

Operating Instructions

Automated Test Lane - Program Description

NTS 8xx and MOT version



005

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1 Instructions for the users

These operating instructions are intended for the operators and owner of the Testlane BT 6xx VISIO as well as NTS 8xx.

Operators are trained automotive personnel, who must be instructed in the operation of the combination of this test bench (for example by means of an Nussbaum training course).

The **owner** is responsible for the conditions surrounding the operation of the test bench (e.g.: accident prevention, check of components, etc.).

Use only for purpose specified

The test lane is for the user-friendly testing of safety-relevant vehicle components such as track, shock absorbers and brakes. The measured values displayed do not, however, replace expert visual examination after the tests, on a lifting platform, for instance.

The dynamic brake analyser serves to test vehicle braking systems for the prescribed safety investigation.

Do not use except for the purpose specified

- **Do not** carry out braking tests on **motorcycles**
- **Do not** start vehicle engine by means of roller-drive motors
- Drive the vehicle **slowly** onto the set of rollers to avoid unnecessary loading strain
- Only drive the vehicle off diagnostic line in a forward direction and with the rollers still moving

Operating conditions

- Never expose operating and display units to direct sunlight!
- Operational temperature between +5° C and +40° C
- Duration of test: In order to avoid overheating of the drive motors, we recommend the following testing cycle: after testing 2 vehicles, allow a five minute brake.

The following pictograms are used in these operating instructions:

 Information - provides information


 Caution - draws attention to dangers for test unit / test piece

 **Danger for persons - general marked**

or specified marked



Electrocution, risk of injury, risk of burning etc.

 Before starting up and operating the unit, always read through the operating instructions and particularly the safety instructions thoroughly. In this way, you can avoid any uncertainties with respect to use of the unit, thus ensuring your own safety and preventing damage occurring to the unit.

Your use of the product means that you accept the following conditions:

Copyright:

Software and data are the property of Otto Nussbaum GmbH & Co.KG or its suppliers and are protected against unauthorized reproduction under copyright laws, international contracts and other national legal provisions. The reproduction or sale of data and software or any part thereof is prohibited and punishable by law; in the event of violations, Otto Nussbaum GmbH & Co.KG reserves the right to prosecute and to assert claims for damages.

Liability:

As far as possible, all the data in this program are based on information from the manufacturer and importers.

Otto Nussbaum GmbH & Co.KG furnishes no guarantee for the correctness and completeness of software or data; we assume no liability for damage caused by faulty software and data. At any event, the liability of Otto Nussbaum GmbH & Co.KG is limited to the amount which the customer has actually paid for this product. This exemption from liability does not apply to damages caused intentionally or by gross negligence on the part of Otto Nussbaum GmbH & Co.KG.

Warranty:

Any use of hardware and/or software not been approved by Otto Nussbaum GmbH & Co.KG constitutes a modification of our products, and hence exclusion of all liability and warranty claims, even if the hardware has been subsequently removed, or the software erased in the interim.

Our products must not be modified in any way. Furthermore, our products may only be used with original accessories.

Disregard for the above will render all warranty claims invalid. The present Nussbaum tester may only be used with operating systems approved by Nussbaum. Using the Nussbaum tester with different operating systems to those which we have approved will render our warranty obligation null and void, in accordance with our terms of delivery. In addition, we cannot assume liability for damages and consequential damages which are the result of the use of a non-approved operating system.


2 Safety Instructions

Observe the safety instructions for your own safety and that of your customers.

The safety instructions indicate possible dangers. At the same time, they show you what action to take in order to avoid such dangers.

The safety instructions are repeated in the operating instructions. They are marked by the following symbols:

 Information - provides information

 Caution - draws attention to dangers for test unit / test piece


 **Danger for persons - general marked**


or specified marked




Electrocution, risk of injury, risk of burning etc.


2.1 Safety precautions for operating staff


 Always observe the accident-prevention regulations!


 If the diagnostic line is not in use, switch off the energy supply at the main switch. Secure mains switch against unauthorised use. Cover the roller sets of the dynamic brake analyser when not in use.


 Do not park vehicles on the diagnostic line components.

 Work on the electrical installation may only be carried out by qualified electricians.


 The bolts securing the covers must be firmly tightened to avoid damage to tyres.


 Drive the vehicle slowly onto the set of rollers to avoid unnecessary loading strain.


 Only drive off the diagnostic line with the test rollers running.


 Do not start vehicle engine by means of testing-roller drive motors.


 Do not carry out braking tests on motorcycles.


 **When the diagnostic line is switched on, no persons or vehicles should be standing on the components.**


 **When the diagnostic line is in operation, no persons are allowed to stand near the components.**


 **There is a risk of fatal injuries to anyone near the test rollers.**


 **No repairs or other work may be carried out on a vehicle when in the roller set of the brake analyzer.**

 **The test lane interacts with a monitor. In order to be able to tell whether the system is on or off, it is not advisable to use the Windows screensaver 'Dark Screen'. Also, you should never switch the monitor off while the rest of the system is under power. Please make also sure to have all energy management functions of the PC disabled.**


 **Operating personnel must wear work-clothes without loose ribbons and loops. This includes workshoes without laces.**


 **Loose ribbons and laces may catch in the roller sets and endanger the operator.**

 **The vehicle must stand at right angles to the diagnostic line, otherwise it will edge sideways.**


 **There is a risk of fatal injuries to anyone near the test rollers.**

 **Correct the position of the vehicle by „slewing“ it.**


 **If the vehicle „climbs“ out of the roller set there is a risk of fatal injuries to anyone near the test rollers.**

 **The diagnostic line should be disconnected from the mains before maintenance work such as exchanging bulbs or fuses is carried out.**


Risk of electric shock!

 **The electrical installation is to be protected from moisture and wetness.**

Risk of electric shock.

 **Do not carry out adjustment work while the test rollers are running.**

Risk of injury!

 **There is a risk of crushing while the wheel-suspension and wheel-alignment testers are being used.**

2.2 Safety regulations for the operator

- ! The brake dynamometer must be designated by a warning light and warning notice on the brake dynamometer or by means of a barrier.
- ! The edge of the installation pit for the roller set must be designated by a painted warning line in accordance with DIN Standard 4844.
- ! If roller covers (special accessories) are used, they are to be provided with a painted warning line in accordance with DIN Standard 4844 on top and bottom surfaces.
- ! Because of its construction, this brake dynamometer may not be operated above inspection pits. The distance between roller set and any inspection pit must be at least 2.5 metres in the direction of vehicle movement.
- ! The brake dynamometer may not be used for brake tests in accordance with § 29 Vehicle Registration Act and Annex VIII to the Vehicle Registration Act in connection with § 41 Vehicle Registration Act until any defects in the brake dynamometer have been remedied. After the defects have been remedied, the routine check test must be repeated within 4 weeks (applies to Germany only).

3 Operation

You can operate test line either using the hard keys and soft keys of the PC keyboard, the remote control or the infrared transmitter of the pedal pressure gauge (special accessory).

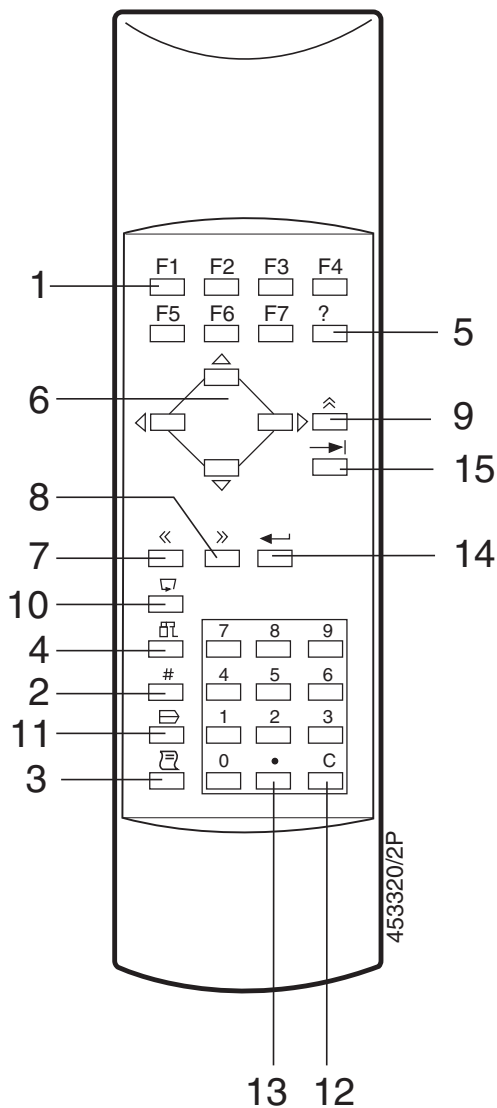
Enter text such as customer data, comments, etc. in input fields using the PC keyboard.

Predefined items available for selection are contained in selection fields. Here again, you can use the PC keyboard, the remote control or the infrared transmitter of the pedal pressure gauge (special accessory).

















Basically, operation is designed in such a way that all functions can be executed using the PC keyboard.

3.1 Soft keys

Soft keys F1 to F7 (on the screen) have reprogrammable functions and are operated using the function keys of the PC keyboard or the mouse. Soft keys which appear grey in the current program step are without function.



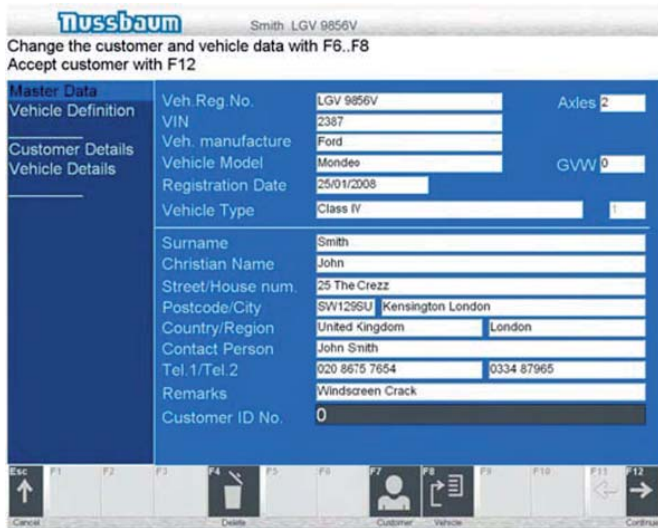
Key assignments

Symbol	Remote control	PC
1	F1-F7 <i>These keys (soft keys) have a different function depending on the application, program or program step</i>	F1-F7
2	# <i>No function at present</i>	F9
3	 <i>Printout of current monitor display (hard copy)</i>	
4	 <i>No function at present</i>	
5	F8 <i>Help function and simultaneous OFF switch for all motors (EMERGENCY OFF)</i>	F8
6	  <i>Cursor keys; for moving the cursor left/right or up/down in listings.</i>	
7	  <i>„Back“ key; for returning to the previous program step</i>	F11
8	  <i>„More“ key; for selecting the next program step</i>	F12
9	 <i>„Escape“ key; for aborting the active program step, menu, pop-up window or function windows.</i>	ESC
10	 <i>Repeat test step</i>	
11	 <i>Change to „Nussbaum Applications Menu“</i>	F10
12	C <i>Deletes the character to the right of the cursor or deletes selected text</i>	Entf
13	. <i>For inputting decimal numbers</i>	
14	 <i>„ENTER“ key; for confirming entered information</i>	ENTER
15	 <i>For switching to the input group</i>	
	0..9 <i>„0..9“; number keys for entering numbers</i>	0..9

3.2 Screen layout

The screen is divided into one or several input groups. An input group is characterized by a green frame all the way round. It contains one or more input fields and / or selection fields. The desired input group is selected with the Tab key.

The hard key and soft key group always forms one of these input groups. In this way, a hard key or soft key shown on screen can also be selected using the cursor → or ← keys and confirmed with the ↵ key.



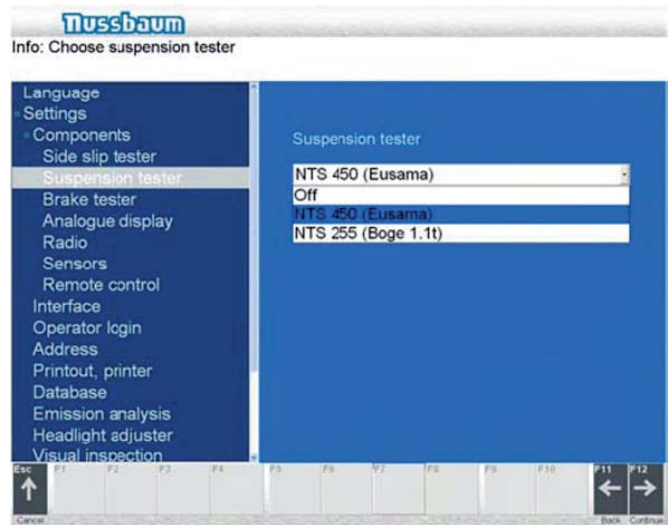
002

3.3 Input fields

When you select an input field, the cursor appears in this field. If the input field already contains text, this appears inversed (i.e. with black background).

Entering a character deletes the old contents of the field. You can also delete the contents of a field using the Delete key. If you only wish to change an existing text, move the cursor mark to the item you wish to change and enter the desired characters or delete characters individually with the Delete or z (Back) key.

Confirm the newly entered text with the E key. Then move to other fields below or above this one with the cursor u or o keys.



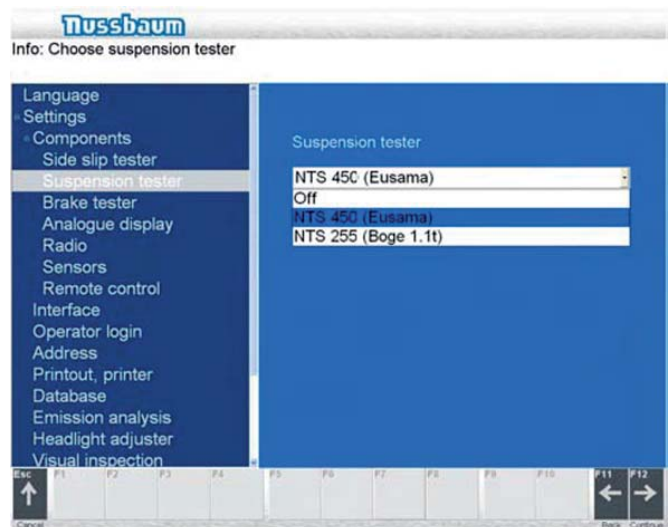
003

3.4 Selection fields

The selection fields all feature a box in the top right-hand corner containing an arrow pointing downwards. Like the input fields, these are selected with the cursor ↓ or ↑ keys.

