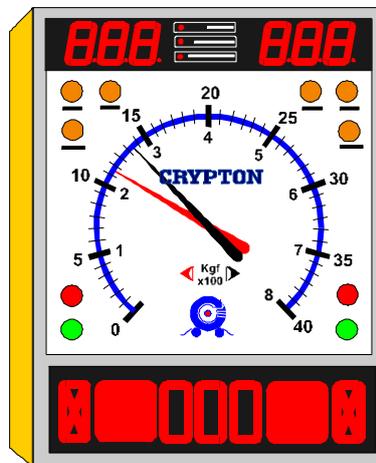


CRYPTON

In tune with the future



Commercial Vehicle Roller Brake Tester.

EB30/EC30/630 Upgrade

OPERATING INSTRUCTIONS

TES1343/A
July 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 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, 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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Safety procedures for brake testing

- ! 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 unauthorised 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

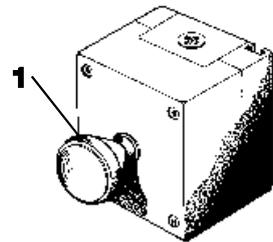
1. Emergency stop
2. Display console.
3. High voltage control unit.
4. Roller unit.
5. PC with brake diagnose program
6. Printer
7. Remote control

Accessories:

Base station for wireless air pressure transducers
Air pressure transducers - wireless
Air pressure transducers - cable connected

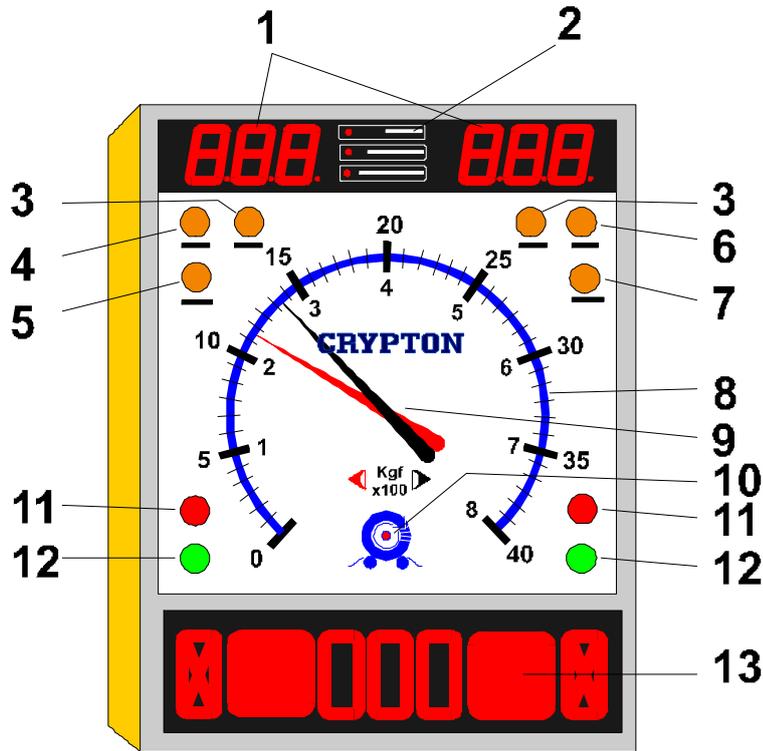
1. Emergency stop

Press for emergency stop.



Note: 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.

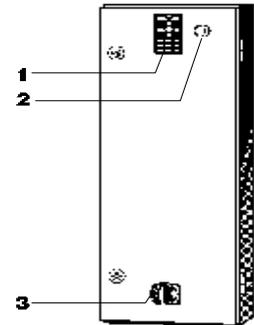
2. Display console



1. Top digital display - air pressure, ovality and weight
2. Indicator showing type of information on top display
3. Indicator light - 4WD (accessory)
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. Scale showing brake force
9. Pointers; red = left, black = right
10. Amber light - zeroing and fault indicator
11. Red lights - wheel locking
12. Green lights - ready for testing
13. Bottom digital display - imbalance, ovality, pressure and weight

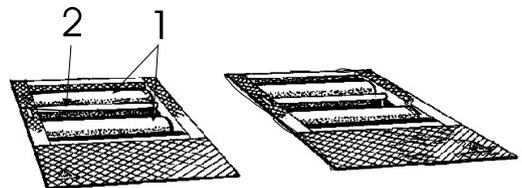
3. High voltage control.

