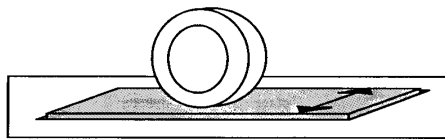
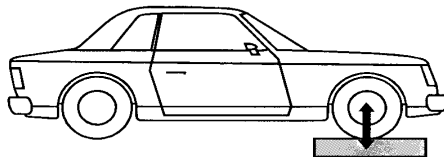
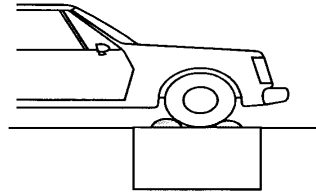
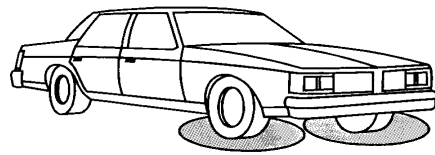
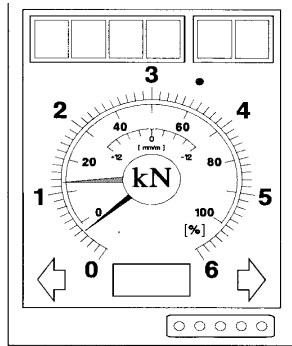


CRYPTON

In tune with the future

BRAKE TESTER CBT6000



OPERATING INSTRUCTIONS

TES1304/A
June 2000

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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1 GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

This device is a roller-type dynamometer for passenger cars and light commercial vehicles. It allows brake systems to be checked on each individual axle. The integrated microprocessor control allows measurements to be linked intelligently, with the result that any additional information, including that on the braking behavior of the entire vehicle, is available to the user.

High operating reliability is assured by auxiliary self-test programs such as:

- * Checking of all sensors and control units when switched on
- * Automatic zero-point correction, monitoring for cable break and short-circuiting etc.

This description also covers any possible options. It is therefore conceivable that the version you have acquired may not perform certain functions described here. The test-rig program can also be used on a version 3 testing line.

1.2 TECHNICAL SPECIFICATION

Max. drive-over load	4 t
Max. testing load	2.5 t
Testing speed	5 km/h
Measuring range, braking force	6 kN (per side)
Measuring range, weigher	4 t (per axle)
Roller diameter	210 mm
Motor output	5 kW
Gear ratios	20.78
Space between rollers	800 mm
Length of rollers	700 mm
Measuring system	DMS-technology
Noise emissions L WA	< 70 dB (A) as under DIN 45635
Weight, roller set	420 kg
Weight, display cabinet	43 kg
Weight, printer container	28 kg
Weight, support column	23 kg
Enclosure rating, display	IP 54

2 INSTRUCTIONS FOR SAFE OPERATION

2.1 TEST RIG SAFETY FEATURES

- * If a difference of at least 4 seconds between the left and right sensing roller position occurs (one at top, one at base), operation cannot continue.
- * If braking force does not change for more than 60 seconds, the test rig shuts down the motors. The automatic mode is likewise deactivated.
- * If the vehicle's wheels lock when the motors start up, the test rig cuts out immediately. During testing of the brakes, the test rig automatically cuts out as soon as one wheel starts to lock. The test rig only starts up if pressure is applied to both sensing rollers (not suitable for single-track vehicles).

