

MAGNETI MARELLI

ALLINEATORE RUOTE WHEEL ALIGNER C 1000

User's manual

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INTRODUCTION

The purpose of this manual is to furnish the owner and operator of this machine with a set of practical and safe instructions for the use and maintenance of the wheel aligner. Follow all the instructions carefully and your aligner will assist you in your work and give lasting and efficient service in keeping with our traditions.

The following paragraphs define the levels of danger regarding the machine, associated with the warning captions found in this manual.

DANGER

Refers to immediate dangers with the risk of serious injuries or even death.

WARNING

Dangers or unsafe procedures that can cause serious injuries or even death.

ATTENTION

Dangers or unsafe procedures that can cause minor injuries or damage to property.

This manual is subject to changes and updates.

Always read the personalisation and update instructions appended to the manual.

The manual is organised into logical chapter headings to facilitate its consultation, and is intended – particularly as far as maintenance operations are concerned – for specialised technicians with the necessary knowledge of mechanical, electromechanical and computerised systems. The system has in any case been designed to simplify as much as possible all the operations relative to its normal functioning, as well those pertaining to the more delicate troubleshooting phases: to this end, a wide array of on-screen messages (which are described in this manual) provide specific information for solving the various problems which may arise.

Read these instructions carefully before powering up the machine.

Keep this manual and all illustrative material supplied with the machine in a folder near the aligner where it is readily accessible for consultation by the machine operator.

The technical documentation supplied is an integral part of the machine, and must always accompany the equipment if it is sold or transferred to a new owner.

The manual is applicable exclusively to the machine model and serial number indicated on the data plate affixed to it.



WARNING

Adhere to the contents of this manual. SIMPESFAIP declines all liability in the case of actions not specifically described and authorised in this manual.

The wheel aligner is a measuring tool, so the suggestions for the adjustments to be made on the vehicle (animations or fixed help-on-line contained in the aligner) are merely indicative. In any case, before making any intervention on the vehicle, the operator must examine and be aware of the regulations (in other words the instructions or recommendations of the manufacturer), and always make the adjustments in compliance with such priority indications.

The company declines all responsibility deriving from the execution of such regulations and any damage that could eventually result.

NOTE

Some of the illustrations in this manual have been taken from photographs of prototypes; the standard production models may differ slightly in certain respects.

These instructions are for the attention of persons with basic mechanical skills. We have therefore condensed the descriptions of each operation by omitting detailed instructions regarding, for example, how to loosen or tighten the fixing devices on the machine, etc. Do not attempt to

SIMPESFAIP S.p.A.

TRANSPORT, STORAGE AND HANDLING

Machine transport conditions

The aligner must be shipped in its original packing and stowed in the position indicated on the outside.

- **Packaging Data:**
perform operations unless properly qualified and with suitable experience. In case of need, please contact our nearest authorised Service Centre for assistance.

NOTE

All the installation operations must be carried out by Technical Service personnel authorised by

- Dimensions (LxWxH):

central unit (without target and 17" monitor) 1165x630x1710 mm

central unit (target - brackets - 17" monitor)..... 1250x810x1730 mm -

Weight:

central unit..... 140 kg target

..... 4 kg

electrical/electronic components weight:..... 45 kg

Ambient conditions in the place of storage

- Relative humidity: 20% ÷ 80%
- Temperature range: -10° ÷ +60°C.



WARNING

Do not stack other items on top of the packing to avoid damaging it.

Handling

To move the packing, insert the tines of a fork-lift truck into the slots on the base of the packing itself (pallet) (fig. 1).



ATTENTION

Always use suitable hoisting belts or tested ropes.



WARNING

This operation must be carried out very carefully to prevent the unit from tipping over or being damaged.



ATTENTION

Handle with care: violent vibrations may damage the equipment.



ATTENTION



Before moving the equipment, first pull out the power supply cable from the socket.

INSTALLING THE MACHINE

Installation clearances



WARNING

Keep the original packaging materials so that the machine can be safely shipped at a later date if necessary.

WARNING

Choose the place of installation in strict observance of local regulations regarding safety in the workplace.

The ground must be sturdy enough to bear a weight equal to the sum of the equipment weight plus the maximum allowed load, including the supporting base to the ground and the specific securing devices

Install the aligner at the desired work position; make sure there is at least 25 cm between the rear part of the machine and the nearest wall.

IMPORTANT: for correct, safe use of the equipment, users must ensure a lighting level of at least 300 lux in the place of use.



WARNING

The machine must not be operated in potentially explosive atmosphere.



ATTENTION

If the machine is to be installed outdoors, it must be properly protected by a canopy roof or any other protection device to avoid contact with water.



ATTENTION

Make sure that there are no permanent magnets, electromagnets or sources of heat in the vicinity of the machine as these could cause irreparable damage (they might irreparably damage the program disk and the Personal Computer).



WARNING

Take the utmost care when unpacking, assembling, lifting and setting up the machine as described in this heading.

Failure to observe these instructions can lead to damage to the machine and injury to operators or other persons.

Assembling the machine

- *Unpack the equipment, placing the packing in the position indicated above.*
- *Remove all the accessories from the pallet and from inside the machine, and set them down nearby.*
- *Place the aligner base in the desired position (see paragraph "Installation Clearances").*
- *Proceed to unpack the accessories.*
- *Remove the rear panel of the aligner in order to access its interior.*
- *Remove the monitor from its packing (keep the packing materials for future transport) and place it on the top of the console (C, fig. 2).*

WARNING

It is highly recommended to always fix LCD monitor in order to avoid possible damagings which had to accidental hits against the equipment. It is recommended therefore to always use the monitor fixing kit accessory PN. 8-61200143 (A, Fig. 2a). The Manufacturer declines all liability for claims deriving from the non-used of the LCD monitor fixing device.

- *Fix the electrical components panel (A, fig. 3) to the rear part of the cabinet using the 4 Allen screws (B, fig. 3) supplied as standard and the corresponding holes on the sides of the two intermediate shelves.*
- *Fix the remote control receiver on the specific pre-set bracket inside the cabinet near the eye (A, fig. 4a), locking the support with the two screws supplied.*
- *Remove the computer "C" from its packing (keep the packing materials for future transport) and place it in the compartment provided inside the cabinet (fig. 4a).*

REMARK: *To position the computer adequately, fit its front part flush with the shelf.*

- *Connect the remote control flat cable connector to the to the D-Sub 25-pole connector marked with the word "PANEL" on the rear part of the "smart card" reader (H, fig. 5a).*
- *Unpack the keyboard (A, fig. 2) and the mouse (B, fig. 2), lay them on the special shelf of the thermoformed cover and pass the cables through the cable guide of the shelf.*

- Pass the monitor cables through the cable holder on the rear of the cabinet (fig. 3a - 3b) and then through one of the slots in the two back corners of the middle shelf (printer compartment) to access the computer compartment.
- Connect the cables to one of the available Shuko sockets (power) and to the computer (signal) as shown in fig. 5b
- Pass the keyboard and mouse data cables through the cable holder on the rear of the cabinet (fig. 3c - 3d) and then through one of the slots in the two back (printer compartment) to access the bottom compartment (computer compartment). (Then connect them to the connector provided on the PC).
- Connect the following cables to the computer: power supply, keyboard, "SMART CARD" reader, mouse and printer (optional), as shown in fig. 5b.
- Hold and take the aligner Sim Card (fig. 26) out of the its pre-cut holder (keep the sim card holder with the serial number for future orders) and insert it in the specific connector (A, fig. 26) with the compartment open) with the golden contacts facingdown and the slot towards the reader outer side (B, fig. 26). Refit the front cover.
- Connect the cables following the wiring diagram (Fig. 32) and the fig. 5b; all plugs are marked univocally on the corresponding PC socket.

REMARK:

Insert the plug all the way down without excessive force and tighten the safety screws wherever present.

Pay attention to any wiring differences, indicated by the presence of a smart card reader, internal or external to the PC, illustrated below.

- When the connections have been made, refit the aligner rear closing panel using the special fastener screws.
- The aligner card supplied with the equipment has been previously inserted in the specific connector for sim cards.
- Insert the power supply cable in the corresponding plug (on the rear of the cabinet) (B, fig. 4b).

REMARK: Before plugging it, read the chapter on "Electrical Connections".

- Turn on the aligner with the main switch (on the rear of the cabinet) (A, fig. 4b), then the monitor and the printer with the specific switches.
- Upgrade the aligner software, see the "Aligner software upgrade" chapter, and install any optional kits as indicated in the "Installing additional functions" chapter.

Aligner software upgrade

The aligner is provided with the software already installed plus an installing DVD-ROM also supplied as standard. Once the aligner has been installed, switch on the machine and display the starting screen. Press this key combination: È + F12 (CapsLock + F12); the software version will be displayed at the top left side of the screen, below the logo. Compare this software version (indicated as "SW STD ...") with that indicated on the installation DVD-ROM supplied together with the aligner. If the DVD-ROM version is newer than the one installed, upgrade the aligner software.

Detailed information on the software upgrade is given in the booklet leaflet attached to the DVD-ROM.



ATTENTION

For additional information about the technical features, warnings, maintenance and any other data about the monitor or the printer, read the relative Users manuals supplied with machine documentation.

Installing the Printer

The Windows[®] operating system supports the installation of the majority of printers available on the market.

Warning !

Some latest-generation printers may conflict (when two or more printers are installed on the same personal computer).

The manufacturer pre-installs one model of printer; if the printer supplied is of this model once the connection has been made it will be ready for use.

If the printer is of a different model it must be installed, following the instructions provided in the installation and set-up manual provided with the printer itself.

To avoid problems when using printers not supplied by the manufacturer, it is better to uninstall all models of printer previously installed before installing a new model. The aligner has been programmed to work together with an 80-column A4 colour printer.



ATTENTION

During installation the aligner **must** be turned off.

- *Open the compartment at the front of the cabinet and place the printer in such compartment (fig. 5).*
- *Connect the other end of the data cable (USB) to the printer (end with square-section connector).*
- *Pass the power supply and the data cable through the slits on the rear left angle of the compartment to get access to the lower space.*
- *Pass the power supply cable through the top slit on the rear left of right angle of the electrical system and connect it to any free Shuko sockets available.*
- *Connect the printer data cable to the connector at the back of the PC (USB port).*

Ambient conditions in the place of operation

Relative humidity: 20% ÷ 90% (without condensation)

Temperature range: 5°C ÷ 35°C

- However, it is important to check that the monitor and printer are preset to operate with voltages other than 230 VAC.
- The power supply cable supplied with the machine complies with the relevant regulations.



WARNING



WARNING

The machine must not be operated in potentially explosive atmosphere.

ELECTRICAL CONNECTIONS

The manufacturer has preset the aligner to operate with a power supply of 230 VAC.
It can be preset to operate on 115 VAC by setting the PC voltage change switch as appropriate.

NOTES

Any operation required for connecting the electrical board of the workshop must be carried out exclusively by qualified personnel and complying with the regulations in force, at the customer's expense and responsibility.

- The electrical supply line must be suitably sized in relation to:
 1. the machine absorbed power, as specified on the machine data plate.
 2. the distance between the machine and the electric hook-up point, in order that the voltage drop at full charge does not exceed 4% (10% during the starting phase) in relation to the rate value of the voltage on the machine data plate.
- The user must:
 1. provide the power supply cable with a plug in appliance with local electrical regulations
 2. connect the machine to a dedicated power line with its own 30 mA circuit breaker
 3. install fuses on the power supply line, suitably dimensioned according to the indications in the general electric diagram in this manual
 4. make sure that the workshop is provided with an efficient ground circuit.
- In order to prevent the machine being used by unauthorised personnel, it is advised to disconnect the power supply plug when the machine remains idle (switched off) for long periods of time
- If the machine is hooked up directly to the main electrical board, without a separate plug to socket connection, a key switch or a switch that can be locked out must be installed to prevent the machine from being used by non-authorised persons.



WARNING

For correct and safe operation of the machine it must be connected to an efficient ground circuit.

NEVER connect the ground wire to a gas pipe, water pipe, telephone line or other makeshift system.



WARNING

Before connecting the power plug to the power panel make sure that the mains voltage is the same as the power supply indicated on the machine data plate.

SAFETY REGULATIONS



WARNING

Failure to observe these instructions and the relative danger warnings can cause serious injury to operators and other persons present.

Do not power up the machine before you have read and understood all the danger/warning notices in this manual.

This machine must be used only by qualified and authorised personnel.

A qualified operator is considered to be a person who has read and understood the manufacturer's instructions, is suitably trained, and is confident with safety and adjustment procedures to be adhered to during operations.

Operators are expressly forbidden from using the machine under the influence of alcohol or drugs capable of affecting physical and mental capacity.

The operator must:

- *Read and understand all instructions on how to use the machine.*
- *Make sure to have a thorough knowledge of the capabilities and features of this machine.*
- *Keep unauthorised persons well clear of the area of operation.*
- *Make sure that the machine has been installed in compliance with established legislation and standards.*
- *Make sure that all machine operators are suitably trained, that they are capable of using the machine correctly and that they are adequately supervised during their work.*
- *Do not touch power lines or the inside of electric motors or other electrical equipment until the power has been disconnected and locked out.*
- *Read this manual carefully and learn how to use the machine correctly and safely.*
- *Always keep this user manual in a place where it can be readily consulted when working with the machine and consult it whenever you are in need of confirmation or explanations.*



WARNING

Do not remove or deface the safety Danger, Warning or Instruction decals. Replace any missing or illegible Danger, Warning or Instruction decal. Missing or damaged decals can be obtained from your nearest SIMPESFAIP dealer.

