

CEMB 3



Vehicle Computerized Analysis

INTEGRATED MEASURING SYSTEM OF:

- SIDE-SLIP (TOE-IN)
- SUSPENSIONS
- SHOCK-ABSORBERS
- CAR WEIGHT
- BRAKING

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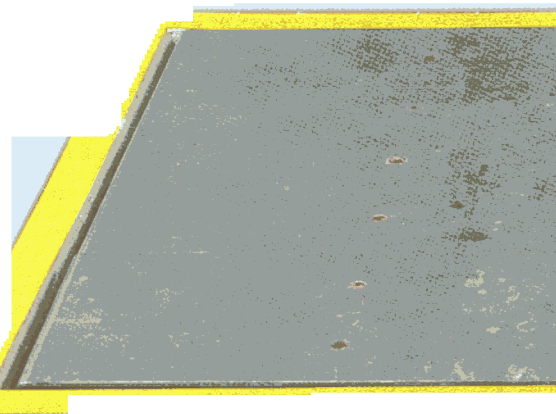
CEMB

DA 3

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INTEGRATED MEASURING SYSTEM OF:

- SIDE-SLIP (TOE-IN)
- SUSPENSIONS
- SHOCK-ABSORBERS
- CAR WEIGHT
- BRAKING
- TACHOMETER TESTER
- To integrate with gas analyzers and opacimeters
- It can be connected to MCTC-NET network
- It can be connected to AWN (ASANET) networks



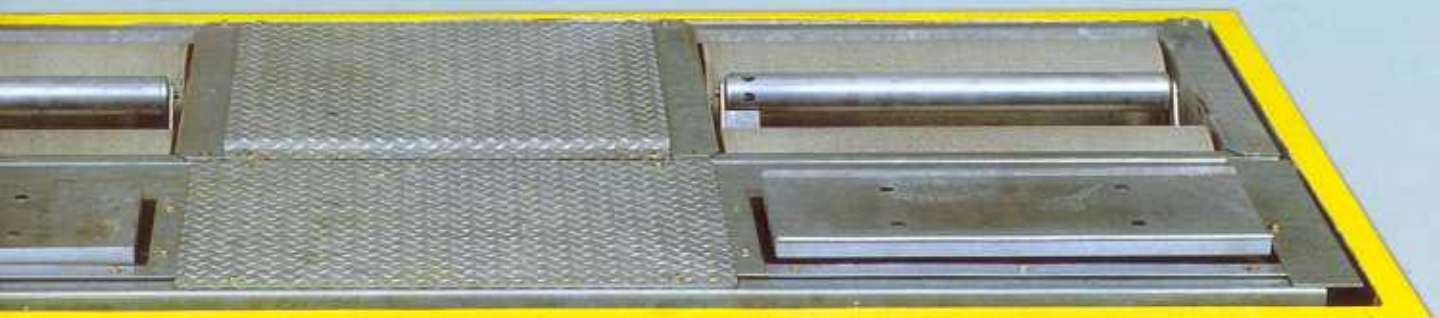
DCA 3 is the testing line fully re-projected and up-dated for the professionals requiring a quality equipment. CEMB technical solutions offer features and advantages particularly appreciated by those who have already used similar equipment:

- Fully galvanized mechanics ensuring the maximum protection against weather conditions (optional).
- Standard brake tester approved at 7500N (rather than 6000N testers generally available), where it is also possible to control light trucks with load on board (es: cold-storage rooms or others). Overdimension guarantees reliability!
- Rollers covered through industrial process according to Mercedes specifications, lasting for at least 50.000 passages. The accurate machining of the rollers and the coating system made with friction material ensure an almost null eccentricity.