You can make your selection using the cursor ← or → keys. Alternatively, you can open the selection field with the ↵ key.

Then make your selection using the cursor keys and confirm with ↵. The selection field is closed and the next input field opened.



004

4 Working with test lane


4.1 Notes for using test lane

Status display:



The status display of test lane is shown on the monitor. In order to ensure that the current operating state (On/Off) can be recognized at all times, it is essential that you only select standard Windows screen savers (with the exception of „Blank Screen“). Furthermore, ensure that the „Low-power standby“ and „Shut-off monitor“ energy-saving functions are deactivated and that the monitor cannot be switched off separately.


PC unit:

 If you have to boot test lane or the PC unit, wait 30 seconds before switching them on again!

Switching off test line:

 Remember to quit Windows properly before switching off test line.

4.2 Switching on the test stand

 Ensure that all the components of the test line are free from load before switching on the test stand.



Ensure that no persons are in the vicinity of the test stand. There is a risk of fatal injury to anyone near the test rollers.



Note the accident prevent regulations. Switch off the master switch in the event of danger.

When the PC unit is started, the Test lane icon is displayed. Start the application by double clicking on the Test lane icon



005

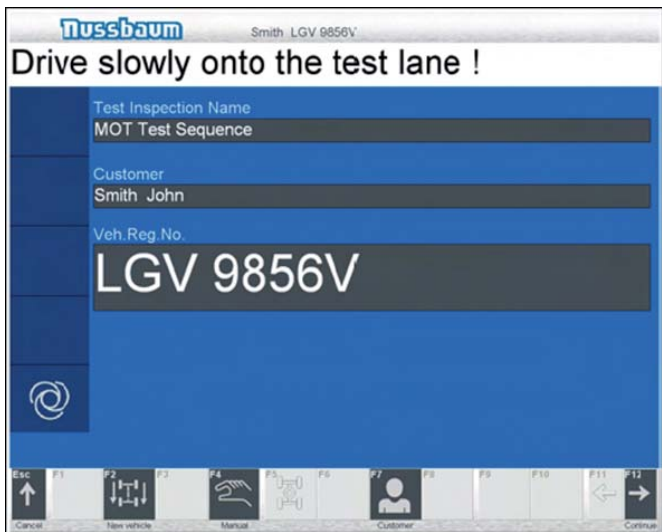
After the successful software start and initialisation of the hardware following screen appears:




006

Choose the category of vehicle that you would like to test, either F2 (trucks), F3 (Cars) or F4 (motorcycles).

Press F12 and the main testing screen for that type of vehicle is activated.



007

 The automatic test mode is now activated.

4.3 Preparing the vehicle

- Check the tyre pressure of the vehicle and correct if necessary.


- ! Sand on the vehicle tyres considerably shortens the service life of the test stand rollers („sandpaper“ effect)!

- Check the tyres before the test and clean if necessary.

- ! The plastic coating of the test rollers is not suitable for vehicle tyres with spikes. A special roller version can be obtained for testing vehicles of this kind.

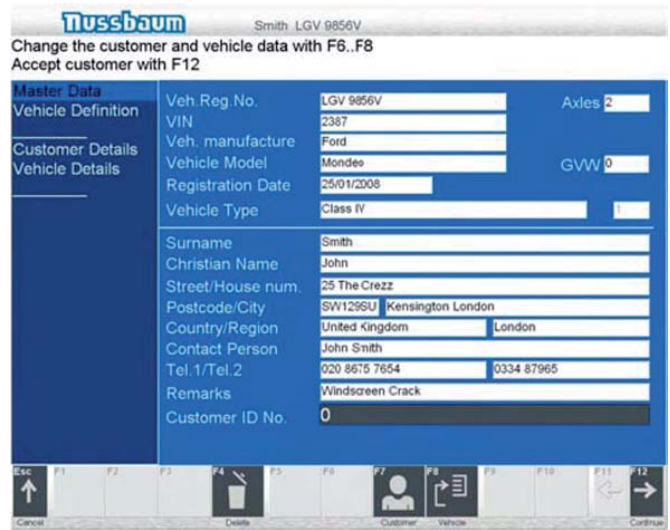
- Secure the pedal force meter (special accessory in some cases) to the brake pedal.

4.4 Complete test sequence with input of customer and vehicle details

 All testing modules can also be used separately by driving the vehicle onto the relevant component. A test is completed once the vehicle either reverses back over the test lane or it exits the test lane at the end and a new vehicle starts the routine by entering the test lane via the side slip tester.

4.4.1 Entry of customer and vehicle data

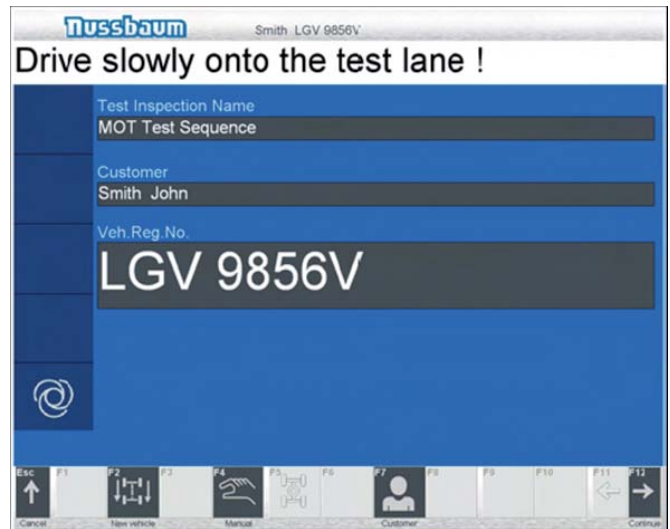
Press the key F7 (customer). The field to enter customer details will be activated.



002

Using either the mouse or the cursor keys, the customers details can be entered. Confirm with key F12.

The screen "Test lane main screen" appears.



007

The „Test line main screen“ re-appears on screen. The information you have entered is now displayed in the „Customer“ and „Reg. number“ fields. You can now commence the test.

4.4.2 Side slip test front axle

Drive slowly (at walking pace) onto the centre of the wheel alignment tester. Do not move the steering wheel. The front alignment plate starts the measurement and switches over to the wheel alignment display.



010

The front alignment plate eliminates disturbing lateral forces (strain) in the tyres. The next plate measures the wheel misalignment.

Result of wheel alignment, front axle

The measured value is displayed as a numerical value and in the form of a bar in m/km, and is stored for the protocol.

Positive value:

The wheels are pointing inwards; outwards shift while driving.

Negative value:

The wheels are pointing outwards; inwards shift while driving.

At the same time, the colour of the field has the following meaning:

- green: Value is OK
- yellow: Value is within tolerance, but high
- red: Value is too high

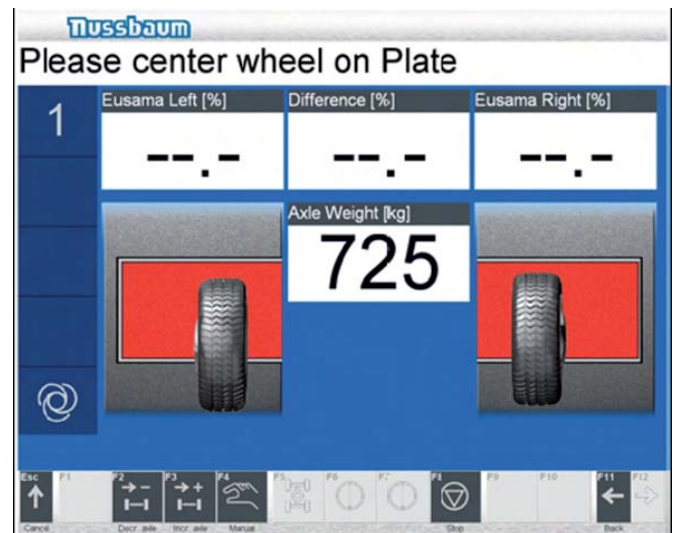


010

ⓘ If the STOP symbol appears on screen, this means: Please brake, the vehicle is already on the wheel suspension tester.

4.4.3 Wheel suspension, front axle

Drive the vehicle onto the centre of the measuring platforms. Shift the gears into neutral and release the brakes.



012

ⓘ You can set the display of the axle weight to either daN, kg or kgf in the Configuration menu (see section configuration).

As soon as a wheel weight in excess of 80 kg is detected on both platforms, the exact wheel weight is determined and displayed as an axle load weight (left + right). This value is also used subsequently for the brake test.

ii If a permissible vehicle total weight is entered either before or after the measurement in the „Entry of customer data“ screen, this has priority over the measured (axle) weight and is therefore used in this case to calculate the braking effect.

First the left then the right-hand wheel is tested.



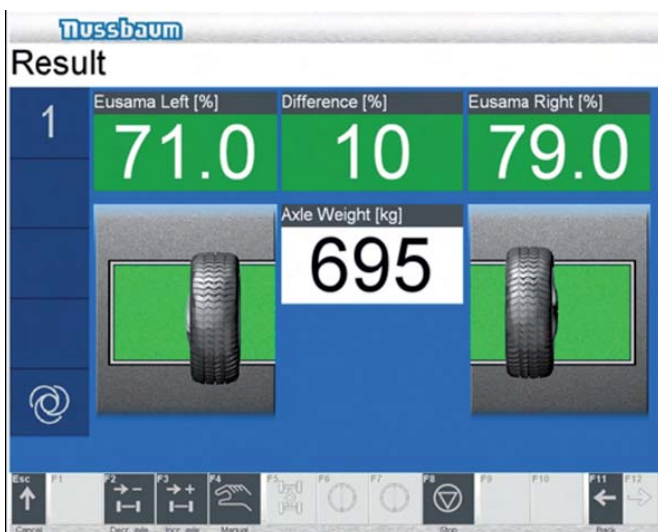
013

The platform begins to oscillate in order to determine the road adherence versus the frequency. To this aim, the motor is revved to its maximum frequency, switched off and measured while it is coasting.

The minimum road adherence is displayed.

ii Before the motor is switched off, a danger symbol is superimposed on screen.

Result of road adherence, front axle



014

Once the test is complete, the following measured values are displayed:

- Minimum road adherence for the left and right-hand wheel in %. These values are calculated from the minimum wheel contact force divided by the static wheel weight.
- Difference in road adherence between the left and right-hand wheel in %.

! A re-calculation after the measurement is complete may cause the minimum road adherence values on the result screen to differ slightly from those in the measurement screen.

Explanations relating to the wheel suspension test

The minimum road adherence value A should be > 25 %.

- A > 45% = good road adherence
- A 25% - 45% = poor road adherence
- A < 25% = excessively poor road adherence

In the case of the rear wheels of light vehicles with the engine installed in the front (low axle load at the rear, e.g. Panda,

Corsa, Twingo, etc.), low road adherence values of 20% - 40% are normal and do not necessarily mean that the running gear is faulty. In cases such as this, as long as the front axle lies within the limit values, the difference is sufficient as a criterion (if necessary or for checking purposes, load the rear seat with two passengers).

The same also applies to the rear axle of light vans with no payload.

The difference D between the left and right-hand wheel should be less than 15 %.

- D < 15% = acceptable difference
- D > 15% = excessive difference

ii When assessing the measured values and deciding whether or not the shock absorbers need to be replaced, you must note

the manufacturing tolerances of the shock-absorber manufacturer. These are stated as being between 10% and 20%. In practice, this means that in exceptional cases, the measured values of new shock absorbers are worse than those which were replaced.

The rear axle test is identical to that of the front axle. The display will show the symbol for the rear axle as soon as the wheel drives onto the platform.

ii The results of the wheel suspension tester cannot replace the experience of the workshop personnel. In particular, attention must be paid to the peculiarities of the vehicle. If excessively low values are displayed, this does not necessarily mean that the shock absorber is defective. Loose or over-tight fastenings, faulty installation or shifted wheel geometry (blocked suspension joint, bent linkage) also lead to lower road adherence results.

A definitive assessment of the wheel suspension can only take place after a visual inspection.

You can call up the result screens of the front and rear axles again later (see section result screen).

Brake test, front axle



Ensure that no persons are in the vicinity of the test stand. There is a risk of fatal injury to anyone near the test rollers.



Note the accident prevent regulations! Switch off the master switch in the event of danger!

A brake test consists of several test steps or measurements. Instructions on the screen guide you through the individual test steps.

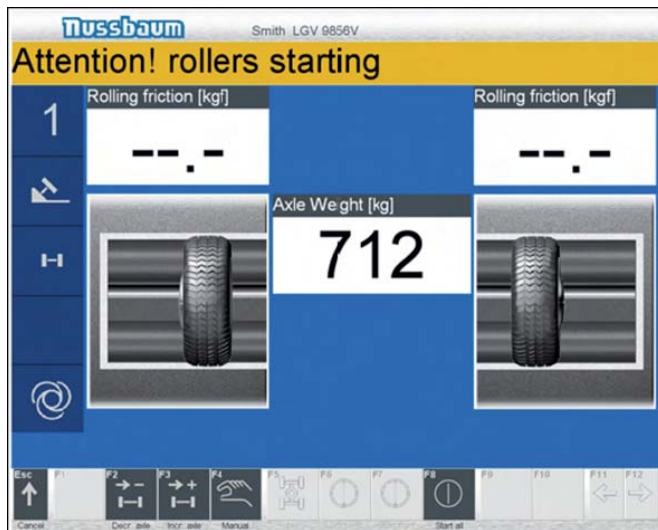
The braking forces for the left and right-hand wheel are displayed in Newton or if chosen, in kgf, while the difference between left and right is displayed in % as a value and a bar.

When a pedal pressure gauge is connected, the narrow bar in the centre shows value in Newton or kgf indicate the measured pedal braking force. For this purpose, you must activate the Pedal pressure gauge IR in the Configuration menu (see section configuration).

Oscillating

Move the vehicle so that the front wheels are on the rollers of the brake test stand.

As soon as an axle drives onto the rollers of the brake test stand, the display switches to the brake test. The rollers start to run and brake measurement of the vehicle can commence.

