

## MBT LON

Roller Brake Tester

## Original Operating Instructions

BA022301-en

MBT 2200 LON  
MBT 2400 LON 4WD  
MBT 3200 LON  
MBT 3400 LON 4WD  
MBT 4200 LON COMPETENCE/CLASSIC  
MBT 4400 LON 4WD  
MBT 5200 LON W COMPETENCE/CLASSIC  
MBT 6200 LON W CLASSIC  
MBT 7200 LON W COMPETENCE/CLASSIC  
MBT 7400 LON 4WD

## Contents

1	Safety .....	5
1.1	Introduction .....	5
1.2	Symbols .....	5
1.3	Intended Use.....	5
1.4	Inappropriate Use.....	5
1.5	Requirements on Operating and Service Personnel.....	5
1.6	Safety Instructions for Installation and Initial Operation .....	6
1.7	Safety Instructions for Operation .....	6
1.8	Danger Zone .....	7
1.9	Safety Instructions for Servicing.....	7
1.10	Safety Features .....	8
1.11	Accessories.....	9
1.12	What to Do in the Event of an Accident .....	9
2	Description.....	10
2.1	General Information .....	10
2.2	Noise Emission.....	10
2.3	Specifications .....	11
3	Transport and Storage .....	18
4	Installation and Initial Operation .....	18
5	Operation.....	18
5.1	Main Switch.....	18
5.2	Analog Displays.....	19
5.3	Remote Control .....	24
5.4	Menu Structure .....	27
5.5	Car Brake Tester with MAH-DOT and IFB .....	30
5.6	Car Brake Tester with MAH-DOT and RECO 1.....	31
5.7	Truck Brake Tester with MAH-DOT and FFB.....	33
5.8	Truck Brake Tester with MAH-DOT and RECO 1 .....	35
5.9	Option Drive Control.....	36
5.10	Noise Detection with IFB / FFB / RECO 1 .....	38
5.11	MSD 3000.....	40
5.12	Clock Changing between Daylight Saving Time/Standard Time.....	42
5.13	Test Procedure with Software .....	43
6	Maintenance .....	46
6.1	Annual Inspection.....	46
6.2	Care Instructions .....	46
6.3	Spare Parts .....	46
6.4	Chain Drive Maintenance: Cleaning, Retensioning, Lubricating.....	47
6.5	Greasing the Sensor Roller Hinges .....	51

6.6 Troubleshooting ..... 52

7 Dismantling .....55

8 Disposal.....55

9 Contents of the Declaration of Conformity .....56

10 Company Information.....57



---

# 1 Safety

## 1.1 Introduction

Thoroughly read this manual before operating the equipment and comply with the instructions. Always display the manual in a conspicuous location.

Personal injury and property damage incurred due to non-compliance with these safety instructions are not covered by the product liability regulations.

## 1.2 Symbols

---



Important safety instructions. Failure to comply with instructions could result in personal injury or property damage.

---



Important information.

---

## 1.3 Intended Use

This equipment is to be used exclusively for the brake testing of motor vehicles. Observe the rated axle load.

The equipment shall not be modified without the express written consent of the manufacturer. In case of non-compliance the declaration of conformity becomes void.

## 1.4 Inappropriate Use

Any use other than described is inappropriate.

## 1.5 Requirements on Operating and Service Personnel

All persons employed in the operation, maintenance, installation, removal and disposal of the device must

- be at least 18 years old,
- be trained and instructed in writing,
- have read and understood this manual
- be on record as having been instructed in safety guidelines.

## 1.6 Safety Instructions for Installation and Initial Operation

- The system shall only be commissioned by MAHA service technicians or authorized service partners.
- All parts of the electrical equipment must be protected from moisture and wetness.
- The system shall not be installed and operated in hazardous locations or wash halls.
- The operator must provide for optional safeguards (e.g. warn lamps, barriers, etc.) depending on local conditions.
- Wear safety shoes and gloves.
- Safeguard roller set with suitable means (e.g. cordon chains or strap).
- The display must be installed in a secure area and folded into the wall when not in use (wall hinges optionally available).
- When folding the display, grasp it on the edges. Danger of pinching!
- Ensure that a lockable emergency-stop main switch is installed based on installation instructions before connecting the feed line. Use motor protection switch and cable cross sections as per specification. Reference in circuit diagram (standard delivery), nameplate. Fuse max. X.X A (see nameplate).
- The main switch must be provided by the customer and installed on-site. It must be positioned in direct vicinity to the tester and takes over the emergency-stop function.

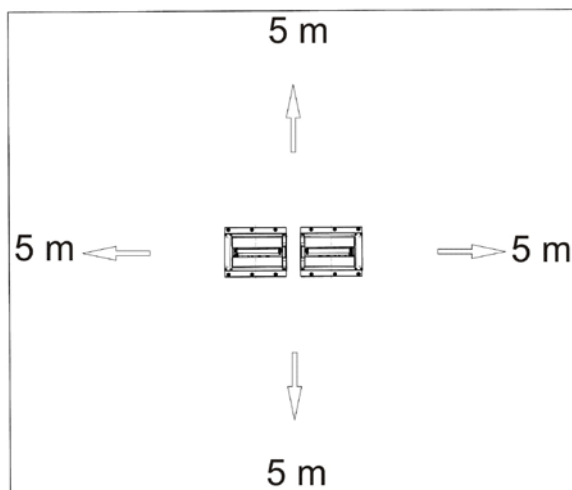
## 1.7 Safety Instructions for Operation

- The system shall only be operated within its performance limits.
- The system shall only be operated by trained personnel.
- The system and surrounding area must be kept clean.
- Switch off the system when not in use and secure the main switch against restart with a padlock.
- In emergency situations switch off system with main switch or emergency-stop switch.
- No persons shall be in the danger zone of the system. Rotating or moving parts (e.g. test stand rollers) are dangerous.
- Danger of carbon monoxide poisoning with running vehicle engine in closed rooms. The operator is responsible for providing sufficient air exchange.
- Avoid unnecessary strain on vehicle and tester.
- Drive the vehicle slowly on to the tester.
- Check the danger zone before driving the vehicle onto the tester.

- When the vehicle with the driven axle is on the roller set, exit only with running roller drive. Exiting with roller drive at standstill can destroy the motors due to extreme roller acceleration.
- The system shall not be operated without functioning slip monitoring. This can cause tire damage.
- Never jump start a vehicle with the system. This can lead to equipment damage.
- No 4 wheel-drive vehicles shall be tested on the standard roller set. Damage to vehicle and system are possible. When in doubt contact your responsible service representative.
- The vehicle must be closed during testing. If persons outside of the vehicle are endangered, use noise protection.
- The operator shall not leave the vehicle during testing.
- No vehicle shall be parked in/on the roller set or on the optional ramps.

## 1.8 Danger Zone

During brake tester operation no persons are allowed in the danger zone: **5 (five) meters** around the roller set in all directions.



## 1.9 Safety Instructions for Servicing

- Service work shall only be done by MAHA service technicians or authorized service partners.
- Work on electric parts of the system shall only be done by trained electricians.
- The main switch must be switched off and secured against restart before doing repair, maintenance and set-up work.
- Fire danger due to rubber abrasion on the roller set. Clean regularly. Remove abrasion before maintenance work.

- The main switch must be secured and if necessary the motor protection switch turned off when doing work in the roller set.
- When working on the control cabinet or on the roller sets pay attention to the heating (optional) or hot parts.
- Immediately turn off the tester when it starts up unintentionally. Contact the service department.

## 1.10 Safety Features

The safety features (partly optional) are to be inspected regularly by an authorized service technician. Official guidelines must be followed at all times. *The equipment shall not be operated when the safety features are defective!*

- **Lockable Main Switch**

Serves as normal On and Off switch for the equipment and as emergency switch. The switch can be padlocked to protect it against unauthorized usage.

- **Emergency Switch**

Is used for quick switch-off during operation. Interrupts the power supply to the equipment.

- **Startup Monitoring**

Prevents the rollers from starting up in case the wheels are blocked (seized bearings, jammed brake pads). This feature helps prevent the vehicle tyres from being damaged.

- **Sensor Rollers**

The RPM difference between equipment rollers and sensor rollers determines the slip. Both sensor rollers must be pushed down in order to start the roller brake tester.

- **Visual and Audible Warning Devices**

These must be positioned at a suitable location and must be easily seen or heard at all times. In the event that the warning devices are defective, the brake tester must be shut down until they are fully functional again.

- **Pit Safety**

Light barrier or infrared movement sensor. If any person enters the safety area, the brake tester is switched off.

- **Yellow-Black Marking Tape**

The yellow-black marking tape around roller set and pit serves to mark out the brake tester and must be replaced if defective. Part # 19 6014 (Ø 38 mm) / 19 6015 (Ø 50 mm).

- **Warning and Information Labels**

Warning and information labels are attached to the equipment. These must not be changed or removed and must be replaced if unreadable (see below for part numbers).





54 2132



54 2683

## 1.11 Accessories

The equipment shall be operated only with accessories which have been approved or permitted by MAHA.

## 1.12 What to Do in the Event of an Accident

- The injured person is to be removed from the danger area. Find out where dressing and bandages are kept. Seek first-aid.
- Provide first-aid (stop bleeding, immobilise injured limbs), report the accident and seal off the accident site.
- Immediately report any accident to your supervisor. Make sure a record is kept of every occasion first-aid is provided, e.g. in an accident book.
- Remain calm and answer any questions that may arise.

## 2 Description

### 2.1 General Information

This brake tester belongs to the group of roller brake testers. This class includes two different measuring methods to record brake forces:

- the testing of drive torque or
- the testing of drive power.

The former is applied in this brake tester. It consists of a proven roller set and an open-ended electronic system based on a processor board with an integral operating system.

The standard brake tester can be expanded to a complete test lane.

### 2.2 Noise Emission

The noise emission during a vehicle test results mainly from the vehicle's engine. The noise emission varies from vehicle to vehicle and cannot be attributed to the testing equipment.

#### **Roller Brake Tester**

The noise emission value created by the brake tester (roller drive) is less than 70 dB(A) in the work area of the operator.

#### **Shock Tester**

The noise emission value created by the shock tester (oscillating test plates) is between 75 and 80 dB(A) in the work area of the operator.

#### **Side-Slip Tester**

The noise emission value created by the side-slip tester is less than 70 dB(A) in the work area of the operator.

## 2.3 Specifications

### MBT 1000 EUROSYSTEM

Version	MCD 1000	MCD 2000	MCD 2000 PC
Absicherung (träge)	25 A		
Antriebsleistung	3 kW		
Messwertanzeige max.	2500 N		
Messwertanzeige min.	0 N		
Netzfrequenz	50 Hz		
Netzspannung	400 V		
Ovalität	in kN		
Phasen	3		
Prüfgeschwindigkeit	5 km/h		
Radlast (überfahrbar)	2000 kg		
Rollenachsabstand	400 mm		
Rollendurchmesser	202 mm		
Rollenlänge	730 mm		
Rollensatz Breite	680 mm		
Rollensatz Höhe	280 mm		
Rollensatz Länge	1420 mm		

## MBT 2000

Version	MBT 2100	MBT 2200 LON	MBT 2250 EUROSYS- TEM MCD 1000	MBT 2250 EUROSYS- TEM MCD 2000	MBT 2250 EUROSYS- TEM MCD 2000, PC	MBT 2450 EUROSYS- TEM ALLRAD MCD 2000	MBT 2450 EUROSYS- TEM ALLRAD MCD 2000, PC
Absicherung (träge)	25 A						
Analoganzeige Durchmes- ser	350 mm	-	-	-	-	-	-
Antriebsleistung der Moto- ren	3,0 kW						
Anzeigekasten Breite	840 mm	-	-	-	-	-	-
Anzeigekasten Höhe	470 mm	-	-	-	-	-	-
Anzeigekasten Tiefe	100 mm	-	-	-	-	-	-
Laufrollendurchmesser	202 mm						
Messwertanzeige	0 – 6 kN	0 – 8 kN					
Netzfrequenz max.	60 Hz	50 Hz					
Netzfrequenz min.	50 Hz	-	-	-	-	-	-
Netzspannung	400 V						
Phasen	3						
Prüfgeschwindigkeit	5 km/h						
Rollenachsabstand	400 mm						
Rollensatz Breite	680 mm	-	-	-	-	-	-
Rollensatz Höhe	280 mm	-	-	-	-	-	-
Rollensatz Länge	2320 mm	-	-	-	-	-	-
Spur max.	2200 mm						
Spur min.	780 mm						
Zul. Achslast (überfahrbar)	3000 kg	3500 kg					

## MBT 3000

Version	MBT 3200 LON	MBT 3250 EUROSYS- TEM MCD 1000	MBT 3250 EUROSYS- TEM MCD 2000	MBT 3250 EUROSYS- TEM MCD 2000, PC	MBT 3400 LON ALLRAD	MBT 3450 EUROSYS- TEM ALLRAD MCD 1000	MBT 3450 EUROSYS- TEM ALLRAD MCD 2000	MBT 3450 EUROSYS- TEM ALLRAD MCD 2000, PC
Absicherung (träge)	35 A							
Antriebsleistung der Mo- toren	5,5 kW							
Messwertanzeige	0-8 kN / 0-16 kN							
Netzfrequenz	-	50 Hz	-	50 Hz	-			
Netzfrequenz max.	60 Hz	-	60 Hz					
Netzfrequenz min.	50 Hz	-	50 Hz					
Netzspannung	400 V							
Phasen	3							
Prüfgeschwindigkeit	5 km/h							
Rollenachsabstand	400 mm							
Rollendurchmesser	202 mm							
Rollensatz Breite	680 mm							
Rollensatz Höhe	280 mm							
Rollensatz Länge	2925 mm							
Spur max.	2800 mm	-	2800 mm					
Spur min.	870 mm	-	870 mm					
Zulässige Achslast (über- fahrbar)	8000 kg							