2.2 RULES FOR SAFE OPERATION

- * **The test rig may only be used in accordance with its designated purpose**
- * **Brake testing work may only be carried out by trained personnel**
- * **Repair work may only be carried out by trained service personnel**
- * **All electrical installation work must be carried out exclusively by skilled electricians**
- * **No persons may remain within the immediate vicinity of the test rig during testing work**
- * **Before testing the brakes, check that the cold tyres are inflated to the correct pressure**
- * **Apply the brakes slowly, gradually increasing the pressure**
- * **Position the vehicle as centrally as possible on the rollers, pointing straight ahead**
- * **Drive slowly onto the test rig**

Driving off the test rig:

- * **Start the vehicle's engine**
- * **Engage 1 st gear and depress the clutch**
- * **Switch on the roller set**
- * **Wait until the lock telltales stop flashing**
- * **Release the clutch and drive swiftly off the test rig**
- * **If the vehicle needs to be reversed off the test rig, engage reverse gear now and drive the vehicle off the test rig with a certain amount of momentum, to overcome the mechanical resistance of the rollers**
- * **Testing four-wheel-drive vehicles:**
 - On vehicles with manual four-wheel drive, it must be disengaged before testing work commences.**
 - On vehicles with permanent four-wheel drive, the test specifications for that particular model must be observed (see also testing program for four-wheel-drive vehicles).**

2.3 INADMISSIBLE FORMS OF USE

- * **Driving in at an angle, with a tyre scraping against the test rig's frame**
- * **Driving onto or across the roller mechanism too quickly**
- * **Actuating the brakes before the lock telltales go out**
- * **Depressing the brakes too abruptly**
- * **Abrupt steering movements when testing the front axle**
- **Exceeding the permitted testing load limit (includes driving across the test rig)**
- * **Testing single-track vehicles (motorcycles etc.).**
- * **Driving off the test rig without switching on the electric motors (the bearings will otherwise be damaged)**

3 TESTING PROGRAMS

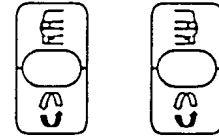
3.1 REGULAR OPERATING MODE

The regular operating mode is the CRYPTON CBT6000's standard testing program and is operated predominantly by remote control. The left-hand and right-hand sides are tested simultaneously (one axle at a time).

The standard testing procedure is as follows:
Drive FRONT axle onto rollers then:

Switch on the motors (both wheel slip lights flash), press:-

Gradually increase brake pressure until the wheel slip lights go out then:



Measure any imbalance if necessary , press:-



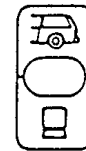
Apply maximum braking force. Roller(s) will stop if wheels slip, pressure is removed from sensing roller or STOP button is pressed.

Store the results for front axle by using remote, press:-

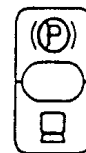


Drive REAR axle onto rollers then:

Test rear axle as for front store by pressing:-



Test again using parking brake and store by pressing:-



Press the PRINT key on the remote to obtain a printout

3.2 INDIVIDUAL WHEEL MODE

The individual-wheel mode is identical to the regular mode with the exception that the wheels on each side can be tested individually. Note that the results should be stored after every testing procedure!

Example (1): Test the REAR LEFT wheel
Switch on and apply brake.
Stop the roller



Store result by pressing:-

Example (2): Testing the REAR RIGHT wheel
Switch on and apply brake.
Stop the roller
Store results by pressing:-



Individual-wheel mode is recommended, in particular, if the vehicle is inclined to lift up and try to leave the rollers when the brakes are applied!

3.3 AUTOMATIC MODE

The automatic-mode program is particularly effective for rapid testing, as the vehicle can be driven into the test rig without remote control and the test procedure starts up automatically. The automatic mode is active if both wheel slip telltales (arrows) are lit up when there is no vehicle on the rollers.

If the test rig is set to the automatic mode and measurements need to be stored, the STOP button should be pressed before starting up the motors again. Only then is storage possible.

Note:

The automatic mode can only be activated if the vehicle is not standing on the roller set.

Important:

If any of the test rig's various safety functions are triggered, the automatic mode will shut down (see also Section 2).

3.4 FOUR WHEEL DRIVE VEHICLES

The CRYPTON CBT6000 includes a four-wheel-drive program as an option. The left and right pair of rollers are driven in opposite directions; only the braking forces of whichever side is rotating forwards is measured. This program is recommended on vehicles with permanent four-wheel drive, as the distortion to the measurements due to superimposed forces is minimised and the differential lock is protected against overloading. Storage is as for the individual-wheel mode.