- Suspension tester based upon a measuring system covered by CEMB patent. Matchless: by a real "Expert System" it gives the simple and clear diagnosis of the problems caused by suspensions and shock-absorbers, with no need of deduction or interpretation. Furthermore, it is the only instrument being so accurate to ensure the exact calibration of adjustable shock-absorbers.
- WARNING LIGHTS: suspension/shock-absorber OK or not OK meeting the requirements of the users who are familiar with suspension testers!
- Noiseless suspension tester (<70 db).
- Indication of vehicle position on the platforms to ease the job of the operator (no more open doors or mirrors to see where the vehicle is!!)
- Weighing tolerance 2% (more accurate relating to 4% required by MCTC).
- Side-slip tester with discharge of side forces, protected

against weather conditions, salt water, etc.

- CEMB design integrated computer with static memories. Quicker and more accurate of any Personal Computer and, above all, much more reliable (according to an investigation made by CEMB on users all over the world, 3 lines out of 10 had problems with the PC!)
- Serial communication assured to an outer PC.
- 256 colour VGA monitor and quick movement graphics (no delay from the PC).
- Quick, reliable and high-quality ink-jet colour printer.



CEMB

Roller Brake Tester

It complies with current international standards and to regulations requested for the approval by **THE TEST CENTRE OF THE MINISTRY OF PUBLIC TRANSPORT in Italy and other ECC countries.**



Suitable for both standard and four-drive wheel cars and commercial vehicles.

It measures:

- Max. braking effect / Percentage difference
- Side skid effect
- Ovalisation
- Braking distribution (between front and rear axle)



- Total adherence used / adherence axle per axle
- Servo brake efficiency
- Hand brake

Obtainable data:

- Numerical table according to current regulations.
- Graphics of braking effect and ovalisation in function of test duration.

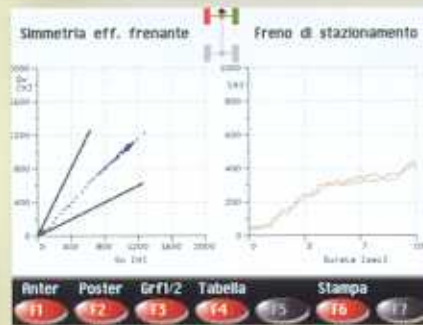
FRENO	Anter	Poster	Fr. Staz
Res. al rotolamento	59	57	35
Qualità	2	1	2
Forza max di fren.	1343	1308	589
Forza max diff.	1869	1884	589
Disimmetria di fren.	2	29	31
Ripartizione di fren.	68	32	18
Aderenza utilizzata	36	23	269
Max. sforzo pedale	347	321	183
Max. dec. teorica m/s ²		3.85	1.85
Efficienza frenante		31	18
Eff. freno soccorso	22	10	0
DEGRAD			
Datore rilevato	m/Km	1	0
SOSPENSIONE			
Aderenza	2	89	88
Peso totale	Kg	489	547
		46	44
		258	289

- Graphics of right-left braking effect with indication of tolerance range. The data obtained from DCA 3 - FN3 are enough to comply with any current regulation on car brake testing.

Graphs, in particular those relating to the load made on pedal, give all data necessary to make a complete diagnosis of car braking problems. Should the line

include S3 Suspension Tester, weighing data of the two vehicle axles are automatically transferred to the computer. If instead it is not included, it is possible to use an additional weighing system (optional) to fit under the Brake Tester or to introduce data through a keyboard.

- In automatic test cycle there is no need for the operator to use the remote control.
- In manual cycle it is possible to measure servo brake efficiency.



Technical data:

Vehicle weight per axle	4000 Kg
Measure range	0 ÷ 7500 N
Motor power absorbed	5.5 Kw each
Rollers durability	> 50.000 tests
Hot-galvanized frame	

SAFETY = SUSPENSIONS + BRAKES perfectly efficient.
 Stop distance is shorter if suspensions are in good conditions.
 One third approx. of the circulating vehicles have suspensions and shock-absorbers in bad conditions!

Suspension and Shock-absorb

- Adherence rate according to EUSAMA principles
- Damping coefficient (CSI) through vectorial proceeding (CEMB patent) to find out how car is damped and

then discriminate shock-absorber efficiency.

- Suitable for cars and commercial vehicles.
- It displays and prints adherence rate graph according

to working frequency.