## MBT 4000

Version	MBT 4200 LON CLASSIC	MBT 4200 LON W CLASSIC	MBT 4200 LON W COMPE- TENCE	MBT 4250 EUROSYS- TEM MCD 2000	MBT 4250 EUROSYS- TEM MCD 2000 PC	MBT 4450 EUROSYS- TEM ALLRAD, MCD 2000
Absicherung (träge)	50 A					
Antriebsleistung der Mo- toren	9 kW					
Netzfrequenz	50 Hz					
Netzspannung	400 V					
Phasen	3					
Prüfgeschwindigkeit	2,3 km/h					
Rollenachsabstand	430 mm					
Rollendurchmesser	202 mm					
Rollensatz Länge	1000 mm					
Zulässige Achslast (über- fahrbar)	13000 kg					

## MBT 5000

Version	MBT 5200 LON CLASSIC	MBT 5200 LON W COMPE- TENCE	MBT 5250 EUROSYS- TEM MCD 2000	MBT 5250 EUROSYS- TEM MCD 2000 PC
Absicherung (träge)	63 A			
Antriebsleistung der Mo- toren	11 kW			
Gewicht pro Rollensatz	800 kg			
Netzfrequenz	50 Hz			
Netzspannung	400 V			
Phasen	3			
Prüfgeschwindigkeit	2 km/h			
Rollenachsabstand	450 mm			
Rollendurchmesser	130 mm			
Rollenlänge	1220 mm			
Rollensatz Breite	1171 mm			
Rollensatz Höhe	460 mm			
Rollensatz Länge	2042 mm			
Zulässige Achslast (über- fahrbar)	18000 kg			

## MBT 6000

Version	MBT 6200 LON W CLASSIC	MBT 6250 EUROSYS- TEM MCD 2000	MBT 6250 EUROSYS- TEM MCD 2000 PC
Absicherung (träge)	63 A		
Antriebsleistung der Mo- toren	11 kW		
Netzfrequenz	50 Hz		
Netzspannung	400 V		
Phasen	3		
Prüfbarer Raddurchmes- ser max.	2200 mm		
Prüfbarer Raddurchmes- ser min.	800 mm		
Prüfgeschwindigkeit	3 km/h		
Rollenachsabstand	685 mm		
Rollendurchmesser	265 mm		
Rollenlänge	1600 mm		
Spurbreite max.	3600 mm		
Spurbreite min.	400 mm		
Zulässige Achslast (über- fahrbar)	18000 kg		



## MBT 7000

Version	MBT 7200 LON CLASSIC	MBT 7200 LON W CLASSIC	MBT 7200 LON W COMPE- TENCE	MBT 7250 EUROSYS- TEM MCD 2000	MBT 7250 EUROSYS- TEM MCD 2000, PC	MBT 7450 EUROSYS- TEM ALLRAD, MCD 2000
Absicherung (träge)	63 A					
Antriebsleistung der Motoren	11 kW					
Netzfrequenz	50 Hz					
Netzspannung	400 V					
Phasen	3					
Prüfgeschwindigkeit	3 km/h					
Rollenachsabstand	475 mm					
Rollendurchmesser	265 mm					
Rollenlänge	1150 mm					
Zulässige Achslast (überfahrbar)	18000 kg					

### 3 Transport and Storage

Check package to ensure it is complete, in accordance with the order confirmation. Report any transport damage to the carrier immediately.

During loading, unloading and transport always use suitable lifting equipment, material handling equipment (e.g. cranes, forklifts, etc.) and the right load handling attachments and slings. Always ensure that the parts to be transported are suspended or loaded properly so that they cannot fall, taking into account size, weight and the centre of gravity.

Store the packages in a covered area, protected from direct sunlight, at a low humidity and with temperatures between 0...+40 °C (32...104 °F). Do not stack packages.

When unpacking, take care to avoid any possibility of injury or damage. Keep at a safe distance when opening the package strapping, do not allow any parts to fall out.

### 4 Installation and Initial Operation

Installation and initial operation of the equipment may be done only by authorized and trained service technicians provided by the manufacturer, licensed dealers or service partners.

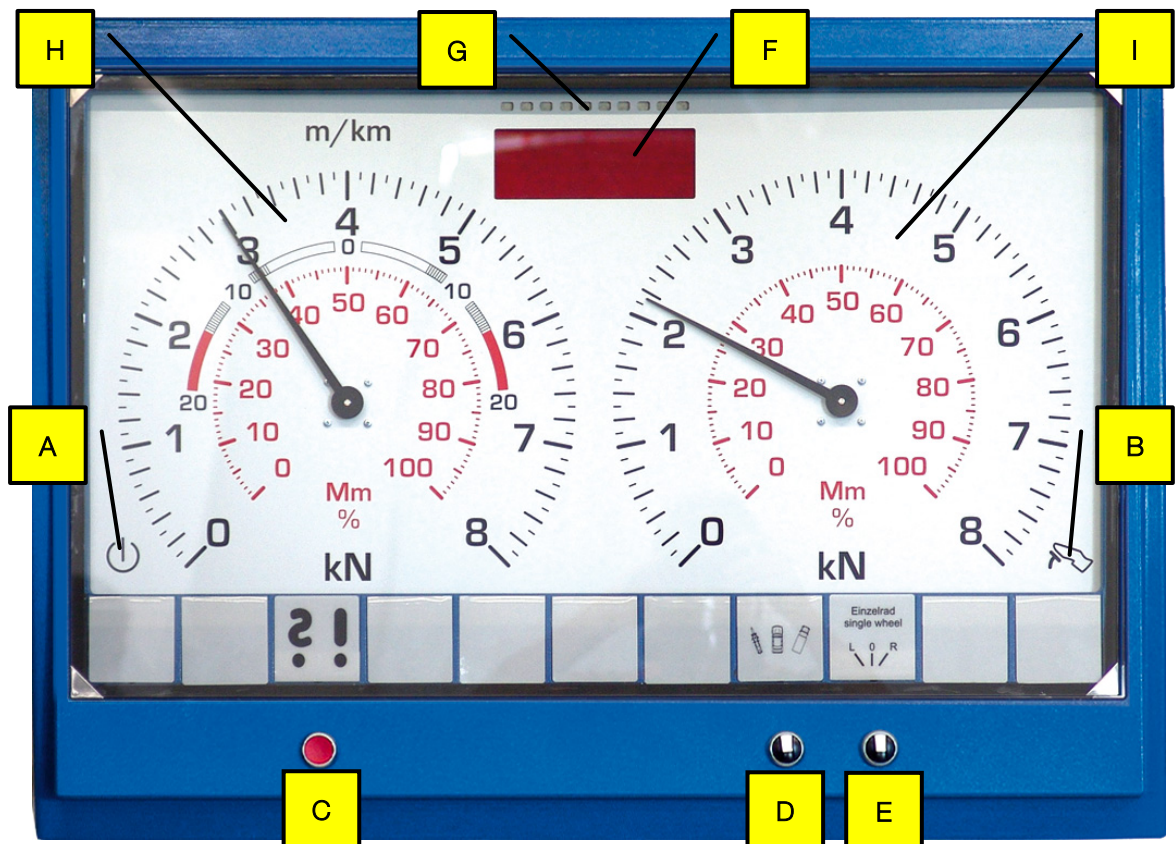
### 5 Operation

#### 5.1 Main Switch

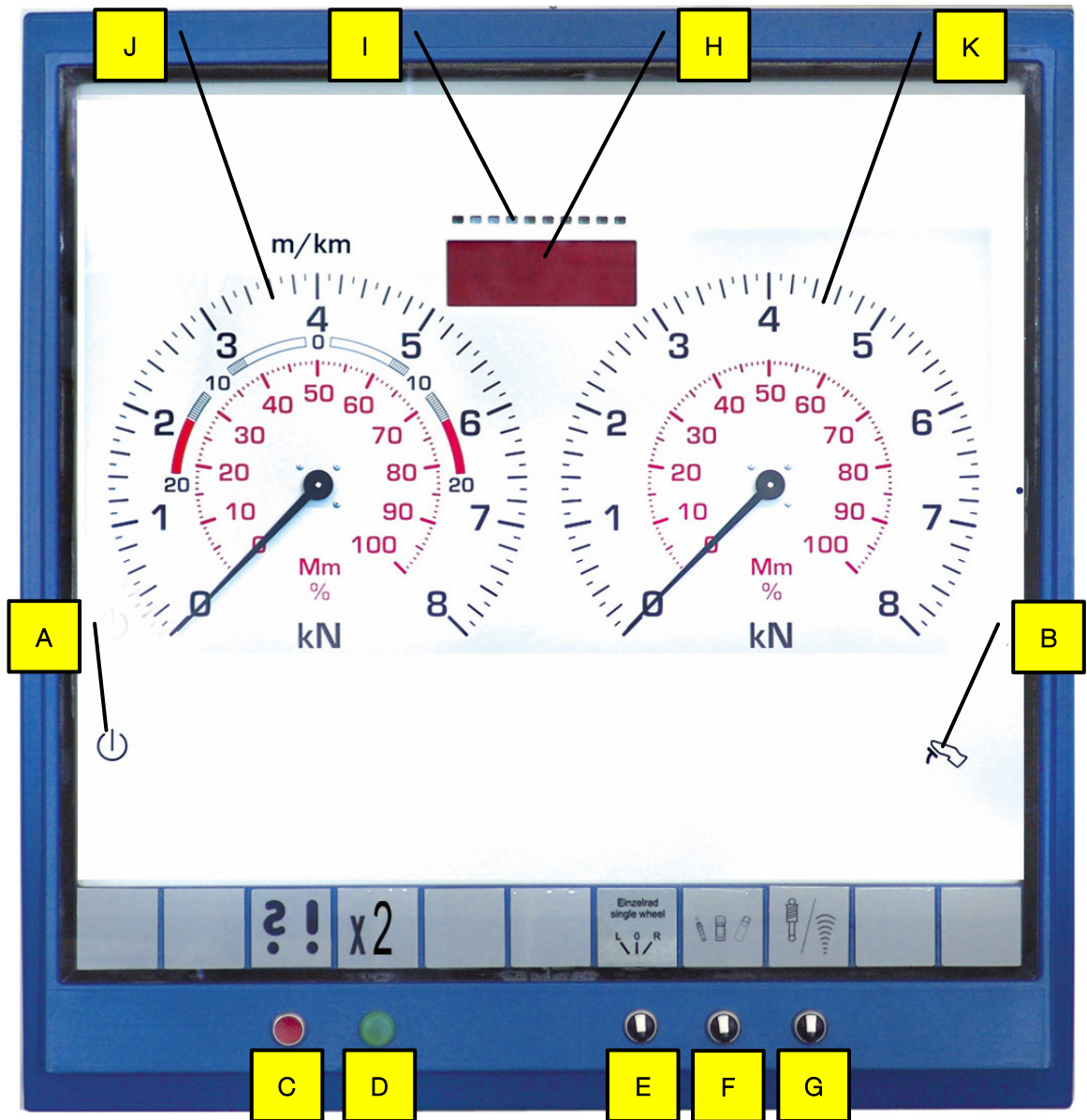
- Main switch in position 0: Power supply OFF
- Main switch in position 1: Power supply ON
- When in position 0, the main switch can be protected against tampering by means of a padlock.



## 5.2 Analog Displays

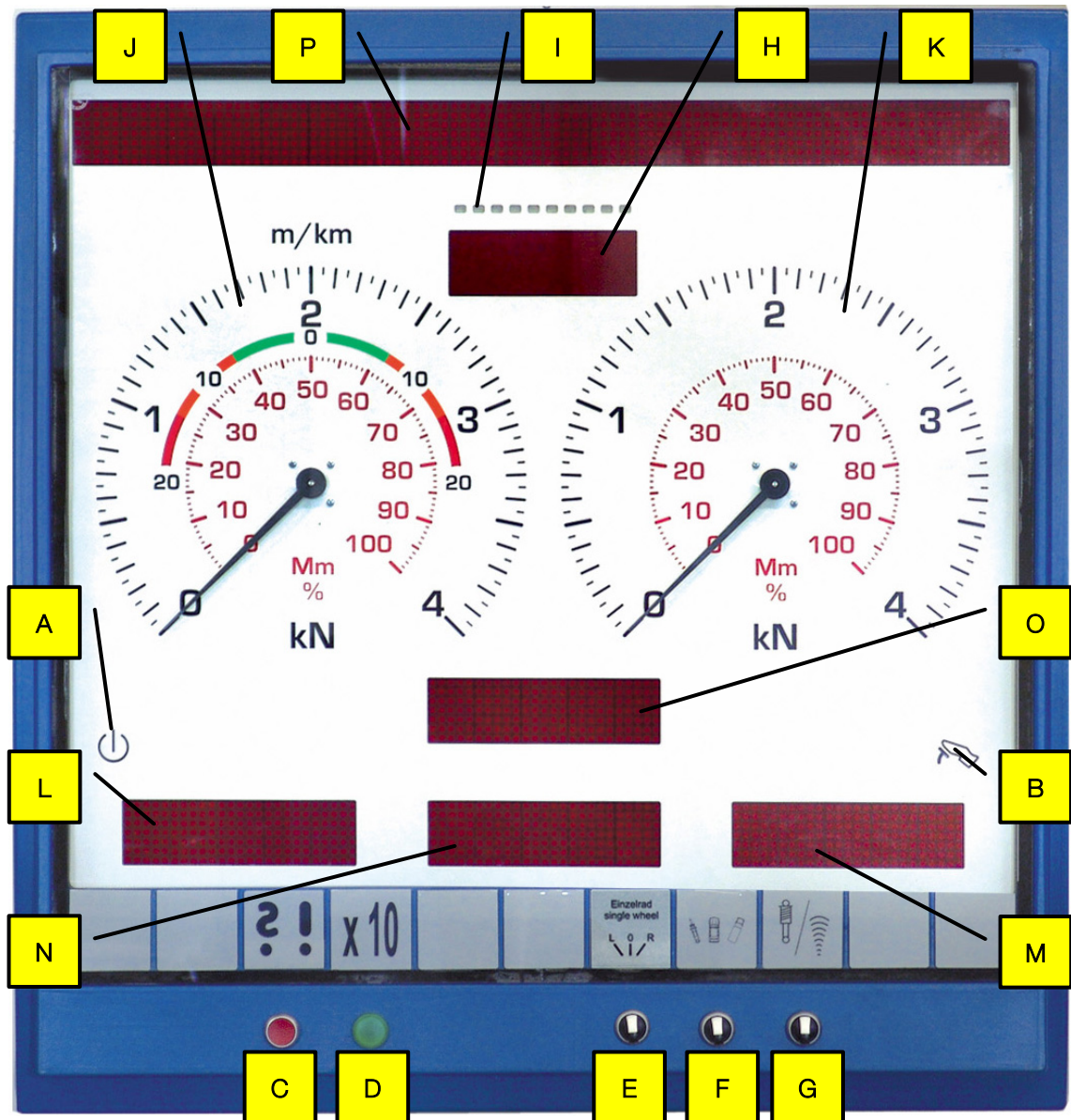


A	Indicator: Power On	F	Dig. display: Brake force diff.
B	Indicator: Ready to test	G	LED display: Difference %
C	Indicator: Error	H	Analog display, left
D	Selector switch: Motorcycle/Car/Truck	I	Analog display, right
E	Selector switch: Single wheel (option)		