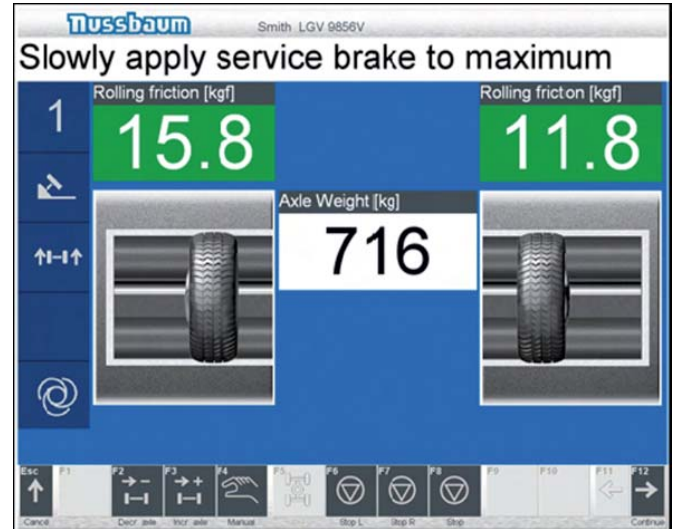


015

Rolling resistance, front axle

Do not brake!

This test step enables the condition of the brake to be assessed to ensure that the wheel is running freely or the brake pad is not stuck. Test time approx. 2 s.



016

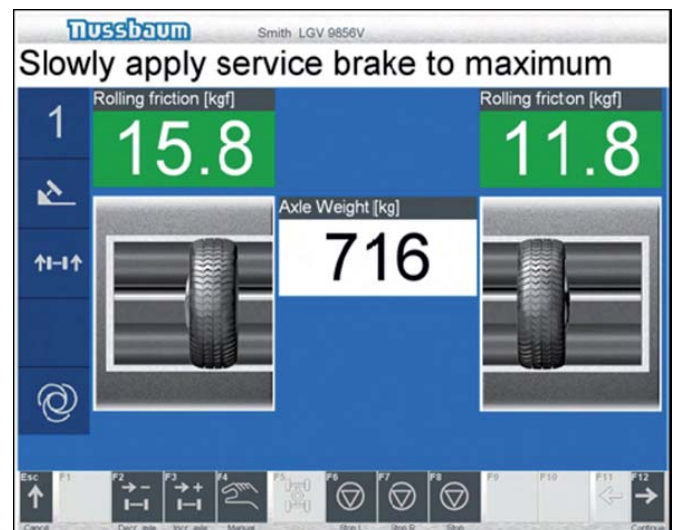
Ovality test, front axle

Slowly brake to values greater than 300 Newton and retain this value.

This test step enables the condition of the brake disk or brake drum to be assessed for out-of-roundness or wear but is not displayed for UK MOT testing.

Max. braking force (braking to limit), front axle

Slowly brake until the maximum braking force is reached.



016

If the slip cut off limit is not reached, you can accept the test step by pressing F10.

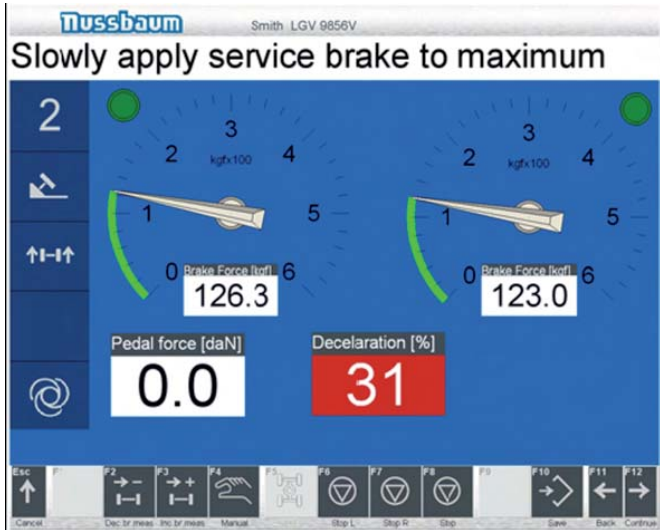
ii Once the 15 seconds are over, you can also end the test by releasing the brake pedal.

4.4.6 Ending the test procedure

Once all measurements have been completed, drive the vehicle out of the rollers.

4.4.4 Rear axle test

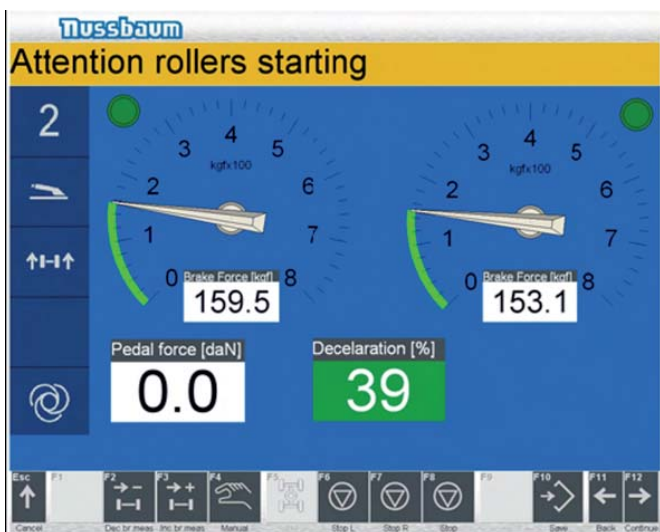
The rear axle test is identical to that of the front axle.



4.4.5 Measurement of parking brake (handbrake)

The handbrake test is provided both for the front axle and rear axle.

ii If the handbrake does not act on the axle which is on the rollers, you can skip this test step and drive the vehicle out of the rollers.



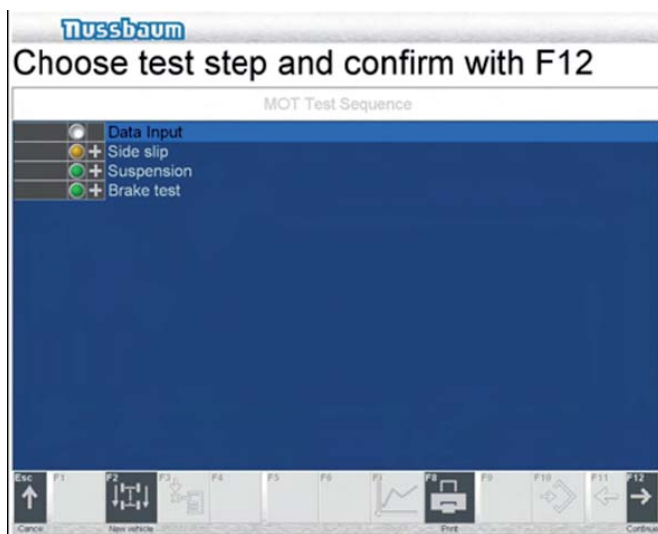
With the handbrake, slowly brake to the max. hand brake force or up to the slip cut off. Test time 6 seconds.

5 Result screens

After the complete testing procedure has been completed, the numerical results table is displayed. At any time during the testing sequence, by pressing F1 the test can be halted. After halting the testing sequence the results table will also be shown.

The numerical result table contains all the measured values at a glance:

- Testing procedures which have not yet been measured will have a white point displayed on the screen next to the testing step.
- Testing procedures which have begun but not completed fully will have a yellow point displayed on the screen next to the testing step.
- Fully completed testing procedures will have a red point displayed on the screen next to the testing step.



020

By pressing F7 (results) on the screen for test procedure overview, the numeric results table can be called up. This table contains all the measured values at a glance. Measurement values which are outside the defined limit are marked in red.

The defined limit values for individual countries can be set prior to testing (see configuration chapter).



021

You can return to the screen for test procedure overview by pressing the F1 ESC key.

5.1 Result, wheel alignment

Choose the test procedure Side slip in the test procedure overview screen and Press F7 to confirm. The side slip result screen appears.



022

The side slip measurement results are shown in m/km of the front (axle 1) and rear (axle 2) axles. This value indicates the axle offset to the left or right of a vehicle in metres, which it exhibited following a drive of one kilometre with no correction to the steering.

To return to the test procedure overview screen, press F1.

5.2 Overall result screen for the suspension test

In the test procedure overview screen, select Suspension tester and confirm with key F7 to see the results of the suspension test.

Measured values which lie outside predefined set limits are highlighted in red.

	Axle 1	Axle 2
Eusama left [%]	71	76
Eusama right [%]	79	77
Eusama difference [%]	10	1
Frequency left [Hz]	15	14
Frequency right [Hz]	10	14
Frequency difference [%]	33	0
Weight left [kg]	393	420
Weight right [kg]	302	363
Axle weight [kg]	695	783
Weight total [kg]	1478	

023

Wheel suspension, road adherence in %:

This value indicates the lowest measured road adherence of each individual wheel, referred to the wheel weight.

Axle weight in kg:

This is the total value of the measured wheel weight (left and right) added together, referred to the front and rear axles.

The sum total axle weight or the entered overall weight is used to calculate the braking effect.

See „Explanations relating to the wheel suspension test“ for further information.

Pressing key F1 will take you back to the test sequence overview screen.

5.3 Result, foot brake

Choose the test procedure Brake tester in the test procedure overview screen and Press F7 to confirm. The brake test result screen appears.

	Left	Right	Total
Brake force service brake [kgf]	*287.4	*257.3	544.8
Brake force parking brake [kgf]	*288.3	178.9	467.2
Static weight [kg]	409	409	818
Dynamic weight [kg]	415	415	830
Rolling friction [kgf]	15.4	14.0	
Pedal force [daN]			
Brake force difference [%]			
Serv. Br.			
Park. Br.			

024

Rolling friction:

This is the resistance force when the brake is not actuated, i.e. deceleration due to friction of the unbraked vehicle. The values are dependent upon the axle weight and whether the axle is driven or not:

- Non-driven wheels: < 200 N
- Driven wheels: < 400 N

An excessive difference may also indicate a fault and should be investigated during the course of the visual inspection, e.g. disc-brake calliper joint too tightly braced or blocked, brake piston seized up, faulty wheel bearing, etc.

Ovality:

The maximum and minimum value over the wheel revolutions are measured for approx. 5 seconds (average peak-to-peak value). This is compared with the maximum braking force. This produces the result in percent, which is dependent upon the braking force at which the out-of-roundness was determined.

Values > 10 % indicates a worn brake disk or drum and should have been clearly perceived during braking. This out-of-roundness can be clearly seen as a wavy line on the graphic result screen (see „Graph of braking force versus time“).

Maximum braking force in Newton (N or kgf):

This is the maximum braking force for the measurement as a whole.

Braking force difference in %:

The braking force difference in percent is calculated from the relationship of the highest braking force between the right and left-hand wheels of an axle to the maximum braking force.

$$\text{Braking force diff. (\%)} = \frac{(\text{high_value(L / R)} - \text{low_value(L / R)}) \times 100}{\text{higher_value(L_or_R)}}$$

If the braking force difference is above 20% it is useful to examine the braking force characteristic curve in the graph screen in order to determine the point at which large differences occur (at low or high braking forces), and where the fault might lie (e.g. poor performance or late response on one braking side).

Braking effect in %:

The braking effect of an axle in % is derived from the sum total of individual braking forces of the wheels divided by the measured axle weight or divided by the permissible total weight, if this has been entered.

$$z_in_ (\%) = \frac{\text{sum total_brak.forces_leftwheel_rightwheel(N)}}{\text{measured_axle_weight_force(N)}} \times 100$$

Overall braking effect in %:

The braking effect in % is derived from the sum total of individual braking forces divided by the vehicle weight, whereby the vehicle weight corresponds to the sum total of axle weights or the entered permissible total weight.

$$z_in_ (\%) = \frac{\text{sum total_brak.forces(N)}}{\text{Overall_weight_force_of_vehicle(N)}} \times 100$$

Braking effect front, rear, crossways in %:

In each case, the braking effect in % is determined from the sum total of front axle braking forces, rear axle braking forces or the poorer value of crossways braking forces, divided by the permissible vehicle total weight. This value indicates how a vehicle with two braking circuits behaves when one of the circuits fails, i.e. how high the remaining braking effect is referred to the total weight (at the moment, this value is only required in Italy).

Pressing F1 (Esc) will take you back to the test sequence overview screen.

5.4 Protocol for the pedal force meter

If a pedal force meter is used during the brake testing procedure, the values can be seen at any time during the brake test by pressing F12. Pressing F11 will take you back to the brake test screen. After the test for each individual axle is completed, the results value will be displayed.

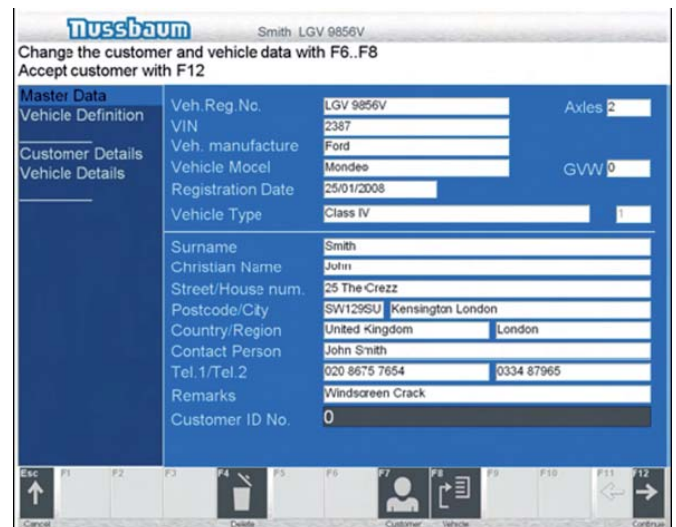


025

5.5 Customer data

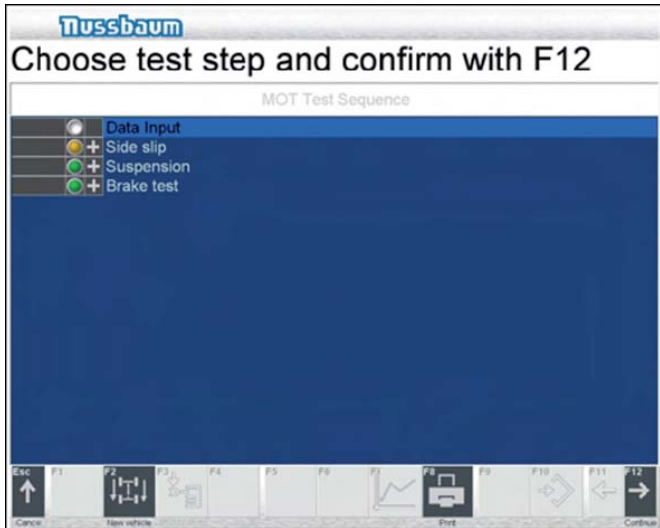
When you are in the test procedure overview screen, you can correct existing customer data or enter new customer data for the next measurement by pressing F7 (Customer).