- *When using the machine and carrying out maintenance on it, observe the standardised industrial accident prevention regulations for high voltage industrial equipment.*
- *Any unauthorised alterations made to the machine automatically release the manufacturer from any liability in the case of damage or accidents in relation with such alterations.*

Specifically, tampering with or removing the machine safety devices is a breach of the regulations for industrial accident prevention.



WARNING

Infrared Radiation!

Key to warning and instructions labels



Unplug the power supply cable before carrying out maintenance/assistance work on the machine.

GENERAL FEATURES

Do not get at close range or exposed too long to infrared radiation. Do not observe directly with optical instruments.

-
- Program developed on the Windows® platform.
 - Angle reading with infrared CCD cameras
 - 0.01 degree data display
 - Databank on Hard disk or CD-ROM
 - User databank and jobs archive
 - On-screen Help available from any point of the program by pressing the dedicated key.
 - Option settings (e.g.: mm / inches, °60, °100, ...) easily configured within each program context using menus invoked by pressing a dedicated key.
 - Primary vehicle databank containing over 19,000 vehicles with the associated reference data for the angles.
 - Personalised vehicle databank, containing the vehicles and data entered by the user using the "insert", "modify", "delete" functions.
 - Vehicles from the primary and personalised databanks displayed in a single list for easier consultation.
 - Handling of reference data for adjustments based on vehicle chassis height (for vehicles which support this mode).
 - Possibility of saving the job sheets of the operations performed on the vehicles ("Customer databank").
 - Guide to vehicle adjustment through animations or slides
 - LCD colour monitor.
 - Colour INKJET printer.
 - Professional alphanumeric keyboard
 - Exceptional operating freedom, the user can shift adjustments as desired
 - Steering measurement in automatic or directly from targets
 - Data can be viewed in sexagesimal, centesimal degrees, millimetres and inches.
 - Graph comparison between data read and the values in the databank
 - Vehicle chassis diagnosis

- Self-centring clamp, 10" to 19", with built-in spoiler adapter

- Off-centre compensation program (ROC):

④ **"Push Mode ROC"**

- ⌚ simultaneous compensation on the four wheels by pushing the vehicle for a distance corresponding to a wheel rotation of approximately 30°; ⌚ applicable to 4WD vehicles (four wheel drive).
- The adjustment windows, with different layouts of the graphic and numeric parts.
- Help function with animated graphic display of adjustment operations.
- Simplified calculation and adjustment of the toe curve. • Other programs:
 - ④ adjustment of the vehicle with wheels raised (jack & hold);
 - ④ calculation and complete adjustment of the toe curve (optional);
 - ④ calculation of databank tolerances and storage of latest generation Mercedes camber and caster values according to the manufacturer's provided procedure (optional);
 - ④ electronic acquisition of chassis height values, very useful when adjusting French cars (optional);
 - ④ calculation and adjustment of the steering rack box height;
 - ④ adjustment of the steering wheel position;
- Utility and diagnosis programs.
- Various types of self-centering clamps are available for the requirements of different wheels.

TECHNICAL DATA

- Measurement fields (in centesimal degrees):

Toe	± 48,00°
Camber.....	± 10,00°
Caster.....	± 30,00°
King pin.....	± 30,00°
Set back.....	± 24,00°
Thrust angle.....	± 24,00°
Steering angle.....	± 24,00°
- Power supply (standard): 230 Vac. - 50/60 Hz
- Absorbed power:500 W •
- Power supply socket protection (mains fuses):..... 3.15 AT - 250 V •
- Net weight:

- Central unit	140 kg
- Target.....	4 kg
- Electrical/electronic components weight: 45 kg
- Noise level in work conditions:..... < 70 db(A)

MACHINE OUTFIT

1 DVD-ROM with programme 1
Instruction manual.
1 Steering wheel holder.
1 Pedal depressor
1 User Manual
1 Spare parts booklet
1 Original accessories booklet

OPTIONAL ACCESSORIES SUPPLIED ON REQUEST

For information, please consult our illustrated catalogue.

WHAT IS AN ALIGNER?

An aligner or wheel aligner is defined as a measurement instrument detecting the characteristic alignment angles of a vehicle.

An aligner consists of a central unit and four targets to be applied to the vehicle wheels.

CHARACTERISTIC ANGLES

1) TOE (Figures 16 and 17)

Toe is the angle between the equatorial plane of the wheel and the axis of symmetry or the thrust axis of the vehicle.

The axis of symmetry is an imaginary line that divides the car into two halves longitudinally; the thrust axis is the direction of travel of the rear axle.

The unit of measurement for toe values is degrees or millimetres (or inches).

2) CAMBER or inclination (Fig. 18)

Camber is the angle between the equatorial plane of the wheel and the vertical plane; camber is positive when the upper part of the wheel is angled away from the vehicle. The unit of measurement for camber values is degrees.

3)) CASTER (Fig. 19)

Caster is the angle formed between the vertical and an imaginary extension from the steering axis on the longitudinal plane of the vehicle (longitudinal upright angle).

Caster is measured with the wheels turned through 10° or 20°. The unit of measurement for caster is degrees.

4) KING PIN angle (Fig. 20)

This is the angle formed between the vertical and the extension of the steering axis on the transverse plane of the vehicle (transverse upright angle).

The king pin angle is measured with the wheels turned through 10° or 20°. The unit of measurement is degrees.

5) Steering angle difference TOE-OUT ON TURN (Fig. 21)

Steering angle toe difference on the front wheels. The angle is conventionally measured with the wheel on the inside of the curve turned through 20°. The unit of measurement is degrees.

6) SET BACK or misalignment of wheels on the same axle (Fig. 22)

This measurement shows the difference in position of one wheel with respect to the other on the perpendicular of the longitudinal axis of the vehicle.

Set back is measured on the front and rear axles of the vehicle; although rear set-back must not be confused with the thrust angle. The unit of measurement is degrees.

7) THRUST ANGLE(Fig. 23)

This is the angle formed between the axis of symmetry of the vehicle and the direction of travel of the rear axle.

The unit of measurement is degrees.

MAIN OPERATIONAL COMPONENTS OF THE MACHINE



WARNING

Get to know your machine. The best way to prevent accidents and obtain top performance from the machine is to ensure that all operators know how the machine works.

Learn the function and location of all commands.

Carefully check that all the commands on the machine are working properly.

To avoid accidents and injury, the machine must be installed properly, operated correctly and serviced regularly.

Central Unit

- *Monitor: shows the jobs screens with the drawings of the angles measured; the operative controls are at the bottom.*
- *Keyboard: used to select the controls and to enter alphanumeric data.*
 - *The ENTER key recalls the control selected with the arrow keys.*
 - *The F2 key is used to go back to the previous step.*
- *Personal Computer: contains and runs the vehicle alignment program. It also contains the electronics to manage the aligner.*
- *Printer: gives out the result of the job done as printouts.*
- *Aligner card, card to enable aligner operation. The second connector is used by the cards included in the upgrading kit.*
- *Power supply plug*
- *Electrical board*
- *Frame grabber card in the PC*

Jobs screen (fig. 7)

- A) *Title (e.g. FRONT AXLE): indicates which procedure is being used.*
- B) *Values read on the vehicle.*
- C) *Databank values*
- D) *Graph comparison between values read and databank values.*
- E) *Target level indications (LEVELS).*
- F) *Representation of angles read at the moment.*
- G) *HELP: used to recall the on-line help.*
- H) *Icon bar: icons to scroll the program. Find further information on the selected icon in the feedback bar.*
- I) *Feedback bar: displays a help message relating to the function of the selected icon.*
- L) *Vehicle name bar: displays the name of the vehicle selected from the databank.*

When a vehicle is selected from the databank the selected market is indicated.

- M) Status bar: displays the system messages.*
- N) Axle values difference: window that indicates the value and the databank reference of the difference of the right and left values of the read angle. This window is shown only then there is a reference value in the databank.*
- O) Working area: section of the screen that shows the information of the job being done.*

INFRARED REMOTE CONTROL

The aligner comes with an infrared remote control to allow the operator to use the aligner software while carrying out measurements and adjustments on the vehicle.

The remote control transmitter has two pushbuttons that correspond to the selections made by the function keys F2 and F3 on the monitor.

To use the remote control correctly, it is advisable to orient the transmitter towards the receiver installed on the central unit (A, fig. 4a) and hold down the desired key for at least a second to guarantee a correct communication.

The power supply system is equipped with a standard 9V battery.

VEHICLE PREPARATION FOR SETTING OPERATIONS

In order to perform wheel alignment correctly, all parts of the vehicle must be in compliance with the manufacturer's specifications; it is especially important to check the tyre pressure and eliminate play in bearings and ball joints.

Position the vehicle over an inspection pit or on a lift that is correctly equipped for alignment operations. Make sure that the turntables and oscillating footboards are locked.

Mount the self-centering clamps on the wheels and lock them on the rim using the handles.

For rims made of steel or with projecting edges, the clamps should be secured from the inside (1, fig. 6); in the case of alloy rims secure the clamps from the outside (2, fig. 6), for rims with plastic covers secure the clamps from the inside with the pins reversed (3, fig. 6).

If necessary, you can tap the wheel clamps gently with the hand to fit the clamp nose between the rim and the tyre bead.

For other types of support clamps with a jaw or dedicated closing device, follow the instructions attached and inserted in the specific package.

Mount the "vertical" targets on the front wheels and the "horizontal" targets on the rear wheels.

SWITCHING THE ALIGNER ON AND OFF

Central unit

Set the rear switch to "I" (On) to turn the aligner on.

Then wait until the starting screen is displayed (fig. 7).

To correctly switch off the aligner:

- go back to the starting screen (fig. 7)

- press the "F10" key;
- confirm by selecting the symbol "✓";
- wait until the computer is off (black screen) and set the rear switch back to "0" (Off).



ATTENTION

Never switch off the machine when there is a page other than the logo page because such an action might damage the PC.

If this should occur, when the PC is switched back on, the software will request the user to press any key to perform the "SCANDISK" operation.

This operation is used to check that the PC has not been damaged and, if necessary, to update some files that might have been damaged.

At the end of the process, if the program reboots normally, then no problems have occurred. Instead, if any message appears that blocks the program start-up procedure, contact the nearest technical assistance centre.

GENERAL CONSIDERATIONS

The equipment simple interface makes operation quick and easy to learn. The operating procedures are generally standardised throughout the program, as summarised below.

Selecting functions

The functions available in each program context are shown as special icons on a bar at the bottom of the screen.

To select a specific function, press the key (from F1 to F10) indicated on the icon in question.

To facilitate and simplify the use of the machine, each key is generally associated with the same type of command in the various program contexts.

In particular:

- F1 displays the on-line "Help".
- F2 equivalent to "Esc", goes back the previous window (except in the starting screen where a password must be entered to shut down the program and switch control to Windows®).
- F3 equivalent to "Enter", advances to the next window.
- F4 calls up a screen of status option settings, subdivided into logical groups. For example: units of measurement, measurement data resolution, ...

The options shown are context-sensitive in relation to the point of the program in which F4 is pressed.

- F10 returns to the starting screen. When pressed from the starting screen, this key exits both the program and Windows®, in order to correctly switch off the PC.
- F5 ÷ F9 have functions which may vary in the context of each specific program.

Scrolling items in a list

To scroll and select items from a list (menu), such as the databank, use the ↑, ↓ arrow keys and the Page↑, Page↓ page up/down keys.

Some times the values in a table can be selected by scrolling up or down through the fields provided using the F5 or F6 keys.

In some cases an item can be selected directly by typing its first letter.

Setting an option

To change the options in the screens called up by pressing the F4 key, use the "Tab", "Shift" + "Tab" keys to move from one group of options to the next, and the ↑, ↓ arrow keys to scroll through the individual options within the selected group.







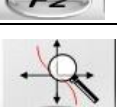

Press the F3 key to exit the Setup window and save the settings.









When the system then prompts confirmation of the choice made, you may:







- select F2 to not save the changes made
- select F3 to confirm the settings made
- select F4 to abort the saving procedure and remain in the set-up window.





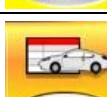
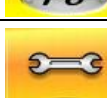









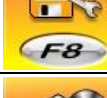
The table below lists the various icons and their corresponding functions.



Each icon also indicates the associated function key.






SYMBOL	FUNCTION DESCRIPTION
	Invokes the on-line Help
	Exits the on-line Help
	Exits the aligner program and go to the Windows desktop (available only from the starting screen)
	Returns to previous screen
	Exits the confirmation window without saving the settings that have been changed (only available in the confirmation windows)
	Exits the confirmation window and confirms the choice made.
	Selects the toe curve checking procedure.
	Selects the toe curve adjustment procedure.