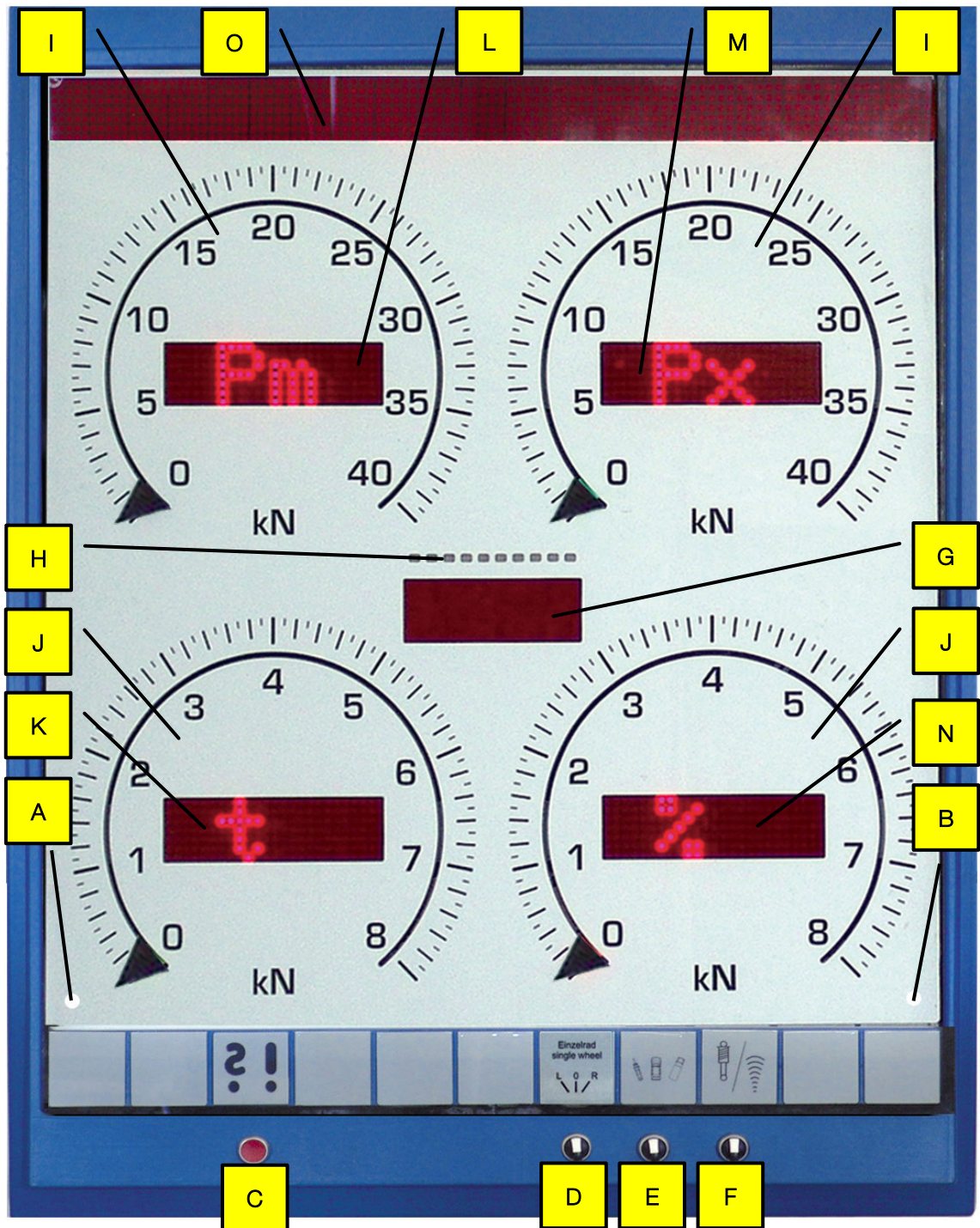


A	Signal lamp: Power On	G	Selector switch: Shock absorber Mm/%
B	Signal lamp: Ready for test	H	Dig. display: Brake force diff.
C	Signal lamp + Acknowledge button: Error	I	LED display: Difference %
D	Signal lamp: Factor 2	J	Analog display, left
E	Selector switch: Single wheel	K	Analog display, right
F	Selector switch: Motorcycle/Car/Truck		





A	Signal lamp: Power On	I	LED display: Difference %
B	Signal lamp: Ready for test	J	Analog display, left
C	Signal lamp + Acknowl. button: Error	K	Analog display, right
D	Signal lamp: Factor 10	L	Digital display: Weight
E	Selector switch: Single wheel	M	Dig. display: Brake press. Pm
F	Selector switch: Mot.cycle/Car/Truck	N	Dig. display: Brake pressure Px
G	Selector switch: Shock abs. Mm/%	O	Digital display: Deceleration
H	Digital display: Brake force diff.	P	Ticker

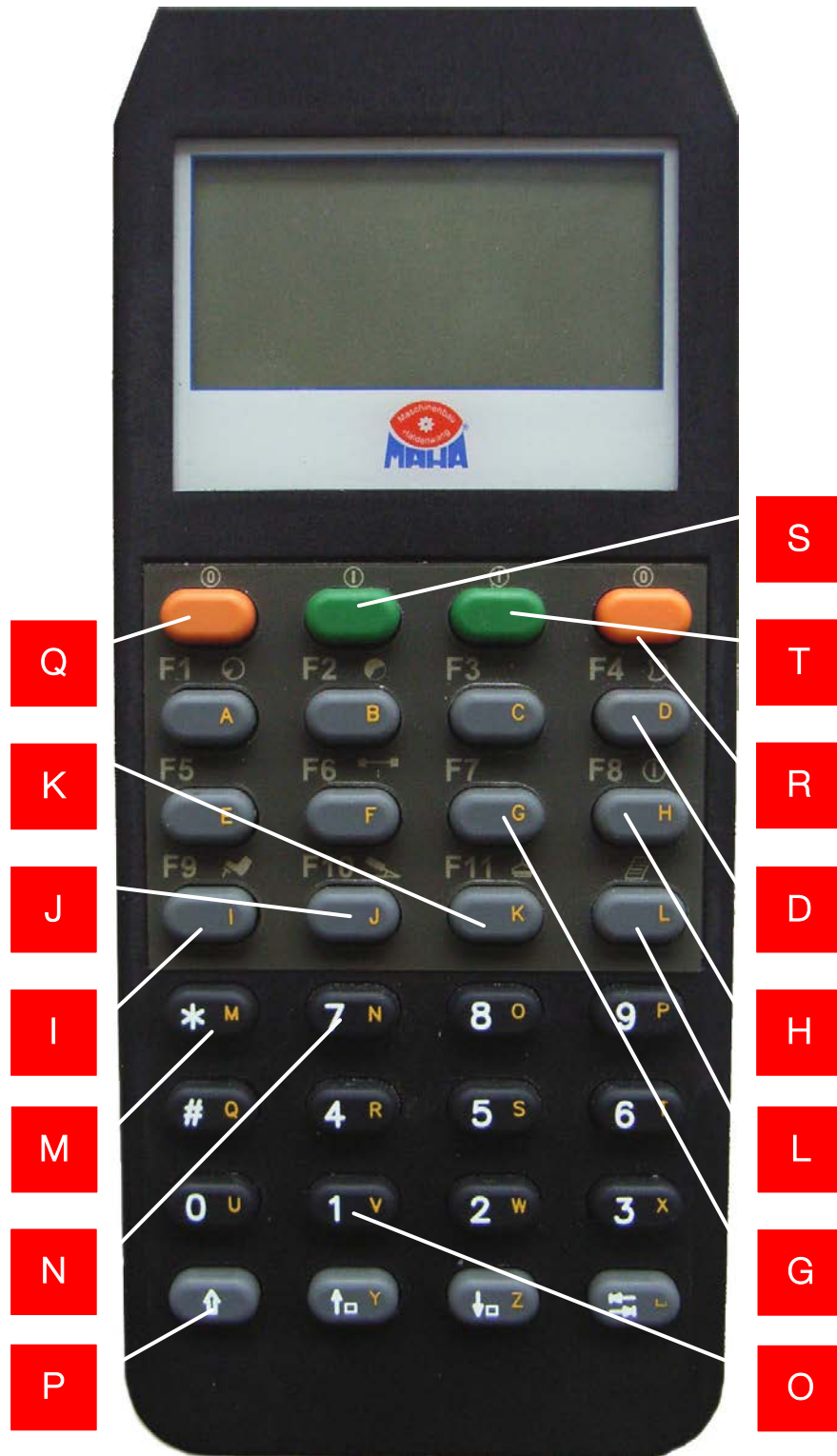


A	Signal lamp: Power On	I	Analog display, 0...40 kN
B	Signal lamp: Ready for test	J	Analog display, 0...8 kN
C	Signal lamp + Acknowl. button: Error	K	Digital display: Weight
D	Selector switch: Single wheel	L	Dig. display: Brake pressure Pm
E	Selector switch: Mot.cycle/Car/Truck	M	Dig. display: Brake pressure Px
F	Selector switch: Shock abs. Mm/%	N	Digital display: Deceleration
G	Digital display: Brake force diff.	O	Ticker
H	LED display: Difference %		



5.3 Remote Control

→ IFB / FFB

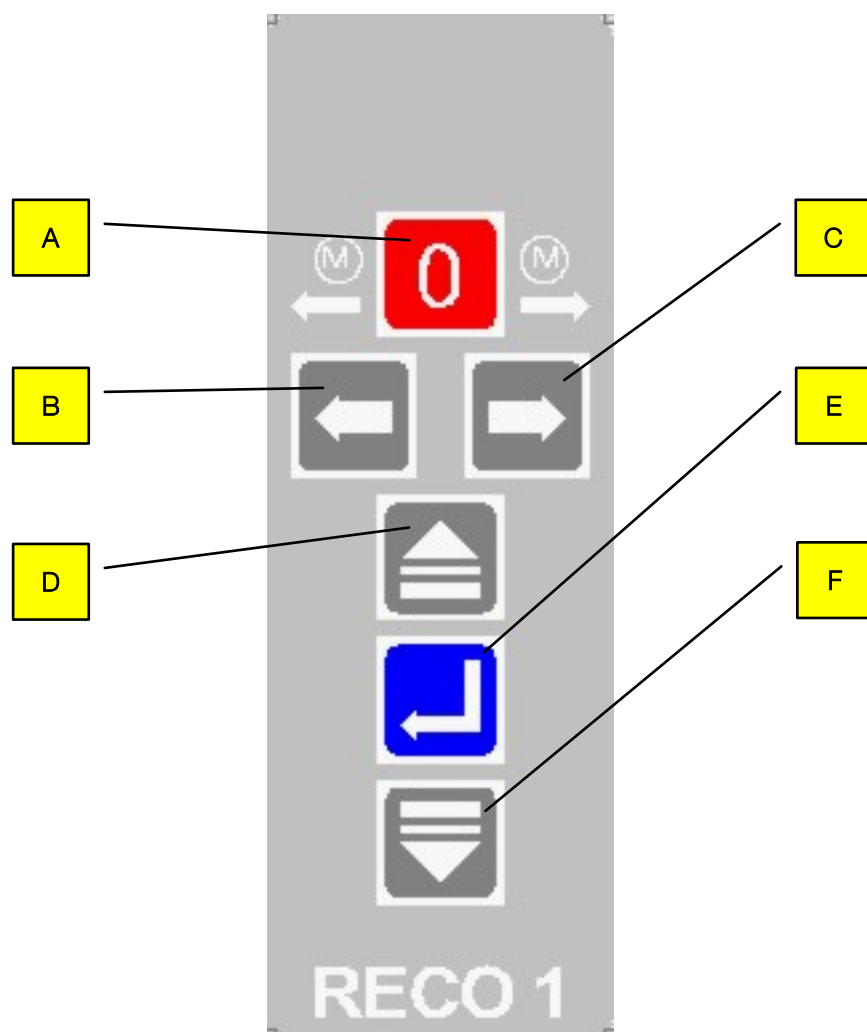




---

	Key	Function
D	F4	Start Ovality test
H	F8	Pointer stop
I	F9	Store Front axle
J	F10	Store Parking brake Re-display MSD measurement value
K	F11	Store Rear axle
L	F12	Auto OFF
G	F7	Start Print menu
M	*	Confirm
N	#	Select Sensor Quit Noise detection
O	Program 1 key	
P	Shift key	
Q	Motor Off left	
R	Motor On right	
S	Motor On left	