1. Keyboard.
2. **RESET** button (resetting of safety relay).
3. Main switch (power supply circuit breaker).



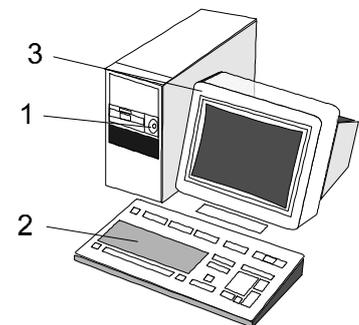
4. Roller unit.

1. Rollers
2. 3rd roller
Fitted with:
Strain gauge transducer.
Speed sensor on third roller.
Speed sensor on gear box
Proximity sensor on third roller assembly



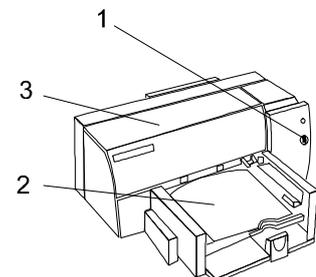
5. PC with diagnostic program

1. On/off switch
2. PC keyboard
3. Monitor



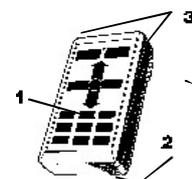
6. Printer

1. On/off switch
2. Paper tray
3. Cover



7. Remote control

1. Keyboard
2. Battery cover
3. Infrared transmitter window



Functions & Facilities

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

Automatic operation (not for UK MOT use)

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 mode.
It changes to manual 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.

Imbalance

In manual operational mode: Press **DAFF** 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 %).

In automatic operational mode: The imbalance is shown when the brake force exceeds 40 kgf.

You toggle between imbalance and air pressure by pressing **AIR** and **DAFF**.

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 MOT testing and 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.

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 a 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 P_M . The top display shows the chosen pressure P_c .

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.

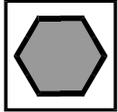
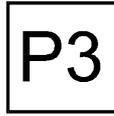
Holding the result on the display.

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.

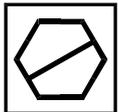
Symbols.

The following symbols will appear on the LED display:

Parking brake and number.



Accept of signal from remote control



Emergency stop activated



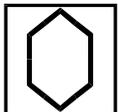
The brake tester is locked and does not communicate with PC



The brake tester transmits signal to printer



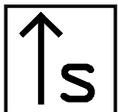
Imbalance in %



Ovality in %



Testing left secondary brake.



Testing right secondary brake



Testing left parking brake.



Testing right parking brake

PC Brake Diagnostic Program

With 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 is dependent upon the content on the screen and provides 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**" and 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

When 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
Mileage:	(Mileage 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 set-up 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 -when air pressure has been measured

For each axle the brake force is shown as P_c . 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 -when air pressure has been measured.

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.

$P_c - P_m$ graph -when air pressure has been measured.

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 -when air pressure has been measured.

The retardation graph shows 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 summary.

The result summary shows the vehicle's braking performance 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 offers 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:

$$\frac{220 - 200}{220} \times 100 = 9\%$$

HGVs and PSV:

On commercial vehicles the imbalance is the difference between the brake force measured at the time of locking of the wheels 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 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 accept an ovality of more than 70%.

Brake Pedal Pressure. (Available as accessory).

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. Dragging brakes, maladjusted brakes or defective valves can cause this. A high rolling resistance can cause considerable wear of the tyres, and on the brake pads and can result in 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.

P_c-pressure. When air transducers are fitted.

The pressure measured in a brake cylinder when being tested.

