

# Crash Test Setup Complete Guide



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# Introduction



# Introduction – Features

Crash Test Setup is a script that helps you set up various crash tests according to different regulations.

Features include:

- Barrier alignment
- Contact definition
- Boundary conditions (restraints, initial velocity and prescribed motion)



# Introduction – Features

The script can be used to set up a single crash test relatively quickly but it is also designed to improve the process of preparing multiple crash test models:

- You can define all of the required settings for a vehicle and link them to the keyword file. Then when you read in the model again to set up a different test, the settings are automatically loaded.
- You can choose the default barrier model for a specific test so that the correct barrier is imported for each test type, preconfigured and ready to go.
- You can edit and save your own Crash Test Setup preferences.

This guide describes each step in the Crash Test Setup process and explains all of the features.

To run Crash Test Setup, click on **Tools** → **Safety** → **Crash test setup**.

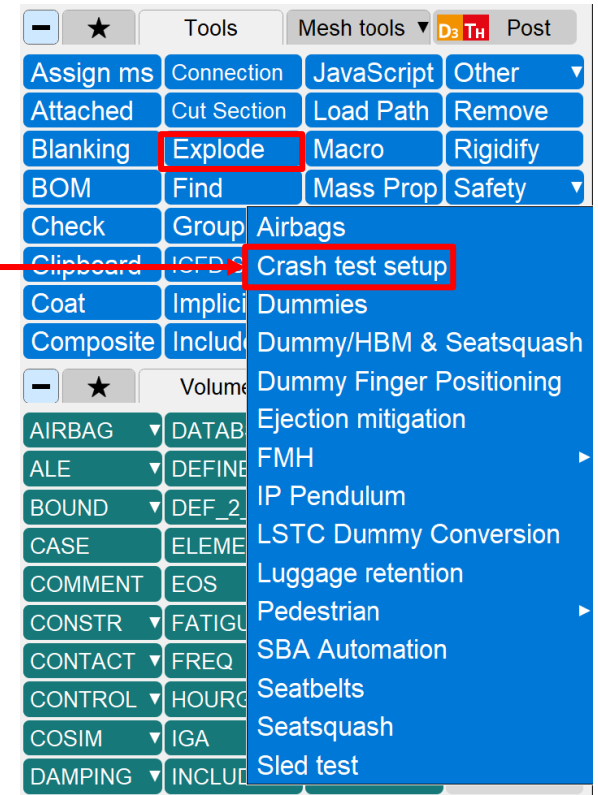


# Introduction – Configuration

- The script can be used with Primer 18.0 and subsequent versions, and is included with the current Primer release. The script can be found in the following area:

➤ [\\$OASYS/primer\\_library/scripts/crash\\_test\\_setup.js](#)

- To run the script, click on the **Tools** → **Safety** → **Crash test setup** button in Primer.



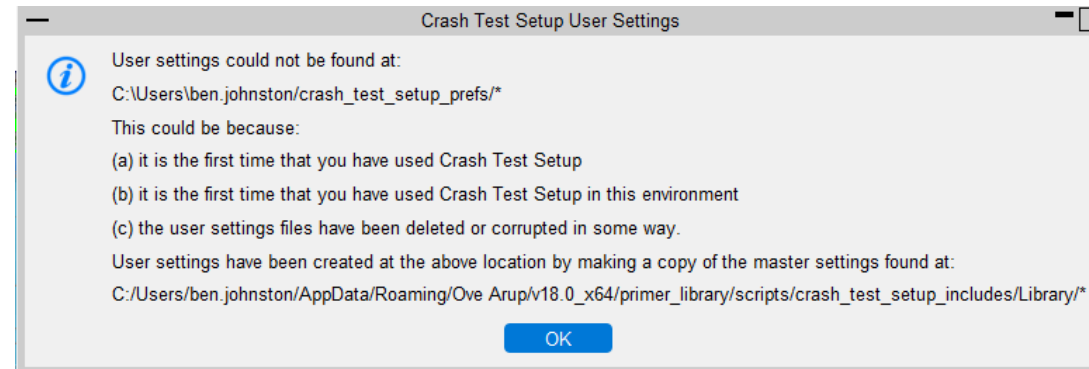
# Introduction – Configuration

- Crash Test Setup uses two sets of settings files
  - A set of **system** settings files, which are stored in the Primer JavaScript Library
  - The **user** settings files, which are stored in your home directory
- Depending on the access controls in your organisation, you may or may not have write permissions for the system settings files
- The system settings files are intended for the default settings for your organisation:
  - Approved crash test configuration
  - Standard barrier models
  - Etc



# Introduction – Configuration

- You have full control over your user settings files, which you can use to save your own:
  - Variants on standard crash tests
  - Vehicle and barrier settings
  - Script preferences
- The first time you run Crash Test Setup on a computer, the following message will appear:



- User settings files are automatically created in your home directory as described.