→ RECO 1

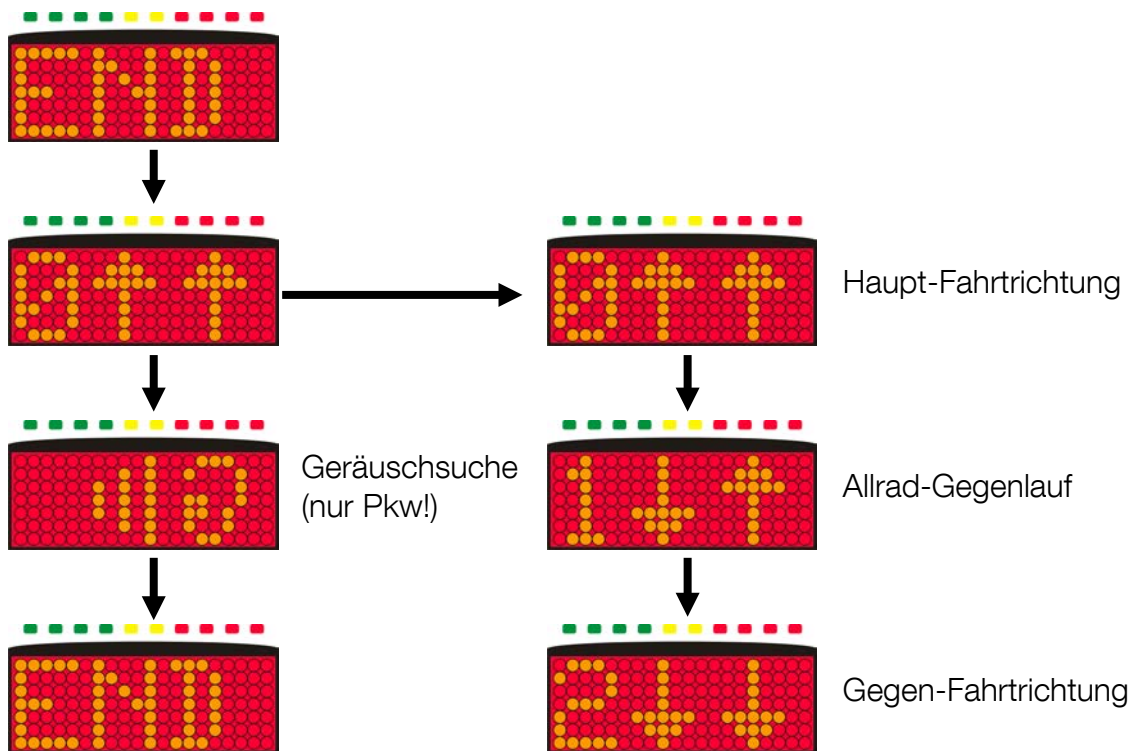
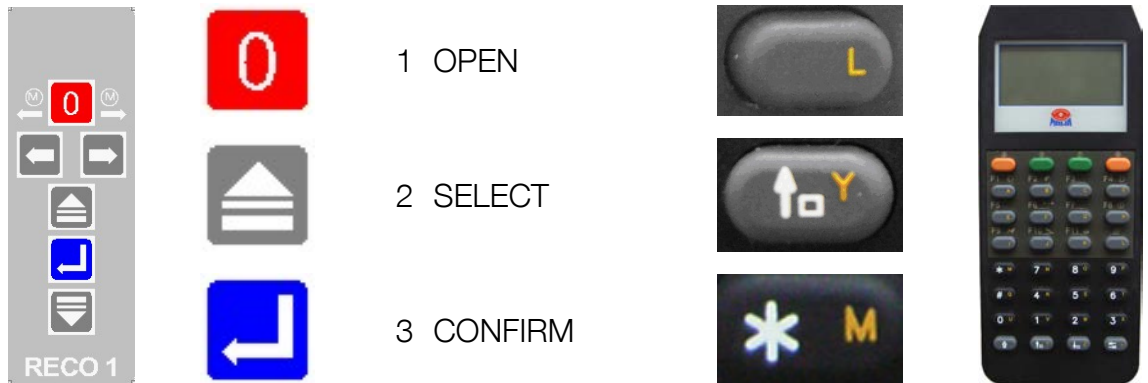


A	Motors Off
B	Start Motor left
C	Start Motor right / Start Ovality test
D	Menu item upwards
E	Confirm
F	Menu item downwards

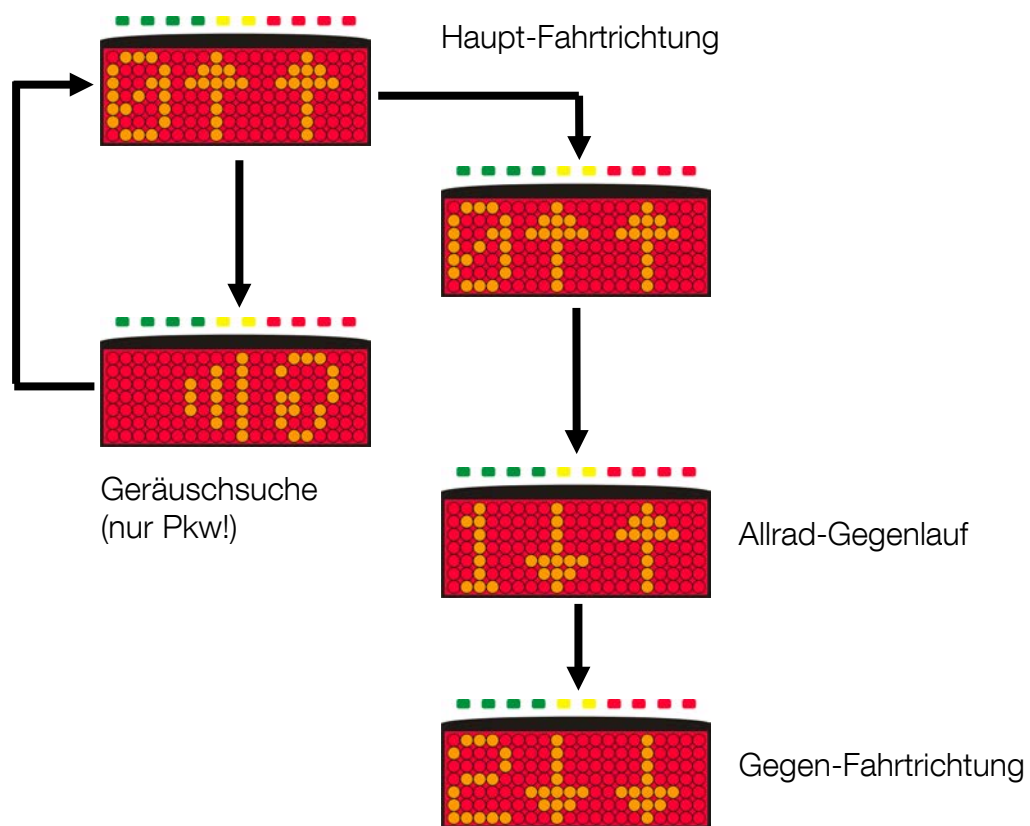
5.4 Menu Structure



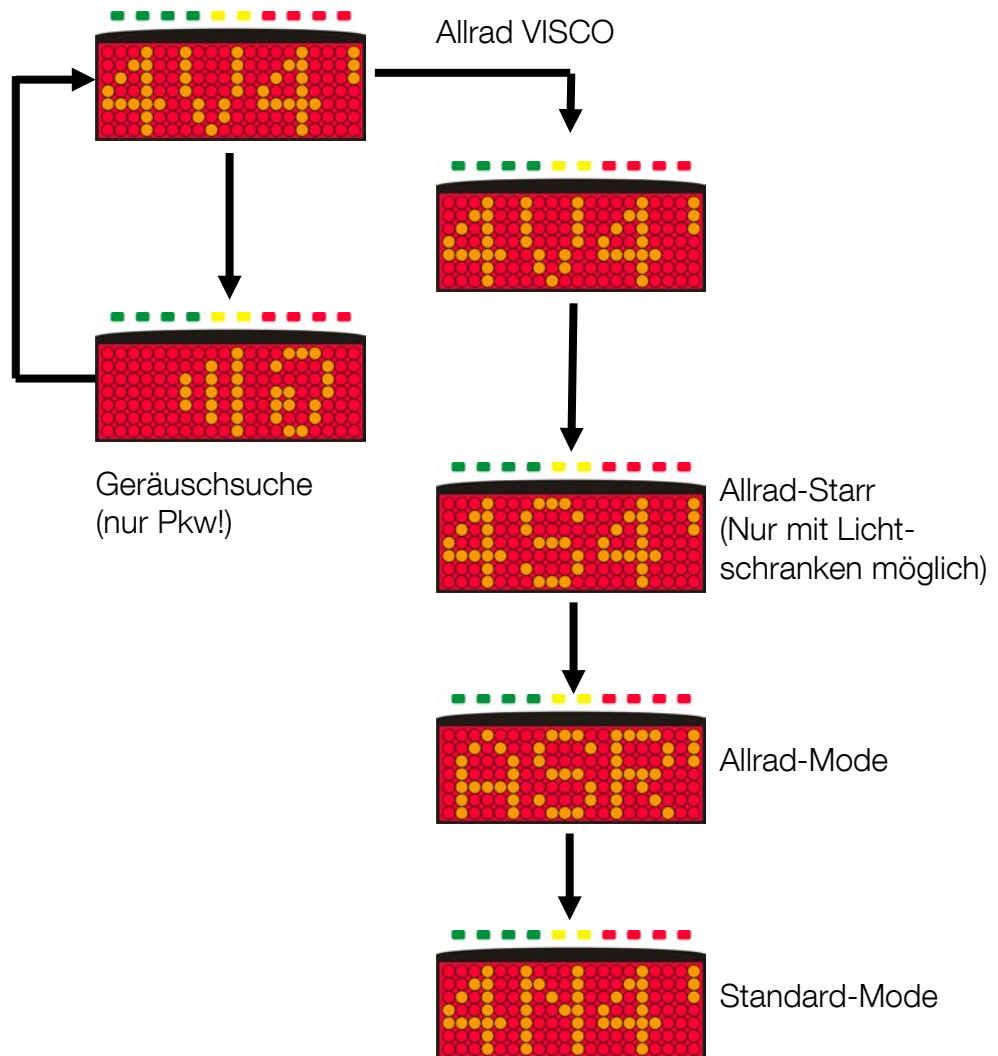
Menü-Aufruf nur außerhalb Rollensatz möglich!



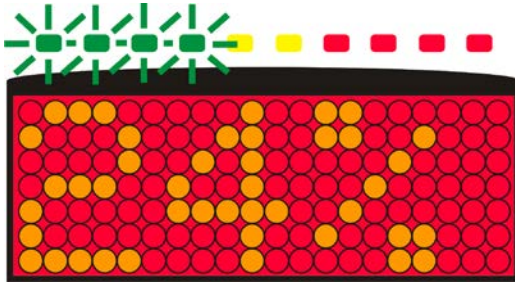
► IWST 380 R120 or higher



► IWST 380 R120 4WD or higher



## 5.5 Car Brake Tester with MAH-DOT and IFB



- 1 Drive onto roller set.
  - 2 Press star key (M) for pointer stop.
  - 3 Brake until slip or max. brake force.
  - 4 Storage with keys F9 to F11.
    - Front axle: F9 (I)
    - Parking brake: F10 (J)
    - Rear axle: F11 (K)
  - 5 After testing, an auto OFF must be done. F12 (L) (not required with PC program LON BASIC).
  - 6 Use F7 (G) to start the print menu.
  - 7 Enter the number of the print program, 1 or 2 and confirm with star (M) (not required with PC program LON BASIC).
    - An ovality measurement can be started with F4 (D).
    - Re-display of the measurement values with F9 to F11.
    - Re-display of the side-slip tester with Shift + Axle number + key F9 (I).
    - Re-display of the shock absorber with Shift + Axle number + key F10 (J).
    - Differential display of the brake force is numerical and via the LED bar.
- New vehicle (NEW) with pound key (N) and star (M). (Delete all test values).



If there is a side-slip tester, shock absorber tester or both, it is necessary after the Auto OFF procedure to set up a new vehicle (NEW). If not, then the measurement values from the previous vehicle are still active.