	<i>Advances to next screen</i>
	<i>Exits the confirmation prompt window and saves the settings that have been changed (only available in the confirmation windows)</i>
	<i>Exits the confirmation window without confirming the choice made</i>
	<i>Aborts the confirmation prompt window and returns to the work or setting selection window (only available in the confirmation windows)</i>
	<i>Resets job count to zero</i>
	<i>Displays the aligner set-up window (in the main window); displays the contextual set-up window (in the working windows)</i>
	<i>Exits the confirmation window without confirming the choice made</i>
	<i>Exits the confirmation window and confirms the choice made.</i>

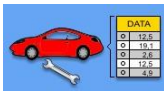

	<i>Aborts the confirmation prompt window and returns to the work or setting selection window (only available in the confirmation windows)</i>
	<i>Decreases the rim diameter measurement</i>
	<i>Scrolls down to the next item in a list (only available in windows with a list of options)</i>
	<i>Chooses adjustment of the vehicle axle with the wheels raised</i>
	<i>Concludes adjustment of the vehicle axle with the wheels raised</i>
	<i>Displays the next page, the windows which contain a large amount of information are divided into pages. (E.g. On-line help, job record management, etc.)</i>
	<i>Displays the Smart Card "Data Form" window (only available in the Diagnosis window)</i>
	<i>Displays the job record management window</i>
	<i>Resets any steering wheel alignment correction values already in the memory</i>
	<i>On/off function for maximum steering angle check. When the option is enabled an icon displaying a turntable appears in the top right-hand corner of the heading bar.</i>
	<i>Prints the current window.</i>
	<i>Switches between display of the caster, total toe and setback adjustment boxes. (only available in the front axle adjustment window).</i>
	<i>Switches between display of the camber, track difference and setback adjustment boxes. (only available in the rear axle adjustment window).</i>
	<i>Accesses and performs the procedure for update of the enabled programs, using the smart card (in the service procedure)</i>
	<i>Deletes the selected datum (a Make, Vehicle, Customer or Job)</i>
	<i>Loads the data of the last job saved into the memory</i>
	<i>No job available for loading into the memory</i>

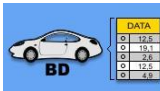





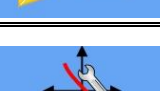
	<i>Increases the rim diameter measurement</i>
	<i>Scrolls up to the next item in a list (only available in windows with a list of options)</i>
	<i>Displays the Make - Vehicle - Customer modification window</i>
	<i>Transmits data between the PC and the (optional) chassis height and angle measurement instrument.</i>
	<i>Displays the vehicle record window.</i>
	<i>Displays the vehicle adjustment window, showing the adjustments of the various angles for the selected vehicle.</i>
	<i>Deletes the selected item (Make - Vehicle - Customer - Job) (Make - Vehicle entered by the user).</i>
	<i>Opens the customer record management window.</i>
	<i>Prints out the final record of the job done.</i>
	<i>Sets chassis clearance data input with unit of measurement in millimetres.</i>
	<i>Sets chassis clearance data input with unit of measurement in degrees.</i>
	<i>Displays the window for input of a new Customer - Vehicle - Make - Operator.</i>
	<i>Displays the operator management window.</i>
	<i>Displays a window with a list of working windows. Used for skipping between windows.</i>
	<i>Displays the service programme selection window.</i>
	<i>Recalls the window for selection of the vehicle from the databank.</i>

	<i>Skips vehicle selection from the databank by selecting "typical vehicle" mode.</i>
	<i>Blocks data to allow for target levelling.</i>


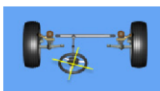




	<i>Unblocks previously blocked data to allow for target levelling.</i>
	<i>Opens the job record for input of the customer and vehicle data</i>
	<i>Aborts the job in progress and goes back to the "starting screen".</i>
	<i>Exits the aligner program and Windows, initiating the correct power-down procedure (available only from the starting screen)</i>
	<i>Returns to the window which opened a list of options (only available in windows with a list of options).</i>

The tables below provide a list of the icons available in the windows, with a list of options (menus for skipping between windows) and the description of the relative functions.



MENU AVAILABLE IN JOB STATUS	
SYMBOL	FUNCTION DESCRIPTION
	Data summary: <i>(Displays the window which summarises the adjustment data for the current vehicle).</i>
	Databank: <i>(Displays the window to select a vehicle from the databank).</i>

	Databank Summary: (Displays the window with the adjustment data for the current vehicle, taken from the databank).
	Steering angle: (Displays the window to carry out the steering lock for measuring caster, king pin, included angle and maximum steering angle).
	Rear Axle: (Displays the rear axle adjustment window).
	Front Axle: (Displays the front axle adjustment window).
	Ballast and fuel: (Displays the window for ballast location and fuel quantity, (only available for vehicles which require ballast and/or known quantity of fuel).
	Previous jobs (Displays the window containing the list of jobs saved previously, to allow comparison with the current measurement).
	Toe curve: (puts into execution the toe curve adjustment procedure).

MENU AVAILABLE IN SERVICE STATUS

SYMBOL	FUNCTION DESCRIPTION
	Demo: (Sets the aligner program in demo mode, without using targets).
	Crooked Steering Wheels: (Starts the crooked steering wheel adjustment procedure).
	Technical Assistance: (Displays the diagnosis window to set-up the targets, to read the settings enabled in the smart card).
	Job Count: (Command to run the visualisation of the jobs performed by the wheel aligner; the visualisation is protected with a password). This function is visible only if enabled in the wheel aligner general set-up.
	DATA BACKUP Procedure: The aligner can "Save data" in any valid disc (Hard Disk, USB support, etc.). The Program manages data storage and keeps available the last five (5) saves on the local disc drive (Disc C, Disc D, etc. corresponding to the permanent disc drives (Hard Disk) installed on the PC).
	DATA RESET Procedure: The "Data reset" procedure is carried out only in manual mode. Before resetting data, the machine performs a backup of the data to be replaced.

MENU AVAILABLE IN THE ROC STATUS

SYMBOL	FUNCTION DESCRIPTION
	
	

Push-mode ROC: (selected to perform the ROC without removing the vehicle's wheels from the lift or from the floor. Carried out by pushing the vehicle backwards about 30 and then forwards up to the starting point).

ROC skip: (The working procedure moves on straight to the working windows, without performing the ROC calculation).

ROC Recall: (Recalls the data from the last ROC procedure performed. Normally used when the data have to be recovered, without having to repeat the ROC procedure, after a power failure while a job is in progress).

ERROR WINDOW

The window shown in figures 14-15 is displayed when there is a reading or measurement error. The figure shows the two vehicle axles and a line plus an arrow indicate between which targets the error is present.

In these cases, the cause of the error must be corrected in order to resume normal operation.

If this is not possible, press F10 to go back to the starting screen and correctly exit the program.

Then call in the Technical Support Service.

If the program is used only as a demo, without using the targets, the program should ignore the measurement and transmission errors resulting from the absence of targets.

To do this, select the "Demo" option in the "Service" window.

To access the service window, press the F8 key from the program starting screen.

In this situation ("Demo" mode), a special icon is displayed in the top right-hand corner of the heading bar. The values displayed are completely random.

At the end of the demo, remember to repeat the same procedure to return the machine to working status.

MAIN WINDOW

The following keys are active in the main (initial) window (fig. 7):

- F1 displays the on-line "Help".
- F2 exits the alignment program (with password prompt) and return to the Windows desktop.
- F3 (or "Enter") goes to the next screen in the established operation sequence (job record, vehicle / customer databank, compensation, measurement).
- F4 sets up all the status option settings (set-up).
- F6 recovers the last job done (with icon active).
- F8 opens the utility procedures window.
- F9 skips vehicle selection from the databank ("generic vehicle" mode).
- F10 exits the alignment program and Windows **with the correct power-down procedure**.

Press the F4 key to display/set up all the aligner options.

The general set-up function (F4 from the starting screen) has been provided because some users prefer to change all the available options before starting the measurement procedures. In all the working windows, press the F4 key to display/set up all the options relating to the current working window.

Tilt level selection

Pressing ALT-O you access the page shown in Fig. 30, in which the current operator can be selected by double clicking on the name.

Some icons are located at the bottom of the screen that are used to set the camera tilting to the preset levels:



Tilting reset and positioning to the factory predefined position.



Tilting positioning in the predefined position for ROC.



Tilting positioning in the predefined position for the steering lock.



Tilting positioning in the predefined position for the adjustment.



Tilting positioning in the 1st auxiliary position.



Tilting positioning in the 2nd auxiliary position.

Click on the F2 icon to return to the initial page.

JOB RECORD WINDOW

If vehicle selection by means of job record has been set in the machine set-up as alignment operating procedure, the job record input window is displayed automatically.

This window allows entering vehicle data, customer data and the vehicle make/model selection following the procedures described in the "General Considerations" section.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 returns to the previous window
- F3 (or "Enter"): advances to the next window - F4 sets:

 ⌘ Units of measurement:

 ⑨ Pressure

- Bar
- Psi.

 ⑨ Mileage/Kilometres on the clock

- Kilometres

- Miles ↔ Job record

⑨ *Type*

- *Minimal*
- *Complete*
- *F5 to access job record management*
- *F6 to access vehicle record management*
- *F7 to access customer record management*
- *F8 to access operator record management*
- *F9 to access the databank and select the vehicle make/model (the databank can also be accessed by pressing the down arrow on the "Make" line)*
- *F10 aborts the job in progress and returns to the starting window.*

Notes

- *By entering the customer and vehicle data, the program checks if the same data are already stored in the file. If the data are already stored, the page is automatically filled in with the previously stored data. If all of or some data are not present, they will be stored upon job completion only.*

Note: Data storage is performed only if set in the wheel aligner general set-up.

JOB RECORD MANAGEMENT WINDOW

To access this window, press the F5 key from the job record input window.

It displays the list of jobs saved on file. To make the selection, proceed as described in the "General considerations" section.

The following keys are active in this window:

- *F1 displays the on-line "Help" function*
- *F2 goes back to the previous window*
- *F3 (or "Enter"): confirms selection of a job and advances to the window which displays the job record on file.*
- *F4 orders the job record list according to:*

To access this window, press the F6 key from the job record input window.

It displays the list of vehicles saved on file.

To make the selection, proceed as described in the "General considerations" section.

The following keys are active in this window:

- *F1 displays the on-line "Help" function*
- *F2 returns to the previous window*
- *F3 (or "Enter") confirms selection of a vehicle and advances to the window which displays the vehicle data.*

- F5 to print the complete list of the vehicles stored in the file.
- F6 modifies the data of the vehicle selected from file
- F7 deletes the selected vehicle from file
- F8 enters a new vehicle on file
- F10 returns to the job record input window.

- Date;
- Customer;
- Vehicle registration number;
- Operator;
- Order number

- F5 complete list of the jobs in the file.
- F7 deletes the job record selected from file
- F10 returns to the job record input window.

VEHICLE RECORD WINDOW

Notes

- Press F8 to enter a new vehicle; the program checks if it is stored in the file when the car number is entered. If the data are present, the program signals it and asks if they have to be displayed. If you answer yes, the window is automatically filled in. If you answer no, an empty window appears so that the car number can be entered.
- If the customer data are changed or new data are entered for the first time, the program asks if you wish to access the customer data sheet management window for entering and storing the data.

CUSTOMER RECORD WINDOW

To access this window, press the F7 key from the job record input window.

It displays the list of customers saved on file.

To make the selection, proceed as described in the "General considerations" section.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 returns to the previous window
- F3 (or "Enter") confirms selection of a customer and advances to the window which displays the customer data.
- F5 to print the complete list of the customers stored in the file. - F6 modifies the data of the customer selected from file
- F7 deletes the selected customer from file
- F8 enters a new customer on file
- F10 returns to the job record input window.

Notes

- Press F8 to enter a new customer; the program checks if the customer is stored in the file when the relevant data are entered. If the data are present, the program signals it and asks if they have to be displayed. If you answer yes, the window is automatically filled in. If you answer no, the window appears completely empty.

OPERATOR RECORD WINDOW

To access this window, press the F8 key from the job record input window.

It displays the list of operators saved on file.

To make the selection, proceed as described in the "General considerations" section.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window
- F3 (or "Enter") confirms selection of an operator and advances to the window which displays the operator's data.
- F5 prints the complete list of the operators stored in the file.
- F6 modifies the data of the operator selected from file
- F7 deletes the selected operator from file
- F8 enters a new operator on file
- F10 goes back to the job record input window.

Notes

- Press F8 to enter a new vehicle; the program checks if the operator is stored in the file when the relevant data are entered. If the data are present, the program signals it and asks if they have to be displayed. If you answer yes, the window is automatically filled in. If you answer no, the window appears completely empty.

In addition to his first and last name, the operator must also enter the operating mode, which refers to the tilting settings set using the Service programme.

From the menu in figure 30, the operator can be set as predefined and the numerical keypad can be enabled for quick tilting positioning.

Once the numerical keypad has been enabled, pressing keys 1,2,3,4,5 accesses the following tilting levels:

- 1: Predefined position for the ROC
- 2: Predefined position for the steering lock
- 3: Predefined position for adjustment
- 4: 1st Auxiliary position
- 5: 2nd Auxiliary position

FILE DATA MODIFICATION WINDOW

The modification screens refer to:

- Vehicle makes in databank (makes entered by the operator)
- Vehicle models in databank (models entered by the operator)
- Customers on file
- Vehicles on file
- Operators on file

To make a modification, proceed as follows:

- select the field to be modified using the "Tab" or "Shift" + "Tab" keys (if the window contains more than one field)
- enter a new character/value over the letters or numbers of the selected item - re-enter the correct value.

To confirm the changes made and exit this window, proceed as follows:

- press the F3 key; you will be prompted to confirm saving of the modified data.

To enter the data, proceed as follows:

- select the field to be entered using the "Tab" or "Shift" + "Tab" keys (if the window contains more than one field)
- type a character/value

To confirm the data entered and exit this window, proceed as follows:

- press the F3 key; you will be prompted to confirm saving of the data. - press F3 to confirm,
- press F3 to confirm.

If you do not wish to confirm saving, press F2.

FILE DATA INPUT WINDOW

The data input windows refer to:

- Vehicle makes in databank;
- Models of vehicle in databank;
- Customers on file;
- Vehicles on file;
- Operators on file.