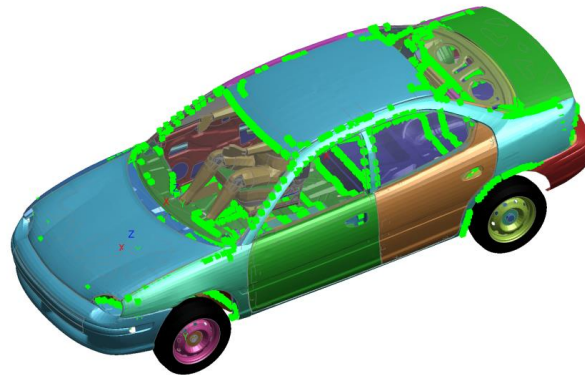
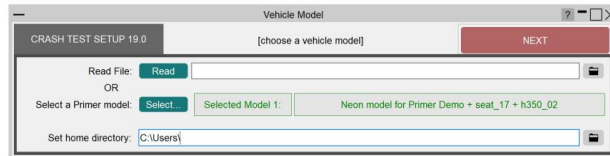
# Introduction – Process

The following slides demonstrate how to set up a crash test in Oasys PRIMER

## Start Window

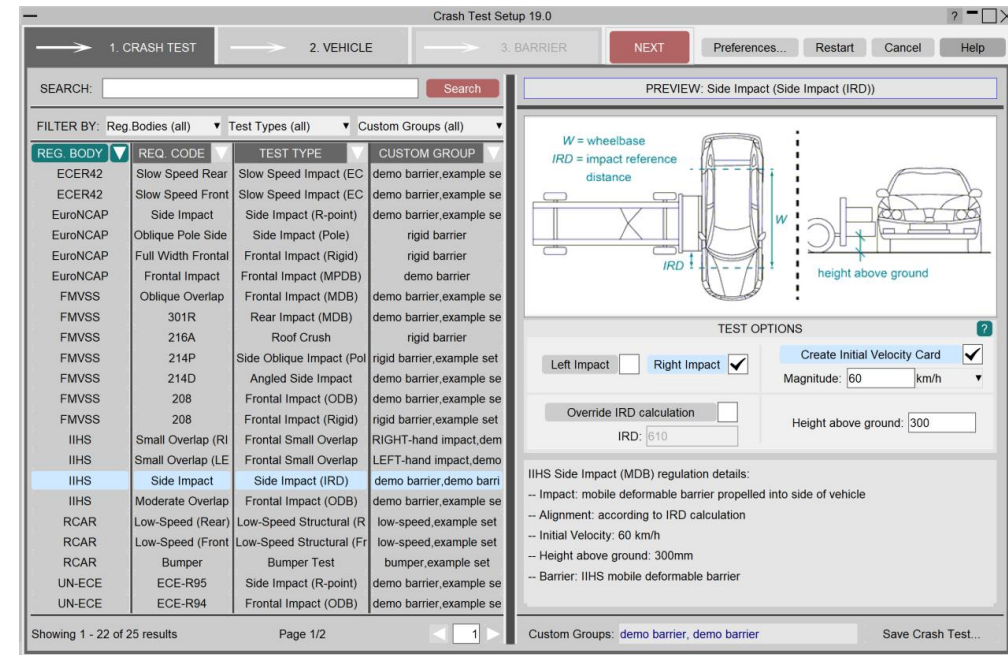
- Read in or select a vehicle model
- Set home directory (where preferences files will be saved)

PRIMER: M1: Neon model for Primer Demo + seat\_17 + h350\_02



## 1. Crash Test

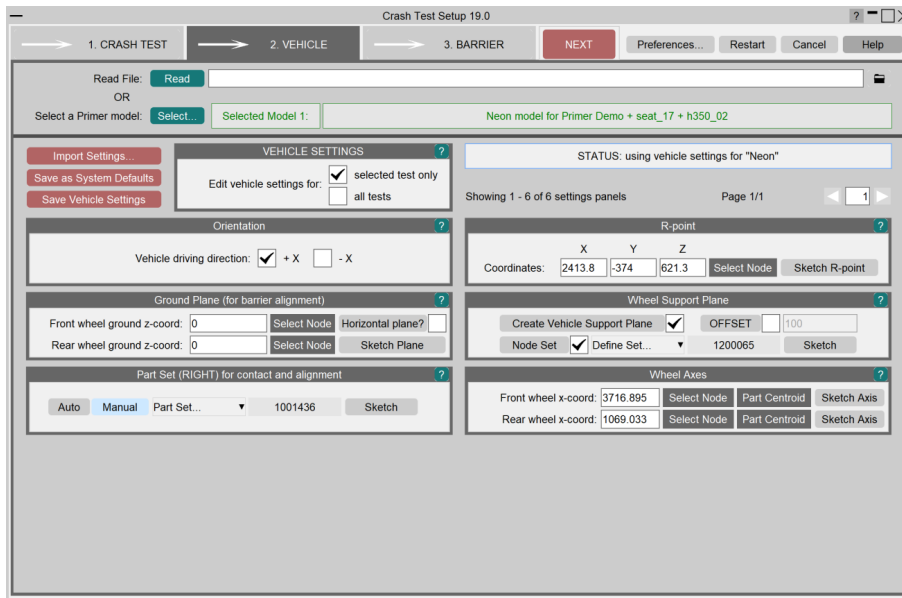
- Select a crash test from the list
- Confirm/edit the test options



