- 3b Press START**
- 4 Measure ovality.**
- 5 Measure brake force.**
- 6 Press OK.**
- 7 Press START. (Left wheel starts)**
- 7a Press START again**
- 8 Measure brake force.**
- 9 Press OK**
- 10 Press START. (Right wheel starts).**
- 10a Press START again**
- 11 Measure brake force.**
- 12 Press OK.**

Lower the rollers - if applicable.

Drive front wheels out of the rollers.

Rear axles

- 1 Drive the (first) rear axle onto the rollers.
- 2 Key in the axle load and lift the rollers - if applicable
- 3 Press START to start the test. (Both wheels start)
- a Choose the relevant transducer with the up/down arrow keys.
- 3b Press START
- 4 Measure ovality.
- 5 Measure brake force.
- 6 Press OK.
- 7 Press START. (Left wheel starts)
- 7a Press START again.
- 8 Measure brake force.
- 9 Press OK.
- 10 Press START. (Right wheel starts).
- 10a Press START again
- 11 Measure brake force.
- 12 Press OK

Secondary brake - if applicable.

- 13 Press PARK and then START (Left wheels start).
- 14 Measure brake force.
- 15 Press OK.
- 16 Press START. (Right wheel starts)
- 17 Measure brake force.
- 18 Press OK.

Parking brake - if applicable

- 19 Apply hand brake.
- 20 Press START (Left wheel).
- 21 When brake force has been measured, press OK.
- 22 Press START (Right wheel).
- 23 When brake force has been measured, press OK.

Lower the rollers - if applicable

Drive next axle onto the rollers and repeat Rear Axle procedure.

To print: When all axles have been tested:

Press PRINT after the "Lock and Key" symbol is turned off.

Procedure in more details:

The procedure is the same as described on page 23 with a few additions which are described below.

Mount the air transducer on the air lines on the vehicle.

The transducer marked Pm must be connected to the main feeding line.

The transducers marked Pc1, Pc2 etc. must be connected to the brake cylinder which are to be tested. Remember to move the Pc air transducers if necessary) e.i. if you have fewer transducers than axles on the vehicle.

a Choose the relevant transducer with the up/down

The number of the active transducer is shown in the upper left hand corner of the display console. If the number is correct press START to go to point 3b. If the number is not correct choose the relevant transducer with the up/down arrow keys on the remote control (or on the key pad on the control cabinet).

3b Press START

Pressing START will start the test on both wheels.

7a and 10a Press START again.

This will confirm the number of the transducer which normally will be the same again since it is the same axle to be tested.

Remember to remove the transducers after completion of the test.

Note: To make it easier to read the graphs it is an advantage to increase the pressure on the brake pedal over a period of several seconds.

Manual Brake Test Procedure.

Procedure for MOT testing Class IV and Class VII vehicles.

The brake tester starts up in manual operational mode when you register the vehicle on the PC. This facilitates the use of the analytic facilities which aids the identification of faults in the brake system. Manual operational mode is used for MOT inspection. It facilitates a printout of the results.

Important: In order to have the result of the imbalance on the printout, it is necessary to “switch “ it on, in the PC program:

After opening the program,

choose “Configuration” at the top of the screen by pressing arrow key ones, then <Enter>.

A pop-up window appears on the middle of the screen.

Press <Enter>, to move the highlight bar down to “SHOW FORCE”. You can also move the highlight bar up or down with the arrow keys (or).

Press the space bar until “YES” appears.

Press <Enter> several time until you reach “OK”. When “OK” is highlighted press <Enter>.

You are now asked if you want to change the password. If not highlight “NO” and press <Enter>.

A pop up window asks you if you want to save the program configuration. “YES” is highlighted, so just press <Enter>.

On the printed report: On the printout you will see the following:

Brake force tested on one wheel at the time. The imbalance (%) (Difference) is measured as the difference of brake force at the individual wheels time of locking.

The brake force during test done on both wheels simultaneously.

The highest measured imbalanced during the cause of the test until the first wheel has locked.

Procedure for MOT Testing Class IV and Class VII Vehicles:

Follow the brake test procedure detailed in the latest version of the relevant MOT inspection manual.

Register the vehicle on the PC. See page 15

Front axle.