Always observe the specific notes on testing supplied in the individual vehicle's operating manual!

3.5 IMBALANCE MEASUREMENTS

The imbalance measurement function can be switched on during measurement during all the above mentioned test programs (braking forces must be greater than 500 N). It can be repeated as often as required, and the last 3 measurements are stored (the command for storing the complete axle values also records the imbalance values).

4 SWITCHING ON THE BRAKE TESTER

The test rig is switched on at the mains switch on the left-hand side of the display cabinet. The switching-on routine is carried out and the printer energised. The test rig must be off-load while this takes place, i.e. no vehicle or other object may be positioned on its mechanical components. Once all LED's have gone out and the indicators have returned to zero, the braketester is operational.

The test rig is in the regular operating mode when it is first switched on.

If all LED's flash and the indicators do not return to zero after the switching-on routine, the system has malfunctioned. This is also indicated on the LCD display, if supplied.

Should this occur, please ensure that there is in fact no load on the mechanical components.

5 OPERATION

The test rig can be operated by both the keyboard on the display cabinet and the infrared remote control.

Each input is confirmed by all difference LED's lighting up briefly.

5.1 BY KEYBOARD ON THE DISPLAY CABINET

It is possible to operate the braketestter without remote control in both automatic mode (one-man operation) and regular mode (two-man operation).

To test an individual LEFT wheel, press:-



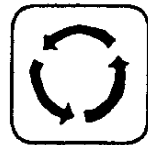
To test an individual RIGHT wheel, press:-



Select REGULAR MODE and start both rollers by pressing in turn:-



Select AUTOMATIC MODE on by pressing:-



Switch off AUTOMATIC MODE by first press of:-



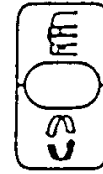
Stop the rollers by second press of:-



5.2 BY INFRARED REMOTE CONTROL

5.2.1 TESTING PROGRAMS

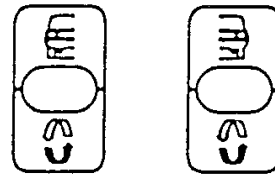
To test an individual LEFT wheel, press:-



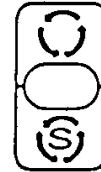
To test an individual RIGHT wheel, press:-



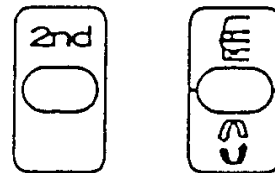
Start REGULAR MODE by pressing both buttons:-



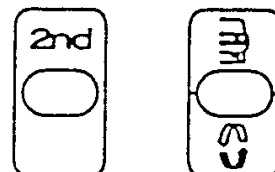
With a Vehicle standing on rollers, press this button once to start both rollers in REGULAR MODE:-
Press again to switch to AUTOMATIC MODE once rollers are running:-



Use this button sequence to select All-wheel Drive vehicle test on LEFT side:-



Use this button sequence to select All-wheel Drive vehicle test on RIGHT side:-



Activate the imbalance display:-



Press once to STOP rollers:-

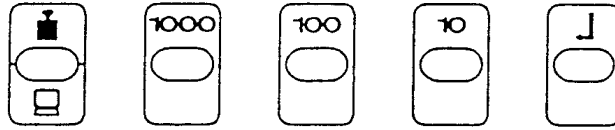


Press STOP again to switch off AUTOMATIC MODE:-



5.2.2 ENTERING VEHICLE GROSS WEIGHT

Use these buttons to enter the vehicle gross weight:-



This entry is shown on the green analogue indicator (1,000 N on display = 1,000 kg) and the left-hand LCD (optional).

If a weight has already been entered, or a weigher is fitted, the entry mode, when called up, will display the actual value.