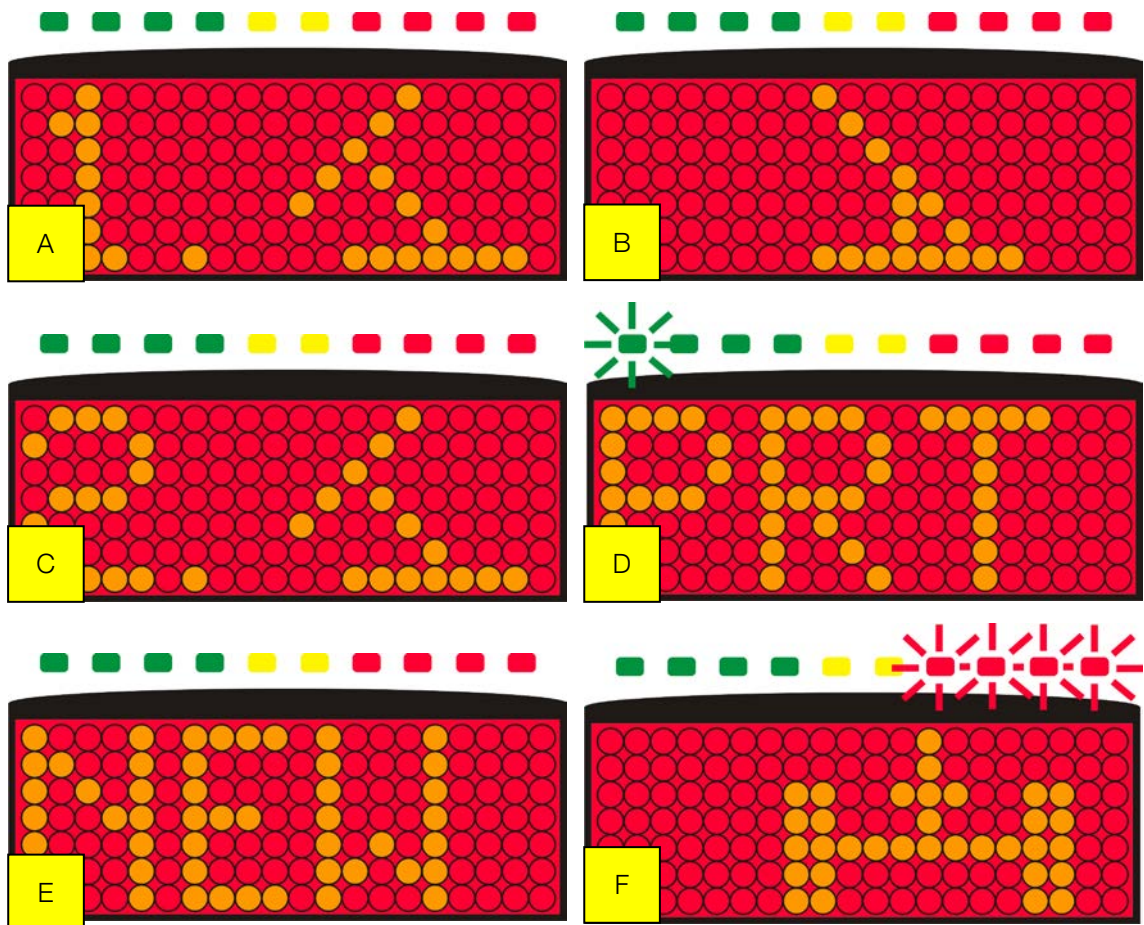
### Brake Tester without Weighing Machine

With brake testers w/o weighing machine the vehicle weight must be entered after the Auto OFF. The axle symbol changes constantly with the weight unit.

The weight entry is done directly via the numerical keypad of the remote control and is confirmed with the star key (\*). The left analog display runs synchronously with the weight entry. Example: Entry of 1580 kilogram total weight.

Enter **1 5 8 0** on the keypad and confirm with the star (\*) key.

## 5.6 Car Brake Tester with MAH-DOT and RECO 1



- 1 Drive onto roller set.
  - 2 Press blue Return key for pointer stop. Front axle symbol starts flashing (A).
  - 3 Brake to slip or max. brake force.
  - 4 Store with blue Return key.
  - 5 Do axle change.
  - 6 The symbol for Parking brake now flashes (B).
  - 7 The parking brake measurement and rear axle measurement (C) are done using the same procedure.
  - 8 After storing the rear axle exit the roller set.
  - 9 Now PRT (D) is flashing for printing. After confirming with the blue Return key, the first LED of the differential display is flashing for print program. Use the scroll key to select between program 1 or 2. Confirm again with Return and print is done.
- Point 8 is omitted with PC program LON BASIC.
  - An ovality measurement can be done with the right-hand Motor-ON key. The ready lamp on the test stand is OFF during the measurement time.



- Re-display of the measurement value: Use the scroll key to go to the axle and press Return. Re-display of side-slip and shock absorber is not possible with the RECO 1.
- If NEW (E) is confirmed with Return, then all existing measurement values are deleted.

#### **Brake Tester without Weighing Machine**

If there is no weighing machine, this can be entered at the end after Auto OFF using the scroll key and Return. Visible by the last 4 LEDs (F) which are flashing, and by the analog pointer.



If there is a side-slip tester, shock absorber tester or both, a new vehicle (NEW) must be set up after Auto OFF. If not, these measurement values from the previous vehicle are still active.

---



## 5.7 Truck Brake Tester with MAH-DOT and FFB

- 1 Drive onto roller set.
- 2 Active pressure sensor starts flashing. If several Px sensors are registered, another sensor can be selected using the desired sensor number and pound key (#). After the measurement the sensors cannot be allocated!
- 3 Press F8 (H) key for pointer stop.
- 4 Brake until slip or max. brake force.
- 5 Enter axle number 1 to 9, F9 for Service brake or F10 for Parking brake and confirm with star key (\*).
- 6 Do axle change and test all axles. Once all axles are tested, do an Auto Off using Remote control F12 (L).
  - Press F12. END flashes at the display. Confirm with the star key.
  - END stops flashing. Calculations are started.
  - After the calculations are complete, [E] appears. Now printing can be done.
- 7 The print program is started with F7 (G). Enter program number 1, 2, 3, 4 or 9 and confirm with the star key (\*). Printout follows.
  - An ovality measurement can be started with F4 (D).
  - Re-display of the Service brake with axle number + key F9 (I).
  - Re-display of the Parking brake with axle number + key F10 (J).
  - Re-display of the Final evaluation with 0 + key F9 or F10.
  - Re-display of the Side-slip tester with Shift + axle number +key F9 (I).

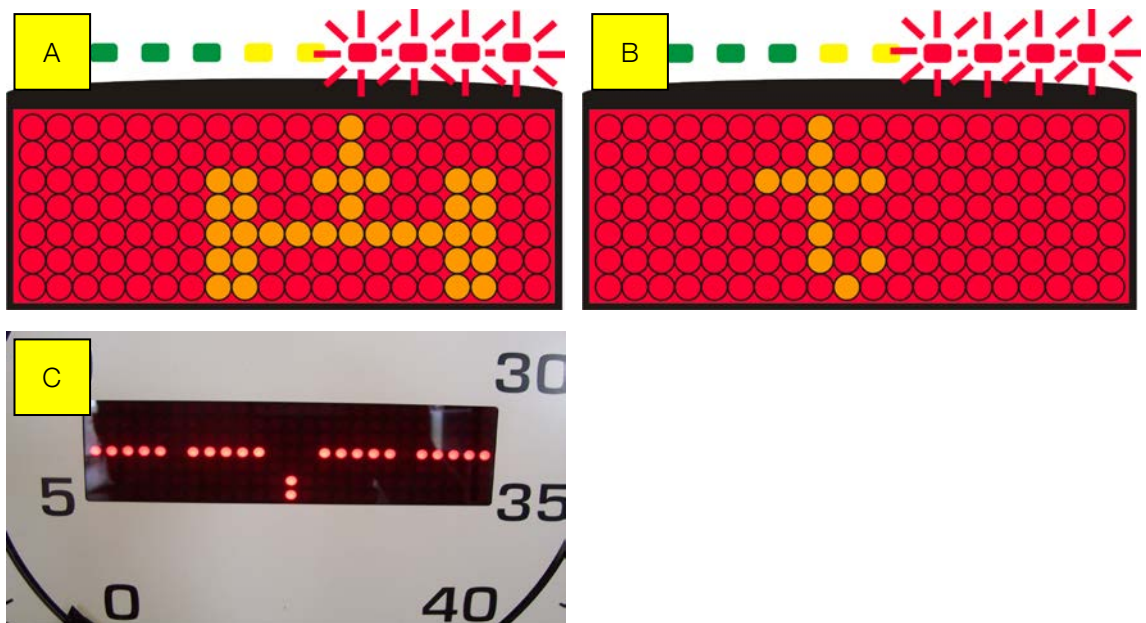
### Brake Tester without Scale

With brake testers without scale the vehicle weight must be entered after the Auto OFF. The axle symbol (A) changes constantly with the weight unit (B). Display 1, if present, flashes for input.

The weight entry is done directly via the numerical keypad of the remote control and is confirmed with the star key (\*). The input is displayed on Display 1 (C). The analog display runs synchronously with the weight input.

Example: Entry of 15.80 tons.

Enter 1 5 8 0 via the keyboard and confirm with star (\*) key.



## 5.8 Truck Brake Tester with MAH-DOT and RECO 1

- 1 Drive onto roller set.
- 2 Active pressure sensor (A) starts flashing. If several Px sensors are registered, another sensor can be selected using the scroll key. After the measurement, allocation of the sensors is not possible!
- 3 Press the blue Return key for pointer stop.
- 4 Brake to slip or max. brake force.
- 5 Press blue Return key for filing mode. Use the scroll key to select Service brake (B) or Parking brake (C).
- 6 Use the scroll key to select axle 1 to 9 and confirm with Return. Measurements are stored (D + E).
- 7 Do axle change and test all axles using the above procedure. Once all axles are tested, do an Auto OFF (F) using remote control (O).
- 8 For printing, select the print mode using the scroll key and confirm with Return. Now PRT (G) is flashing for print. After confirmation with the blue Return key the first LED of the differential display flashes for print program 1. Use the scroll key to select program 1, 2, 3, 4 or 9. Confirm print program with Return, printout is done.

### Brake Tester without Scale

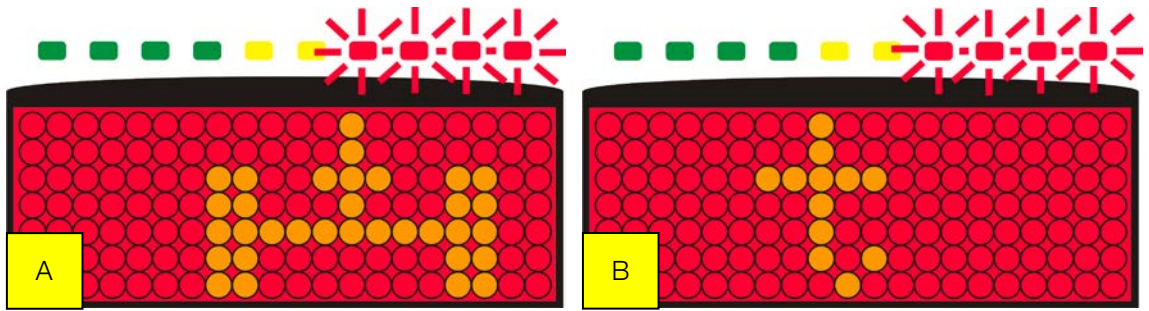
With brake testers without scale the vehicle weight must be entered after the Auto OFF. The axle symbol (A) changes constantly with the weight unit (B), and the last 4 LEDs are flashing.

The entry is done with the scroll-up key of the Reco1. As soon as the weight input is confirmed with Return, the corresponding LED changes to permanent light. The analog display runs synchronously with the weight input.

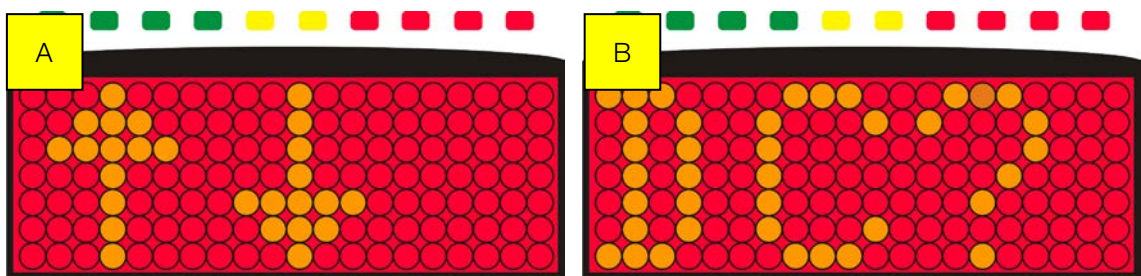
Example: Entry of 15.80 tons.

The last 4 LEDs are flashing.

- 1 Press the scroll-up key once and confirm with Return. (The first LED goes to permanent light.)
- 2 Press the scroll-up key five times and confirm with Return.
- 3 Press the scroll-up key eight times and confirm with Return.
- 4 Confirm the last LED with Return for 0.
- 5 The MAH-DOT changes to the Print symbol.



## 5.9 Option Drive Control



- 1 Drive onto the roller set with a 4WD vehicle.
- 2 After 2-time start-up monitoring the test stand switches automatically to DCO. The DCO lamp starts flashing. The left roller starts automatically in driving direction, the right-hand one in the opposite direction.
- 3 Brake with connected pedal force meter to max. brake force or slip. Release brake. The display shows the driving direction of the wheels (Fig. A).
- 4 Now the right-hand wheel starts automatically in driving direction, the left-hand wheel in opposite direction. Brake to the same pedal force of the left-hand wheel. Once pedal force is reached, release brake. The rollers stop without re-starting. The display shows the wheels' driving direction. Pointers go to the maximum value respectively. Now store at the respective axle using the remote control. Change to the next axle.
- 5 Test the other axle as described above.

Store using keys F9 –F11.

- Front axle: F9 (I)
- Parking brake: F10 (J)
- Rear axle: F11 (K)



After the measurements an “Auto OFF“ must be done.  
F12 (L)! (not necessary if evaluation is done via PC-LON BASIC Program)

### Special Features

- When exiting the roller set, the test stand returns automatically to Standard mode.
- Repeat measurement: After measurement of the left-hand and right-hand wheels the rollers are at a standstill. Now storage is possible, or the measurement can be repeated with the green key, or the Parking brake can be tested.
- Outside of the roller set the DCO can be activated with “Auto Off“ key (L) and the arrow-up key (Y). Confirm with the star key (M). DCO lamp starts flashing. This saves from doing the start-up monitoring twice in the roller set.
- After 3 start-up monitorings the rollers stop and the tester changes from Drive Control Mode to manual standard mode. Motors can be started individually via the remote control. The display shows DC as optical help (Fig. B).