# Introduction – Process

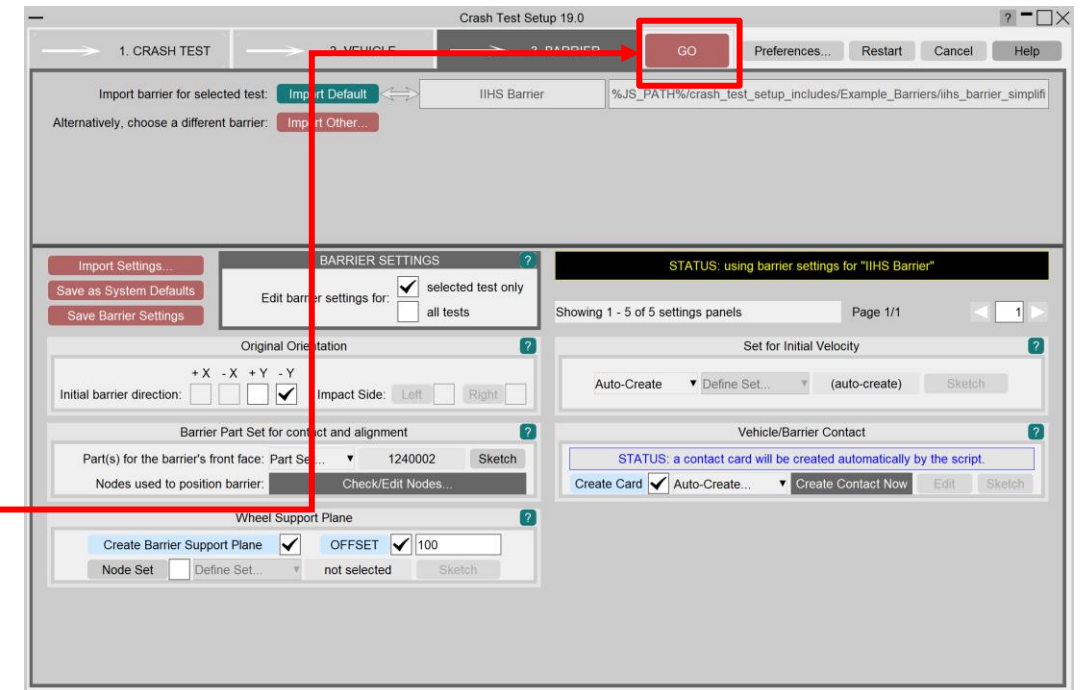
## 2. Vehicle

- Confirm/import/edit/save vehicle settings



## 3. Barrier

- Import a barrier model
- Confirm/import/edit/save barrier settings



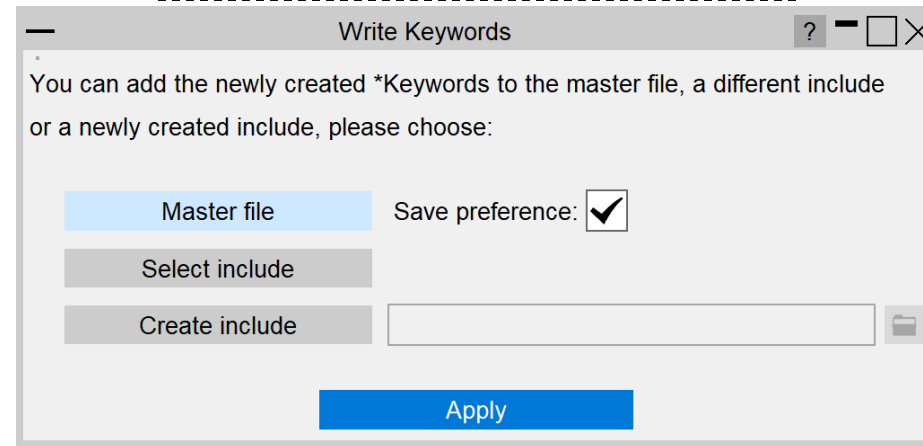
**GO**

Crash Test Setup aligns barrier and creates contact/velocity/other boundary conditions.