P_c-start pressure. When air transducers are fitted.

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

P_m-pressure. When air transducers are fitted.

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 the 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 zeros the settings. 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.

It is in automatic mode for a quick test.

For manual mode, register the vehicle on the PC before driving it onto the rollers.

Automatic Brake Test Procedure.

- **NOT ALLOWED 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 **Wait for start and green light.**
- 3 **Measure ovality at 100 - 500 kgf.**
- 4 **Slowly increase the brake force.**
- 5 **The brake tester stops automatically when the wheels lock.**
- 6 **Tests the parking brakes.**
- 7 **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 **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.

3 **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 for commercial vehicles (100 kgf for cars). Keep the pressure steady and press **OVAL** to start the test. Follow procedure in MOT manual for relevant class of MOT testing.

The 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.

4 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.

5 The brake tester stops automatically when the wheels lock.

The brake tester stops 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 the test. If ovality was measured, the top display will show the 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

6 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 wheel locks.

7 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.

Manual Brake Test Procedure

Procedure for MOT testing commercial 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 all vehicles with mechanical, hydraulic and air brake systems, and when a thorough and detailed analysis is wanted and when conducting a MOT test.

Procedure:

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

- 1) Ensure there is no vehicle in the rollers
- 2) Switch on Console
- 3) Press white RESET button (to the right of safety stop)
- 4) Switch on PC
- 5) WAIT for 'jumping men' and PC password screen
- 6) Enter password (default = 123456) and press RETURN
- 7) If PC has a blank screen, ensure BRAKETEST in top Left Hand corner is highlighted and press RETURN
- 8) If the vehicle is in the database, highlight 'LOAD VEHICLE DATA' and press RETURN (In not in database, use ENTER VEHICLE DATA, SAVE VEHICLE DATA and then do step 8)
- 9) Highlight vehicle registration in the list and press RETURN
- 10) Highlight 'BEGIN A BRAKETEST' in list and press RETURN top LH lights on console should switch from AUTO to MANUAL
- 11) Get in vehicle and use handset from now on
- 12) Drive front wheels of vehicle into rollers, lower display = U 1⁻ U
- 13) Press START, both rollers should start, wait for two green lights
- 14) Centre vehicle in rollers and apply brake to about 500kgf and hold steady
- 15) Press OVALITY, wait about 5 seconds for readings to stabilise

- 16) Press STOP
- 17) Press OK to store ovality result for front axle
- 18) Press START, left roller only should start, wait for LH green light
- 19) Apply foot brake smoothly until front LH wheel locks and roller stops
- 20) Press OK to store front near side brake result
- 21) Press START, right roller only should start, wait for RH green light
- 22) Apply foot brake smoothly until front RH wheel locks and roller stops
- 23) Press OK to store front off side brake result
- 24) Drive rear wheels of vehicle into rollers, lower display = U 2 [—] U
- 25) Press START, both rollers should start, wait for two green lights
- 26) Centre vehicle in rollers and apply brake to about 500kgf and hold steady
- 27) Press OVALITY and wait about 5 seconds until readings stabilise
- 28) Press STOP
- 29) Press OK to store ovality result for rear axle
- 30) Press START, left roller only should start, wait for LH green light
- 31) Apply foot brake smoothly until rear LH wheel locks and roller stops
- 32) Press OK to store rear near side brake result
- 33) Press START, right roller only should start, wait for RH green light
- 34) Apply foot brake smoothly until rear RH wheel locks and roller stops
- 35) Press OK to store rear off side brake result, WAIT for lock and key symbols to appear and disappear.
- 36) Press PARK to start test of parking brake lower display = UP1 S ↑U
- 37) Press START, left roller only should start, wait for LH green light
- 38) Apply parking brake smoothly until wheel locks and roller stops
- 39) Press OK to store rear near side parking brake result, lower display = U ↑SU
- 40) Press START, right roller only should start, wait for RH green light