Notes:

The weights can be entered before or after the individual tests. An entry can also be made after a printout provided no new measurement has yet been stored.

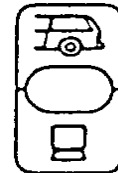
If a weigher is fitted, but a different value is to be used for calculating braking forces, these can be entered as described above (weigher values are overwritten).

5.2.3 STORAGE FUNCTIONS

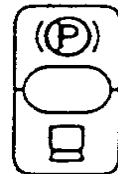
To store FRONT axle service brake results press:-



To store REAR axle service brake results press:-

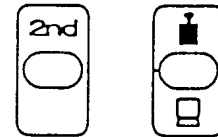


To store PARKING brake results press:-

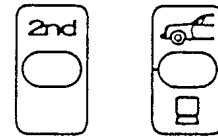


5.2.4 REPEAT DISPLAYS

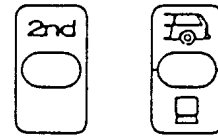
Display stored GROSS WEIGHT by pressing:-



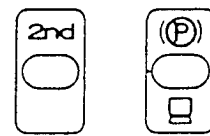
Display stored maximum brake effort for FRONT axle by pressing:-



Display stored maximum brake effort for REAR axle by pressing:-

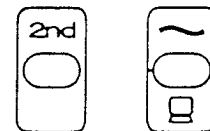


Display stored maximum brake effort for PARKING brake by pressing:-



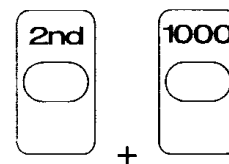
Display imbalance by pressing:-

If several imbalance measurements are made these will be displayed in the order they were stored but ONLY for the last axle tested.



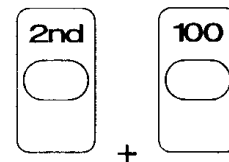
5.3 BRAKING DECELERATION DISPLAY

Display overall SERVICE brake deceleration by pressing these buttons together:-



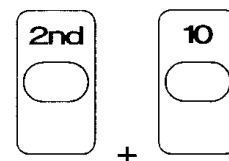
+

Display overall PARKING brake deceleration by pressing these buttons together:-



+

Display overall EMERGENCY brake deceleration by pressing these buttons together:-
(applies only to special Italian versions)



+

The corresponding value is displayed on the 4-digit LCD-display.

The display starts to flash if the pre-set value is undercut. The flashing mode can be cancelled by confirming with the "ENTER" button.

If the overall deceleration values for the service or parking brakes are undercut during the "SUPERAUTOMATIC" program, the above mentioned display is automatically activated and the "SUPERAUTOMATIC" program is closed down.

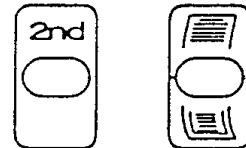
5.3.1 PRINTOUT

The desired printout language can be selected in the configuration routine.

To produce a STANDARD PRINTOUT with evaluation,
press:-



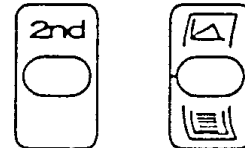
To produce ONLY a STANDARD PRINTOUT,
press:-



To produce a GRAPHICAL PRINTOUT, press:-
(printer connected to TEST LANE)



To produce a FINAL EVALUATION, press:-

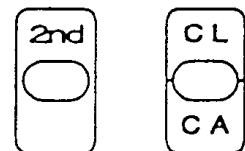


5.3.2 DELETE FUNCTIONS

To delete the last measurement, press:-



to clear the memory of all measurements, press:-



Stored values can always be overwritten by entering a new value for the same memory allocation, or storing again for the same brake system and same axle. The entire memory is also deleted if one or more printouts are made and a new measurement is stored.

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 our 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 436238

Overseas

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

Fully Comprehensive After-Sales Service

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.