# Introduction – Process

## Write Master File

- Select/create include file to write newly created \*keywords



The screenshot shows a dialog box titled "Write Keywords" with a standard Windows-style title bar (minimize, maximize, close buttons). The main text inside the dialog reads: "You can add the newly created \*Keywords to the master file, a different include or a newly created include, please choose:". Below this text are three buttons: "Master file" (highlighted in light blue), "Select include" (greyed out), and "Create include" (greyed out). To the right of the "Master file" button is a "Save preference:" label followed by a checked checkbox. To the right of the "Create include" button is a text input field and a folder icon button. At the bottom center of the dialog is a large blue "Apply" button.

# Introduction – Process

## Write Master File

- Review script actions
- Write out master file for completed crash test model

Write Master File

Barrier Alignment

The barrier alignment was completed with "ihs\_barrier\_simplified.key" ("INCLUDE\_TRANSFORM 49, TRANID = 140001").

Support Planes

A \*RIGIDWALL card (label = 1, heading = "Crash Test Setup: Vehicle Support Plane") was created for the Vehicle Support Plane

A \*RIGIDWALL card (label = 2, heading = "Crash Test Setup: Barrier Support Plane") was created for the Barrier Support Plane

Initial Velocity

An \*INITIAL\_VELOCITY\_GENERATION card was created referencing Part Set ID = 1240003.

Contact

A contact card was created with ID = 50130002 and heading = "Crash Test Setup vehicle-to-barrier contact".

Sets

A node set was created with ID = 1740039.

A part set was created with ID = 1240003.

Model Write

Select directory:

Filename:

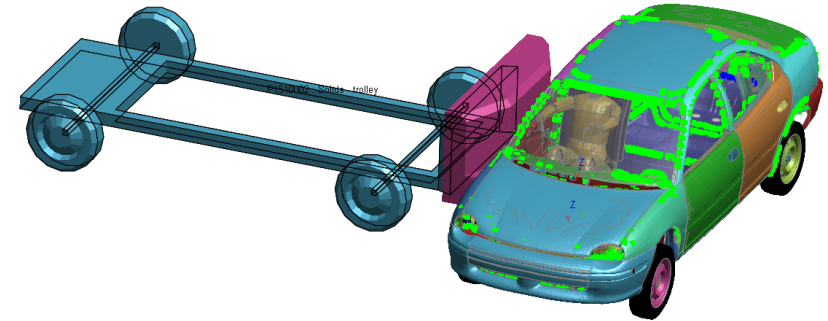
Model title:

Absolute or relative include paths: ☐ Absolute ☒ Relative Include req code: ☐

The model will be linked to vehicle settings "Neon".

The created Keywords will be written to the master file

PRIMER: M1: Neon model for Primer Demo + seat\_17 + h350\_02



# Start Window



# Start Window



- The Crash Test Setup start window requires you to choose a vehicle model – either:

Browse for a keyword file and then click **Read**

Select a model already read into the current Primer session by clicking **Select....** If there is only one model in Primer, it will then be selected automatically.

PRIMER: M1: Neon model for Primer Demo + seat\_17 + h350\_02

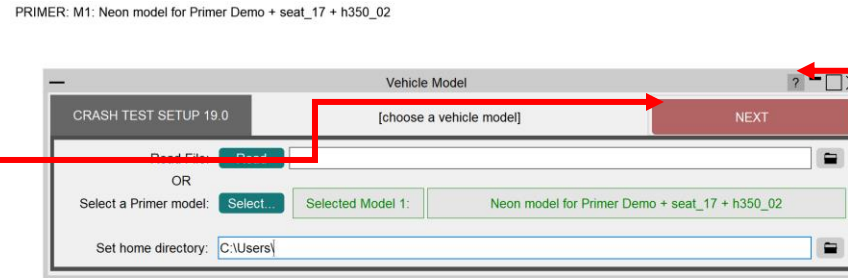
The screenshot shows the "Vehicle Model" window of "CRASH TEST SETUP 19.0". The window has a title bar with standard OS controls. Inside, there's a header area with "CRASH TEST SETUP 19.0" on the left, "[choose a vehicle model]" in the center, and a red "NEXT" button on the right. Below the header, there are two main sections. The first section is labeled "Read File:" and contains a "Read" button and an empty text field. Below this is an "OR" label. The second section is labeled "Select a Primer model:" and contains a "Select..." button, a "Selected Model 1:" label, and a text field displaying "Neon model for Primer Demo + seat\_17 + h350\_02". At the bottom, there is a "Set home directory:" label, a text field with "C:\Users\" and a file explorer icon. Red arrows from the surrounding text boxes point to the "Read" button, the "Select..." button, the "NEXT" button, and the "Set home directory:" text field.


You can select any directory to save user settings files

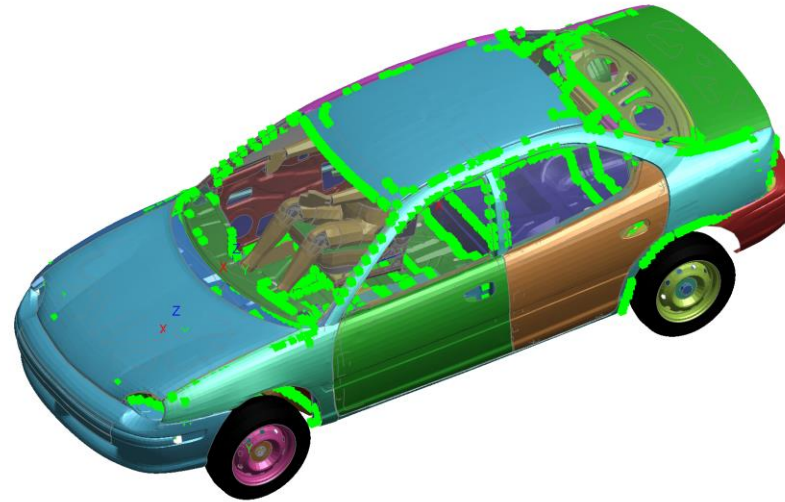
# Start Window

- It is simpler if the vehicle model you choose does **not** already contain a barrier model – you will import the barrier later in the process.

Once you have chosen a vehicle model, click **NEXT** to enter the main Crash Test Setup.



In Crash Test Setup, help can be found via the  buttons positioned throughout the graphical interface.



# Main Window



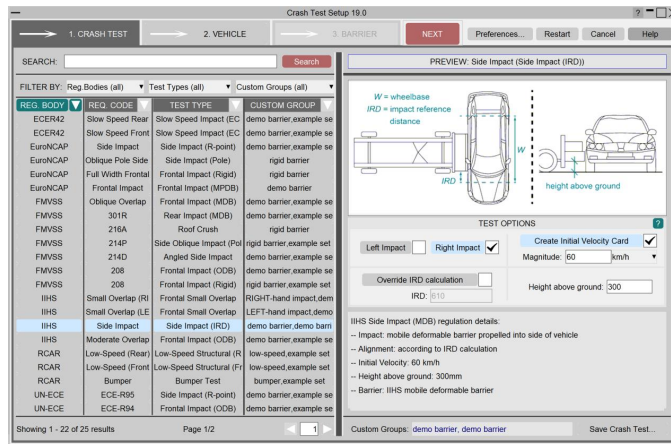


# Main Window

- The main Crash Test Setup window has three tabs:

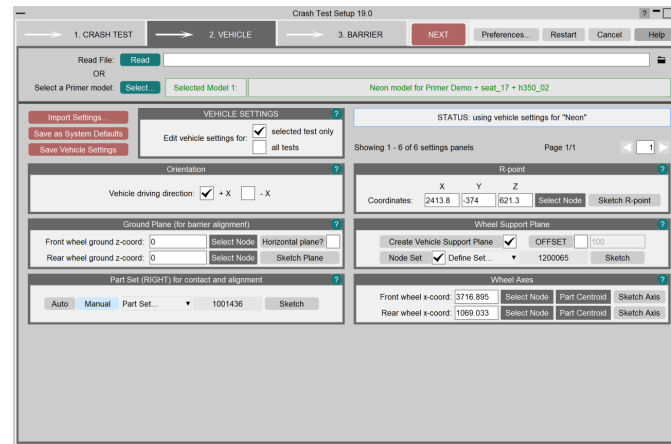
## 1. Crash Test

- Select a crash test from the list
- Confirm/edit the test options



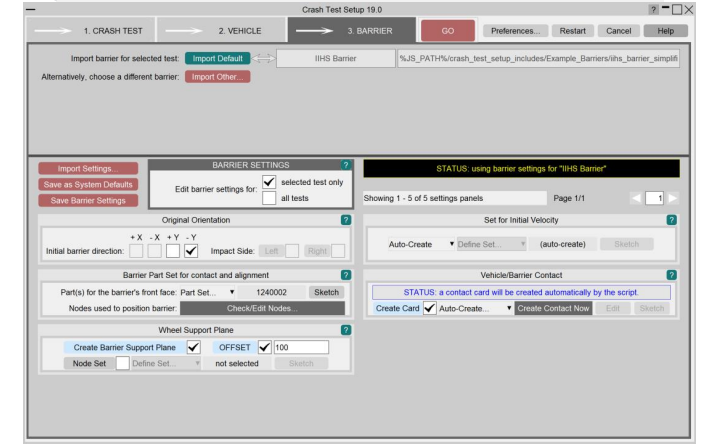
## 2. Vehicle

- Confirm/import/edit/save vehicle settings



## 3. Barrier

- Import a barrier model
- Confirm/import/edit/save barrier settings



- Navigate between tabs by clicking on the large tab buttons along the top of the main window, or by clicking **NEXT** (You can go back to a previous tab at any time)
- To go back to the Start Window click on **Restart**. This will rescan the model and reset all test/vehicle/barrier settings.