If you do not wish to confirm saving, press F2.

When entering a new item, the system prompts the user with data for a similar vehicle to simplify the entry of the tolerance data.

Notes

The data for a new customer and/or a new vehicle can also be entered at the end of the measurement and adjustment procedure of a model chosen from the vehicle databank.

In the printing window, a message prompting the input of data will appear when saving of data on request or in automatic mode has been set in the set-up. In the printing window, the data input window is accessed by pressing the F9 key.

VEHICLE MAKE AND MODEL SELECTION WINDOW

If display of the vehicle make and model selection window has been set as part of the operating sequence in the machine set-up, this window appears automatically.

It allows the user to select the make of the vehicle using the procedures described in the "General Considerations" section.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window
- F3 (or "Enter"): confirms selection of a make and advances to model selection window - F4 chooses whether to display:
 - ⑨ Makes/models file
 - all the available makes;
 - only makes from the primary databank;
 - only user-defined makes in the secondary (personalised) databank.
 - ⑨ Markets
 - Argentina
 - Brazil

- China
 - Europe
 - Japan
 - Korea
 - Asia
 - North Africa
 - North America
 - Oceania
 - South Africa
 - South America
 - ⑨ Listing order
 - Alphabetical
 - By date
 - ⑨ Vehicle description
 - Commercial
 - Manufacturer
- F6 modifies a previously entered make (only for user-entered makes)
- F7 deletes a previously entered make (only for user-entered makes if there are no associated models).
- F8 enters a new make (see paragraph "Enter/Modify window") - F10 returns to the starting window.

Notes

- The aligner cannot be operated unless a hardware protection key (SIM) has been inserted.
- The main protection circuit board configured for the basic version is supplied with the machine.



ATTENTION

For the wheel aligner to operate, the main card must always be present and fitted into the slot inside the unit; in case of malfunction, make sure that the reader is wired correctly as described in the User manual.

- At start up, the program checks for the sim card and operating levels enabled. If the sim card is not detected, an error message is displayed (fig. 24). The program can be used only in demo mode.
- Check that the "smart card" reader next to the PC is correctly connected to the computer and/or there is a "sim card" in the reader or it is adequately inserted
- To check the "sim card" is correctly inserted, remove the plastic front cover (A, fig. 25) to reach the reader card where there is a specific compartment (A, fig. 26) at the top.

NOTES

- To give an idea of the sim card card and its location in the card, fig. 26 illustrates how it should be extracted: press with your thumb on the centre of the card to release the two connecting tabs and extract the sim card to be used.
- Insert the sim card with its golden connector (B, fig. 26) facing down and the front right chamfer towards the outer side, as shown in fig. 26 and push as far as it will go.
- After checking, replace the plastic front cover of the reader.
- At start up, the program, besides checking for the sim card, also checks the operating levels enabled on the card.

- If a databank upgrade is installed without entering the upgrade smart card, the enabling for use of the new databank will not be added to the sim card, so the program will continue to display the databank enabled previously.
- The "smart cards" related to the upgrades are inserted in the slot "A", with their golden contacts facing up (C, fig. 25).

Key to data bank abbreviations

/	<i>Separates different models</i>
4WD	<i>Four Wheel Drive</i>
4WS	<i>Four Wheel Steering</i>
4x4	<i>Four wheel drive</i>
8565050+	<i>From this chassis number on</i>
8565050-	<i>Up to this chassis number</i>
ALU	<i>Lightweight alloy wheels</i>
AS	<i>Pneumatic suspension system</i>
HS	<i>Hydraulic suspension system</i>
CAB	<i>With cab</i>
CABR.	<i>Cabriolet</i>
CYL.	<i>Cylinders</i>
DR	<i>Door</i>
ESTATE	<i>Estate version (station wagon)</i>
FWD	<i>Front wheel drive</i>
HD	<i>Hard drive or off-road use</i>
LHD	<i>Left hand drive</i>
PAS	<i>Power assisted steering</i>
R	<i>Radial</i>
RHD	<i>Right hand drive</i>
BT	<i>"BIAS" tyre</i>
RT	<i>Radial tyre</i>
RWD	<i>Rear wheel drive</i>
S	<i>Special or sport</i>
SPORT	<i>Sport</i>
SLS	<i>Self levelling suspensions</i>
STD	<i>Standard automobile</i>
SW	<i>Station wagon</i>
T	<i>Turbo</i>
TD	<i>Turbo diesel</i>
TDI	<i>Turbo diesel injection</i>
XP	<i>Normal tyres</i>
IRS	<i>Independent rear suspensions</i>
IFS	<i>Independent front suspensions</i>
SPS	<i>Sports suspensions</i>
SWB	<i>Short wheel base</i>
MWB	<i>Medium wheel base</i>
LWB	<i>Long wheel base</i>
MM/AA+	<i>After the indicated date (month/year)</i>
MM/AA-	<i>Before the indicated date (month/year)</i>

"COMPENSATION" (ROC) WINDOW

Used to select and execute the procedure to compensate for the rim out-of-centre and out-of-plane following the mode set by the selected method (figures 9-10-11).

The following ROC options are available:

- **Push-mode ROC**
- **ROC skip**
- **ROC Recall**

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window
- F3 starts the selected ROC procedure (to move on to the next screen if the ROC Skip or ROC Recall procedure has been selected)
- F4 sets up the desired type of default compensation procedure and selects the vehicle weight unit of measurement:

☞ Roc

⑨ Roc

- "Push-mode ROC (90° movement)
- "ROC Skip"
- "ROC Recall" ☞ unit of measurement:

⑨ Weight • Kilograms

- Pounds.

- F5 used to scroll downward through the list of ROC options available
- F6 used to scroll upward through the list of ROC options available - F10 used to go back to the starting screen.

Push-mode ROC



Select the icon

Fit the 4 targets to activate the procedure.

- 1) Place the vehicle on the lift on over the pit with front wheels straight and lock the steering wheel with the steering lock.
- 2) Fit the targets on the wheels but do not lock the brake.
- 3) Follow the on-screen instructions.
- 4) Move the vehicle backwards so that the wheels complete a 30° rotation.
- 5) Move the vehicle forwards back to the initial position.
- 6) If the values of the final position differ a lot compared with the initial values, a procedure error is signalled

ROC skip



Select the icon to go directly to "Steering angle measurement at 10° or 20°" without the need to carry out any operation on the targets and inhibiting compensation.

Fit the 4 targets and wait until the compensation skip operation is over. The operations can be continued with the front targets only; the rear targets cannot be used afterwards.

Note: The rim geometric errors and the clamp fitting errors are not considered. In such cases, automobiles with hard suspensions and alloy rims) it is best to skip compensation, since after the car is lifted suspensions can adopt in a setting position different from that used for running. This may lead to more important errors regarding rim deformation.

Previous ROC



Select the icon to go directly to "Steering angle measurement at 10° or 20°" without the need to carry out any operation on the targets, recalling the compensation previously carried out on the targets. Fit the 4 targets and wait until the compensation skip operation is over. The operations can be continued with the front targets only; the rear targets cannot be used afterwards.

Note: This procedure is advisable when the targets have not been removed from the wheels, but for any reason it has been necessary to restart the alignment procedure.

CHASSIS CLEARANCE WINDOW

After ROC has been performed, if the selected vehicle requires certain databank values to be varied as a function of the height of the chassis at specific points, the chassis clearance window is displayed.

The operator must select the height values on the displayed tables, which most closely match those of the vehicle in question.

To make the selection, proceed as described in the "General considerations" section.

In certain cases it is not possible to make a selection; the displayed height values are "prescribed" values, i.e. the only correct references for databank values, to be achieved if necessary by applying weights to the vehicle.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F3 (or "Enter"): goes to the next window in the established operating sequence.
- F10 goes back to the starting screen.

DATABANK SUMMARY WINDOW

Shows the databank values for the selected vehicle and allows the rim diameter to be changed using the F5 and F6 keys (fig. 8).

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window

- F3 goes to the next window in the established operating sequence - F4 to set the unit of measurement and the alignment procedure:

↻ unit of measurement

⑨ Toe angle

- Degrees;
- Length;

⑨ Diameter

- Diameter selected by user
- Diameter 28.65;
- Diameter 27.28;
- Diameter 400 mm

⑨ Setback and Track Difference

- Degrees;
- Length;

⑨ Length

- Millimetres;
- Inches;

⑨ Angles

- Centesimal degrees;
- Bar;
- Sexagesimal degrees;

⑨ Pressure

- Psi;

⑨ Weight

- Kilograms;
- Pounds; ↻ Alignment procedure

⑨ View Databank values

- Yes;
- No;

- F5 decreases the rim diameter measurement

- F6 increases the rim diameter measurement

- F7 displays the vehicle adjustment window

- F8 displays a window with a list of working windows. Used for skipping quickly between windows.

- F10 returns to the starting window.

ANIMATION WINDOW

This window is recalled by pressing key F7 from the following windows:

- Databank data summary; - Rear axle adjustment - Front axle adjustment.

This window is used for playing video clips, which illustrate the procedure for adjusting the following angles:

- rear toe

- rear camber (or inclination)

- front toe

- toe curve (for Audi/Volkswagen)

- front camber (or inclination)

- caster

- king pin angle (King pin)

Certain angles may be adjusted, in which case the corresponding animations will or will not exist, as indicated by the graphics. To select a video clip, press key F5 or F6 and then press to switch to F3 step-by-step display.

When the video clip of the adjustment has finished, key F5 or F6 can be used to scroll through the various steps of the procedure.

To switch from step-by-step viewing mode to selection of an angle video clip for display, use the "Tab" or "Shift" + "Tab" keys.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 (or "Esc"): halts playback of the clip or returns to the previous screen
- F3 (or "Enter"): starts or replays the animation
- F5 Scrolls down through the adjustment selection list /moves on one step in display of the clip for an adjustment.
- F6 Scrolls up through the adjustment selection list /moves back one step in display of the clip for an adjustment.
- F10 returns to the starting window.

STEERING WINDOW

For executing the 10° or 20° steering for calculating: caster, king pin angle, included angle, toeout on turn at 20° (fig. 12).

If turntables with graduated scales are fitted, maximum steering can also be measured visually and the reading performed can be entered in a suitable window using the keyboard. Admitted values range from 21.00° to 99.99°; if a value out of that range is entered, the program changes the entered value to the lowest admitted value (21.00°).

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window - F3 advances to the next screen - F4 sets:
 - ☞ Unit of measurement
 - ⑨ Angles
 - Centesimal degrees
 - Sexagesimal degrees
 - ☞ Wheel aligner
 - ⑨ Turntables enabled;
 - Always;
 - On request;
 - Never;
 - Yes, steering box check;
 - ⑨ Caster measurement steering lock
 - 20 Degrees
 - As chosen by user
- F8 displays a window with a list of working windows. Used for skipping quickly between windows.
- F10 returns to the starting screen.

To perform the standard steering procedure, follow the on-screen instructions and proceed as described below:

- release the turntables;
- align the wheels by following the on-screen indicator until "STOP" is displayed;

- lock all the targets, perfectly level
- turn the wheels 10° or 20° to the left until the "STOP" message is displayed;
- wait for the data acquisition and for the turn-right arrows to appear;
- turn the wheels 10° or 20° to the right (relative to the centre position) until the "STOP" message is displayed;
- wait for the data acquisition and for turn-left arrows to appear; • turn the wheels back to the left to straighten the steering.

If the full steering procedure has been selected, proceed as follows:

- release the turntables;
- align the wheels by following the on-screen indicator until "STOP" is displayed;
- Set the graduated scale necessary for measuring maximum steering to zero on both turntables.
- lock all the targets, perfectly level
- turn the wheels 10° or 20° to the left until the "STOP" message is displayed;
- wait for the data acquisition;
- turn the wheel further to the left until the steering wheel locks;
- read the graduated scale on the turntables, the internal (left wheel) and external (right wheel) maximum steering angle and enter the read values in the corresponding fields on the relevant data input window.
- turn the wheels 10° or 20° to the right (relative to the centre position) until the "STOP" message is displayed;
- wait for the data acquisition;
- turn the wheels further to the right until the steering wheel locks;
- read the graduated scale on the turntables, the internal (right wheel) and external (left wheel) maximum steering angle and enter the read values in the corresponding fields on the relevant data input window.
- turn the wheels back to the left to straighten the steering.

The full steering procedure implies the use of turntables with graduated scale, of suitable sizes.

At the end of the steering procedure, a screen is displayed, with icons indicating the operations to be performed next:



Position the steering wheel with the spokes straight



Lock the steering wheel

Press F3 (Enter) to confirm and advance to the next screen.

At this point the system acquires and saves the "diagnosis" data for the vehicle, i.e. the values describing the state of the vehicle prior to adjustment.

These values are then shown on the screen of the measurement data summary table.

REAR AXLE MEASUREMENT AND ADJUSTMENT WINDOW

Displays the measured angles for the vehicle rear axle and the adjustment reference tolerances (fig. 13).

The values are continually updated to guide the operator performing the adjustment.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window - F3 (or Enter): advances to the next window - F4 sets:
 - ⌘ Unit of measurement
 - ⑨ Toe angle
 - Degrees;
 - Length;
 - ⑨ Setback and Track Difference
 - Degrees
 - Length
 - ⑨ Length
 - Millimetres
 - Inches
 - ⑨ Angles
 - Centesimal degrees
 - Sexagesimal degrees ⑨ Pressure
 - Bar
 - Psi ⑨ Weight
 - Kilograms
 - Pounds
 - ⑨ Mileage/Kilometres on the clock
 - Kilometres
 - Miles
 - ⌘ Alignment procedure
 - ⑨ Adjustment with car lifted
 - On;
 - Off;
- F5 enables/disables execution of the "Jack & Hold" procedure
- F6 switches between display of the camber, Track Difference and Setback adjustment boxes - F7 displays the animation window
- F8 displays a window with a list of working windows. Used for skipping quickly between windows.
- F10 returns to the starting screen.