- 1 Drive the front axle onto the rollers.
- 2 Press START to start the test. (Both wheels start) Align the wheels on the rollers.
- 3 Measure ovality. - if applicable.
- 4 Measure brake force (Highest imbalance is registered when measuring the brake force at this point).
- 5 Press STOP.
- 6 Press OK.
- 7 Press START. (Left wheel starts).
- 8 Measure brake force.
- 9 Press OK.
- 10 Press START. (Right wheel starts).
- 11 Measure brake force.
- 12 Press OK.

Drive front wheels out of the rollers.

Rear axles

- 1 Drive the (first) rear axle onto the rollers.
- 2 Press START to start the test. (Both wheels start) Align the wheels on the rollers.
- 3 Measure ovality. If applicable.
- 4 Press STOP.
- 5 Press OK.
- 6 Press START. (Left wheel starts)
- 7 Measure brake force.
- 8 Press OK.
- 9 Press START. (Right wheel starts).
- 10 Measure brake force.
- 11 Press OK

Parking brake.

- 12 Press PARK and then START (Left wheels start).
- 13 Measure brake force.
- 14 Press OK.
- 15 Press START. (Right wheel starts)
- 16 Measure brake force.
- 17 Press OK.

To print:

When all axles have been tested:

Press PRINT after the "Lock and Key" symbol is turned off.

Note: During manual operation the cycle from two wheel - to left wheel - to right wheel operation takes place when pressing OK. The cycle can be started at another point by pressing PAGE (left of the arrows on IR control) or TEST (right of the arrows on IR control). Watch the green indicators lights on the display console.

Procedure in more details:

Register the vehicle on the PC:

Key in the relevant data on the PC. (For details see the chapter "PC Diagnostic Program") page 15. The data are used for printouts showing the results.

Front axle.

- 1 Drive the front axle onto the rollers.
The bottom display shows a "U" for each of the wheels when placed properly on the rollers. The brake tester will not start if this is not the case. The display shows the weight and the number of the axle.
- 2 Press START to start the test. (Both wheels start)
When both wheels are correctly placed on the rollers indicated by two "U"s on the display console, the test is started by pressing START. The green lights will be turned on and the red lights will be turned off when the rollers have reached the correct speed. The brake pedal must not be activated until the green lights are on. The test can now begin. The two pointers will show the rolling resistance, whereas the bottom display will show the imbalance in percent when the brake force exceeds 50 kgf on both wheels. If the brakes of the vehicle are cold or wet, take this opportunity apply the brake to warm/dry the brakes.
- 3 Measure ovality.
To measure ovality takes approximately 6 seconds. Apply gentle pressure on the brake pedal until the pointers show 500 kgf (100 kgf for cars). Keep the pressure on the pedal steady and press OVAL on the remote control.
During the test the bottom display shows the symbol "O" for ovality and the largest measured value. The top display shows the ovality for each wheel as kgf
Keep the pedal pressure constant until the bottom display shows the Imbalance symbol "<>". This indicates the end of the test. The top display will keep showing the ovality on both the left and right wheel. The bottom display will show the imbalance as percentage.
- 4 Measuring the brake force and imbalance.
Increase the pressure on the brake pedal in a controlled motion until the wheels lock. If locking cannot be achieved press STOP to stop the rollers.
- 6 Press OK.
Press OK to store the result. The test can be performed several time and will only be stored when OK has been pressed. Pressing OK will bring the brake tester to the next step.
- 7 Press START. (Left wheel starts).
Pressing START will start the left wheel, (leaving the right wheel stationary).
- 8 Measure brake force.
Measure the brake force as described in point 5.
- 9 Press OK.

Press OK to store the result and to go to the next step.

- 10 Press START. (Right wheel starts).
Pressing START will start the right wheel, (leaving the left wheel stationary).
- 11 Measure brake force.
See point 5.
- 12 Press OK.
This completes the test of the front axle.

Drive the next axle onto the rollers and repeat the procedure described above.

Parking brake.

- 13 Press PARK and then START (Left wheels start).
- 14 Measure brake force.
- 15 Press OK.
- 16 Press START. (Right wheel starts)
- 17 Measure brake force.
- 18 Press OK.

Press Print to generate the report.

When all axles have been tested press PRINT to print the report. Choose the wanted type of report from the menu on the screen.

Maintenance.

Remote control - change of battery
Cabinet - cleaning
Cabinet - replacing light bulbs
Roller units - cleaning
Roller units - lubrication
Roller units - adjustment of tension of chain
Roller units - changing of gas damper
Printer - changing ink cartridge
Printer - loading the paper
Periodical maintenance

Remote control - change of battery.