You can enter comments regarding the result of the test in the Comments input field (max. 2 lines of 30 characters each).



026

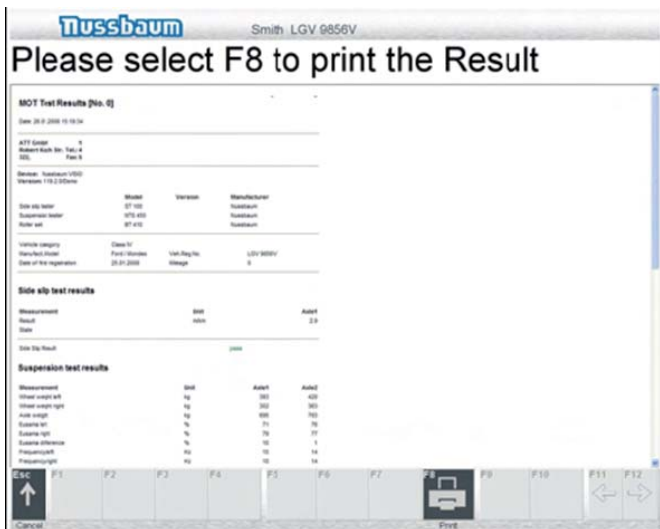
5.6 Protocol Printouts



027

5.6.1 Protocol Brake Test

In the test procedure overview screen select brake tester and by pressing F8 (results) the protocol for the brake test results will be shown. To print out the protocol press F8 again.

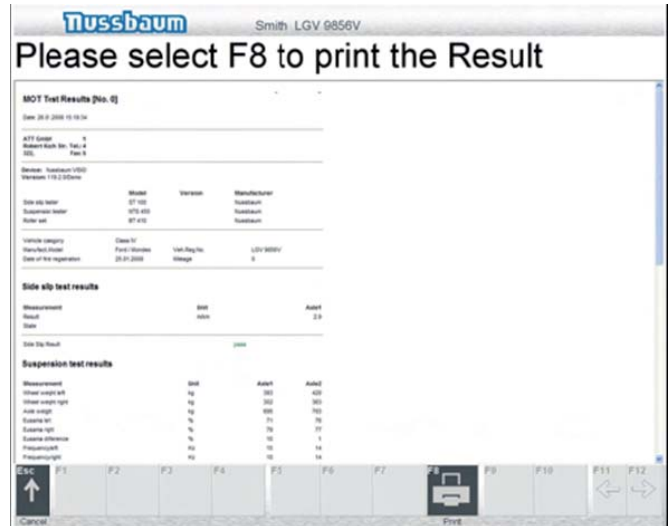


028

Pressing F1 will bring you back to the test procedure overview screen.

5.6.2 Protocol Suspension Test

In the test procedure overview screen select suspension tester and by pressing F8 (results) the protocol for the suspension test results will be shown. To print out the protocol press F8 again.

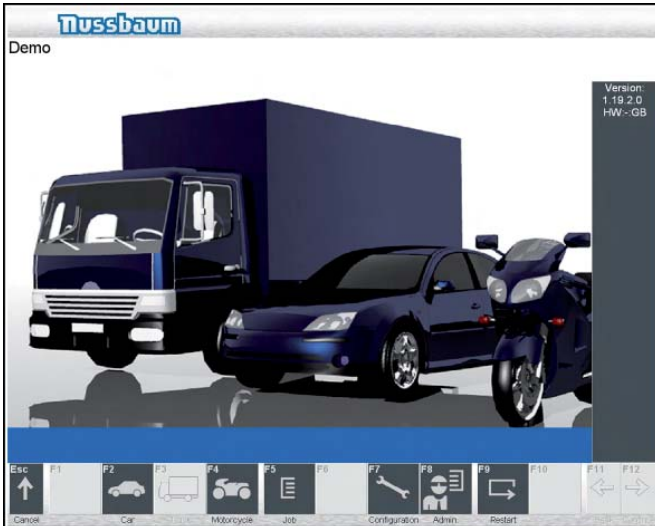


029

Pressing F1 will bring you back to the test procedure overview screen.

6 Commissioning into service and general settings

Test line must be set in accordance with particular features the first time it is put into operation, when there is a change in the components used and when there is a change of operator (examiner) or workshop address.



030

In the start screen, press F7 (Configuration) to select the Configuration menu.

You will be asked to enter a password.
Enter the password „Nussbaum“.




031


Confirm this with F4 (yes). The Configuration menu is displayed.




032

The individual menu items with the various parameters which may be set are now explained.

 You can return to the Configuration menu from any menu item by pressing F1 (ESC).

 The configuration menu titles can be chosen by scrolling using keys F11 or F12.

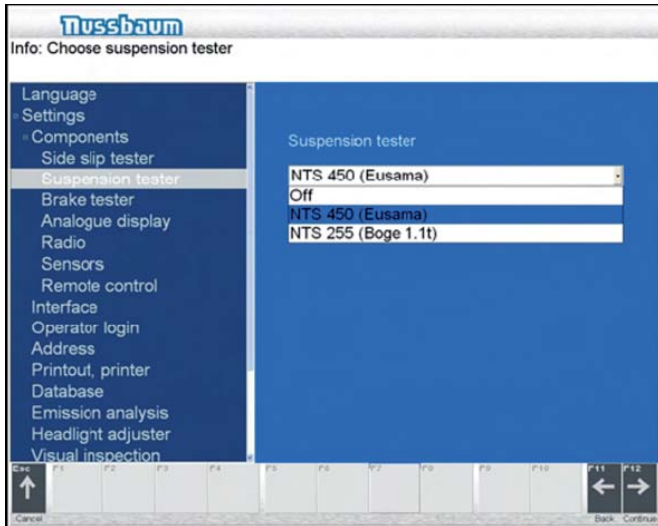
 The configuration menu title can be selected by clicking with the mouse.

6.1 Settings under „Configuration / Settings“

In order for the test procedure to take place in a manner suitable for the structure of test line, the test line must be set accordingly.

6.1.1 Selection of components

In the Configuration input group, select the menu item Adjust with the mouse or the cursor o or u keys, or enter the first letter of the menu item with the keyboard. Now select Components. Confirm with F12.



033

Wheel alignment test On/Off

Side Slip Tester

The desired mode of operation can be selected in the menu under Components, Side slip tester.

The following modes of operation are available:
 Off The side slip tester is not available.
 Standard
 Country and Customer specified variants

Confirm the selection with key F12.

Select and set the other menu items as described for „Wheel alignment tester On/Off“.

Wheel suspension tester On/Off

Suspension Tester On/Off

Brake test stand On/Off

Off Brake test stand not available
 Weighing device Yes/No
 Four wheel drive On/Off
 Pit safety device Yes/No

Simultaneous Display

Analogue display Off/Indication scale size
 Amount of analogue displays 1-4
 LCD On/Off

Data bank

Data bank
 Off/local data/data on another computer/ASA network
 Computer name
 Mode results/Assignment and results

Radio Control

Radio Control On/Off
 Net ID 0/1
 RC alarm limit min = 0/max = 100

Pressure Sensors

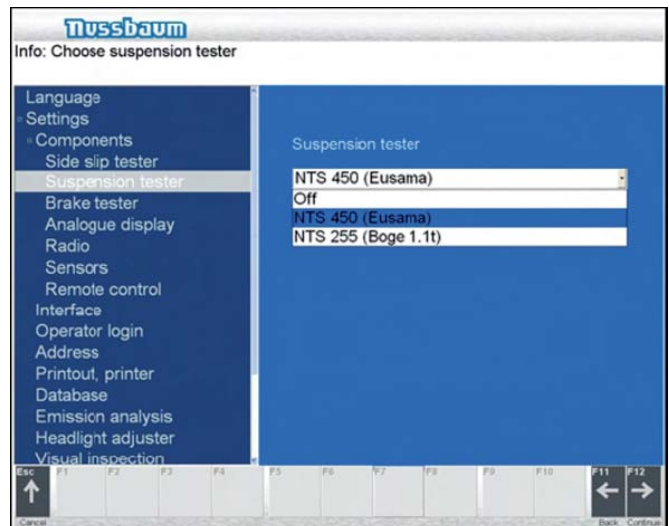
P_d Off/Cable connected/RC
 P_m Off/Cable connected/RC
 P_z Off/Cable connected/RC

Tachometer

Tachometer On/Off

6.1.2 Configuration of interfaces

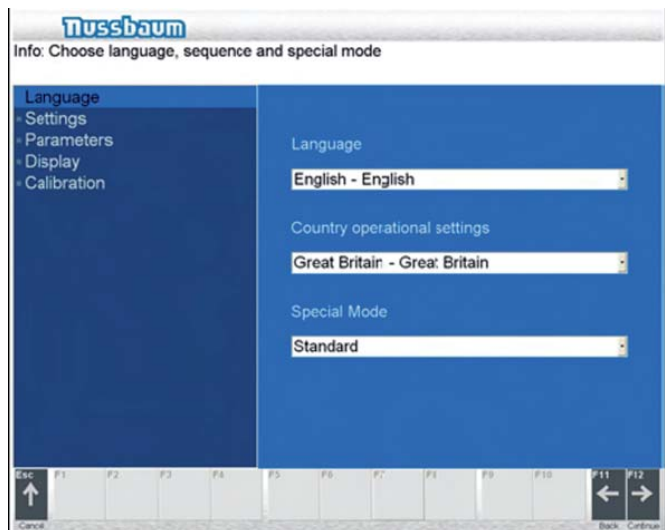
In this menu you can select the number of available serial interfaces. These interfaces are assigned to the existing components.



034

6.1.3 Selection of language, countries and customer specified procedures

The user language can be chosen from this menu. If a country-, or customer specific test procedure is required, make your selection in this menu.

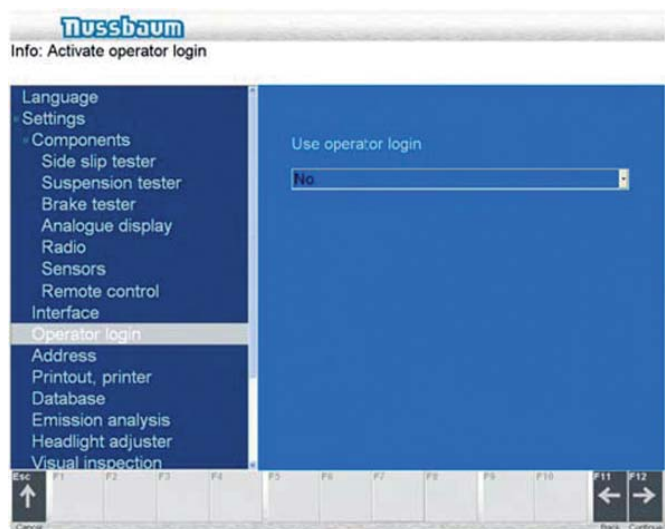


035

Under Components choose the menu title Country specifications and then choose the required language and the particular country or customer specified procedures. Confirm by selecting key F12.

6.1.4 Entry and selection of examiner name

This menu item allows you to enter a new examiner's name or select an examiner who has already been entered. The name of the examiner is printed on the protocol.



036

Type in the name of the examiner. Press F4 to accept this entry.

You can delete an existing entry by pressing F5. Choose the testing persons name and confirm with the key F12.

6.1.5 Inputting the Address and Contact Details

The address and contact details of the customer can be written in the associated fields and they will also be printed out on the protocol results sheets.

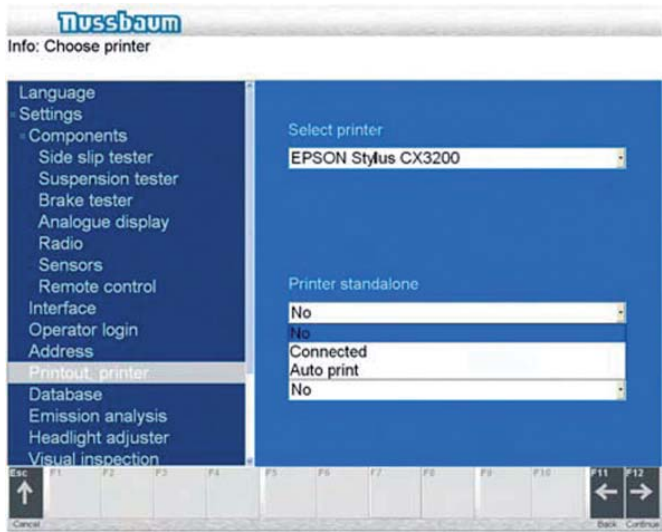


037

Write the address and details in the associated fields using the keyboard. The information can be overwritten if a mistake is made or incorrect data already exists. Confirm with key F12.

6.1.6 Select Print /Printer

Select the field for choice of printer and choose which printer the protocol results sheets should be printed on.

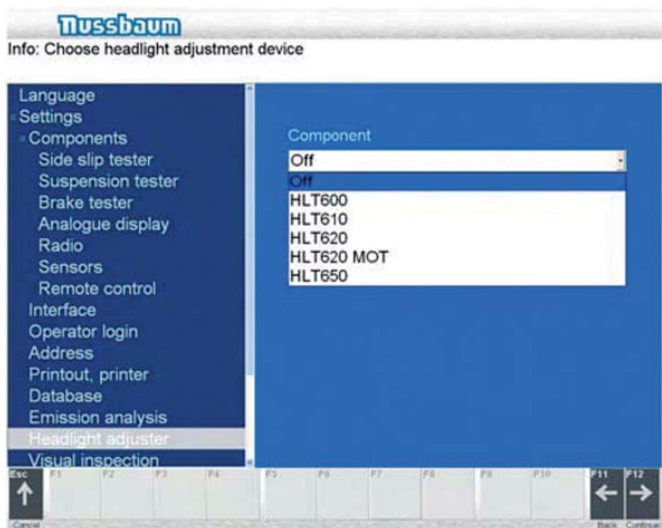


038

Choose the desired printer and confirm with key F12.