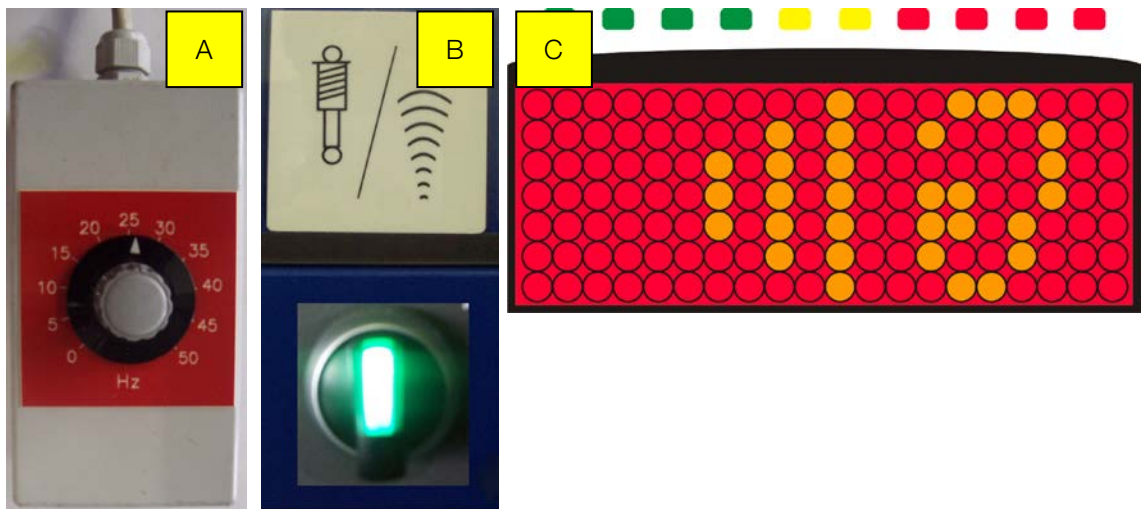
## 5.10 Noise Detection with IFB / FFB / RECO 1



Activation is only possible with unoccupied tester.

### Activation via IFB / FFB

- 1 Press Auto-Off key (Display shows END).
  - 2 Select Noise Detection symbol (C) with the arrow key and confirm with the star key.
  - 3 Drive onto the shock absorber tester.
  - 4 Start the respective side with motor On left / right.
  - 5 The motor RPM can be regulated using the potentiometer (A). ⇨ Only when rotary switch on the tester is set to Noise Detection.
  - 6 Press one of the red keys for motor stop.
  - 7 Noise detection can be quit using the pound key (#) with **unoccupied** test stand.
- The switch on the tester (B) must be set to Noise Detection for RPM regulation of the motors. Otherwise **no** RPM regulation is possible.



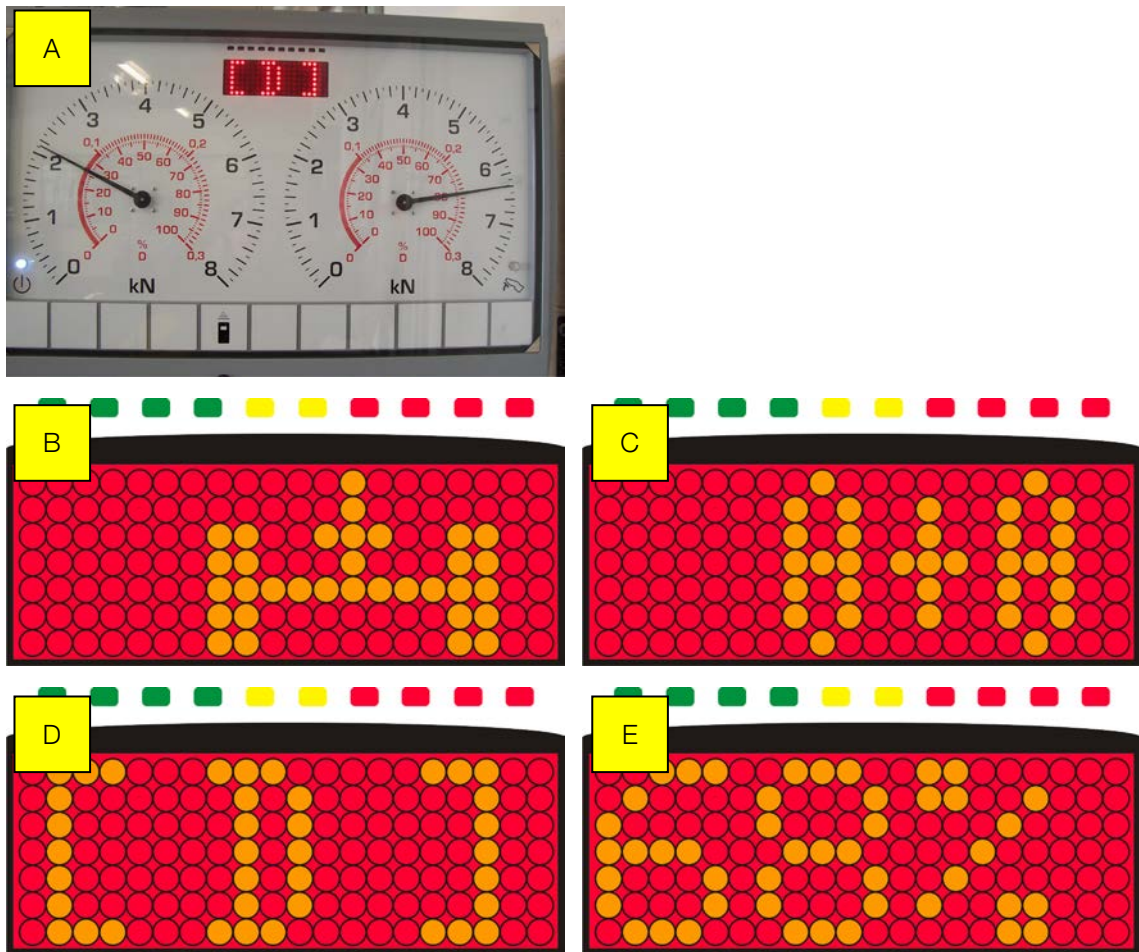
### Activation via RECO 1

- 1 Press the Motor Off key.
- 2 Select Noise Detection symbol (C) using the arrow key. Confirm with Return.
- 3 Drive onto shock absorber tester.
- 4 Start the respective side with Motor ON left / right.
- 5 The motor RPM can be regulated using the potentiometer (A). ⇨ Only when rotary switch on the test stand is set to Noise Detection.
- 6 Press the motor OFF key for motor stop.

- 7 Noise detection can be quit using Motor OFF key with **unoccupied** test stand.
  - The switch (B) on the test stand must be set to Noise Detetcion for the RPM regulation of the motors. Otherwise **no** RPM regulation is possible.



## 5.11 MSD 3000

**Test**

- 1 Drive onto the MSD (A). Weight measurement (B)!
- 2 Both sides start up simultaneously (C).
- 3 After measurement completion the pointers move to test value 0 to 0.3 D. If the test value is above 0.3, the pointers move slightly above 0.3 D.
  - The display changes between the unit (D) and the difference (E) in % until the tester is exited. The differential value is based on the left and right measurement value.
  - If the measurement value of a wheel is under 0.13 D, or if the difference is > 29%, then an additional single wheel measurement is done of each wheel. The display flashes during the single wheel measurement (C).
- 4 Measurement values are automatically stored without remote control.



With 2 additional AN5-Displays the wheel weight is displayed during the measurement procedure, and the measurement value 0...0.3 is displayed after completed measurement.



---

### Printing and Re-display of the Measurement Values

(Re-display of the measurement values is **not** possible with the RECO remote control.)

- The print program is started with F7. Enter Program 1 and confirm with star key (\*). Printout follows.
- Re-display of the shock absorber with Shift + Axle number + key F10.



If AN5 displays are present, press the F10 key again to switch to the wheel weight.

- Re-display of the side-slip tester with Shift + Axle number + key F9 if available.
- New vehicle (NEW) with pound key # and star key \* (Delete all measurement values).

## 5.12 Clock Changing between Daylight Saving Time/Standard Time

### One Hour Forward

- 1 Turn on the main switch of the tester by holding the power-on key down and waiting until the left-hand pointer (small measurement range 0-8 kN) moves to 3.2 (kN) Now release the power-on key.
- 2 Press the Start key twice so that the pointer moves to 4.2 (kN) (small measurement range left).
- 3 Now press the Return key (↵ or \*) on the remote control.
- 4 The clock has now been put **one hour forward**. As confirmation the customer header is printed out with the new time.
- 5 Switch the main switch off and on again. Now the tester is ready for operation with the new time.

### One Hour Back









- 1 Turn on the main switch of the tester by holding the power-on key down and waiting until the left-hand pointer (small measurement range 0-8 kN) moves to 3.2 (kN). Now release the power-on key.
- 2 Press the start key three times so that the pointer moves to 4.4 (kN) (small measurement range left).
- 3 Now press the Return key (↵ or \*) on the remote control.
- 4 The clock has now been put **one hour back**. As confirmation the customer header is printed out with the new time.
- 5 Switch the main switch off and on again. Now the tester is ready for operation with the new time.



The changeover only takes place on the control PCB and is not shown on the simultaneous display.

---

## 5.13 Test Procedure with Software

Button	Key	Assignment
	F2	Previous page
	F3	Next page
	F4	Start page (main menu)
	Page ↑	One level up
	Page ↓	One level down
	F1	Start help
	F12	Start printout
	Esc	Exit page

- ▶ When the green LED in the main menu lights up, the system is ready for testing.



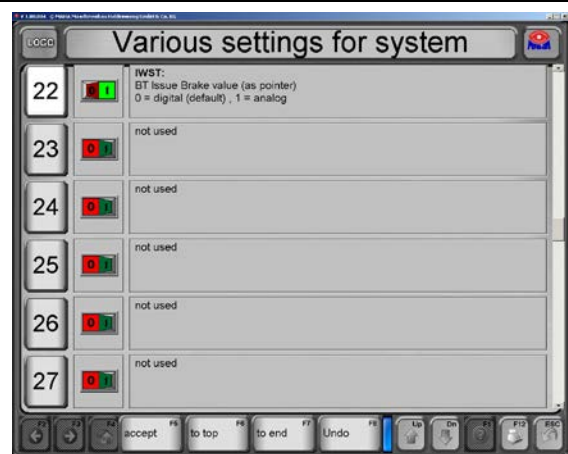
1 Conduct a brake test for front axle, parking brake and rear axle.



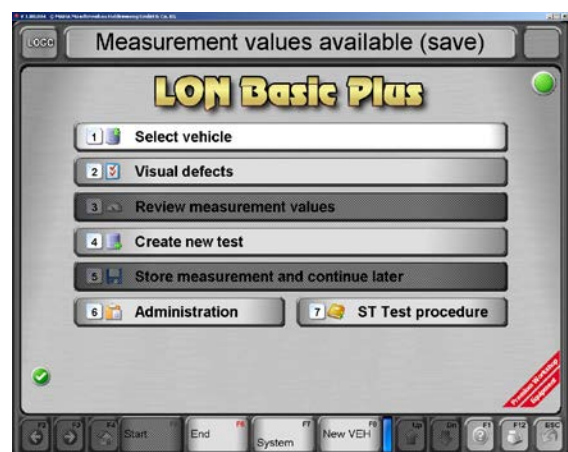
Selection between digital and analog display:



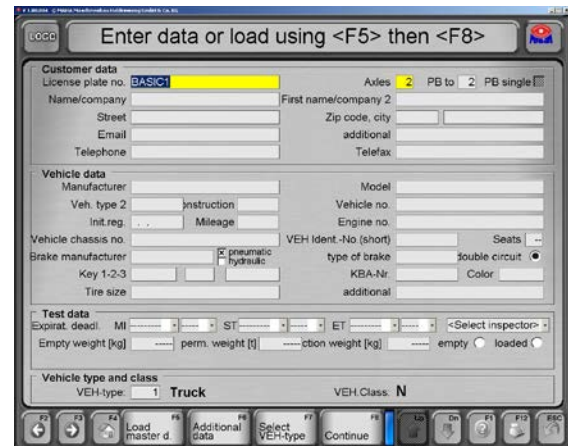
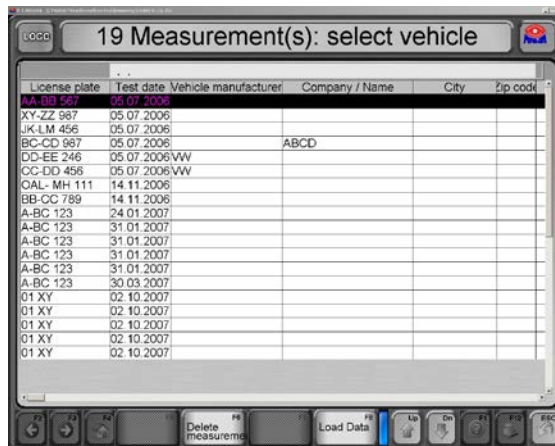
- Main menu
- <F7> System
- <2> Settings
- <K> Softdips miscellaneous
- <22> IWST



▶ After test completion this screen appears.



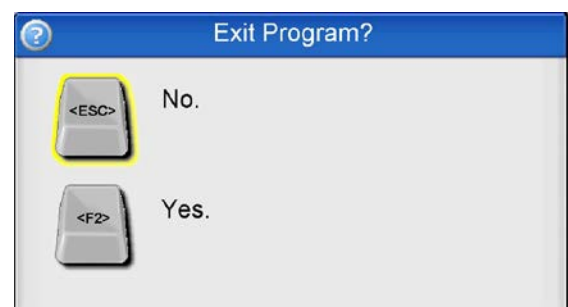
- 2a Use <1> to load an existing data record.  
 2b Use <6> to create a new data record.