Change the battery when discharged - on the average once a year.

1. The battery cover is on the back of the remote control.
2. Remove the screw holding the cover.
3. Remove the cover.
4. Remove the discharged battery and discard according to local regulations.
5. Insert a new 9 Volt battery, type IEC 6F22 (or equivalent). Make sure that the clip is connected correctly.
6. Screw the cover back on.

Cabinet - cleaning

Use a soft cloth moistened in soapy water to wipe down dust and dirt from the surfaces of the cabinet.

Note: The front of the cabinet is made on composite materials and will not withstand corrosive or abrasive cleaning agents or solvents.

Cabinet - replacing light bulbs.

Unscrew the 6 M1.5 Alan screws from the front panel of the cabinet and remove it.

The small amber zeroing light is pulled out after melting the soldering holding the wires on the back of it. Insert a new bulb and solder the wires back on.

The other bulbs are replaced by unscrewing the cover and removing the burnt out bulb and replacing it with a new one.

Refit the front panel.

Roller units - cleaning.

IMPORTANT: Before attempting to begin the work, Turn the brake tester off and lock the switch in off position.

Remove stones and dirt from the rollers. Clean up the pit. Remove oil spills from the cover plates.

Check and clean the drainage in the pit at least once a year.

Roller units - lubrication.

IMPORTANT: Before attempting to begin the work, Turn the brake tester off and lock the switch in off position.

- 1 Remove the cover plates, i.e. the plates over the gas dampers, chain tension assemblies and motors.
- 2 Lubricate the bearings of the rollers by pumping grease through the nipples. Use a high quality grease for ball bearings. Lubricate the bearings once a year.
- 3 Lubricate the bearings of the motors once a year. Lifting the rollers allows better access to the bearings.
- 4 Lubricate the chain with a suitable oil or special grease at least once a year.
- 5 Clean the hydraulic filter with benzine. The filter is located in the front left corner of the right hand roller unit. The easiest access is through a service pit. It can also be reached from above. Remove the filter using a 30 mm spanner. Clean the filter once a year.
- 6 Check the oil level in the hydraulic system. The oil tank is located on the right hand side of the left roller unit. Check twice a year. Replenish with hydraulic oil of the type, Hyspin AWS 68.
- 7 Check the oil level in the gear box. Remove the 22 mm bolt on top of the motor to gain access. Check once a year.

Replenish with one of the following types:

BP	Energol GR-XP 220
ESSO	Spartan EP 220
MOBIL	Mobilgear 630
SHELL	Omala 220
TEXACO	Gear lubric. DX 90

Bolt the cover plates back on.

	Left side	Right side
Oil quantities	11.6 litres	14.3 litres

Roller units - adjustment of tension of chain.

IMPORTANT: Before attempting to begin the work, Turn the brake tester off and lock the switch in off position.

NOTE: The chains are pre-stretched thus needing very little adjustment. It is adjusted by moving the front roller or the gear motor.

- 1 Remove the right and left cover plates of the roller units.
- 2 Control the tension of the chain, it must not deflect more than 3 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 (loosen and re-tighten the Locking nuts) and re-tighten the bolts.
- 4 Bolt the cover plates back on.

Roller units - changing of gas damper.

IMPORTANT: Before attempting to begin the work, Turn the brake tester off and lock the switch in off position.

- 1 Remove the cover plates over the gas damper.
- 2 Remove the old gas damper.
- 3 Mount the new damper with the rod end bolted to the chassis of the roller unit, and the cylinder end to the third roller bracket.
- 4 Bolt the cover plates back on.

Printer - changing ink cartridge.

Change the ink cartridge when the print on the printout becomes faint. The printer is fitted with two cartridges, one with black ink and one with coloured ink. The two cartridges can be changed individually.

- 1 Turn the printer on.
- 2 Open the cover. After a moment the printer head will move to the centre.
- 3 Remove the cartridge from the printer head by pulling the top of the cartridge towards you. The colour cartridge is placed to the left and marked with three coloured dots on the face. The black one sits to the right and is marked with one black dot.
- 4 Take the new cartridge out of the wrapping taking care not to touch the copper contact points or the ink nozzles.
- 5 Remove the tape from the ink nozzles. The colour cartridge has one tape to be removed, the black one has two.
- 6 Place the cartridge in the printer head aligning the arrow on the top of the cartridge with the dot/dots on the printer head. Press it forward until it clicks into place.
- 7 Close the cover of the printer. The printer head will return to its stand by position on the right hand side.