6.1.7 Headlight Tester Procedures

If a Headlight tester is installed as part of the test sequence, it can be integrated into the sequence in this position.

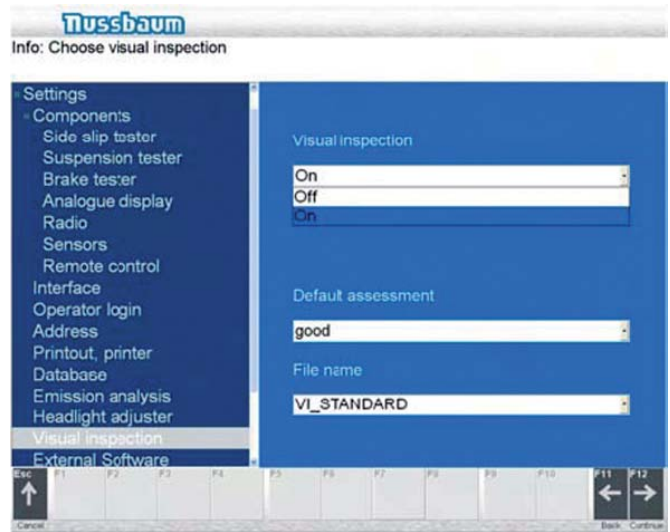


039

Choose the desired printer and confirm with key F12.

6.1.8 Visual Inspection Procedures

If a visual inspection is carried out, the inspection details can be entered into the fields in this menu title.



040

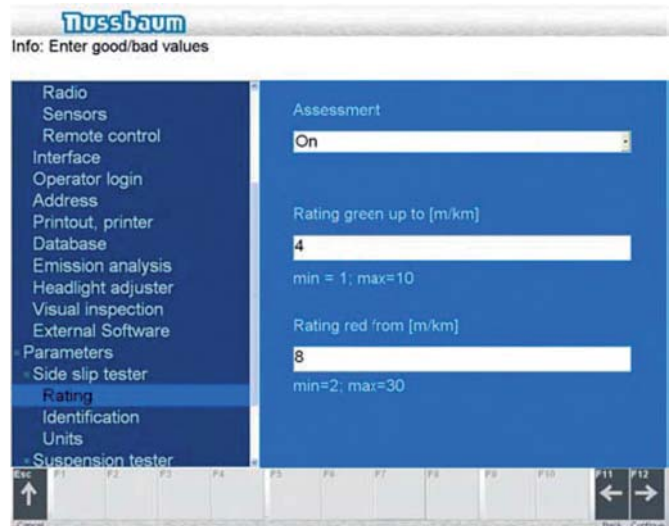
Select On or Off with the mouse. Confirm with key F12.

6.2 Settings under „Configuration / Parameters

In this menu, you can enter the limit values for the good/poor evaluation of values from the wheel alignment tester, the wheel suspension tester and the brake test stand in the test procedure.

! Your country's legal regulations must be observed!

6.2.1 Settings for the wheel alignment tester



041

Under the menu title Parameters, choose the title Side Slip Test. Confirm the selection with key F12.

Result green up to

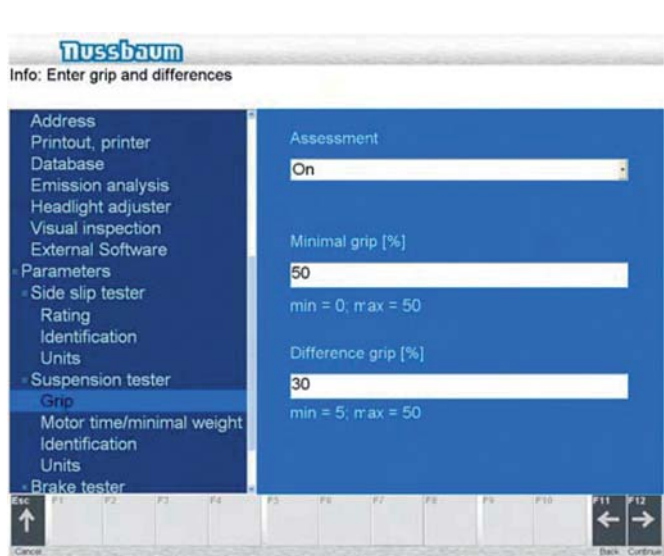
With the mouse click the field „Evaluation green to“. Enter the desired number with the keyboard. The result will now be good (green) up to this deviation from straight-line stability. If this value is exceeded, the value becomes yellow logged.

Result red from

With the mouse click the field „Evaluation red from“. Enter the desired number with the keyboard. The value will now remain yellow logged until the alignment plate reaches this degree of deviation. If this value is exceeded, the value becomes red logged. Confirm with F12 key.

6.2.2 Settings for the wheel suspension tester

Select with the mouse in the menu Parameters the item Wheel suspension tester and confirm with F12.



042

Min. road adherence - front axle

Click on the Min. road adher. - front axle and enter a value using the keyboard.

If, during the test procedure, the difference of the measured road adherence between the left and right-hand wheels of the front axle is greater than the value you have entered, the measured value is highlighted in red (result: poor). Confirm with key F12.

Min. road adherence - rear axle

To set the assessment criteria for the Min road adher.-rear axle item, proceed as for the front axle.

Road adherence difference - front axle

To set the Road adh.diff, front axle menu item, proceed as described for the Min. road adher.-front axle.

If, during the test procedure, the difference of the measured road adherence between the left and right-hand wheels of the rear axle is greater than the value you have entered, the measured value is highlighted in red (result: poor).

Road adherence difference - rear axle

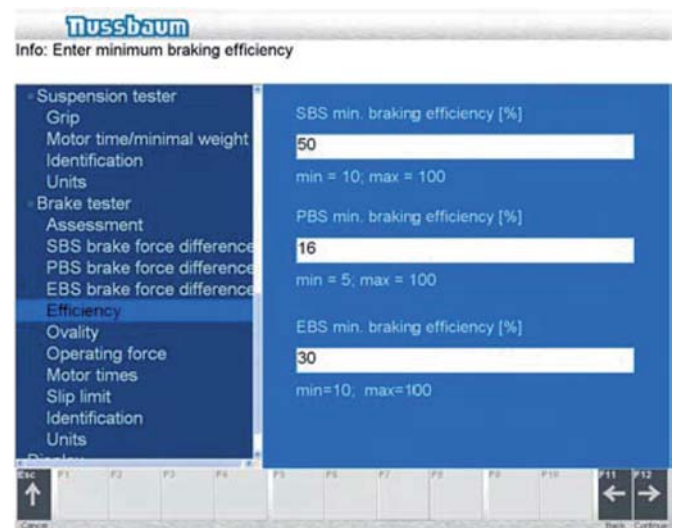
To set the Road adh.diff, rear axle menu item, proceed as described for the Min. road adher. - rear axle.

If, during the test procedure, the difference of the measured road adherence between the left and right-hand wheels of the rear axle is greater than the value you have entered, the measured value is highlighted in red (result: poor).

Motor running time/minimum weight

6.2.3 Settings for the brake test stand

Select with the mouse in the menu Parameters the item Brake test stand and confirm with F12.



043

Min. braking force difference of foot brake, front axle

Select the Min.frc.diff,f.brake front item from the menu. Type in the numerical value for the maximum permitted braking difference of the foot brake for the front axle. Confirm your entry with F12.

Set the menu items Max.br.force diff,f.axle to Park.brk.op. force: hand as described for the Min.frc.diff,f.brake front.

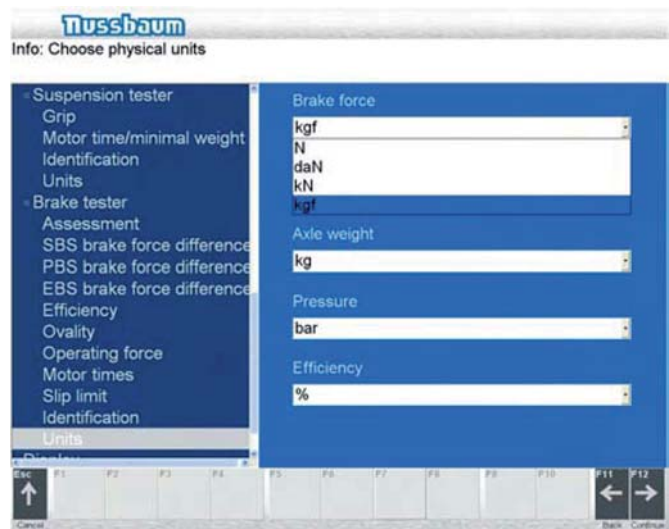
The meaning of the various menu items is explained below.

- Max.br.force diff,f.axle
Maximum permitted braking force difference of the foot brake for the front axle.
- Min.br.force diff,r.axle
Minimum permitted braking force difference of the foot brake for the rear axle.
- Min.frc.diff,f.brake rear
Minimum permitted braking force difference of the foot brake for the rear axle.
- Max.frc.diff, park brake
Maximum permitted braking force difference for the parking brake (handbrake).
- Max.frc.diff, aux. brake
Maximum permitted braking force difference for the auxiliary brake.
- Maximum Rolling resistance difference.
Maximum Rolling resistance difference between left and right wheels.
- Min. braking, foot brake
Minimum value of braking for the foot brake in % in relation to the vehicle as a whole.
- Min. braking, front axle
Minimum value of braking for the foot brake of the front axle in % in relation to the vehicle as a whole.
- Min. braking, park brake
Minimum value of braking for the parking brake (handbrake) in % in relation to the vehicle as a whole.
- Min. braking, aux. brake
Minimum value of braking for the auxiliary brake in % in relation to the vehicle as a whole.
- Max.out-of-round, f. axle
Maximum out-of-round value for the front axle.
- Max.out-of-round, r. axle
Maximum out-of-round value for the rear axle.
- Max. roll.friction diff.
Maximum rolling friction difference between the left and right-hand wheels.
- Foot brake operat. force
Maximum operating force (pedal force) for the foot brake.
- Park.br.op. force: foot
Maximum operating force (pedal force) for the parking brake.

- Park.brk.op. force: hand
Maximum operating force (pedal force) for the parking brake.
- Run up period of motor
- Time of restarting motor
- Slip limit low speed
- Slip limit high speed
- Identification Number of equipment

6.2.4 Selection of axle/wheel weight and units

This menu enables you to determine whether the weight is displayed for the axle or for the wheel and if the weight is displayed and printed out in kg or daN or kgf.



044

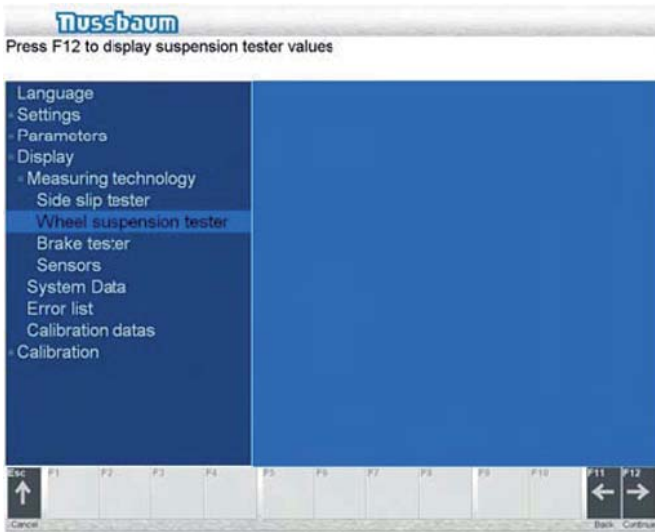
Click on the respective field and pull down a menu to choose your desired weight measurement. Confirm your choice by pressing F12.

6.3 Display of measurement system, system data and error list

To be able to determine the status of the test line quickly and easily, you can view and print out current measured values and information on the measurement system, system data and, if present, the error list. Do this in the Display input group in the Configuration menu.

6.3.1 Measurement system

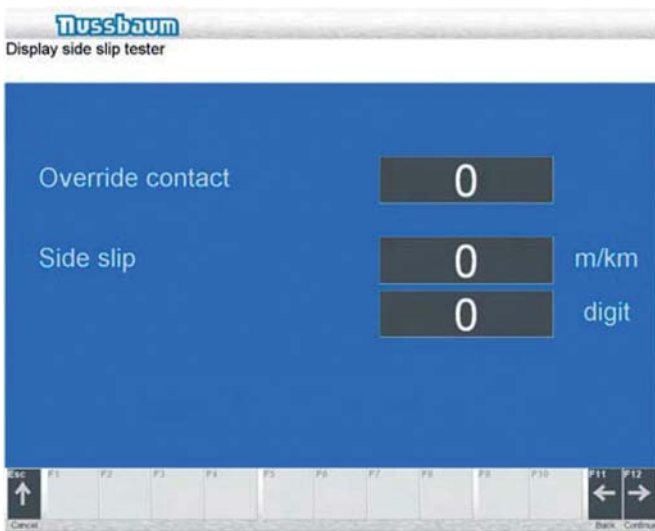
Select with the mouse in the menu the Display the item Measurement system and confirm with F12.



045

Side slip tester

Choose the Side slip tester with the mouse and select with the key F12. The value of the suspension tester will then be displayed.

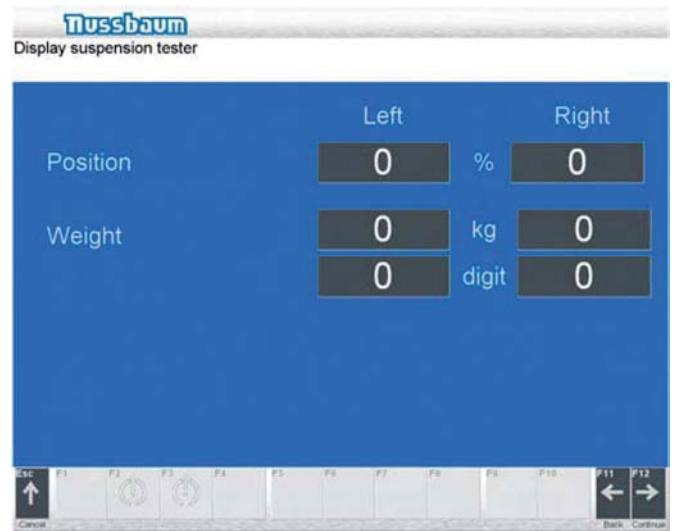


046

Under unloaded conditions the value should be around 0.