Notes

- The numeric values are colour-coded as follows:
 - Red background: value outside the permitted tolerance range;
 - Green Background: value within the permitted tolerance range;
 - Blue background: value with no associated reference tolerance range;
- Animated icons that respond to the progress in the adjustment procedure appear beside the adjustment value display fields.

The icons assume the following forms:

- Large icon with pointer.

Provides an approximate indication of the status of the angle and the wheel position (shown on an arc with different coloured zones: red zones mean value outside tolerance range, central green zone mean acceptable value);

The large icon with pointer ceases to be animated and the coloured arc disappears when there are no tolerance values for the vehicle selected.

- Small icon with coloured scale.

Provides a high-precision reading, appropriate to the tolerance value, of the variations in the adjustment value in relation to the tolerance value. Displayed instead of the large icon with pointer when this icon gives a reading in the green zone. The reading is provided on a graduated bar. When the wheel value is near the limits of the tolerance range, the bar background is white. It switches to green when the wheel adjustment value is at +/- 4 grades from the nominal setting value.

- *At the bottom of the window, over the F5 and F6 keys, there is the status of the levelling gauges of the targets applied on the axle being measured.*

- *Inches*

- ⑨ *Angles* ○

- Centesimal degrees*

- *Sexagesimal degrees*

- ⑨ *Pressure* ○ *Bar* ○ *Psi*

- ⑨ *Weight* ○ *Kilograms* ○ *Pounds*

- ⑨ *Mileage/Kilometres on the clock* ○ *Kilometres* ○ *Miles*

- ☞ *Alignment procedure*

FRONT AXLE MEASUREMENT AND ADJUSTMENT WINDOW

Displays the measured values for the vehicle front axle and the adjustment reference tolerances.

The values are continually updated to guide the operator performing the adjustment.

The following keys are active in this window:

- F1 displays the on-line "Help"
- F2 goes back to the previous window
- F3 (or Enter): advances to the next window
- F4 sets:

 ⌘ Unit of measurement

 ⌚ Toe angle

 ○ Degrees

 ○ Length

 ⌚ Setback and Track Difference

 ○ Degrees

 ○ Length

 ⌚ Length

 ○ Millimetres

 ⌚ Adjustment with car lifted ○

 On; ○ Off;

- F5 enables/disables execution of the "Jack & Hold" procedure
- F6 switches between display of the caster, Total Toe and Setback adjustment boxes
- F7 displays the animation window
- F8 displays a window with a list of working windows. Used for skipping quickly between windows.
- F9 freezes / de-freeze the caster values measured so that the operator can level again the targets.
- F10 goes back to the starting window.

Remarks

- *If the steering angle procedure has not been performed, the caster adjustment boxes are displayed completely empty.*
- *If the steering angle procedure is performed, the front adjustment window is displayed, with not-level front targets, caster registration boxes are displayed completely empty, with the outof-level target indications beside.*
Level the targets so that the data in the registration box can be viewed (in this case it is not necessary to press the F9 key to freeze the caster measurement values as the software automatically and imperceptibly executes this operation).
- *While detecting caster, and if the variation is big, the front target may incline so that it causes a major error on the toe and setback values calculated. If this condition occurs at the end of the adjustment, it is recommended to proceed as follows:*
 - *press F9 to lock (freeze) the displayed caster value (shown on yellow background);*
 - *position the sensor in a visually horizontal position (level); - press F9 again to unlock the caster value; - adjust the toe.*
- *If a clamp or a wheel had to be demounted in order to adjust caster or camber, a new compensation must be performed on that wheel. The only type of compensation (ROC) that can be performed out of the ROC environment - consult the "Compensation" (ROC) window section- is the three-point ROC.*

MEASUREMENT SUMMARY WINDOW

The measurement summary window (fig. 28) can be called up from different parts of the program by pressing the F8 key, selecting the "Data Summary" option from the list and pressing the F3 key.

This window shows the tolerance value and current adjustment measurements of all the vehicle axles.

The following keys are active in this window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window - F3 (or "Enter") goes to the next window - F4 sets the units of measurement:

- ⑨ Toe angle ○

- Degrees; ○

- Length;

- ⑨ Setback and Track Difference

- Degrees

- Length

- ⑨ Length ○

- Millimetres ○

- Inches

- ⑨ Angles ○

- Centesimal

- degrees ○

- Sexagesimal

- degrees

- ⑨ Pressure ○ Bar

- Psi

- ⑨ Weight ○

- Kilograms ○

- Pounds

- F10 returns to the starting window.

PREVIOUS JOBS WINDOW

The window can be called up from different parts of the program by pressing the F8 key, selecting the "Previous Jobs" option from the list and pressing the F3 key.

If the job record (at least the registration number) has been filled in for the vehicle being measured, when this function is accessed the program displays the list of jobs already saved for the vehicle; otherwise, it displays the full list of all the jobs on record, to allow selection of the job required.

After selecting the memorised job for display, press F3 and the screen will display all the values saved and the values currently measured, to allow easy comparison, so any shifts in the vehicle's geometry can be identified at a glance.

The following keys are active in the job record selection screen:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window
- F3 (or "Enter") goes to the next window - F4 to print the list of jobs on record
- F10 goes back to the previous window.

The following keys are active in the screen which compares with saved and current values:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window
- F7 prints the comparison between the saved and current values.
- F10 goes back to the previous window.

TOE CURVE WINDOW

The window can be called up from the front axle adjustment window only, by pressing the F8 key, selecting the "Toe Curve" option from the list and pressing the F3 key.

It allows the manual toe curve measurement and adjustment procedure to be performed. The "preparing vehicles for wheel alignment" window is displayed. Follow the instructions indicated and press F3.

The toe curve adjustment window is displayed; adjust, then press F3.

The "preparing vehicles for wheel alignment" window is displayed again. Follow the instructions indicated and press F3 to go back to the front axle adjustment procedure.

The following keys are active in the "preparing vehicles for wheel alignment" window and in the "Toe curve" window:

- F1 displays the on-line "Help" function
- F2 goes back to the previous window
- F3 (or "Enter") goes to the next window
- F7 displays the vehicle adjustment window - F10 goes back to the previous window.

PERSONALISED PRINTOUT WINDOW

Displayed at the end of a measurement cycle (fig. 27).

Used to set the advertising message that will appear on the printout, together with the number of copies.

JACK & HOLD PROGRAM

This program is started by selecting the corresponding F4 menu option from the wheel aligner program starting window.

It allows the vehicle characteristic angles to be adjusted with the axle concerned lifted, by first locking ("freezing") the value displayed for the lowered vehicle, so that the variations caused by the lifting operation are ignored.

Follow the graphic prompts on the screen, described below:

- *press F5 with the vehicle lowered to lock (freeze) the values;*
- *level all the targets*
- *lift the vehicle;*
- *level all the targets again;*
- *press the F3 key to confirm that the vehicle has been lifted;*
- *perform the adjustment;*
- *press the F5 key to lock (freeze) the values again;*
- *level all the targets again*
- *lower the vehicle;*
- *level all the targets again;*
- *press the F3 key again to confirm that the vehicle has been lowered.*

SERVICE PROCEDURE WINDOW

The service window is accessed by pressing key F8 from the wheel aligner program starting window.

A list of the options available is displayed:

- *Demo;*
- *Technical Assistance;*
- *Job Count (if enabled in the wheel aligner general set-up – F4 from the Logo page).*

Select an option and press F3 to access the chosen procedure.

Demo

Select the "Demo" option and press key F3 to enable/disable operation of the program in demo mode. Target cannot be used in demo mode, all values viewed are random. Enabling/disabling of this function is indicated by an icon (red X over a white car) in the top right-hand corner of the working window.

Target test

This window is used to check the correct operation of the targets when they are used on a vehicle.

The following keys are active in this window:

- *F1 displays the on-line "Help" function - F2 goes back to the previous window - F10 goes back to the starting menu window.*

Technical Assistance

Window for use by the technical support service only.

Users are urged not to access this window. Improper use of the procedures in this program section may cause aligner malfunctions.

Job count

This option is visible only if previously enabled in the wheel aligner general set-up.

To access the "Job Count" window, enter the password (the password is not indicated in this manual for security reasons).

If interested in this option, please request the password from the support service.

The total count of the jobs performed is indicated in the left section of the two-section window (Fig. 29). In the left section, the job count per working day is displayed together with a calendar from where to choose a day to be viewed.

Three boxes are located above the calendar, where the desired day, month and/or year can be selected for rapid selection of the date searched. After setting the date, confirm the selection by pressing the "Enter" key

This window behaves like message windows, where the active function keys are in the window, whereas the function bar keys are disabled.

The following keys are active in this window:

- F2 returns to the previous window - F4 resets the overall job count to zero.

Notes

When resetting the overall job count to zero, only the overall count is reset to zero, while the number of jobs saved every day is not altered.

UNAUTHORISED USE

It is forbidden to use the aligner for any purpose other than measuring the characteristic alignment angles of a vehicle (see description in the chapter "Characteristic Angles").



WARNING

Use of the aligner for any purpose other than its original function releases the manufacturer from all responsibility for any damage or injury that may result.

It is recommended to use the Personal Computer installed in the central unit only with the programs supplied by SIMPESFAIP S.p.A.



ATTENTION

The software in the HARD DISK and in the update CD ROMs are the property of SIMPESFAIP S.p.A. and can be used only with the personal computer supplied with the machine.



ATTENTION

It is highly recommended not to use the Personal Computer for games or with other software based on unauthorised copies, to avoid reducing the safety of plants and persons. This is mandatory to avoid any possible contamination from computer viruses.

In any case, it is recommended to check the compatibility of all original software not supplied by SIMPESFAIP S.p.A. with an authorised Technical Service Centre.



ATTENTION

Do not remove the Personal Computer from its installation position to avoid any damage to the connections.

MOST COMMONLY ENCOUNTERED VEHICLE ALIGNMENT FAULTS

Vehicle tends to wander to the left or the right.

Cause: *tyre side slip.*

Invert the position of the wheels on the same axle:

- *if movement is inverted, turn one of the two wheels where the position has been inverted, on its rim.*
- *if movement is not inverted, invert the position on the other axle.*
- *if this double inversion procedure fails to solve the problem, check that camber values on the same axle are identical, make the same comparison for caster values.*

Steering wheel not aligned with vehicle trajectory.

Possible **causes:**

- *mechanical backlash.*
- *ROC has been skipped or performed incorrectly.*
- *wheel alignment performed with the steering wheel off centre.*
- *front wheels adjusted with respect to the axis of symmetry instead of the thrust axis.*

Disparity between steering locks.

- *Manual procedure:*
 - *The steering box range must be centred by counting the number of steering wheel revolutions from full lock to full lock.*
 - *Position the steering wheel in the centre of its range and perform the normal procedure for adjustment of the front half-toe values.*
 - *Position the steering wheels correctly, disassembling it from the steering column if needs be.*

Steering wheel is excessively stiff with vehicle stopped.

Possible causes:

- excessive caster.
- incorrect king pin angle.
- excessive camber.
- Low tyre pressure.

Steering wheel return is too low or too forceful when driving.

- Incorrect caster value - adjust.

Tyre wear.

- tyres with irregular wear on both walls: incorrect pressure - under-inflated.
- tyre with irregular wear in the centre of the thread: incorrect pressure - over-inflated.
- tyre wear with stepped profile: shock absorber not working properly.
- tyres on the same axle with irregular wear on a single wall: toe values are out of tolerance.
- only one tyre on the same axle with an irregularly worn wall: camber out of tolerance.

Vehicles with just one register.

- Adjust total toe to the manufacturer's specifications.
- Set the left and right front toe values so that they are identical.
- Remove the steering wheel from the steering column and move it to the correct position; if the steering wheel has adjustment slots, use them.

Adjusting vehicle with power steering.

- Before making any adjustments start the engine, turn the steering wheel to full lock in both directions, position it in the centre of its turning range and immobilise it.
- With the exception of vehicles for which manufacturer's specifications indicate adjustment with the engine running only, the engine can be switched off or left running during adjustments, as preferred.

Vehicles with hydro-pneumatic or intelligent suspension systems.

- Adjust the vehicle with the engine running and the suspensions for normal driving road clearance.

Vehicles with fixed rear axle.

- Even if the rear axle is fixed, measure the relative values to pick up on possible misalignment; now adjust the front left and right half-toes with respect to the thrust axis in order to eliminate the problem of a misaligned steering wheel.

TROUBLE SHOOTING

The machine shows no signs of life

Mains voltage incorrect or not present.

- *Check the electrical plant and hook up the machine correctly.*

Plug inserted in the wrong socket.

- *Connect the plug properly.*

Wrong power voltage selected.

- *Set the voltage changer to the correct position.*

Monitor power switch OFF.

- *Set the monitor power switch to ON.*

Keyboard

Keyboard not accepting commands.

Keyboard connection cable is not inserted.

- *Make sure the cable is inserted in the computer inside the aligner.*

Faulty keyboard.

- *Call the service centre.*

Function key jammed (Alt, Alt Gr and Ctrl keys)

- *Check all the keys and release as necessary.*

MAINTENANCE



WARNING

SIMPESFAIP declines all liability for claims deriving from the use of non-original spares or accessories.



WARNING

Before making any adjustments or performing maintenance, disconnect the electrical supply from the machine and make sure that all moving parts are suitably immobilised. Do not remove or modify any parts of this machine except in the case of service interventions.



ATTENTION

Keep the working area clean.

Do not clean the machine with compressed air or jets of water.

When cleaning the area take steps to avoid raising dust as far as possible.

- *Put back the targets with caution and in a dry place.*
- *Calibrate.*
- *Keep the turntables and the oscillating footboards on which the vehicle alignment is performed perfectly clean and do not oil or grease them.*

SCRAPPING INFO

If the machine is to be scrapped, remove all electrical, electronic, plastic and metal components and dispose of them separately, as provided for by local legislation (see figs. 31-31a).

ENVIRONMENTAL INFORMATION

Following disposal procedure shall be exclusively applied to the machines having the crossed-out bin symbol on their data plate.

This product may contain substances that can be hazardous to the environment or to human health if it is not disposed of properly.

We therefore provide you with the following information to prevent releases of these substances and to improve the use of natural resources.

Electrical and electronic equipments should never be disposed of in the usual municipal waste but must be separately collected for their proper treatment.



The crossed-out bin symbol, placed on the product and in this page, remind you of the need to properly dispose of the product at the end of its life.

In this way it is possible to prevent that a not specific treatment of the substances contained in these products, or their improper use, or improper use of their parts may be hazardous to the environment or to human health. Furthermore this helps to recover, recycle and reuse many of the materials used in these products.

For this purpose the electrical and electronic equipment producers and distributors set up proper collection and treatment systems for these products.

At the end of life your product contact your distributor to have information on the collection arrangements.

When buying this new product your distributor will also inform you of the possibility to return free of charge another end of life equipment as long as it is of equivalent type and has fulfilled the same functions as the supplied equipment.

A disposal of the product different from what described above will be liable to the penalties prescribed by the national provisions in the country where the product is disposed of.

We also recommend you to adopt more measures for environment protection: recycling of the internal and external packaging of the product and disposing properly used batteries (if contained in the product).

With your help it is possible to reduce the amount of natural resources used to produce electrical and electronic equipments, to minimise the use of landfills for the disposal of the products and to improve the quality of life by preventing that potentially hazardous substances are released in the environment.

RECOMMENDED FIRE-EXTINGUISHING EQUIPMENT

When choosing the most suitable fire extinguisher consult the following table:

	Dry combustibles		Flammable liquids			Electrical fires
Water	YES	NO	NO	YES	YES	NO
Dry chemical			YES*		YES	YES
CO ²			YES*		YES*	YES*

YES* = Use only if more appropriate extinguishers are not on hand and when the fire is small.



WARNING

The indications in this table are of a general nature. They are designed as a guideline for the user.

The applications of each type of extinguisher will be illustrated fully by the respective manufacturers on request.

GLOSSARY

Find below a brief description of some of the technical terms used in this manual.

Characteristic Angles

This term refers to all the angles that can be normally measured on a wheel aligner (total front/rear toe, left/right and front/rear half toe values, left/right and front/rear camber, left/right caster, left/right king pin angle, and steering angle difference at 20°).

Clamp

Adapter from wheel and measurement sensor.

Equatorial plane

Hypothetical vertical plane that divides the wheels into two equal parts.

Turntable

This is a base mounting a disk on which the steer wheels of the vehicle are positioned. Turntables reduce friction between the tyre and the ground to facilitate settling in of the suspensions and to cancel measurement errors during steering turns.

The area between the disk and the base must be always clean. Do not oil or grease this area.

Infrared beams (IR)

Electromagnetic waves that are invisible to the naked eye.

Transducer

Electronic component that converts a physical parameter into another type of parameter, e.g. angle transducers convert angles into proportional electronic signals.

GENERAL WIRING DIAGRAM

Mod. **C 1000**

Measurement instruments that are applied to the vehicle wheels to measure characteristic angles.

PN. 4-109584 (Fig. 32)

AP1	Personal computer.
AP2	Remote control card
AP3	Keyboard
AP4	Printer
AP5	Monitor
AP10	Motherboard (CPU)
AP13	Control board
AP16	Mouse
AP17	PC interface board
BR2	Telecamera
EV1	Fan
FU	Fuse 10 A T
HL1	LED light.
M1	Motor
QS1	Master switch
XS2	Multiple socket

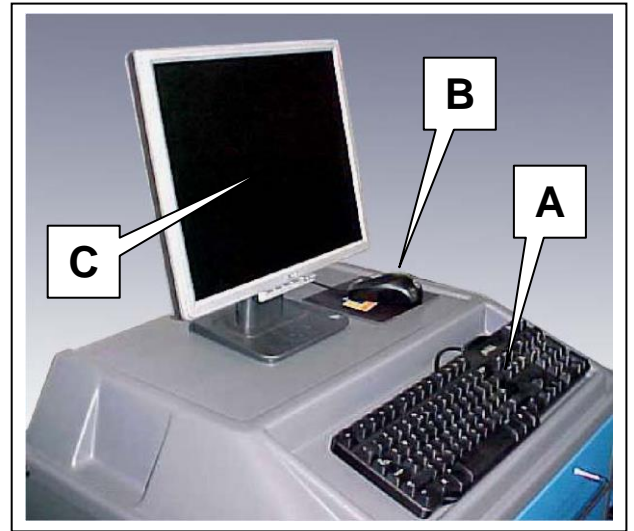
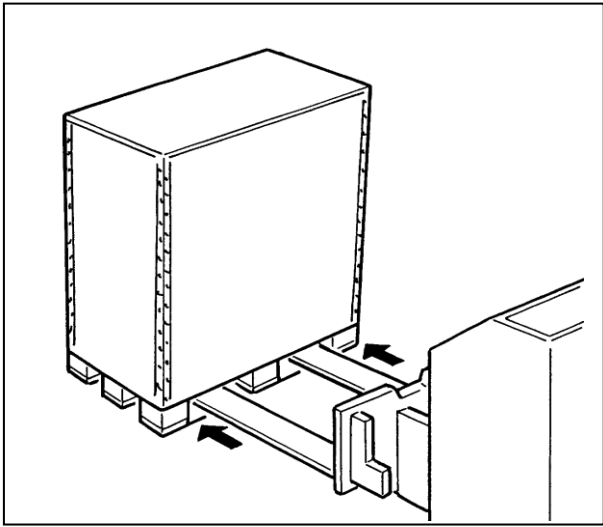


Fig. 1

Fig. 2

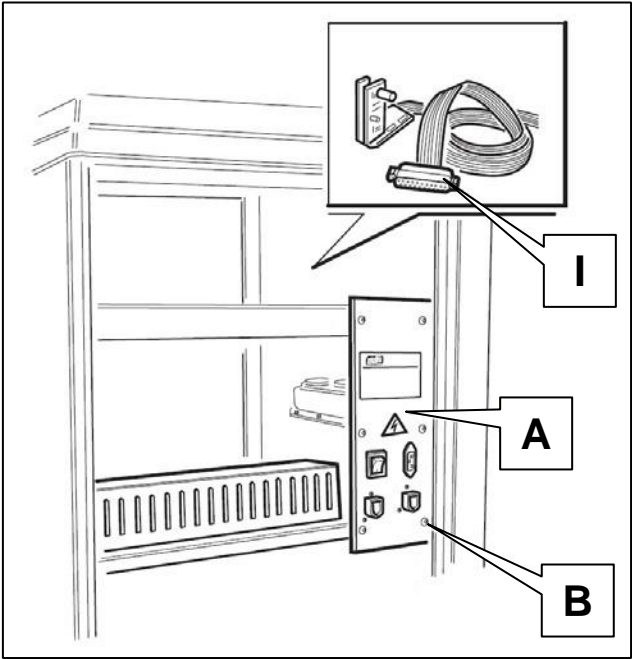
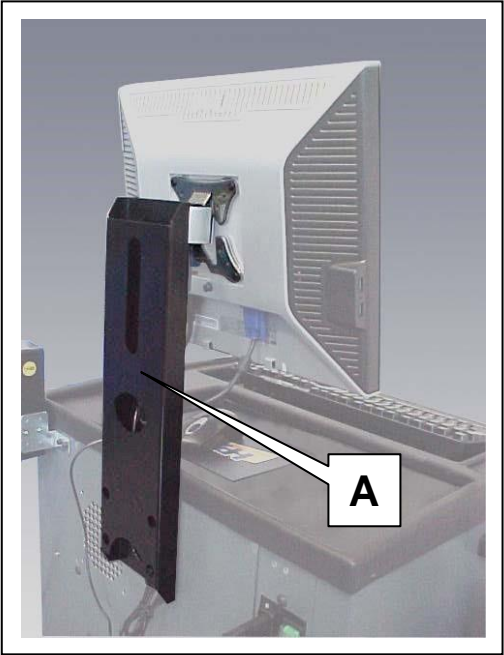


Fig. 2a

Fig. 3

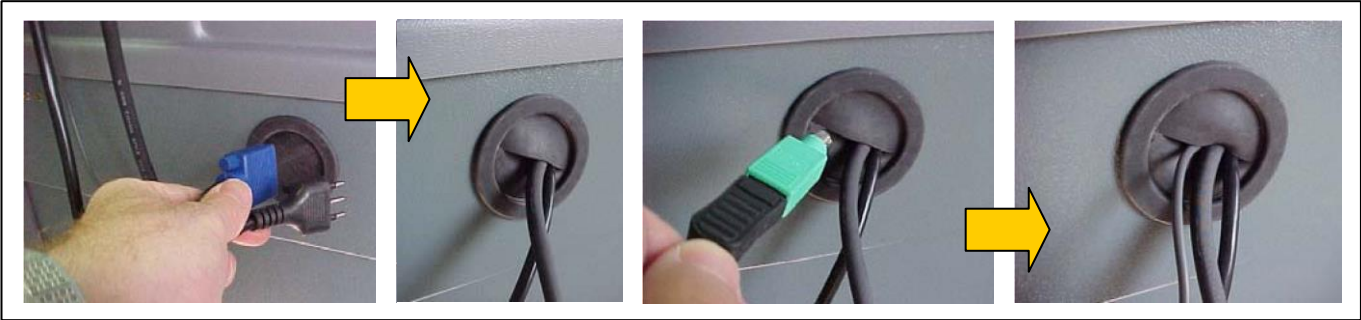


Fig. 3a

Fig. 3b

Fig. 3c

Fig. 3d

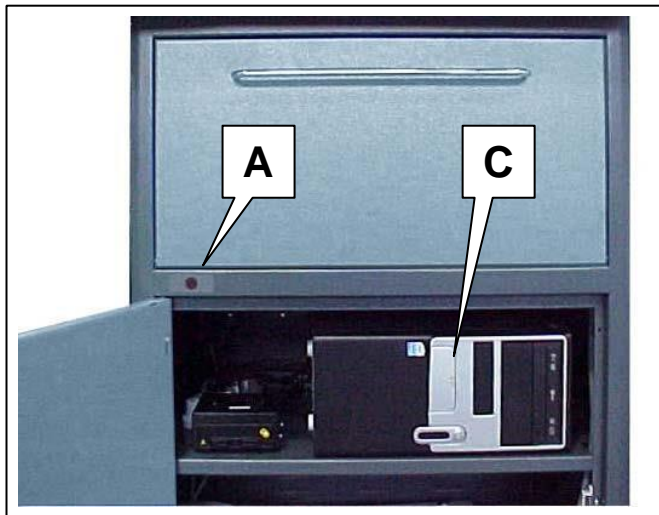


Fig. 4a

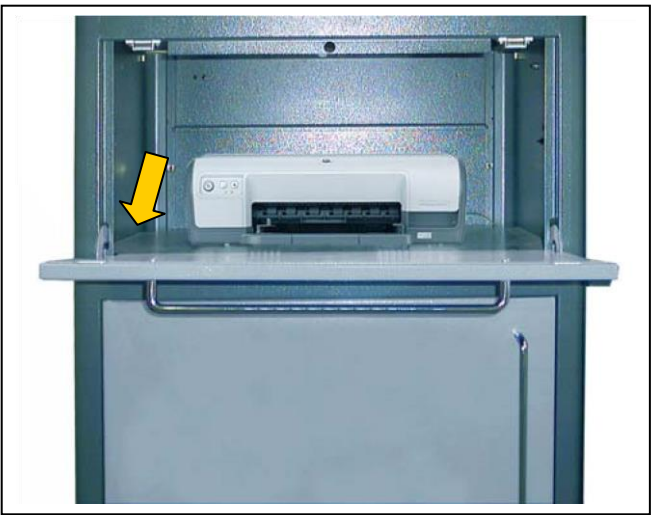


Fig. 5

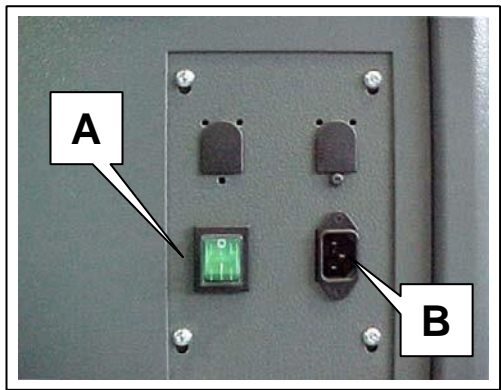


Fig. 4b

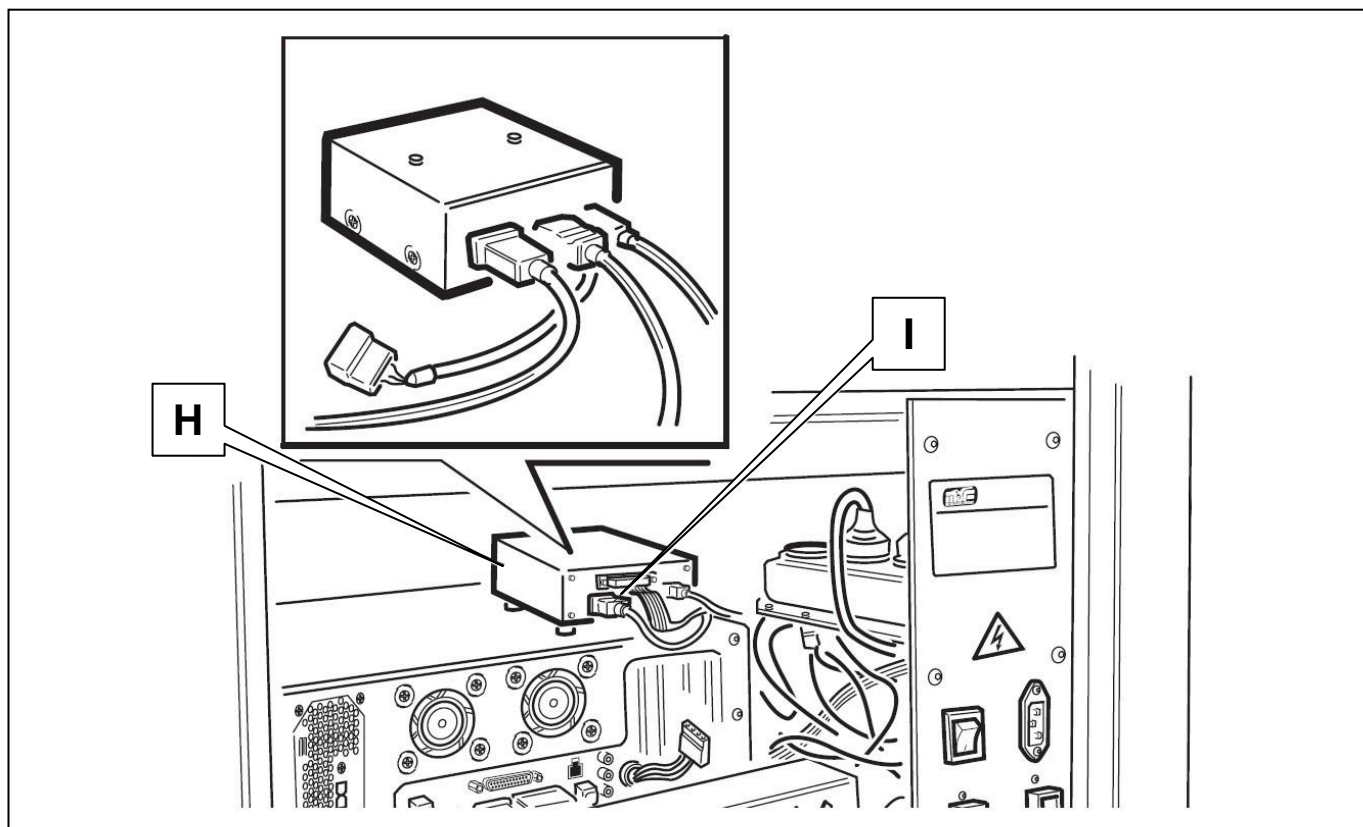


Fig. 5a

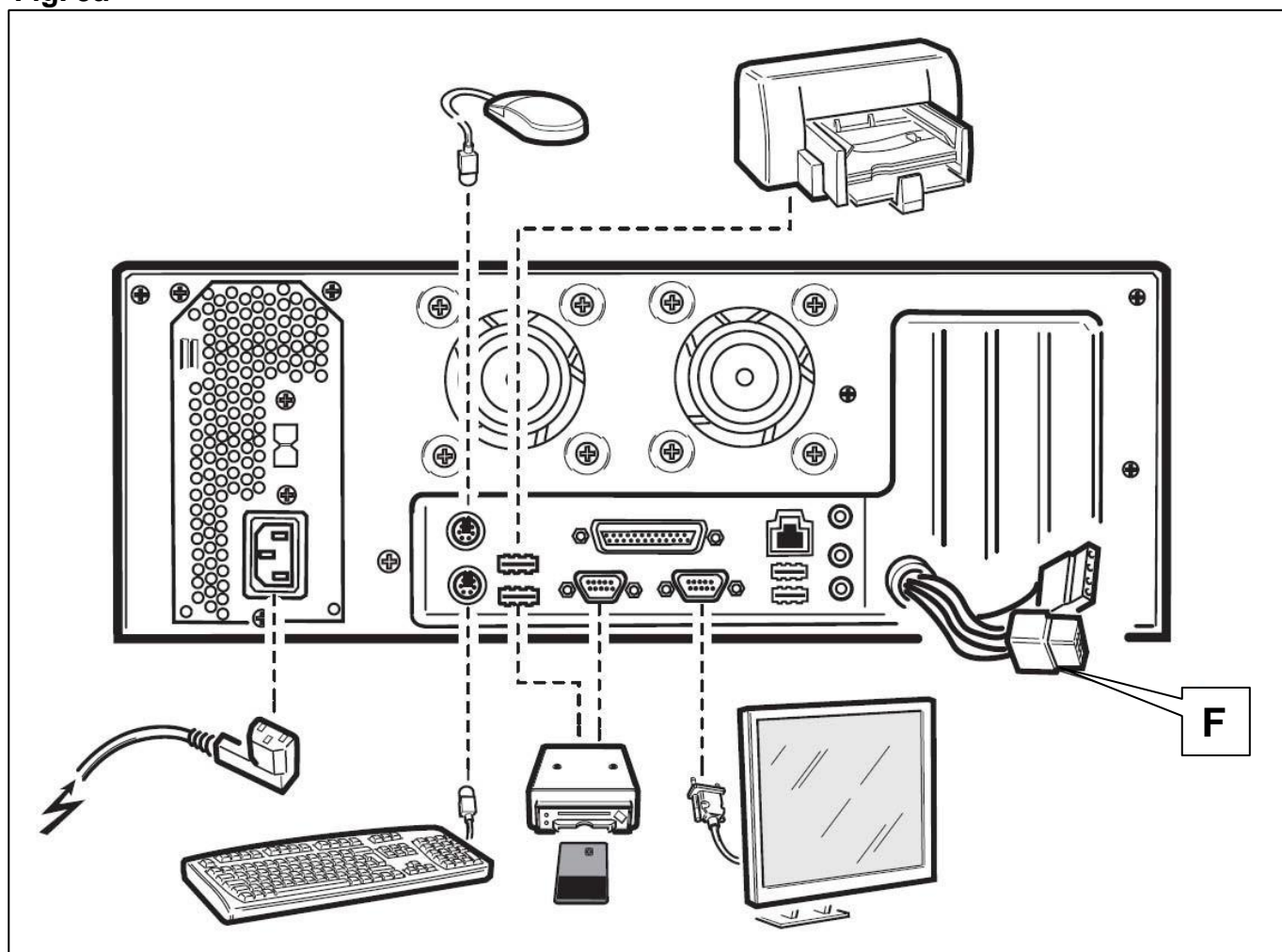


Fig. 5b



Fig. 9



Fig. 10



Fig. 11



Fig. 12



Fig. 13

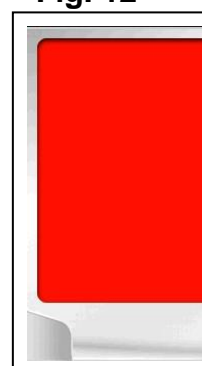


Fig. 14

Fig. 16

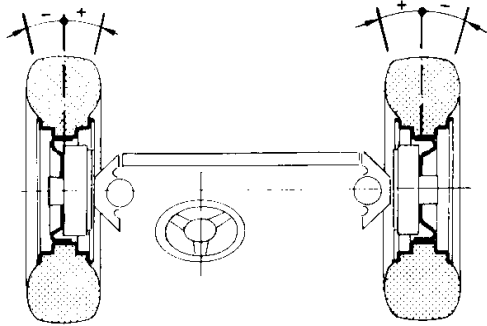


Fig. 17

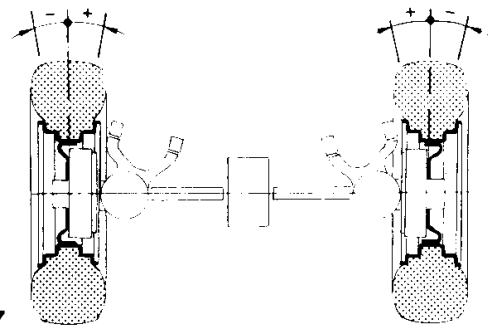


Fig. 18

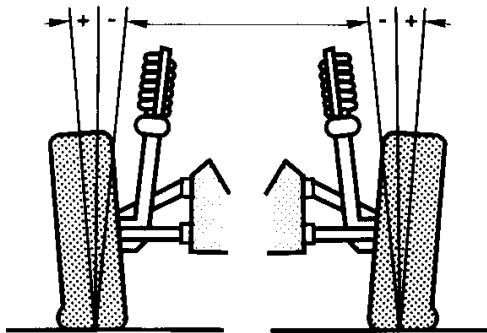


Fig. 19

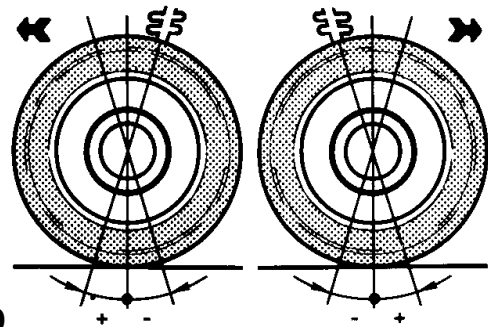


Fig. 20

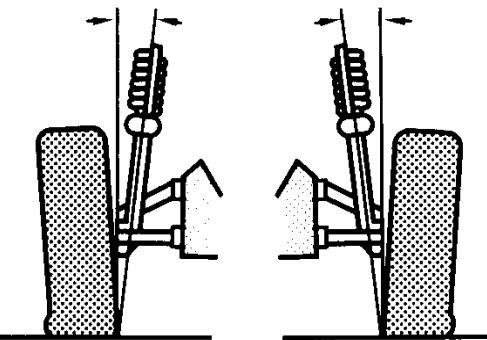


Fig. 21

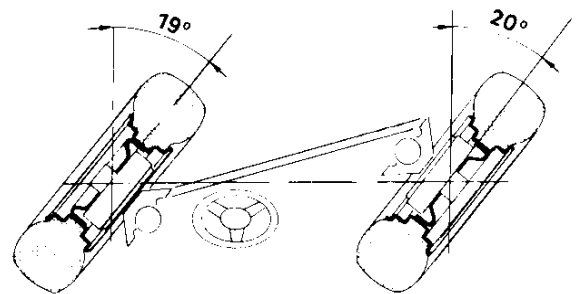


Fig. 22

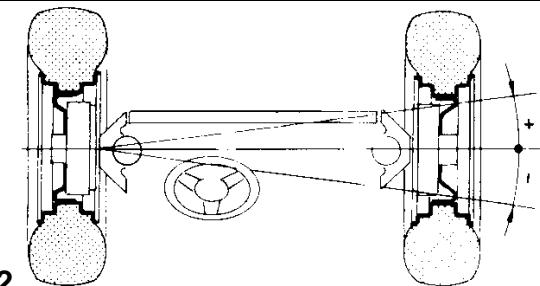
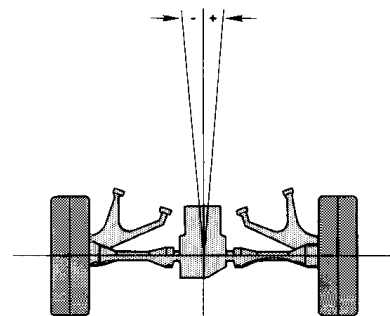