Printer - loading the paper.

The printer prints on normal printer paper or copy paper (60 - 132 grams/m²).

- 1 Move the paper guide to "A4" position.
- 2 Pull the guide for the length of the paper towards you.
- 3 Take a stack of paper (up to 1 cm) and fan it thoroughly. Align the sheets of the stack and place it in the paper feeder with the print side downwards. With the right edge of the stack onto the right side of the paper feeder. The print side is marked on the paper package.
- 4 Push the paper guides onto the edges of the paper making sure that paper lays flat.

Periodical maintenance.

Daily.

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

Weekly.

Check the action of the gas dampers for the third rollers.

Check the proximity sensors of the third rollers one at the time. The display will show an "U" when the roller is pressed down. The brake tester must not start if only one roller is pressed down.

Drive a vehicle on the roller and perform a brake test noting if any discord has developed.

Half yearly.

IMPORTANT: Before attempting to begin the work, Turn the brake tester off and lock the switch in off position.

Remove all cover plates from the roller units.

Clean the pits for oil and dirt.

Check that the adjustment bolts support the main bearings properly.

Check the gear motors for leakage.

Check the oil level in the gear motors and replenish if necessary. The oil must be replaced at 10,000 hours operation. See page XX for recommended types of oil. The oil level is checked from the top of the gear box to the surface of the oil. For the left gear box the distance must be 130 ml. and for the right 95 ml.

Check the tension of the chain and adjust if necessary. Check that the deflection does not exceed 10 mm. when pressing by hand.

Clean the chains and lubricate with chain grease.

Un-painted/un-galvanized metal surfaces are rust proofed by the factory. Maintain this protection with penetrating oil or tectyl.

Check proximity sensors and switches for wear and tear and replace if necessary.

Check the clearance for the sensors. It must be 2 mm. \pm 0.2 mm.

Check all light in the cabinet and replace if necessary.

Replace the battery in the remote control. Type: 9V, IEC 6F22.

Clean the surfaces of the remote control and the cabinet.

Bolt the cover plates back in place.

Perform a full check of all functions.

Yearly.

IMPORTANT: Before attempting to begin the work, Turn the brake tester off and lock the switch in off position.

Remove all cover plates from the roller units.

Clean the pits for oil and dirt.

Check that the adjustment bolts support the main bearings properly.

Check the gear motors for leakage.

Check the oil level in the gear motors and replenish if necessary. The oil must be replaced at 10,000 hours operation. See page XX for recommended types of oil. The oil level is checked from the top of the gear box to the surface of the oil. For the left gear box the distance must be 130 mm. and for the right 95 mm.

Check the tension of the chain and adjust if necessary. Check that the deflection does not exceed 10 mm. when pressing by hand.

Clean the chains and lubricate with chain grease.

Un-painted/un-galvanized metal surfaces are rust proofed by the factory. Maintain this protection with penetrating oil or tectyl.

Check proximity sensors and switches for wear and tear and replaced if necessary.

Check clearances for the sensors. It must 2 mm. \pm 0.2 mm.

Check all lights in the console and replace if necessary.

Replace the battery in the remote control. Type: 9V, IEC 6F22.

Clean the surfaces of the remote control and the cabinet.

Check the gas dampers for the third rollers and replace if necessary.

Lubricate all bearings with ball bearing grease

Check the bearings on the third rollers.

Check the tolerance of the measured values of the display. The acceptable variations are: The shown value must not vary with more than \pm 5% and no more than \pm 3% of the full scale showing.

The difference between left and right side must not exceed 2.5% of the maximum value and no more than 1.5% of the full scale value.

If adjustment is needed call a qualified service engineer.

Bolt the cover plates back in place.

Perform a full check of all functions. Adjust the timing in the star-delta switch.

Trouble shooting.

The brake does not start after having driven a wheel set onto the rollers.

Turn the brake tester on and press the white RESET key. Wait until the amber light is off.

If the brake tester is in manual operational mode: Press START.

If the brake tester is in automatic mode: STOP has been pressed. Press START.

The remote control does no work.

Replace the battery.

The rollers do not lift when pressing LIFT and UP.

The wheels (both) are not properly placed on the rollers.

Printout: The axles of the trailer are not included in the printout.

The trailer was not registered on the computer.

PRINT has been pressed before the axles have been tested.

The brake tester does not start after the emergency stop has been activated.

Remove possible blockage from the safety light beam in the pit.

Press the white RESET button on the front of the cabinet.

The internal safety test shows a fault in the safety system.

Call a qualified service engineer.

Technical specifications.

Brake Tester CVBT 9000

Measuring range:	0-4000 kgf .
Principle of measuring:	Strain gauge.
Power supply:	400V 3N/PE 50Hz AC.
Maximum power consumption:	
Noise level:	<70 db (A).
Operational temperature:	0°C - 40°C.
Weight:	
- Console and control box:	65 kilos.
- Roller units:	1450 kilos.
Dimensions:	
- Display console (d*w*h):	200 mm x 620 mm x 800 mm.
- Control console (d*w*h):	180 mm x 380 mm x 1100 mm.
- Roller unit (each) (d*w*h):	1470 mm x 1165 mm x 640 mm.
- Roller diameter:	200 mm
Roller speed:	2.5 kph (200 rpm.).
Battery for remote control:	9V type 6LR61 (E-BLOCK) XXX
Zeroing light bulb:	1W 30V "RAFI 69507"
Other light bulbs:	4W 30v e14

Computer:

Power supply:	230V 1N/PE 50Hz AC
Weight:	25 kilos
Printer paper:	DIN A4, 60-135 gr/m ²

Wireless air transducer system.

Power supply:	230V 1N/PE 50Hz AC
Dimensions:	
- Base station (h*w*d)	950 mm x 470 mm x 220 mm
- Transducer (Ø x h)	Ø 55 mm x 220 mm
Frequency:	433 Mhz
Conformity no.:	DK: ALR-9622 N: NO96000172-R S: UE 960082

EU - Declaration of conformity.

The Manufacturer:

EWJ Teknik A/S
Sønderskovvej 14
DK-3460 Birkerød
Danmark

Telephone: +45 45 81 45 45

Telefax: +45 45 81 46 46

hereby declare that:

The brake tester,
Type EWJ 92500 (also known as Crypton CVBT9000)

conforms with the following directives:

73/23/EØF,
89/392/EØF with the amendment 91/368/EØF, 93/44/EØF and 93/68/EØF.
89/336/EØF

The equipment is manufactured in conformity with the following national standards

DS/EN292-1
DS/EN292-2
DS/EN60204-1
DS/EN418

Birkerød, Date: _____

Signed by

Henrik Wagner Jørgensen,
General manager

TERMS AND CONDITIONS OF SALE

GUARANTEE

We guarantee our products as free from defects due to faulty material or bad workmanship for a period of 12 calendar months for all products. The period of the guarantee commences from the date of delivery to the Purchaser, either by us or by our distributor. Our liability is limited to the replacement of parts found defective and making good defects found within the prescribed period arising solely from faulty material or bad workmanship, in the products of our own manufacture, properly used solely for the purposes for which they were intended, and not due to wear and tear, misuse, neglect or improper adjustment.

Any product alleged to be defective shall be forwarded to us, carriage paid, immediately the alleged defect is discovered, for identification, examination and report or if not capable of being so forwarded, notice in writing shall be sent to us immediately. The Purchaser will be charged for engineers time and travelling expenses if a warranty repair is carried out on site, other than for fixed items of equipment such as brake testers. If we accept liability the repaired or new product, in replacement, will be delivered free from our works. We give no guarantee in respect of any proprietary electrical or other equipment made by other manufacturers, and supplied with our products, but will so far as possible, transfer the benefit of such guarantee, if any, given by such other manufacturers. We are in no circumstances liable for any consequential or other loss or damage arising through any defect in our product. In lieu of any express or implied statutory or other warranties, guarantees, conditions or liabilities (whether as to fitness, quality, standard of workmanship or otherwise) which are hereby excluded, the following provisions shall apply:

- (a) The Purchaser shall not be entitled to rescind the contract or to claim damages on the grounds of any statement whatsoever as to the suitability of the goods for any particular purpose, and the Purchaser assumes responsibility for the capacity and performance of the goods being sufficient and suitable for his purpose, and for his premises being suited to the installation and operation of the plant and machinery. The Purchaser agrees and confirms that apart from the express terms of the contract, no statement or representation has been made by the Company relating to the goods to be supplied under the contract or, if any has been made, he has not relied on it.
- (b) The Company's liability in respect of any defect whether quality, suitability or performance or otherwise in any goods supplied or for any loss, injury or consequential damage attributable thereto is limited to the terms of this guarantee and the Purchaser hereby acknowledges:
 - (i) that if purchased the goods in a competitive market and that the bargaining strength of the Company was in no way a relevant factor in the purchase of the goods from the Company.
 - (ii) that the Purchaser knows the extent of the meaning of this Condition and the limitations thereby imposed by it under Sections 13, 14 and 15 of the Sale of Goods Act 1979.

Our guarantee does not apply should equipment be operated or stored under adverse conditions e.g. outside installations or in areas used for steam cleaning or pressure washing, etc., unless otherwise specified in the relevant equipment manual.

The above guarantee is given in lieu of all other terms, conditions, warranties, guarantees, undertakings and representations, express or implied, statutory or otherwise, which, except to the extent that this provision is held to be void or unenforceable under or by virtue of any provision contained in the Sale of Goods Act 1979 or the Unfair Contract Terms Act 1977 or any statutory modification or re-enactment thereof for the time being in force, are hereby expressly excluded.

DESIGN We reserve the right to alter the design or construction of equipment at any time without notice.

LAW OF CONTRACT

All contracts for the sale of the Company's products shall be deemed to be made and executed in England, and the same shall be construed, performed and enforced in accordance with English Law and the parties submit to the jurisdiction of the English Courts. The application of the Uniform Laws of International Sales shall be excluded.

This condition shall not prevent the Company instituting proceedings in the Courts of any other country to enforce such contract against the customer.

DELIVERY

Delivery dates, given in good faith, are approximate and reflect conditions prevailing at that time.

No liability can be accepted arising from delays in delivery, irrespective of the cause of any such delay.

CANCELLATION AND VARIATION

Orders once accepted by us are binding and cannot be cancelled or varied unless we at our discretion accept the cancellation or variation. We will make every effort to meet our Purchasers in this respect but

- (a) we cannot accept cancellation for non-standard products; and
- (b) we cannot accept cancellation changes in delivery dates or other variations notified to us later than the end of the penultimate month prior to the month fixed for delivery; and in such circumstances and any other cancellations or variations to which we have not agreed we shall enforce our contractual rights and/or impose an appropriate charge.

TERMS

Quotations given are open for acceptance within 14 days and are subject to revision should the state of the raw material market or other circumstances render this action necessary.

Orders, whether received as a result of a quotation or not, can only be accepted for execution at prices ruling at date of despatch.

Payment - except where otherwise stated in our invoice, or agreed in writing, our terms are nett cash and payment is due on presentation of invoice. Where we have agreed to open an account with the Purchaser invoices are due for payment by the 25th of the month following month of invoice and interest will be charged on overdue accounts at the prevailing County Court rate.

VALUE ADDED TAX

VAT is not included in our prices and will be shown separately on all invoices at the rate ruling at date of despatch and subject to current legislation.

CARRIAGE

Carriage is paid to destinations on the mainland of England, Scotland and Wales on all orders of £500 Nett or over, except accessories, spare parts and repairs. Where carriage is chargeable its cost is added to the invoice value at current rates.

PACKING AND UNLOADING

Damages or shortages must be signed for as such and claim made on the carriers, in writing, within three days of delivery. Where Company vehicles are used the driver must be notified at the time of unloading and the consignment note marked to indicate the damage or shortage. The practice of signing for the goods "not examined" does not absolve the Purchaser from this condition. The consignee is responsible for unloading. Packing cases and slings, when used, are charged extra but credited in full on return, carriage paid and in good condition.

LOSS IN TRANSIT

Public Transport Companies and the Post Office only accept claims for loss in transit made within a limited period. If goods are not received within 14 days of the date of our invoice, we must be advised immediately otherwise neither the carriers nor ourselves will be liable for any loss involved.

PASSING OF RISK

The risk in the goods shall remain in us until delivery to the Purchaser or his agent. In the absence of written notice from the Purchaser to us and the carriers, as prescribed above, the goods shall be deemed to have been delivered complete and in satisfactory condition.