Wheel suspension tester

Choose the suspension tester with the mouse and select with the key F12. The value of the suspension tester or the weighing device will be displayed.

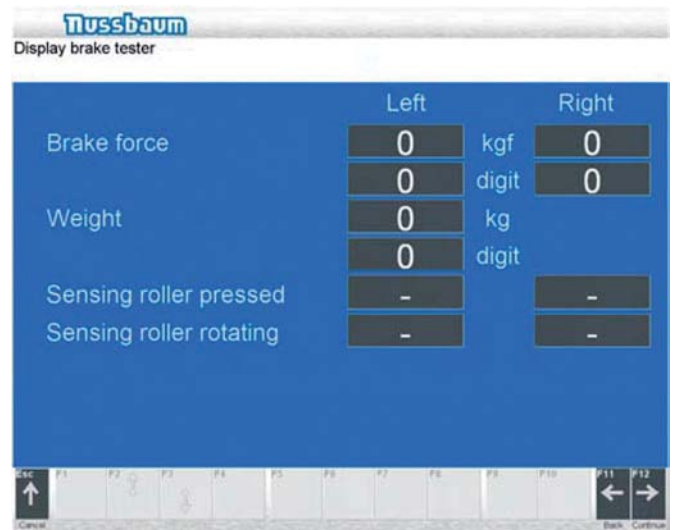


047

Under unloaded conditions the value should be around 0.

Brake tester

Choose Brake tester with the mouse and select with key F12. The values of the brake test stand are displayed.



048

A stand empty of a vehicle should show a brake force of 0.

A stand empty of a vehicle should show a weight measurement of between -3kg and +3kg.

When the stand is switched off, the motors should be Off

Speedometer

Choose Speedometer with the mouse and select with key F12. The value of the speedometer will be displayed.

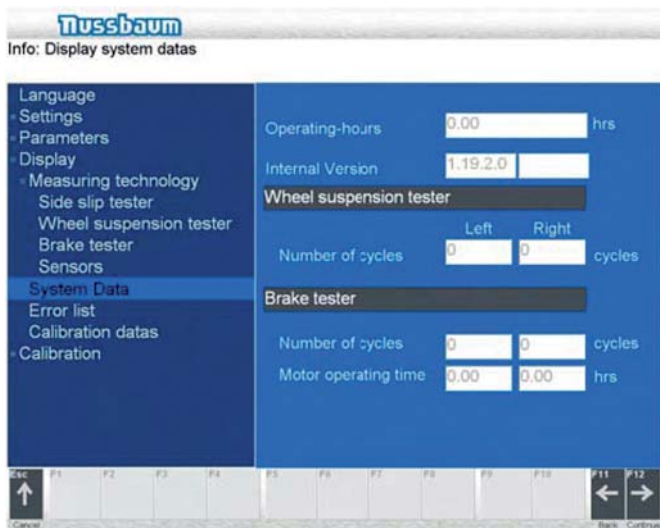


049

6.3.2 System data

Using the mouse Select the System data item from the menu and confirm with F12.

When this menu item is selected, general information about the system (test line components and measurement computer) is displayed.



050

General information about the test line components which has been determined by the measurement system is displayed.

During operation, the measurement system ascertains the number of measurement cycles for each test line component, the motor running time of the brake test stand and the operating hours.

In addition, the software version and Firmware version are displayed.

6.3.3 Error list

Select the Error list item from the menu using the mouse. Confirm with F12.



051

The warning and error messages which have occurred are displayed.

You can delete entries by pressing F5 (Delete).

If an error continues to be present, this is displayed again (see section error codes).

6.4 Calibration

The instructions for calibrating the test lane can be found in the installation manual.

7 Administration

Under the heading Administration the test lane can be configured to user specifications.

In the menu Administration you can change the following:

- New definition of the test sequence, customise, re-define as standard and delete
- Define the basic settings for the test entry data
- Call up saved measurement data.

After switching on the test lane and after the hardware has been successfully initialised, the start screen will be displayed on the monitor.



052

Choose Administration with the key F8.



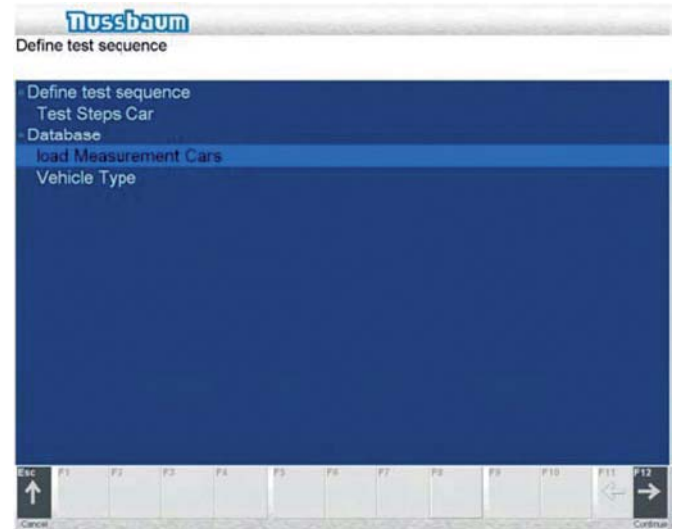
053

A password request follows: Enter the password „Nussbaum“ and confirm with key F4 (Yes). The administration program will now appear on the screen.

By pressing F12 from any menu position you can get back to the test beginning.

7.1 Defining the test sequence

Double click on the heading Define test sequence and choose either . Confirm with F12.

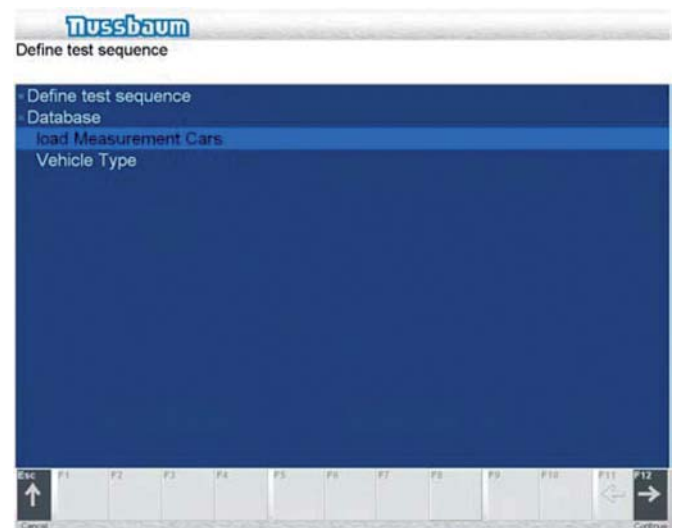


054

In this menu prompt the test sequence can be re-defined, customise, renamed or defined as standard. It can also be deleted as well as defining the basic settings for the test sequence.

7.1.1 Define new test sequence

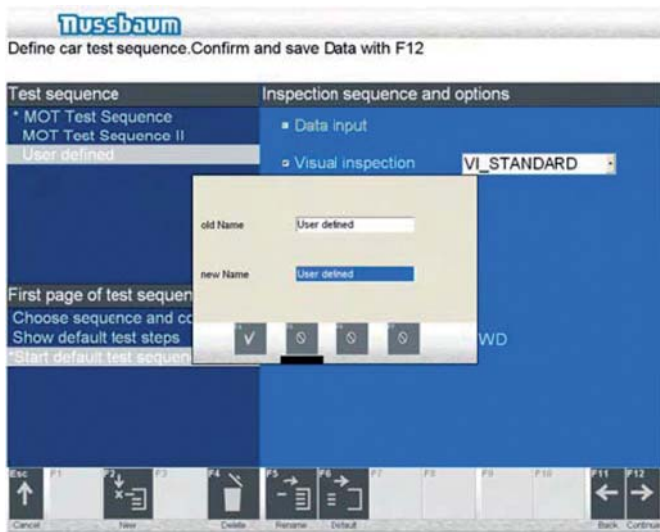
Click F2 to define a new test sequence. Indicate the desired test sequence in the field Test sequence and Options. Confirm the selection with F12. The new test sequence will now be under the name Default. (chance test sequence see below).



055

7.1.2 Rename existing test sequence

Mark the test sequence that you want to redefine. Press F5 to open a window to enable you to redefine your new test sequence. Confirm with F4 or delete with F5.



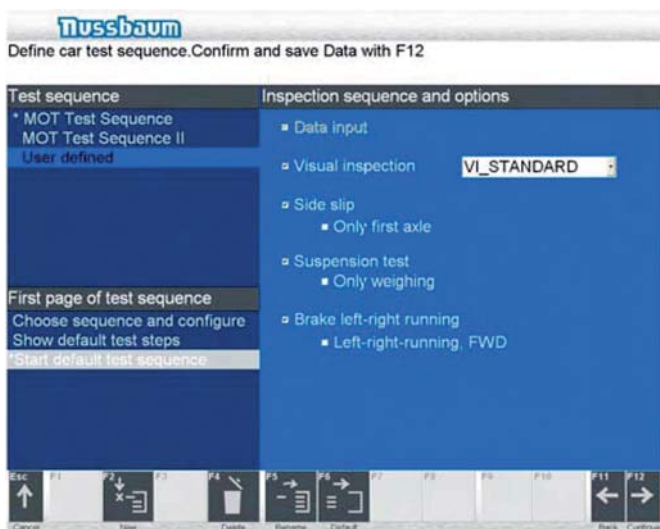
056

7.1.3 Customise existing test sequence

Mark the test sequence that you would like to customise. Indicate the desired test sequence in the field Test sequence and Options that you want to customise. After you have made the changes save with F3.

7.1.4 Define test sequence as basic settings

Mark the test sequence that you want to redefine as Basic settings. Use F6 to allocate. The desired test sequence will have a star before its name. A small star before the name of the sequence indicates the sequence.



057

7.1.5 Delete existing test sequence

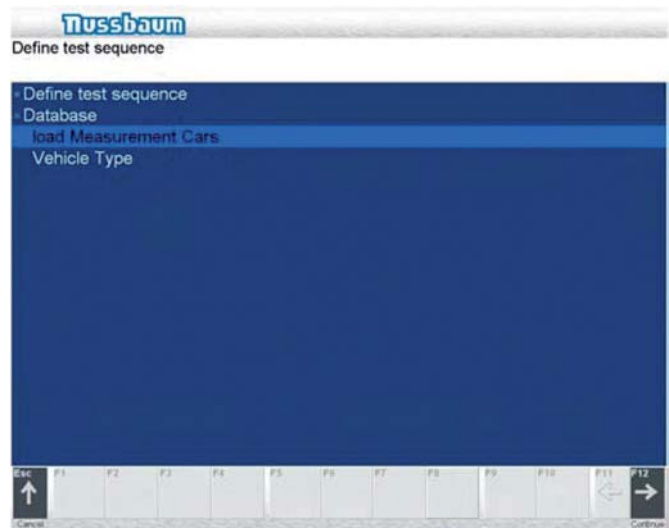
Mark the test sequence that you want to delete. Press F4 to delete the chosen test sequence. Use F12 to return to test begin from any menu.

7.2 Select entrance to test sequence

There are three possible ways to enter the test sequence which can be defined in the program titled Administration.

After switching on the test lane and with successful initialisation of the hard ware a start screen will appear. Select key F8 (Administration).

A password request follows: Enter the password „Nussbaum“ and confirm with key F4 (Yes). The administration program will now appear on the screen.



058

Double click on the heading Define test sequence and choose either Truck or Car. Confirm with F12.

Mark the desired start position in the test sequence and confirm F3. Press F12 to return to the start position and confirm with F13. Choose a Car F2 or a Truck F3 start the test.

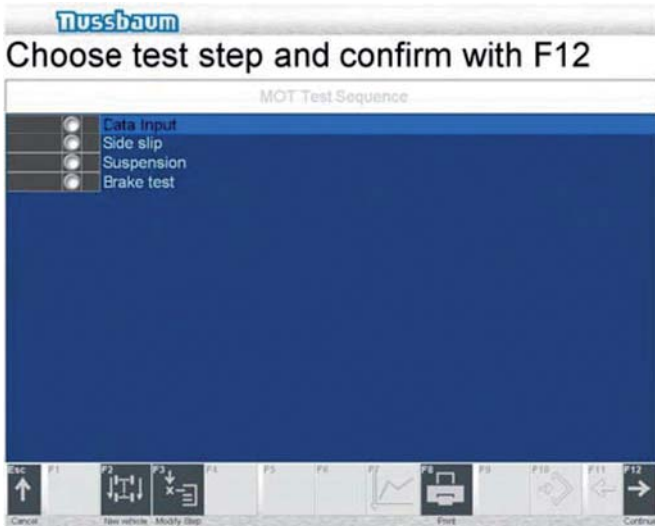
7.2.1 Test sequence Car (respective Truck)

This entry to the test sequence enables you to configure any of the test procedures. Note: If a standard test sequence already exists, it will be skipped over!

For the following two options, the desired test sequence should already be defined as Basic settings. (See define test sequence as Basic settings).

7.2.2 Basic settings test procedures

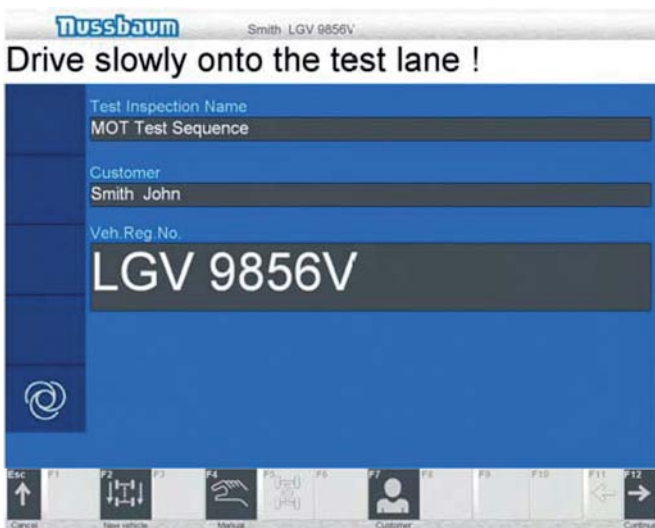
When choosing "Basic setting test procedures", the defined test steps will appear. Clicking on the individual test procedure will determine which test step the test will be started with. Press F12 to return to the first test step.



059

7.2.3 Measurement Basic setting

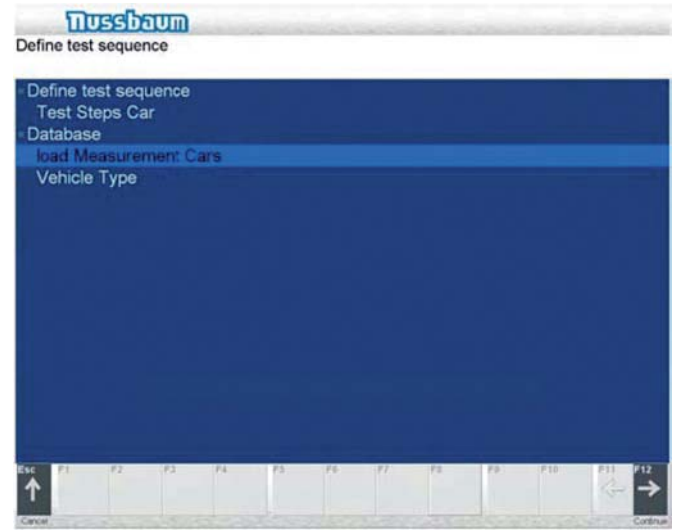
After the first screen, the instruction „Drive slowly onto the test lane“ appears. The basic defined test sequence runs automatically.



060

7.3 Recalling saved data

Double click the title Recall save data. Click on the data and confirm with F12.



061

It is possible to search by vehicle registration number or date.



062

Mark the desired data and confirm your choice with F12.

8 Country and customer specific sequences

8.1 Country specific sequence

8.1.1 UK MOT

Brake test, front axle

The following procedure pertains to the current UK MOT testing procedures. When this test equipment is used for testing vehicles brakes other than for MOT purposes, a different suitable testing procedure should be used.

Ensure that no persons are in the vicinity of the test stand. There is a risk of fatal injury to anyone near the test rollers.



Note the accident prevent regulations!
Switch off the master switch in the event of danger!

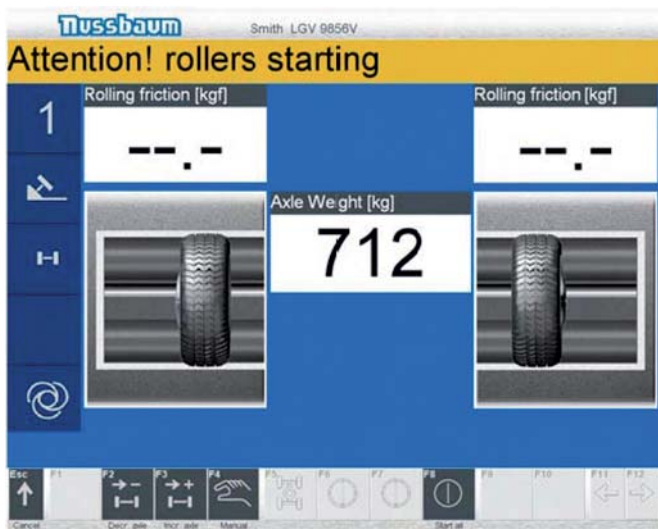
A brake test consists of several test steps or measurements. Instructions on the screen guide you through the individual test steps.

The braking forces for the left and right-hand wheel are displayed in kgf while the difference between left and right is displayed in % as a value.

Driving onto the test stand

Move the vehicle so that the front wheels are on the rollers of the brake test stand.

As soon as an axle drives onto the rollers of the brake test stand, the display switches to the brake test. The rollers start to run and after rolling resistance has been completed, brake measurement of the vehicle can commence. This will all be shown by on screen instructions.



063

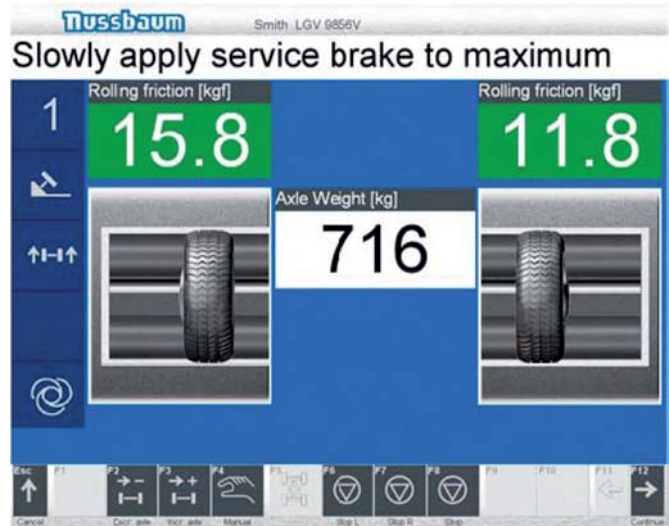
Rolling resistance, front axle

Do not brake!

- This test step enables the condition of the brake to be assessed to ensure that the wheel is running freely or the brake pad is not stuck. Test time approx.2 s.

Max. braking force (braking to limit), front axle

- Slowly brake until the maximum braking force is reached.



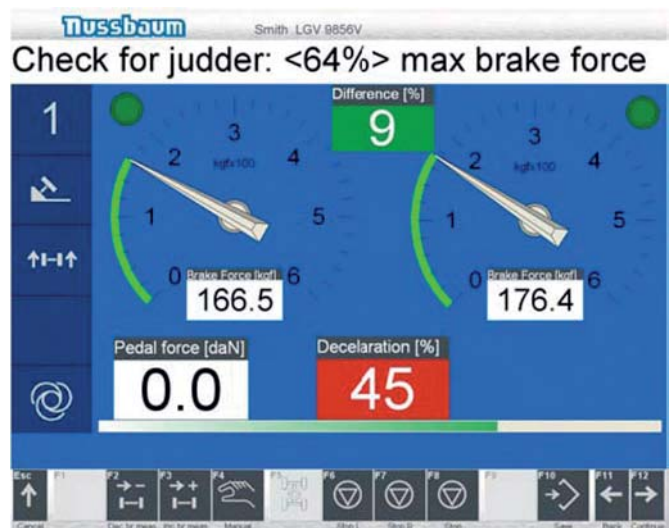
064

After the slip limit cut of has been achieved or 5 seconds has elapsed, decrease the force on the brake pedal.

The rollers will start again to enable the brake force imbalance to be calculated. Slowly brake a second time to 75% of braking force checking for judder, rate of increase/decrease and binding.

Instructions on the screen will inform the user to decrease braking force when the rollers will stop the instructions will inform the user to drive out of the rollers.

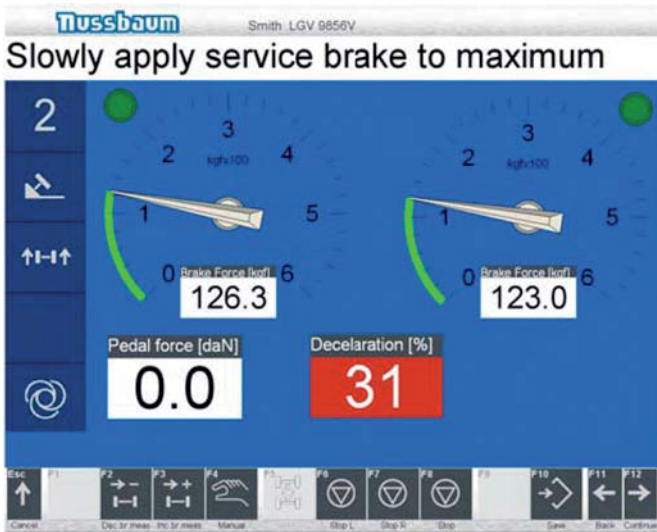
Follow the instructions to move out of the rollers.



065

UK MOT brake test rear axle

The rear axle test is identical to that of the front axle. The rollers will automatically start up again after slip limit is reached or 5 seconds time elapsed in order to test the handbrake.



066

UK MOT brake test of parking brake (handbrake)

The handbrake test is provided both for the front axle and rear axle.

If the handbrake is to be used in conjunction with the front axle it will not appear on the rear axle and visa versa.

With the handbrake, slowly brake to the max. handbrake force or up to the slip cut off. Test time 5 seconds.



067

Ending the UK MOT testing procedure

Once all measurements have been completed, drive the vehicle out of the rollers engage the handbrake and go to the control unit.

Selecting the next page of the test which will show the operator a selection of manual entry boxes with questions pertaining to the action of braking on the front and rear axles.

These questions should be judged by the operator and manually entered with pass or fail by the operator and if all boxes have not been filled in and saved using the active save button the program will not end. After the manual input and saved button has been pressed, select the escape button to return to the main page.

UK MOT Testing Procedure for Motorcycles

Testers are requested to apply and conform to the latest VOSA MOT regulations when testing motorcycles

It is important to fit the respective class IV or Class VII cover plate onto the selected test roller before the test starts.

The second unused roller should be covered with a cover plate at all times during the testing procedure.

The tester shall not place any part of his foot or leg into the rollers while testing. Special footrests either side of the plate are to be used to rest the feet.

The On/Off switch to the right side of the control cabinet is also a safety stop for the rollers.

The brake test should always be done in manual mode.

Application:

Switch the motorcycle switch to roller 1 or 2 for the desired testing roller. (Found on the right side of the cabinet) Drive the motorcycle into the roller with the first axle: Weight is automatically calculated.

Start the roller by pressing F6 (left side) or F7 (right side) rolling resistance is measured bike is lined up straight in the rollers Brake to full braking on the front axle and check for judder and bind. Note: If the braking force is not able to lock the rollers upon full braking, they can be stopped manually using the F8 button on the remote control Start the roller again using the remote control F6 (left side) or F7 (right side) and drive out the front wheel.

Rear wheel:

Drive the motorcycle onto the rear wheel in the roller and repeat the test as for the front wheel.

Note: If the braking force is not able to lock the rollers upon full braking, they can be stopped manually using the F8 button on the remote control.

The complete braking force together with the vehicle weight can be read either on the screen or on the protocol printout at the end of the test. There is no assessment given on the results page as this will have to be calculated by the tester.

8.2 Customer specific sequence

8.2.1 Mercedes-Benz

How to test:

Normally the test is conducted in automatic mode. If a vehicle is situated in the roller set in manual mode, then the test can be started in manual mode.

Pit safety :

If a pit safety device is installed (special accessory) and somebody is in the danger area of the pit, then this will be signalled by a white lamp and the modes manual and automatic will immediately stop running.

If the danger area is then vacated, the former chosen mode becomes activated again. If a vehicle is in the rollers at this time, due to safety reasons, the unit will not start in automatic mode but will switch to manual mode instead.

Emergency stop switch:

If the emergency stop switch is activated and then the unit is switched back on again, the mode will return to the former selection. If a vehicle is in the rollers at this time, out of safety reasons, the mode will return only to manual mode.

9 Error Messages

If an error occurs on the test stand or if an impermissible operating mode is set, an error message appears at the indicator instruments of the large measuring range and the indicator lights flash.

The indicators move to a certain position from which a diagnosis may be derived using the error list. To show the error code, both gauges are used.

Example:

Left indicator gauge 1.0 kN (10 graduations) - Right indicator gauge 1.5 kN (15 graduations) -> The error message reads 10 15.

On a scale with two measuring ranges, the smaller range applies, e.g. BT 6xx 0-8kN.

If an LCD display (option) is installed, the error code is additionally shown there.

Error messages marked with "*" can be cancelled by the customer using the "STOP" key (52) in order to continue the test sequence.

General Errors

Error code 00 05 *

During the zero balance adjustment, the left or right sensor roller limit switch was closed.

Cause:

- Vehicle in roller set during zero balance adjustment
- Connecting line between inductive sensor and switch-box defective.
- Inductive sensor defective.

Error code 00 10 *

Test stand is set to CW/CCW rotation mode and the speed switch is set to 5 km/h.

Cause:

This operating mode is only permissible for 2.5 km/h as it is an uncontrolled CW/CCW operation which must not be used for passenger cars (5 km/h).

Error code 00 11 *

During the self-test, 1 hardware component could not be initialized on CPU PCB A1.

Cause:

- Printed circuit board A1 defective.

Error code 00 15 *

N/A

Error code 00 20 *

If the brake force for a passenger car > 150 N and for a truck > 750 N increases within the last 2 seconds before reaching the measuring range end value, the braking process was too fast and the measurement is invalid.

Error code 00 21 *

Checksum Error.

- flashing not completed or interrupted
- EP0 flash device broken

Error code 00 22

When switching on the system, an error on the EEPROM was detected.

Cause:

- After replacing the printed circuit board, the EEPROM does not contain any valid values.

Remedy:

- Confirm error with "C"
- In the configuration menu step 59, accept and save basic values.

Error code 00 23 *

Error when reading out the EPROM.

Cause:

- No EPROM present.
- EEPROM defective.
- Printed circuit board A1 defective.

Error code 00 24 *

Error when reading out the EPROM.

Cause:

- No EPROM present.
- EEPROM defective.
- Printed circuit board A1 defective.

Error code 00 25 *

Operator error at the remote control. An incorrect value was entered.

Error code 00 27 *

Timeout when writing the EPROM.

Cause:

- No EPROM present.
- EEPROM defective.
- Printed circuit board A1 defective.

Error code 00 29

System error.

Error code 00 30 *

The measuring value exceeded a max. permissible measuring value in the measuring range „passenger car“. If this value is exceeded, the roller set is deactivated for safety reasons.

Cause:

- Inspection of a truck in the passenger car mode.

Error code 01 01 *

Weight varies by more than 3%.

Error code 05 00 *

Start-up locking protection or no turning signal from sensor rollers when activating the motors.

Cause:

- Vehicle brake not released.
- Inductive sensor defective.
- Printed circuit board A1 defective.

Error code 05 30 *

When switching on the test stand, the left/right sensor roller limit switch was closed.

Cause:

- Vehicle in roller set when switching on.

Error code 10 05

The key "STOP" (52) was pressed during activation of the test stand.

Error code 10 15 *

When switching on, the printer that has been entered into the configuration menu is not recognized.

Cause:

- Printer incorrectly configured.
- Defective printer cable.
- Printer not available.
- Printer defective.

Error weighing system**Error code 10 30 ***

No signal weighing system left-hand side.

Cause:

- Weighing system has been activated in the configuration menu, but does not exist physically.
- Wire breakage of the sensor line
- Weighing system defective (unlikely, since weighing system on the left-hand side consists of 4 sensors = composite signal).

Error code 10 31 *

When switching on, no cal-check-function of the weighing system on the left-hand side.

Cause:

- Sensor line defective.
- Cal-check-line interrupted (wire breakage).

Error code 10 32 *

Weighing system left-hand side has not been calibrated.

Error code 10 35 *

When switching on, comparison of zero point weighing system left-hand side from EEPROM with actual weight. If the difference is too high, the error is displayed.

Cause:

- Weighing system not calibrated.
- Vehicle is on or in left-hand roller set.

Error code 10 40 *

No signal weighing sensor right-hand side.

Cause:

- Weighing system has been activated in the configuration menu, but does not exist physically.
- Wire breakage of the sensor line.
- Weighing system right-hand side defective (unlikely, since weighing system on the right-hand side consists of 4 sensors = composite signal).

Error code 10 41 *

When switching on, no cal-check-function of the weighing system on the right-hand side.

Cause:

- Sensor line defective.
- Cal-check-line interrupted (wire breakage).

Error code 10 42 *

Weighing system right-hand side has not been calibrated.

Error code 10 45 *

When switching on, comparison of zero point weighing system right-hand side from EEPROM with actual weight. If the difference is too high, the error is displayed.

Cause:

- Weighing system not calibrated.
- Vehicle is on or in right-hand roller set.

Error code 10 50 * (for France)

When switching on, comparison of zero point weighing system from EEPROM with actual weight. If the difference is too high (>+/-50daN), the error is displayed.

Cause:

- Weighing system not calibrated.
- Vehicle is on or in right-hand roller set.

Error code 10 51 * (for France)

When switching on, comparison of zero point weighing system from EEPROM with actual weight. If the difference is too high (>+/-100daN), the error is displayed.

Cause:

- Weighing system not calibrated.
- Vehicle is on or in right-hand roller set.

Error code 10 52 * (for France PC Vversion)

After switching on the current value of zero balance is compared to the prior 14 days.

A critical difference (>+/- 100daN) will cause the error.

Cause:

- Not calibrated scale
- Vehicle is on or at right roller set

Error inductive sensor**Error code 11 00 ***

No signal sensor rollers speed left-hand side.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Inductive sensor defective.
- Sensor line defective.
- Distance between inductive sensor and sensor roller > 3 mm.

Error code 11 05

No signal sensor rollers limit switch left-hand side.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Inductive sensor defective.
- Sensor line defective.
- Distance between inductive sensor and switching lug > 3 mm.

Error code 11 10 *

No signal sensor rollers speed right-hand side.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Inductive sensor defective.
- Sensor line defective.
- Distance between inductive sensor and sensor roller > 3 mm.

Error code 11 15

No signal sensor rollers limit switch right-hand side.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Inductive sensor defective.
- Sensor line defective.
- Distance between inductive sensor and switching lug > 3 mm.

Error code 11 40

No signal speed sensor drive roller left-hand side.

Cause:

- Cable break.

Error code 11 45

No signal speed sensor drive roller right-hand side.

Cause:

- Cable break.

Error code 11 60

The start-up locking protection for the roller sets has been triggered 3 x in sequence.

Cause:

- Vehicle stands in roller set with the brake blocked or tightened.
- Defect at the sensor roller inductive sensor: Inspect switching distance and wiring.

Error pedal force measuring gauge**Error code 11 20 ***

No signal pedal force measuring gauge (cable version).

Cause:

- Pedal force measuring gauge cable version has been activated in the configuration menu, but does not exist physically.
- Connecting line defective.
- Sensor defective.

Error code 11 22 *

Pedal force measuring gauge (cable version) not yet calibrated.

Error code 11 25 *

When switching on, comparison of zero point pedal force measuring gauge (cable version) from EEPROM with actual pedal force. In case of a difference > 20 N, the error is displayed.

Cause:

- Pedal force measuring gauge cable version has been activated in the configuration menu, but does not exist physically.
- Pedal force measuring gauge not calibrated.
- Pedal force measuring gauge is loaded when switching on.

Error radio sensors**Error code 14 10 ***

No connection to radio base station PCB A8.

Cause:

- Radio module has been activated in the configuration menu, but does not exist physically.
- Incorrect DIP switch setting on PCB A2 S1
- PCB A8 defective.

Error code 14 20 *

No signal pressure sensor Pm (radio version) during the measurement.

Cause:

- Pressure sensor Pm (radio version) has been activated in the configuration menu, but does not exist physically.
- Pressure sensor defective.
- Accumulator discharged.

Error code 14 30 *

No signal pressure sensor Pz (radio version) during the measurement.

Cause:

- Pressure sensor Pz (radio version) has been activated in the configuration menu, but does not exist physically.
- Pressure sensor defective.
- Accumulator discharged.

Error code 14 40 *

No signal from pedal force measuring gauge (radio version) during the measurement.

Cause:

- Pressure sensor Pm (radio version) has been activated in the configuration menu, but does not exist physically.
- Pedal force measuring gauge defective.
- Accumulator discharged.

Error pressure sensors cable version

Error code 15 01 *

When switching on, comparison of zero point pressure sensor Pm (cable version) from EEPROM with actual pressure. In case of a difference > 0.15 bar, the error is displayed.

Cause:

- Pressure sensor Pm (cable version) has been activated in the configuration menu, but does not exist physically.
- Pressure sensor Pm (cable version) not calibrated.
- Pressure sensor Pm (cable version) is loaded when switching on.

Error code 15 02 *

No signal pressure sensor Pm (cable version).

Cause:

- Pressure sensor Pm (cable version) has been activated in the configuration menu, but does not exist physically.
- Pressure sensor defective.
- Sensor line defective.

Error code 15 03 *

Pressure sensor Pm (cable version) not yet calibrated.

Error code 15 06 *

When switching on, zero point pressure sensor Pz (cable version) from EEPROM compares to current pressure. In case of a difference > 0.15 bar, the error is displayed.

Cause:

- Pressure sensor Pz (cable version) has been activated in the configuration menu, but does not exist physically.
- Pressure sensor Pz (cable version) not calibrated.
- Pressure sensor Pz (cable version) is loaded when switching on.

Error code 15 07 *

No signal pressure sensor Pz (cable version).

Cause:

- Pressure sensor Pz (cable version) has been activated in the configuration menu, but does not exist physically.
- Pressure sensor defective.
- Sensor line defective.

Error code 15 08 *

Pressure sensor Pz (cable version) not yet calibrated.

Error wheel tester

Error code 17 00 *

No signal from wheel tester potentiometer.

Cause:

- Wheel tester set has been activated in the configuration menu, but does not exist physically.
- Sensor line defective.
- Potentiometer defective.

Error code 17 02 *

Wheel tester not calibrated.

Error code 17 05 *

Measuring board of the wheel tester outside of the zero position. The measuring board does not return to the home position (stored zero position) after the axle has been measured.

Cause:

- Measuring board of the wheel tester has not yet been calibrated.
- Springs in the measuring board defective.
- Measuring board has been keyed mechanically.

Error code 17 10 *

No signal from wheel tester limit switch.

Cause:

- Wheel tester set has been activated in the configuration menu, but does not exist physically.
- Sensor line defective.
- Limit switch defective.

Error wheel suspension tester

Error code 18 00

No signal wheel suspension tester left-hand side.

Cause:

- Wheel suspension tester set has been activated in the configuration menu, but does not exist physically.
- Wheel suspension tester left-hand side defective.
- Sensor line defective.

Error code 18 01 *

When switching on, no cal-check-function of the wheel suspension tester on the left-hand side.

Cause:

- Wheel suspension tester set has been activated in the configuration menu, but does not exist physically.
- Sensor line defective.
- Cal-check-line interrupted (wire breakage).

Error code 18 02 *

Wheel suspension tester left-hand side has not yet been calibrated.

Error code 18 05 *

When switching on, comparison of zero point wheel suspension tester left-hand side from EEPROM with actual force. In case of a difference > 500 N, the error is displayed.

Cause:

- Wheel suspension tester left-hand side defective.
- Wheel suspension tester sensor has not been calibrated.
- When switching on, a vehicle or an object is located on the measuring board.

Error code 18 10

No signal wheel suspension tester right-hand side.

Cause:

- Wheel suspension tester set has been activated in the configuration menu, but does not exist physically.
- Wheel suspension tester right-hand side defective.
- Sensor line defective.

Error code 18 11 *

When switching on, no cal-check-function of the wheel suspension tester on the right-hand side.

Cause:

- Wheel suspension tester set has been activated in the configuration menu, but does not exist physically.
- Sensor line defective.
- Cal-check-line interrupted (wire breakage).

Error code 18 12 *

Wheel suspension tester right-hand side has not been calibrated.

Error code 18 15 *

When switching on, comparison of zero point wheel suspension tester right-hand side from EEPROM with actual force. In case of a difference > 500 N, the error is displayed.

Cause:

- Wheel suspension tester right-hand side defective.
- Wheel suspension tester sensor has not been calibrated.
- When switching on, a vehicle or an object is located on the measuring board.

Error code 18 20 *

One or two wheel weights to be inspected > 1000kg. In order to avoid a defect, the measurement is not started.

Error code 18 30 *

One or two wheels to be inspected were rolled out of the center of the measuring board during the measurement.

Error on the PCB**Error code 19 00**

Power supply 12V DC for sensors not available

Cause:

- Printed circuit board A1 defective.
- Short-circuit on a sensor line.

Error code 19 10

Reference voltage VREF not available on PCB A1. This voltage is necessary for the correct functioning of the AD converter.

Cause:

- Printed circuit board A1 defective.

Error code 19 20

24 V AC for contactor control not available.

Cause:

- Printed circuit board A1 defective.
- Fusible cut-out F2 defective.
- Transformer T1 defective.
- Pit safety defice is connected, but interrupted and un-configured

Error code 19 30 *

No CAN-bus communication possible underneath the PCBs.

Cause:

- A PCB is defective.
- CAN terminating resistors not available.
- CAN line defective.

Error code 19 40 *

Coin cell (battery) on PCB A1 not available or discharged.

Error code 19 50 *

No conflict with PC.

Cause:

- PC switched off.
- PC not connected.
- Serial cable defective.
- Serial port defective.
- Access to PC serial port by other program.
- Serial port head card defective.

Operator error**Error code 20 20 ***

A sensor roller limit switch has been pressed exclusively for more than 5 sec.

Cause:

- Vehicle stands in roller set only on one side
- The opposite sensor roller limit switch is defective.

Error code 20 25

The set-up key EINRICHTEN >0< was pressed when switching on the test stand.

Error code 20 30

Lifting/lowering threshold does not move up.

Cause:

- Lifting/lowering threshold has been activated in the configuration menu, but does not exist physically.
- No air supply to lifting/lowering threshold.
- Lifting/lowering threshold not connected.
- Lifting/lowering threshold is defective.
- One or several sensors defective.
- Pneumatic valve defective.
- Pneumatic supply defective.

Error code 20 35

Lifting/lowering threshold does not move down.

Cause:

- Lifting/lowering threshold has been activated in the configuration menu, but does not exist physically.
- No air supply to lifting/lowering threshold.
- Lifting/lowering threshold not connected.
- Lifting/lowering threshold is defective.
- One or several sensors defective.
- Pneumatic valve defective.
- Pneumatic supply defective.

Error code 20 40

Overheating protection of the left engine

Cause:

- left motor is overheated
- Thermal protection is defective
- Engine has mechanical fault

Error code 20 45

Overheating protection of the right engine

Cause:

- right motor is overheated
- Thermal protection is defective
- Engine has mechanical fault

Error brake force sensor**Error code 25 00 ***

No signal brake force sensor left-hand side.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Brake force sensor left-hand side defective.
- Sensor line defective.

Error code 25 01 *

When switching on, cal-check-function of the brake force sensor on the left-hand side does not function.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Sensor line defective.
- Cal-check-line interrupted (wire breakage).

Error code 25 02 *

Brake force sensor left-hand side has not been calibrated.

Error code 25 05 *

When switching on, comparison of zero point brake force sensor left-hand side from EEPROM with actual brake force. If the difference is too high, the error is displayed.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Brake force sensor left-hand side has not been calibrated.
- Brake force sensor left-hand side is loaded when switching on.

Error code 25 10 *

No signal brake force sensor right-hand side.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Brake force sensor right-hand side defective.
- Sensor line defective.

Error code 25 11 *

When switching on, cal-check-function of the brake force sensor on the right-hand side does not function.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Sensor line defective.
- Cal-check-line interrupted (wire breakage).

Error code 25 12 *

Brake force sensor right-hand side has not been calibrated.

Error code 25 15 *

When switching on, comparison of zero point brake force sensor right-hand side from EEPROM with actual brake force. If the difference is too high, the error is displayed.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Brake force sensor right-hand side has not been calibrated.
- Brake force sensor right-hand side is loaded when switching on.

Error code 25 50 * (for France)

When switching on, comparison of zero point brake force sensor from EEPROM with actual brake force. If the difference is too high (>+/-25daN), the error is displayed.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Brake force sensor right-hand side has not been calibrated.
- Brake force sensor right-hand side is loaded when switching on.

Error code 25 51 * (for France)

When switching on, comparison of zero point brake force sensor from EEPROM with actual brake force. If the difference is too high (>+/-50daN), the error is displayed.

Cause:

- Roller set has been activated in the configuration menu, but does not exist physically.
- Brake force sensor right-hand side has not been calibrated.
- Brake force sensor right-hand side is loaded when switching on.

Error code 20 52 * (for France PC Vversion)

After switching on the current zero point brake force sensor is compared to the prior 14 days.

A critical difference ($> \pm 50 \text{ daN}$) will cause the error.

Cause:

- Roller set is enabled in the configuration menu, but not physically available.
- Not calibrated brake force sensor
- Braking force sensor is loaded during the power right.

Error exhaust gas analyzer (for PC version)**Error code 70 01 ***

Error for exhaust gas analyzer No. 1

Error code 70 02 *

Error for exhaust gas analyzer No. 2

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