# 1. Crash Test



# 1. Crash Test – Select a Test

- Select a crash test from the list

Each test belongs to a certain **regulatory body** (EuroNCAP, FMVSS, IIHS, etc.), has a **requirement code**, a **test type** and can belong to one or more **custom groups**

There are thirteen test types:

- Angled Side Impact
- Frontal Impact (ODB)
- Frontal Impact (MDB)
- Frontal Impact (MPDB)
- Frontal Impact (Rigid)
- Frontal Small Overlap
- Side Impact (IRD)
- Side Impact (R-point)
- Side Impact (Pole)
- Side Oblique Impact (Pole)
- Rear Impact (MDB)
- Rear Impact (Rigid)
- Roof Crush

Search for a crash test by entering text in this box

Filter your search by using the drop-down menus

Crash Test Setup 19.0

1. CRASH TEST 2. VEHICLE 3. BARRIER NEXT Preferences... Restart Cancel Help

SEARCH: [ ] Search

FILTER BY: Reg.Bodies (all) Test Types (all) Custom Groups (all)

REG. BODY	REQ. CODE	TEST TYPE	CUSTOM GROUP
ECER42	Slow Speed Rear	Slow Speed Impact (EC)	demo barrier,example se
ECER42	Slow Speed Front	Slow Speed Impact (EC)	demo barrier,example se
EuroNCAP	Side Impact	Side Impact (R-point)	demo barrier,example se
EuroNCAP	Oblique Pole Side	Side Impact (Pole)	rigid barrier
EuroNCAP	Full Width Frontal	Frontal Impact (Rigid)	rigid barrier
EuroNCAP	Frontal Impact	Frontal Impact (MPDB)	demo barrier
FMVSS	Oblique Overlap	Frontal Impact (MDB)	demo barrier,example se
FMVSS	301R	Rear Impact (MDB)	demo barrier,example se
FMVSS	216A	Roof Crush	rigid barrier
FMVSS	214P	Side Oblique Impact (Pol)	rigid barrier,example set
FMVSS	214D	Angled Side Impact	demo barrier,example se
FMVSS	208	Frontal Impact (ODB)	demo barrier,example se
FMVSS	208	Frontal Impact (Rigid)	rigid barrier,example set
IIHS	Small Overlap (R)	Frontal Small Overlap	LEFT-hand impact,demo
IIHS	Small Overlap (LE)	Frontal Small Overlap	demo barrier,demo barri
IIHS	Side Impact	Side Impact (IRD)	demo barrier,example se
IIHS	Moderate Overlap	Frontal Impact (ODB)	demo barrier,example se
RCAR	Low-Speed (Rear)	Low-Speed Structural (R)	low-speed,example set
RCAR	Low-Speed (Front)	Low-Speed Structural (Fr)	low-speed,example set
RCAR	Bumper	Bumper Test	bumper,example set
UN-ECE	ECE-R95	Side Impact (R-point)	demo barrier,example se
UN-ECE	ECE-R94	Frontal Impact (ODB)	demo barrier,example se

Showing 1 - 22 of 25 results Page 1/2

PREVIEW: Side Impact (Side Impact (IRD))

W = wheelbase  
IRD = impact reference distance

TEST OPTIONS

Left Impact ☐ Right Impact ☒ Create Initial Velocity Card ☒

Magnitude: 60 km/h

Override IRD calculation ☐ Height above ground: 300

IRD: 610

IIHS Side Impact (MDB) regulation details:

- Impact: mobile deformable barrier propelled into side of vehicle
- Alignment: according to IRD calculation
- Initial Velocity: 60 km/h
- Height above ground: 300mm
- Barrier: IIHS mobile deformable barrier

Custom Groups: demo barrier, demo barrier Save Crash Test...

**Custom groups** can be used to categorise different tests. For example, you could give tests that you use frequently the custom group name "favourites", or put all of the tests required for a particular project into a custom group

