D412 / D712

Roller Brake Tester ATL Test Procedure (Annex A)

USER MANUAL

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Introduction — Chapter 1

In This Chapter

Audience

This manual is intended for the final users of the equipment who will operate and maintain the system throughout its working life.

Boston Garage Equipment requires that operators of this equipment:

- Have sufficient technical knowledge and experience to operate the equipment
- Can recognize and prevent potential hazards
- Have read and understood this manual
- Have been adequately trained
- Follow the procedure in this manual

Scope

The purpose of this manual is to:

- Describe the new ATL Software Operation as per the 2013 DVSA Specification

Organisation

This manual is organised into:

- Operating Instructions – Contains all the procedures necessary to operate the equipment in relation to the June 2013 ATL DVSA specification.

Layout Conventions

In this manual we use a number of typographical conventions to highlight particularly important information and to guide the user through the manual. This section lists these conventions.

Two types of list are used.-

1) Lists that are numbered (like this sentence) contain actions you must carry out in sequence.
- In lists that use arrow points (like this sentence), the sequence is not critical.

NOTE
Text with additional information, such as expanded explanations, hints or reminders.

CAUTION
Indicates situations that can be dangerous or cause damage.

Commands (such as menu items and buttons) are **bold**. Menu names are also **bold**.
Example: On the remote control press **4**.

Information that requires special attention is shown in *italic.*
Example: Use the **Emergency Stop** button *only* in emergencies.

Related Documents

Document Name	Document Number
➢ SW900 User Manual	BOS0320
➢ RFC-95 User Manual	BOS0423
➢ D412 User Manual	BOS0481
➢ D712 User Manual	BOS0482

Safety — Chapter 2

In This Chapter

General Safety Instructions

In order to comply with your responsibilities under the Health and Safety at Work Act 1974, it is essential that this Roller Brake Tester (RBT) and any optional accessories are sited, installed, operated, and maintained by Boston Garage Equipment or your local authorised / approved distributor.

- All persons installing, operating or maintaining the equipment and any optional accessories must be familiar with the layout of the equipment, the safety precautions, the emergency shutdown procedures and vehicle braking systems.
- Appropriate training is required, prior to installing, using or maintaining the equipment.
- The instructions in this manual must be strictly adhered to, to avoid injuries to personnel and damage to the machine and vehicle.
- Only a qualified technician should carry out work on the electrical system, and should follow procedures pre-described by national standards.
- Never remove or bypass any of the safety features.
- Avoid any direct or indirect electrical contact.
- The unit should be placed inside a rigid, flat and clean surface, protected against water, humidity and weather influences.
- Keep the operating environment clean and free of oil. Never leave loose objects around the RBT.
- Never leave parked vehicles on the RBT overnight.
- Make sure the remote control is stored safely when not in use.
- The equipment may be operated only within its rated capacity. The equipment is designed for MOT Class 1, 2, 3, 4, 5L & 7 vehicles.
- The equipment should only be used when the operator has a good view of the whole machine.
- During the test no person should stand close to the roller bed(s).
- The testing area should be clear of personnel, tools and equipment before starting each stage of the test.
- Do not stand on, or walk over the rollers at any time.
- Take precautions to extract exhaust in the workplace properly while testing.
- Do not test a vehicle when there is insufficient light.
- Never make any adjustments to the vehicle braking system when the vehicle is in the rollers.
- When the RBT rollers are in operation, any key on the remote control or PC keyboard will immediately stop the rollers, irrespective of their prescribed function.
- In case of an emergency, all operations can be stopped immediately by pressing the emergency stop button on the side of the control cabinet.
- If the RBT is not working correctly, switch off immediately and refer to the user manual or contact Boston or their local agent.
- Always isolate the RBT from the power supply before maintenance.
- Follow the maintenance specifications accurately.

Maintenance Safety

In addition to the general safety instructions, the following instructions apply when carrying out maintenance on the equipment:

- Switch off the main electrical supply before opening any part of the equipment.
- The equipment must only be operated within its rated capacity.
- Protect the electrical parts of the equipment from water and humidity.
- Only qualified technicians are permitted to do work on the electrical system of the equipment and must follow procedures prescribed by national standards.
- Many safety features are bypassed inside the service areas of the software. Only qualified service personnel are permitted to use the service section of the software.
- Any unauthorised modification or changes to the system will invalidate the CE-declaration and equipment warranty.

Safety Features

The D412 and D712 RBTs offer the following standard safety features to minimise personal risk as much as possible.

- The RBT is provided with an emergency stop button on the side of the control cabinet by which any active operation can be stopped immediately in case of an emergency. To release the emergency stop button after operation, rotate the button.
- The rollers of the RBT's can only be started if the centre rotating measuring rollers are pressed down, i.e. when there is a vehicle axle in the roller brake tester (except when 3-wheel or motorcycle modes are selected).
- By applying brake force and locking any wheels under test, the rollers will stop immediately.
- Closed covers for the chain and electrical components are fitted as standard.
- All electrical cabling is covered to reduce any direct danger or risk.
- The RBT is ground wired to earth.
- Cover plates are provided to cover the rollers when the brake tester is not in use.
- Whenever the rollers of the RBT are in operation, any key press on the keyboard or remote control will immediately stop the rollers irrespective of the assigned key function.

Misuse

The RBTs are designed for use as brake testers for statutory testing of MOT Class 1, 2, 3, 4, 5L & 7 vehicles and for brake diagnostic purposes **only.**

They must NOT be used for any other purpose e.g.

- 'Running in' of brake linings.
- Brake adjustments.
- Diagnosis of vehicle faults e.g., tyre examination etc.
- Any purpose requiring the operator to be in the danger zone, other than to conduct a brake test and/or maintenance and calibration purposes (authorised personnel only).
- If access to any service area requires driving over the RBT then cover plates must be used

Product Description — Chapter 3

In This Chapter

RFC-95 (RF Remote Control)

The remote control is the most commonly used control for the SW900 software. It has many of the same functions as the keyboard but from a wireless range of approximately 50m. There is a separate User Manual available for the Boston RF Remote Control, but the main functions are covered here.

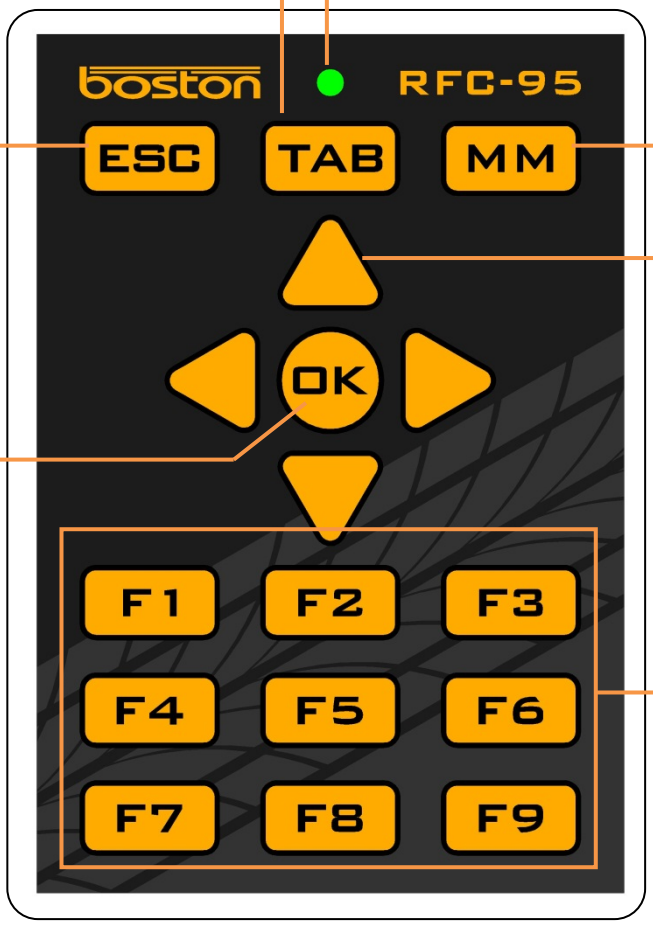
Many remote controls operate using infra-red (IR) technology. Whilst being reliable, they are restricted to 'line-of-sight' operation which in some environments can make them impractical. The Boston RFC-95 is a ruggedized control, ideally suited for the testing industry where rugged protection is required. It operates using the latest Zigbee Radio Frequency (RF), which unlike IR doesn't require line of sight operation. This provides greater flexibility and allows it to be used from inside the vehicle to control different items of equipment.

The RFC-95 button functions are shown below.

'TAB' Key
This button duplicates the 'Tab' key function on the main keyboard.

Transmission LED
The LED illuminates to confirm any key press.

'MM' Button
This button returns the operator to the Main Menu (only for Boston SW-900 software).



'ESC' Button
This button duplicates the 'ESC' key function on the main keyboard.

Arrow Keys
These buttons duplicate the arrow key functions on the main keyboard.

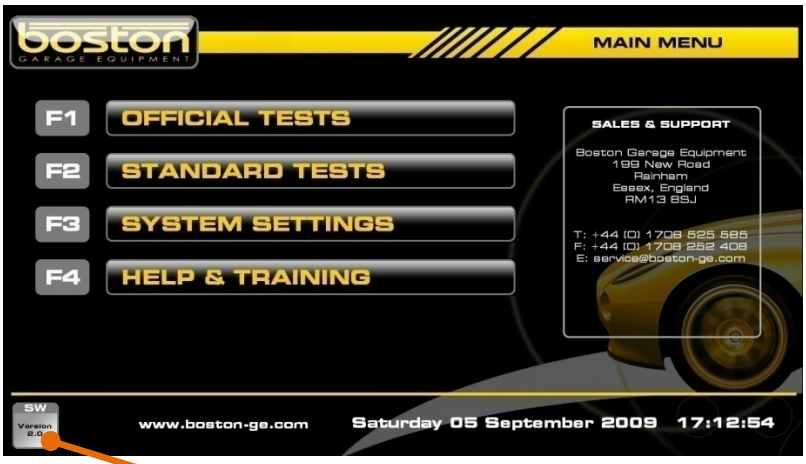
'OK' Key
This button duplicates the 'ENTER' key function on the main keyboard.

'F' Keys
These buttons duplicate the 'F' key functions on the main keyboard.

Button	Associated keyboard Function
ESC	ESCAPE
TAB	TAB
MM	MAIN MENU (SW900 Software only)
ARROW UP	ARROW UP
ARROW DOWN	ARROW DOWN
ARROW LEFT	ARROW LEFT
ARROW RIGHT	ARROW RIGHT
OK	ENTER
F1	FUNCTION KEY F1
F2	FUNCTION KEY F2
F3	FUNCTION KEY F3
F4	FUNCTION KEY F4
F5	FUNCTION KEY F5
F6	FUNCTION KEY F6
F7	FUNCTION KEY F7
F8	FUNCTION KEY F8
F9	FUNCTION KEY F9

Software Version

As new products become available and changes / additions are made to the various software procedures, the SW900 software will require updating. To easily find out which software version is currently installed, simply look at the bottom left-hand corner of any of the MAIN MENU pages.



The current software version is shown here (DVSA 2013 ATL update is ver. 3.41 or higher)

By clicking on the button with the mouse, a pop-up window will be shown detailing the software version and changes made in the current version since the previous version. See below.

Software Updates are released periodically and it is important that your software is up to date. Updates can be installed automatically if your system is connected to the internet. If not, your local agent can install updates on request.

Please see the SW900 USER MANUAL for further information about updating software.

Official Brake Tests (ver. 3.41 or higher) — Chapter 4

In This Chapter

This chapter describes how to carry out an OFFICIAL brake test using both the MANUAL and AUTOMATED software procedures in ver.3.41 or higher. This manual assumes that installation of the RBT is complete and the software is fully enabled for the user. This manual also assumes that the user is familiar with the SW900 software and has read the SW900 software manual.

Before continuing, it is important to note and check the following:

- Always refer to the DVSA MOT Inspection Manual when carrying out an official test.
- Brake forces are indicated in kgf.
- Weight input is indicated in kg.
- Imbalance is indicated in %.
- Brake efficiency is indicated in %.
- Examine the tyres to ensure they are not under-inflated, if the tyre pattern is in good condition and if the tyres are free from mud and stones.
- Determine whether the vehicle has a SINGLE brake control system or a split (DUAL) brake control system.
- Ensure the roller covers are removed from the RBT.
- Ensure the wheels of the vehicle are always placed centrally in the rollers before starting the test.
- Understand the quick stop emergency procedures should they be required.

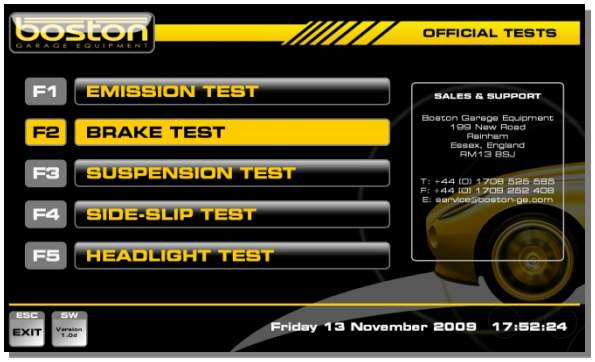
NOTE

All references on the software pages to the 'F' keys on the keyboard also relate to the same function keys on the RF remote control. The following procedures do not relate to the remote control although the functions of the keyboard and remote control are the same.

Official Tests - Data Entry

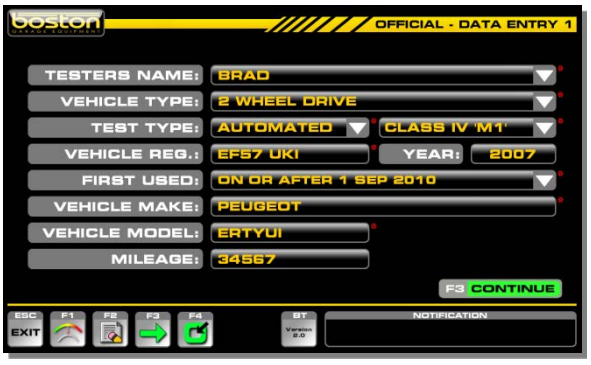
From the MAIN MENU, select option F1 'OFFICIAL TESTS' and follow the procedure below to reach the DATA ENTRY page.

F1 – OFFICIAL TESTS



From this page the user selects the type of test required. If the relevant hardware and software is installed the software will continue into the respective program, if not, the message 'ACTIVATION REQUIRED' is shown. Similarly, if no tester's names have been set, the message 'SET TESTERS NAMES' will be shown.

F2 – BRAKE TEST



The OFFICIAL DATA ENTRY page allows the user to enter specific vehicle data for the vehicle about to be tested. As the software is able to test different types of vehicles, it is important to ensure that the data is correct before selecting continue. The available types of test for MANUAL and AUTOMATED are shown below.

MANUAL TEST OPTIONS	AUTOMATED TEST OPTIONS
Motorcycle Test	2 Wheel Drive Vehicle Test
2 Wheel Drive Vehicle Test	
3 Wheeled Vehicle Test	
4 Wheel Drive Test	

Using the mouse and keyboard, enter the relevant information into the DATA ENTRY page. It is not compulsory for the user to enter all vehicle specific data for the MANUAL tests, but the **VEHICLE TYPE, TEST TYPE** and **FIRST USED** entry fields must be completed to allow the software to follow the correct route.

If the user wishes to carry out an AUTOMATED test, then specific fields must be completed on the DATA ENTRY page before the software will continue. Compulsory data fields are indicated with a red asterix. There is also a second DATA ENTRY page to complete when carrying out an AUTOMATED test. If data is missing from the required entry fields the message DATA MISSING is shown.

Official Test - Required Vehicle Information

MANUAL TESTS

- Test Type COMPULSORY
- Vehicle Registration COMPULSORY

AUTOMATED TESTS – CLASS IV 'M1' (

- Test Type COMPULSORY
- Vehicle Make COMPULSORY
- Vehicle Model COMPULSORY
- Vehicle Registration COMPULSORY
- Brake System Type COMPULSORY
- Park Brake Position COMPULSORY
- Vehicle First Used COMPULSORY (CLASS IV 'M1' ONLY)

AUTOMATED TESTS – CLASS VII

- The same as CLASS IV **plus** the DGW (Design Gross Weight).

NOTE

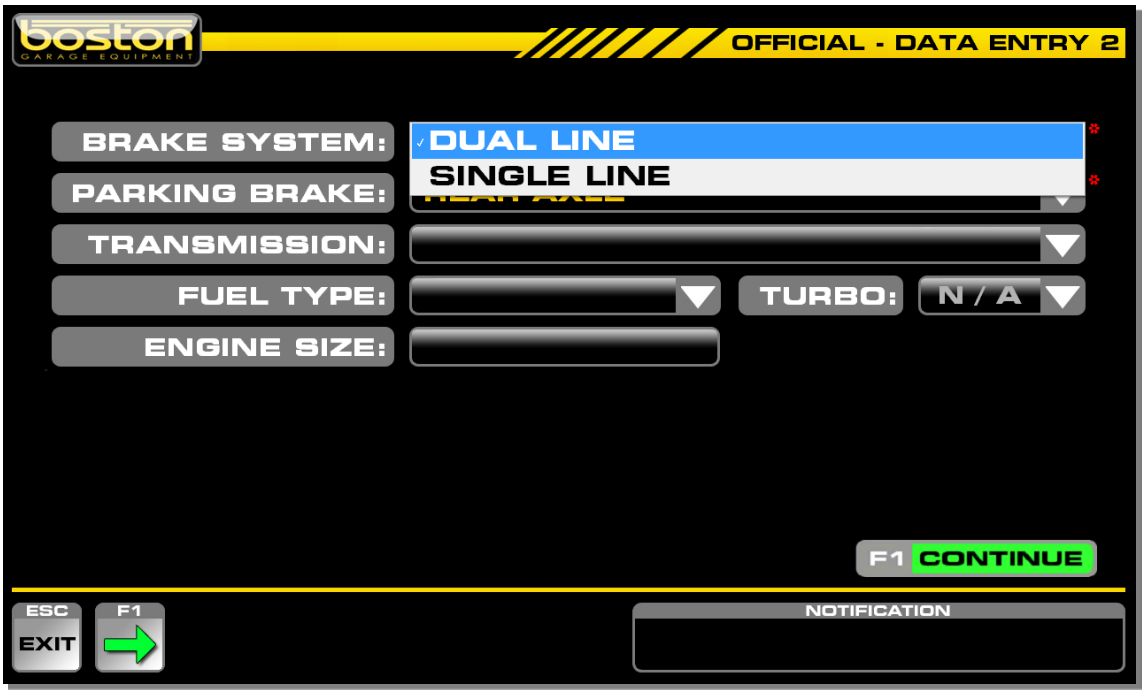
The default settings when first entering into this page are: **2 WHEEL DRIVE, AUTOMATED and CLASS IV 'M1'**. The display layout can also be set by selecting F1.

"M1" in the MOT scheme means passenger vehicles with 4 or more wheels (except quadricycles) and not more than 8 passenger seats in addition to the driver's seat.

Test Selection Criteria – DATA ENTRY page 2

The second DATA ENTRY page is only shown for the AUTOMATED test. See screenshot below.

- The default setting for the BRAKE SYSTEM field is DUAL LINE.
- The default setting for the PARKING BRAKE field is REAR AXLE.
- The default setting for the TRANSMISSION field is empty data.
- The default setting for the FUEL TYPE field is empty data.
- The default setting for the TURBO field is empty data.
- The default setting for the ENGINE SIZE field empty data.

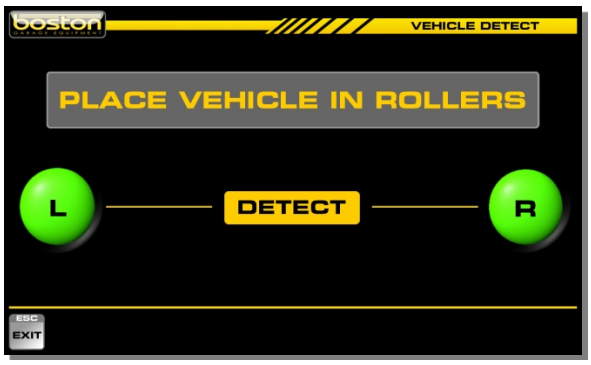


The compulsory fields are already completed by the software as default and the user can select F1-CONTINUE if the data is correct for the vehicle being tested.

Official Manual Brake Test

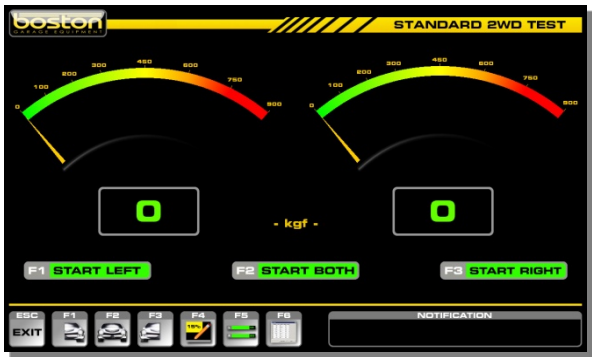
Once the DATA ENTRY page has been completed select **F2** to continue. The software will now ask the user to PLACE VEHICLE IN ROLLERS, see screenshots below.

At this point the software is waiting for the first axle to be placed in the rollers. The two grey circles indicated as 'L' and 'R' will turn green when the respective detection roller has been depressed by the wheel.



Both wheels have been placed in the rollers as shown by the two green indicators. This page is shown only for a few seconds before the software moves on to the vehicle testing page.

Once the rollers have been depressed, the detect indicators turn green and the software enters into the vehicle testing page. From this point onwards the testing procedures may differ depending on the vehicle details entered on the DATA ENTRY page.



Vehicle Weight

The SW900 control software automatically detects if a weighing system has been fitted to the roller bed. If so, the WEIGHT box on the DATA ENTRY page is not shown. All Boston ATL Braketesters are fitted with a weighing facility as standard. If the Braketester is **not** fitted with a weighing facility then the operator should enter the total vehicle weight in the WEIGHT box on the DATA ENTRY page. Although this is not compulsory, it is required if the user wishes the software to make the overall brake efficiency calculations. Note: for Class VII testing the vehicle weight (DGW) must be entered manually even a weighing system is fitted to the roller bed.

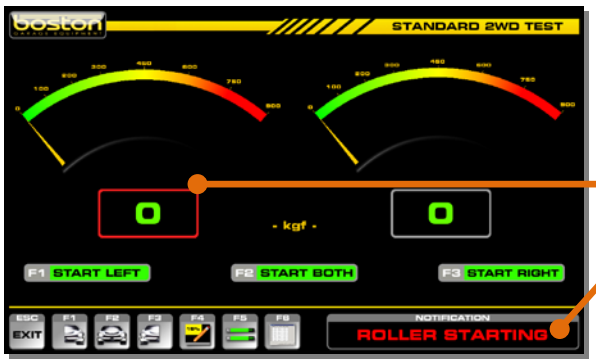
The total vehicle weight should be entered here if the **weighing system is not fitted** to the roller bed.

The software will acquire the axle weight automatically when the user starts either roller for the first time for each axle. The message ACQUIRING AXLE WEIGHT is shown while the system checks for a stable weight. The acquired axle weight is shown shortly after. See screenshots below are in sequence. Once the weight has been acquired the software reverts back to the testing page and the selected roller(s) will start. There is an audible warning and warning text in red to alert the user.

From the testing page select F1, F2 or F3 to start the rollers. The software will automatically acquire the axle weight.

Testing Front Axle

After the axle weight has been acquired the operator is warned by on-screen prompts in red and an audible buzzer that the rollers are about to start. See below.

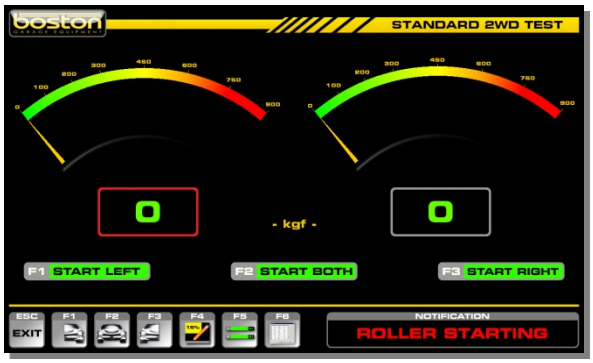


In this example, the left roller has been selected. There is an audible buzzer and three flashes of the red box to alert the user. The message 'ROLLER STARTING' is also shown in the notification box.

NOTE
Whenever the rollers are running, the corresponding results box is shown in red. This applies to all screen layouts.

In order to quickly describe the front axle test, the test procedure below is shown in sequential format with simple graphical illustrations.

1. Place the front wheels in the rollers as instructed by the software.
2. Select 'F1 - START LEFT'. The software will first carry out the automatic weighing of the axle, then an audible alarm will sound and the roller will start. The outer box on the active roller will also flash red to indicate that the roller is running.



The user selects F1 and the rollers are about to start

3. **Slowly apply** force to the brake pedal and observe the real-time reading increase on the display.

Left roller is running and brake force is being slowly applied.

4. Continue to apply brake force until maximum force or wheel-lock is achieved. If wheel-lock occurs a red indicator will be shown on the display. At the point where the tyre slips on the roller the motor will be stopped immediately to avoid unnecessary tyre wear.

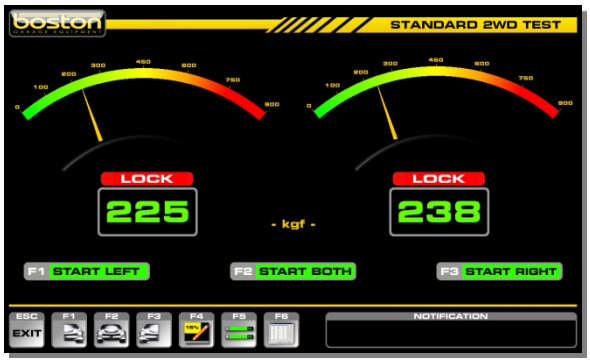
Left roller has stopped due to wheel lock. The wheel-lock indicator is shown above the corresponding reading. The highest brake force reading achieved is shown in the results box.

5. If wheel-lock cannot be reached while maximum brake force is being applied the rollers can be stopped by pressing the F1 key again (or any other key). The roller will also stop automatically if stable readings are detected for a period of three seconds.

Left roller stopped by the user using the remote control or keyboard. The wheel-lock indicator is not shown but the highest brake force reading achieved is shown in the results box.

NOTE
Whichever means of stopping the rollers was used, the display will show the highest brake force achieved in the left hand display. The needle pointer will also indicate the same value on the analogue dial.

6. Once the result has been obtained for the LEFT wheel, carry out the same procedure for the RIGHT wheel using the F3 key to start the roller.

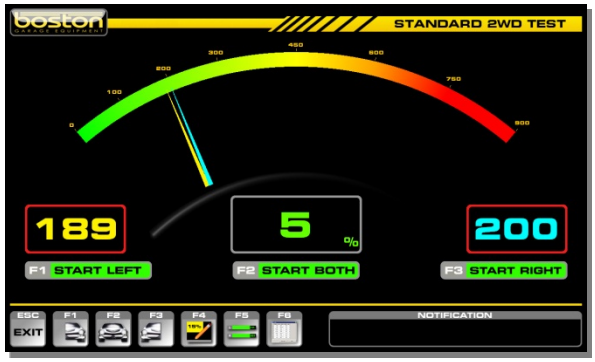


Even though the RIGHT wheel was tested, the result for the LEFT wheel still remains shown for comparison. The RIGHT wheel result is shown in the corresponding result box.

Testing Imbalance

7. Now that the service brake has been tested for both front wheels, the brake imbalance must be checked between them. To do this, both rollers are started together and the difference in brake force between the two wheels at maximum effort is measured. Select F2 – START BOTH. Without applying the brakes, note if any significant brake force (rolling resistance) is recorded from any wheel.

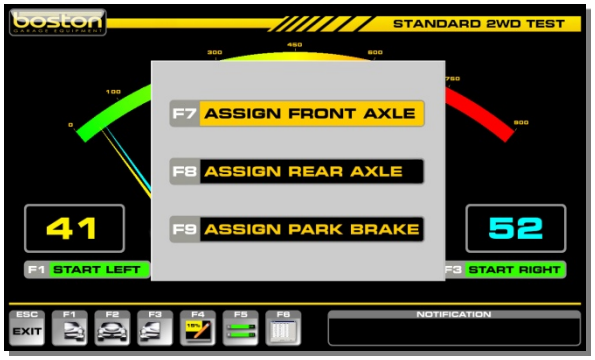
   Slowly apply the brakes to maximum. If one wheel locks, the other will continue until wheel-lock is also achieved or stable readings have been detected for a period of three seconds. The maximum imbalance will be calculated and displayed.



The rollers have started. Both readings for LEFT and RIGHT can be seen together in both digital and analogue format.

After the rollers have stopped, the result for maximum IMBALANCE achieved is shown in the centre of the display. The LEFT and RIGHT readings are those which were used to calculate the imbalance percentage.

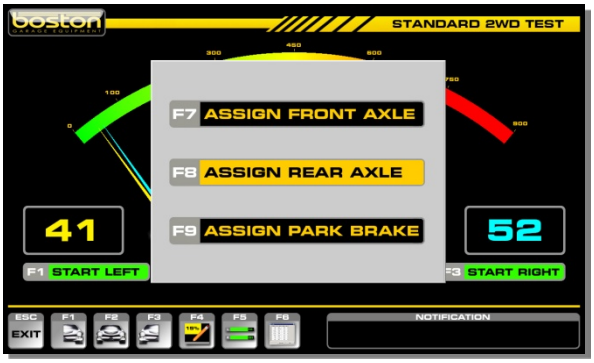
8. Once all tests have been completed for the front axle, the user can save them to be used in the overall brake efficiency calculation. To do this, select F4 ASSIGN TEST DATA and select where to save the results. As this is a FRONT AXLE test, select F7 to ASSIGN FRONT AXLE.



Select F7 to assign all the results from the FRONT AXLE test to memory.

Testing Rear Axle

9. To test the rear axle, drive the vehicle forward and place the rear wheels in the RBT. Repeat steps 1 to 8 above but when assigning the test results, select F8 ASSIGN REAR AXLE to store in the correct memory location. If the F7 ASSIGN FRONT AXLE is selected, the previous test results will be overwritten.



Select F8 to assign all the results from the REAR AXLE test to memory.

Testing Parking Brake

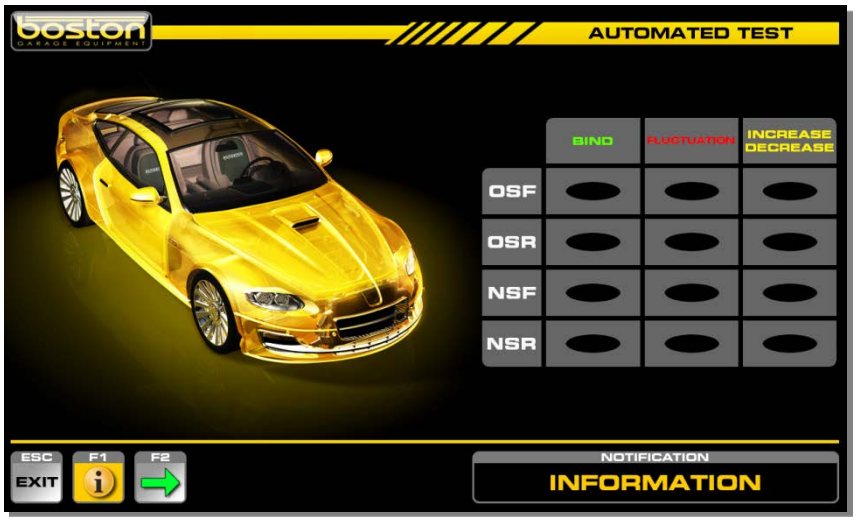
10. The parking brake is tested in the same way as the service brake but instead the user operates the vehicle's parking brake. If the parking brake is located on the front axle then the user should perform the parking brake test before placing the rear axle in the rollers.

Select F9 to assign the results for the PARKING BRAKE to memory.

Test Results and Printout

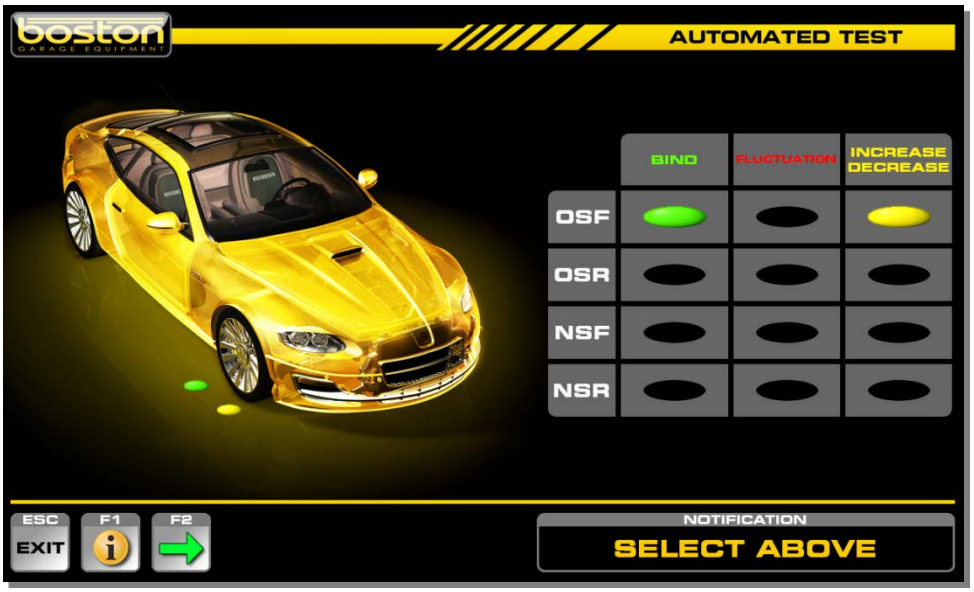
Once the full test has been completed and all results are saved, select F6 – TEST RESULTS.

This next page allows the user to enter any BIND, FLUCTUATION or INREASE/DECREASE for each wheel tested. This information is not detected or measured by the software; it must be looked for and noted by the tester as the test is being carried out. The user must select (by using the mouse, remote control or TAB/ARROW keys) which wheel (if any) exhibited any signs of BIND, FLUCTUATION or INCREASE/DECREASE. To do this, click in the open oval or by pressing the TAB key on the remote, a yellow bar is shown underneath the selection. The bar can be navigated around the table using the arrow keys. See screenshots below:

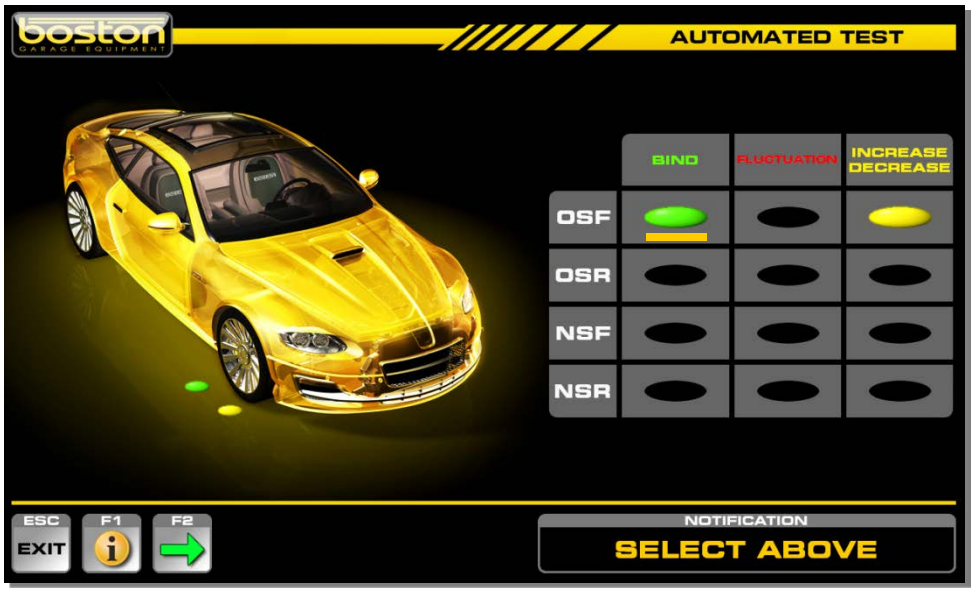


- OSF = Off Side Front (Driver side)
- OSR = Off Side Rear (Driver side)
- NSF = Near Side Front (Passenger side)
- NSR = Near Side Rear (Passenger side)

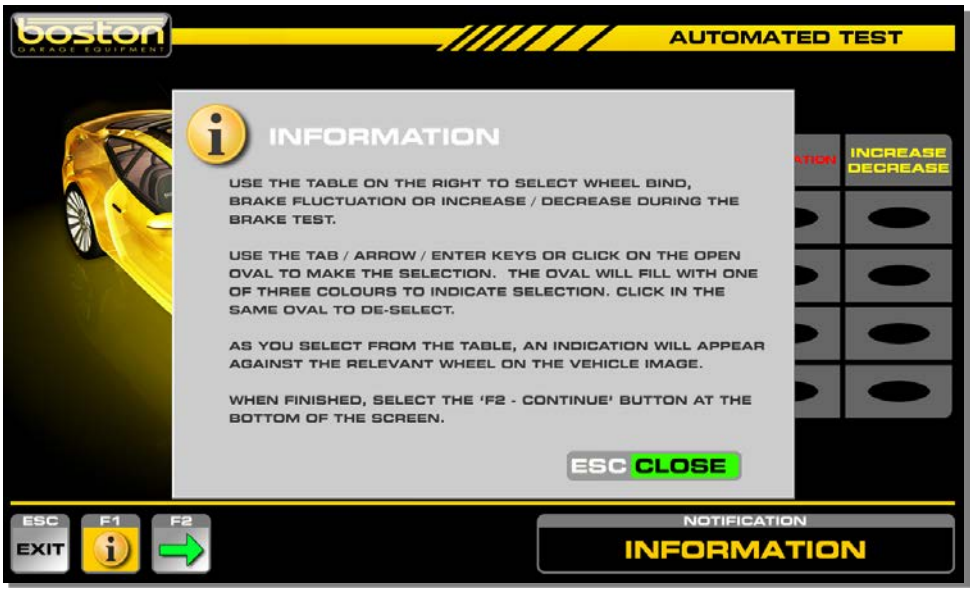
When a selection is made, a coloured tag is shown against the corresponding wheel. See below.



Select the TAB key from either the remote control or the keyboard, a yellow line will appear in the table which can be moved between selections by using the arrow keys.

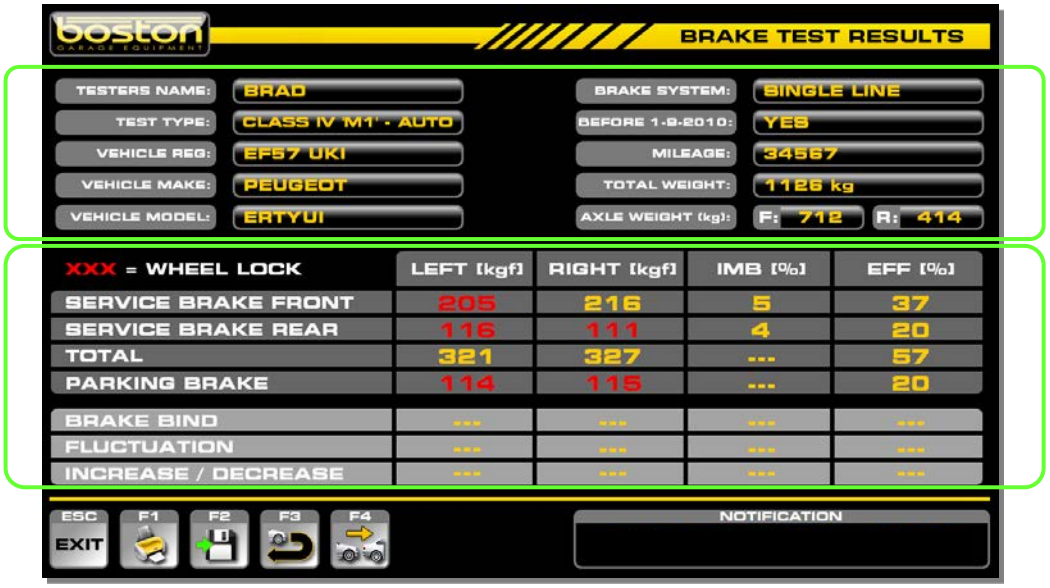


To assist the user, the option F1 INFORMATION is available to describe the operation of the page. See below.



Once all selections have been made, select F2 CONTINUE to proceed to the results page.

The top section of the page shows the vehicle and test specific information that was completed during data-entry. The results table shows the test data collected during the test.



Vehicle Specific Data

Vehicle Results Table

The vehicle data is shown at the top of the page. If the RBT is fitted with a vehicle weighing system, the weight for both the front and rear axles is shown individually. If the user entered the total weight at the beginning of the test, the 'AXLE WEIGHT' line will not be shown.

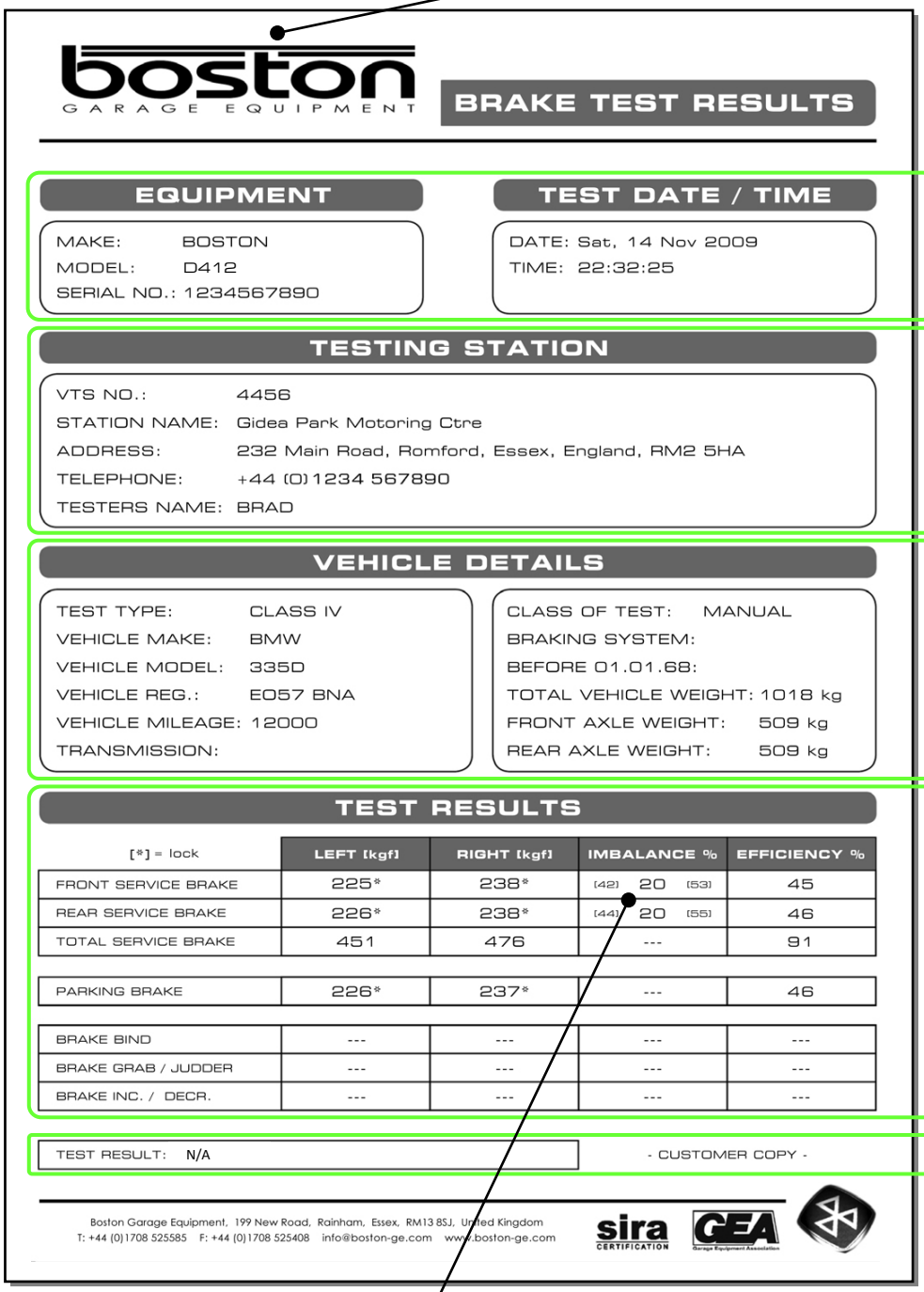
The test results grid contains all the results as stored by the user during the test. Only if all results were stored correctly can the software calculate the correct brake efficiencies. In the example above, all data has been saved and we can see the efficiencies calculated on the right side of the table.

As this is a MANUAL test, the software does not generate or display a PASS or FAIL result. From this page the user can choose to print the results as many times as required by selecting the F1-PRINT button. The printout contains all the same information that is shown on this page together with the testing station information. A sample printout can be seen on the following page.

NOTE
If BIND, FLUCTUATION or INCREASE/DECREASE is selected for any wheel, the test result should always be FAIL, irrespective of the brake efficiencies achieved by each wheel.

Sample Printout from an OFFICIAL TEST

The garage logo can be placed here if required. See the SW900 User Manual for further information.



boston GARAGE EQUIPMENT

BRAKE TEST RESULTS

EQUIPMENT

MAKE: BOSTON
MODEL: D412
SERIAL NO.: 1234567890

TEST DATE / TIME

DATE: Sat, 14 Nov 2009
TIME: 22:32:25

This section contains information about the test equipment and when the test was carried out.

TESTING STATION

VTS NO.: 4456
STATION NAME: Gidea Park Motoring Ctre
ADDRESS: 232 Main Road, Romford, Essex, England, RM2 5HA
TELEPHONE: +44 (0)1234 567890
TESTERS NAME: BRAD

This section contains information about the testing station and the tester.

VEHICLE DETAILS

TEST TYPE: CLASS IV
VEHICLE MAKE: BMW
VEHICLE MODEL: 335D
VEHICLE REG.: E057 BNA
VEHICLE MILEAGE: 12000
TRANSMISSION:

CLASS OF TEST: MANUAL
BRAKING SYSTEM:
BEFORE 01.01.68:
TOTAL VEHICLE WEIGHT: 1018 kg
FRONT AXLE WEIGHT: 509 kg
REAR AXLE WEIGHT: 509 kg

This section contains information about the vehicle as entered by the user at DATA-ENTRY.

TEST RESULTS

[*] = lock	LEFT [kgf]	RIGHT [kgf]	IMBALANCE %	EFFICIENCY %
FRONT SERVICE BRAKE	225*	238*	[42] 20 [53]	45
REAR SERVICE BRAKE	226*	238*	[44] 20 [55]	46
TOTAL SERVICE BRAKE	451	476	---	91
PARKING BRAKE	226*	237*	---	46
BRAKE BIND	---	---	---	---
BRAKE GRAB / JUDDER	---	---	---	---
BRAKE INC. / DECR.	---	---	---	---

This section contains the test results

TEST RESULT: N/A

- CUSTOMER COPY -

This section shows notes automatically generated by the software about the test.

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T: +44 (0)1708 525585 F: +44 (0)1708 525408 info@boston-ge.com www.boston-ge.com

sira CERTIFICATION GEA Garage Equipment Association

The two small sets of numbers in brackets are the values that were used by the software to calculate the imbalance.

Official Automated Brake Test (ATL)

The OFFICIAL AUTOMATED brake test is only available for standard 2 wheel drive vehicles. If the user selects any other type of vehicle from the DATA ENTRY page, the software will only allow for a MANUAL test.

The AUTOMATED program carries out the test in a different way to the MANUAL test. For each test, both rollers are started together and the brake force measurement is taken at the same time for both wheels on the axle. After each test, the software automatically saves the results and there is no need for any user input.

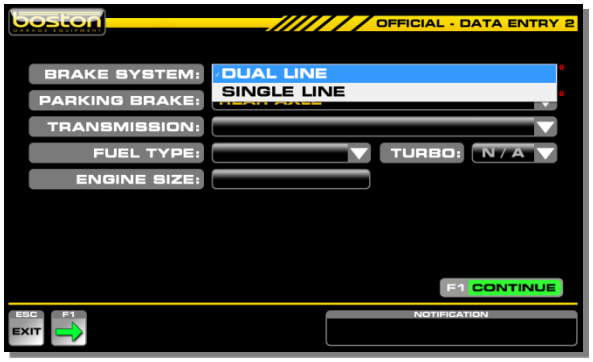
The automated test is carried out in the following order.

1.	First Axle Service Brake	-	LEFT and RIGHT brake force measurement with imbalance
2.	Parking Brake (if front axle)	-	LEFT and RIGHT brake force measurement with imbalance
3.	Second Axle Service Brake	-	LEFT and RIGHT brake force measurement with imbalance
4.	Parking Brake (if rear axle)	-	LEFT and RIGHT brake force measurement with imbalance

In some cases, the PARKING BRAKE may act on the front wheels and it may be necessary to test the PARKING BRAKE with the front wheels still in the rollers. If the parking brake is connected to the FRONT axle then this must be selected by the user on the second DATA ENTRY page.

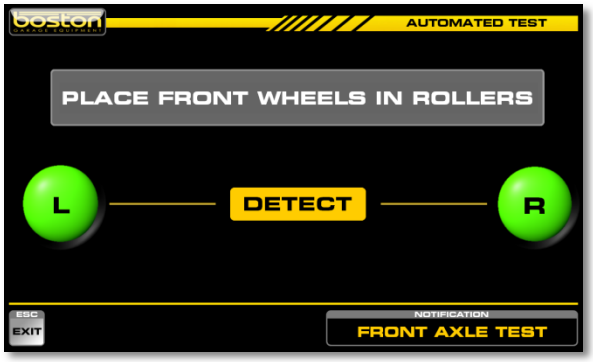
The AUTOMATED software procedure is shown below:

Complete the DATA ENTRY page as before but select TEST TYPE: AUTOMATED. Select CONTINUE.



The second DATA ENTRY page must be completed correctly. This information is necessary for calculating the results and for the software to follow the correct testing procedure.

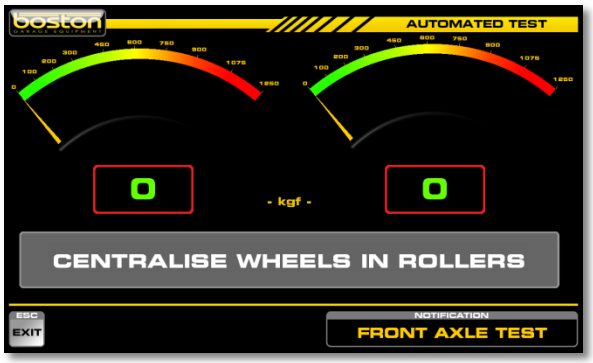
The software will only continue when the wheels are detected in both rollers.



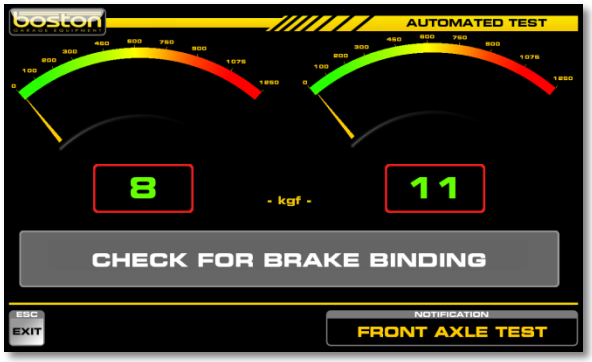
The circular indictors will show green as the detection roller is depressed by the wheel.

The software waits for a few seconds to allow the vehicle to stabilise in the rollers before the weight measurement is taken.

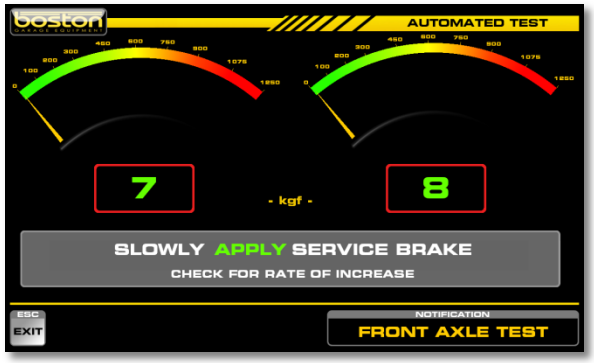
The axle weight is now displayed.



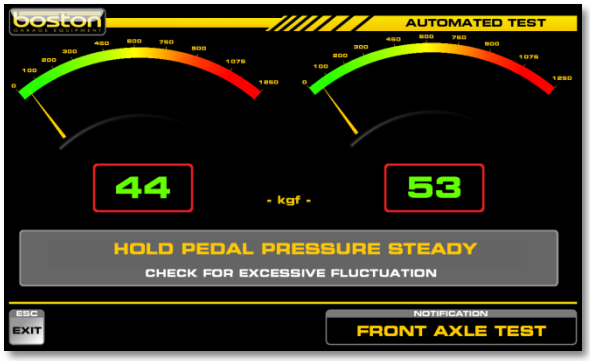
The rollers start and the operator should ensure the wheels are central in the rollers.



The operator should now check for binding from either wheel.

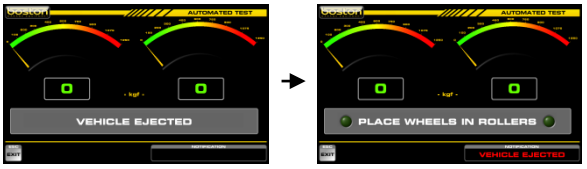


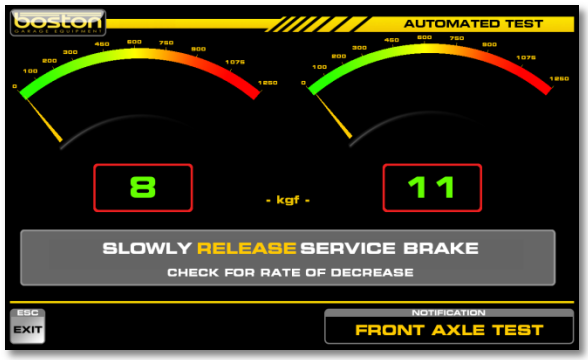
The operator should now apply the service brake slowly but not to maximum.



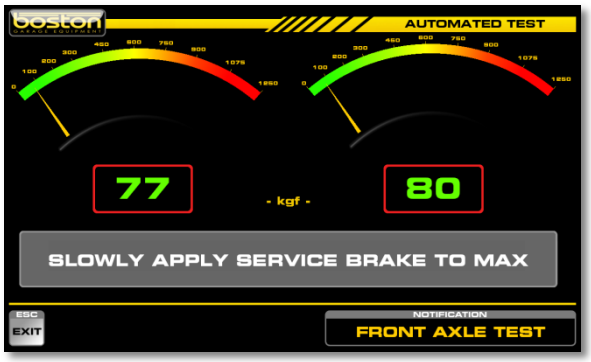
The pedal pressure must be held steady until instructed to release.

In the event that the vehicle is ejected from the roller bed the following message will be shown. Place the vehicle back into the rollers to continue with the test.

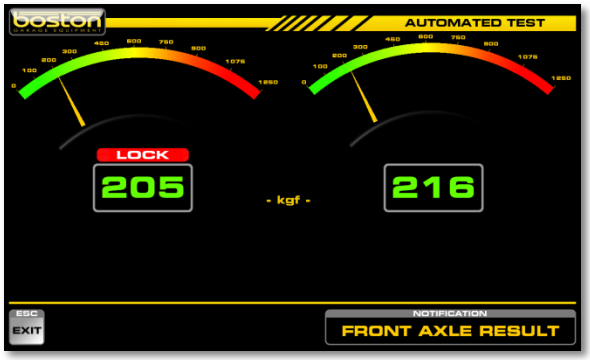




Release the pedal pressure.



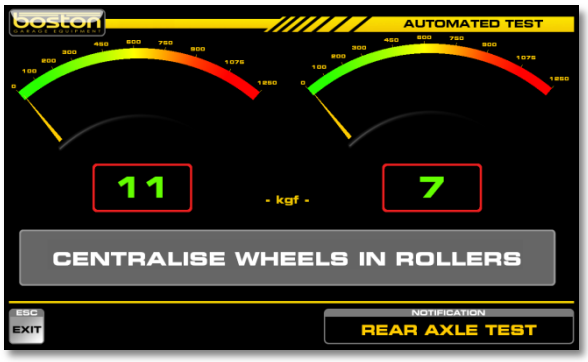
An audible 'bleep' will sound and the operator must now apply the SERVICE BRAKE to max.

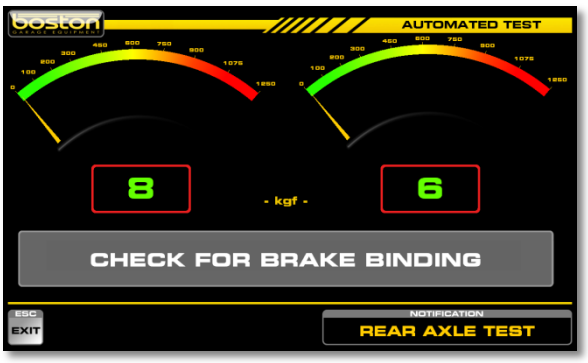


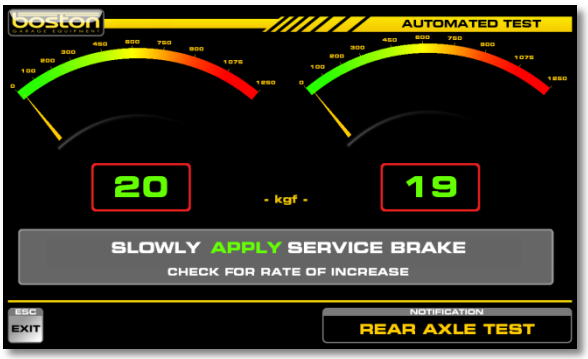
The LEFT wheel produced a lock. If the software detects a stable reading for three seconds then the roller is stopped automatically.

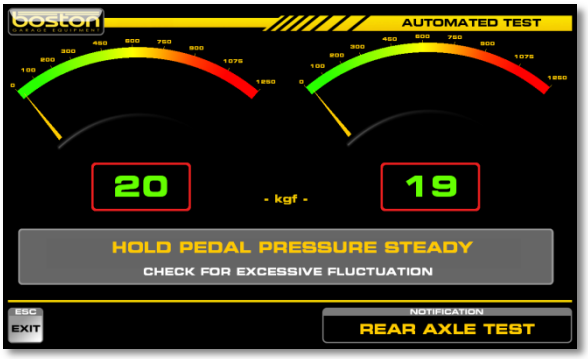
Drive the vehicle forward and place the rear axle into the roller bed.

As before, the software detects the wheels and automatically weighs the axle.

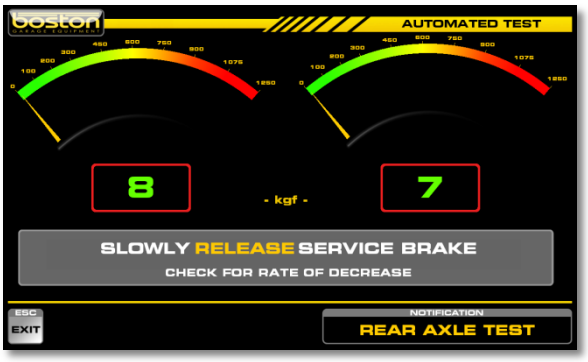


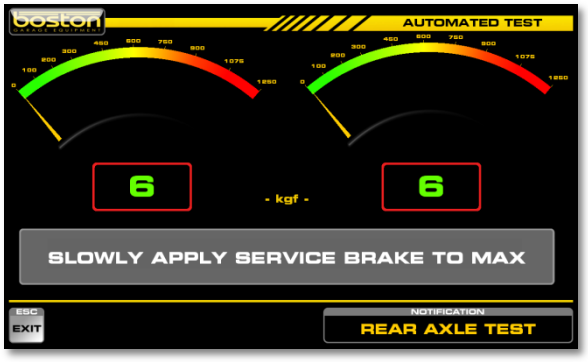




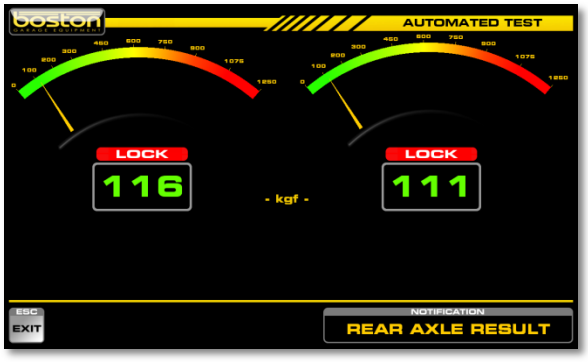


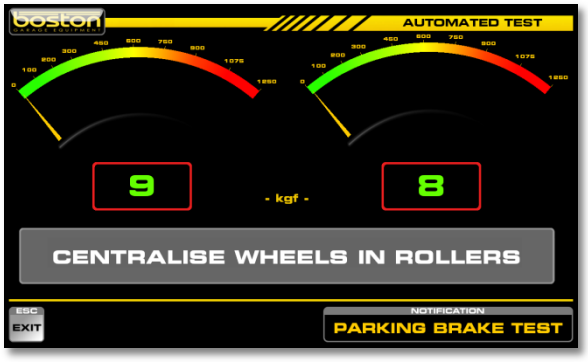
The operator must carry out the same procedure for the rear service brake as was done for the front service brake.



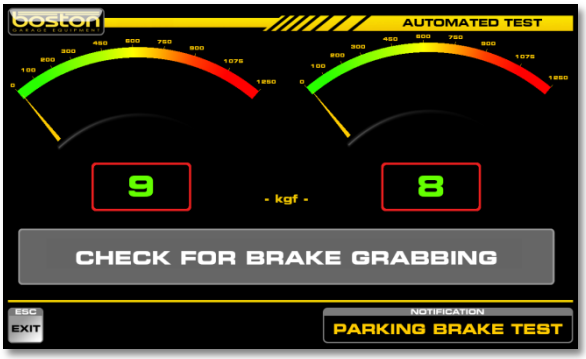


An audible 'bleep' will sound and the operator must now apply the SERVICE BRAKE to max.

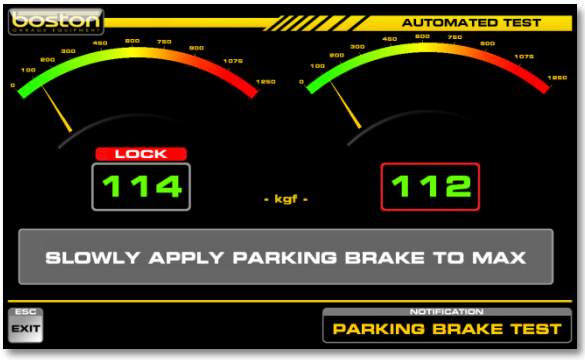




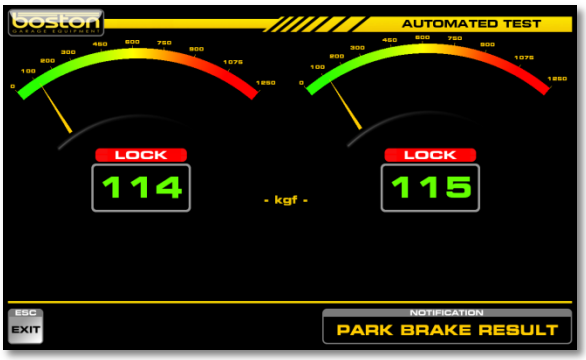
Once the SERVICE BRAKE test is complete the PARKING BRAKE must be tested. With the rear axle still positioned in the roller bed the rollers will re-start.



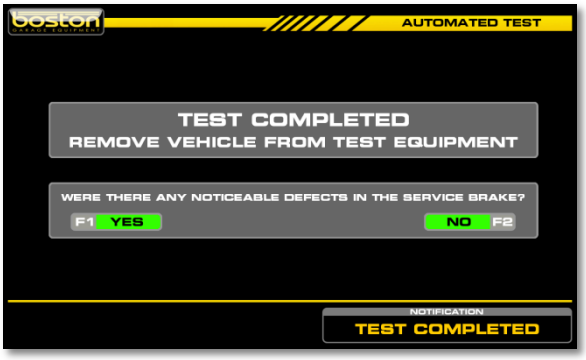
Check for any GRABBING from the PARKING BRAKE.

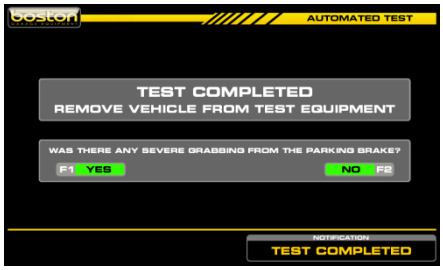


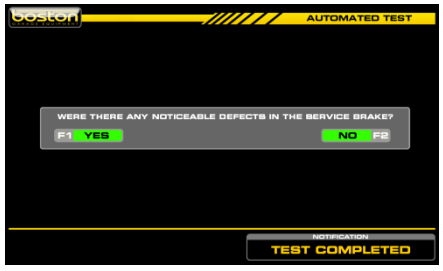
An audible 'bleep' will sound and the operator must now apply the PARKING BRAKE to max.

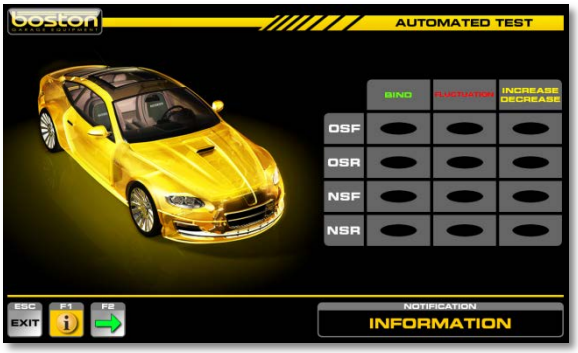


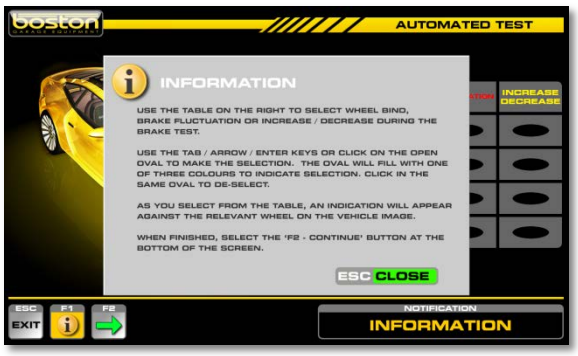
If the option SINGLE LINE was selected at the DATA ENTRY page then the option to select SEVERE GRABBING will be shown. If not, then this option is bypassed.



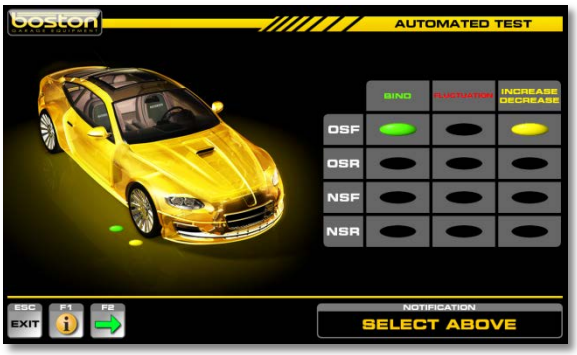






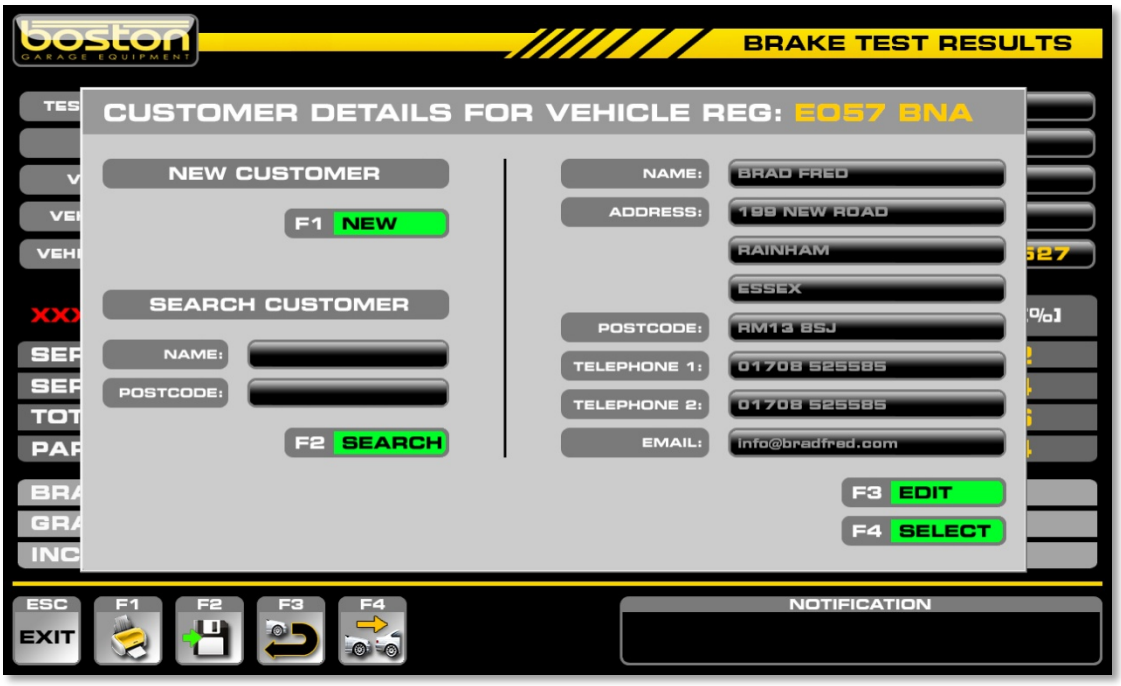


Further information about the use of this page can be seen by selecting F1 INFORMATION.



When the user reaches the results page, the software will automatically generate a PASS or FAIL result and the operator can print the results by selecting F1. The software will also save the vehicle details and test data automatically in the internal database. The user has the option to also add the customer's details to the test information by selecting F2 SAVE DATA.

If the vehicle registration number and customer details have been stored on the system from a previous test, they will be shown automatically on the right side of the pop-up window; the operator only needs to select F4-SELECT to save the vehicle test results against the customer shown.



For further information about recalling customer / test information and using the internal software database please refer the SW900 software user manual available separately.

DVSA Regulations (UK) — Chapter 5

In This Chapter

Brake Efficiency

The brake efficiency of each system is calculated from the total brake force of that system and expressed as a percentage of the vehicle weight.

To calculate the brake efficiency of a vehicle, follow the procedure below:

- Add together the braking effort from all wheels of the vehicle when the **service brake** is applied.
- Add together the braking effort recorded from the appropriate wheels when the **parking brake** is applied.
- Obtain the total weight of the vehicle. This can be determined from a Brake Data Chart or the automatic weighing system if fitted to the RBT.

Efficiency calculation (separate for service brake and parking brake):

$$\text{Efficiency \%} = \frac{\text{Total brake effort all wheels}}{\text{Total vehicle weight}} \times 100$$

Brake Imbalance

The imbalance of brake force between the left and right wheels of an axle is expressed as a percentage of the higher brake force. The imbalance of the braking effort on an axle is obtained by comparing the maximum brake efforts at each wheel.

Imbalance calculation:

$$\text{Imbalance \%} = \frac{\text{Higher brake effort} - \text{Lower brake effort}}{\text{Higher brake effort}} \times 100$$

Efficiency Limits (DVSA - JULY 2013)

ISSUE DATE: JULY 2013 **VEHICLES WITH 4 OR MORE WHEELS** (Excluding quadricycles)	MINIMUM BRAKE EFFICIENCIES REQUIRED		
	SERVICE BRAKE	PARKING BRAKE	
		Single line service brake system	Split (dual) service brake system
Passenger vehicles with **not more than** 8 passenger seats in addition to the driver's seat, having a service brake (foot-brake) operating on at least 4 wheels and a parking (handbrake) operating on at least 2 wheels which were first used:			
• On or after 1 September 2010	58%	N/A	16%
• Before 1 September 2010	50%	25%	16%
Goods vehicles in Classes 4 or 7	50%	25%	16%
Passenger vehicles with **more than** 8 passenger seats in addition to the driver's seat, having a service brake (foot-brake) operating on at least 4 wheels and a parking (handbrake) operating on at least 2 wheels which were first used:			
• On or after 1 January 1968	50%	25%	16%
• Before 1 January 1968	45%	20%	Not Specified (See Note 1)
Vehicles first used before 1 January 1968 which do NOT have one means of control operating on at least 4 wheels and which have one brake system with two means of control or two brake systems with separate means of control.	30% from first means of control	25% from second means of control	
Vehicles first used before 1st January 1915	One efficient braking system required		

NOTE 1: The parking brake on these vehicles must be capable of preventing at least two wheels from rotating when the vehicle is stationary. There is no specified efficiency requirement.

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