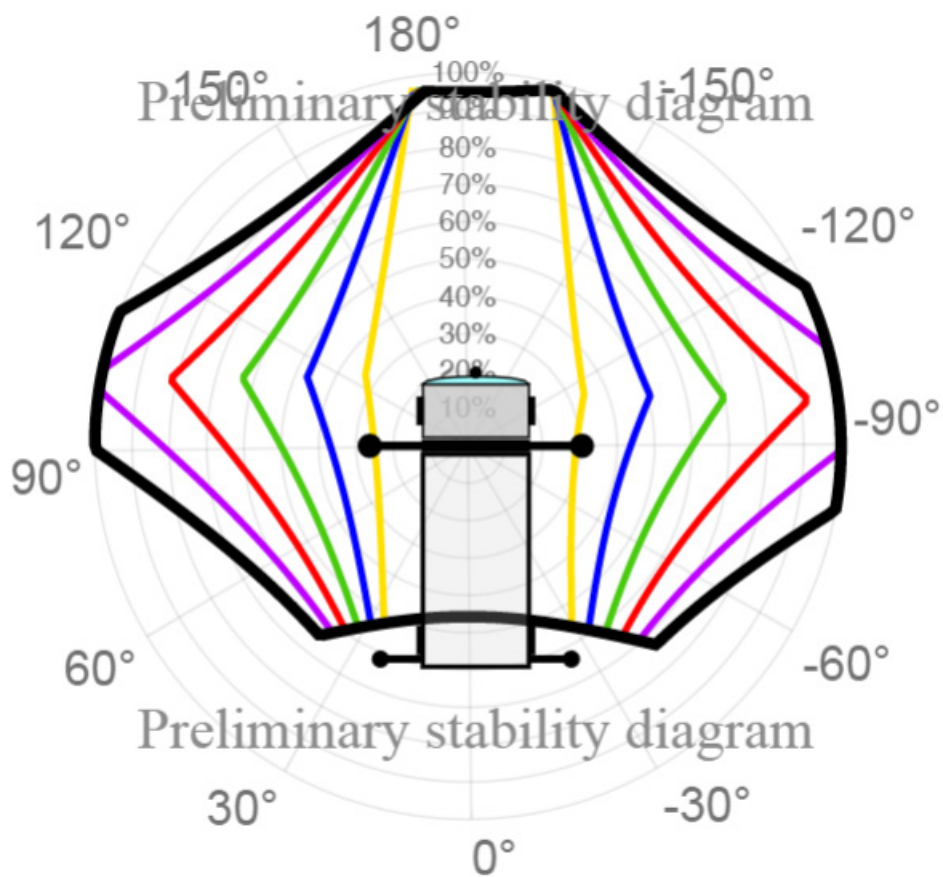


C-Stab



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Introduction

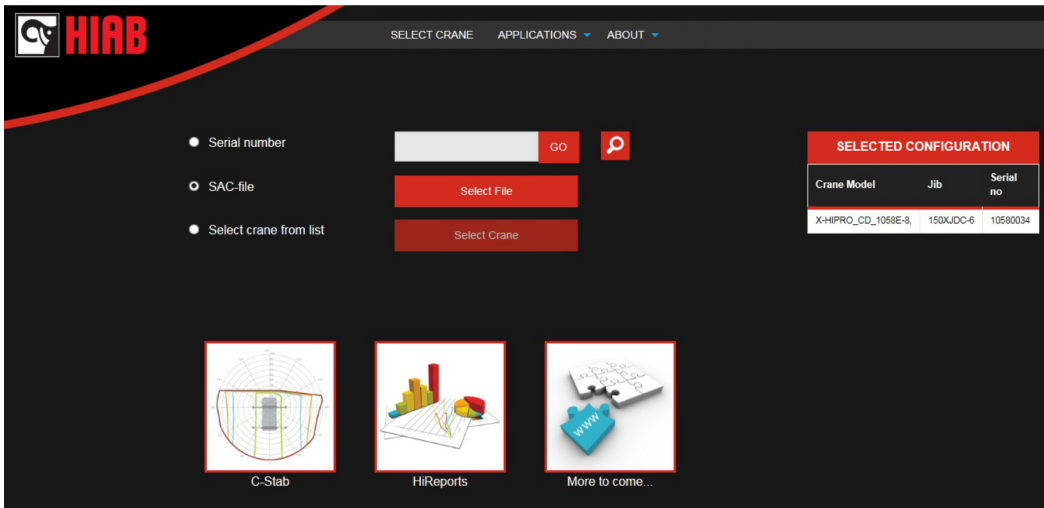
The C-stab is an online application that makes it easy to calculate a preliminary stability diagram based on the Users choice of crane configuration, stabiliser system and vehicle parameters. This to match crane, stabiliser system and vehicle for the purpose in question.

C-stab is mainly developed to draw stability charts based on the Users choice configuration. However, it can also be used for some other tasks, such as drawing the stability chart based on a SAC-file and saving the selected installation parameters in a SAV-file which after that can be fed into a SPACE box with help of the Terminal Program to change some installation parameters for a crane mounted on a vehicle in order to optimize stability. Simplified, there are three ways of using C-stab.

- Start C-stab from C-office and set all crane, vehicle and stabiliser system settings manually.
- Start C-stab from C-office and import all crane, vehicle and stabiliser system settings from a SAC-file
- Start C-stab from TrailerWin

Select crane in C-stab

You need to select the desired crane and its SAC-file before starting an application in C-stab. There are three search alternatives to get the desired SAC-file, Serial number, SAC-file or Selecting crane from list.



In the list "Selected Configuration" the selected crane, jib (if fitted) and its serial number is shown.

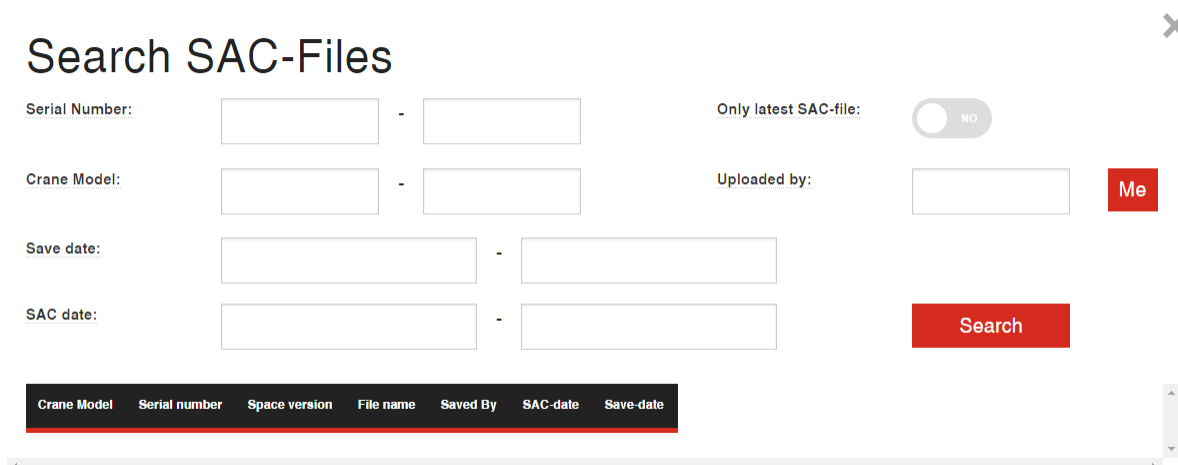
SELECTED CONFIGURATION		
Crane Model	Jib	Serial no

Serial number

Write the serial number of the crane in question in the search field. Press "Go" to get the associated SAC-file. If you don't know the serial number you can go to an extended search view by pressing the magnifying glass. Now it is possible to search for SAC-files created by a specific user (Uploaded by) and/or within a range of Serial numbers, Crane models, Save-dates and/or SAC-dates.

The different search options can be used separately or together to refine the search result. The control Only latest SAC-file lets you choose whether to show all SAC-files found or only the latest revision. Found SAC-files are listed at the bottom of the page. Click the desired file to open it.

NOTE! Only files intended for the current user will be listed.



Only latest SAC-file

This is a control that lets you decide if you want to see all the SAC-files or only the latest revision. As default the control is set to No. Click the control to switch setting.

Only latest SAC-file:

 NO

Uploaded by

Write the username of the user in question in the field. By pressing the “Me” button you easily chose your own user name. Press the search button to get a list of SAC-files created by that specific user. Double click desired file in the list to select the SAC-file.

Uploaded by:



Serial numbers

Write the first serial number in the left field and the last serial number in the right field. Press the search button to search for SAC-files within that range of crane serial numbers. Double click desired file in the list to select the SAC-file. Example: We want to find all cranes with serial number 1058xxxxx. Write 1058 in the left field and 1059 in the right. Press the search button and get a list of all serial numbers beginning with 1058.

Serial Number:

 -

Crane models

Write the first model name in the left field and the last model name in the right field. Press the search button to search for SAC-files within that range of crane models. Double click desired file in the list to select the SAC-file. Example: We want to find all cranes in the product range X-HiPro 192 to XS 322 HiPro. Write X-HiPro 192 in the left field and XS 322 HiPro in the right. Press the search button and get a list of all products in that range.

Crane Model:

 -

Save date

Save date is the date when the SAC-file originally was uploaded to C-Space. Write the first date in the left field and the last date in the right field. Press the search button to search for SAC-files within that range of save dates. Double click desired file in the list to select the SAC-file.

Save date:

 -

SAC-date

The SAC-date is the date that the SAC-file was most recently edited and saved. Write the first date in the left field and the last date in the right field. Press the search button to search for SAC-files within that range of SAC-dates. Double click desired file in the list to select the SAC-file.

SAC date:

 -

SAC-date

The SAC-date is the date that the SAC-file was most recently edited and saved. Write the first date in the left field and the last date in the right field. Press the search button to search for SAC-files within that range of SAC-dates. Double click desired file in the list to select the SAC-file.

SAC date:

 -

SAC-file

Press the Select file button to select a locally stored SAC-file. Chose a desired SAC-file in the browser window and click the Open button.



Selecting crane from list

Chose from different alternatives in the drop down menus. The red warning signs are replaced with green ticks as the selections are made. Depending on selections made, one or several red warning signs can be replaced with green ticks. If no selections are available, the space for the warning sign/green ticks will be left blank. You can make the selections in the different drop down menus in the order of your choice. When all the red warning signs are gone, click OK to get the SAC-file.



Crane model

Chose the desired crane model.

Control system

Chose the desired control system.

Boom system

Chose the desired boom system.

Select boom extensions

Select the desired boom extensions.

Select jib

Select the desired jib.

Select jib extension

Select the desired jib extensions.

Crane base

Select the desired crane base.

Stabiliser extension

Select the desired stabiliser extension.

Stabiliser leg

Select the desired stabiliser leg.

Keep truck settings










With this control you can chose whether to keep or dispose previous truck settings. The control is set to No as default. Click the control to change it to Yes.

Garbage can

Click the garbage can to clear all the selections made in the dialog.

Select crane manually



Crane Model	<input type="text" value="Choose crane..."/>	
Control system	<input type="text" value="Choose control system..."/>	
Boom system	<input type="text" value="B"/>	
Select boom extensions	<input type="text" value="2"/>	
Select jib	<input type="text" value="No jib"/>	
Select jib extensions	<input type="text" value="Choose jib extensions..."/>	
Crane Base	<input type="text" value="Choose base..."/>	
Stabiliser extension	<input type="text" value="Choose stab ext..."/>	
Stabiliser leg	<input type="text" value="Choose stab leg..."/>	
Keep truck settings	<input checked="" type="checkbox"/>	

OK

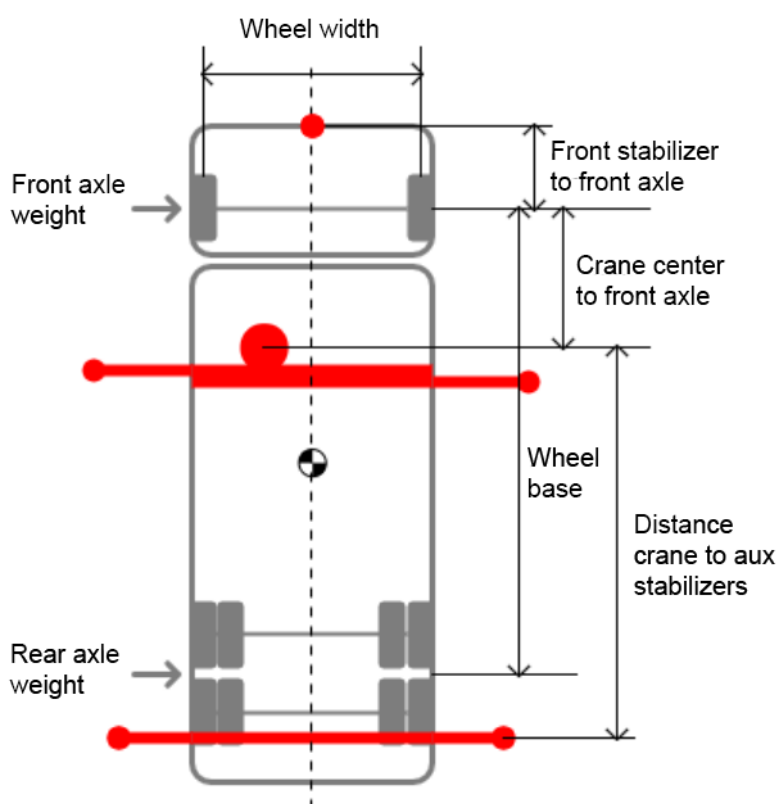
Cancel

C-stab

The crane-data needed for calculating the preliminary stability diagram is stored in a SAC-file. At the right of the Hiab Applications window you'll find the Selected Configuration. To change the selected configuration, see section Select crane. Start the C-stab application by clicking the C- stab icon. The preliminary stability diagram of the selected crane is shown. At the top left corner there is a control for choosing if the configuration has ballast or not and on configurations with jib applicable, a control for choosing if the crane is equipped with jib or not. Click the controls to get the desired settings. On the left there are several buttons for navigation between different menus for setting of parameters, printing diagrams and saving projects. At the start of C-stab, the menu Stability diagram is shown. Some menus in the list below are optional.

Vehicle data

Click the button to open the vehicle data settings menu. In this menu data of the vehicle can be set. The results of the selections made are shown in the illustration.



Number of axles

Set the number of axles on the vehicle in question. The result of the settings made is shown in the graphics.

Number of axles

Wheel base

Set the wheel base on the vehicle in question. The result of the settings made is shown in the graphics.

Wheel base

Crane placement

Set the position of the crane. The result of the settings made are shown in the graphics.

Front stabiliser system

Set if the vehicle is equipped with front stabiliser system or not. Click the control to switch setting. Default value is No.

Front stabiliser system

 NO

Wheel width

Set the wheel width of the vehicle in question. The result of the settings made are shown in the graphics.

Wheel width (mm)

Crane center to front axle

Set the distance from the center of the crane to the front axle of the vehicle in question. The result of the settings made are shown in the graphics.

Crane center to front axle

Total vehicle mass

This control defines if you want to set the total mass of the vehicle and the center of gravity or if you want to set the weight of the front and rear axle.

Total vehicle mass

 YES

Vehicle mass

Set to total mass of the vehicle. The result of the settings made are shown in the graphics.

Vehicle mass

Center of gravity

Set the distance between the center of gravity and the front axle. The result of the settings made are shown in the graphics.

Center of gravity

Auxiliary stabiliser system

The control sets if the vehicle is equipped with auxiliary stabiliser system or not. Default setting is Yes. Click the control to switch setting. The result of the settings made are shown in the graphics.

Auxiliary stabiliser system

 YES

Distance crane to auxiliary stabiliser system

Set the distance between the auxiliary stabiliser system and crane. The result of the settings made are shown in the graphics.

Distance crane to auxiliary stabiliser system

Separate main stabiliser beam

This control defines if the main stabiliser system is mounted on the crane or not.

Separate main stabiliser beam

 NO

C-Stab

System description



Crane offset 1

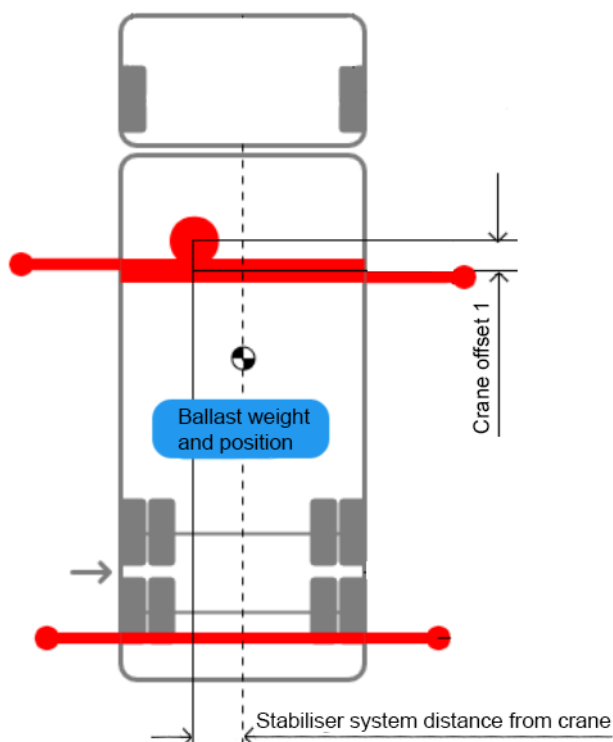
Set the distance between the crane and the center of gravity if Separate main beam is set to Yes. The result of the settings made are shown in the graphics.

Crane offset1

Stabiliser system distance from crane

Sets the distance between the crane and the stabiliser if Separate main beam is set to Yes. The result of the settings made are shown in the graphics.

Stab leg distance from crane



Truck with ballast

This control defines if the calculation of the stability diagram should include ballast or not.

Truck with ballast

Show ballast

This control is only available if the control Truck with ballast has been set to Yes. Set if the ballast should be visible or not in the Vehicle data graph. This control has to be set to Yes to enable positioning of the ballast

Show ballast

C-Stab

System description



Vehicle mass

This setting is only available if the control Truck with ballast has been set to Yes. Set the total mass of the vehicle with ballast included.

Vehicle mass

Positioning the ballast

If Show ballast is set to Yes, the ballast can be positioned by “drag and drop” in the graphics.

Center of gravity

Is only visible if the control Truck with ballast has been set to Yes. Shows the position of center of gravity. The value will change as the position or weight of the ballast is changed.

Center of gravity

Front axle weight

Is only visible if the control Truck with ballast has been set to Yes. Shows the front axle weight. The value will change as the position or weight of the ballast is changed.

Front axle weight

Rear axle weight

Is only visible if the control Truck with ballast has been set to Yes. Shows the rear axle weight. The value will change as the position or weight of the ballast is changed.

Rear axle weight

Safety Parameters

Click the button to open the Safety Parameters settings menu. In this menu Safety Parameters can be set.

Use front axle as tipping line

This control is only available if Front legs is set to No in the Vehicle data settings menu. It sets if you want to use the front axle as a tipping line or not. Default value is Yes. Click the control to switch setting. The result of the settings made are shown in the graphics.

Use front axle as tipping line 3



Wheel width correction factor front

This setting is only available if Use front axle as tipping line is set to Yes. It sets the wheel width correction factor of the front axle. Standard value is 60%.

Wheel width correction factor front: (%)

Wheel width correction factor rear

This control is only available if auxiliary stabiliser system is set to No in the Vehicle data settings menu. It sets the wheel width correction factor of the rear axle. Standard value is 60%.

Wheel width correction factor rear: (%)

Additional safety factor for retracted stabiliser extension

Set additional safety factor for retracted extension. Standard setting is 100% i.e. fully extended extensions.

Stability diagram

Click the button to open the Stability diagram. This is the C-stab startup page.

With jib

This control is only available if the chosen crane is available with jib. It makes it possible to switch between a configuration with and without jib. Click the control to switch to desired setting.

With Jib



With ballast

This control is only available if Truck with ballast is set to “Yes” in the Vehicle data menu. The control makes it possible to switch between a configuration with and without ballast. Click the control to switch to desired setting.

With Ballast



Safety factor K1, K2, K3, K4, K5, K6

Around the graph there are sections K1, K2, K3 and so on. In these sections, the safety factor “K” is set. It’s one safety factor for each tipping line i.e. the number of safety factors will vary depending on the configuration of the crane. As standard the safety factor is set to 140 (+40% safety factor). The Safety factors should only be changed after stability test.

K3

120

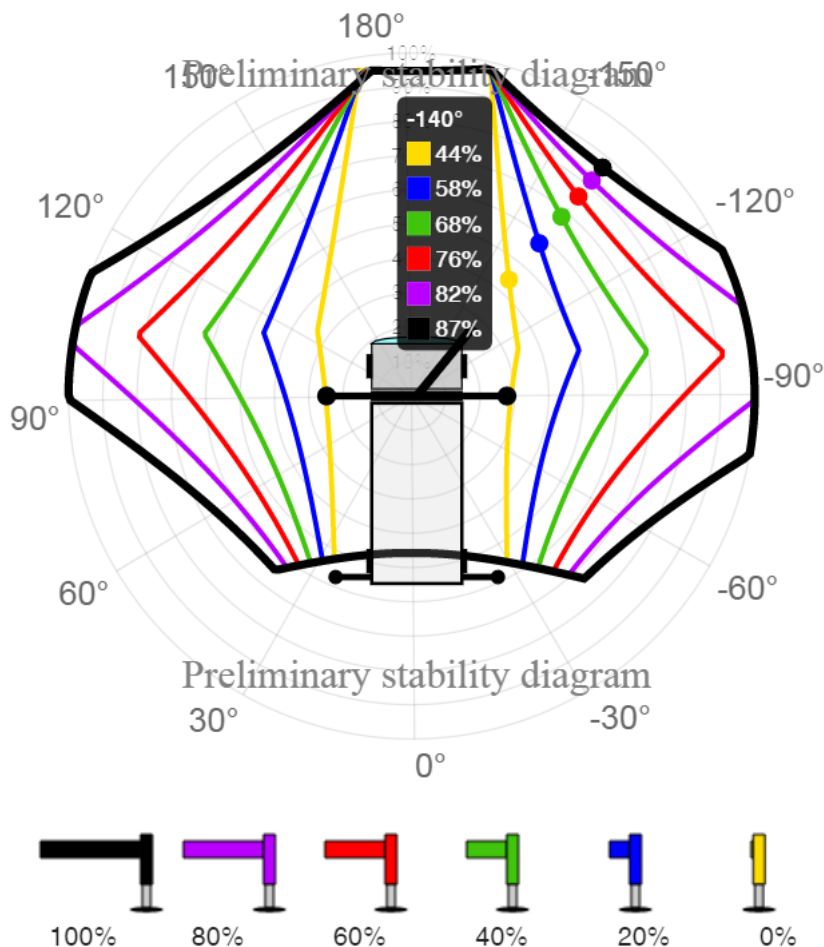
C-Stab

System description



Diagram

The diagram shows the crane capacity in percent depending on the outreach of the stabiliser extensions. Each line correspond to some stabiliser extensions positions (0%, 40%, 60%, 80%, 100%) Moving the cursor in the diagram simulates the crane slewing, a popup window shows the crane angle and current crane capacity for different degree of extension of the stabiliser systems. The crane capacity is specified in percentage of the maximum capacity. The degree of extension is specified in percentage of maximum extension.



Update

Press this button to update the diagram after changing any settings.



Print

Press this button to generate a printable version of the stability diagram. A preview of the printable diagram is shown together with a menu for choosing printer and printer settings. After choosing the desired printer and printer settings, press print to print the Stability diagram.



Graph options

At the bottom of the page there is a button which lets you customize the graphics of the graph to your liking. You can change the units, number of shown lines, the color and thickness of the lines. Click the button to open the settings menu, customize the graphics to your liking and then close the menu by clicking the button once again.

GRAPH OPTIONS

Show stabiliser system extension width in

You can chose to show the stabiliser extension in three different units, percentage, millimeters or inches. Click the drop down menu and chose the desired unit. As default, the unit is set to percentage.

Show stabilizer extension width in:

Show line

Each line has a control for choosing whether to have the line visible in the graph or not. The default value is Yes. Click the control to switch the setting.

Color

Each line has a drop down menu for choosing the color of the line. Click the drop down menu to set the color of your liking.

Line width

Each line has a drop down menu for setting the line width. Click the drop down menu to set the width to your liking. As default lines 0 ,20, 40, 60, 80% are set to 3, the 100% line is set to 5.

Show 100% line

Line width:

Stabiliser system

In this menu data of the chosen stabilizer system can be set/viewed. At the top of the settings menu there are two Radio buttons. These buttons indicates which stabilizer system the settings apply to, auxiliary stabiliser system or front stabiliser system. Click the buttons to switch to the desired stabilizer system. However, the menus are only available if the stabilizer system control in question has been set to Yes in the Vehicle data menu.

- Auxiliary stabiliser system Front stabiliser legs

Auxiliary stabiliser system

Type of stabiliser system

Click the drop down menu and chose desired type of stabiliser system. Choose between the available predefined stabilisers or define your own by choosing "User defined".

Type of stabiliser systems

2 Extendable ▾

Extensions

If predefined stabiliser systems are chosen in the Stabiliser type drop down list, the setting of the chosen stabiliser system is shown, however, the settings cannot be customized. Click the drop down menu and chose the number of extensions. Depending on the number of extensions set, the number of extension settings below will vary.

Extensions

2 Extensions ▾

XminL

Type the dimension of the first extension on the left hand side of the stabiliser system.

XminR

Type the dimension of the first extension on the right hand side of the stabiliser system.

XmidL

Type the dimension of the second extension on the left hand side of the stabiliser system.

XmidR

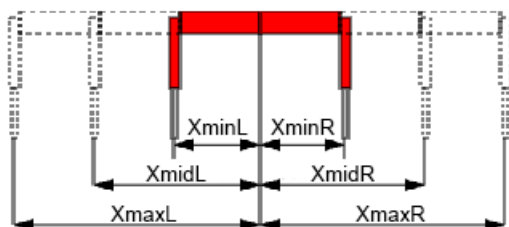
Type the dimension of the second extension on the right hand side of the stabiliser system.

XmaxL

Type the dimension of the third extension on the left hand side of the stabiliser system.

XmaxR

Type the dimension of the third extension on the right hand side of the stabiliser system.



C-Stab

System description



Extension sensor type

Click the drop down menu and choose between available sensor types.

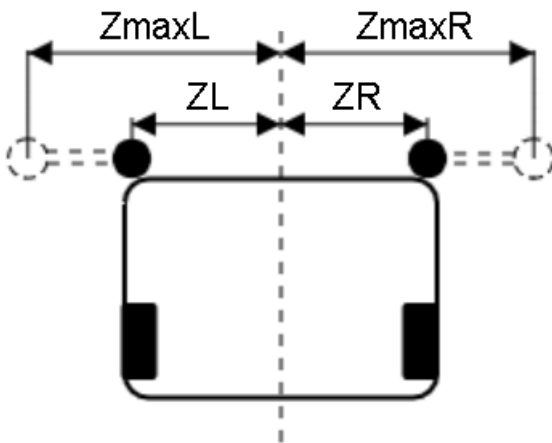
Front stabiliser system

Type of stabiliser systems

Click the drop down menu and chose desired type of stabiliser system.

Stabilizer type

The number of stabiliser extensions varies depending on the type of front legs chosen. Type the dimension of the stabiliser extension respectively. Settings made are shown in the graphics.



On/Off extension sensor

Click this radio button if the stabiliser system is equipped with On/Off extension sensors.

OnOff extension sensor

Analog extension sensor

Click this radio button if the stabiliser system is equipped with analog extension sensors.

Analog extension sensor

Piston diameter

This setting do not affect the stability diagram. The setting will however be included in the SAV-file (Save vehicle parameters (SAV-file)). Type the piston diameter

Piston rod diameter

This setting do not affect the stability diagram. The setting will however be included in the SAV-file (Save vehicle parameters (SAV-file)). Type the piston rod diameter

Piston rod diameter

mm

Max pressure when stabiliser extensions are out

This setting do not affect the stability diagram. The setting will however be included in the SAV-file (Save vehicle parameters (SAV-file)). Type the maximum pressure when the legs are out.

Max pressure when stabiliser extensions are out

MPa

Max pressure when stabiliser extensions are in

This setting do not affect the stability diagram. The setting will however be included in the SAV-file (Save vehicle parameters (SAV-file)). Type the maximum pressure when the legs are in.

Max pressure when stabiliser extensions are in

MPa

Crane properties

Click the button to open the crane properties chart. The specifications given here are based on the chosen SAC-file and on specifications given in the setting menus Vehicle data, Safety parameters, Stability diagram and Stabilisers.

Truck properties

Click the button to open the truck properties chart. The specifications given here are based on the chosen SAC-file and on specifications given in the setting menus Vehicle data, Safety parameters, Stability diagram and Stabilisers.

Project

Click the button to open project administration site. From here you can:

Open project

Click this button to browse and open an earlier locally saved project file.

Save project

Click this button to browse and save a project to desired local location. The file can later be opened to proceed with the current project or used as a base when creating a new project.

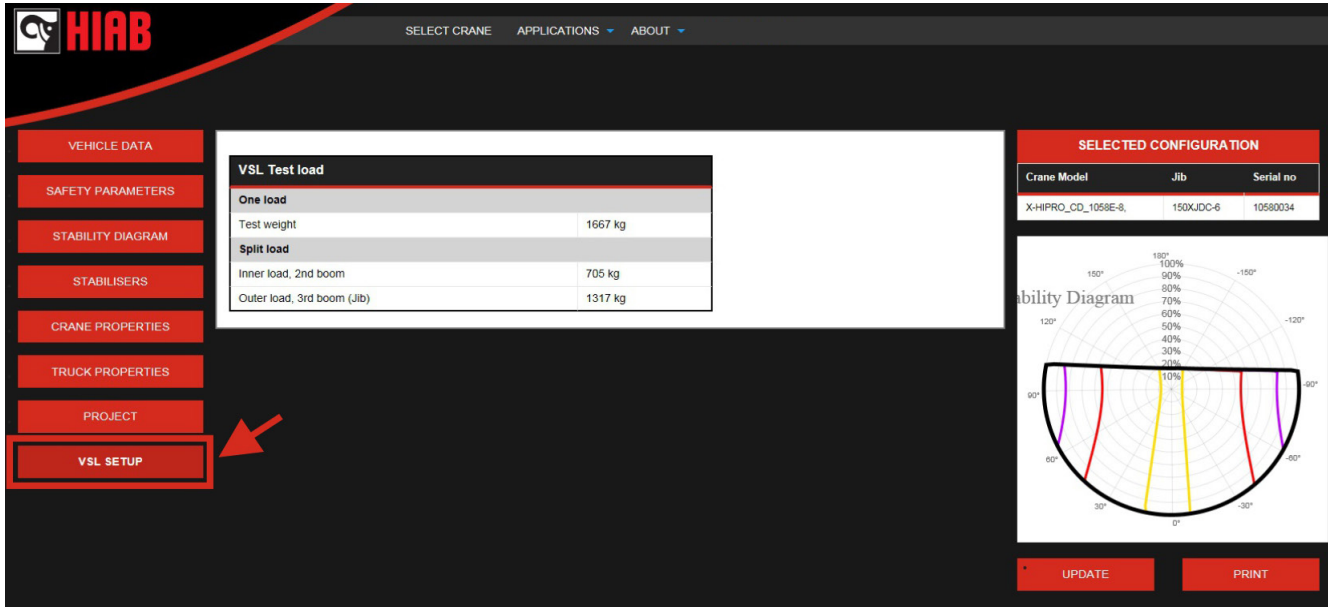
Save vehicle parameters (SAV-file)

Click this button to save vehicle parameters in a SAV-file. The file will be saved in the folder specified as the download folder of the web browser, mostly the "Downloads" folder but the specified folder can be changed in the web browser settings. The SAV-file can then be fed into a SPACE box with help of the Terminal Program to change installation parameters for a crane mounted on a vehicle in order to optimize stability.

VSL Setup

To find the Test Load in 'C-Stab', click the button to open VSL Setup page and get the test loads.

If the calculated TL is heavier than the maximum allowed Jib capacity multiplied by 1.25, the TL needs to be split into two loads.



The screenshot displays the HIAB VSL Setup software interface. On the left, a sidebar contains navigation buttons: VEHICLE DATA, SAFETY PARAMETERS, STABILITY DIAGRAM, STABILISERS, CRANE PROPERTIES, TRUCK PROPERTIES, PROJECT, and VSL SETUP (highlighted with a red box and arrow). The main area shows the 'VSL Test load' table:

VSL Test load	
One load	
Test weight	1667 kg
Split load	
Inner load, 2nd boom	705 kg
Outer load, 3rd boom (Jib)	1317 kg

On the right, the 'SELECTED CONFIGURATION' table shows:

Crane Model	Jib	Serial no
X-HIPRO_CD_1058E-8,	150XJDC-6	10580034

Below the configuration table is a 'STABILITY DIAGRAM' showing a circular stability chart with various load capacity curves. At the bottom right, there are 'UPDATE' and 'PRINT' buttons.

In the example from 'C-Stab', we can see the standard TL calculated is 1667 Kg and that weight cannot be supported by the Jib. In that case, we need to split the TL in two: 705 Kg in the hook of the 2nd boom and 1317 Kg in the Jib.