- 3a Use <5> to store the measurement intermediately, e. g. if you want to repeat the test later.  
 3b Use <4> to finish and save the measurement.  
 4 Use <F12> to print out the test results.



- 5 To exit the program, press <Esc> in the main menu and confirm with <F2>.



## 6 Maintenance

---



Danger! Electric shock hazard!

Before doing any maintenance work, turn off the main switch and protect it against tampering.

---

### 6.1 Annual Inspection

---



- The maintenance interval prescribed by the manufacturer is **12 (twelve) months**. This maintenance interval refers to normal workshop usage. If the equipment is used more frequently or under severe operating conditions (e.g. outdoors), the interval must be reduced accordingly.



- Maintenance work shall be done only by authorized and trained service technicians provided by the manufacturer, licensed dealers or service partners.
  - In case of non-compliance the manufacturer's warranty becomes void.
- 

### 6.2 Care Instructions

- Periodically clean the equipment and treat it with a care product.
  - Repair damage to the paintwork immediately to prevent corrosion.
  - Usage of caustic cleaning agents or high pressure and steam jet cleaners may lead to equipment damage.
- 



Regular care and maintenance is the key condition for functionality and long life expectancy of the equipment!

---

### 6.3 Spare Parts

To ensure safe and reliable operation, only use original spare parts supplied by the equipment manufacturer.

## 6.4 Chain Drive Maintenance: Cleaning, Retensioning, Lubricating



Maintenance interval: Monthly

Before doing any maintenance work, turn off the main switch and protect it against tampering.

Remove the roller set covers from above the chains, reinstall before restarting the brake tester.

### Cleaning the Chains

The chains can normally be cleaned using a cloth or brush, stubborn dirt can be removed with petroleum solvent or benzine. Do not use pickles or acids! Reapply a new anticorrosive film immediately after using degreasing agents (see section "Greasing the Chains").

### Retensioning the Chains

Check the chain slack: the chain should be movable by hand approx. 5 mm up and down. If the chain needs retensioning, proceed as follows:

- Open the fastening screws.
- Adjust the chain tension using the tensioning screw.
- Tighten the fastening screws (see table for torque figures).
- Recheck the chain slack.

Brake tester model	Thread	Strength	Tightening torque	Position	Required for chain tensioning?
MBT 1xxx/2xxx/3xxx	M10	8.8	50 Nm	Running roller	yes
	M16	8.8	120 Nm	Motor mount	yes
MBT 4xxx	M18	8.8	350 Nm	Running roller	yes
	M20	8.8	350 Nm	Motor mount	only for RS1
MBT 5xxx	M16	8.8	220 Nm	Running roller	no
	M18	8.8	350 Nm	Motor mount	yes
MBT 6xxx/7xxx	M18	8.8	350 Nm	Running roller	yes
	M20	8.8	350 Nm	Motor mount	only for RS1 + RS3
MBT 7xxx	M18	8.8	500 Nm	Raised running roller	yes
	M27	8.8	500 Nm	Motor mount 3:4	no

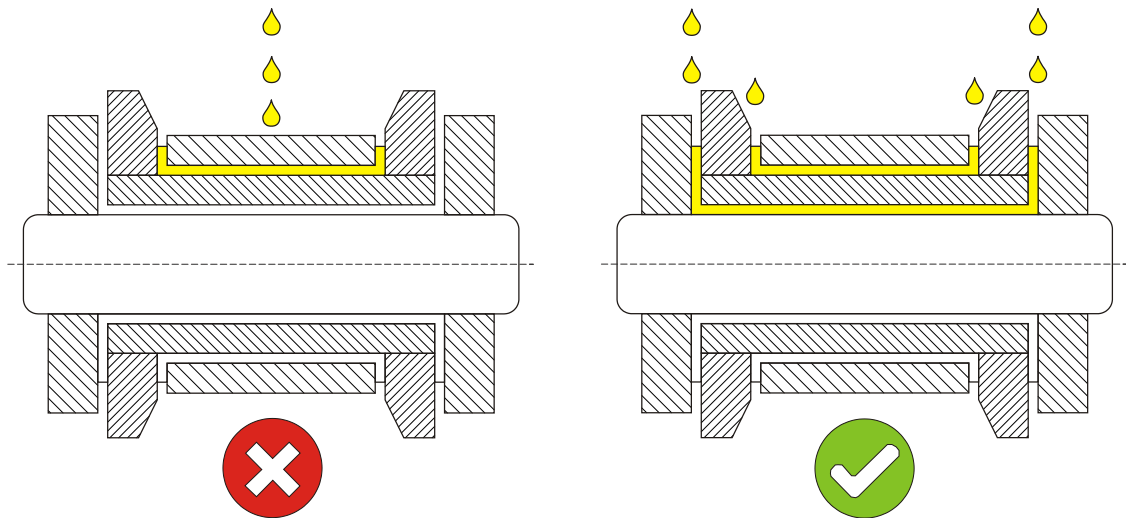
## Lubricating the Chains



The service lifetime of the chains directly depends on correct lubrication. Provided that the lubricating film is continuously maintained, chain wear can be reduced to a minimum

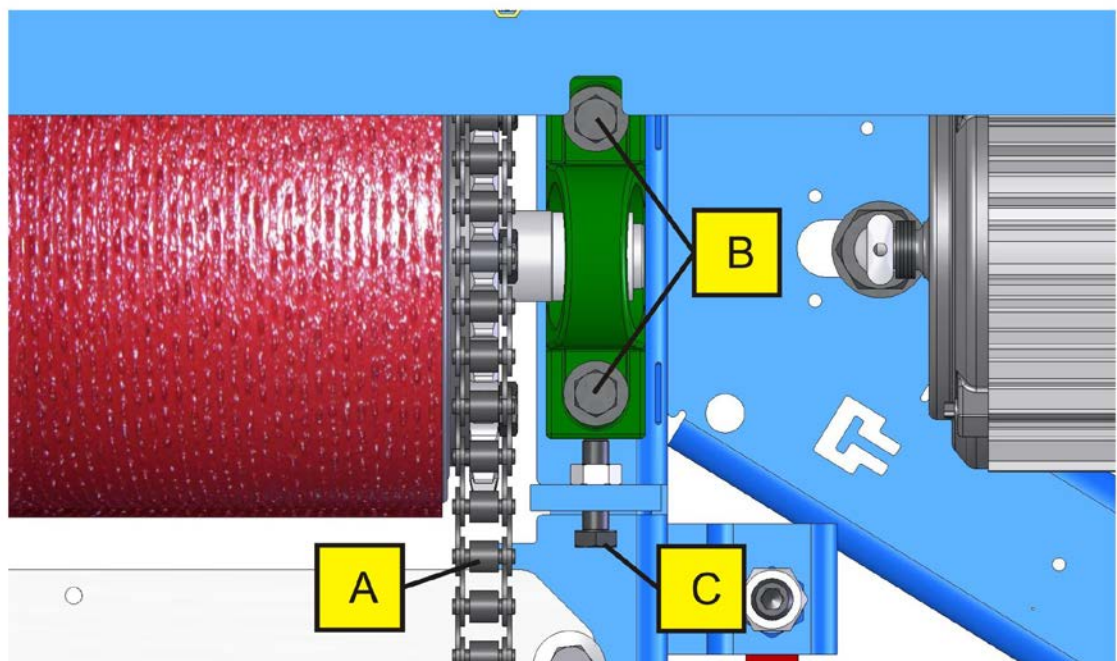
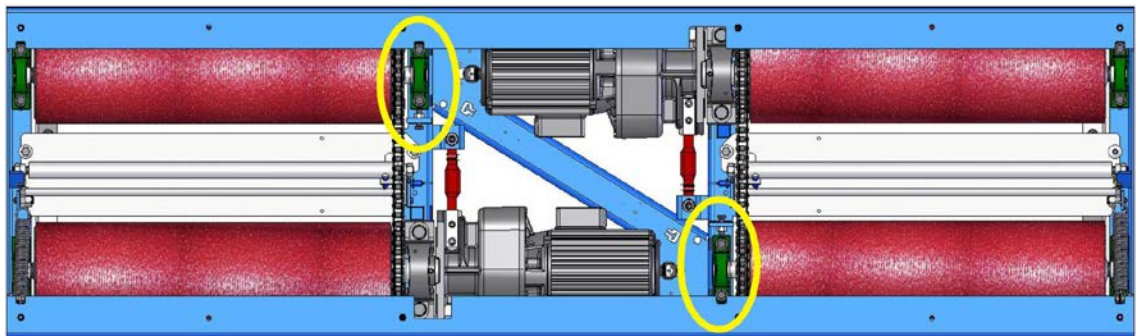
Recommended lubricant: LongLub adhesive lubricant (MAHA part # 35 1020)

- Lubricate the chain over its entire length while turning over the rollers by hand.  
**Important: The lubricant must contact the chain links!**





## ► M BT 3x00

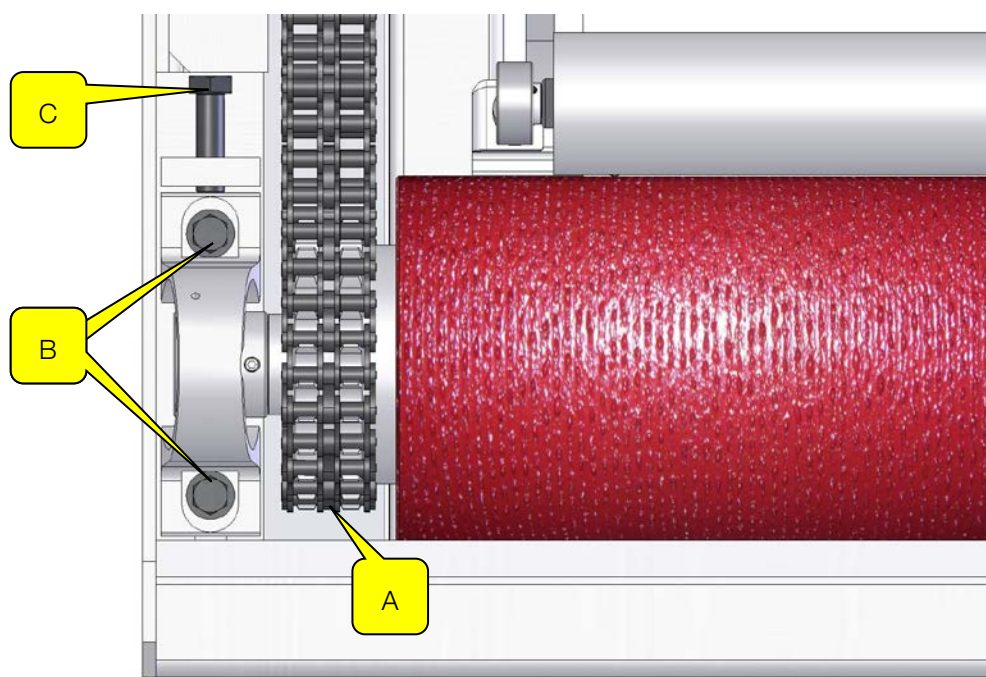
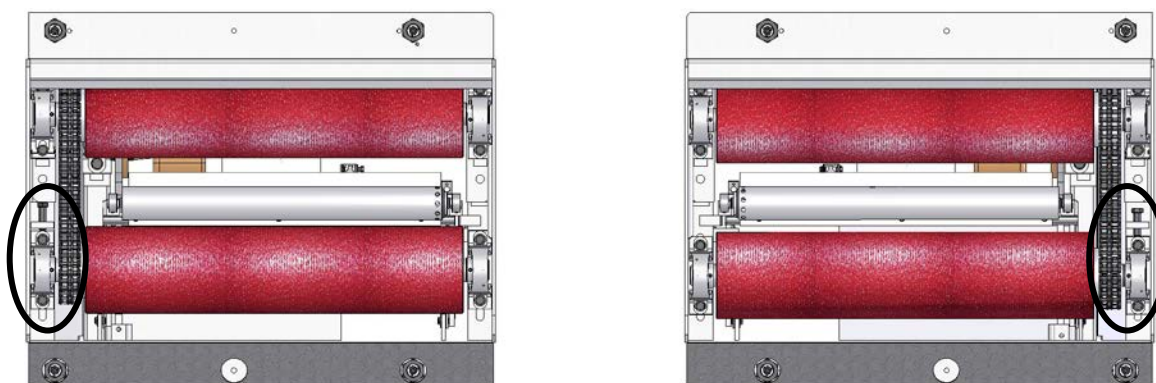