PASSING OF PROPERTY

Until such time as all sums due to the Company from the Purchaser whether in respect of goods delivered by the Company to the Purchaser or otherwise have been paid the provisions of this Condition shall have effect:

- (a) All goods delivered by the Company to the Purchaser will remain the property of the Company to the intent that the whole legal and beneficial interest therein shall remain that of the Company.
- (b) If the Purchaser becomes or threatens to become insolvent or being a body corporate has a Receiver appointed or passes a resolution for winding up or if a Court makes an Order to that effect or being an individual or partnership makes any composition or arrangements with his or their creditors or has a receiving order made against him or them or if the Purchaser shall be in breach of these Conditions, then the Company shall be at liberty to forthwith remove and repossess all goods which remain the property of the Company in accordance with this Condition and enter upon any property to do so or to inspect goods to identify the Company's goods.
- (c) The Purchaser shall only be at liberty to resell the goods purchased from the Company prior to the passing of title on the understanding that if it does not resell the goods then it will hold on trust for the Company so much of the proceeds of sale received by it under contracts which include any of the goods hereby sold either in their original or altered state as are necessary to discharge payment in full to the Company.
- (d) No provision of this Condition shall be deemed to cause a Mortgage or Charge of the Property or undertaking of the Purchaser or any part thereof to have been created by the Purchaser in favour of the Company.

SEPARABILITY

Any failure by us in respect of one delivery shall not entitle the Purchaser to treat the contract as repudiated, each delivery being, for such purpose, deemed a separate contract.

INSTALLATION

The Purchaser is responsible for the preparation of the site, where such a site is necessary, together with the provision of any supplies and services that may be required. The specifications and the responsibilities of agents, distributors and end-users are clearly set forth in separate leaflets, available on the various products concerned.

If failure to fulfil this responsibility extends the time taken to commission equipment or results in extra visits by engineers the Purchaser is fully liable for the extra cost. If installation of equipment is unduly delayed, the Company reserves the right to pass on cost inflation as a supplementary charge.

REFUSAL

Goods consigned to the order of end-users and/or distributors render them liable for all carriage and handling charges incurred, if delivery of the goods is refused on arrival at destination.

RETURNED EQUIPMENT

In exceptional conditions, subject to agreement in writing, and the equipment being of current standard design, new equipment in good condition will be accepted, carriage paid to factory, subject to a handling charge. Any costs incurred in making the equipment as new will be charged in addition to the handling charge.

SPARES AND AFTER SALES SERVICE

Spare parts and service are available through our service agents. Initial contact should be made via the Crypton Product Support Helpline on 01278 436225. All spare parts purchases are subject to minimum order values.

RIGHT TO TERMINATE

If the Purchaser breaks any of these conditions or becomes insolvent or subject to any law relating to bankrupts or being a corporation goes into liquidation, whether voluntary or compulsory or has a receiver appointed over its assets, we may suspend deliveries or, by notice to the Purchaser, terminate the contract and such termination shall be without prejudice to any other rights or remedies to which we may be entitled.

All quotations and tenders are given and contracts are made by the Company subject to the above terms and conditions and unless previously agreed in writing by an authorised officer of the Company:

- (i) no verbal, written or other addition hereto or variation hereof including (without prejudice to the generality of the foregoing) any representation or warranty relating to the goods or services to be provided by the Company shall be effective; and
- (ii) these terms and conditions supersede any other terms and conditions appearing elsewhere and shall prevail over and exclude any course of dealing established between the Company and the Purchaser and any other terms and conditions stipulated or incorporated or referred to by the Purchaser or his agent or any third party; and
- (iii) it shall be a pre-condition of the Company giving any quotation or tender or entering into any agreement for the supply of any goods or services that such agreement be made subject to these terms and conditions.

CRYPTON

Crypton Technology Business

Park, Bristol Road, Bridgwater, Somerset TA6 4BX

Tel: +44 (0) 1278 436200 Fax: +44 (0) 1278 450567 Email: sales@CryptonTechnology.com

Website: www.cryptontechnology.com

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 an Authorised Agent. 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.

Cryptonn 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 450 567
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.

Training Centre

The Crypton Training Centre offers a full range of courses, from training on the practical use of new equipment, to the vehicle electrical / electronic systems likely to be encountered. For details of courses or for further information please contact:

The Secretary, Crypton Training Centre, Bristol Road, Bridgwater, Somerset TA6 4BX.

Tel: 01278 436224 Fax: 01278 450 567
email: Training@CryptonTechnology.com

Notes: