Excellence in Collision Repair

Electronic Measuring System
Car-O-Tronic Vision

Instruction Manual

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CAR-O-LINER®

Foreword

Car-O-Tronic Vision is an electronic measuring system which allows you to electronically measure vehicles. Car-O-Tronic Vision comprises Car-O-Tronic II, Car-O-Soft Vision and VisionData or Car-O-Data. Car-O-Tronic II is the measuring hardware, Car-O-Soft Vision is the measuring software. VisionData and Car-O-Data is a data base containing Car-O-Liner DataSheets, photo DataSheets and indexes for most vehicles. The difference between VisionData and Car-O-Data is that VisionData is an *online subscription* which enables you to updata your vehicle data base via Internet. Car-O-Data is a CD subscription which is updated 4 times a year.

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NOTE: Before installation of Car-O-Soft Vision and Car-O-Data CD, be sure to read the Licence Agreements. By installing the software, you agree to the terms of the Agreement.

NOTE: It is important that you do not throw away Car-O-Tronic Vision Start Up guide after you have performed the installation of the Car-O-Tronic II and Car-O-Soft Vision as it is closely connected to Car-O-Tronic Vision Instruction Manual.

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NOTE: Car-O-Tronic Vision Instruction Manual is one instruction out of three that describes Car-O-Tronic Vision, the other two are Start Up Guide and Quick Reference Guide.

Notice

Dimensions and information contained on Car-O-Liner DataSheets are compiled from information prepared by measuring vehicles and from information provided by the car manufacturers. The methods used in the measurement of vehicles are normally considered reliable as regards to the accuracy required.

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Contents

1 Introduction

1.1 General

Car-O-Tronic Vision is an electronic measuring system which allows you to electronically measure vehicles. The basic delivery of the electronic measuring system from Car-O-Liner AB comprises of the following parts:

- **Car-O-Tronic Vision**
  - Cabinet M81
  - Measuring slide Car-O-Tronic II
  - Battery and charger
  - Measuring bridge
  - Measuring bridge support
  - Measuring adapters and tubes
  - Box MS Cable
  - PC Radio II
  - HMP 705
- **Car-O-Soft Vision**
- **VisionData or Car-O-Data**

1.2 Car-O-Tronic Vision– Measuring hardware

Car-O-Tronic Vision is an electronic measuring system designed primarily to measure and check the dimensional correctness of vehicle chassis. Car-O-Tronic measures either with reference to Car-O-Liner DataSheets or on an absolute or comparative basis.

Advanced mathematics and computer technology mean that Car-O-Tronic can be used without any other special equipment. The only requirements are that the measuring system should be on a flat surface, and that the object to be measured should also be on a flat surface. There is no need for these surfaces to coincide or be aligned to each other in any particular way.

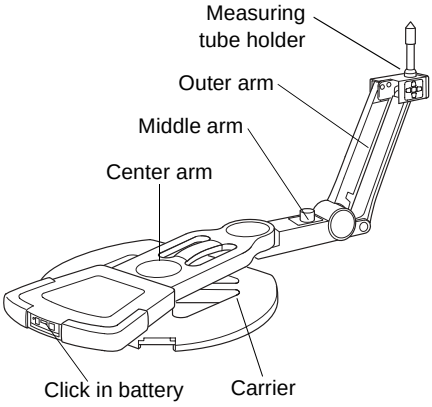
The five main parts of the measuring system are:

- Measuring slide Car-O-Tronic II with measuring adapters and tubes
- Measuring bridge
- PC
- Cabinet M81
- PC Radio II unit

1.2.1 Measuring slide

The measuring slide's carrier forms the basis of the measuring arm. It runs on wheels, which makes it easy to move to different positions along the measuring bridge.

The measuring arm constitutes the actual measuring unit. It comprises three arms:



- The center arm is movable in the horizontal plane. It is mounted on a vertical axis on the measuring slide's carrier. The center arm can rotate a maximum of two turns.
- The middle arm is mounted on a vertical axis on the center arm.
- The outer arm, with a parallel movement arm, is mounted on a horizontal axis at the end of the middle arm. At the other end of the parallel movement arm there is a measuring stylus holder for different measuring tubes which hold the measuring adapters in accordance with the DataSheets.

There is an angle sensor in each pivot which emits electric signals, proportional to the actual angle of the arm. By knowing the angle of each arm and the distance between the pivots, the position of the adapter relative the center of the measuring slide can be calculated. This is the same type of mathematics that is used in robotics. In reality, the mathematics is more advanced if you take the tolerances in the arm lengths, angle errors in positioning etc. into consideration. Every measuring slide is therefore individually calibrated prior to delivery, and the parameters, lengths, angles etc. which are calculated, apply only to that particular measuring slide.

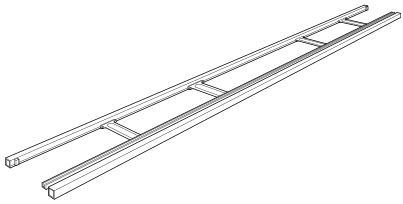
CD containing the measuring slide calibration parameters.

The major part of the electronics, together with the rechargeable battery, are mounted in the center arm.

In addition to the above mentioned length and angle sensors, the measuring stylus holder sensor can automatically identify which measuring tube is selected. Therefore, it is possible to change the measuring tube as necessary to reach the desired measurement point, and still automatically have the correct measuring value.

For practical reasons it is not possible to read off the measurement on the measuring slide, instead the measured values are transmitted, via wire-less communication, to the PC. This is where all measured data, DataSheets, measurement reports etc. are processed and stored.

1.2.2 Measuring bridge



There are two different measuring bridges, M75 and M74. Which one that is used depends on the type of bench. The instructions in this instruction manual are valid for both versions.

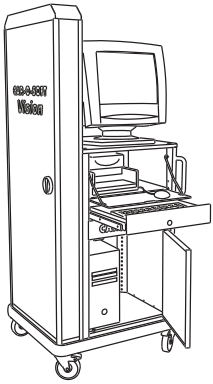
The measuring bridge is complemented with a longitudinal measurement rail. The measuring bridge forms the surface (track) for the measuring slide, and it is therefore important that it is placed on a plane surface.

The longitudinal measuring rail on the measuring bridge constitutes, in combination with the length measuring head under the measuring slide's carrier, a longitudinal measuring system which keeps a record of where on the measuring bridge the measuring slide is. This should be placed on left side of the veihcle.

Ensure that the vertical distance remains within certain limits to provide the optimum range and the arrow on the bridge is pointing to the front of the vehicle.

The longitudinal measuring system gives double readings, both incremental (pulse) and absolute. The absolute reading imply that once the measuring system is active and centered to the vehicle, the measuring slide can be lifted on and off the measuring bridge without the calibration being lost. This occurs provided that the measuring bridge is not moved from its original position in relation to the vehicle.

1.2.3 Cabinet and PC



The cabinet holds the PC, the measuring slide and a set of measuring tubes and adapters. It is recommended that the measuring slide should be stored in the cabinet when not in use.

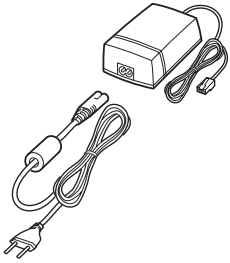
PC

The PC processes all measured data, DataSheets and measurement reports etc. The computer is not included in the basic delivery of Car-O-Tronic Vision, but a computer is required for using the Car-O-Soft Vision software. Along with the PC you also need a printer, a keyboard and a mouse.

Box MS Cable

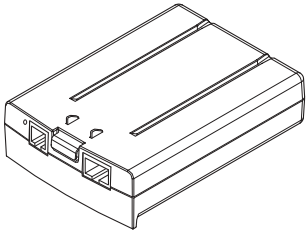
If the wire-less communication between the PC and the measuring slide is not working or if you prefer not to use this kind of communication, the Box MS Cable can be connected between the PC and the measuring slide

Measuring slide charger and click in battery



The battery used with Car-O-Tronic Vision are Lithium-ION. Full capacity of the battery is enough for about 6-8 hours of continuous operation. But, since Car-O-Tronic II shuts down automatically after a set time, the battery actually last much longer.

NOTE: Before charging the battery you must remove it from the measuring slide.

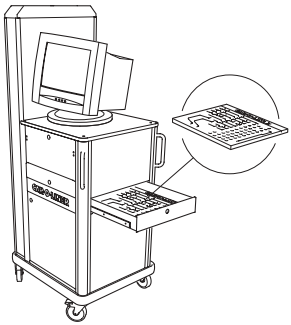


The capacity of the battery is continuously displayed in *Car-O-Soft Vision* during measuring mode. The range displayed is 15-100%. The battery should not be exposed to severe heat. During charging in particular, the units should be protected from excessive heat, as this adversely affects their ability to absorb the charge.

Once the battery has been discharged it takes 2-3 hours before you have 80% capacity in the battery and 6 hours to reach full charge.

Measuring parts M62

The measuring tubes and adapters are stored in the drawer at the right side of the cabinet.



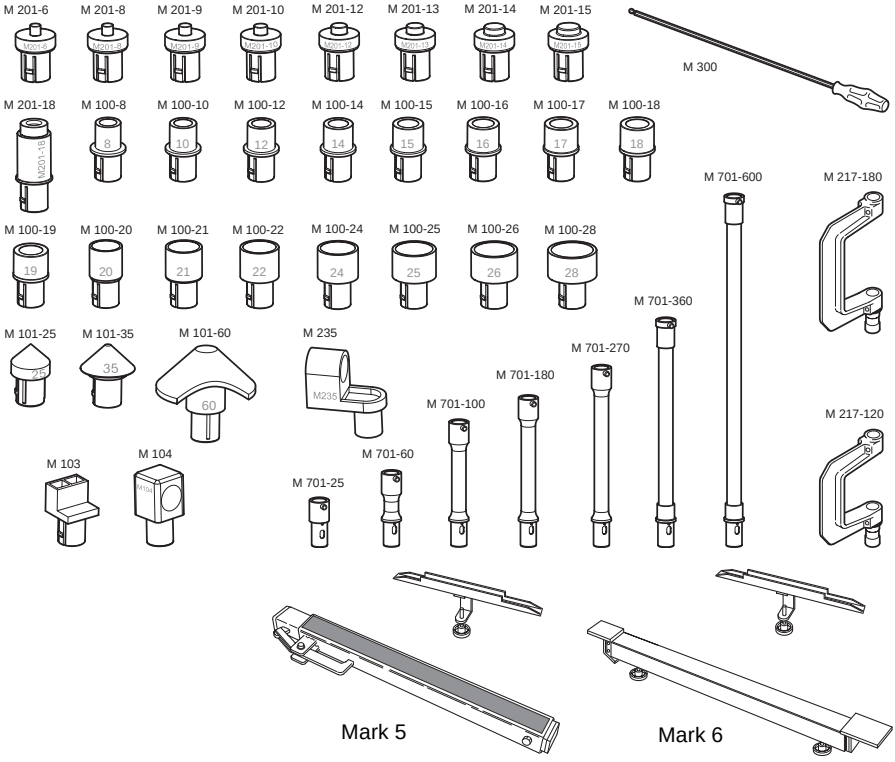
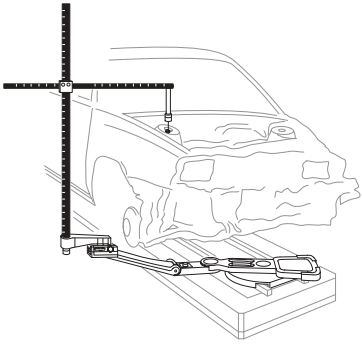


Figure 1.1 Measuring tubes and adapters and measuring bridge supports

HMP 705

The high measurement point (HMP) unit is used to measure high points on the vehicles chassi and in the engine compartment see *section 3.8 "High measurement point (HMP)"*.



1.3 Car-O-Soft Vision – Measuring software

Car-O-Soft Vision contains the original version of the measuring software. *Car-O-Soft Vision* automatically checks for updates every two weeks if you are a registered VisionData user. As a VisionData user you can also manually update Car-O-Soft Vision. For CD subscribers the updates for Car-O-Soft Vision are included on the Car-O-Data Update CD. Always make sure you have the most recent CD version.
Car-O-Soft Vision **must** be installed on the hard drive.

1.4 VisionData and Car-O-Data – CD:s

VisionData and Car-O-Data is a data base containing all Car-O-Liner DataSheets, photo DataSheets and indexes for vehicle models. The photo DataSheets provide easier understanding of system operation.

VisionData

Dimensions and information on Car-O-Liner DataSheets are compiled from information prepared by measuring vehicles, and from information provided by the car manufacturers. The methods used in the measurement of vehicles are normally considered reliable as regards to the accuracy required.

VisionData is an online subscription which enables you to update your vehicle database via internet When you update you can choose to update either a group or a specific model.

Car-O-Data Update

As an CD subscriber you will receive new DataSheets four times per year. Always make sure you have the most recent version of Car-O-Data Update.

Car-O-Data CD#x

Car-O-Data Update **must** be installed on the hard drive in order to update *Car-O-Liner Index* and the Car-O-Data database.

1.5 Marking

The name plate is placed at the bottom of the measuring slide.

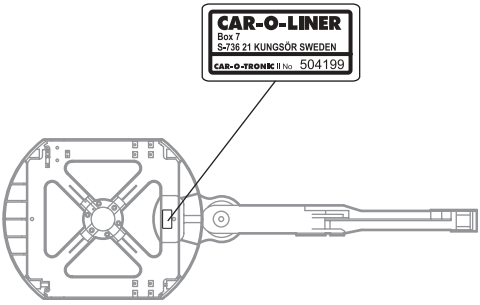


Figure 1.2 The name plate of Car-O-Tronic II measuring slide.

2 Safety

2.1 General

Car-O-Tronic Vision has been designed and tested to meet strict safety requirements. Please read the following instructions carefully before operating Car-O-Tronic Vision, and refer to the instructions as needed to ensure the continued safe operation of Car-O-Tronic Vision.

Information provided in this manual describes the suggested best working practices and should in no way take precedence over individual responsibilities or local regulations.

Great effort has been placed on the design and manufacture of Car-O-Tronic Vision so that it will comply with all applicable safety aspects for this type of equipment. During operation and other work, it is always each individual's responsibility to consider:

- Their own and other's personal safety.
- The safety of Car-O-Tronic Vision through correct use of the equipment in accordance with the descriptions and instructions provided in this manual.

By observing and following the safety precautions, users of Car-O-Tronic Vision will ensure safer working conditions for themselves and their fellow workers.

2.2 Warnings and important notices

The following types of safety signs are used on the equipment and in Car-O-Liner's instruction manuals:

PROHIBITED – Prohibits behaviour that can cause injury.

COMMAND – Prescribes a specific responsibility or action.

WARNING – Warns of risks for personal injuries and or damages to equipment.

The following warnings and important notices are used in the instruction manual:

WARNING
Warning (in bold type) is used in this manual to indicate a possible danger that could lead to personal injury. An instruction is normally given, followed by a short explanation plus the possible effect if the instruction is not followed.

IMPORTANT
Important (in bold type) is used to indicate a possible danger that could lead to damage to the equipment and/or cause environmental damage.

NOTE: (in bold type) is used to accentuate supplementary information that is required for problem-free use or optimal use of the equipment.

In addition to the safety signs illustrated in section 2.3 "Safety signs", the following warnings and important notices appear in the manual:

WARNING! All electrical connections must be carried out by a qualified electrician. Risk for electrical shock.

WARNING! Most service must be carried out by Car-O-Liner service personnel and service support. Risk for electrical shock.

WARNING! Never remove any covers or perform any work to the equipment without unplugging it from the wall outlet. Risk for electrical shock.

WARNING! Unplug the equipment from the wall outlet before servicing, cleaning or maintenance. Risk for electrical shock.

WARNING! Do not disassemble or short circuit the battery. Do not overcharge or put it into a fire. Risk for injuries.

WARNING! The arm of the measuring slide must be locked when moving it from the measuring bridge. Risk for crush injuries.

IMPORTANT! It is the responsibility of the owner (user) to ensure that the equipment has been installed as specified in the instructions provided. It is also the owner’s responsibility to ensure that the equipment is inspected in accordance with applicable regulations before it is used.

IMPORTANT! Keep the measuring tubes, the measuring adapters and the measuring tube attachments clean. These are

precision parts which contribute to accurate measurement results.

IMPORTANT! Lock the measuring tubes and the measuring adapters with the proper locking devices. Accuracy will suffer if these items are not properly secured.

IMPORTANT! The measuring slide Car-O-Tronic II should be kept away from moisture and fluids.

IMPORTANT! Dust, paint and other chemicals should be kept away from the measuring bridge.

IMPORTANT! The measuring bridge should be kept clean to allow smooth operation of the measuring slide.

IMPORTANT! The measuring slide Car-O-Tronic II and bridge should be kept away from all welding sparks and slag.

IMPORTANT! The battery should not be exposed to severe heat. During charging in particular, the battery should be protected from excessive heat, as this adversely affects it’s ability to absorb the charge.

IMPORTANT! No strong solvents should be exposed to the measuring slide or the measuring bridge.

IMPORTANT! For the sake of the environment, it is important that the equipment is dismantled in an environmentally friendly way.

IMPORTANT! The measuring bridge should be stored hanging from the side without measuring scale. Do not use the measuring bridge as a storage place and do not place heavy objects on the measuring bridge as it can be damaged.

IMPORTANT! Only one extension at a time is allowed.

IMPORTANT! To assure tensionless measuring of the point, make sure to place the adapter by the measuring point without tension when using the HMP unit.

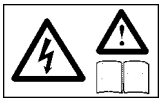
IMPORTANT! When measuring with the HMP unit, the reading of the setting on the display must agree fully with the scales and the selected measuring tube length and angle. If not, the measuring value will be incorrect.

IMPORTANT! To assure a correct measuring when using the HMP unit, avoid to record the measuring points by pressing the Target button on the measuring slide.

2.3 Safety signs

Undamaged safety signs shall always be affixed at the indicated places. If any signs are damaged or missing, the user is responsible for their immediate replacement. The following safety signs can be found on Car-O-Tronic Vision:

Risk of tripping on loose hoses, etc.



All electrical modifications must be made by a qualified electrician. Disconnect the supply before performing any service or installation work.

Risk of cabinet overturning.

2.3.1 Placement of safety signs

The safety signs are placed as follows:

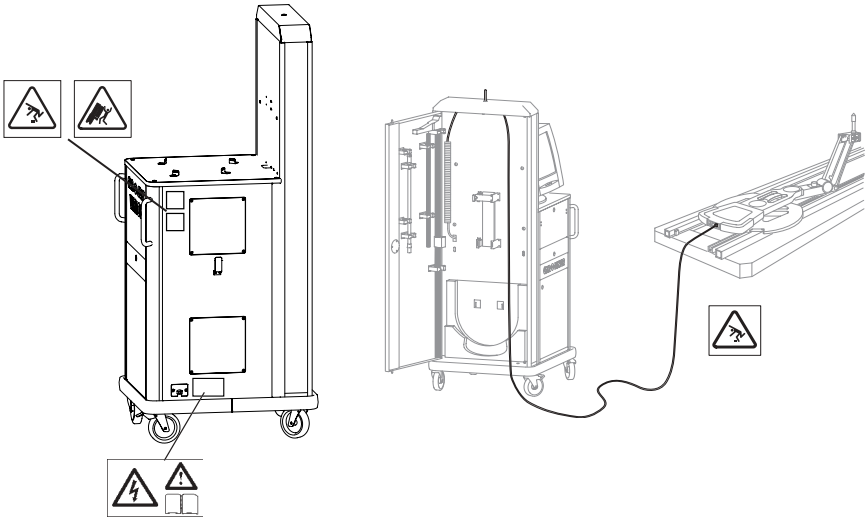


Figure 2.1 Placement of safety signs.

3 Operation

3.1 General

Before you begin using Car-O-Tronic II and Car-O-Soft Vision, be sure to read the instructions in this Instruction Manual and that you understand them. The equipment is inspected and checked prior to leaving the factory to guarantee consistent quality and maximum reliability.

Measurement can be performed either with or without DataSheets. When a DataSheet is available for the vehicle to be measured, Normal, Absolute and Comparative measurement, see *section 3.4 "Measurement with DataSheets"*, could be used. If no DataSheet is available, Absolute or Comparative measurement can be used, see *section 3.5 "Measurement without DataSheets"* .

IMPORTANT! It is the responsibility of the owner (user) to ensure that the equipment has been installed as specified in the instructions provided. It is also the owner's responsibility to ensure that the equipment is inspected in accordance with applicable regulations before it is used.

IMPORTANT! Keep the measuring tubes, the measuring adapters and the measuring tube attachments clean. These are precision parts which contribute to accurate measurement results.

IMPORTANT! Lock the measuring tubes and the measuring adapters with the proper locking devices. Accuracy will suffer if these items are not properly secured.

IMPORTANT! The measuring slide Car-O-Tronic II should be kept away from moisture and fluids.

IMPORTANT! Dust, paint and other chemicals should be kept away from the measuring bridge.

IMPORTANT! The measuring bridge should be kept clean to allow smooth operation of the measuring slide.

IMPORTANT! The measuring slide Car-O-Tronic II and bridge should be kept away from all welding sparks and slag.

3.2 Installation of measuring slide Car-O-Tronic II

Before centering a vehicle, the measuring slide must be locked onto the measuring bridge.

WARNING! The measuring slide arm must be locked whenever the measuring slide is moved outside the measuring bridge. Risk of crushing injuries.

1 Make sure that the measuring bridge is secured to the bench, see *Car-O-Tronic Vision Start Up Guide section 6.3 "Installation of measuring bridge"*.

2 Place the measuring slide onto the measuring bridge.

NOTE: When placing the measuring slide onto the bridge, grab the measuring slide as shown. Grab the outer arm of the measuring slide with your left hand and grab the center arm with your right hand.

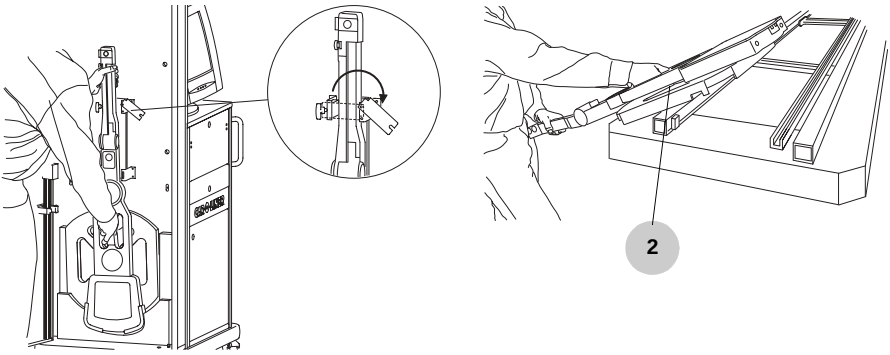


Figure 3.2 Placing the measuring slide onto the bridge.

3 Push the measuring slide into place onto the bridge.

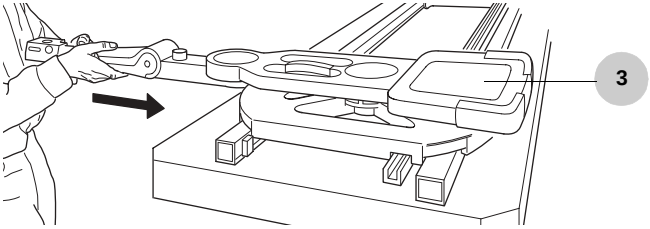
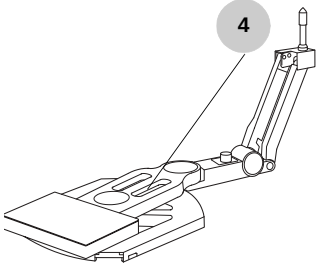


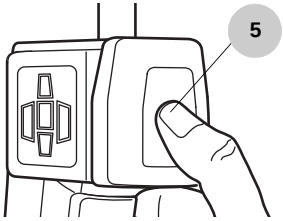
Figure 3.3 Installation of measuring slide onto the bridge.

The measuring slide arm must always be kept locked whenever the measuring slide is moved outside the measuring bridge. Therefore, the arm must be unlocked once the slide is placed onto the bridge.



4 Turn the locking handle 90 degrees to unlock the measuring slide arm.

5 Start the measuring slide by pressing the target button on the measuring slide.

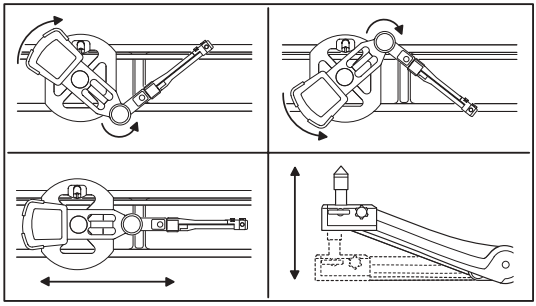


Once the measuring slide is started, the Smart LED shows that the measuring slide is active. The measuring slide now has to be zero-set before it can be used. A resetting symbol will also appear on the screen of the computer if the measuring slide is not zero-set.

You can receive the following color codes from the Smart LED:

- **Blinking red** = The measuring slide is not zero-set and is not fitted with an adapter and do not have any communication with the PC .
- **Blinking green** = The measuring slide is zero-set and is fitted with an adapter but do not have any communication with the PC.
- **Blinking orange** = The measuring slide is zero-set and is not fitted with an adapter may have communication with the PC (please check the communication between the measuring slide and the PC see *section 4.8.1 "Vision Diagnose > Radio"*).
- **Fixed red light** = The measuring slide is zero-set and is fitted with an adapter and have communication with the PC but is not at an measuring point.
- **Fixed green light** = The measuring slide is zero-set and is fitted with an adapter and have communication with the PC and is at an measuring point.

6 Zero-set the measuring slide by moving the slide according to the procedure at the right. Take special note of the direction the arm is pointing according to the length scale.



If the resetting procedure isn't done correctly, the red LED will remain blinking and a resetting symbol will appear on the Lower status line of *Car-O-Soft Vision*.

3.2.1 Connect communication cable between the PC and the measuring slide

If the wire-less communication between the PC and the measuring slide is not working or if you prefer not to use the wire less communication, the Box MS Cable can be connected between the PC and the measuring slide. The cable is connected as follows:

1 Connect the cable to the “black box” contact on the PC Radio II at the top of the cabinet.

2 Connect the other end of the cable to the battery on the measuring slide.

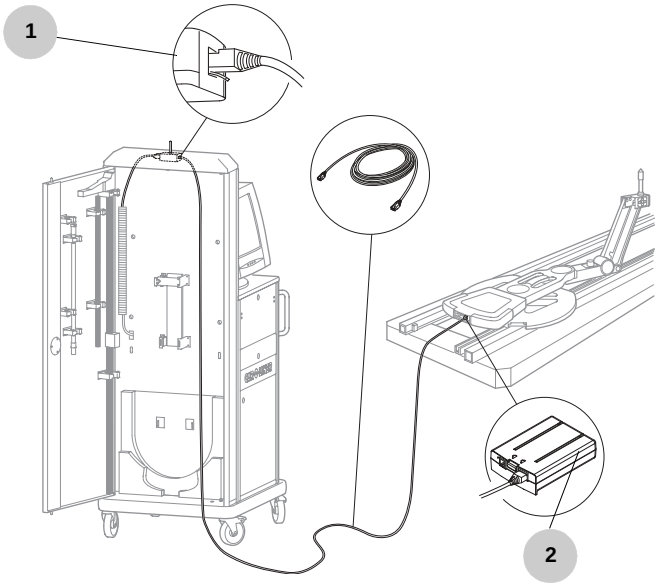
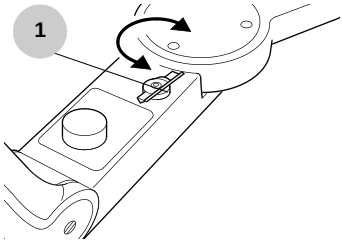


Figure 3.4 Connecting the communication cable between the PC Radio II and the measuring slide.

3.2.2 Spring load the measuring slide arm

When measuring during a pull, you are advised to tighten the spring load handle so that the measuring slide arm follows the point more easily.



1 Rotate the spring load handle 90 degrees to spring load the measuring slide arm.

3.3 Open Car-O-Soft Vision

1 Click on the Car-O-Soft Vision icon on the *desktop*.

2 Now Car-O-Soft Vision starts, and the *Main menu* is displayed on the screen.

3 As default, Car-O-Soft Vision shows the last used Workorder.

Figure 3.5 Car-O-Soft Vision Main menu.

3.4 Measurement with DataSheets

Measurement with DataSheets is used to measure the vehicle and compare the recorded values against the recommended values in a DataSheet.

Measurement with DataSheets is done in the following steps, *see fig 3.6*:

1 Create new Workorder.

2 Measure the vehicle using Normal, Absolute or Comparative measuring.

3 Print a report.

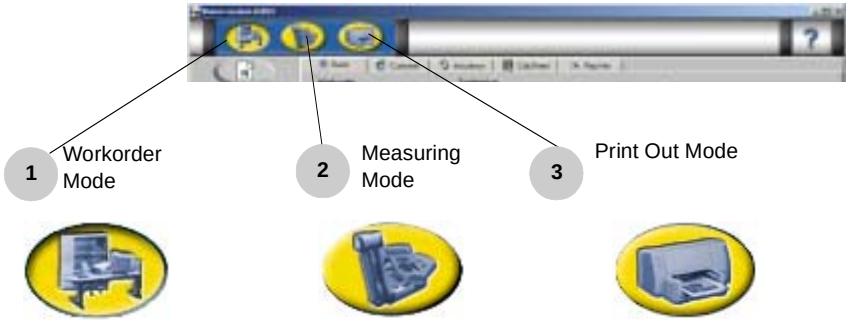


Figure 3.6 Car-O-Soft Vision Main menu.

3.4.1 Create new Workorder

The Workorder unites the job information together with the Workorder registration, customer's files and *Car-O-Liner Index*.

1 Click on "  (Workorder Active)" in Car-O-Soft Vision Main menu. Now, the "***Workorder***" menu is opened.

2 Click on the "**New Workorder**"  button.

3 Fill in a Workorder number or use the default Workorder number which is the date of the day with a running number added to form a unique Workorder number.

4 Click on the "**OK**"  button in the upper right corner to confirm the Workorder number and to open the *Car-O-Liner Index*.

5 To insure that you are always using the latest -DataSheet click on "**Update Car-O-Liner Index**"  button (Internet users only!).

NOTE: In Vision Data there are three different symbols in front of the vehicle model:

- @ A blue @ sign indicates that the DataSheet is not stored locally on your hard drive and it needs to be down-loaded from the internet.

- @ A green @ sign indicates that the DataSheet is stored locally on the hard drive but there is a new version available on the internet.

- ● A green dot indicates that the most recent version of the DataSheet is stored locally on the hard drive.

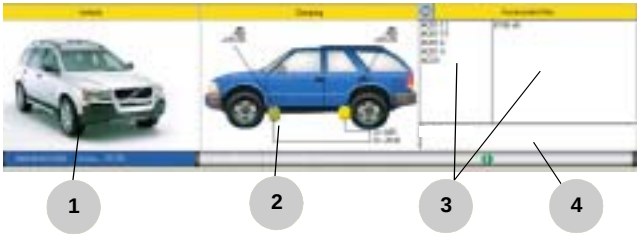
6 Select Make from the left pane in the window. Click the “+” to the left of the make to view the subgroups.

7 Select subgroup.

8 Select model

NOTE: To download DataSheets select the model in the Car-O-Liner Index. Then click on the “**Update/Get DataSheet**” button.

9 When you have selected a model, the InfoCenter shows a photo of the vehicle automatically (**1**). The InfoCenter also display the position of the clamps (**2**) and the required bench and measuring accessories (**3**). Make sure to check this (**4**) pane for Infosheets and additional information. The Infosheets contains special information concerning the vehicle.



10 Click on the “**OK**” button to confirm the DataSheet selection.

11 Enter name of **Technician**. All yellow fields could be filled in.

12 Click on **Customer** and fill in the customer form or select a customer from the customer list to the left of the form. All yellow fields could be filled in.

13 Click on **Insurance** and fill in the form or select a previously used insurance company from the list to the left of the form. All yellow fields could be filled in.

14 Click on “**OK**” button.

15 Select in Engine In or Out. Click on the “**OK**” button to confirm.

16 The DataSheet opens up and you are now ready to begin measuring. Check the datasheet to find out which adapters you will need to measure vehicle.

3.4.2 Normal measuring

“Normal” measuring is used to measure the vehicle and compare the recorded values against the recommended values from the DataSheet.

Once you have selected if the vehicle has its engine “In” or “Out” the DataSheet opens up automatically and you can begin measuring the vehicle.

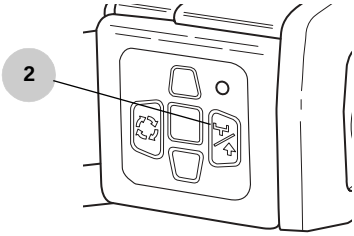
It is very important to use the adapters as indicated on the DataSheet, if the parts or engine are in or out and to set the point up for these conditions. It is very important to measure the points in the same way as shown on the DataSheet, and in the way they are selected in *Car-O-Soft Vision*.

Through the complete measuring process you are aided by a function called Automatic Searching Point or “**ASP**”. This function shows nearest point to measure by using the Smart LED. The Smart LED indicates where the measuring point is and how close to the point you are (when the Smart LED is green you are at the point).

Figure 3.7 The "Normal" measuring menu.

1 Start measuring the vehicle by recording the preselected start point. (The preselected point is the zero point on the left side of the vehicle.) Make sure that the preselected point is undamaged. If the point is damaged select another one.

2 Make sure that you reach the measuring point using the necessary adapter. Also select measuring options as necessary by pressing the "Parts In / Parts Out" button on the remote control.



3 Record the first point by pressing the "**Target button**  " on the measuring slide or "  (Measure)" on the Main menu.

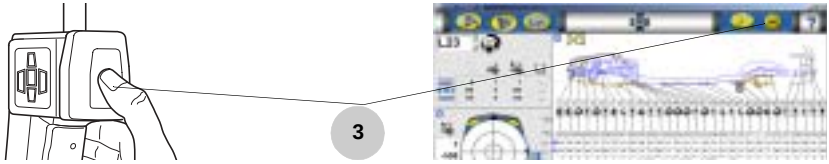


Figure 3.8 Record the point value.

4 Continue to measure undamaged points.

When 4-5 undamaged points have been recorded, Car-O-Soft Vision will give you an visual and audible indication. If the automatic centering was successfull, the green Quality symbol is shown on the lower status line. If the centering was not successful the red Quality symbol is shown on the lower status line. Recenter the vehicle if the red symbol is shown.

5 If centering is not satisfactory, locate the most inaccurate point by clicking on the green Quality symbol .

6 If a point has been recorded incorrectly, either re-center the most inaccurate point or delete it and choose another point.

1. QS: Shows the spread between the points in length and width. The best possible value is 100%. The best possible QS can be obtained when the centering points are covering more than 50% of the car. The closer the points are together the lower the QS value will be.

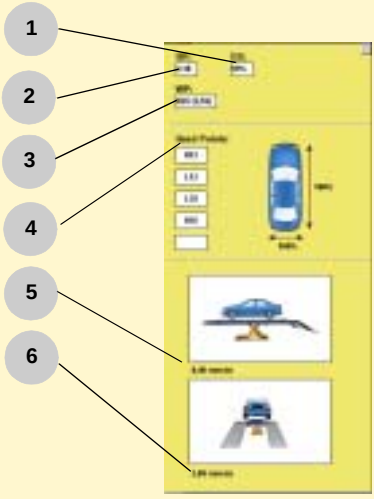
2. QR: Shows the total error sum divided by the number of points used for centering. The QR value should be as low as possible.

3. WP: Shows the worse point used for centering. It indicates it's position and its fault radius.

4. Used points: Shows the amount of points used for centering the vehicle.

5. This value indicates how much the vehicle is tilting length wise.

6. Shows the vehicle's actual position (width) according to the measuring bridge.



7 Once you have centered the vehicle continue to measure the vehicle.

8 If required, fit the measuring slide with a High measurement point equipment, see *section 3.8 "High measurement point (HMP)"*.

The adapter necessary to measure the active point is shown in the Upper left pane of the screen. A circle ◯ around the adapter indicates that parts need not to be removed to obtain measurement. A square □ indicates that removal of some parts may be necessary to measure the point. (Circles and squares that have shadows are clickable.)

The extension tubes should be chosen to make sure you could easily reach the measuring point. Car-O-Tronic Vision automatically detects the tube length.

9 Place the measuring slide in position at a measuring point.

NOTE: If measuring during a pull, spring load the measuring slide arm, *section 3.2.2 "Spring load the measuring slide arm"*. This will make the measuring slide arm follow the measuring point more easily.

10 Make sure that you reach the measuring point using the necessary adapter. Also select measuring options as necessary by pressing the the “Parts In / Parts Out” button on the remote control.

If the system is "*Unlocked*", the closest point to the measuring slide is always the active point (ASP – Automatic Searching Point). This means that it's not necessary to activate the system on each point you are going to measure. Just move the arm around the car and measure the points (according to the DataSheet). You can see on the *Lower Status line* if the system is locked or not.

If the system is "*Locked*" it is necessary to select the point by manually clicking on the measuring slide or click on the measuring points dimension box on the screen.

To "Lock/Unlock" the system, click on the "**Unlock/Lock"** symbol on the *Lower Status line*.

11 Record the measuring points by pressing the "**Target button**  " on the measuring slide or "  (Measure)" on the Main menu.

During damage diagnosis, make sure that the *Lower status line* shows "*Record before"* (Red car icon). "*Record before"* records the measurement values before repairs.

After damage diagnosis, switch to "*Record after"* (Green car icon), and then proceed with the repairs. "*Record after"* records the measurement values after the repairs.

"Record before" and "*Record after"* is changed by clicking on "**Record before/after"** (Red car/Green car icon) on the *Lower status line*.

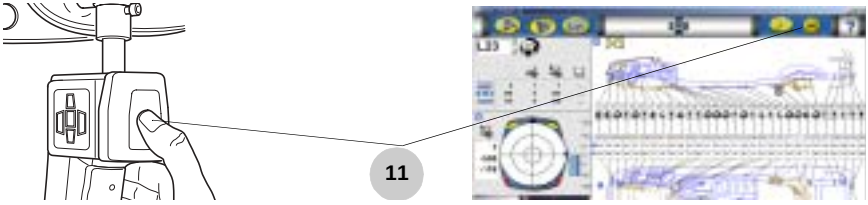


Figure 3.9 Record measuring value.

NOTE: The point's values are automatically stored and/or updated in the memory of the PC and it can be obtained whenever needed.

12 Click on the "**Print Out Mode**" button to move forward to Print Out mode, see *section 3.9 "Print Out"*.

3.5 Measurement without DataSheets

The procedure for measuring without DataSheets is as follows:

1 Create new Workorder.

2 Center the vehicle, using Cord centering.

3 Measure the vehicle, using Absolute or Comparative measuring.

4 Print a report.

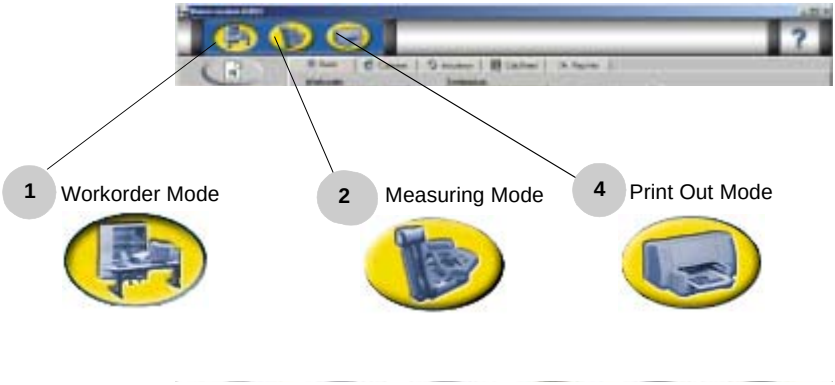


Figure 3.10 Car-O-Soft Vision Main menu.

3.5.1 Create new Workorder

1 Click on “  (Workorder Mode)“ in Car-O-Soft Vision Main menu. Now, the “***Workorder***” menu is opened.

2 Click on the “**New Workorder**”  button.

3 Fill in a Workorder number or use the default Workorder number which is the date of the day with a running number added to form or a unique Workorder number.

4 Click on the "**OK**" button in the upper right corner to confirm the Workorder number and to open the *Car-O-Liner Index*.

5 Select Car-O-Liner from the left pane in the window. Click the "+" to the left of the make to view the subgroups.

6 Select subgroup Cars.

7 Select "**Empty data sheet**"

8 Click on the "**OK**" button to confirm the DataSheet selection.

9 Fill in the Basic, Customer and Insurance forms. Click on the "**OK**" button to confirm.

10 Select in Engine In or Out. Click on the "**OK**" button to confirm.

11 The DataSheet opens up and you are now ready to begin measuring.

3.5.2 Cord centering

When having performed cord centering it is possible to measure the vehicle with either Absolute or Comparative measuring, but not with “normal” measuring.

When you select cord centering, the system will automatically fill in the points in the centering screen. The name of the points are RF (Right Front), LF (Left Front), RZ (Right Zero) and LZ (Left Zero).

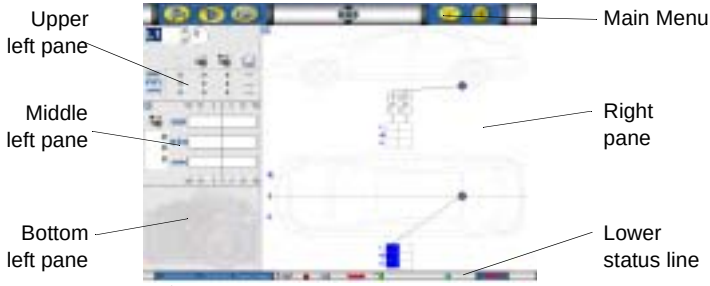
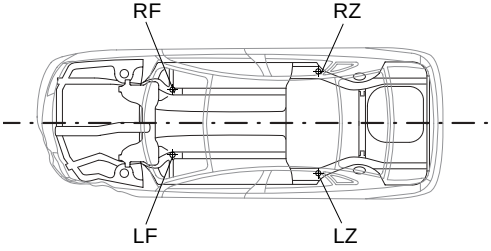


Figure 3.11 Cord centering menu.

When using cord centering, you have to select the centering points in **Car-O-Soft Vision**:

When cord centering the vehicle, you must select:

- Two pair of points that are symmetrical.
- Undamaged points.
- Points that are as far apart as possible from each other.
- Points within in the passenger area.



NOTE: It is important that you measure the points in the following order: LZ, RZ, RF, LF

1 Put the measuring slide in position by the first centering point (LZ - Left Zero). As the point name states, this point must be positioned on the rear left side of the vehicle.

2 Record the first centering value by pressing the **"Target button**  " on the measuring slide or "  (Measure)" on the "*Main*" menu.

When you have recorded the first center point, the next point is automatically activated.

3 Record the three remaining centering points in the following order (**RZ** – Right Zero, **RF** – Right Front and **LF** – Left Front).

Once all centering points have been recorded, Car-O-Soft Vision will give you an visual and audible indication if the centering was successful. If the centering was successful the green Quality symbol  is shown on the lower status line. If the centering was not successful the red Quality symbol  is shown on the lower status line. Recenter the vehicle if the red symbol is shown.

4 If centering is not satisfactory, locate the most inaccurate point by clicking on the green Quality symbol  .

5 If a point has been recorded incorrectly, either re-center the most inaccurate point or delete the pair and choose a new pair points.

The system now creates a center line below the vehicle. The center line goes from the middle of the two front points (LF and RF) to the middle of both zero points (LZ and RZ).

3.5.3 Measuring

Once the vehicle has been cord centered it can be measured, using Absolute or Comparative measuring.

Absolute measuring can be used to measure point to point, e.g. parallell measurement, as using a measuring-tape. It can also compare two like measurements, e.g. cross measurement of a center section, to compare the measurements for a diamond damage.

Comparative measuring is used to compare symmetrical points at each side of the vehicle.

1 Measure the vehicle, using Absolute measuring, see *section 3.6 "Absolute measuring"* or Comparative measuring , see *section 3.7 "Comparative measuring"*.

3.6 Absolute measuring

Absolute measurement is used when no DataSheet is available or if you want to measure a point that is not included on the DataSheet. Absolute measurement can also be used if the information is not electronically formatted. When using Absolute measurement, the user may choose any centering and measuring points. The vehicle can either be measured using Parallel measurement or Cross measurement.

Absolute measuring can be used to measure point to point (Parallell measurement) as using a measuring-tape. It can compare two like measurements (Cross measurement of a center section) to compare the measurements for diamond damage.

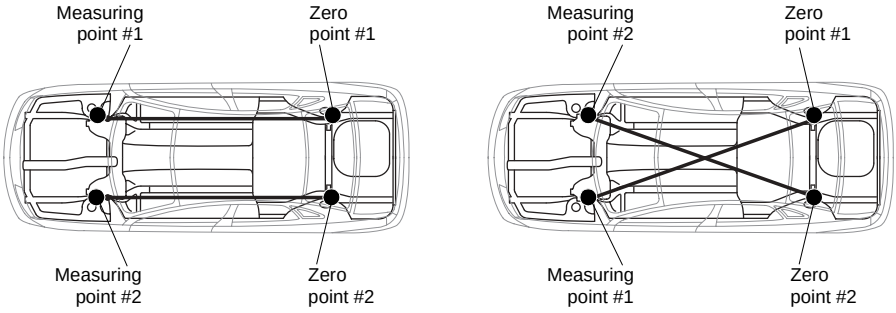


Figure 3.12 Parallel measurement and Cross measurement

Figure 3.13 Absolute measuring menu.

1 If required, fit the measuring slide with a High measurement point (HMP) unit, see *section 3.8 "High measurement point (HMP)"*.

2 Fit the measuring slide with an adapter and or tube.

3 Place the measuring slide in position at the first zero point .

> **NOTE:** If measuring during a pull, spring load the measuring slide arm, *section 3.2.2 "Spring load the measuring slide arm"*. This will make the measuring slide arm follow the measuring point more easily.

4 Record the first zero point by pressing the "**Target button** " on the measuring slide or " (Measure)" on the Main menu. The measured values are shown in the *measuring field*.

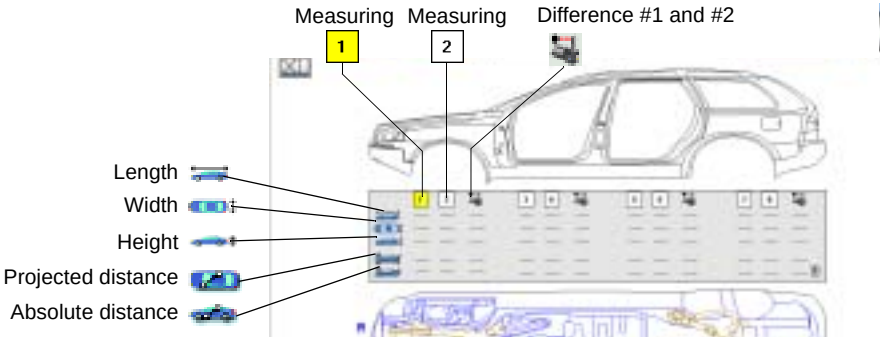
5 Place the measuring slide in position at the first measuring point.

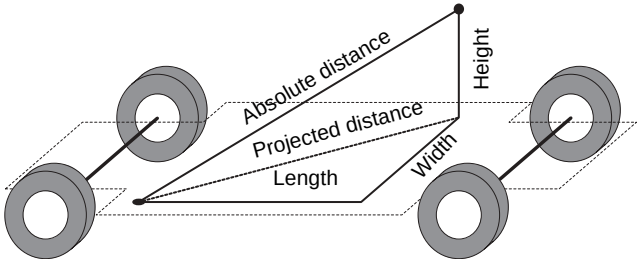
6 Record the first measuring point. Once the first measuring point is recorded, the point's measuring value is given in the measuring field.

7 Record the second zero point.

8 Record the second measuring point.

Once the second measuring point has been recorded, the difference between point #1 and point #2 is presented in the measuring field etc. As long as summetrical points were measured.





NOTE: If the measuring system is not centered, only the the Absolute distance will be shown.

NOTE: The point's values are automatically stored in the memory of the PC and it can be obtained whenever needed.

During damage diagnosis, make sure that the *Lower status line* shows *Record before* (Red car icon). *Record before* records the measurement values before repairs.

After damage diagnosis, switch to *Record after* (Green car icon), and then proceed with the repairs. *Record after* records the measurement values after the repairs.

Record before and *Record after* is changed by clicking on **Record before/after** (Red car/Green car icon) on the *Lower status line*.

3.6.1 Exit Absolute measuring

To exit Absolute measuring:

1 Press the "Blue Enter button" on the remote control or click on the button in Car-O-Soft Vision.

2 Select the "Absolute measuring" button.

3 Select "Normal measuring" to return to normal measuring.

3.7 Comparative measuring

When no DataSheets are available, comparative measuring can be used. Comparative measurement can also be used if you want to measure a point that is not included on the DataSheet, and can also be used if the information is not electronically saved. When performing comparative measuring, one side of the vehicle is compared to the other side. (The differences against the center line is then presented).

When performing a comparative measurement, the user may choose any centering and measuring points, using Parallel measurement.

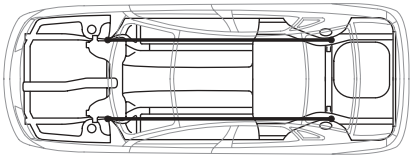
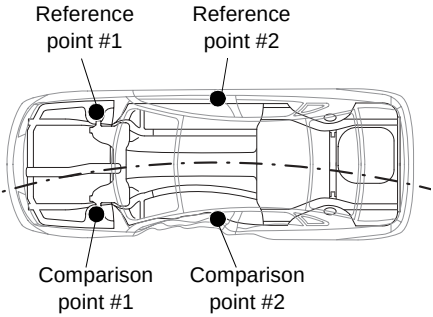


Figure 3.14 Parallel measurement.

Comparative measuring is used to compare symmetrical points at each side of the vehicle. A total of 9 sets of points can be compared. Each set of comparative points comprises two points – a reference point and a comparison point. The reference point must be set on the undamaged side of the vehicle.



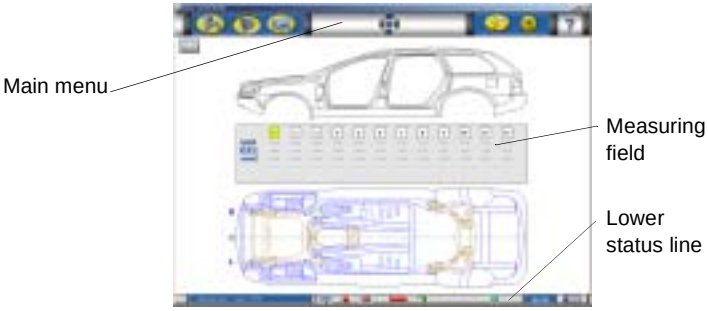


Figure 3.15 Comparative measuring menu.

1 If required, fit the measuring slide with a High measurement point (HMP) unit, see *section 3.8 "High measurement point (HMP)"*.

2 Fit the measuring slide with an adapter and or tube.

3 Select measuring options (parts in/out) as necessary.

4 Place the measuring slide in position at the first reference point. Make sure to set the reference point on the undamaged side of the vehicle.

NOTE: If measuring during a pull, spring load the measuring slide arm, *section 3.2.2 "Spring load the measuring slide arm"*. This will make the measuring slide arm follow the measuring point more easily.

NOTE: Make sure that all reference points are situated on the undamaged side of the vehicle.

NOTE: Comparative measurement can only be used if the car is only damaged on one side of the vehicle.

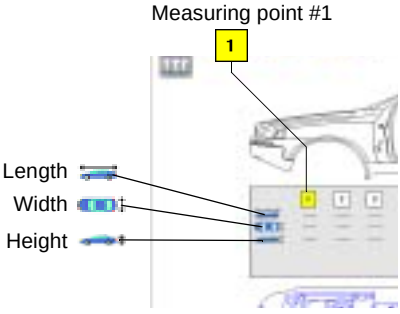
5 Record the first reference point by pressing the "**Target button**  " on the measuring slide or "  (Measure)" on the Main menu. The measured values are shown in the *measuring field*. Once the first point has been recorded it will be automatically set as reference point.

Note that the recorded point, which is the reference point, turns yellow on the screen. Also note that the recorded values goes to zero except for the width, which shows a negative value.

6 Place the measuring slide in position by the comparison point which must be symmetrical with the reference point (on the other side of the vehicle).

7 Record the comparison point.

Once the comparison point has been recorded, the difference between the reference point and the comparison point is given in the right pane.



E.g. if the recorded values are showing "0, 0, 0" (length = 0, width = 0 and height = 0) it means that the reference point and the comparison point are perfectly symmetrical. If the recorded values are showing "5, -4, 3" (length = 5, width = –4 and height = 3) it means that the comparison point is 5 mm longer, 4 mm narrower and 3 mm higher than the reference point.

NOTE: The point's values are automatically stored in the memory of the PC and it can be obtained whenever needed.

During damage diagnosis, make sure that the *Lower status line* shows "*Record before"* (Red car icon). "*Record before"* records the measurement values before repairs.

After damage diagnosis, switch to "*Record after"* (Green car icon), and then proceed with the repairs. *Record after* records the measurement values after the repairs.

"Record before" and "*Record after"* is changed by clicking on "**Record before/after"** (Red car/Green car icon) on the *Lower status line*.

3.7.1 Exit Comparative measuring

To exit Comparative measuring:

1 Press the "Blue Enter button" on the remote control or click on the button in Car-O-Soft Vision.

2 Select the "Comparative measuring" button.

3 Select "Normal measuring" to return to normal measuring.

3.8 High measurement point (HMP)

3.8.1 High measurement point equipment M705

The high measurement point (HMP) unit is used to measure high points on the vehicles chassi and in the engine compartment.

Mesuring can be done in the following steps:

1 Place HMP with adapter and extension on point to be measured.

2 Set height and width dimensions to desired position.

3 Record width, height, angle (A, B, C) pointer direction and extension information in software.

3.8.2 Equipment set up

When the HMP-unit is set on the measuring slide, the measuring slide automatically informes the PC that high measuring points are to be measured. The PC-screen changes automatically to the high measuring points.

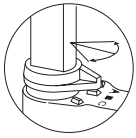
HMP unit lenght angle

Set the length of the HMP unit so that it will reach the chosen measuring point:

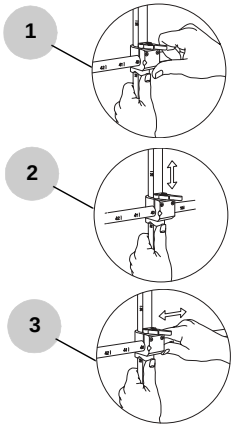
1 Loosen the locking screw.

2 Turn the vertical bar to position A, B or C as desired.

3 Tighten the locking screw.



HMP unit set height and width



1 Hold a thumb on the bottom edge of the junction, and open the lever.

2 Set the height on the vertical bar, graded from 0-26.

3 Set the width on the horizontal scale, graded 30-45.

4 Release the lever. Make sure to hold the thumb on the junction until the lever is locked.

HMP unit fit adapter or extension

Fit the HMP unit with an adapter and, if necessary, an extension. The adapter are chosen according to the data given in the Car-O-Liner upper body DataSheets.

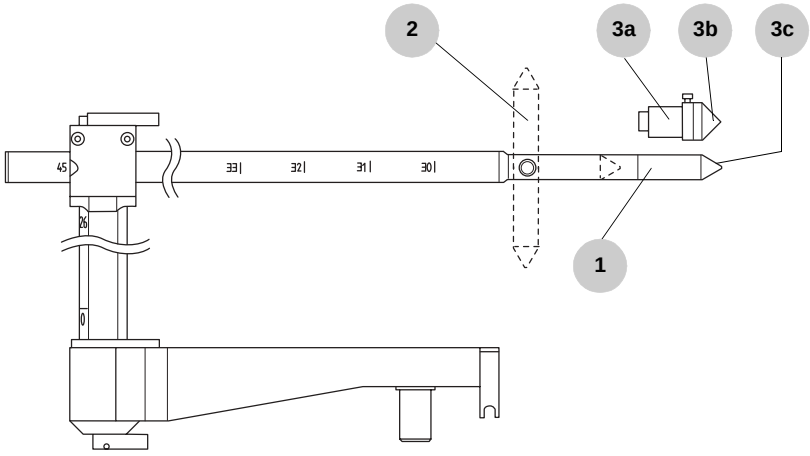
1 To change the extension, unscrew the old extension from the HMP unit. Fit the new extension onto the HMP unit.

2 To adjust the angle of the extension, loosen the extension and flip it to the correct direction and tighten it again.

NOTE: The angle of the extension must fit the description from the Car-O-Liner upper body DataSheet.

IMPORTANT! Only one extension at a time is allowed.

3 Fit the adapter holder (3a) with an adapter [3b] or a pointer [3c] according to the DataSheet.



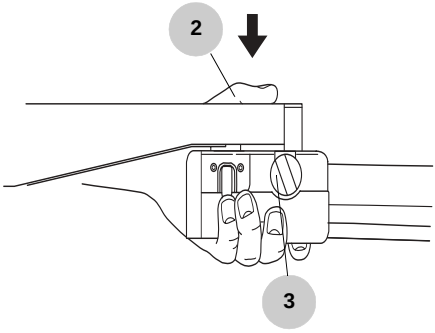
Fit HMP unit to measuring slide

Finally, in order to obtain good measuring accuracy it is important to fit the HMP-unit onto the measuring slide as follows:

1 Insert the HMP-unit on the measuring slide arm.

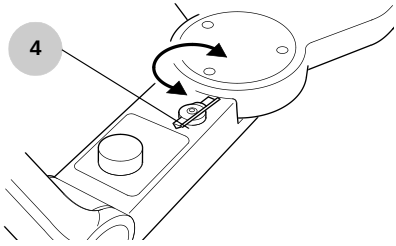
2 Apply pressure to the HMP-unit by pressing the left thumb at the indicated position.

3 Tighten the knob.



4 To balance the weight of the HMP-unit, see *section 3.2.2 "Spring load the measuring slide arm"*.

5 Place the adapter and the HMP unit by the measuring point.



IMPORTANT! To assure tensionless measuring of the point, make sure to place the adapter by the measuring point without tension when using the HMP unit.

HMP unit set up in Car-O-Soft Vision

If you have communication between the M705 HMP unit and the PC, the M705 HMP Set Up will automatically appear on the screen once the HMP unit is inserted. The DataSheet automatically switches to Upper Body DataSheets too.

The M705 HMP Set Up can also be accessed by clicking on the "**Blue Enter Button**" which is located in the center of the "**Remote control**" see *section 4.4 "Normal measuring menu"*. Change between.

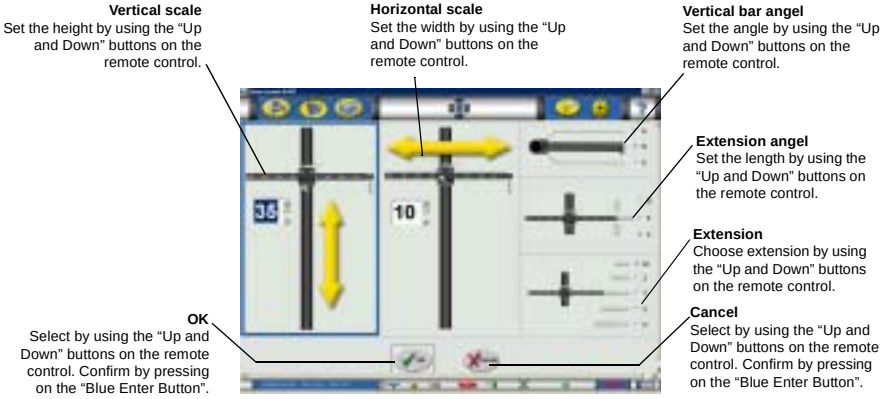


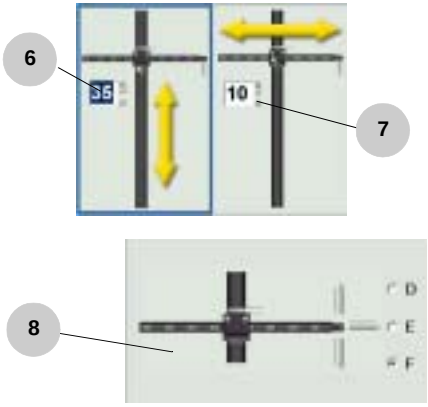
Figure 3.16 HMP Set Up window.

IMPORTANT! When measuring with the HMP unit, the reading of the setting on the display must agree fully with the scales and the selected measuring tube length and angle. If not, the measuring value will be incorrect.

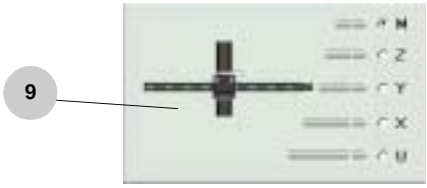
6 Set the chosen height of the horizontal HMP scale (graded from 0-26) in the drop down box.

7 Set the chosen width of the vertical HMP scale (graded from 30-45) in the drop down box.

8 Set the chosen angle of the extension.



9 Set the length of the chosen extension.



NOTE: The minimum information required is Workorder (number or name) and select a DataSheet.

10 Set the angle of the vertical bar.

11 Select "**OK**" to confirm the selections in the HMP Dialog window.

IMPORTANT! To assure a correct measuring when using the HMP unit, avoid to record the measuring points by pressing the Target button on the measuring slide.

3.9 Print Out

The “Print Out“ mode is used to make printouts of the measurements.

1 Click on the “printer icon“ to choose the type of Print Out.

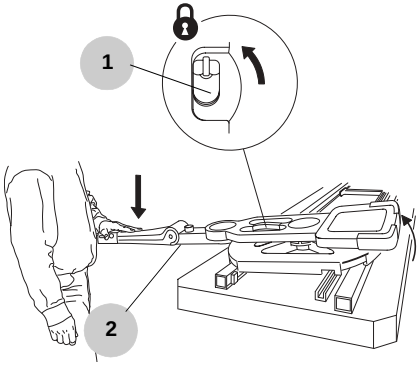
2 Click on “  (Print Out)“ to print the report or click on “  (Save selected Records on file)“ to make a digital file of the report.

> **NOTE:** By default, the digital file is saved in the “Rep info menu” destination folder X:\car-o-liner\Vision\ My documents. (*X:* is the same disc as Car-O-Soft Vision has been installed on.) The destination folder can be changed in the Car-O-Soft Vision Setup.

The following Print Outs are available in Car-O-Soft Vision see *section 4.6.1 "Print Out"*

3.10 Removing the measuring slide from the measuring bridge

Remove the measuring slide from the measuring bridge by doing as follows:



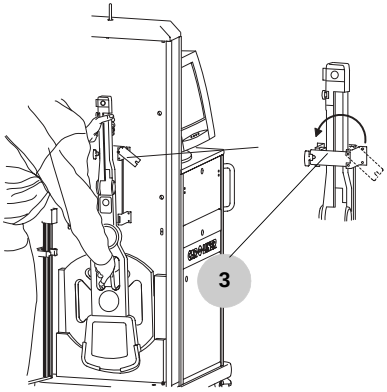
1 Lock the measuring slide locking handle by turning it 90 degrees.

2 Push down the measuring slide arm to remove the slide from the measuring bridge.

NOTE: Grab the measuring slide as shown. Grab the outer arm with your left hand and grab the center arm with your right hand.

WARNING! The arm of the measuring slide must be locked when moving it from the measuring bridge. Risk for crush injuries.

3 Replace the measuring slide into the cabinet. Make sure to close the locking hatch.



3.11 View DataSheet and photos

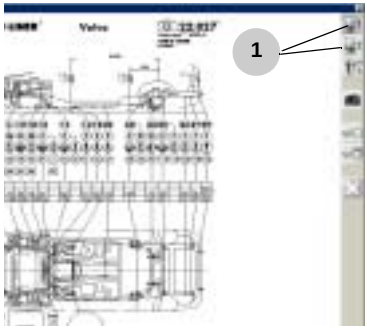
From the function button bar on the DataSheet you can:

- Show page1 or 2.
- Change between Upper and Lower Body.
- View DataSheet and details.
- Print DataSheet and details.
- View photographs.
- Print photographs and details.
- Exit DataSheet.
- Zoom in or out on details.

3.11.1 Switch between DataSheet pages

Most DataSheets contains two pages. To switch pages for viewing:

1 Click “  “ or “  “ to change between page 1 and page 2.

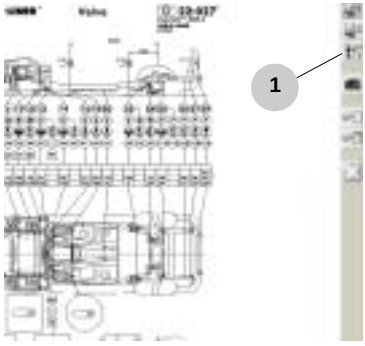


NOTE: Button 2 (Show page 2) is only visible when the DataSheet contains two pages.

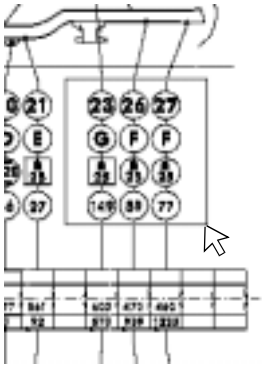
3.11.2 Change between Upper and Lower Body

If you want to change between Upper and Lower Body you can click the “Upper/Lower body“ button.

1 Click “  (Show UpperBody)“ to view the Upper Body DataSheet (if available).



3.11.3 Zoom



To zoom in for a closer look at details, two methods can be used:

- Point at the detail you would like to zoom in on and press the left mouse button.
- Point at the upper left corner of the area you would like to zoom in on, and press and hold down the left mouse button. Move the pointer to the bottom right corner of that area and release the button (click and drag).

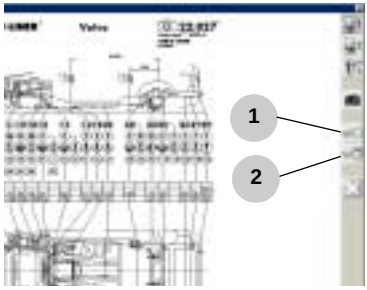
To zoom out, press the right mouse button.

3.11.4 Print DataSheet

By using the print buttons on the function button bar, you can print out the DataSheet. You can either print the DataSheet on a printer or you can print the screen after enlarging details on the screen.

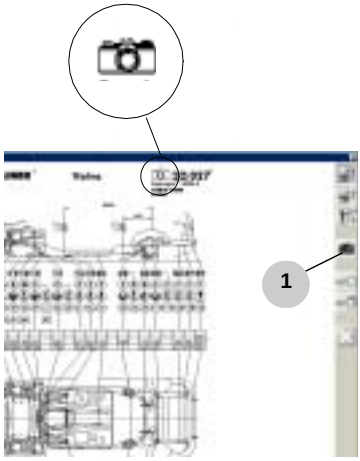
1 Click “  (Print the screen presentation)“ to print the DataSheet on a printer.

2 Click “  (Print all pages)“ to print all DataSheet pages for the vehicle.



3.11.5 View and Print Photos

Photo DataSheets give user the ability to view photos of most measuring points. Measuring information for each point is also given. (The camera symbol  in the upper right corner of the DataSheet indicates that the DataSheet is a photo DataSheet.)



1 Click “  (Show photos)“ to view photos of the photo DataSheet (if available). The “*Show photo*“ window is shown on the screen, see .

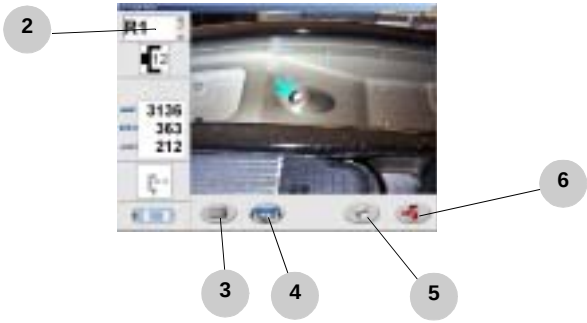


Figure 3.17 View photo windows.

2 To change measuring points use the “Measuring Point drop-down box“. The drop-down box shows the location of the measuring point, e.g. “R1“= Lower right side, measuring point number 1 and “HR1”= High right side, measuring point number 1.

3 Click “  (Engine In or Out)“ to choose between engine mounted or unmounted during measurement.

4 Click “  “ to switch between Upper and Lower body measuring points.

5 Click “  “ to print all photos from the active DataSheet.

6 Click “  (Close)“ to return to the DataSheet.

3.12 Close Car-O-Soft Vision

1 Return to the Car-O-Soft Vision Main menu.

2 Click on the “**Close**“ button to exit Car-O-Soft Vision.

4 Key functions

4.1 Main Menu

From the Car-O-Soft Vision Main menu you can control the measuring and you can also acquire a wide selection of information. There are three main modes in Car-O-Soft Vision – “Workorder”, “Measuring” and “Print Out”.

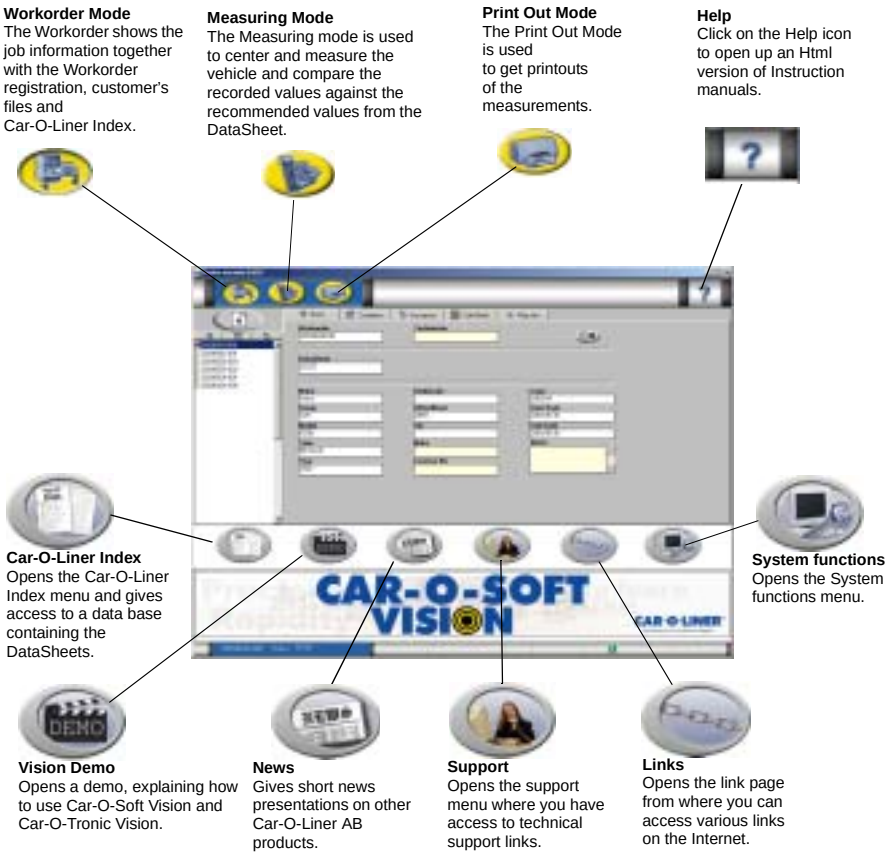


Figure 4.1 Car-O-Soft Vision Main menu

4.2 Workorder

Each Workorder form gives you information about the customer, the Insurance company involved and allows you to make a specification of the work performed on the vehicle, including an estimation of the costs.

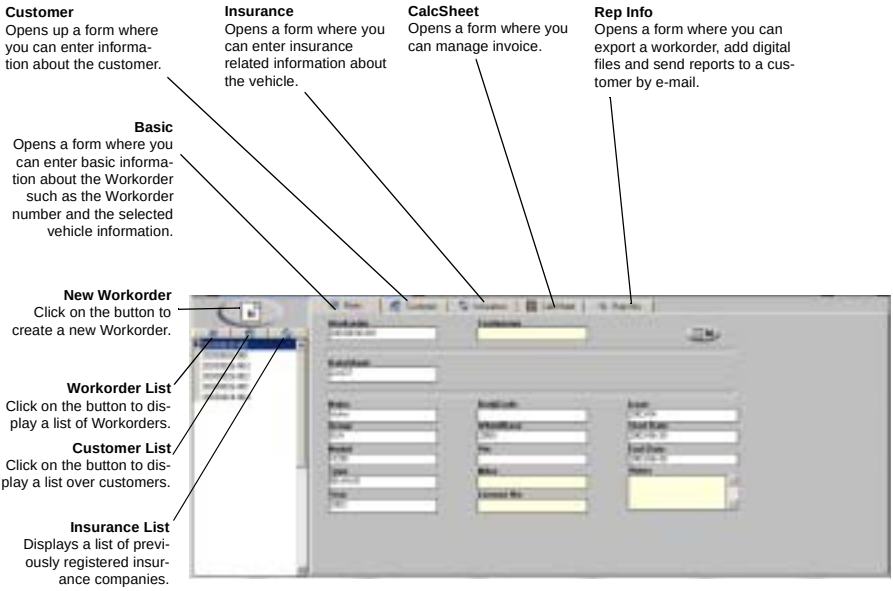
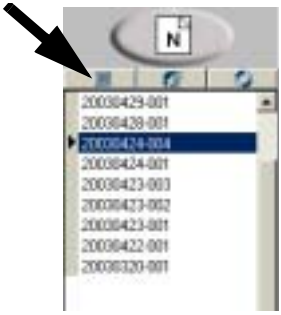


Figure 4.2 Workorder form

4.2.1 Workorder List



The “**Workorder List**“ shows all Workorders saved in the Workorder data base. Each Workorder contain information about customer, Insurance company and price estimation on the repair work etc. The “**Workorder List**“ is open as default when you start Car-O-Soft Vision, but if it isn´t, it can be can be activated by clicking on “ (**Workorder List**)“.
To register a new Workorder, click on “ (New Workorder)“ see *section 3.5.1 "Create new Workorder"*.

4.2.2 Customer List

The “**Customer List**“ shows all customers saved in the customer data base. The list can be activated by clicking on “ (**Customer List**)“. To register a new customer see *section 4.2.5 "Customer"*.

4.2.3 Insurance List

The “**Insurance List**” shows all insurance companies saved in the insurance data base. The list can be activated by clicking on “ (**Insurance List**)“. To register a new insurance company see *section 4.2.6 "Insurance"*.

4.2.4 Basic

The “**Basic**” form shows you the basic information in the Workorder. When you start Car-O-Soft Vision this is the view that is shown as default.

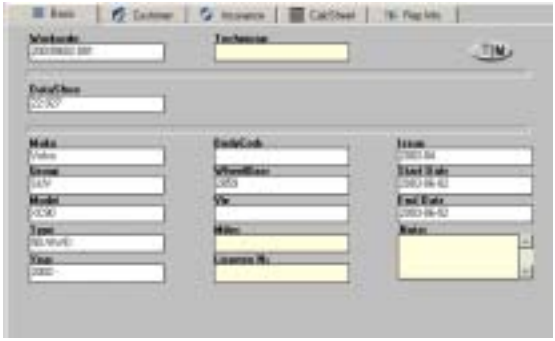


Figure 4.3 Basic form

View Basic Menu

When you click on the “**View Basic Menu**”  the view Basic menu opens up.

Figure 4.4 View Basic Menu

To edit Basic information:

1 Click on the Workorder in the Workorder list that you wish to edit.

2 Enter the new information in the customer form. The new information is automatically stored.

4.2.5 Customer

The “**Customer**” form shows customer related information. Here you can also add new customers to the customer data base or edit a previously registered customer.

Figure 4.5 Customer form

View Customer Menu

When you click on the “View Customer Menu” the view customer menu opens.

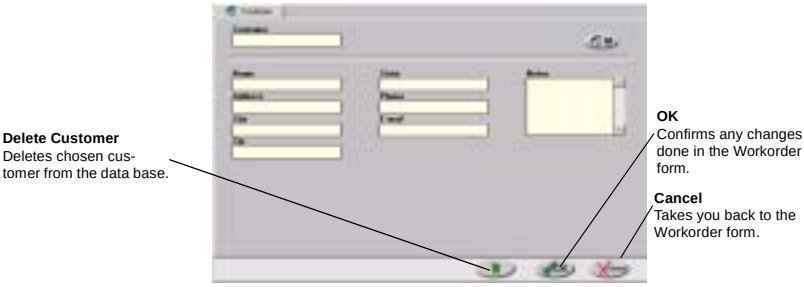


Figure 4.6 View Customer Menu

To edit an customer:

1 Click on the customer in the customer list that you wish to edit.

2 Enter the new information in the customer form.

4.2.6 Insurance

The “**Insurance**” form shows insurance related information. Here you can also add new insurance companies to the insurance data base or edit an previously registered insurance company.

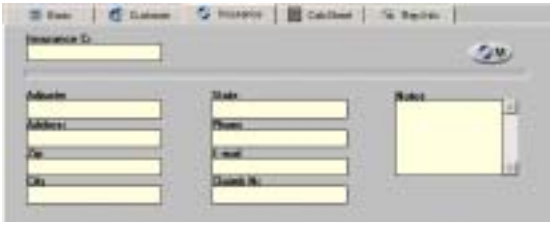


Figure 4.7 Insurance form

View Insurance Menu

When you click on the "**View Insurance Menu**" the view Insurance menu opens up.

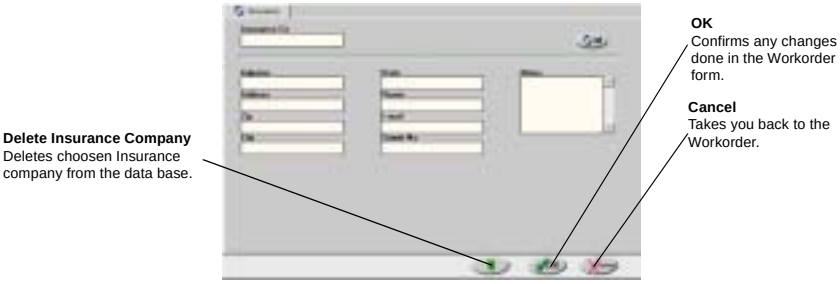


Figure 4.8 View Insurance Menu

To edit an Insurance company:

1 Click on the insurance company in the insurance company list that you wish to edit.

2 Enter the new information in the insurance company form.

4.2.7 CalcSheet

The “**CalcSheet**” form is used to estimate and summarize the costs (work and material) for repairing the vehicle.

To add costs to the list, simply click in an empty line in the form. Enter a work description, cost of work, how much time it took and cost of materials. Click on the “Add work” button and the line is added to the list. The work performed is also added to the pricelist so that next time you wish to add a work cost, you can choose from a drop down list.

Figure 4.9 Calculation form

Pricelist

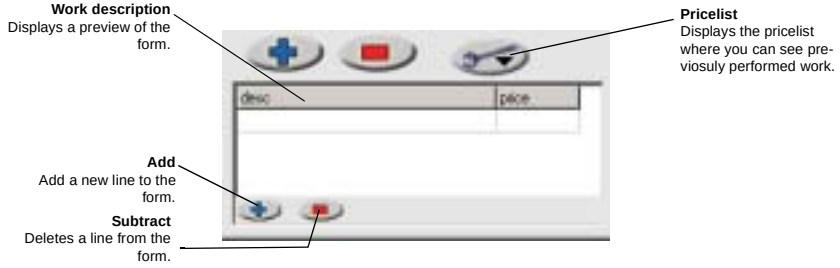


Figure 4.10 Calculation form > pricelist

4.2.8 Rep Info

The “**Rep Info**” form is used to handle and add photos of a vehicle to a report. Here you can also send a report via e-mail or export it.

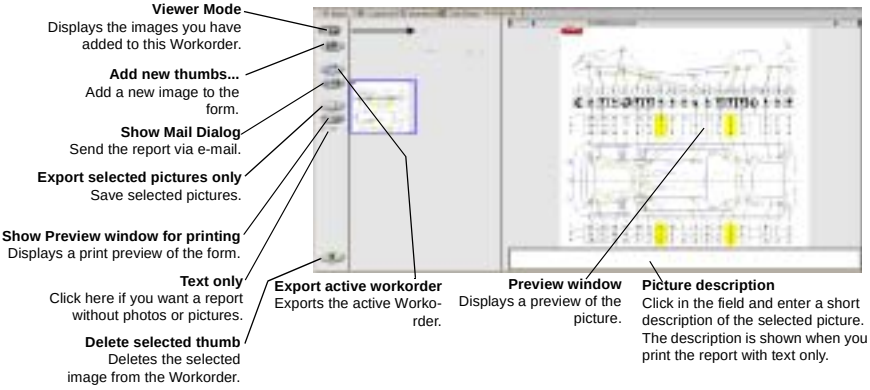


Figure 4.11 Rep Info > view images

Export active workorder

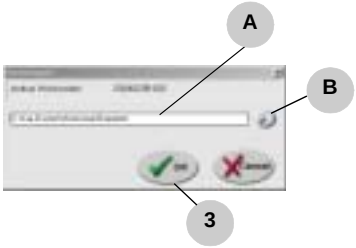
To export active workorder:

1 Click on the button “**Export active workorder**”

2 Select where the export of the workorder should be saved by:

A)Type in the search path.

B) Or click the “Search” button and select the folder where you want to save the workorder.



3 Click “**OK**” to finish the export.

Add image

To add images:

1 Select the photo you want to add in the “Explorer”. You can select more than one photo by holding down the Ctrl button on your keyboard.

2 Click on the “Add new thumbs...” button.

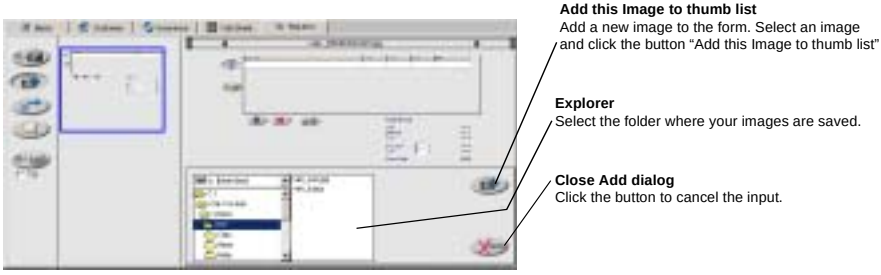


Figure 4.12 Rep Info > Add thumbs mode

Show Mail Dialog

To send e-mail:

1 Select the reports/images you want to attach to your e-mail. (You can select more than one file by holding down the Ctrl button on your keyboard.)

2 Click the button “Show mail dialog”.

3 Fill out the e-mail form (From, To and Subject) and, if you want to, a message to the recipient.

4 Click the button “Send mail”.

Figure 4.13 Rep Info > Show mail dialog

4.2.9 Car-O-Liner Index

The **Car-O-Liner Index** includes all DataSheets stored in the Car-O-Data database. (The **Car-O-Liner Index** is visible when the Workorder form is in “Edit“ or “New mode“ it can also be accessed by clicking on the “**Car-O-Liner Index**” button in the “Vision menu”.) To choose a DataSheet, see *section "View DataSheet".*

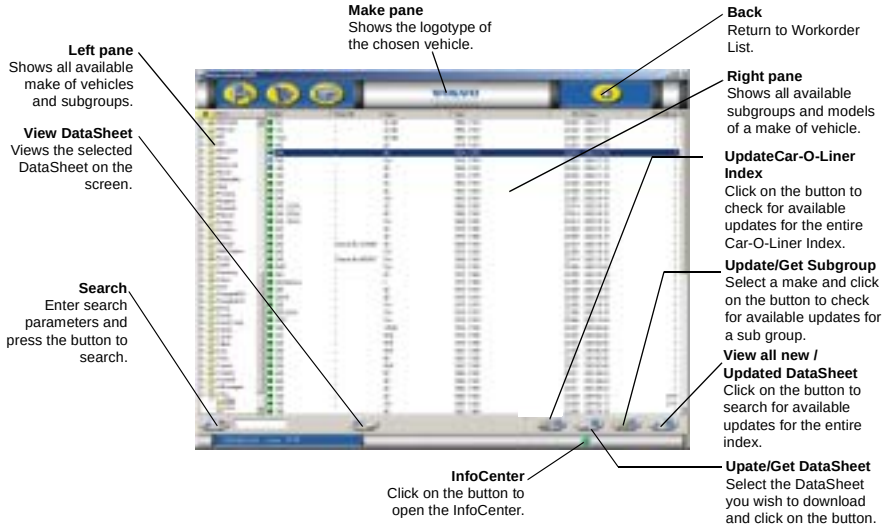


Figure 4.14 Car-O-Liner Index.

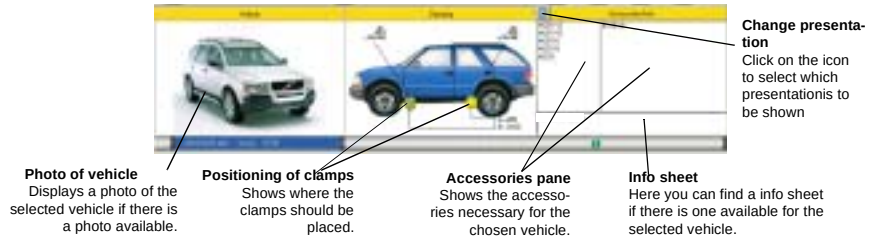
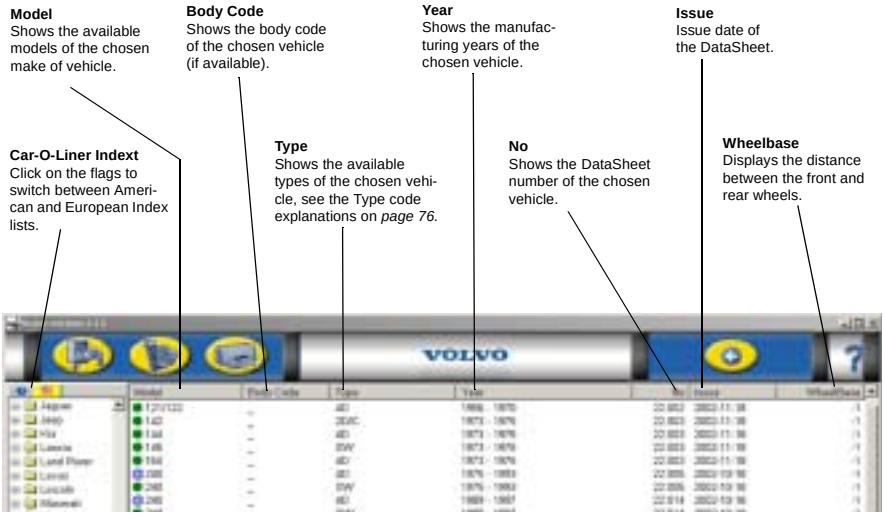


Figure 4.15 Car-O-liner Index InfoCenter



The manufacturing years are given as follows:

2000–	Manufacturing started in 2000, and the vehicle is still in production.
2000	Vehicle was only manufactured during 2000.
1995–2000	Manufacturing started in 1995 and ended 2000.

Figure 4.16 Car-O-Liner Index

4.2.10 Type Codes for Car-O-Liner Index

2	Two Seater	**LoB**	Long Bed
4	Four Seater	**LS**	Leaf Springs
2+2	Two + Two Seater	**LWB**	Long wheelbase
2D	Two Door	**Man**	Manuel gearbox
3D	Three Door	**McP**	McPherson
4D	Four Door	**MPV**	Multi Purpose Vehicle
5D	Five Door	**MV**	Mini Van
3HB	Three Door Hatchback	**MWB**	Middle wheelbase
5HB	Five Door Hatchback	**NT**	Narrow track
2HT	Two Door Hardtop	**O**	Open
4HT	Four Door Hardtop	**P**	Petrol
4L	4-link Suspension	**PS**	Power steering
5L	5-link Suspension	**PU**	Pick Up
2WD	Two Wheel Drive	**R**	Roadster
4WD	Four Wheel Drive	**RC**	Regular Cab
2WS	2 wheel steering	**RHD**	Right Hand Drive
4WS	Four Wheel Steering	**RWD**	Rear Wheel Drive
Aut	Automatic gearbox	**S3**	3 cylinder straight engine
AWD	All Wheel Drive	**S4**	4 cylinder straight engine
B4	4 cylinder Boxer engine	**S5**	5 cylinder straight engine
B6	6 cylinder Boxer engine	**S6**	6 cylinder straight engine
B	Bus	**S**	Sedan
C	Coupe	**Sh**	Short
CO	Combi	**ShB**	Short Bed
CP	Compact	**Sp**	Sport
CS	Coil Springs	**SR**	Servo
CV	Convertible/Cab	**Std**	Standard
CVP	Cab Plus	**StdC**	Standard Cab
D	Diesel	**StdV**	Standard Van
DC	Double Cab	**SUV**	Sport Utility Vehicle/Outback
E	Extended	**SW**	Station Wagon
ExC	Extended Cab	**SWB**	Short wheelbase
ExV	Extended Van	**Ute**	Utility Vehicle/Outback
EV	Electric vehicle	**V**	Van
FWD	Front Wheel Drive	**V4**	4 cylinder V-engine
HB	Hatchback	**V5**	5 cylinder V-engine
HD	Heavy duty	**V6**	6 cylinder V-engine
HT	Hardtop	**V8**	8 cylinder V-engine
IRS	Independent Rear Suspension	**V10**	10 cylinder V-engine
LB	Liftback	**V12**	12 cylinder V-engine
LC	Light Commercial	**W**	Wankel engine
LHD	Left Hand Drive	**WB**	Wheelbase
Lo	Long	**WT**	Wide track

Table 1.1 Type codes for Car-O-Liner Index

View DataSheet

A DataSheet can be viewed by clicking “  (**Car-O-Liner Index**)“ in the **Vision menu** and then by double clicking on a model in the list or by clicking on the “View DataSheet”  button.

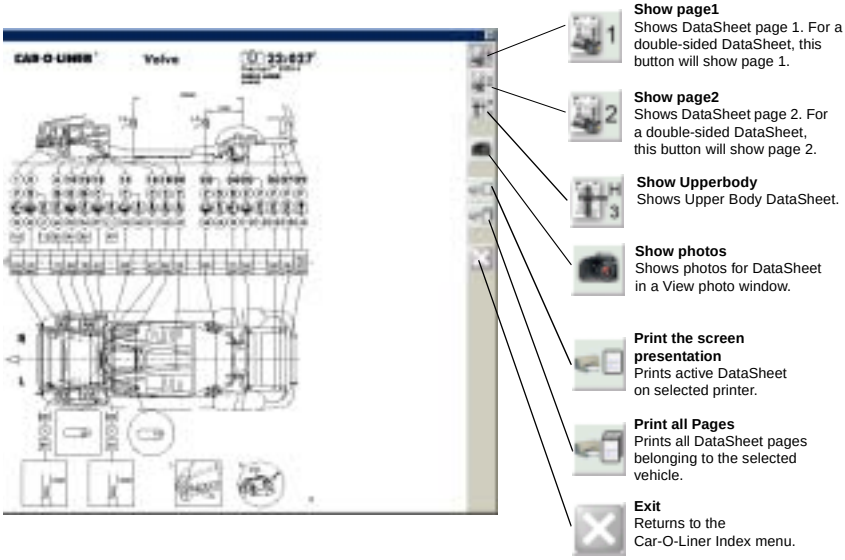
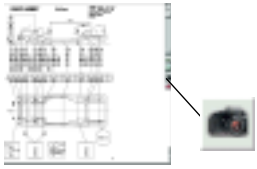


Figure 4.17 View DataSheet

View photo

To open the "*View photo*" window, click " (View photos)" in the "*View DataSheet*" window.



Explanatory drawing
Explanatory drawings for measuring point.
Circle = Assembled
Square = Dismantled

Measuring direction
Shows the direction for measuring the point.

Print photos
Prints all photos from the active DataSheet.

Close
Returns to View DataSheet window.

Figure 4.18 View photo.

Measuring point drop-down box

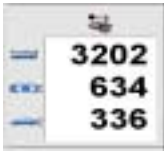
For changing the measuring point. The drop-down box shows the location of the measuring point, e.g. L1= Lower left side, measuring point number 1. HL1= High left side, measuring point number 1.

Required adapter

Adapter for actual point. Clickable if symbol has a shadow, which means that point is both part in/out.

DataSheet Values

Shows the DataSheet values of the length, width and height for the actual point.



Engine In or Out

For changing between engine in or engine out during measurement.

Upper / LowerBody

For changing between high and low measuring points.

Figure 4.19 Show photo.

4.2.11 Search function

The search function is an alternate method of finding a DataSheet in the *Car-O-Liner Index*. You can search all items given in the index (e.g. make, model, DataSheet number, issue, accessories, body code, type code).

1 Click in the search field and enter the search parameters.

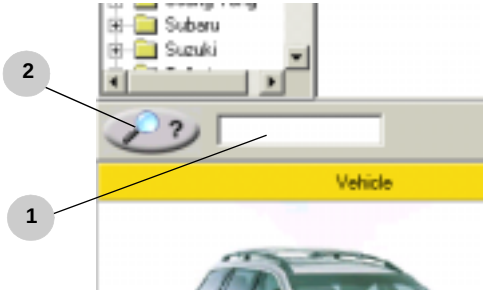


Figure 4.20 Search function

2 Click on the “Search”  button to start searching.

NOTE: To get a list of all models in the index enter % in the search field and then click on the search button.

4.3 Remote control

The “**Remote control**” is a device which enables you to navigate the menus in **Car-O-Soft Vision** directly from the measuring slide. In the upper status line of Car-O-Soft Vision you also have a “**Remote control**”. It looks exactly as the remote control on the measuring slide and has the same functions.

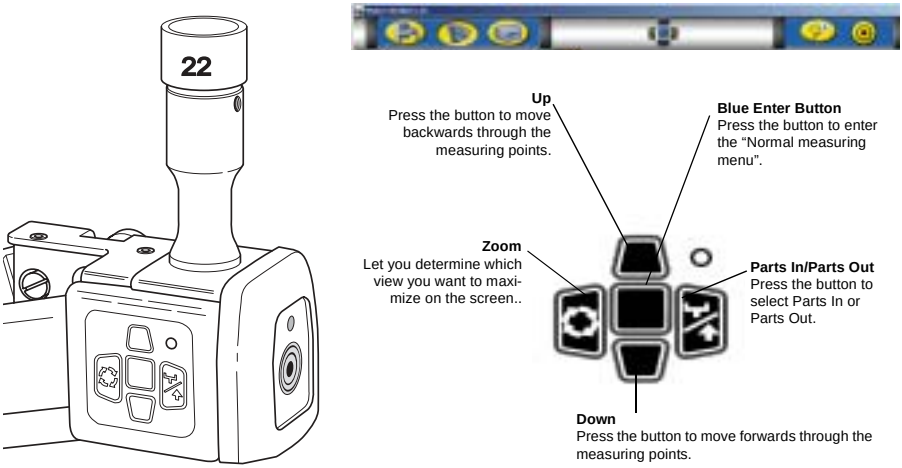


Figure 4.21 The Remote control.

4.4 Normal measuring menu

In the “Normal measuring menu” you have access to functions such as “**Absolute and comparative measuring**”, “**HMP**” “**Print screen**” etc. The “**Normal measuring menu**” is accessed by pressing the “**Blue Enter Button**” on the remote control. To navigate the menu, use the “Remote control” on the measuring slide. Select by pressing the “**Blue Enter Button**”.

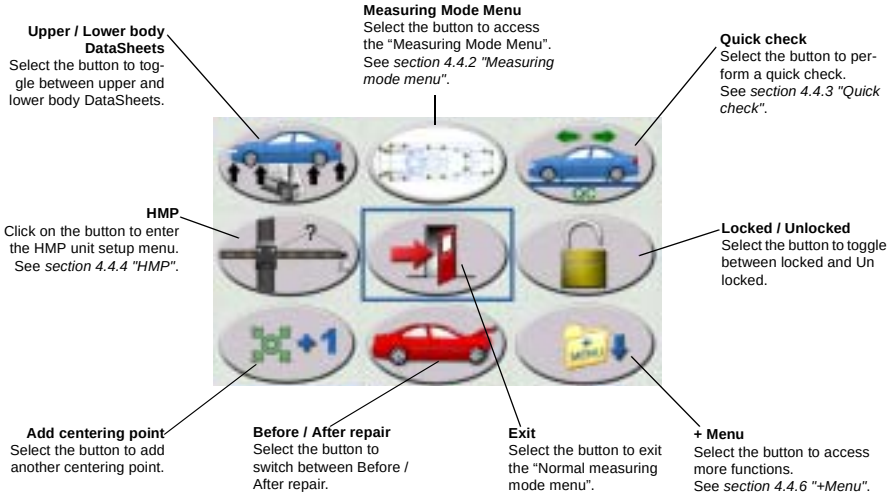
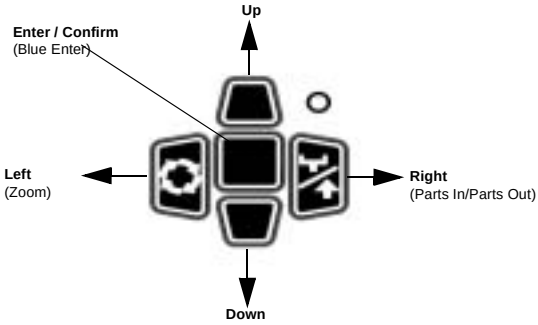


Figure 4.22 Normal measuring menu.

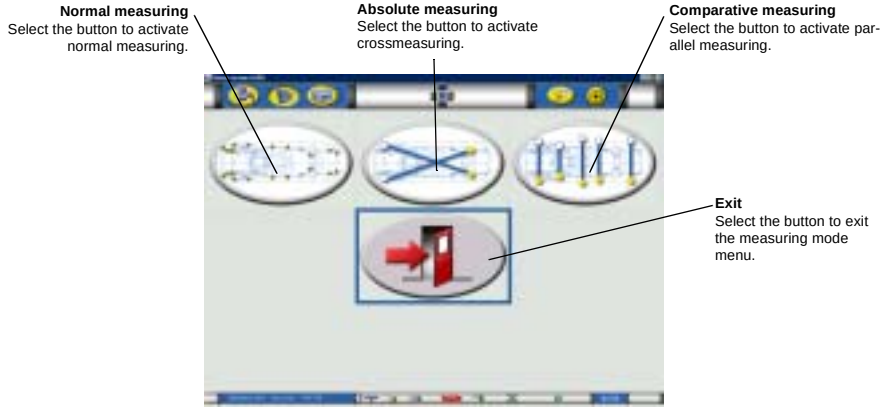
4.4.1 Navigation in the “Normal measuring menu”

The buttons on the remote control are used to navigate in the “Normal measuring menu”. See figure below for the buttons navigational functions.



4.4.2 Measuring mode menu

Select the “**Measuring mode menu**” button in the “**Normal measuring menu**” to access Normal- Absolute- and Comparative measuring mode. Use the “Remote control” on the measuring slide to navigate in the menu, see *section 4.4.1 "Navigation in the “Normal measuring menu”"*.



When chosing Absolute or Comparative measuring, it is necessary that you change to Normal measuring before you can go back to the "**Normal measuring menu**". If you press the "Blue Enter Button" before you have changed the measuring mode to Normal, you will enter the menu below. To change to Normal measuring click on the button **"Abolute/Comparative measuring"**.

Absolute/Comparative measuring
Click this button to enter the "Measuring mode menu"

4.4.3 Quick check

Use the "Remote control" on the measuring slide to navigate in the menu, see *section 4.4.1 "Navigation in the "Normal measuring menu"".*

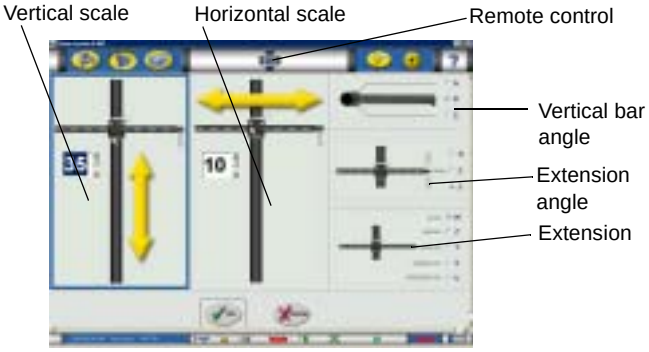
Difference in measuring point values
Shows the difference in length an width between the DataSheet values and the measured point. When the blue point is in "Bulls eye" there is no difference between the DataSheet values and the measured values (Vertical placement = difference in width, horizontal placement = difference in length).

Difference in measuring point values
Numericallyy shows the difference between the DataSheet and the measured values (length, width and height).

Difference in height
Shows the difference in height between the DataSheet values and the measured point.

4.4.4 HMP

Use the “Remote control” on the measuring slide to navigate in the menu and make adjustments, see *section 4.4.1 "Navigation in the “Normal measuring menu”"*.



4.4.5 Add centering point

If the centering is stopped without any points are measured the button "add centering" point will add all centring points.

4.4.6 +Menu

Use the “Remote control” on the measuring slide to navigate in the menu, see *section 4.4.1 "Navigation in the “Normal measuring menu”"*.

Tolerance
Select the button to enter the “Tolerance setup” menu.

Swap
Select the button to swap between left and right measuring points.

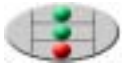
Engine In or Out
Select the button to switch between engine in or out during measuring.

Delete measuring point
Select the button to delete a selected measuring point.

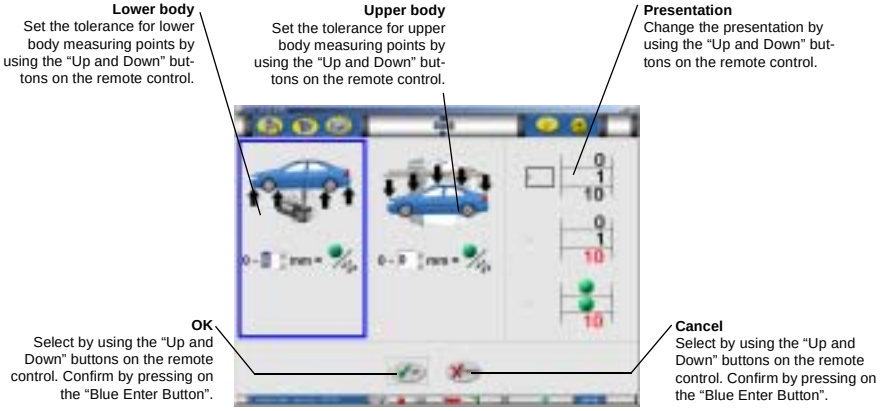
Exit
Select the button to exit the measuring mode menu.

Extension
Select the button to enter the Extension setup menu.

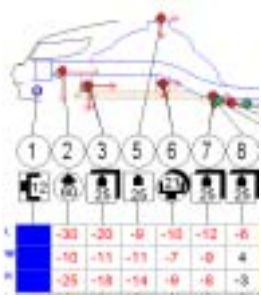
4.4.7 Tolerance



To enter the tolerance setup menu, click the button “**Tolerance**” in the “+Menu”. The changes you make here, only affect the current DataSheet. Use the “Remote control” on the measuring slide to navigate in the menu, see *section 4.4.1 "Navigation in the “Normal measuring menu”"*.

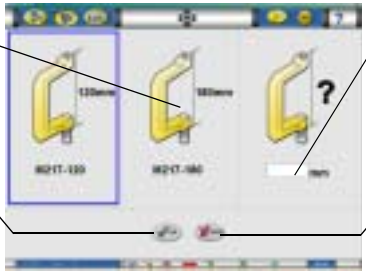


If you select the second or the third choice in the presentation menu, red arrows appear on the DataSheet where the measuring values are out of tolerance.



4.4.8 Extension

To enter the setup menu för extension, click the button “**Extension**” in the “+Menu”. Use the “Remote control” on the measuring slide to navigate in the menu, see *section 4.4.1 "Navigation in the “Normal measuring menu”"*.



4.5 Measuring

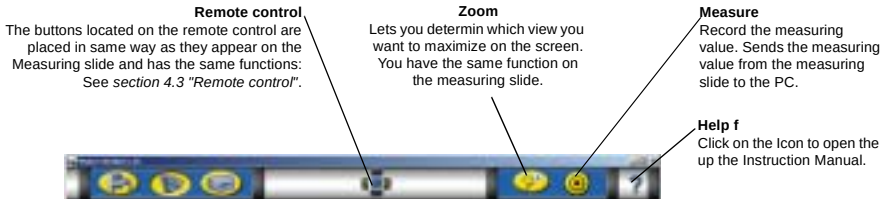


Figure 4.23 Measuring – Upper status line.

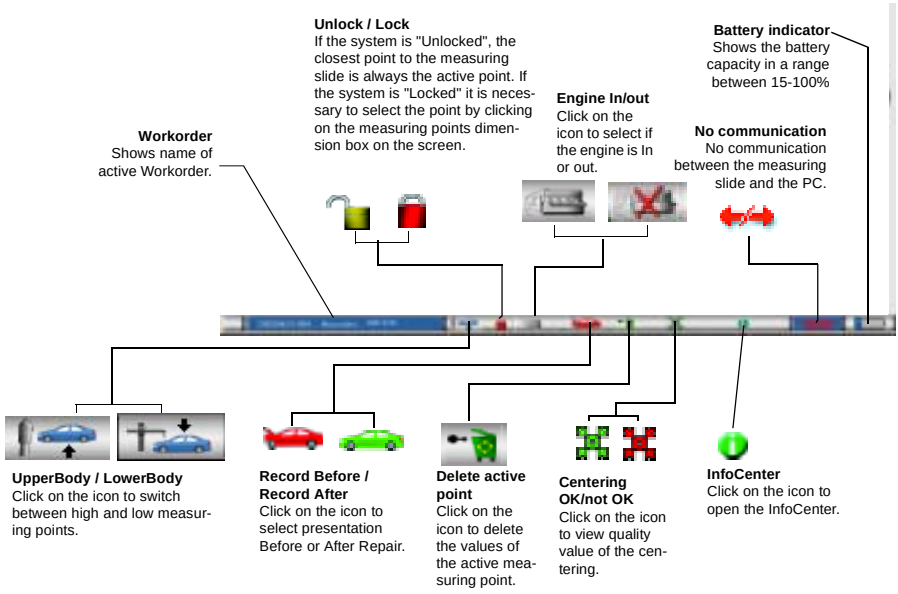


Figure 4.24 Measuring – Lower status line

4.5.1 Measuring > Normal measuring

Symbolic DataSheet – Normal measuring

The *Symbolic DataSheet* is shown in the *Right pane*.

Figure 4.25 Normal measuring – Symbolic DataSheet.

Analyze – Normal measuring

The "*Analyze*" is shown in the Right pane by clicking on the "Change Presentation" button.

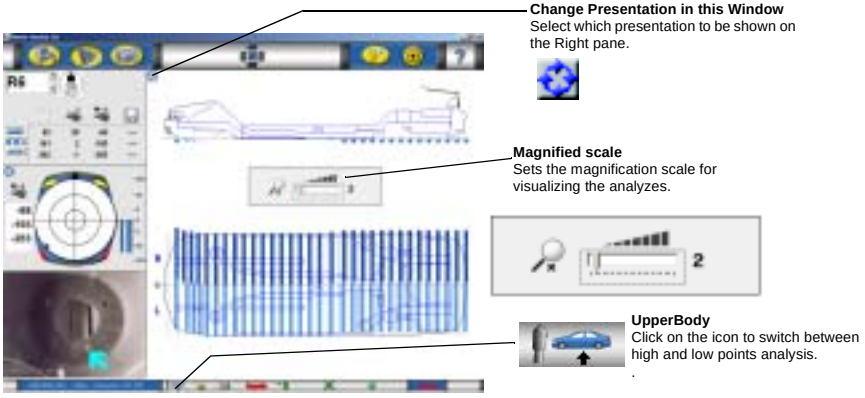


Figure 4.26 Normal measuring – Analyze low points

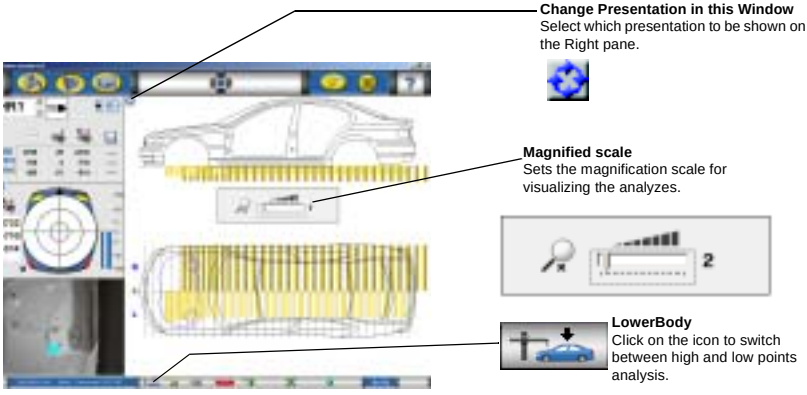


Figure 4.27 Normal measuring – Analyze high points

Single point presentation – Normal measuring

The “Single point presentation“ graphically illustrates how the measuring point values deviates from the DataSheet values. The “Single point presentation“ is displayed in the Middle left pane.

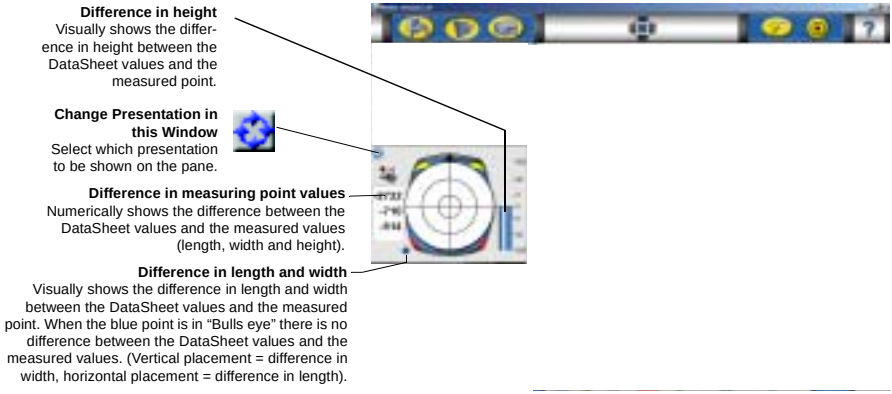


Figure 4.28 Normal measuring – Single point presentation

Bars – Normal measuring

The “Bars“ graphically illustrates how the measuring point values deviates from the DataSheet values. The “Bars“ can be seen in the Middle left pane.

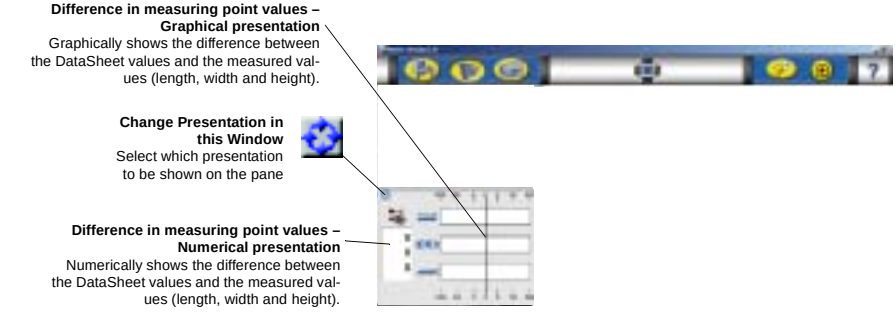


Figure 4.29 Normal measuring – Bars

Values – Normal measuring

The “**Values**“ numerically shows the difference between the DataSheet values and the measured values in length, width and height. The “**Values**“ can be seen in the **Middle left pane**.

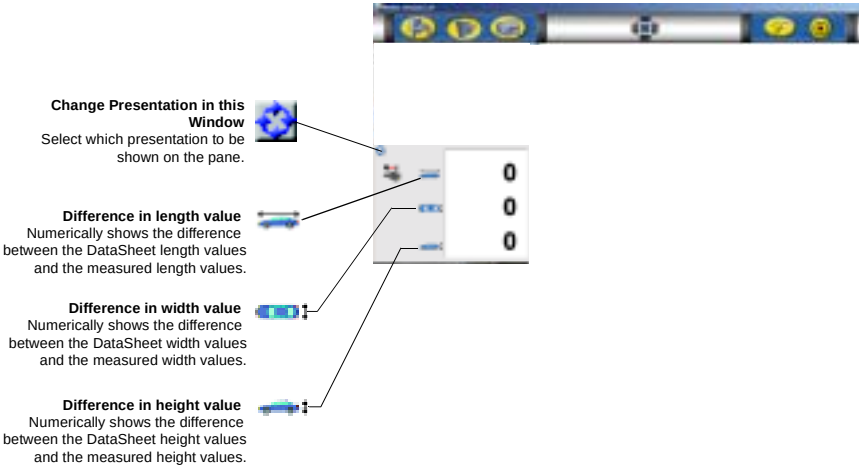


Figure 4.30 Normal measuring – Values

4.5.2 Cord centering

For more information concerning the functions in cord centering see *section 3.5.2 "Cord centering"*.

4.5.3 Measuring > Absolute measuring

Measuring points – Absolute measuring

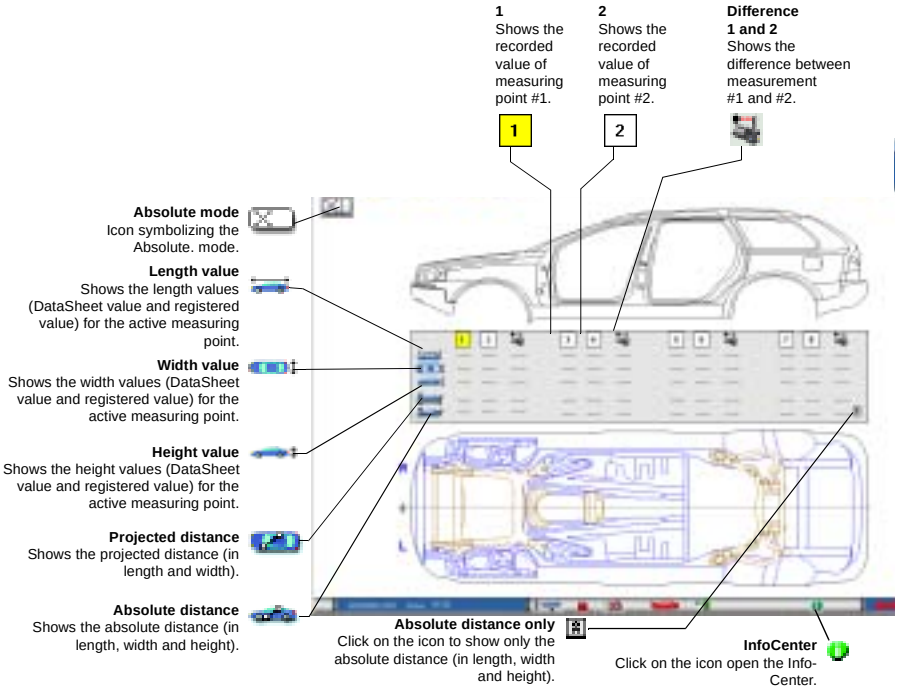


Figure 4.31 Measuring points – Absolute measuring

4.5.4 Measuring > Comparative measuring

Measuring points – Comparative measuring

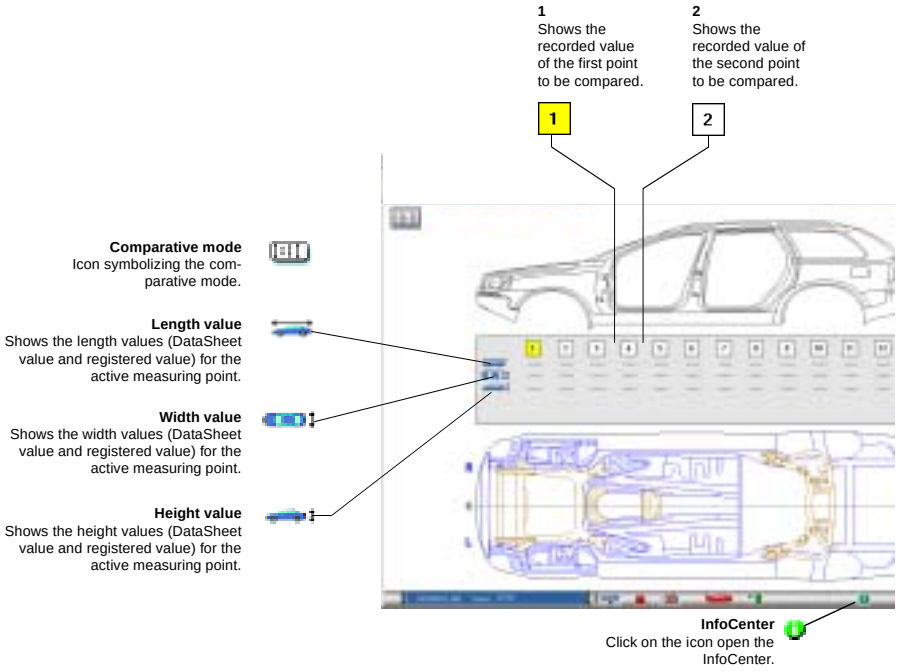


Figure 4.32 Comparative measuring – Measuring points

4.5.5 InfoCenter Absolute- and Comparative measuring

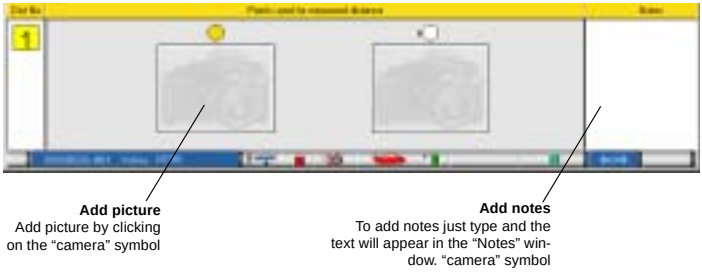


Figure 4.33 InfoCenter Absolute- and Comparative measuring.

4.6 Print Out Mode

Figure 4.34 Print Out Mode– Upper status line.

4.6.1 Print Out

The following "*Print Outs*" are available in *Car-O-Soft Vision*:

			
 Normal lower body measurements (with DataSheets) before repair.	 Normal lower body measurements (with DataSheets) after repair.	 Normal lower body measurements (with DataSheets) before and after repair.	
 Normal upper body measurements (with DataSheets) before repair.	 Normal upper body measurements (with DataSheets) after repair.	 Normal upper body measurements (with DataSheets) before and after repair.	
 Absolute measurements before repair.	 Absolute measurements after repair.	 Absolute measurements before and after repair.	
 Comparative measurements before repair.	 Comparative measurements after repair.	 Comparative measurements before and after repair.	
 Analyze of the measurements before repair.	 Analyze of the measurements after repair.	 Analyze of the measurements before and after repair.	

 Printout of the Car-O-Liner DataSheet	 Text based printout	 Text based printout on a file

4.7 Car-O-Soft Vision Setup

The “Vision Setup“ is used to setup the wire-less communication, language, tolerances, text settings, printer font settings, etc.
To start Vision Setup go to:
Start > Program > Car-O-Liner > Utilities > Car-O-Soft Vision Setup

For more information concerning Car-O-Soft Vision Setup see *Car-O-Tronic Vision Start Up guide section 6.6 "Car-O-Soft Vision Setup"*.

4.8 Car-O-Soft Vision Diagnose

The “Vision Diagnose“ menu helps the user to diagnose the measuring slide if something is malfunctioning.
To start Vision Diagnose go to:
Start > **Program** > **Car-O-Liner** > **Utilities** > **Car-O-Soft Vision Diagnose**

4.8.1 Vision Diagnose > Radio

The “Radio“ menu tests the communication between the PC and the measuring slide. The menu can also be used to set off the power to the measuring slide.

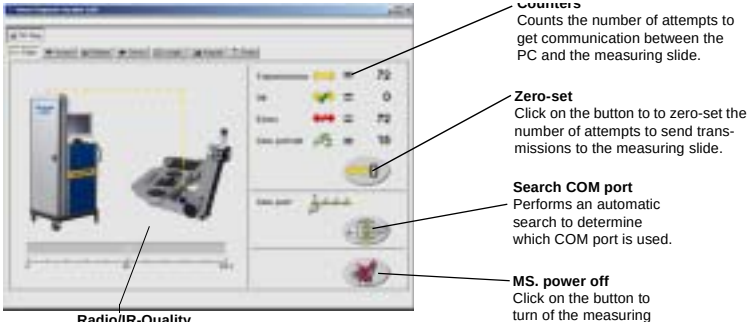


Figure 4.35 Vision Diagnose > IR test.

4.8.2 Vision Diagnose > Version

The “**Version**“ menu gives information about version numbers and serial numbers, etc.

Figure 4.36 Vision Diagnose > Version.

4.8.3 Vision Diagnose > Battery

The “**Battery**“ menu gives information about the battery voltage, etc.

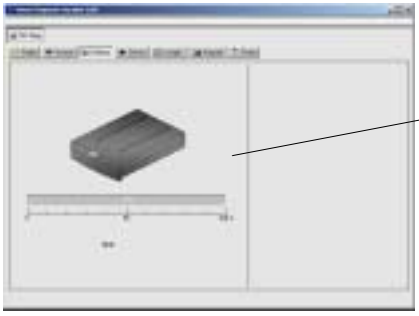


Figure 4.37 Vision Diagnose > Battery.

4.8.4 Vision Diagnose > Sensor

The “**Sensor**“ menu gives information about the angle sensors and the reset value for the measuring slide.

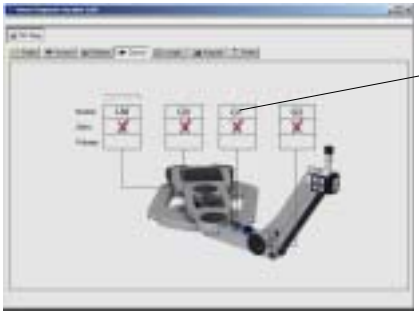


Figure 4.38 Vision Diagnose > Angle Sensors.

4.8.5 Vision Diagnose > Length

The “Length“ menu gives information about the length scale on the measuring bridge.

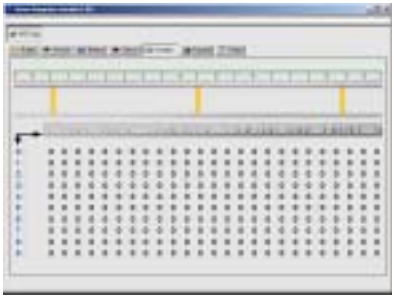


Figure 4.39 Vision Diagnose > Length .

4.8.6 Vision Diagnose > Keypad

The “ **Keypad**“ menu tests the LEDs on the measuring slide and also verifies the communications between the measuring slide and the computer. The Measuring slide must be zero-set and fitted with an adapter

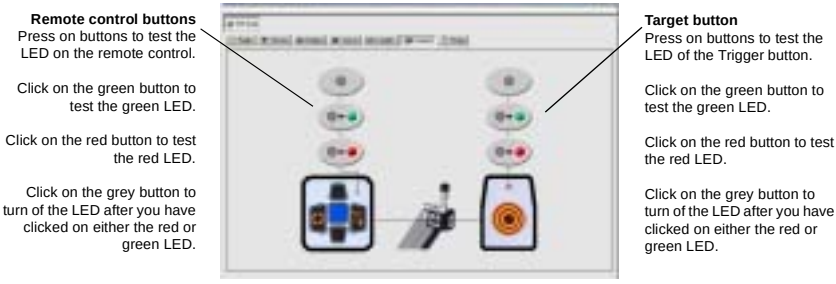


Figure 4.40 Vision Diagnose > Keypad.

Test that the buttons on the measuring slide can communicate with the PC by pressing each button. If the button is OK it will recieve the symbol as shown in figure 4.40. If you do not not receive the symbol something is wrong. Please contact you local Car-O-Liner distributor.

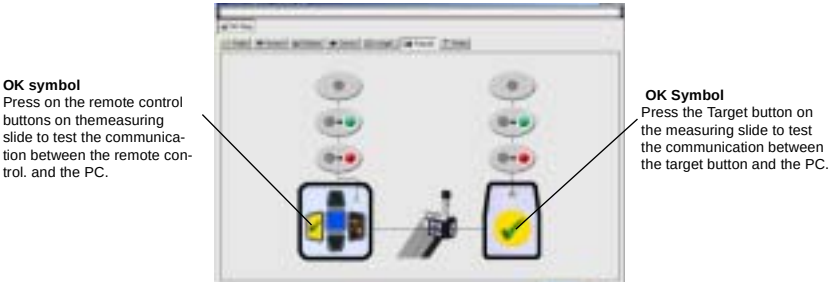


Figure 4.41 Vision Diagnose > Keypad test from measuring slide Car-O-Tronic II

4.8.7 Vision Diagnose > Probe

The “**Probe**“ menu gives information about the tubes.

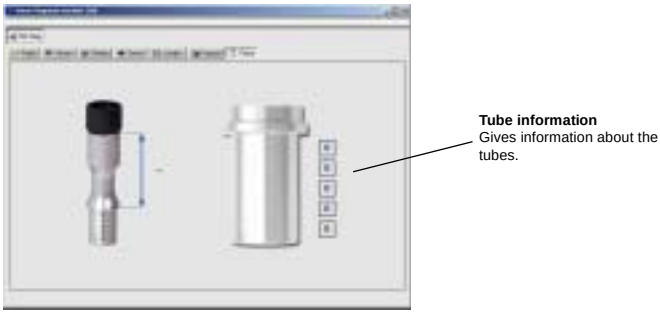
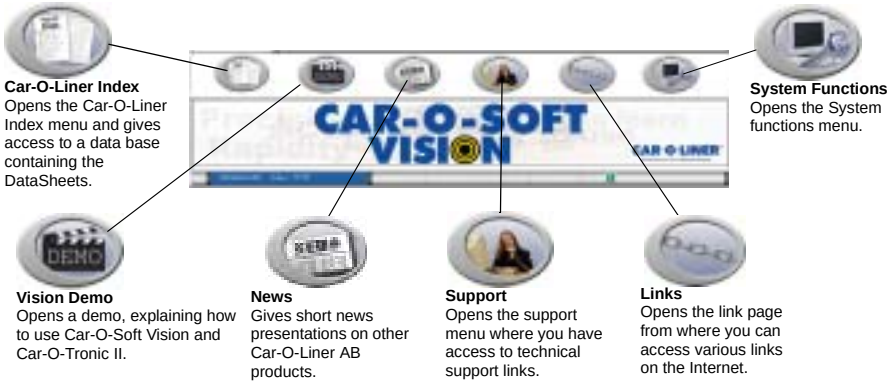


Figure 4.42 Vision Diagnose > Probe.

4.9 Vision menu



4.9.1 Car-O-Liner Index

The **Car-O-Liner Index** includes all DataSheets stored in the Car-O-Data database. The **Car-O-Liner Index** is visible when creating a new Workorder, it can also be accessed by clicking on the "**Car-O-Liner Index**" button in the "**Vision menu**". For more information, see *section 4.2.9 "Car-O-Liner Index"*.

4.9.2 Car-O-Soft Vision Demo

The "**Car-O-Tronic Vision Demo**" is a demonstration file, explaining how to use **Car-O-Soft Vision** and **Car-O-Tronic Vision**. The demonstration file guides the user through the measuring process step by step.

4.9.3 News

Click on the “**News**”  button to receive short presentations of **Car-O-Liner** news.

4.9.4 Support

The “**Support**”  menu offers you online contact with Car-O-Liner Support and let you compile an error report. You can also find links to user forums for Car-O-Liner´s customers.

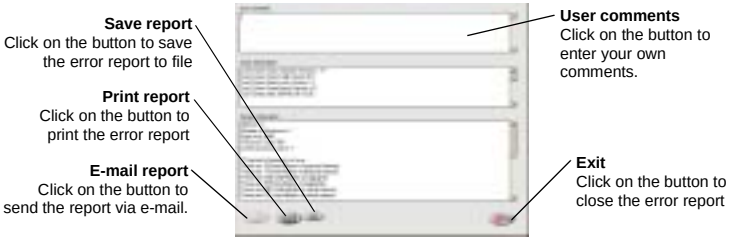
Error report
Click on the “Error report“ button to recieve a list of version numbers and errors including all errors from the measuring slide.

User Forum
Click on the button to open up the User forum on the Internet where you can discuss features and troubles with other users.
(Internet users only!)

Tech Notes
Click on the button to open up the Tech note page where you can receive vital information from Car-O-Liner Technical Support.
(Internet users only!)

Error report

Click on the “**Error report**“ button to recieve a list of version numbers and errors including all errors from the measuring slide. Please, note that most of the error codes doesn´t mean that the unit is wrong. The majority of the error codes are made for Car-O-Liner AB service personnel, so that they can make diagnostics of the unit.

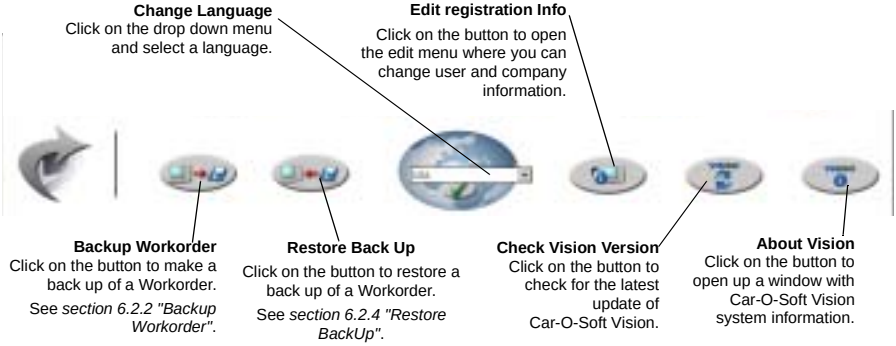


4.9.5 Links

Click on the “**Links**” button to open the link page from where you can access various links on the Internet.

4.9.6 System functions

The “**System Functions**” menu let you make and restore back ups of Workorders. Here you can also change the language in Car-O-Soft Vision.



About Vision

Click on the button to open up a window with Car-O-Soft Vision system information such as version number, date of the latest update etc.

5 How to read DataSheets

5.1 General

This chapter provides necessary information on Car-O-Liner DataSheets. Car-O-Liner has been measuring vehicles since the middle of the 1970's. The manufacturers and the work shops demand efficient and fast collision repairs. To fulfil these demands,
Car-O-Liner has developed and refined the DataSheets over the years. Therefore, the look of the DataSheets has changed and we have chosen to assign them different versions. In this chapter, we explain the most common versions of DataSheets. The years stated for each version generally indicate the years when the layout was most commonly used.

The DataSheets provide information on measuring data for both the upper and lower body of a vehicle. The DataSheets show the height, length and width dimensions of specified measuring points on a vehicle. DataSheets also provide information on adapters and methods for measuring specific points on the vehicle. The dimensions given must be regarded as guidelines since dimensions may vary slightly between vehicles of the same model, due to manufacturing tolerances or previous repair work. The upper diagram on the DataSheet shows the left side of the vehicle, with the position of the chassis clamps (expressed as A and B) from the center of the rear axle to the center of the clamp. The diagrams of the chassis clamps indicate where the toothed jaw segments are to be attached to the angle of the clamp or to the mounting plate. The drawing in the center of the DataSheet shows the vehicle as seen from above. Near the bottom of the page are explanatory drawings of the measuring points, showing special clamps or measuring devices and setups if required. (All displayed from the left side of the vehicle.)

5.2 Lower Body DataSheets

5.2.1 Version 1

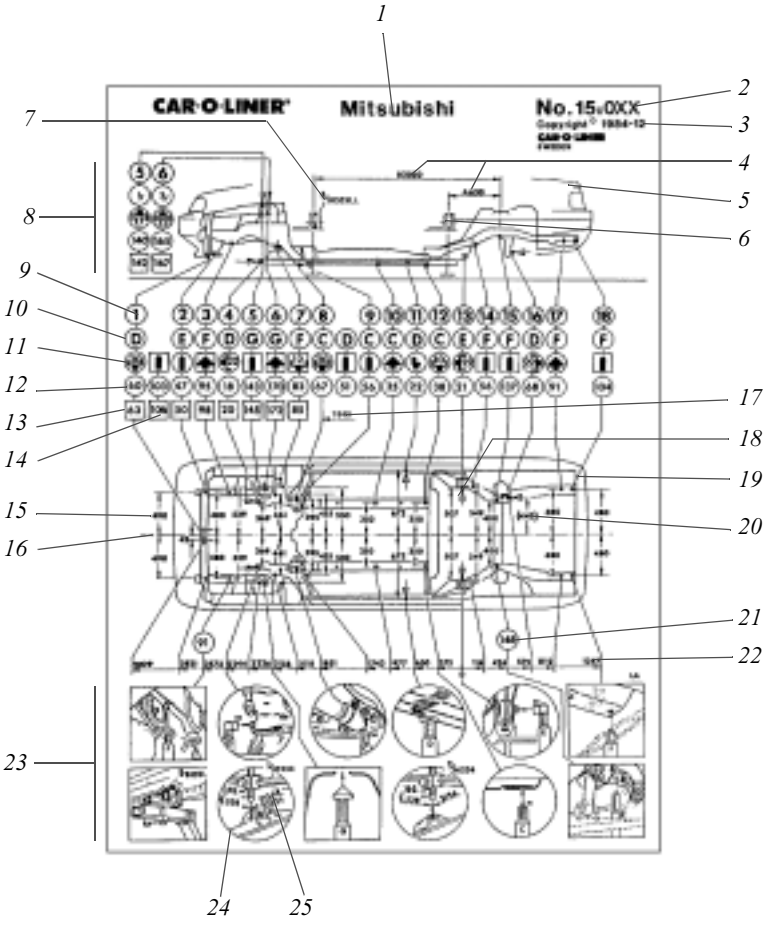


Figure 5.43 Version 1 – Lower body DataSheet (–1993).

1	Make
2	DataSheet number
3	DataSheet issue
4	Distance of clamps from rear axle center
5	Side view, left side (contour may vary)
6	Position of clamping jaws
7	Special chassis clamps. R = right, L = left
8	Adapter type. Height M234 HMP (M910 HMP)
9	Measuring point number
10	Height tube M40. Different length B, C, D, etc.
11	Type of measuring adapter. Circle = assembled, Square = dismantled
12	Height dimension
13	Height dimensions with engine removed
14	Parts out branch
15	Width dimension from center line
16	Vehicle center line
17	Length dimension right side of vehicle (for asymmetrical lengths, right side-left side)
18	Measuring direction (if not from underneath)
19	Vehicle viewed from above
20	Dimension in bracket = major deviations between vehicles of the same model
21	Height dimension left side for asymmetrical vertical dimension
22	Length dimensions from zero point
23	Explanatory drawings for measuring points. Circle = assembled, Square = dismantled
24	Dimensions for M234 HMP (M910 HMP) in the illustration
25	Length dimensions for M234 HMP (M910 HMP), R = right, L = length

Table 1.2 Version 1 – Lower body DataSheet (–1993).

5.2.2 Version 2

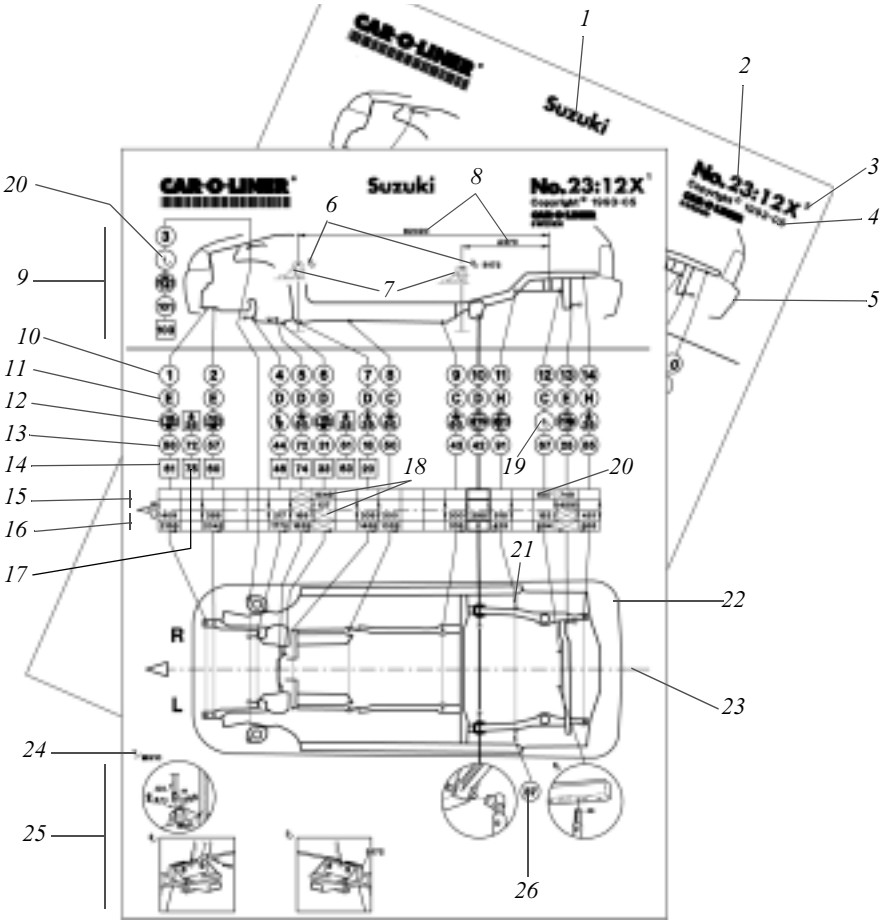


Figure 5.1 Version 2 – Lower body DataSheet (1994–).

1 Make
2 DataSheet number.
3 Page
4 DataSheet issue date
5 Side view, left side (contour may vary)
6 Special chassis clamps. R = right, L = left
7 Position of clamping jaws
8 Distance of clamps from rear axle center
9 Measuring points measured from above with M910 HMP (M234 HMP)
10 Measuring point number
11 Height tube M40. Different length B, C, D, etc.
12 Type of measuring adapter. Circle = assembled, Square = dismantled
13 Height dimension
14 Height dimensions with engine removed
15 Right length and width dimensions (if not symmetrical)
16 Left and right length and width dimensions (if symmetrical)
17 Parts out branch
18 Point only exists on right side
19 See explanatory drawing
20 Different length dimensions but equal width dimensions
21 Measuring direction (if not from underneath)
22 Vehicle viewed from above
23 Vehicle center line
24 Dimensions for M910 HMP
25 Explanatory drawings for measuring points.
Circle = assembled, Square = dismantled
26 Height dimension left side for asymmetrical height dimension

Table 1.3 Version 2 – Lower body DataSheet (1994–).

5.2.3 Version 3

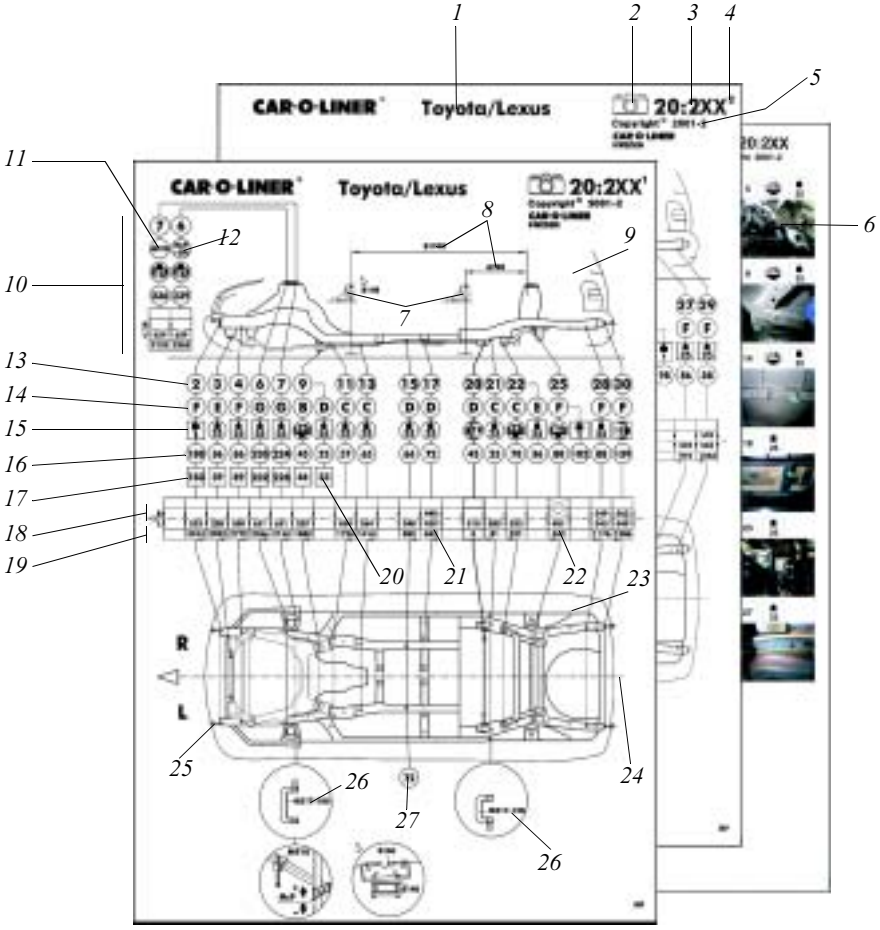


Figure 5.2 Version 3 - Lower Body photo DataSheet (1999–).

1	Make
2	Symbol for version 3 (Photo DataSheet)
3	DataSheet number.
4	Page
5	DataSheet issue date
6	Page 3 with explanatory photos is only available by printing the photos from the *Car-O-Soft Vision* “View Photo“ window
7	Position of clamping jaws.
8	Distance of clamps from rear axle center
9	Side view, left side (contour may vary)
10	Measuring points measured from above with M910 HMP
11	A symbol for the M910 measuring system HMP
12	This symbol is used when the crossbeam needs to be lowered (-) or raised (+). The measurement dimension is shown in the symbol and also as a standard illustration (M910, HMP)
13	Measuring point number
14	Height tube M40. Different lengths B, C, D, etc.
15	Type of measuring adapter. Circle = assembled, Square = dismantled
16	Height dimension
17	Height dimensions with engine removed
18	Right length and width dimensions (if not symmetrical)
19	Left and right length and width dimensions (if symmetrical)
20	Parts out branch
21	Different width dimensions but equal length dimensions
22	Point only exists on left side
23	Vehicle viewed from above
24	Vehicle center line
25	Measuring direction (if not from underneath)
26	Explanatory illustration for extraordinary measuring adapter (accessory). Circle = assembled, Square = dismantled
27	Height dimension, left side for asymmetrical height dimension

Table 1.4 Version 3 - Lower Body photo DataSheet (1999–).

5.3 Upper Body DataSheets

NOTE: To measure the upper body of a vehicle, you need M705 (High Measuring Point unit - HMP).

5.3.1 Version 1

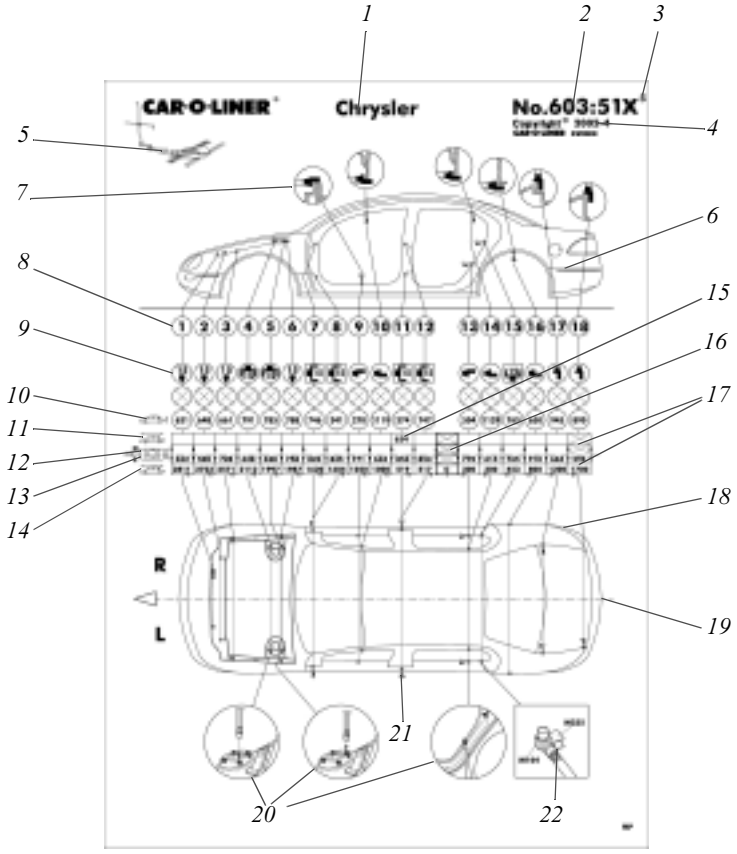


Figure 5.3 Version 1 - Upper body DataSheet (1996 – 1998).

1 Make
2 DataSheet number.
3 Page number for Car-O-Tronic DataSheet
4 DataSheet issue date
5 Symbol for M700 or M705, High Point Measuring (HMP) system
6 Side view, left side
7 Explanatory illustration for adapter M103
8 Measuring point number
9 Type of measuring adapter. Circle = assembled, Square = dismantled
10 Height dimensions
11 Length dimensions, right side
12 Width dimensions, right side
13 Width dimensions, left side
14 Length dimensions, left side
15 Different length dimensions but equal width dimensions
16 Zero-point symbol
17 Point only exists on left side
18 Vehicle viewed from above
19 Vehicle center line
20 Explanatory illustrations for measuring points.
Circle = assembled, Square = dismantled
21 Measuring direction if not from above
22 Explanatory illustrations for extraordinary measuring adapter

Table 1.5 Version 1 - Upper body DataSheet (1996 – 1998).

5.3.2 Version 2

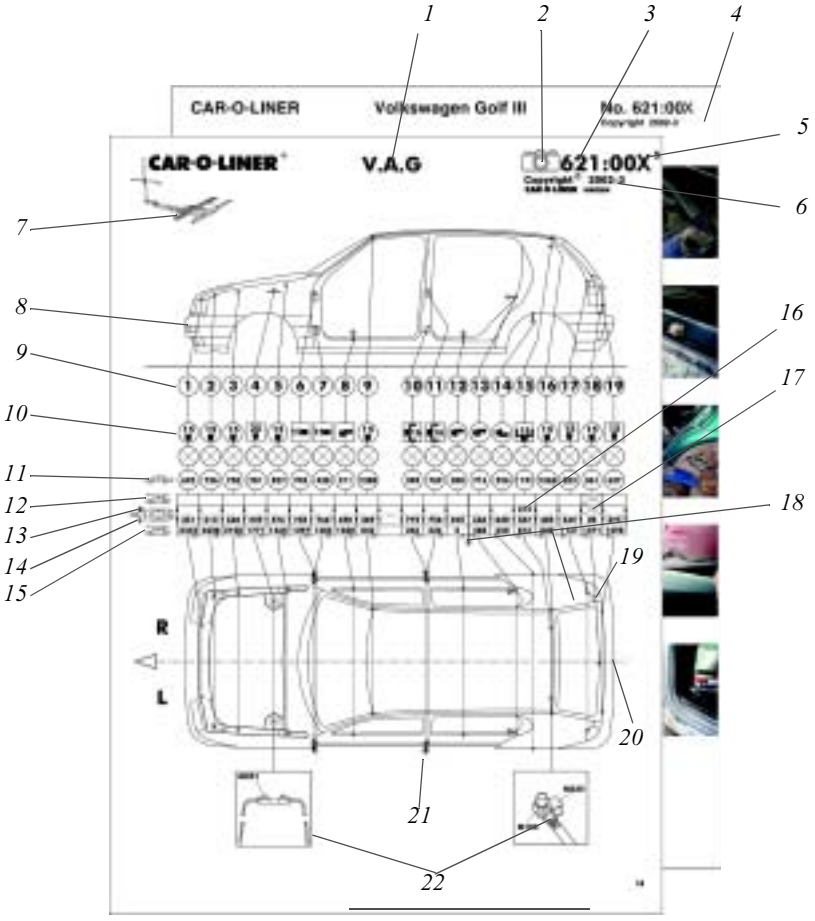


Figure 5.4 Version 2 - Upper Body photo DataSheet (1999–).

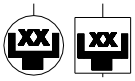
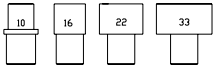
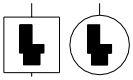
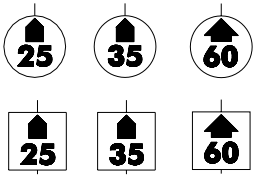
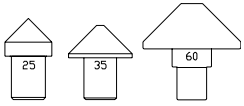
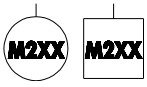
1 Make
2 The camera indicates that this is a photo DataSheet
3 DataSheet number
4 Page with explanatory photos is only available by printing the photos from the Car-O-Soft Vision View Photo window
5 Page number for Car-O-Tronic DataSheet
6 DataSheet issue date
7 Symbol for M700 or M705, High Point Measuring (HMP) system
8 Side view, left side
9 Measuring point number
10 Type of measuring adapter. Circle = assembled, Square = dismantled
11 Height dimensions
12 Length dimensions, right side
13 Width dimensions, right side
14 Width dimensions, left side
15 Length dimensions, left side
16 Different width dimensions but equal length dimensions
17 Point only exists on left side
18 Zero point symbol
19 Vehicle viewed from above
20 Vehicle center line
21 Measuring direction if not from above
22 Explanatory illustrations for extraordinary measuring adapter (accessories).

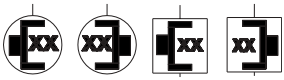
Table 1.6 Version 2 - Upper Body photo DataSheet (1999–).

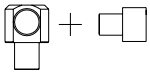
5.4 Adapter Symbols

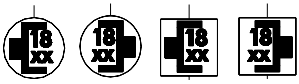
On the DataSheets, the adapters below are only indicated with a symbol. Therefore, the adapters are not shown in any explanatory illustrations on the DataSheets. The symbols to the left symbolizes the required adapters that are shown to the right. If the symbol is turned 90 ° 

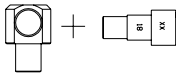
, the adapter is fitted with M104 (as shown on *page 119.*).

Symbols	Adapter examples
	 M100-xx
	 M103
	 M102
	 M101-xx
	M209   M224

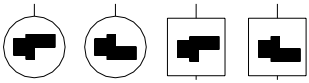


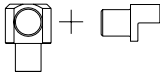
M104  M100-xx

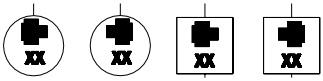


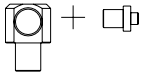
M104 

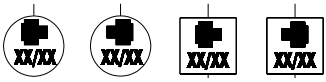
M100-18 + M100-xx

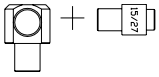


M104  M103



M104  M201-xx



M104 

M201-xx/xx

The following frames are used for symbols and explanatory illustrations:

Dismantled – Main assemblies or component need to be removed to reach measuring points e.g. subframes, struts, suspension, etc.

Assembled – Accessible measuring points excluding removal of exhaust, heat shields, plastic covers, etc.

5.5 Clamp Replacement Chart

The chart below indicates how the new-style clamps supersede or replace the preious-style clamps.

NOTE: Previous-style clamps may not work in place of current style clamps.

	Current clamp	Previous-style clamps (out of production)			
Standard clamps	**B106**	B105	B103	B102	
	B223	B219	B218		
	B256	B239	B222		
	B245	B134	B139		
BMW (B331)					
Base	**B248**	B244	B153		
Bottom pin	**B248-A1**	B237	B204		
Side pin + Holder	**B248-B1 + C1**	B236	B202		
Mercedes (B330)					
Base	**B248**	B244	B153	B143	B137
Bottom pin	**B248-A2**	B142	B142	B142	B142
Bottom pin	**B248-A3**	B138	B138	B142	B142
Side pin + Holder	**B248-B2 + C2**	B207	B207	B125	B126
Frame vehicle kit	**B250, E1, H2**	B161 + B212			
	B250, E1, H2, B213	B161 + B212 + B213			
	B260, E4	B240		B156	
	B260, E5	B240 + B213		B156 + B213	
	B260, E5, B213	B240 + B212		B156 + B212	
B156 Adapters and Cup replacements	**B156-A6**	A1			
	B156-A8	A4			
	B156-A14	A7 + A9			
	B156-B6	B2			
	B156-B9	B4			
	B156-B11	B8			

Table 1.7 Clamp replacement chart

6 Maintenance

WARNING! All electrical connections must be carried out by a qualified electrician. Risk for electrical shock.

WARNING! Most service must be carried out by Car-O-Liner service personnel and service support. Risk for electrical shock.

WARNING! Never remove any covers or perform any work to the equipment without unplugging it from the wall outlet. Risk for electrical shock.

WARNING! Unplug the equipment from the wall outlet before servicing, cleaning or maintenance. Risk for electrical shock.

6.1 Hardware Car-O-Tronic Vision

6.1.1 Charging measuring slide battery

The battery used with the Car-O-Tronic II are lithium-ION. In order to insure long life cycle of the battery, they require special charging procedures. The battery should be removed from the measuring slide before charging due to heat build up. Once the battery has been discharged it takes several hours before you have any capacity in the battery and 6-8 hours to reach full charge. (The capacity of the battery is continuously displayed  on the *Lower status line* of *Car-O-Soft Vision*. The range displayed is 15-100%.)

There is no point in charging the battery for just 1 hour now and then as it only shortens the life span of the battery. The best thing

to do, is to have two battery to insure that you always have one battery fully charged and ready for usage.

WARNING! Do not disassemble or short circuit the battery. Do not overcharge or put it into a fire. Risk for injuries.

IMPORTANT! The battery should not be exposed to severe heat. During charging in particular, the battery should be protected from excessive heat, as this adversely affects it's ability to absorb the charge.

NOTE: Short charges will shorten the usage time and life span of the battery. Therefore, it is important only to charge for a short while when it is absolutely necessary.

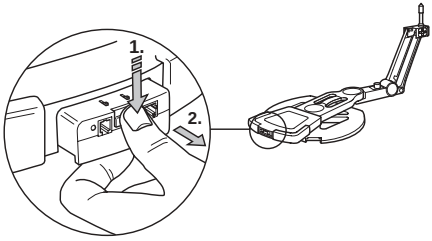
NOTE: It is recommended to fully discharge the battery on a weekly basis.

1 Check the capacity of the battery in the lower right corner of Car-O-Soft Vision.

2 Remove the battery from the measuring slide in the following way:

1. Press the button on the back of the battery downwards to release the lock.

2. Pull the battery outwards.



When the charger is connected the diod starts blinking fast. During charging, the green LED on the measuring slide is shining with a fixed light.

NOTE: There is no indication from the LED on the charger that the battery is fully charged.

6.1.2 Cleaning

Car-O-Tronic II is a precise measuring tool and should be treated as such. Therefore, care should be used when cleaning the Car-O-Tronic II.

IMPORTANT! No strong solvents should be exposed to the measuring slide or the measuring bridge.

1 Clean compressed air should be used to remove dust from the electronic sensor on the measuring slide.

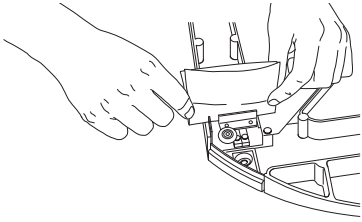
2 Care should also be taken to maintain the PC unit of your system. Make sure both PC and printer stay as clean as possible.

The equipment can be cleaned by using air. Canned air can be purchased at any office supply store.

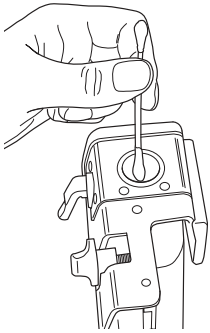
6.1.3 Cleaning the measuring slide

In order to always recieve the correct measurment data you once in a while have to clean the “Lenght Measuring Head” and the measuring tube holder.

- Clean the “**Lenght Measuring Head**” by pulling a clean piece of folded cloth back and forth (see picture to the right).



- Clean the “**Measuring tube holder**” with a clean q-tip (see picture to the right).



NOTE: Do not use water or any other type of solvent when cleaning the measuring tube holder.

6.2 Software Car-O-Soft Vision

6.2.1 Quick check the centering

”**Quick check**” is a function that allows you to easily check if the vehicle has moved in the bench mountings since the centering was last completed.

The ”**Quick Check**“ is performed as follows:

1 Make sure that the vehicle is centered normally.

2 In the ”Measuring mode”, press on the “Blue Enter Button” to access the “Normal measuring menu”. Select the ”**Quick Check**“  button. The ”**Quick Check**” single point presentation will now appear on the screen.

3 Choose freely a point (the ”**Quick Check point**”). The point should be accessed easy and should not normally move during a pull, e.g. a measuring point somewhere between the clamps.

4 Record the chosen point with ”  **Measure**” on the ”**Main menu**”. The numbers to the left in the ”**Quick Check single point presentation**” will then go to zero which means that the ”**Quick Check**” is ready for use.

Check if the vehicle has been moved, by performing any of the following procedures:

- If the system is unlocked, the **Quick check point** will appear when you come close to it again.
- Activate the **Quick check** . The number of the left of the ”**Quick check single point presentation**” shows you the distance from the vehicles original position to the present position. E.g. “0, 0, 0” (length = 0, width = 0 and height = 0) means that it is in the same position and “25, 0, 0” means that it has moved 25 mm in length from its original position.

6.2.2 Backup Workorder

Car-O-Soft Vision has the ability to backup work files. This allows the user to save the files on diskette, recordable CD-Rom or on the hard drive in case the files are unexpectedly lost. Following the procedure below can perform this feature:

1 Click “  (**System Functions**)“ in the **Vision Menu**. The “**System Functions**“ menu will open.

2 Click “ (**BackUp Workorder**)“ to open the “**VisionBackUp**“ menu.

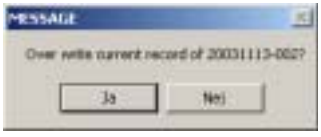
3 Click on to highlight the Workorder that you wish to make a back up of.

When you select a Workorder it will appear in the right window. To delete a Workorder from the list, select it and press “delete” on your keyboard.

NOTE: To select more than one file to back up, click and drag down the list of files. You can also hold down the CTRL-key when you select multiple files. Selected files are marked with a dot in front of the workorder number.

4 Click “ (**BackUp Workorder**)“ to confirm the selected Workorders and make a back up of them.

If any of the selected files have been previously backuped, the window to the right will be shown. Confirm the back-up by clicking **OK**.



6.2.3 Prompt for Back Up

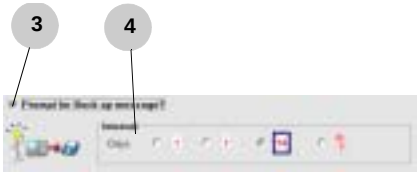
To make Car-O-Soft Vision prompt for back up do as follows:

1 Go to **Start** > **Program > Car-O-Liner > Utilities > Car-O-Soft Vision Set up**.

2 Click on Backup to open up the "**Backup**" menu.

3 Check the box "**Prompt for Back up message?**".

4 Select at which interval Car-O-Soft Vision should prompt for back up.



5 Click on the "**OK**"  button.

6.2.4 Restore BackUp

Car-O-Soft Vision has the ability to restore lost files. This is done as follows:

1 Click "  (**System Functions**)" in the **InfoCenter**. The "**System functions**" menu will open.

2 Click “  (**Restore Back Up**)“ to open the “**VisionRestore**“ menu.

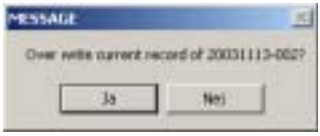
3 Click on and highlight the Workorders to back-up.

When you select a Workorder it will appear in the left window. To delete a Workorder from the list, select it and press “delete” on your keyboard

NOTE: To select more than one file to restore, click and drag down the list of files. You can also hold down the CTRL-key when you select multiple files.

4 Click “  (**Restore Workorder**)“ to confirm the selected Workorders and to restore them.

If any of the selected files have been previously backuped, the window to the right will be shown. Confirm the back-up by clicking “**Yes**“.



7 Trouble shooting

The troubleshooting instructions in this chapter will help you to quickly find and correct the most common faults that may occur when using *Car-O-Soft Vision* and Car-O-Tronic.

WARNING! All electrical modifications must be carried out by a qualified electrician. Risk for electrical shock.

WARNING! Unplug the equipment from the wall outlet before servicing, cleaning or maintenance. Risk for electrical shock.

WARNING! Never remove any covers or perform any work to the equipment without unplugging the heater from the wall outlet. Risk for electrical shock.

The troubleshooting schematic is a useful tool when tracing problems with **Car-O-Tronic II**, **Car-O-Soft Vision**, **VisionData** and **Car-O-Data**. The schematic presents the most common problems and their possible causes.

When this warning is displayed, the CD **Car-O-Data Update** cannot be read:

When this warning is displayed, it is time to update **Car-O-Soft Vision** and/or **Car-O-Data**.

7.1 Checklist

Before contacting your Car-O-Liner distributor, open up and print the “Error report” (see *section 4.9.4 "Support"*) and follow the instructions on the checklist below.

1 What version of *Car-O-Soft Vision* is installed on the computer?

_____
Version of Car-O-Soft Vision

2 What version of *Car-O-Data Update* is installed on the computer?

_____
Version of Car-O-Data Update

3 What is the DataSheet number, issue date and copyright date of the faulty DataSheet. (For locating this information, see *section 5 "How to read data sheets".*)

_____
DataSheet number

_____
Issue date

_____
Copyright date

The information in points 4-9 are required only if the problem concerns faulty measuring values.

4 Which measuring points are not correct?

Faulty measuring points

5 What is the difference in height, length and width between the correct DataSheet measuring points and the faulty points being measured?

Height

Length

Width

6 Which centering points have you used?

Centering points

7 What is the make of car and what is the model?

Make of car

Model

8 In what year was the vehicle manufactured?

Manufacturing year

9 What is the wheelbase (distance from the center of the front wheel to the center of the rear wheel) of the vehicle?

Wheelbase

7.2 Checking the centering quality value

The centering quality value can be seen when you click on the green quality icon in the lower status line.

By clicking on the green Quality symbol you can access the quality and positioning values.

1. QS: Shows the spread between the points in length and width. The best possible value is 100%. The best possible QS can be obtained when the centering points are covering more than 50% of the car. The closer the points are together the lower the QS value will be.

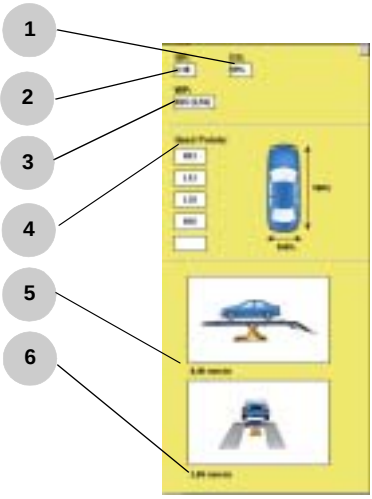
2. QR: Shows the total error sum divided by the number of points used for centering. The QR value should be as low as possible.

3. WP: Shows the worst point used for centering. It indicates it's position and its fault radius.

4. Used points: Shows the amount of points used for centering the vehicle.

5. This value indicates how much the vehicle is tilting length wise.

6. Shows the vehicle's actual position (width) according to the measuring bridge.

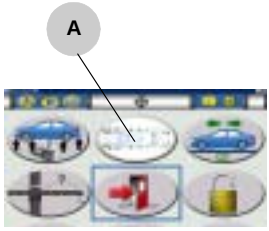


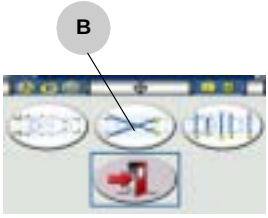
7.3 One point measuring test

The ”**One point measuring test**“ is a quick way to test all angle sensors and the length measuring at the same time.

1 In the **Car-O-Soft Vision Main menu** click on  to open the “Measuring mode”.

2 Press the “**Blue Enter Button**” on the remote control to access the “**Normal measuring menu**”.
Select the “**Measuring mode menu**” (**A**).
Select “**Absolute measuring**” (**B**).
The ”**Absolute measuring**” mode is marked with the ”**Absolute mode** icon  “ in the upper left corner of the Right pane”. (If you need more details on how Absolute measuring works, see *section 3.7 "Absolute measuring"*.)





3 Choose a point, on a bench mounting or something else below the vehicle, that is steady. The point should be easily reached from several different directions when using the measuring slide.

4 Fit the measuring slide with a measuring tube and an adapter.

5 Record the chosen point.

6 Change the tube to a different length.

7 Move the measuring slide around and read the ”**Absolute distance difference**”.

The ”**Absolute distance difference**“ should not vary more than a couple of millimeters, depending on how long measuring tube you use and how well the adapter fits to the chosen point.

If you have a bigger variation than a couple of millimeters, do the ”**One point measuring test** ” once more without moving the measuring slide in length. If the ”**Absolute distance difference**” is below a couple of millimeters now, the length measuring head is probably defected. If so please, contact your Car-O-Liner distributor.

7.4 Wrong communication parameters PC - Measuring slide

If you experience problems in the communication between the PC and the measuring slide, please check the communication port:

- Open **Car-O-Soft Vision Diagnose** and click on "**Radio**" to check that **Car-O-Soft Vision** is set to communicate to the same COM port as the radio unit is connected to. Click on the "**COM**" button to make Car-O-Soft Vision search for the correct COM port.
- Once you have tried the above mentioned you should look over your settings in the PC, see the computer's manual.
  The recommended settings for the COM ports are 9,600 bits/sec. If you have an old PC try with a lower setting (4,800 or 2,400 bits/sec).

7.5 Changing channel

NOTE: Changing channels must be performed by a Car-O-Liner distributor.

7.5.1 Install Car-O-Liner Radio commander

In order for you to be able to change the operating frequency (channel) on the radion units of the measuring slide and PC you need to install the Car-O-Liner Radio commander software.

1 Insert the Car-O-Data Update CD into your CD-drive.

2 Open **Windows Explorer** and select the CD-drive.

3 Browse the table of contents on the CD.

4 Open up the folder named "**Update**".

5 Open up the folder named "**Car-O-Soft**".

6 Select and make a copy of "**COL Radio commander2.exe**"

7 Paste the copy of "**COL Radio commander2.exe**" in a folder on the PC (create a new folder or select an already existing folder).

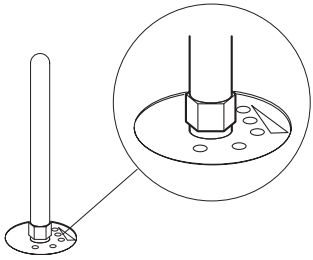
8 Installation is now complete. Close Windows Explorer.

NOTE: Remember that "**COL Radio commander2.exe**" is not protected by a password and can be accessed by anyone. Therefore remember to place the file where it can't be accesed by accident.

7.5.2 How to change channel

Before you change the channel:

- Make sure that you have communication between the two radio units either by making sure that the two diodes on the measuring slide are shining or by checking under System functions > Diagnose MS.
- Check which channel is active by switching the power on and off on the radio unit. The 5 diodes will start to blink corresponding times to the channel setting.
  (E.g 5 blinks = Channel 5.)



- Make sure that Car-O-Soft Vision is not in operating mode.

1 Start the Car-O-Liner Radio Commander Software by double clicking on "**COL Radio commander2.exe**".

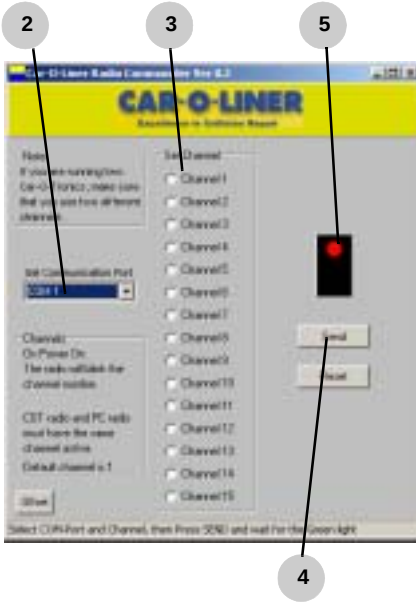
2 Select which COM-port the radio unit is connected to.

3 Select which channel you wish to use.

4 Click on the "**Send** " button to change channel.

5 When the red marker changes to green, the channel has been changed.

6 Start Car-O-Soft Vision and make sure that you have communication.



7.5.3 If you have a mismatch of channels

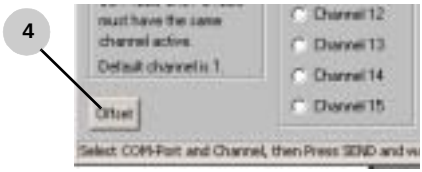
If the radio units for some reason are using different channels (e.g. Car-O-Tronic radio is using channel 2 and the PC radio is using channel 3) you can easily correct this problem with the "**Offset**" function in Car-O-Liner Radio commander.

1 Check which channel is active.

2 Make sure that Car-O-Soft Vision is not in operating mode.

3 Start Car-O-Liner Radio commander.

4 Click on the "**Offset**" button. When you have clicked on the "**Offset**" button you are only able to affect channel settings for the PC radio.

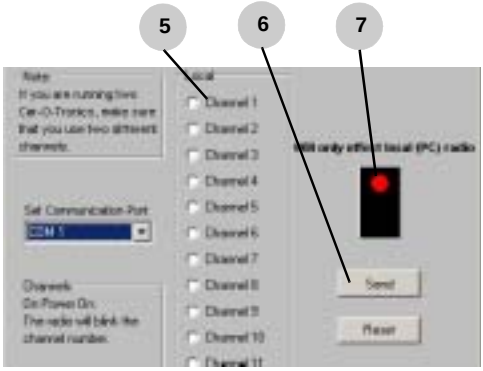


5 Select the correct channel (in this case channel 2).

6 Click on the "**Send**" button to change channel.

7 When the "red marker" has changed to "green" the channel has been changed.

8 Start Car-O-Soft Vision and make sure that you have communication.

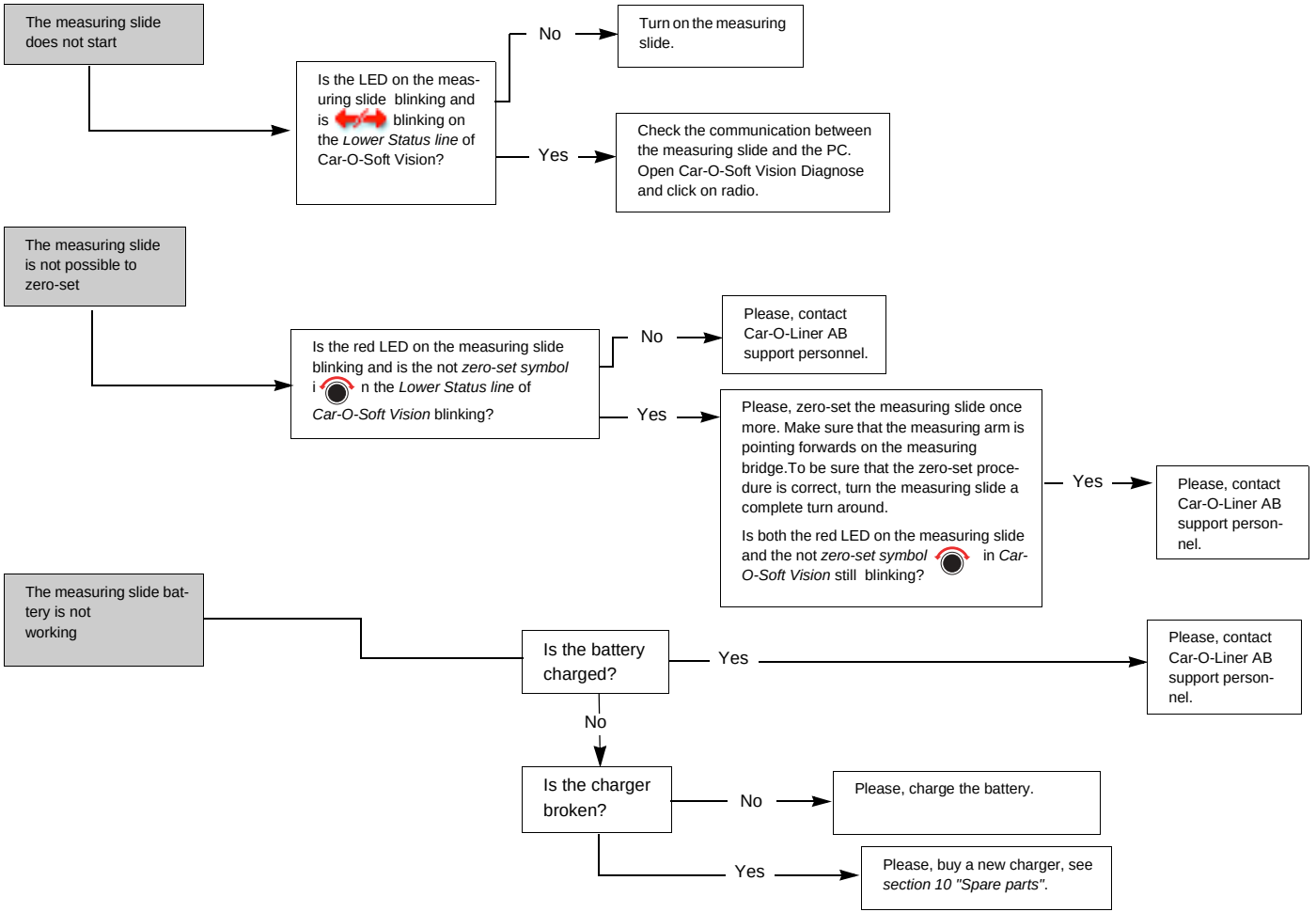


7.5.4 Using more than one Car-O-Tronic II in the same area

When you are working with more than one Car-O-Tronic II in the same area try not to use channels that lie beside each other. Use channel 1, 3, 5, 7... 13, 15 and so on.

7.6 Trouble shooting schematics

The trouble shooting schematic is a useful tool when tracing problems with Car-O-Tronic II, Car-O-Soft Vision and Car-O-Data. The schematic presents the most common problems and their possible causes.


The measuring slide does not start
Is the LED on the measuring slide blinking and is blinking on the *Lower Status line* of Car-O-Soft Vision?
No
Turn on the measuring slide.
Yes
Check the communication between the measuring slide and the PC. Open Car-O-Soft Vision Diagnose and click on radio.
The measuring slide is not possible to zero-set
Is the red LED on the measuring slide blinking and is the not *zero-set symbol* in the *Lower Status line* of *Car-O-Soft Vision* blinking?
No
Please, contact Car-O-Liner AB support personnel.
Yes
Please, zero-set the measuring slide once more. Make sure that the measuring arm is pointing forwards on the measuring bridge.To be sure that the zero-set procedure is correct, turn the measuring slide a complete turn around.
Is both the red LED on the measuring slide and the not *zero-set symbol* in *Car-O-Soft Vision* still blinking?
Yes
Please, contact Car-O-Liner AB support personnel.
The measuring slide battery is not working
Is the battery charged?
Yes
Please, contact Car-O-Liner AB support personnel.
No
Is the charger broken?
No
Please, charge the battery.
Yes
Please, buy a new charger, see *section 10 "Spare parts"*.

The radio communication between the measuring slide and the PC is not working

Is  blinking on the *Lower Status line* of Car-O-Soft Vision ?

Yes

Check if the wrong serial port on the PC is set up in Car-O-Soft Vision, see *section 7.6 "Wrong communication parameters PC - Measuring slide"*

No

Is the communication working when the communication cable is used?

No

Have you checked if the correct communication parameters is set in Car-O-Soft Vision?

Yes

Is the PC and the measuring slide standing closer than 1-2 metres from each other.

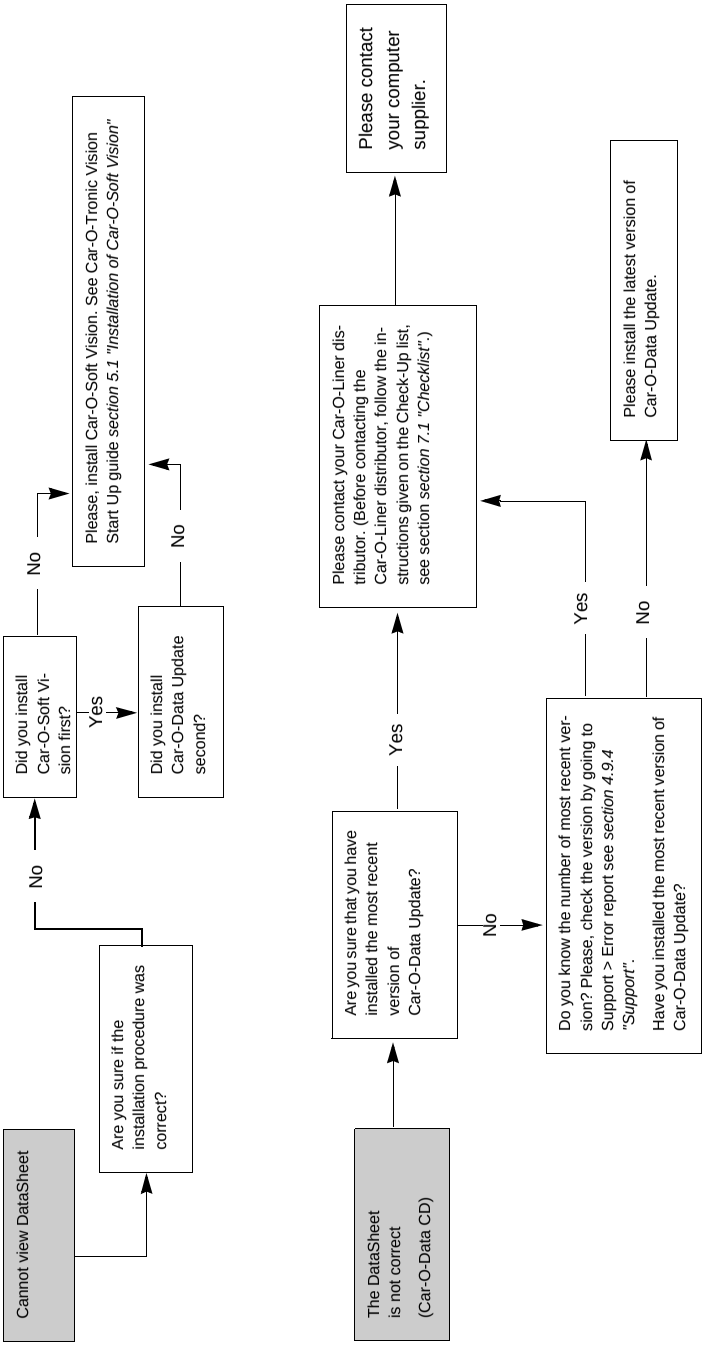
Yes

If the distance between the measuring slide and the PC is closer than 1-2 metres, the communication sometimes work bad. Please, move the PC so that the distance is above 2 metres.

No

Other measuring slides in the same room may be using the same frequency. Please, change the measuring slide frequency, see *section 7.7.2 "How to change channels"*

Problems with the software



The DataSheet is not correct (VisionData)

Is there a green dot next to the DataSheet in Car-O-Liner Index?

Yes

Please contact your Car-O-Liner distributor. (Before contacting the Car-O-Liner distributor, follow the instructions given on the Check-Up list, see section *section 7.1 "Checklist"*.)

Yes

Select the incorrect DataSheet and then click on download DataSheet  .

Is the DataSheet still not correct?

Yes

The installation of the calibration files was not successful

Are you sure if the installation procedure was correct?

Yes

The CD might be damaged. Please, check the CD for scratches or other damages.

Undamaged

Make sure that your CD drive is working correctly. Check the CD drive by installing any other software.

Damaged

Damaged

Please contact your Car-O-Liner distributor.

Are you sure if the definition for the CD drive is correct?

No

Make sure that your CD drive is working correctly. Check CD drive by installing any other software.

Damaged

Please contact your computer supplier.

The printout from Car-O-Soft Vision is blank, black or in some other way unrecognizable.

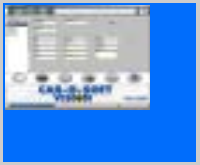
To determine if the problem is in your PC or in Car-O-Soft Vision, try to make a printout from some other software.Can you make a printout from any other software?

No → Please contact your Car-O-Liner distributor.

Please, refer to your computer manual to get information on how to check the free disk space. Is it possible to increase the disk space?

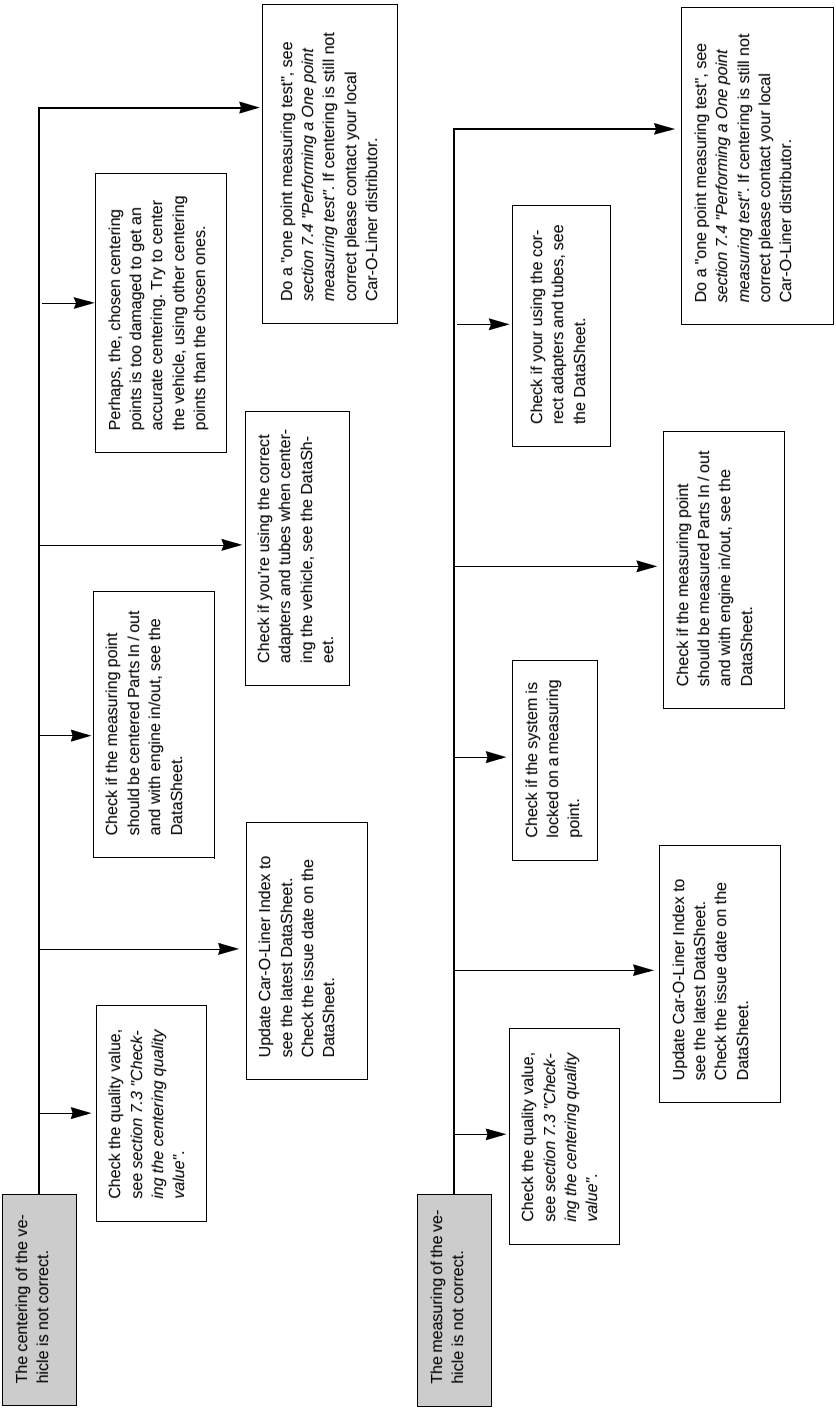
No → Please contact your computer supplier.

When opening Car-O-Soft Vision, the screen looks like the following example.



The screen resolution on the computer is not correct. (Car-O-Soft Vision is optimized for a screen resolution of 1027 × 768 pixels.) Please, refer to your computer manual to get information on how to change the screen settings.

Problems when centering and or measuring the vehicle



8 Dismantling and Salvage

IMPORTANT! For the sake of the environment, it is important that the equipment is dismantled in an environmentally friendly way.

To limit strain on the environment and its natural resources, it is important that the various parts of the equipment are recycled.

Mechanical components, electrical components, plastic hoses, and steel and aluminium should be sorted for material recycling.

8.1 Battery

The battery in the measuring slide must be recycled or disposed of properly.

9 Technical Specifications

9.1 Computer requirements

The *Car-O-Soft Vision* system requirements are:

- 1 GHz (or higher) processor
- 128 MB of RAM (or higher)
- Windows 98 / ME / 2000 / XP
- Graphic card and monitor that support 1024 × 768 pixels resolution at 24-bit color
- CD-ROM drive
- 2 GB or more free hard disk space
- Microsoft mouse or compatible pointing device
- Serial port

9.2 Car-O-Soft Vision

Software features:

- Self checking centering (up to 5 points)
- Measuring with DataSheet (Upper and Lower body)
- Comparative measuring – measuring without DataSheet
- Absolute measuring – measuring without DataSheet
- Damage analyses
- Multi function printouts

9.3 Car-O-Tronic II

Supply voltage	Input: AC 100-240 V, 800 mA 50-60 Hz Output: DC 15 V 2.2 mA
Display resolution	± 0.5 mm
Working area (Upper body capability): Length Width Height	 5.720 / 6.720 mm 2.120 mm 1.985 mm
Measuring slide power Working time Recharging	Rechargeable battery 6-8 hours 2-3 hours (80%) 6 hours (100%)
Weight measuring slide	18 kg
Calibration	Individual calibration with full traceability to international/national standards of length. (Certificate of calibration is included, see enclosure.)
Communication between the measuring slide and the PC	Wireless radio (standard)
Output power	5 mW
Frequencies for the communication between the measuring slide and the PC	433.2 - 434.6 MHz (ISM band 15 channels)
Hardware features	- Measuring during pulling - Easy to use on other benches - Upper body capability - Measuring slide can be moved between - workstations without recalibration - Smart Led - Built in remote control
Quality certificate, Car-O-Liner AB	BS EN ISO9001, No. 11557
Cerificates	EN50081-1/1991 EN55022/1985 class B prEN50082-2/1992 FCC part 15, subpart B, class A

Table 1.8 Technical specifications of Car-O-Tronic II.

9.4 Software Versions

9.4.1 Car-O-Soft Vision

The CD **Car-O-Soft Vision** contains the original software. Updates of **Car-O-Soft Vision** are included on the CDs called **Car-O-Data Update**. Each time the software is updated the version number of **Car-O-Soft Vision** is increased.

The actual version number of **Car-O-Soft Vision** can be found at *section 4.9.6 "System functions"*.

9.4.2 Car-O-Data and VisionData

CD subscribers get their updates of **Car-O-Data** (new DataSheets and new photo DataSheets) on the CD Car-O-Data Update

VisionData subscribers get their updates of DataSheets and new photo DataSheets by the internet.

Every time **Car-O-Data** is updated (with **Car-O-Data Update** or **VisionData**), the version number of **Car-O-Data** is changed according to the version of **Car-O-Data Update**.

Existing DataSheets are found on CDs called Car-O-Data CD #x. (Numbering of **Car-O-Data CD #x** can vary depending on the number of CDs released. Numbering starts from **Car-O-Data CD #1**.)

The actual version number of **Car-O-Data** can be found at *section 4.9.6 "System functions"*.

9.5 Article numbers

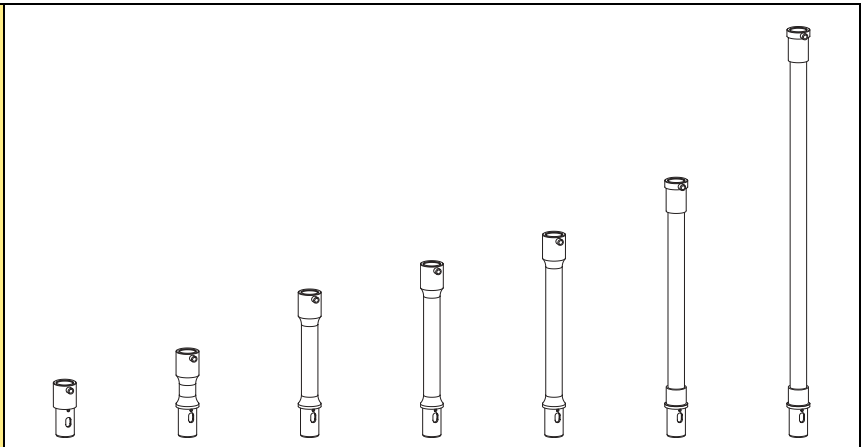
Instruction manual 141 06 01 533
CD – Car-O-Soft Vision 141 06 00 266
CD – Car-O-Data CD #1 ..... 141 06 00 445
CD – Car-O-Data CD #2 ..... 141 06 00 446
CD – Car-O-Data Update 141 06 00 440

10 Spare parts

The spare parts required for the maintenance of Car-O-Tronic Vision are listed in the tables below.

NOTE: Use only genuine Car-O-Liner AB spare parts. To order contact your local Car-O-Liner distributor.

10.1 Measuring tubes

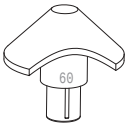
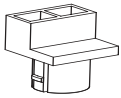


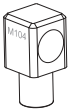
Object	Quantity	Art. No
M701-25 Measuring tube L=25	1	141 07 00 021
M701-60 Measuring tube L=60	1	141 07 00 022
M701-100 Measuring tube L=100	1	141 07 00 035
M701-180 Measuring tube L=180	1	141 07 00 023
M701-270 Measuring tube L=270	1	141 07 00 024
M701-360 Measuring tube L=360	1	141 07 00 025
M701-600 Measuring tube L=600	1	141 07 00 029

10.2 Measuring adapters

Art. No	Quantity	Object						
								
		M100-8 Adapter Ø8	**M100-10** Adapter Ø10	**M100-12** Adapter Ø12	**M100-14** Adapter Ø14	**M100-15** Adapter Ø15	**M100-16** Adapter Ø16	**M100-17** Adapter Ø17
131 02 06 114	1							
	1							
131 02 06 130	1							
131 02 06 131	1							
131 02 06 132	1							
131 02 06 127	1							
131 02 06 133	1							
131 02 06 128	1							

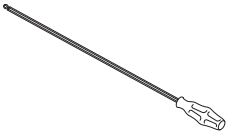
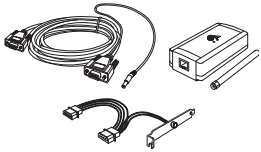
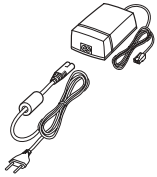
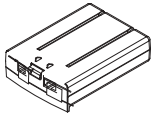
Art. No	Quantity	Object						
								
		M100-18 Adapter Ø18	**M100-19** Adapter Ø19	**M100-20** Adapter Ø20	**M100-21** Adapter Ø21	**M100-22** Adapter Ø22	**M100-24** Adapter Ø24	**M100-25** Adapter Ø25
131 02 06 134	2							
131 12 11 000	1							
131 02 06 135	1							
131 12 12 000	1							
131 02 06 136	1							
131 02 06 137	1							
131 02 06 129	1							

						
Object	**M100-26** Adapter Ø26	**M100-28** Adapter Ø28	**M101-25** Stud Ø25	**M101-35** Stud Ø35	**M101-60** Stud Ø60	**M103** Angle stud
Quantity	1	1	1	1	1	1
Art. No	131 02 06 138	131 02 06 139	131 02 06 110	131 02 06 111	131 02 06 181	131 02 06 151

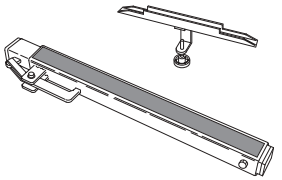
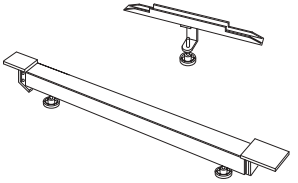
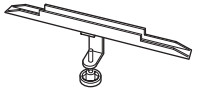
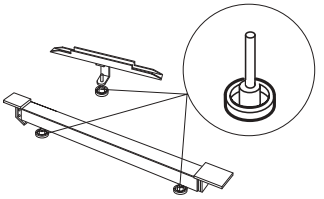
							
Object	**M104** Adapter	**M201-6** Adapter Ø6	**M201-8** Adapter Ø8	**M201-9** Adapter Ø9	**M201-10** Adapter Ø10	**M201-12** Adapter Ø12	**M201-13** Adapter Ø13
Quantity	2	1	1	1	1	1	1
Art. No	131 02 06 152	131 02 06119	131 02 06 145	131 02 06 153	131 02 06 147	131 02 06 158	131 02 06 126

Object						
						
M201-14 Adapter Ø14	**M201-15** Adapter Ø15	**M201-18** Adapter Ø18	**M217-120** Measuring gauge	**M217-180** Measuring gauge	**M235** Angle measuring	
Quantity	1	1	1	1	1	1
Art. No	131 02 06 122	131 02 06 150	131 02 06 142	131 02 08 312	131 02 08 311	131 02 06 000

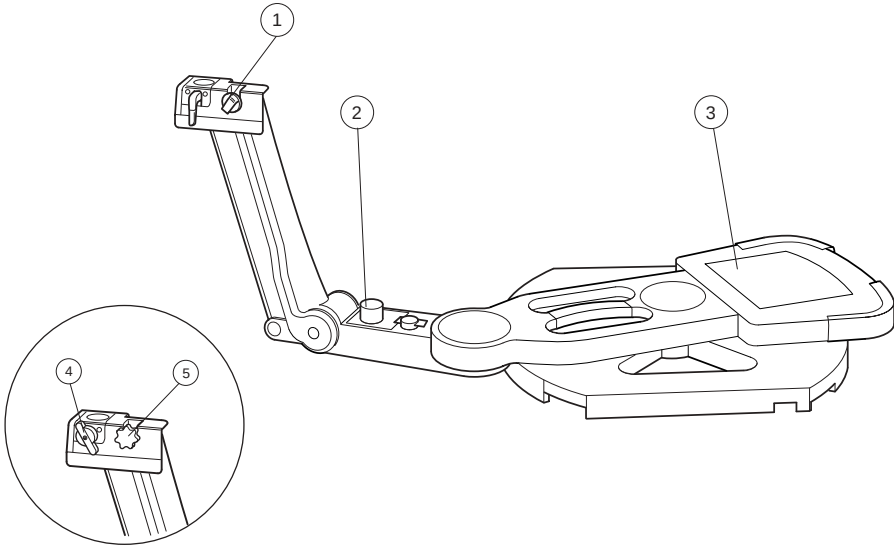
10.3 Miscellaneous, Car-O-Tronic

Object		Quan-tity	Art. No
	**M300** Allen screw driver	1	131 04 50 000
	**Box MS Cable**	1	141 05 00 029
	**PC Radio II Vision**	1	141 050 04 00
	**Charger, 220 V (EU)** **Charger, 110 V (UK)** **Charger, 110 V (US)**	1 1 1	141 05 00 037 141 05 00 220 141 05 00 210
	**Battery**	1	141 02 50 200

10.4 Measuring bridge support

Object		Quantity	Art. No
	**Measuring bridge support (for Mark 5 and BenchRack)**	1	141 08 00 008
	**Measuring bridge support (for Mark 6 and BenchRack)**	1	131 02 00 330
	**Measuring bridge lock**	1	131 01 18 241
	**Knob (for measuring bridge support and measuring bridge lock)**	1	99 308

10.5 Measuring slide Car-O-Tronic II M90



Position	Object	Quan-tity	Art. No:
1	Locking screw	1	99 329
2	IR cover	1	141 05 20 006
3	Top cover	1	141 02 50 107
4	Locking handle	1	141 04 50 200
5	Locking knob	1	99 325

Table 1.1 Measuring slide spare parts

10.6 Cabinet M81

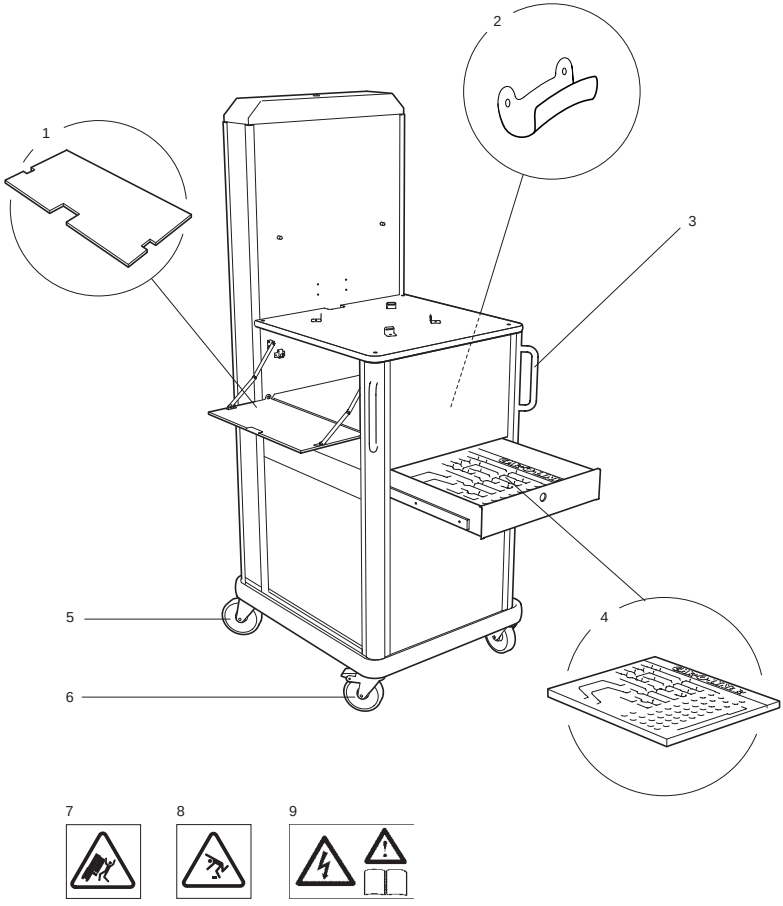


Figure 10.1 Cabinet spare parts.

Position	Object	Quan-tity	Art. No:
1	Mouse-pad	1	141 09 00 055
2	Holder	1	141 09 10 108
3	Handle	1	99 381
4	Box inset with measuring tubes and adapters	1	141 09 00 056
5	Wheel without brake	1	131 08 10 002
6	Wheel with brake	1	131 08 10 024
7	Safety sign “Risk of cabinet overturning”.	1	99 787
8	Safety sign “Risk of tripping on loose hoses, etc.“	1	99 786
9	Safety sign “All electrical modifications must be made by a qualified electrician.“	1	99 824

Table 1.2 Cabinet spare parts.

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In 1973, Car-O-Liner® was the first to introduce a universal repair bench, and in 1990, the first to introduce a computerized electronic measuring system.

Today, Car-O-Liner is the best-selling collision repair equipment in the world. More than 30,000 Car-O-Liner collision repair systems are in use throughout the world – all backed by a distributor network spanning 60 countries whose members are selected for their knowledge of the auto collision repair business and their ability to provide superior service to Car-O-Liner customers.

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