- 41) Apply parking brake smoothly until wheel locks and roller stops
- 42) Press OK to store rear off side parking brake result, wait for lock & key to flash on lower display
- 43) Apply parking brake fully to allow locked brake test
- 44) Lower display shows U P2 P[↑] U
- 45) Press START, left roller only should start for 2 seconds to perform locked brake test on near side parking brake
- 46) Press OK to store rear near side parking brake locked test result, lower display should now show U [↑] P U
- 47) Press START and right roller only should start for 2 seconds to perform locked brake test on off side parking brake
- 48) Press OK to store rear off side parking brake locked test result , wait for lock & key symbols to flash on display.
- 49) Press PRINT to produce printout
- 50) Press PARK twice to end test

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 indicator 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 10. The data are used for printouts and calculating and analysing the results.

Front axle. a) 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.

b) 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.

c) 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.

d) Press STOP.

Press **STOP** to stop the rollers.

e) 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.

- f) **Press START. (Left wheel starts).**
Pressing START will start the left wheel, (leaving the right wheel stationary).
- g) **Measure brake force.**
Measure the brake force as described in point 5.
- h) **Press OK.**
Press OK to store the result and to go to the next step.
- i) **Press START. (Right wheel starts).**
Pressing START will start the right wheel, (leaving the left wheel stationary).
- j) **Measure brake force.**
See point 5.
- k) **Press OK.**
This completes the test of the front axle.

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

- l) Press **PARK** and then **START** (Left wheels start).
- m) Measure brake force.
- n) Press **OK**.
- o) Press **START**. (Right wheel starts)
- p) Measure brake force.
- q) Press **OK**.

The brake tester is now ready to test the applied parking brake.

Parking brake - if applicable

The rollers are stationary at the start of this test.

- r) Apply hand brake.
- s) Press **START** (Left wheel)
The left will attempt to start (bypassing the “delta” starting procedure). This test takes a fraction of a second.
- t) When brake force has been measured, press **OK**.
This stores the result.
- u) Press **START** (Right wheel).
Same as point 20
- v) When brake force has been measured, press **OK**.
If you want to perform the applied parking brake test without testing the secondary brakes: press P and then P again, and perform the test.

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.

Manual Brake Test Procedure for Class IV & VII.

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.

Procedure:

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

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>.

By pressing <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 times 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>.

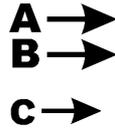


On the print: On the print you will see the following

A:

Results for: 21234567, Tested: 9B/1			
Axle no.: 1		Measured	
One wheel brake force	1419 kgf	40 x 2753 kgf	
Brake force [kgf]	L 1364	R 1427	
Difference [%]	4		
Axle no.: 2		Measured	
One wheel brake force	592 kgf	61 x 1533 kgf	
Brake force [kgf]	L 1000	R 1100	

Brake force tested on one wheel at the time.



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

B:

The brake force during test done on both wheels simultaneously.

C:

The highest measured imbalance during the cause of the test until the first wheel locks.

Now to the test.

Register the vehicle on the PC. See page 10

- 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.

During manual operation the cycle from two wheels - 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 indicator 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 10. 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.

5 Press OK.

Press OK to store the result. The test can be performed several times and will only be stored when OK has been pressed. Pressing OK will bring the brake tester to the next step.

6 Press START. (Left wheel starts).

Pressing START will start the left wheel, (leaving the right wheel stationary).

7 Measure brake force.

Measure the brake force as described in point 5.

8 Press OK.

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

9 Press START. (Right wheel starts).

Pressing START will start the right wheel, (leaving the left wheel stationary).

10 Measure brake force.

See point 5.

11 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.

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**.

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.

Re-fit 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.
- 2** Lubricate the bearings of the rollers by pumping grease through the nipples. Use 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. Clean and refill oil bath if fitted.
- 5** Check the oil level in the gearbox
Replenish with a 90 grade gear oil
- 6** 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 downward 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 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.

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.

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 agent. 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

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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 Transervice or Authorised Agent (outside the UK). 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.

Fully Comprehensive After-Sales Service

Call Crypton Helpline for details of local service agents. 01278 436225

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: