# **TRAILER CONSULTATION**

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TrailerWIN Trailer Consultation



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# The guided Example 1: Truck and Trailer

To start calculating a new vehicle click Begin on th	e Toolbox.		
TrailerWIN - [ TrailerConsultation ]			
🖏 File Print Picture Truck Trailer Options Special Help			
L 🖉 🚛 🖨 🗆 T 🖸 📉 🗠 🖾 🕬	08:48 22.9.1999	End	Begin
New button	Begi	in button	
Calculation			
Task name			
Customer Text 1 Calculation made by :		<b>.</b>	00
Then click o	n		

# **Choosing Chassis**

From Chassis Window you can choose the chassis fabricate, next model series and then wheelbase and cab

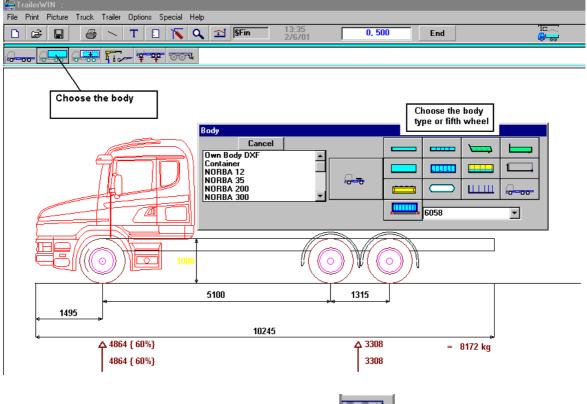
Chassis : MAN 10		_ 🗆 > Cancel
Mercedes-Benz ACTROS SCANIA4 G	Pre-	view
P124 GB 6x2 A P94 GA 4X2 A R124 GB 4X2 A R144 GB 8x2 NB T124 GB 6x2 Z		<b>00</b>
4500+1315 Sleeper cab 5100+1315 Sleeper cab		OK
SCA4G T124 GB 6x2 Z 5100+1315 Sleeper cab		

Now you can go through the chassis data, weights and dimensions.

hassis : SCANIA4 GA			Cancel
SCANIA4 GB SCANIA 93113143 92	.112142		Previe <del>w</del>
T124 GB 6x2 A (11.5+7.5) T124 GB 6x2 Z T124 GB 6x4 A Choose 5100+1315 clicking 5100+1315 Sleeper cao 5300+1315			5100 <b>(</b> 315)
Chassis truck make	Choose the SCANIA wheel	e body type or f	Tifth Cancel
type	T124 GB 6x2 Z		
model (wheelbase, cab etc	.) 5100+1315 Sleeper ca	ıb	
G.V.W. front axle		7500	OK
G.V.W. rear axle		19000	
G.V.W. total		25000	
chassis weight, front axle		4724	
chassis weight, rear axle		3308	
basic wheelbase (front ax	le- first rear axle)	5100	-

#### **Choosing Body**

Choose the body by clicking on the BODY-button. In the BODY Window you can choose the body type or fifth wheel.



Continue with choosing the trailer coupling.

			-			1
	1	1	1.	ι.	•	_
80	6		58		-	С
82		e		•		

#### **Choosing Trailer**

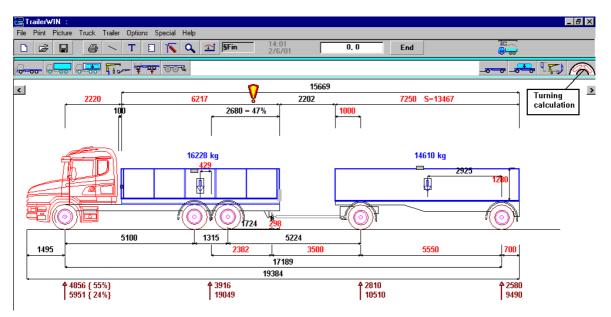
Now you can choose the trailer

\_<del>\_\_\_\_\_</del>

after that choose the trailer type (how many axles...) and the body type of the trailer

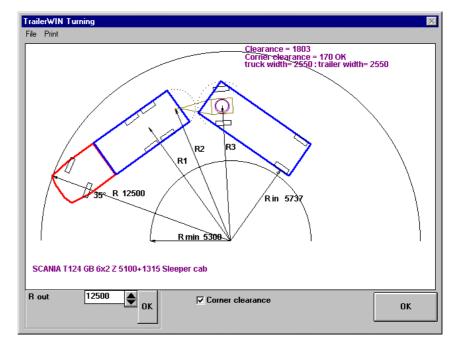
TRAILER	
	Cancel
_ <mark>0_0'</mark>	
_ <del></del>	
_ <del></del>	
-00-000-	
	<u> </u>

There you have a combination vehicle:



#### **Checking Turning**

By clicking on the turning circle icon you are able to see the result of the turning calculation:



# The guided Example 2: Truck with Crane and Hooklift

To start calculating a new vehicle click on the **Begin** button or on the **New** button.

🚝 TrailerWIN - [ TrailerConsultation ]	
🖏 File Print Picture Truck Trailer Options Special Help	
	8:48 2.9.1999 End Begin
New button	Begin button
Calculation	It helps to find this calculation later by typing the task name and customer name here.
Calculation made by :	Then click
on for beginning with	the truck.

## **Choosing Chassis**

From Chassis Window you can choose the chassis fabricate, after that model series and then wheelbase and cab

In this example: FODEN A3-6R-3126 6x4 RIGID 5500 Day cab

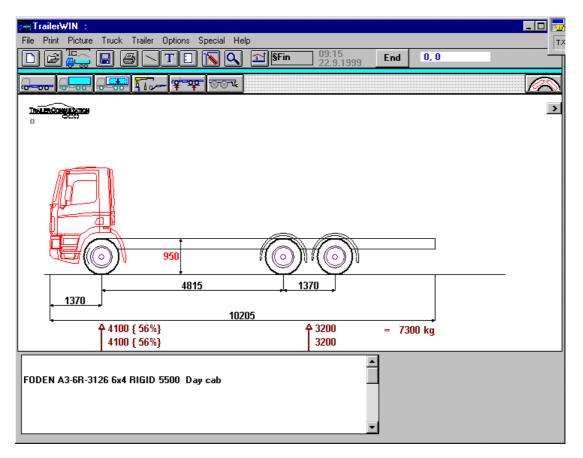
Chassis :	
ÖAF 🗾	Cancel
ERF	
FODEN 🗖	🗹 Preview
A3-6M-C10 6x2 MID-LIFT TRACTOR A3-6M-M11 6x2 MID-LIFT TRACTOR A3-6R-3126 6x4 RIGID A3-6R-C10 6x4 RIGID A3-6R-M11 6x4 RIGID	
A3-6R.M-3126 6x4 MIXER A3-6R.T-3126 6x4 MIXER A3-6R.T-3126 6x4 TIPPER A3-6R.T-C10 6x4 TIPPER	1370 4815 11370 1370
4525 Day cab 4525 Sleeper cab 4725 Day cab 4725 Sleeper cab 5000 Day cab 5000 Sleeper cab 5500 Sleeper cab 5500 Sleeper cab	ОК
5800 Day cab 5800 Sleeper cab 6100 Day cab FODEN A3-6B-3126 6x4 RIGID	
5500 Day cab	

In Chassis data window you can check chassis weights and dimensions

Chassis			_ 🗆 🗵
truck make	FODEN		 Cancel
type	A3-6R-3126 6x4 RIGID		
model (wheelbase, cab etc.)	5500 Day cab		
G.V.W. front axle		7500	ок
G.V.W. rear axle		19000	
G.V.W. total	26000		
chassis weight, front axle		3960	
chassis weight, rear axle 3200			
basic wheelbase (front axle-	first rear axle)	4815	-
bogie wheelbase		1370	

When you are ready, click OK.

You will get the chassis in the big picture.

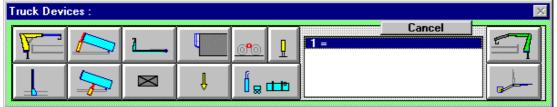


#### **Choosing Crane:**

Click on the **equipment** button to get a crane behind the cab.

		ᠮᢆᢧ᠆ᢡ᠊ᢡ	004
¥	Bodywork	Equipment	

In following equipment window you will see the crane button (yellow crane) on the left side. The other crane button (green crane) on the right side is for rear-mounted crane.



Click the yellow crane on the left side.

Now it is possible to choose the crane model, in this example at first the group HIAB 200 ... 225, and then the model **HIAB 200C-3 (172 kNm)** 

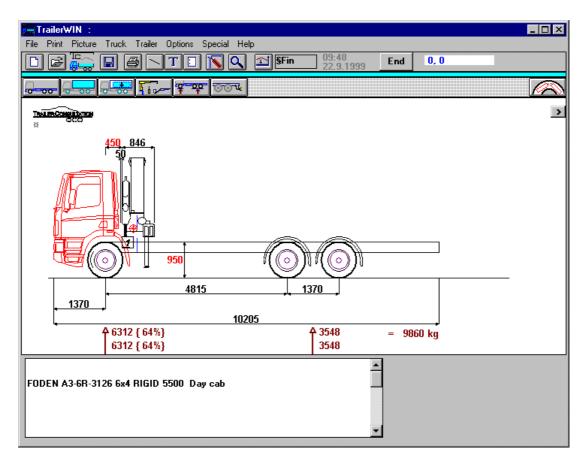
Truck Devices :	$\times$
	7
HIAB 050 052 060 071 081 085 090 092 095 HIAB 100 102 105 110 115 120 125 135 140 160 175 185 195 HIAB 200 205 210 215 220 225 HIAB 230 245 250 260 280 290	
200C-1 (192 kNm)       ▲         200C-2 (177 kNm)       ▲         200C-3 (172 kNm)       ▲         200C-4 (168 kNm)       ▲         200C-5 (163 kNm)       ▲         205-1 (197 kNm)       ▲         205-2 (187 kNm)       ▲         205-2 (187 kNm)       ▲         205-3 (183 kNm)       ▲	
205-3 JIB60 205-4 (178 kNm) 205-4 JIB60 210 K-2 (181 kNm) 210 K-3 (150 kNm) ▼	
200C-3 (172 kNm)	

Click OK

1: HIAB 200C-3 (172 kNm)				ور کیے
				Cancel T
846		4	4730	
<b>849</b>				
Cranes first spot, measu length	red backwards from fron	t axle	450 846	
Crane weight			2270	
			2270	
Mountings part weight			40	т ок
- Mar - Mar <u>- M</u> ar	nually 4730mm nually 5430mm n. (tiltable) 4790mm n. (tiltable) 5490mm			
Support legs weight			250	
Turn support legs				
devices centre of gravi centre of cranes frame		-102	1100	
Distance Cranes slewin	g centre - Crane First po	int	399	
devices corner width corner length (body - de	vices corner)		2451 840	
and a second sec				

On following Crane Data Window you can check and edit crane weight and dimension data. You can also choose stabiliser leg model and crane position: folded or unfolded.

Click OK

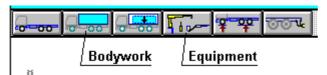


Now you have the crane on the chassis.

There are 3 different methods to move the crane 200 mm to the rear:

- 1. Double-Click on the red dimension number (hot dimension) 450, and type new value 650, and click then OK.
- 2. Drag the crane with mouse from the small grey rectangle under the crane. The crane moves to a new place. Very exact movements are difficult with this method.
- 3. Click on the Equipment button, and choose from the list this crane, so you will come back to the Crane Data Window. Type there the new value; 650

#### **Choosing Demountable**

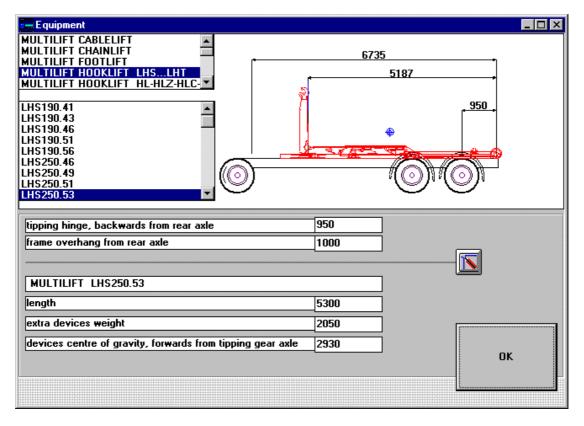


Click on the Equipment button

and Click on the Demountable button (1. row; 3. from left, ) in the following window

Truck Dev	vices :						×
¥.		<b>L</b>		<u>e</u>	1 =	Cancel	57
	5	X	Ļ				

Then you will see the demountable window

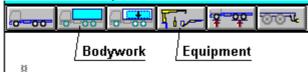


At first choose the demountable group in the list box on the top. Below it choose the model (second list box). The preview window shows the chosen model.

Type suitable values for "tipping hinge, backwards from rear axle" and "frame overhang from rear axle"

#### **Choosing Bodywork**

Click on	the	Bodywork	button.
----------	-----	----------	---------



The Bodywork Window opens.

Body				×
Cancel				
Own Body DXF	· · · · · · · · · · · · · · · · · · ·			
Container NORBA 12				
NORBA 35 NORBA FrontLoader LIEBHERR		$\bigcirc$	шш	
		6058		

If you have already chosen the bodywork, you do not come to Bodywork Window by clicking on the Bodywork button. In that case choose **Menu: Truck - Body type** 

Truck	Trailer	Options	Special	Help
Chas	sis			
Chas	sis Optior	nal		
Cab				
Body				
Body	type			
Load	s centre	of gravity		
Devid	ces			
Weig	ihts			Ctrl+G
Fram	e rear ov	erhang		
Fifth	Wheel C	oupling / T	railer Cou	pling
Load	Curve			
Truck	k: Turnin	g		

Choose the Body type Button.

In this example we choose Body frame button

(Body frame for demountable)

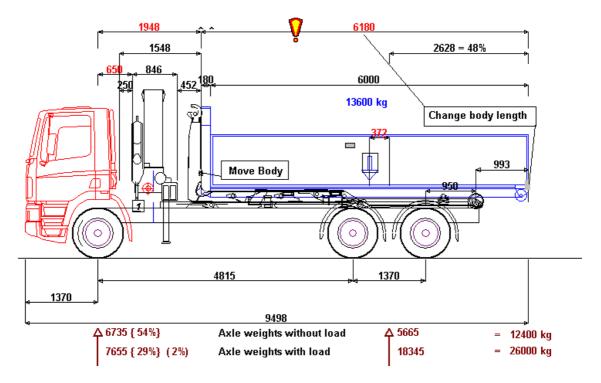
	Body	data	window	appears.
--	------	------	--------	----------

Body				$\square$ ×
Body		<u> </u>	Cancel	
bodys startpoint backwards from front axle	1948		Optimum	_
Hookbeam > <	180			
body length	6180		OK	
body height	1000			
load spaces own weight kg/m	80			
subframe height	200			
frame overhang from rear axle	1000			

The program has at first calculated the body length so, that the rear axle weight is near maximum allowed, when the body is even loaded.

If you have a special length, which you like to have, you can type this length on the input box.

You can also change body length later from picture; double-click the red dimension or drag with mouse the small grey rectangle at the end of the body.



Axle weight with and without load is shown below the picture.

# The guided example 3: Truck with Hooklift

To start calculating a new vehicle. Click on the **Begin** button or **New** button.

TrailerWIN - [ TrailerConsultation ]	
53 File Print Picture Truck Trailer Options Special	
	Image: Spin         08:48         End         Begin           22.9.1999         End         Begin         1000000000000000000000000000000000000
New button	Begin button
Calculation	
	later by typing the task name
Task name	
Customer     Text 1	
Calculation made by :	Choosing Chassis
Chassis : MAN L2000 MAN M2000	for beginning with the truck.
MAN F2000	🔽 🛛 🗹 Preview
33.403 DFK/H 6x4/2 33.403 DF-KI 6x4/2 33.403 DF-KI 6x4/2 33.403 DF/H-KI 6x4/2 33.414 DFC 6x4/2 33.414 DFC/H 6x4/2 33.414 DFS 6x4/2 33.414 DFS/H 6x4/2 33.414 DFK 6x4/2	
33.414 DFC LT48JV07 BBB/N 3175+1400 33.414 DFC LT48JV08 BBB/N 3500+1400 33.414 DFC LT48JV09 BBB/N 3825+1400 33.414 DFC LT48JV11 BBB/N 4075+1400 33.414 DFC LT48JV10 BBB/N 4575+1400 33.414 DFC LT48JV12 BBB/N 4575+1400 33.414 DFC LT48JV21 BBB/G 3825+1400 33.414 DFC LT48JV23 BBB/G 4075+1400 33.414 DFC LT48JV24 BBB/G 4575+1400	ΟΚ
FH16 33.414 DFC 6x4/2 33.414 DFC LT48JV07 BBB/N 3175+1400	

From Chassis Window you can choose the chassis fabricate, next model series and then wheelbase and cab

In this example:

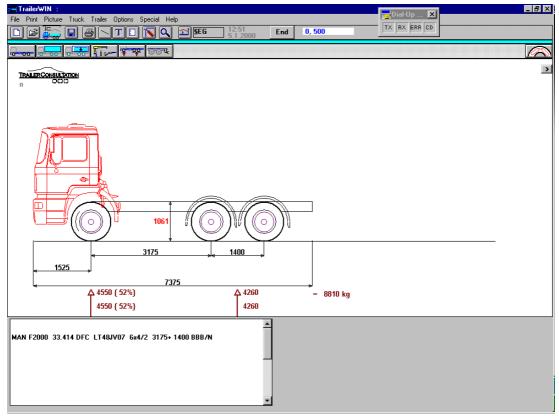
#### MAN F2000 F2000 33.323 DFC LT18T 07 6x4/2 3175+ 1400 BBB/N

In Chassis data window you can check chassis weights and dimensions

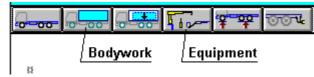
Chassis			_ <b>□</b> ×
truck make	MAN		Cancel
type	F2000 33.414 DFC L	T48JV07 6x4/2	
model (wheelbase, cab etc.) 3175+ 1400 BBB/N			
G.V.W. front axle		7500	— ок
G.V.W. rear axle		19000	
G.V.W. total		26000	
chassis weight, front axle		4475	
chassis weight, rear axle		4260	
basic wheelbase (front axle-	basic wheelbase (front axle- first rear axle)		
bogie wheelbase		1400	

When you are ready, click OK.

Now you will get the chassis in the big picture.



## **Choosing demountable**



#### Click on the **Equipment** button

and click on the demountable button (1. row; 3. from left, ) in the following window

Truck Devi	ices :						×
Y		<b>L</b>		<u>e</u>	1 =	Cancel	
	5	X	Ļ	Í₂œ			

Then you will see the demountable window

🚍 Equipment	
AJK Hooklift MULTILIFT CABLELIFT MULTILIFT CHAINLIFT MULTILIFT FOOTLIFT MULTILIFT HOOKLIFT LHSLHT	4950 Free space
LHS 190.43 LHS 190.43 LHS 190.46 LHS 190.51 LHS 250.46 LHS 250.51 LHS 250.53	
tipping hinge, backwards from rear axle	800
frame overhang from rear axle	1275 Redraw
MULTILIFT LHS190.46	
length	4600
extra devices weight	1800
devices centre of gravity, forwards from tipping gear axle	

At first choose the demountable group in the list box on the top. Below it choose the model (second list box). The preview window shows the chosen model.

# Type suitable values for "tipping hinge, backwards from rear axle" and "frame overhang from rear axle"

Activating new values to drawing click on the Redraw button.

Continue with:

Choosing Container Bodywork (you can choose length and height etc.) or

**Choosing Standard Container Bodywork (fixed dimensions)** 

#### Choosing Container Bodywork (you can choose length and height etc.)

Click on the Bodywork button.

	40,000-	<del>? ?</del>	004
 Bodywork	Equ	ipment	

(If you have already chosen the bodywork, you do not come to Bodywork Window by clicking the Bodywork button. In that case use Menu: Truck - Body type)

The Bodywork Window opens.

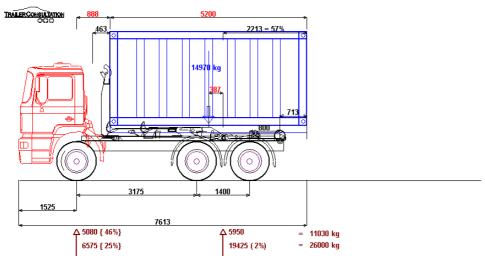
This example shows how to get a 5200 mm long container

Body				×
Cancel				
Own Body DXF	·			
Container NORBA 12				
NORBA 35 Norba 200				
NORBA 300	▼			*0 <del>***00*</del>
		, 🛄	5200	•
		$\geq$		
Write length 5200 here	$\neg \uparrow$	-		
Click then the Container F	Button			

Click then the Container Button

Body data window appears. You can choose container dimensions. Click then OK.

Following picture shows the result.



other possibility is to Choose Standard Container Bodywork with fixed dimensions

#### Choosing Standard Container Bodywork (fixed dimensions)

Click Bodywork button.

<b></b>		Ti- 7 - 001	ł
×	Bodywork	Equipment	

(If you have already chosen the bodywork, you do not come to Bodywork Window by clicking the Bodywork button. In this case use **Menu: Truck - Body type**)

The Bodywork Window opens.

Body				×
OK Cancel				
Own Body DXF 🔺				
Container 🔤				 · · · · · · · · · · · · · · · · · · ·
NORBA 12				
NORBA 35				
NORBA 200			$\square$	-000-
NORBA 300	Laurence			 
			6058	-
		L	[	

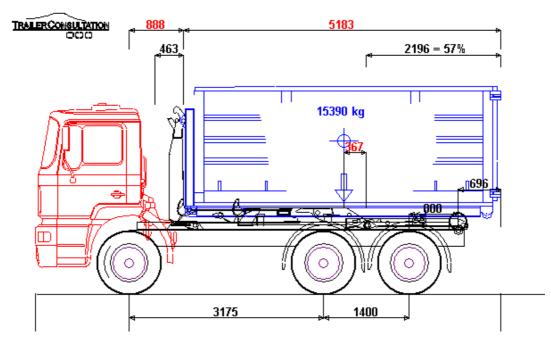
Click row **Container** on the standard bodywork listbox.

Bodywork Windows opens more: Click UNI18 on the Container Listbox

Body	×
Cancel Own Body DXF Container NORBA 12 NORBA 35 NORBA 200 NORBA 300 UNI16 UNI16 UNI18 UNI19 UNI20 20" 30" V	
Container UNI18	
bodys startpoint backwards from front axle	888
load spaces own weight	0
load spaces centre of gravity	2620
Loads centre of gravity	2620
dy ^ move up	210

Change data if needed, and click **OK**.

You will get a standard body UNI18



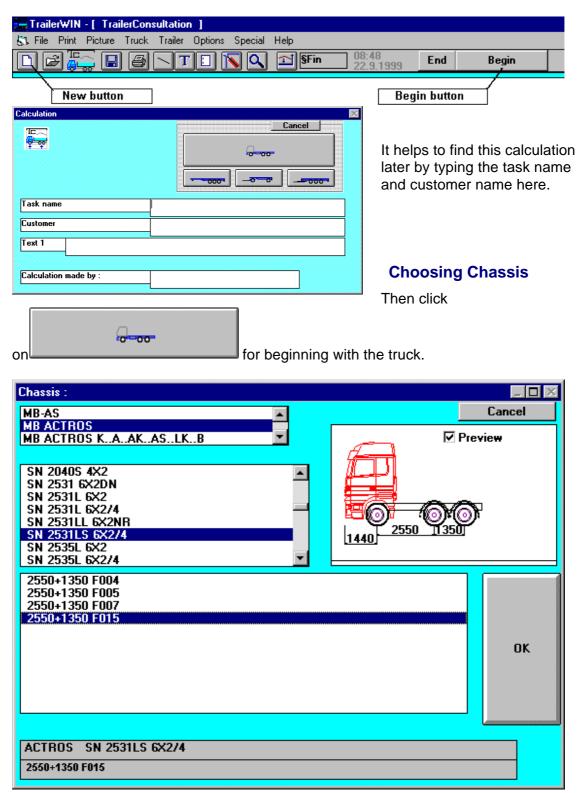
You cannot change any dimensions in this case, because the drawing is now a fixed drawing, not programmatically made as in previous cases.

It is also possible to draw own standard body models in AutoCAD and use these in theTrailerWIN.

See details in the TrailerWIN manual.

# The guided example 4: Tractor and Semitrailer

To start calculating a new vehicle click on the Begin button or New button.



From Chassis Window you can choose the chassis fabricate, next model series and then wheelbase and cab

In this example:

#### MERCEDES-BENZ ACTROS SN 2531LS 6X2/4 2550+1350 F015

#### (in the listbox: MB ACTROS) model wheelbases, cabin model code

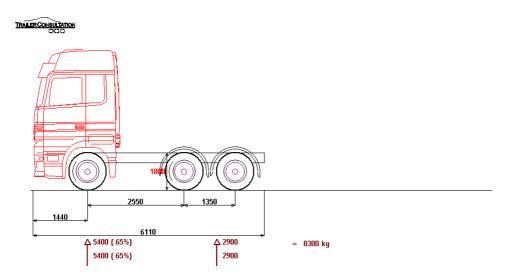
In the picture you see small arcs on first and also on second axle. This means, that in this model also the second axle is steer axle.

In Chassis data window you can check chassis weights and dimensions

Chassis				_ 0 2
truck make	MERCEDES-BENZ			Cancel
type	SN 2531LS 6X2/4			11
model (wheelbase, cab etc.)	2550+1350 F015			
G.V.W. front axle	-	7100		ОК
G.V.W. rear axle		18600	1	<u>[</u> ]
G.V.W. total		25000	1	
chassis weight, front axle		5325	1	
chassis weight, rear axle		2900	]	
basic wheelbase (front axle-	first rear axle)	2550		
bogie wheelbase		1350		

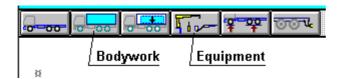
When you are ready, click OK.

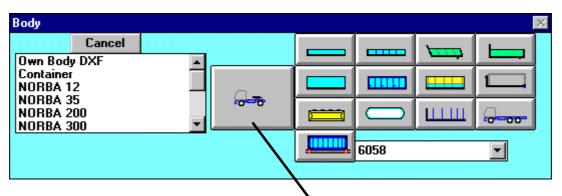
Now you will get the chassis in the big picture.



## **Choosing Fifth Wheel Coupling**

Click on the Bodywork button.





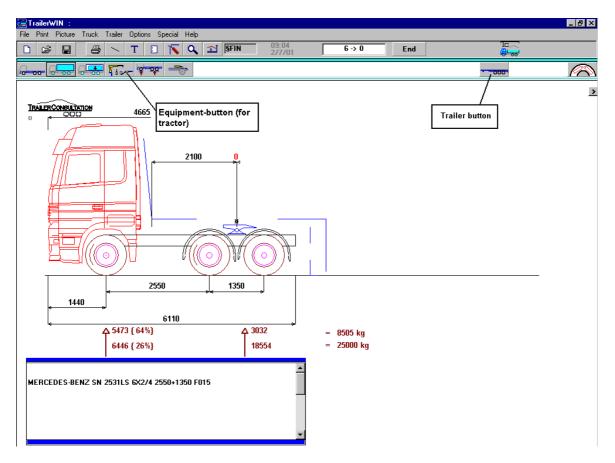
Click the button for the Fifth Wheel Coupling

			<b></b>	Cancel
ifth Wheel Coupling	Fifth Wheel Coupling			
ifth wheel place ( measu	rement-t )	3		Uptimum
ifth wheel weight		140		
rame overhang from rear	axle	770		
ruck width		2550		
dy ^ move up		0		

The program has at first calculated the Fifth Wheel Place so, that the rear axle weight is near maximum allowed, when total weight is on maximum (loading on the fifth wheel is on maximum).

You can change data on this window, if needed. Click OK.

Now the Tractor unit is ready. If you want to add some pieces of equipment, you can choose this using **Equipment - button**.



Axle weights without load and with load on Fifth Wheel Coupling, you see under the picture.

#### **Choosing the Semitrailer**

Click on Trailer button



You will get a button group for choosing semitrailer.

You have to make two choices:

From the left column: how many axles on trailer and the steering properties
 From other buttons: Body type, if container, choose also the length of the

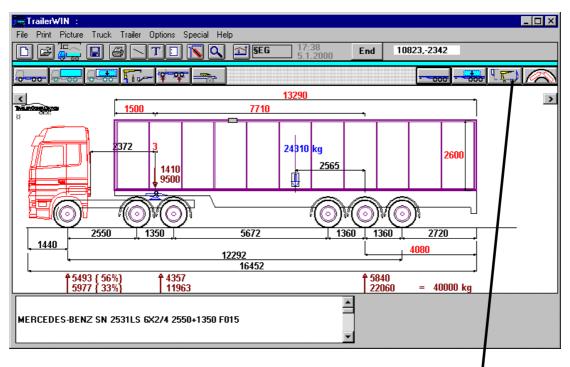
container (B Double is only for programs for Australia)

SEMITRAILI	ER			×
	Car	ncel		
	8 8		Container 6058	
00-1				
		×		
000 0				
	0000 0000			
		B Double		

When you have made these two choices, you see the semitrailer data window.

SEMITRAILER			_ <b>D</b> ×
SEMITRAILER		<u> </u>	Cancel
semitrailer weight	31560		Optimum
allowed fifth wheel weight	15000		
trailer front overhang	1500		ОК
trailer length	13290		
rear overhang (to centre of bogie)	4080		
BOGIE WHEELBASE: bogies first axle - middle axle	1360		
BOGIE WHEELBASE:bogies middle axle - rear axle	1360		

The program has made a calculation for finding the optimum semitrailer. Combination length near the maximum, weight distribution correct and turning in EU circle possible. If needed, you can change the values.



#### **Choosing equipment on the Semitrailer**

For taking equipment on the semitrailer or trailer click the **Trailer Equipment button** near right side of the screen.

#### Trailer Equipment Window appears.



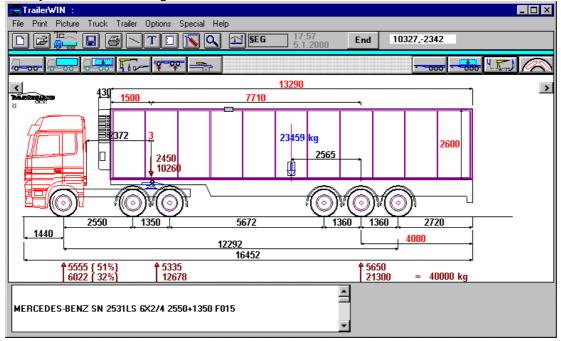
Click Refrigerator button.

	×
THERMO KING	
SMX-II 50 SMX 30 TCI SMX 50 TCI LND-II MAX 30 LND-II MAX 50 HEAT KING-III FRECH KING SUPER II 30 MAX+ SL-100 30	
SL-100 50 SL-200 30 SL-200 50 SL-300 30 SL-300 50	
SL-300 50	

Now we can choose refrigerator fabricate and model, in this example THERMO KING SL-300 50, and go to data window.

1				]
extra devices name	THERMO KING SL-300 50	<b>_</b>	Cancel	
extra devices weight	851			
length	430			
refridgerating machines height	223	5	ОК	
>	0			
^	0			
devices corner width	160			
corner length (body - devices	corner) 430			

On data window you can edit data if needed. Click OK on data window.



Now you have the Refrigerator on the semitrailer.

Weight for this refrigerator is calculated also on axle loads, which you can see on the screen.

Notice that the semitrailer weight on the fifth wheel coupling has influence on axle weights on the tractor. When tractor was alone, without the semitrailer, we were calculating axle loads, with maximum possible load on the fifth wheel.

When the semitrailer is known, we use as load on the fifth wheel this support reaction force, which semitrailer needs on fifth wheel.

If you move the loading point on the semitrailer, also axle weights on the tractor will change.

# The guided example 5: Truck + Crane Calculation with TrailerWIN and CraneWIN:

#### **Starting the Calculation**

To start calculating a new vehicle. Click the Begin button or New button.

🚟 TrailerWIN 2000	TrailerConsultation		
File Help			
D, B	09:27 17.1.2001 End	Begin	
New butto	n Begin / Start button		

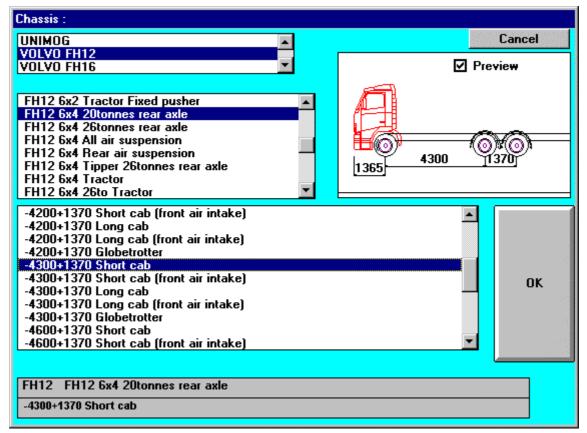
Calculation	It helps you to find this calculation later by typing the task name
Task name	and customer name here.
Customer Text 1	
Calculation made by :	

-----

Then click on

for beginning with the truck.

### **Choosing Chassis**



From Chassis Window you can choose the chassis fabricate, next model series and then wheelbase and cab

In this example we choose:

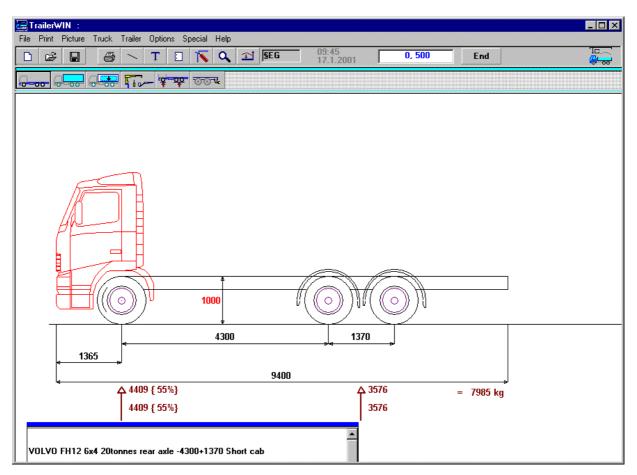
#### VOLVO FH12 6x4 4300+1370 Short cab

In Chassis data window you can check and change chassis weights and dimensions Maybe you have to change for example allowed weights, therefore that your chassis has not standard tyres.

Chassis			
truck make			Cancel
type	FH12 6x4 20tonnes rear axle		
model (wheelbase, cab etc.)	-4300+1370 Short cab		
G.V.W. front axle		6700	ок 👘
G.V.W. rear axle			
G.V.W. total		25700	
chassis weight, front axle		4334	
chassis weight, rear axle		3576	
basic wheelbase (front axle-	first rear axle)	4300	
bogie wheelbase		1370	

When you are ready, click OK.

Now you will get the chassis in the big picture.



#### **Choosing Crane:**

To have a crane behind the cab do as follows Click on the **Equipment** button.

- <del></del>	Ģ	-00-	<b>, .</b>	٢		<b>₽</b>	TOOU
	Į	Bod	ywork	l	Equ	ipment	

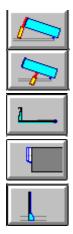
In following equipment window you will see the crane button (yellow crane) on the left side. The other crane button (green crane) on the right side is for rear-mounted crane.

Truck Devi	ces :							
Y		<b>L</b>	4	<u>0</u> 0	IJ	1=	Cancel	- 7
	$\mathbf{P}$	X	Î	(				

#### Buttons for choosing the device type:

T.	ſ
<b>۲</b> —	

Crane (front of the body)



Tipping gear (Front Tipping Gear or Underbody Tipping Gear)

Interchangeable body

Refrigerator



Point weight, with following alternatives



- 1. For example Winch front
- 2. Box between the cab and body
- 3. Box inside the body (e.g. toolbox inside the tank)
- 4. Rectangular Box
- 5. Box with rounded corners
- 6. Box with round ends
- 7. Circular Box
- 8. Air dryer
- 9. Box inside the rear body
- 10. Box behind the body



Point weight (as vector)

Rear Crane

Rear Lifter (Tail Gate)

Truck Devi	ces :							
Y		<b>1</b>		<u>0</u> °0	Ţ	<b>[1 =</b>	Cancel	- 57
	5	$\boxtimes$	Ļ	(   8	i i			

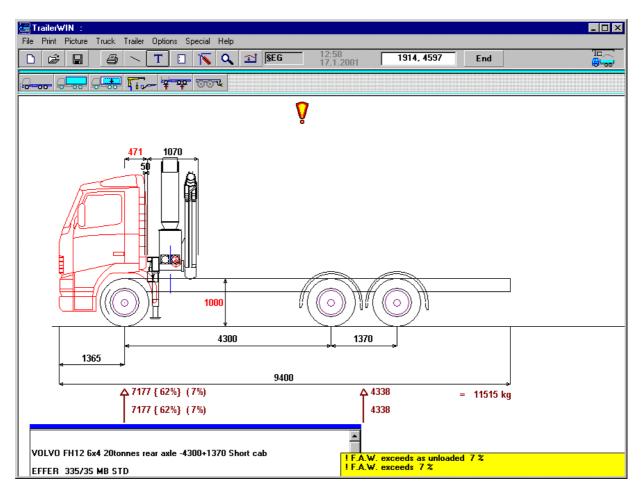
Click the yellow crane on the left side. Then we can choose the crane model, in this example at first the group EFFER 335 ... 360, and then the model EFFER 335/3S MB STD

ruck Devices : 1: EFFER 335/6S MB STD	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
EFFER 150 170 EFFER 210 250 EFFER 335 360 EFFER 400 430 44N 460 47N	
335/2S MB STD       ▲         335/3S MB STD       335/4S MB STD         335/5S MB STD       335/6S MB STD         335/6S MB STD       335/6S MB STD         335/4S +JIB 3S STD       335/4S +JIB 3S STD         360/3S STD       360/4S STD	
360/6S STD 360/7S STD 360/4S + JIB 3S STD 360/4S + JIB 4S STD 360/6S + JIB 3S STD ▼	с. С
335/3S MB STD	

Click OK. On following Crane Data Window you can check and edit crane weight and dimension data. You can also choose stabilizer leg model and crane position folded or unfolded.

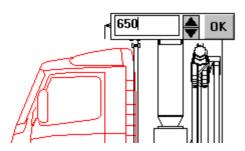
Cancel Ca	EFFER 335/3S MB STD			
Cranes first spot, measured backwards from front axle 650   length 1070   Crane weight 3530   Mountings part weight 0   Support legs 0   Support legs weight 0   Turn support legs 0   devices centre of gravitys place, from 115   Distance Cranes slewing centre - Crane First point 490   devices corner width 2495			6110	Cancel
Cranes first spot, measured backwards from front axle 650   length 1070   Crane weight 3530   Mountings part weight 0   Support legs 0   Support legs weight 0   Turn support legs 0   devices centre of gravitys place, from 115   115 1025   Distance Cranes slewing centre - Crane First point 490   devices corner width 2495	EFFER 335/	'3S MB STD		<u>→</u>
Crane weight 3530 Mountings part weight 0 Support legs Support legs weight 0 Turn support legs devices centre of gravitys place, from centre of cranes frame 115 1025 Distance Cranes slewing centre - Crane First point 490 devices corner width 2495		red backwards from front axle		
Mountings part weight 0  CK  Support legs Support legs Support legs Unit of the second	length		1070	
Support legs   Support legs weight   O   Turn support legs   devices centre of gravitys place, from   115   1025     Distance Cranes slewing centre - Crane First point   490   devices corner width	Crane weight		3530	
Support legs   Support legs weight   O   Turn support legs   devices centre of gravitys place, from   115   1025     Distance Cranes slewing centre - Crane First point   490   devices corner width				<b>•</b>
Support legs weight   O   Turn support legs     devices centre of gravitys place, from   centre of cranes frame     115     Distance Cranes slewing centre - Crane First point   490   devices corner width	Mountings part weight		0	— ок
Support legs weight   O   Turn support legs     devices centre of gravitys place, from   centre of cranes frame     115     Distance Cranes slewing centre - Crane First point   490   devices corner width				
Turn support legs         devices centre of gravitys place, from centre of cranes frame         115         Distance Cranes slewing centre - Crane First point         devices corner width	- Support legs			
Turn support legs         devices centre of gravitys place, from centre of cranes frame         115         Distance Cranes slewing centre - Crane First point         devices corner width				
Turn support legs         devices centre of gravitys place, from centre of cranes frame         115         Distance Cranes slewing centre - Crane First point         devices corner width	Support legs weight			
Distance Cranes slewing centre - Crane First point     490       devices corner width     2495			J	
devices corner width 2495	devices centre of gravi centre of cranes frame	itys place, from 115	1025	
	Distance Cranes slewin	ng centre - Crane First point	490	
corner length (body - devices corner) 1070			2495	
	corner length (body - de	vices corner)	1070	

Click OK



Now you see the crane on the chassis. We want to move the crane to the rear. We can make it on 3 different methods.

1. Double-Click the red dimension number (hot dimension) 471, and type new value 650, and click then OK.



- 2. Drag the crane with mouse from the small grey rectangle under the crane. The crane moves on a new place, but very exact movements are difficult with this method.
- 3. Click on the Equipment button, and choose from the list this crane, so you will come back to the Crane Data Window. Type there the new value; 650

#### **Choosing the Bodywork**

Click the Bodywork button.

<b></b>		
	Bodywork	Equipment

The Bodywork Window opens.

Body				
Cancel				
Own Body DXF 🗾 🔺		 		
Container	~			
NORBA 35 NORBA 200 NORBA 300	20- <b>25</b> -	$\bigcirc$	ШШ	- <del></del>
		6058		

If you have already chosen the bodywork, you do not come to Bodywork Window by clicking the Bodywork button. In this case use **Menu: Truck - Body type** 

Truck	Trailer	Options	Special	Help
Chas	sis			
Chas	sis Option	nal		
Cab				
Body	,			
Body	type			
Load	ls centre i	of gravity		
Devi	ces			
Weig	phts			Ctrl+G
Fram	e rear ov	erhang		
Fifth	Wheel Co	oupling / T	railer Cou	pling
Load	l Curve			
Truck	k: Turnin	g		

Choose the Body type Button. In this example we choose Open Body button

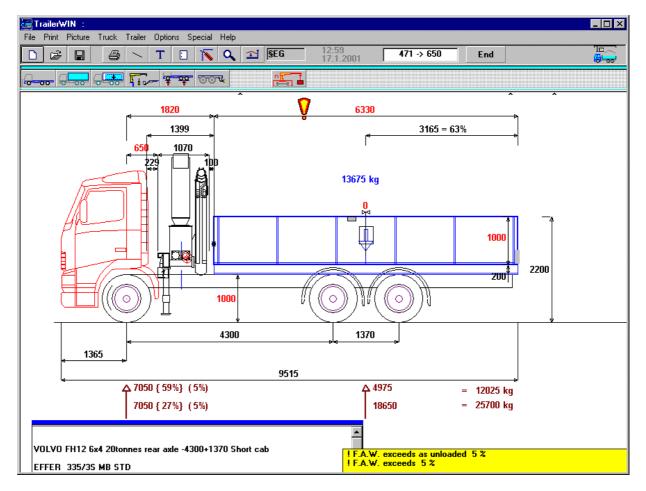
Body data window appears.

Body				
Bodu			Cancel	
bodys startpoint backwards from front axle	1820		Optimum	
body length 6330				
body height	1000		UK	
load spaces own weight kg/m				
subframe height	200			
frame overhang from rear axle	2365			
truck width	2550			

The program has at first calculated the body length so, that the rear axle weight is near maximum allowed, when the body is even loaded.

If you have a special length, which you like to have, you can type this length on the input box.

You can also change body length later from picture; double-click the red dimension or drag with mouse the small grey rectangle at the end of the body.



Axle weight without load and with load, you can see under the picture. First row shows axle loads without payload and the second row with payload. The numbers on brackets "**{59%}**" means that the front axle takes 59% of the vehicle weight. Second brackets "**(5%)**" means overload 5%. Also now we have 5% overload on the front axle.

For correcting this, we have to take smaller crane or to choose this truck with heavier axle (bigger load capacity).

For changing the max. frontaxle load, click the chassis button



Chassis				_	
truck make	VOLVO			Cancel	
type	FH12 6x4 20tonnes rea	ar axle			
model (wheelbase, cab etc.)	-4300+1370 Short cab				
G.V.W. front axle		7500 🛛 🗲		OK	
G.V.W. rear axle		19000	1		
G.V.W. total		26000 🔫			
chassis weight, front axle		4334			
chassis weight, rear axle		3576			
basic wheelbase (front axle-	first rear axle)	4300			
hogia wheelbase		1070	╡╶╶┊╧╧┛║		

Change **G.V.W. front axle** to 7500 kg, then we can also add the total weight to 26000 kg. Click OK button.

If we want now to see, what is the optimum body length with these weights, click again Bodywork button.

	- * * · · ·
Bodywork	Equipment

Body		
		- 🛋 Cancel
		Ontinum
bodys startpoint backwards from front axle	1820	
body length	6295	
body height	1000	OK
load spaces own weight kg/m	80	
subframe height	200	
frame overhang from rear axle	1550	
truck width	2550	

In bodywork window, click the **Optimum** button You will see that the body length changes.

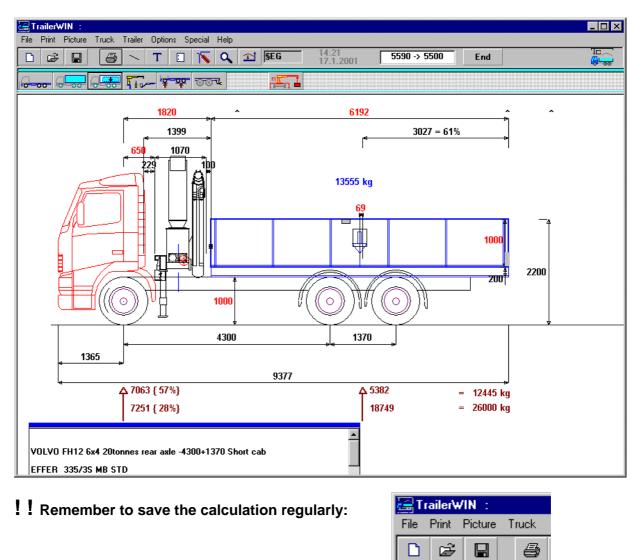
If we did not notice to change body weight (load spaces own weight) on the previous window, we can make it later from Load data.

<del>- 00 - 00 - 1</del> 0	00 0 00	Tir- For Court
Bodywork∫	Load	Equipment

Click the Load button on the toolbar.

Cancel
<ul> <li>Max Load</li> <li>Redused Load</li> </ul>
kg mm mm
Load 13985 4916 69
Loads centre of gravity mm 929 4916 69 OK
load spaces own weight/m kg/m 150

We change **load spaces own weight kg/m** to value 150 kg/m. Then click OK.



New Open Save Print<sub>38</sub>

Click on the Save Button:

Save As			? ×
Savejn:	🔁 Data	· E (	* 🔳
ACTROS_S		🔊 Gfoell2.hpl	1.0
ATLAS Hyd			JTO valiteli Magnu
🛛 🞑 Carrosserief	abriek Hartog-Est	🙍 laa2000	
🛛 🛋 Eurotrakker	+Loglift120	🔄 MAN 41.40	03+EFFER600
🛛 🖻 EuroTrakke	r+SemiTr+HIAB225	폐 MAN 41.40	03+EFFER720
🖌 🛋 Freightliner B	3Double	🛋 MANTGA+	EFFER720
•	]		Þ
File <u>n</u> ame:	VOLVO+EFFER335		<u>S</u> ave
Save as <u>t</u> ype:	All files *.*	•	Cancel
I	Open as <u>r</u> ead-only		

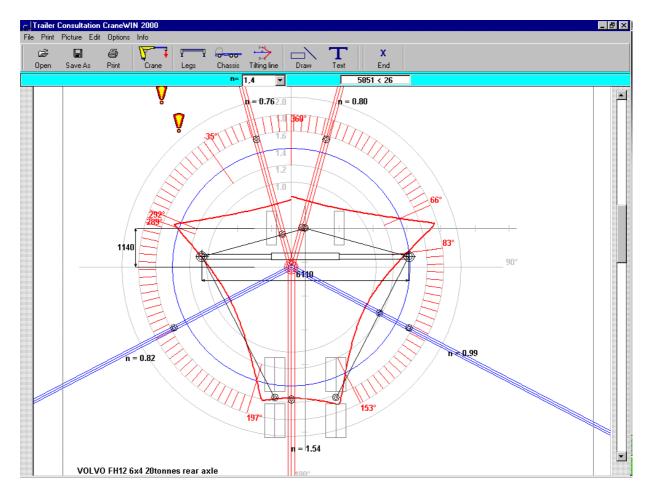
Use logical name. It helps you to find this calculation later.

Now you can check to Crane Stability. We go to CraneWIN Program.

	Frailer\	VIN : D	):\VB6\	Tr₩20	00\D a	ta\VO	LV0+	EFFE	R335				
File	Print	Picture	Truck	Trailer	Option	ns Spe	ecial	Help					
	I 🖻		9	/	Т		$\overline{\mathbf{N}}$	٥,	Ì	§EG	19:22 17.1.	2 2001	5590 -> 5500
P	-00	000	, <b></b>	5.00	- 7	<u></u>	00	<b>u</b> .					
											to Crane	e Stabili	ity Calculation

Click on the "to Crane Stability Calculation" button.

CraneWIN will start:



This diagram shows, that stability is very bad. Extra stabilizer legs are absolutely needed. Click on the **End**-button for going back to the TrailerWIN picture.

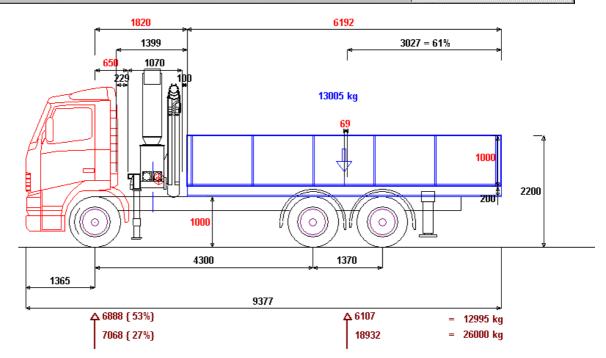
		۲.	- <del>* *</del> * *
l	Bodywork	1	Equipment

Click on the equipment button.

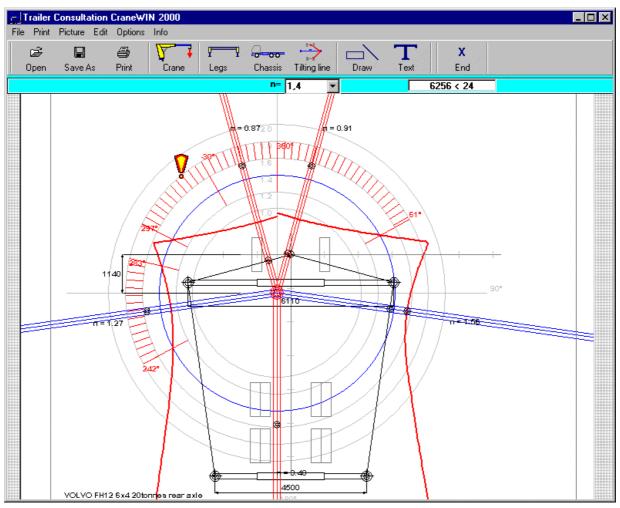
Truck Devi	ces :							
Y		L		<u>0°0</u>	£.	1 = EFFER 3 2 =	Cancel 335/3S MB STD	57
	$\mathbf{P}$	X	Ļ	( <sup>8</sup> c	<b>1 1</b> °	Stabilize	er legs	

Choose Stabilizer legs-button and type correct weight and width data.

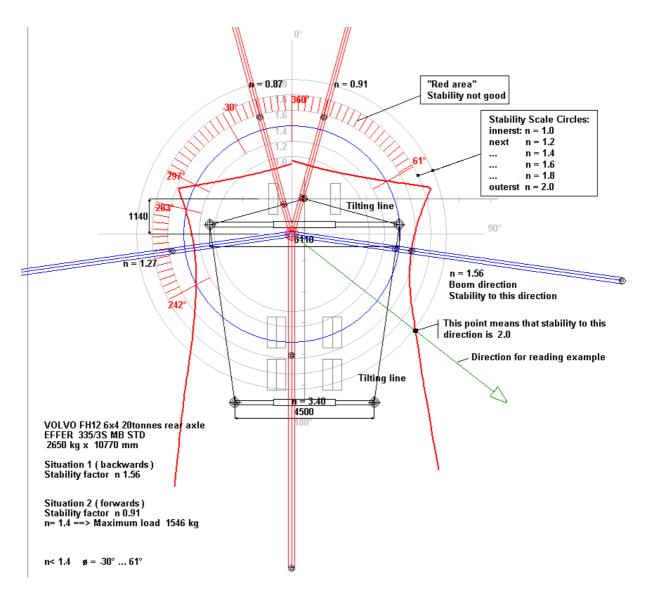
extra devices name	Stabilizer		 Cancel
extra devices weight		550	
length		250	
extra supports width	4500	UK	
devices centre of gravity: front axle	6570		



Now it is possible to test stability again: Click on "to Crane Stability Calculation" button.



## Reading the stability diagram:



The circle diagram shows stability to all directions.

Imagine the boom in the picture to this direction, for which you want to read stability. Where the boom direction line crosses the red stability curve, this point shows the stability. If this point is for example on scale circle 2.0, the stability is 2.0 to this direction (see example point on the picture).

#### **Modifications in CraneWIN**

<u>−</u> ]Ti	railer (	Consultation	Crane₩I	N 2000							
File	Print	Picture Edit	Options	Info							
	È		8	Ţ ↓	<b>F</b>	<b>0-00</b>	$\rightarrow$		Т	X	
C	)pen	Save As	Print	Crane	Legs	Chassis	Tilting line	Draw	Text	End	
						n= -	1,4 💌			<b>4</b> 956 < -29	

You can make many changes also in the CraneWIN; e.g. change load, outreach, stabilizer width, chassis weights etc. If you change something in the CraneWIN, it doesn't have any influence to the TrailerWIN calculation.

Task name			Cancel
Customer			
Truck	VOLVO FH12 6x4 20tonnes rear axle		<b>4</b>
Crane	EFFER 335/3S MB STD		1
Loading Moment			]
Lifting capacity k	g	2650	ок
Outreach mm		10770	
		M1 = 285 kNm	
Weight of base k		1790	° 👫 🚽
Weight of boom I		1740	
Dist. Cranes slev	. centre - COG of booms at max outreach mm	<b>3900</b> M2 = 68 kNm	• 🕂
	M1	+ M2 = 353 kNm	

For changing Crane load, outreach etc; click on the Crane-button.

		Cancel
Distance Cranes slewing centre - First front	axle mm 1140	
V		
Span of support legs mm	<< >> 3055 3055 6110	- I ⊙ 📇
	3055 3055 6110	
Dist. Cranes slew. centre - Centre of suppo	rt legs bean -305  -305  -305	
K.2 * 1 * 2		
Weight of support legs kg	0	0 -
Dist. Cranes slew.centre - Centre line of tru	ick mm -410	
· 2		
Span of extra support legs mm	4500	
Weight of extra support legs kg	550	
Distance Extra support legs - Front axle m		OK
Protection Fund adaptor logo - Fork date in		
2		

For changing Stabilizer legs data click on Legs-button.

On this screen the Weight of support legs is 0 kg therefore, that EFFER has given data so, that crane weight includes the standard support legs.

#### **Text Page**

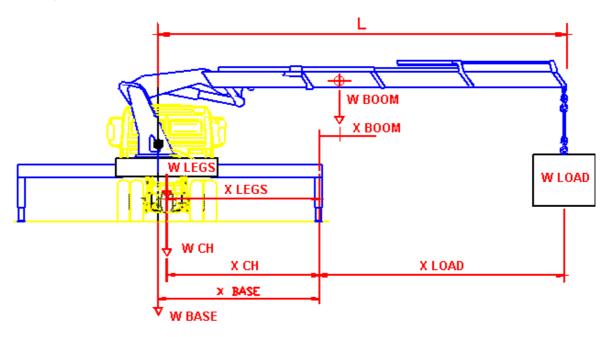
VOLVO FH12 6X4 20TONNES REAR AXLE EFFER 335/3S MB STD Distance Cranes slewing centre - First front axle 1140 mm Crane weight 3530 kg Weight of base 1790 kg Weight of boom 1740 kg Dist. Cranes slew. centre - COG of booms at max outreach mm 3900 Outreach 10770 mm Lifting capacity 2650 kg Chassis weight Front axle kq 4347 Chassis weight Rear axle 4493 kg Dist. Cranes slew. centre - Centre of support legs beam -305 mm Span of support legs 6110 mm Weight of support legs kg 0 Distance Extra support legs - Front axle 6570 mm

Span of extra support legs	mm	4500
Weight of extra support legs	kg	550
Distance First front axle - Front axle support por	intmm	0
Distance Front axle - Rear axle support point	mm	4985
Track front axle	mm	2000
Track Rear axle	mm	1800

CRANES STABILITY CALCULATION (Measures from tilting line)

Chassis weight Front axle	4347	x	3,14141	=	13655
Chassis weight Rear axle	4493	x			
Weight of support legs	0	x	3,025342	=	0
Weight of extra support legs	550	x	2,228157	=	1225
Weight of base	1790	x	3,388965	=	6066
Stabilizing moment			Sum	=	31948
Weight of boom	1740	x	0,5110	=	889
Load * Max outreach	2650	x	7,381035	=	19559
Tilting moment			Sum	=	20449
Stability factor n	31948	/	20449	=	1.56
Chassis weight Front axle	4347		-	=	0
Chassis weight Rear axle	4493	х	4,80862		
Weight of support legs	0	х	0,805456	=	0
Weight of extra support legs	550 x	2	6,33754	=	3485
Weight of base	1790	х	1,207762	=	2161
Stabilizing moment			Sum	=	27253
Weight of boom 4684,495	1740	x	2,692238	=	
Load * Max outreach 25339,93	2650	x	9,562239	=	
Tilting moment				=	30024
Stability factor n n= 1.4 ==> Maximum load 1546 kg	27253	/	30024	=	0.91

Principle formulas as follows:



CRANES STABILITY CALCULATION (Measures from tilting line)

Chassis weight Front axle	WchFront	х	xChFront	=	xxx
Chassis weight Rear axle	WchRear	х	xChRear	=	XXX
Weight of support legs	WLegs	х	xLegs	=	XXX
Weight of base	Wbase	х	xBase	=	xxx
Stabilizing moment			Sum	=	xxxx
Weight of boom	WBoom	х	xBoom	=	xxx
Load * Max outreach	Wload	х	xLoad	=	xxx
Tilting moment			Sum	=	
XXXXX					
		/			

Stability factor n Stabilizing moment / Tilting moment = n

---

# The guided example 6: B-Double (Tractor + Semitrailer + Semitrailer)

Not allowed on all countries!

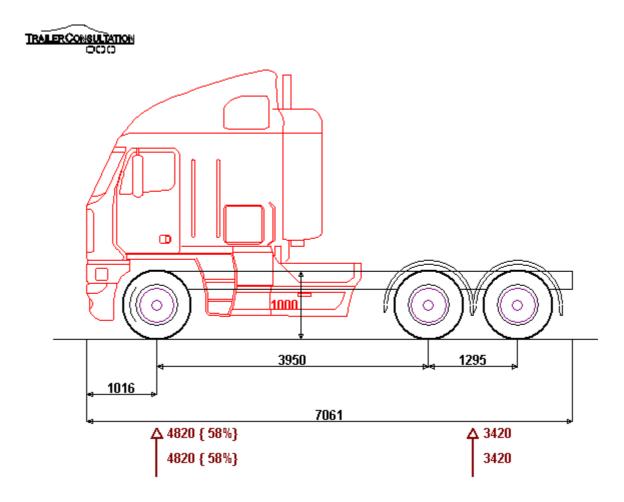
To start calculating a new vehicle click on the **Begin** button or **New** button.

TrailerWIN - [ TrailerConsultation					
	Options Special Help	08:48			
<u> Let : Belt</u>	📋 Ň 🔍 🖆 §Fin	22.9.19	199 <b>E</b> I	nd Begin	
New button		Г	Begin b	utton	
Calculation		×			
		la la	ater by t	to find this cat typing the ta comer name	sk name
Task name					
Customer					
Text 1					
Calculation made by :			Choos	ing Chass	is
			hen clia	•	
on	for beginning	with the	truck.		
Chassis :					
FORD_US Freightliner GMC	▲ ▼			Ca Preview	ncel
ARGOSY RANGE 6x4 C120 CENTURY CLASS LONG FL112 6x4 STANDARD DISTE		Æ		]	
2755+1295 Day cab 3950+1295 Sleeper cab		1016	395		<b>)</b>
Chassis					_ <b>D</b> X
truck make	FREIGHTLINER			Car	icel
type	ARGOSY RANGE 63 6	.4			
model (wheelbase, cab etc.)	3950+1295 Sleeper cal				
G.V.W. front axle		, 6620		0	к 📗
G.V.W. rear axle		16000			
G.V.W. total		22620			
chassis weight, front axle		4680			
chassis weight, rear axle		3420			
basic wheelbase (front axle-	first rear axle)	3950			
bogie wheelbase		1295			

From Chassis Window you can choose the chassis fabricate, then model series and then wheelbase and cab.

In Chassis data window you can check chassis weights and dimensions

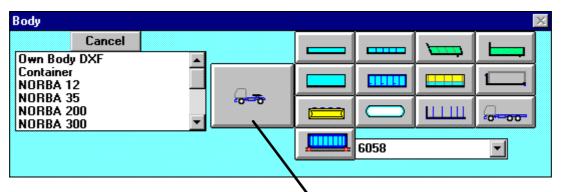
When you are ready, click OK.



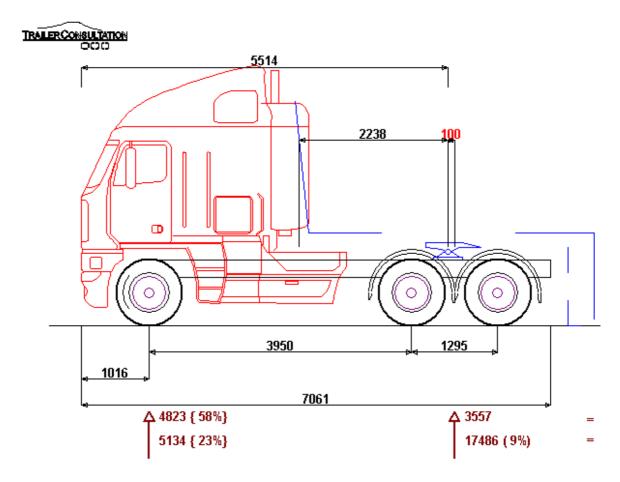
## **Choosing Fifth Wheel Coupling**

Click on the Bodywork button.

		 ۱۵,۰۰۰-	¥ <u></u>	001
	Bodywork	Equi	ipment	



Click on the button for the Fifth Wheel Coupling and choose the place.



The program has at first calculated the Fifth Wheel Place so, that the rear axle weight is near maximum allowed, when total weight is on maximum (loading on the fifth wheel is on maximum).

Now the Tractor unit is ready. If you want to add some pieces of equipment, you can choose them using **Equipment - button**.

Axle weights without load and with load on Fifth Wheel Coupling, you see under the picture.

## **Choosing the Semitrailer**

Click on Trailer button



You will get a button group for choosing semitrailer.

You have to make two choices:

- \* From the left column: how many axles on trailer and the steering properties
- \* From other buttons: Body type, now choose B Double

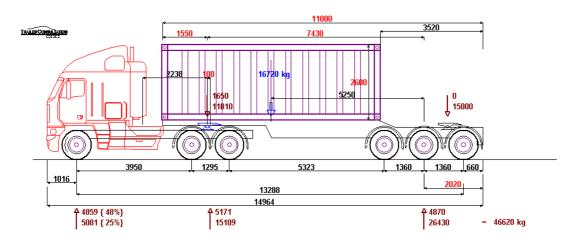
SEMITRAILER			$\times$
Can	cel		
		Container	
8-8		6058 💌	]
	B Double		

When you have made these two choices, you see the semitrailer data window.

SEMITRAILER			
SEMITRAILER		 Cancel	
semitrailer weight	38240	Optimum	
allowed fifth wheel weight	17000		
trailer front overhang	1550	OK	
trailer length	11000		
Container length	7500		
Frame rear overhang	2020		
bodys rear overhang (to centre of bogie)	-1500		

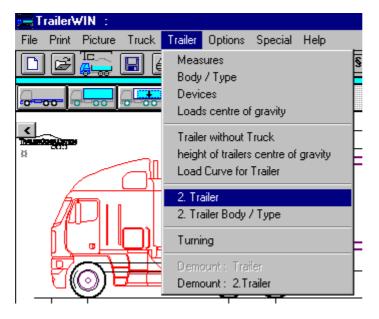
The program has made a calculation for finding the optimum semitrailer. Combination length near the maximum, weight distribution correct and turning in EU circle possible. If needed, you can change the values.

First semitrailer on B-Double is now always as model Container. For choosing the container place, use body's rear overhang (to centre of bogie) = for example -1500



## **Choosing second Semitrailer**

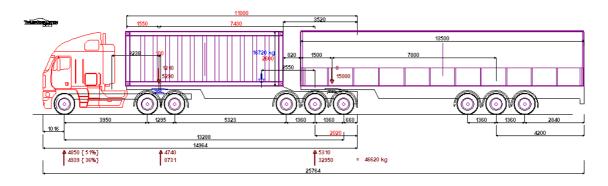
### Use Menu Trailer - 2. Trailer



Choose axle type and body type for the 2. Trailer.

TRAILER 2	_ [	$\mathbf{X}$		
	1200	A	Cancel	
towing couplings under body measurement_2	4	0-1-		
SEMITRAILER			Optimum	
semitrailer weight	36000			
allowed fifth wheel weight	17000		OK	
trailer front overhang	1500			l
trailer length	13500			
rear overhang (to centre of bogie)	4200			
BOGIE WHEELBASE: bogies first axle - middle axle	1360			

The first item on this screen "towing couplings under body measurement\_2" means also the place of the second fifth wheel.



Remember that if you want to change data for 2.Trailer, you have to go through the **Menu Trailer – <u>2. Trailer</u> or** Menu **Trailer – <u>2. Trailer Body/Type**</u>