- It indicates the position of vehicle on platforms.
- It displays and prints the graph of the ratio between pressing exerted on platform and displacement of the platform itself (this is an



unavoidable parameter for a correct diagnosis).

- It eliminates mass effect on the platform (CEMB patent).
 - **WARNING LIGHTS:** suspension/shock-absorber OK or not OK.
- From one test only DCA 3 tester processes many and significant measures complementary one to another, allowing to infer the state of the suspension and the elements it is made up by. This **"MULTICRITERIA"** method is the only one able to give data exempt from errors in all practical cases. As a matter of fact, all suspension testers available on the market give data which are not significant enough, whichever system is used, to make a correct and full diagnosis of a complex mechanical system as suspension of car is, especially light ones.

Taking into account 10 different parameters, among which CSI (CEMB patent) is essential, it is possible to obtain automatically the diagnosis of the suspension thanks to a real **"EXPERT SYSTEM"** controlled by a computer. Twenty different diagnosis approximately are automatically elaborated, giving some precise indications on the state of suspension and informing the operator when it is necessary to replace shock-absorbers or other components.



Technical data:

Power supply:	3 Kw
Vehicle weight per axle	2500 Kg
Weighing accuracy	± 2%

- It measures the side displacement of a wheel respect to the others, expressed in m/km.
- It provides for a quick check of the alignment of vehicle wheels in order to see whether it needs to be adjusted by using an alignment equipment.

Wheel toe is defined as the angle between the plane passing through wheel center line and the longitudinal axle of the vehicle, viewed from above. When the extensions of the planes passing through wheel center line tend to converge on the front side of the vehicle, toe-in is said to be positive; if, on the contrary, they tend to converge on the rear side of the vehicle, toe is said to be negative or toe-out (see Fig. 1). When the extensions of the planes passing through wheel center line are parallel one to the other, toe-in is zero.

- It is equipped with a double mobile platform to cancel out the forces acting on the wheel before the test. Only thanks to the double platform it is possible to obtain reproducible data from the test.
- Toe-in rate is usually expressed in mm., corresponding to the difference between the distance of wheel rims one respect to the others but it can be evaluated in another way: if a converging wheel were allowed to run freely, after a certain distance it would

be in a different position from where it is obliged to stay by the mass of the vehicle and the resistance exerted by the other wheel (see Fig. 2). This side displacement is called **WHEEL SIDESLIP**.

It is conventionally expressed in m/km, that is how many metres the wheel would slip sideways if it can run freely for one kilometre.



Technical data:

Max. vehicle weight per axle	2500 Kg
Stainless inner components	

Fig. 1

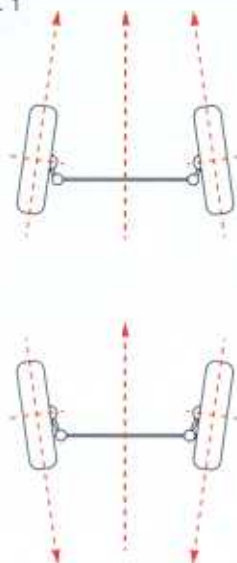
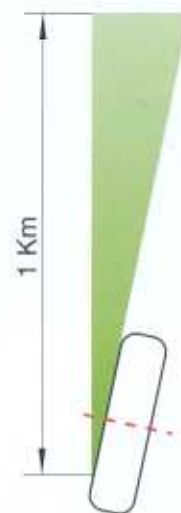


Fig. 2



Available connections to DCA 3

The tester can simply be connected through a serial cable to :

- Gas Analyzers and Opacimeters; this connection is useful to display test data found with instruments such as CEMB Gas Analyzer model DCA-5000 and CEMB Opacimeter model DCA-2000 on a video and to print them out.

A simple 'Data collection Centre' can be then easily organized.

- MCTC-NET network. To link the line to other instruments and to the specific Italian MCTC software.

AWN (ASANET) network. To link various instruments of ASA association.

This connection is useful in view of future investments. As a matter of fact the network can freely grow in time, connecting any kind of instrument to a

central software which is able to collect and use all information coming from those instruments at the best. This network being independent from the manufacturer of a single instrument, it assures a higher flexibility in time and a continuous up-dating.

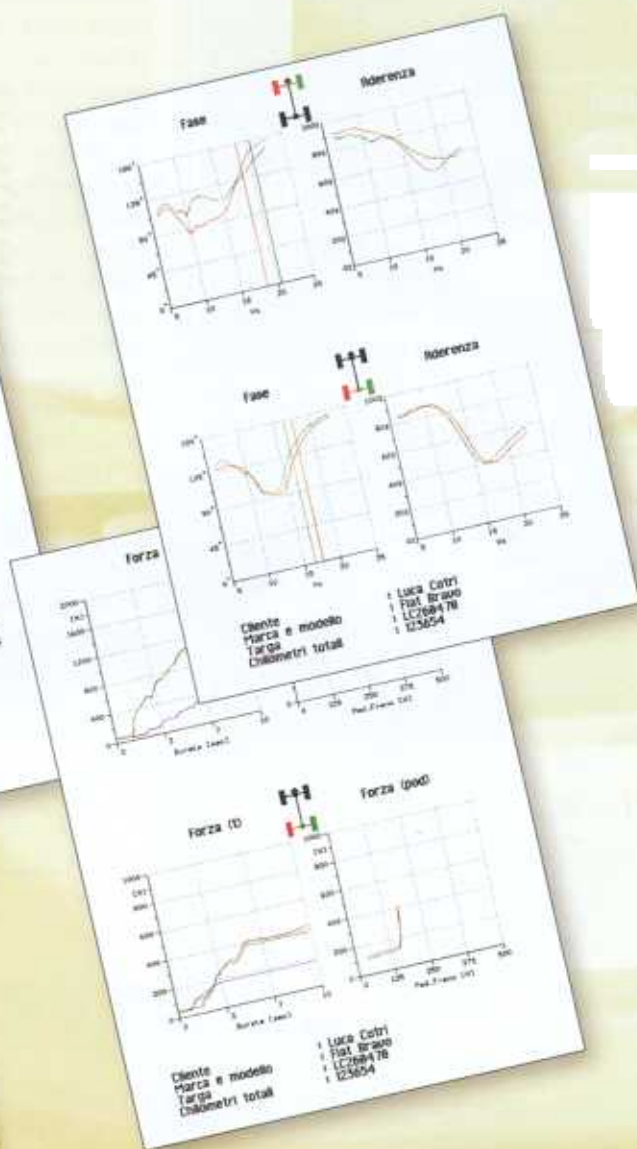
Print-out



Print-out of numerical certificate



Print-out of Ministerial certificate



Print-out of suspension and brake test graphics

Possible configurations

DCA 3-FN3-S3-D

- ROLLERS BRAKE Tester
- SUSPENSION Tester
- SIDE-SLIP Tester

Standard accessories
Printer, remote-control,
podometre, weighing.

DCA 3-FN3-S3

- ROLLERS BRAKE Tester
- SUSPENSION Tester

Printer, remote-control,
podometre, weighing.

DCA 3-FN3

- ROLLERS BRAKE Tester

Printer, remote-control,
podometre.

DCA 3-FN3-D

- ROLLERS BRAKE Tester
- SIDE-SLIP Tester

Printer, remote-control,
podometre.

DCA 3-S3

- SUSPENSION Tester

Printer (weighing)

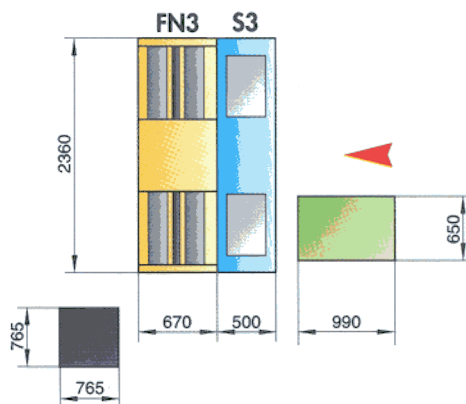
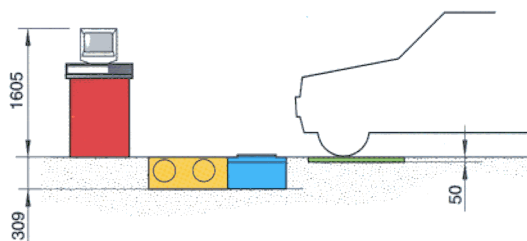
DCA 3-S3-D

- SUSPENSION Tester
- SIDE-SLIP Tester

Printer (weighing).

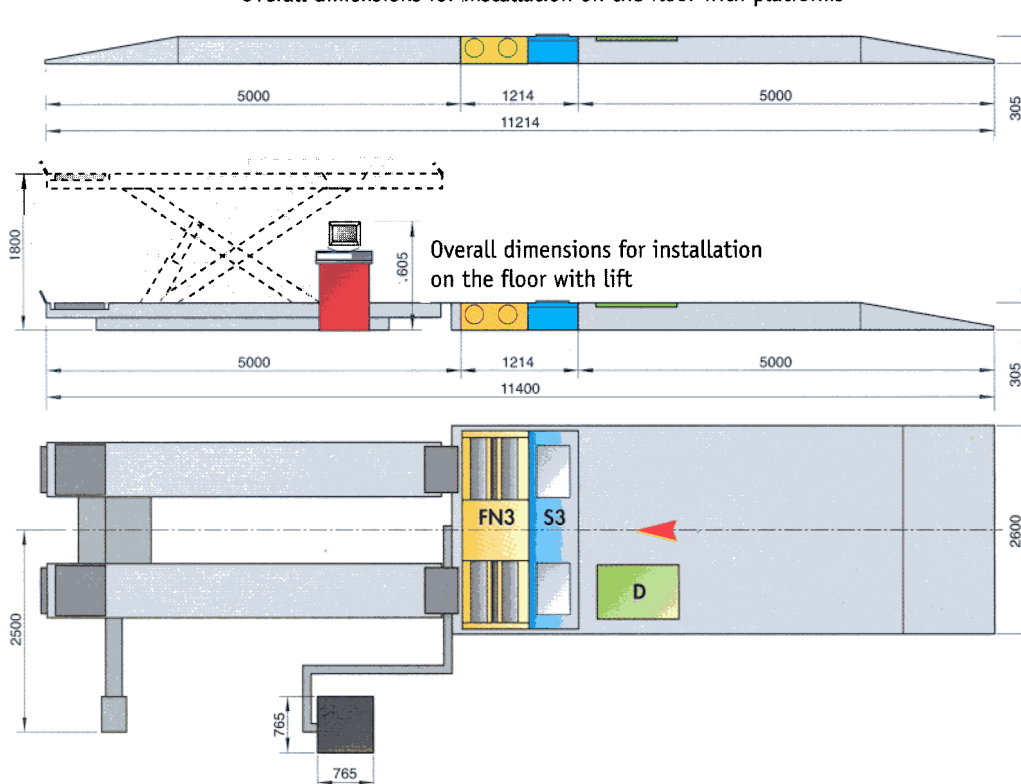
DCA 3-FN3-S3-D

Overall dimensions for installation in a pit



DCA 3-FN3-S3-D

Overall dimensions for installation on the floor with platforms



Options

Roller covers for DCA 3 – FN3

To allow vehicle transit on the Brake Tester.

Portable weight Kg. 4000 per axle.

DCA 3 – T

Platform with free rollers to check the correct calibration of vehicle tachometre (compulsory in some countries).

Complete with roller blocking system to allow vehicle exit.

Vehicle automatic weighing system

(for versions without DCA 3 - S3 Suspension testers),

to fit under DCA 3 - FN3 Brake Tester.

All the data and features mentioned in this catalogue are purely for information and do not constitute any commitment on the part of our company, which reserves the right to make any and all alterations it may consider suitable without notice.



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