A Chain

B Fastening screws

C Tensioning screw

► M BT 4x00/7x00



A Chain

B Fastening screws

C Tensioning screw

## 6.5 Greasing the Sensor Roller Hinges

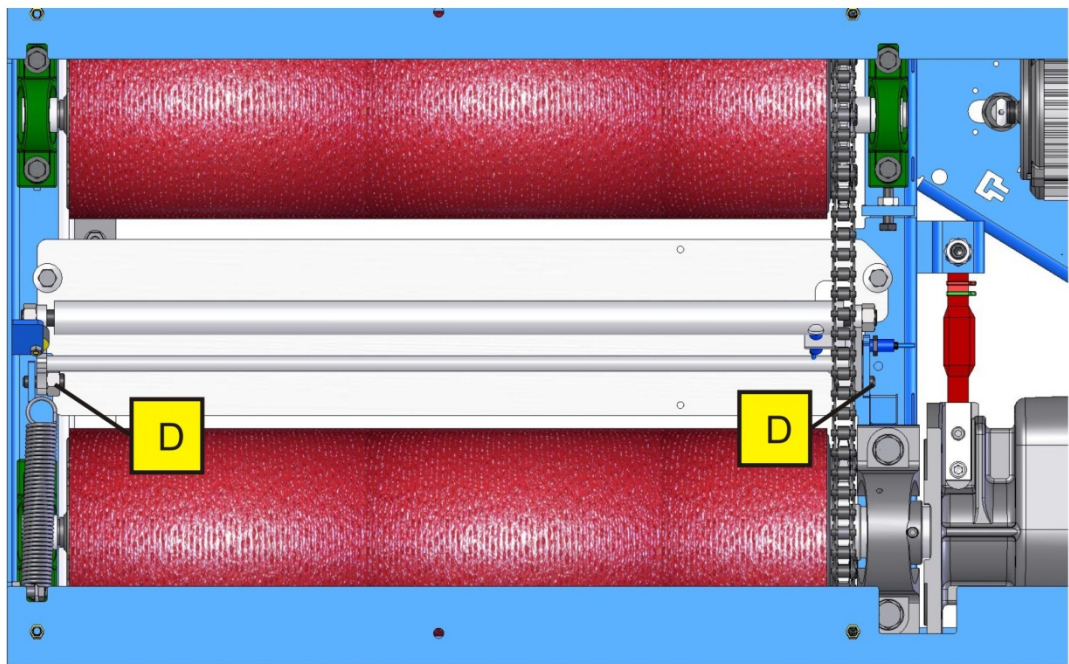
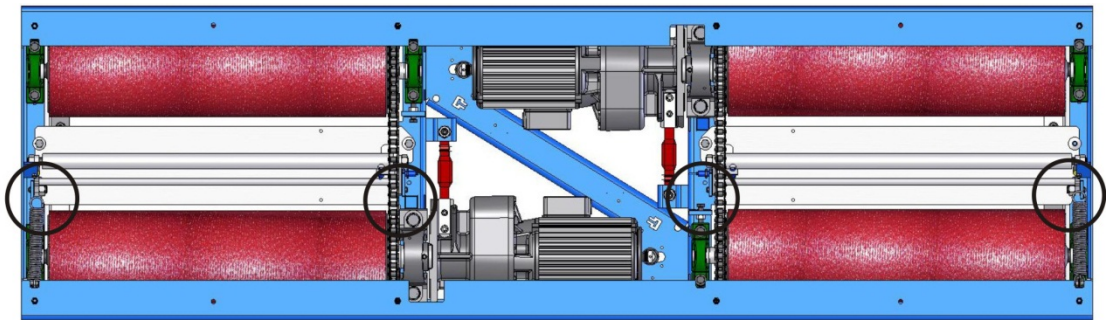


Maintenance interval: 200 hours / 12 months

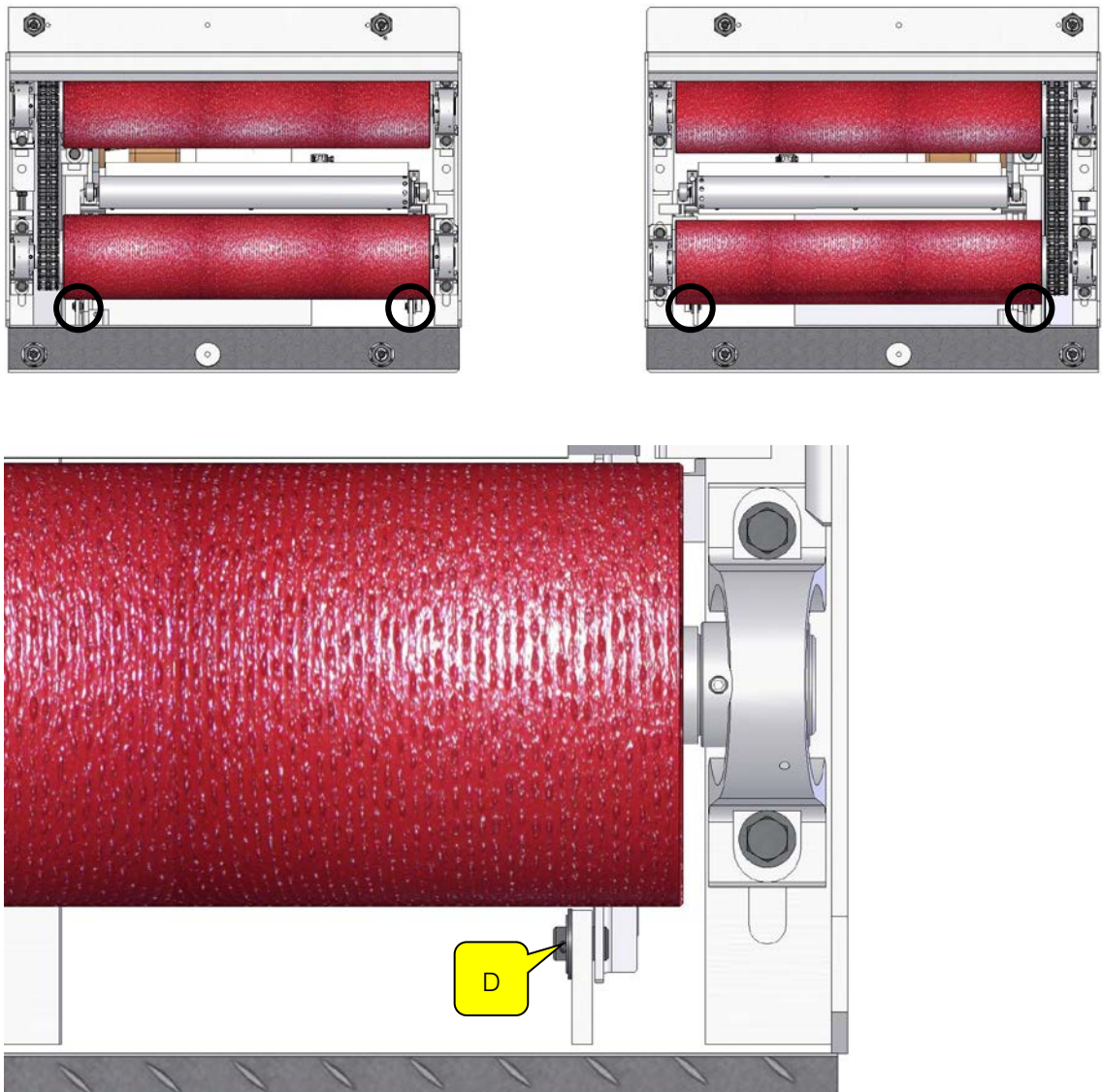
Grease the sensor roller hinges every 200 (two hundred) operating hours or once annually.

- 1 Remove the cover plates from the roller set.
- 2 Treat the greasing points (D) using a spray lubricant. Move the sensor roller up and down.
- 3 Reinstall the cover plates to the roller set.

► **M BT 3x00**











**► M BT 4x00/7x00**

## 6.6 Troubleshooting

- The brake tester shows an error code when there is a malfunction. The error code is indicated by the pointers of the small measurement range. All error codes (except for 33) can be acknowledged with the Error acknowledgement key.
- The roller set starts up automatically when a vehicle is on the roller set with the setting 'Automatic start-up Yes'!
- A few seconds must pass between switching the tester off and on, so that the tester can be properly re-started.

Error code	Cause	Remedy
01	Side-slip tester node	Contact service.
02	SA 2 D node	Contact service.
03	LON MOREG	Contact service.
11	LON BPLKW node	Check node and LON network. Contact service.
12	Multi-function display (e.g. MFA DOT) missing.	Contact service.
22	Left- and/or right-side overload protection switch(es) Off.	Position overload protection switch(es) to 1, main switch OFF and ON.
	 Motor damage may have occurred.	
32 <sup>1)</sup>	Left-side speed sensor defective.	Check sensor for switching clearance and proper contact of connections. Contact service.
	 Slip monitoring on left side disabled as safety feature! Contact service! Tyre damage!	
33	Neither left- nor right-side speed pulses.	Check sensors for switching clearance and proper contact of connections. Contact service.
	Selector switch for '2 measuring directions' (optional) on position 0.	Drive vehicle off rollers and turn selector switch to position '1' or '2'.
	Fuse of phase L2 and/or L3 triggered.	Switch off tester and replace fuses.
	 In case of persisting errors shut down the tester and contact service!	
34 <sup>1)</sup>	Right-side speed sensor defective.	Check sensor for switching clearance and proper contact of connections. Contact service.
	 Slip monitoring on right side disabled as safety feature! Contact service! Tyre damage!	
40	Faulty zero point adjustment of pointers.	Drive vehicle off rollers, turn off main switch and on again.

Error code	Cause	Remedy
	 In case of persisting errors shut down the tester and contact service!	
41	Only left-side sensor roller pressed.	Error occurs after the tester was switched on. It is likely that a sensor roller switch is defective.
42	Only right-side sensor roller pressed.	Error occurs after a vehicle drives onto the roller set: Vehicle is perhaps not positioned properly on the roller set (only one sensor roller pressed). Re-position vehicle axle and then press the "Power On" key.
	 Use extreme caution! Contact service immediately if there is sensor roller malfunction.	
43 <sup>2)</sup>	MOREG error (general).	Contact service.
44 <sup>2)</sup>	No signals from left-side light barrier.	Position reflector strips correctly. Light barrier may be defective.
45 <sup>2)</sup>	No signals from right-side light barrier.	In addition, red Error lamp is flashing: Slowly → left side
46 <sup>2)</sup>	No signals from both light barriers.	Fast → right side Fast/Slowly → both
50	Zero point of scale out of range.	Contact service.
51	Tester already occupied with vehicle when switched on.	If driven axle of vehicle is on the roller set, start rollers using remote control and exit test stand.
61	LON network error.	
62	Emergency shutdown due to excessive brake force.	

1) Error messages can be confirmed with the Error acknowledgement key. Afterwards the pointers on the analog display move to the zero point and the tester is ready for operation. Please note, however, that weight and brake force measurement as well as slip monitoring will not function properly.

2) Applicable for 4WD testers only.

## 7 Dismantling

Decommissioning and dismantling of the equipment may be done only by specially authorized and trained personnel provided by the manufacturer, licensed dealers or service partners.

## 8 Disposal

Pay attention to the product and safety data sheets of the lubricant used. Avoid damage to the environment. Should a disposal of the device be necessary it must be done in adherence with locally applicable legal regulations regarding environmental protection. Remove all materials properly sorted out and bring them to a suitable waste disposal service. Collect operating materials such as grease, oils, coolant, solvent-based cleaning fluids etc. in suitable containers and dispose of in an environmentally protective manner.

Alternatively, you may take the equipment to a specialised waste management plant to ensure that all components and operating liquids are properly disposed of.

## 9 Contents of the Declaration of Conformity

### MAHA Maschinenbau Haldenwang GmbH & Co. KG

herewith declares as a manufacturer its sole responsibility to ensure that the product named hereafter meets the safety and health regulations both in design and construction required by the EC directives stated below.

This declaration becomes void if any change is made to the product that was not discussed and approved by named company beforehand.

<b>Model:</b>	MBT 2200 LON / MBT 2400 LON 4WD MBT 3200 LON / MBT 3400 LON 4WD MBT 4200 LON COMPETENCE/CLASSIC / MBT 4400 LON 4WD MBT 5200 LON W COMPETENCE/CLASSIC MBT 6200 LON W CLASSIC MBT 7200 LON W COMPETENCE/CLASSIC / MBT 7400 LON 4WD
<b>Designation:</b>	Roller Brake Tester:  MBT 2200 LON / MBT 2400 LON 4WD: Rated Axle Load 3500 kg (optional 4000 or 5000 kg) Motor Power 2x3 kW (optional 2x4 kW)  MBT 3200 LON / MBT 3400 LON 4WD: Rated Axle Load 8000 kg Motor Power 2x5.5 kW  MBT 4200 LON COMPETENCE/CLASSIC / MBT 4400 LON 4WD: Rated Axle Load 13 000 kg (optional 15 000 kg) Motor Power 2x9 kW (optional 2x11 kW)  MBT 5200 LON W COMPETENCE/CLASSIC/ MBT 6200 LON W CLASSIC: Rated Axle Load 18 000 kg Motor Power 2x4 kW (optional 2x11 kW)  MBT 7200 LON W COMPETENCE/CLASSIC / MBT 7400 LON 4WD: Rated Axle Load 18 000 kg (optional 20 000 kg) Motor Power 2x11 kW (optional 2x16 kW)
<b>Directives:</b>	2006/42/EC; 2004/108/EC
<b>Standards:</b>	DIN EN ISO 12100:2010; DIN EN ISO 13850, DIN EN ISO 13857, DIN EN 349; DIN EN 60204-1; DIN EN 61000-6-3, DIN EN 61000-6-2



---

## 10 Company Information

© MAHA Maschinenbau Haldenwang GmbH & Co. KG

Legal notice based on ISO 16016:

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without explicit authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or design.

The contents of this edition have been checked with great care. However, errors cannot be fully excluded. Subject to technical change without notice.

### Document

Document No.: BA022301-en  
Approval Date: 2014-07-04

### Manufacturer

MAHA Maschinenbau Haldenwang GmbH & Co. KG  
Hoyen 20  
87490 Haldenwang  
Germany

Phone: +49 8374 585 0  
Fax: +49 8374 585 590  
Mail: [maha@maha.de](mailto:maha@maha.de)  
Web: <http://www.maha.de>

### Service

MAHA Service Center  
AutomoTec GmbH  
Maybachstraße 8  
87437 Kempten  
Germany

Phone: +49 8374 585 100  
Fax: +49 8374 585 491  
Mail: [service@automo-tec.com](mailto:service@automo-tec.com)  
Web: [www.automo-tec.com](http://www.automo-tec.com)