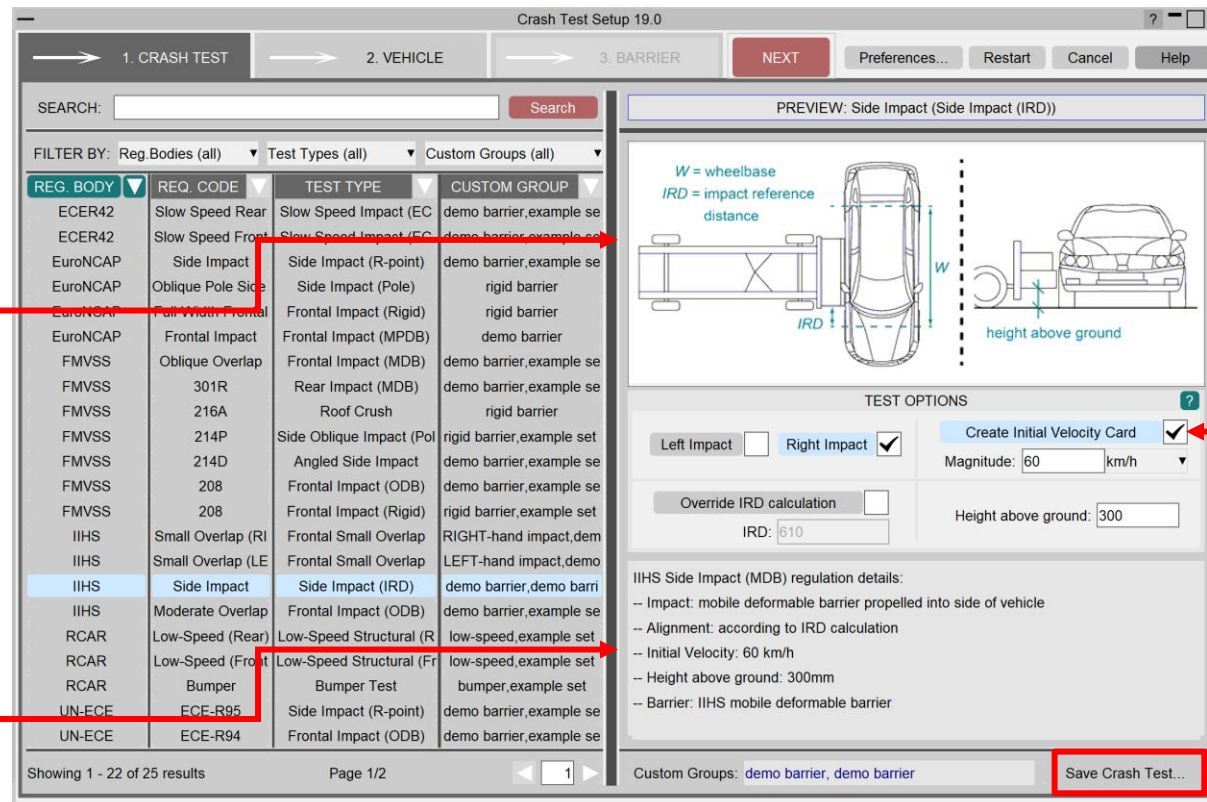
Navigate through multiple pages of the list using these controls


# 1. Crash Test – Test Options

- If you are happy with the **test options** for your selected test, click **NEXT** to proceed to the Vehicle tab
- Otherwise you can edit and/or save test options:

Each test has a preview image that shows what the model will look like once Crash Test Setup is complete

Each test provided originally with Crash Test Setup has a list of the regulation details that specify the default test options



- The test options define all of the parameters required to configure the test according to the regulations
- The test options are different for each **test type**
- For help with the options for a given test, click the  button
- All of the test options are described in the **Appendix** of this guide

Click **Save Crash Test...** to **replace** a crash test entry with different test options or to **save** a new entry

# 1. Crash Test – Save Crash Test

- If you edit the test options, you may wish to save a test variant by clicking **Save Crash Test...** – This opens the Save Crash Test window:

By default, you will replace the currently selected test unless you select a different test to replace (must have the **same** test type) or enter new, unique information in the text boxes

- If you have write permissions for the system settings files you can choose to save the crash test in the user or system settings
- Otherwise, the test will be saved in your user settings

You can **Delete** crash test entries but take care not to delete important entries

The 'Save Crash Test' window displays a table with the following data:

REG. BODY	REQ. CODE	TEST TYPE	CUSTOM GROUPS
FMVSS	214D	Angled Side Impact	demo barrier,example set 01
FMVSS	208	Frontal Impact (ODB)	demo barrier,example set 01
FMVSS	208	Frontal Impact (Rigid)	rigid barrier,example set 01
IIHS	Small Overlap (RI)	Frontal Small Overlap	RIGHT-hand impact,demo barrier
IIHS	Small Overlap (LE)	Frontal Small Overlap	LEFT-hand impact,demo barrier
IIHS	Side Impact	Side Impact (IRD)	demo barrier,demo barrier
IIHS	Moderate Overlap	Frontal Impact (ODB)	demo barrier,example set 01
RCAR	Low-Speed (Rear)	Low-Speed Structural (R)	low-speed,example set
RCAR	Low-Speed (Front)	Low-Speed Structural (F)	low-speed,example set
RCAR	Bumper	Bumper Test	bumper,example set

Below the table, there is a section for replacing or creating a new test by entering unique info:

Replace selected test or create a new test by entering unique info:

IIHS Side Impact Side Impact (IRD) My job 027, Oasys Favourites

Default barrier: IIHS Barrier

User crash tests shown in black. Page 2/3 Showing 11 - 20 of 25 entries

System crash tests shown in blue.