Fig. 23



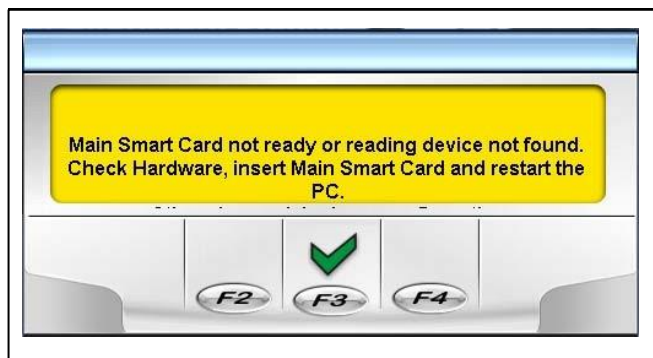


Fig. 24

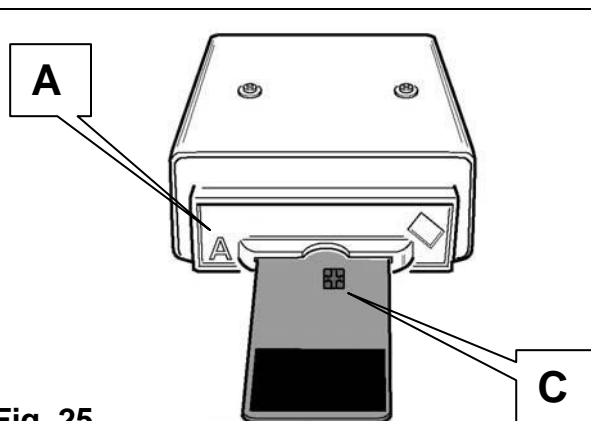


Fig. 25

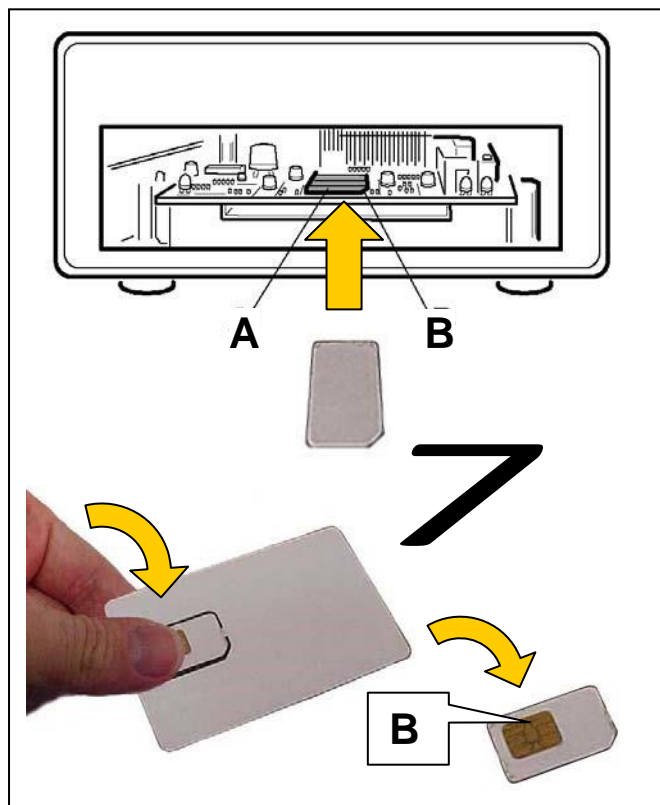


Fig. 26

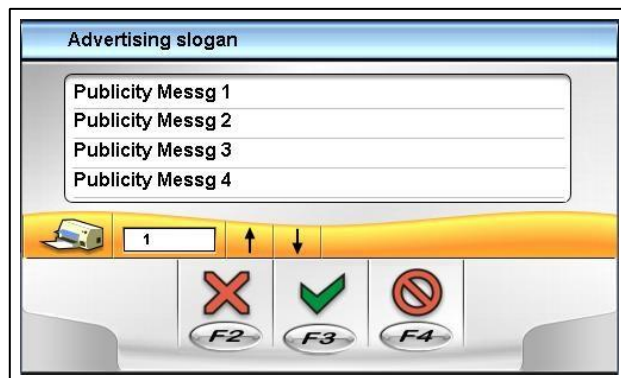


Fig. 27

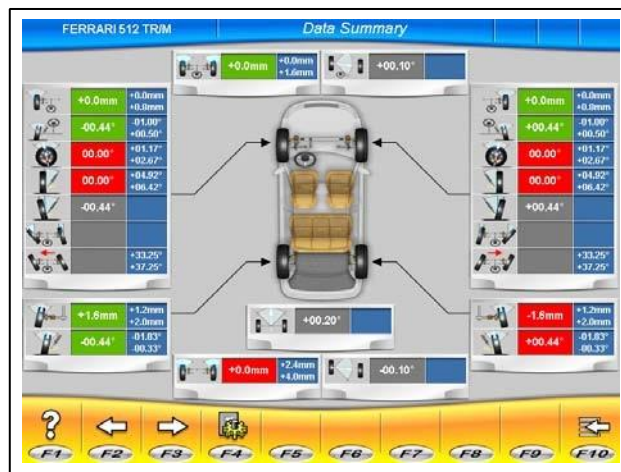


Fig. 28



Fig. 29

Fig. 30

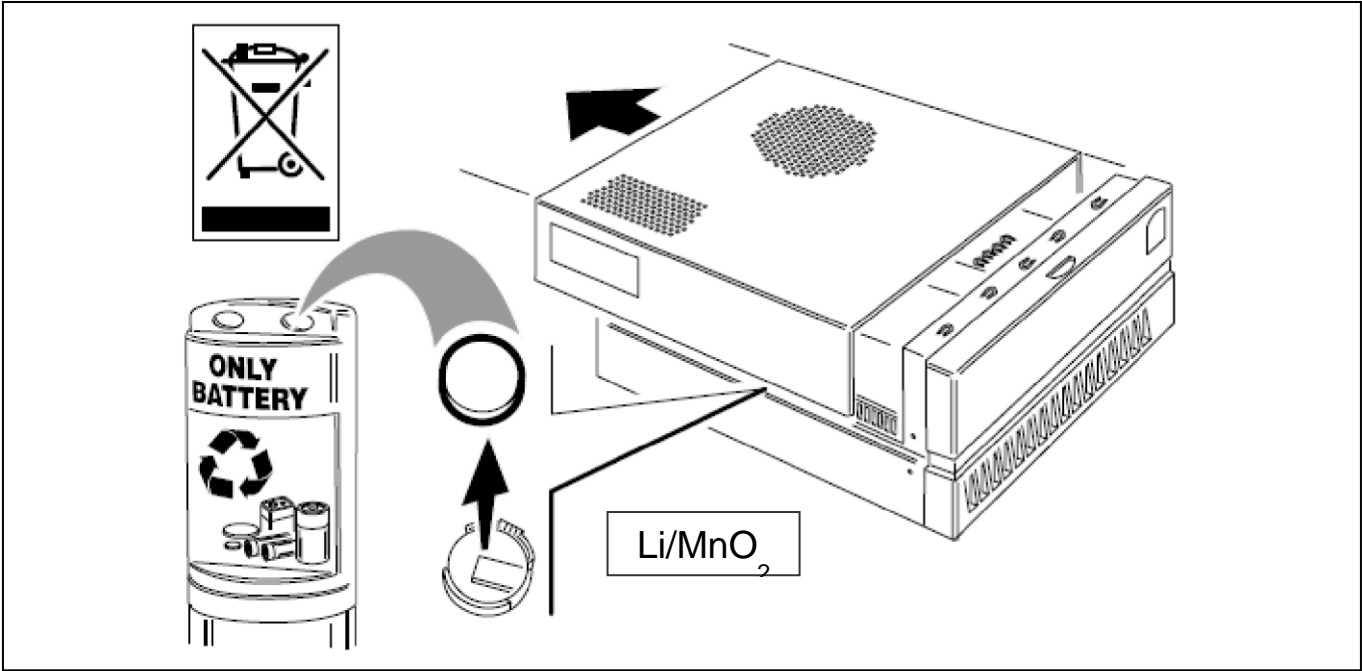


Fig. 31

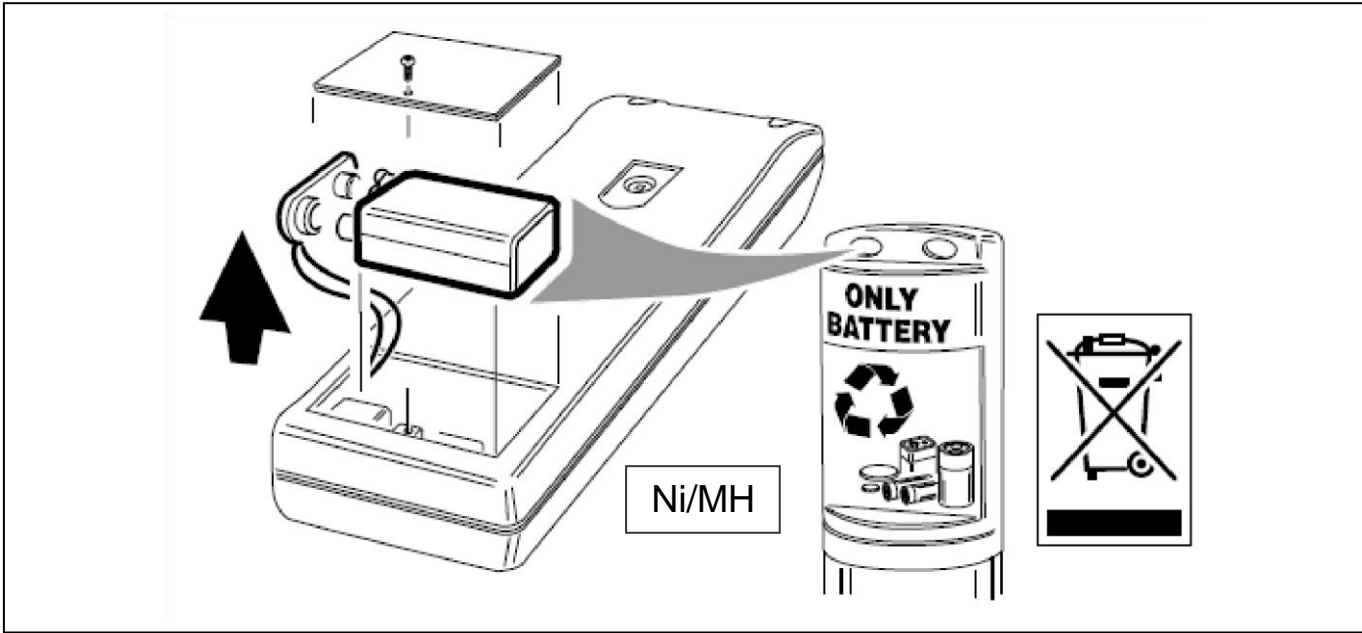


Fig. 31a

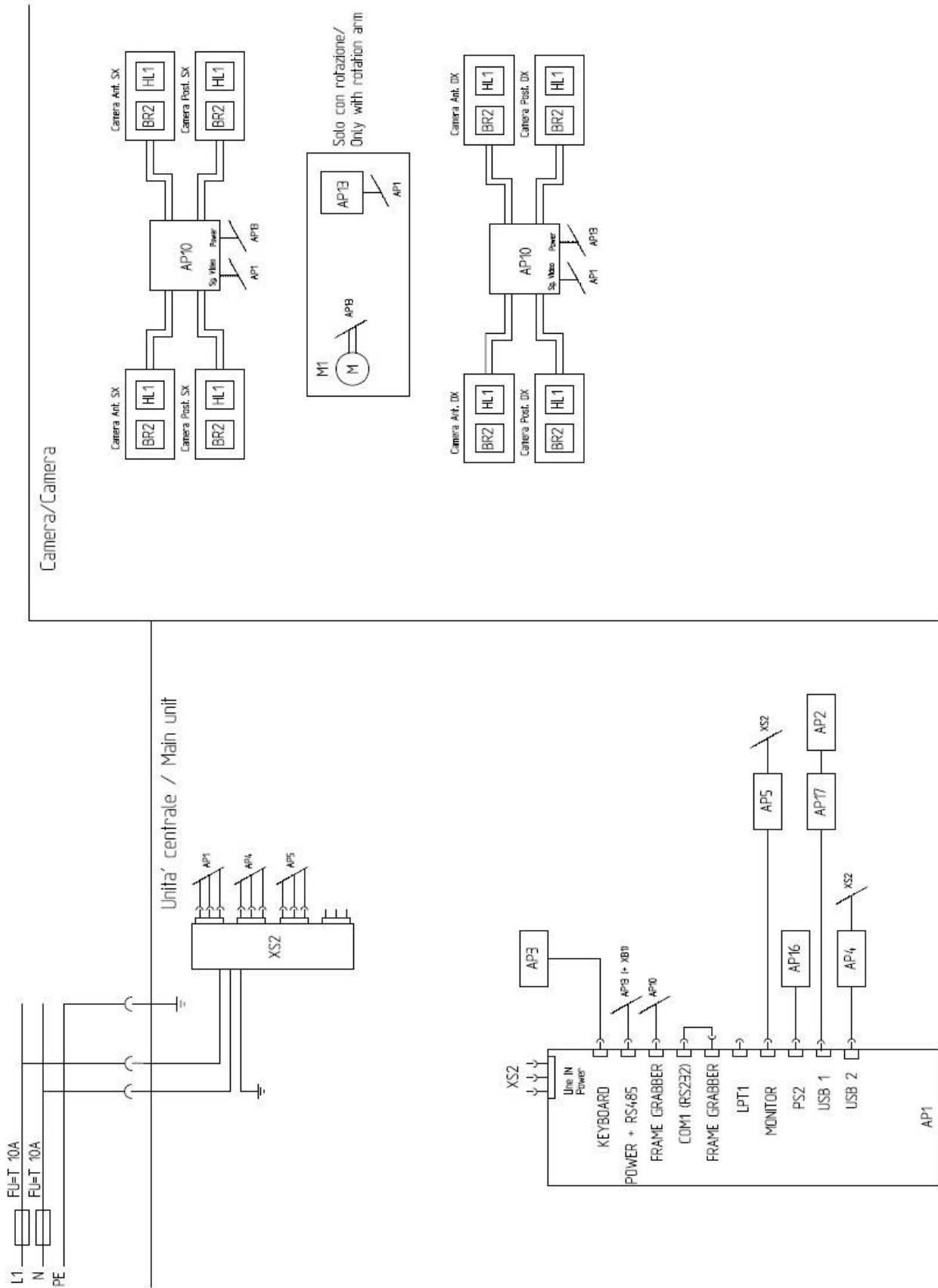


Fig. 32



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