Save to user system settings Delete Cancel Save

**Useful tip:** give your edited test a unique name or description under custom groups (e.g. "modified height" or "simplified barrier")

Change the default barrier for a test by browsing the list of pre-saved barriers (refer to the section on the Barrier tab for more details)

Change the default barrier for a test by browsing the list of pre-saved barriers (refer to the section on the Barrier tab for more details)

## 2. Vehicle





## 2. Vehicle

- The Vehicle tab displays the **vehicle settings** required to complete Crash Test Setup – vehicle settings are displayed in individual **panels** on the tab

There is no need to read or select a vehicle again – this just displays which vehicle model is currently selected by the script

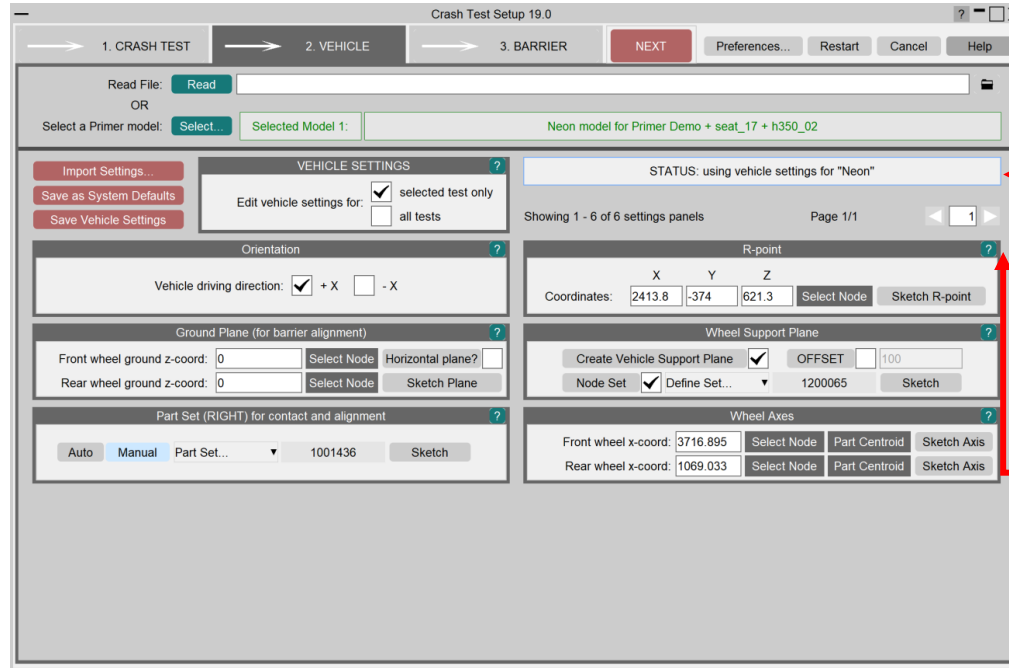
- By default, only the vehicle settings required for the selected test are displayed
- However, you may wish to tick “all tests” in order to define the settings for every possible test
- Then you can save all of the settings ready to be used in future for any Crash Test Setup involving this vehicle model.

- If previously you **linked** the selected vehicle with a **vehicle settings entry**, those vehicle settings will automatically have been imported and will be displayed in the panel
- In this case, the vehicle was linked with the settings entry named “Neon” and so those settings are being displayed

All of the vehicle settings panels are described in the *Appendix* section at the end of this guide

## 2. Vehicle

- If your vehicle model has not been linked to a vehicle settings entry, the default vehicle settings will be displayed:



The status bar tells you if the default settings have been imported.

- In this example the default R-point coordinates are [0, 0, 0]
- Crash Test Setup cannot tell if these are correct or not; you will have to check

- Vehicle settings that have yet to be defined and that are required by the selected test are highlighted with a red border
- However, the absence of a red border **does not** necessarily mean that the vehicle setting is correct – for example, Crash Test Setup cannot tell if you have selected the correct vehicle Orientation and it cannot tell if the coordinates entered in Wheel Axes, Ground Plane, etc. are correct
- Make sure that **all** of the panels for the selected test are correct before continuing to the Barrier tab



## 2. Vehicle – Import Vehicle Settings

- If your vehicle model has not been linked to a vehicle settings entry, you may wish to import previously saved vehicle settings:

Click **Import Settings...** – this opens the Import Vehicle Settings window

Import Settings...

Save as System Defaults

Save Vehicle Settings

You can **Delete** vehicle settings entries but note that changes are permanent

SETTINGS NAME	SETTINGS DESCRIPTION
<default>	default settings loaded when none previously saved for the mod
Front settings	Setting for QA test
Front settings	Setting for QA test
Neon	for use with "neon_demo_with_sets.key"
Neon - inclined ground plane	for use with "neon_demo_with_sets.key"
Neon - raised ground plane	for use with "neon_demo_with_sets.key"
Side settings	Settings for QA test
Side settings	Settings for QA test

User vehicle settings entries shown in black.  
System vehicle settings entries shown in blue.

Page 1/1  
Showing 1 - 8 of 8 entries

Delete Cancel Apply

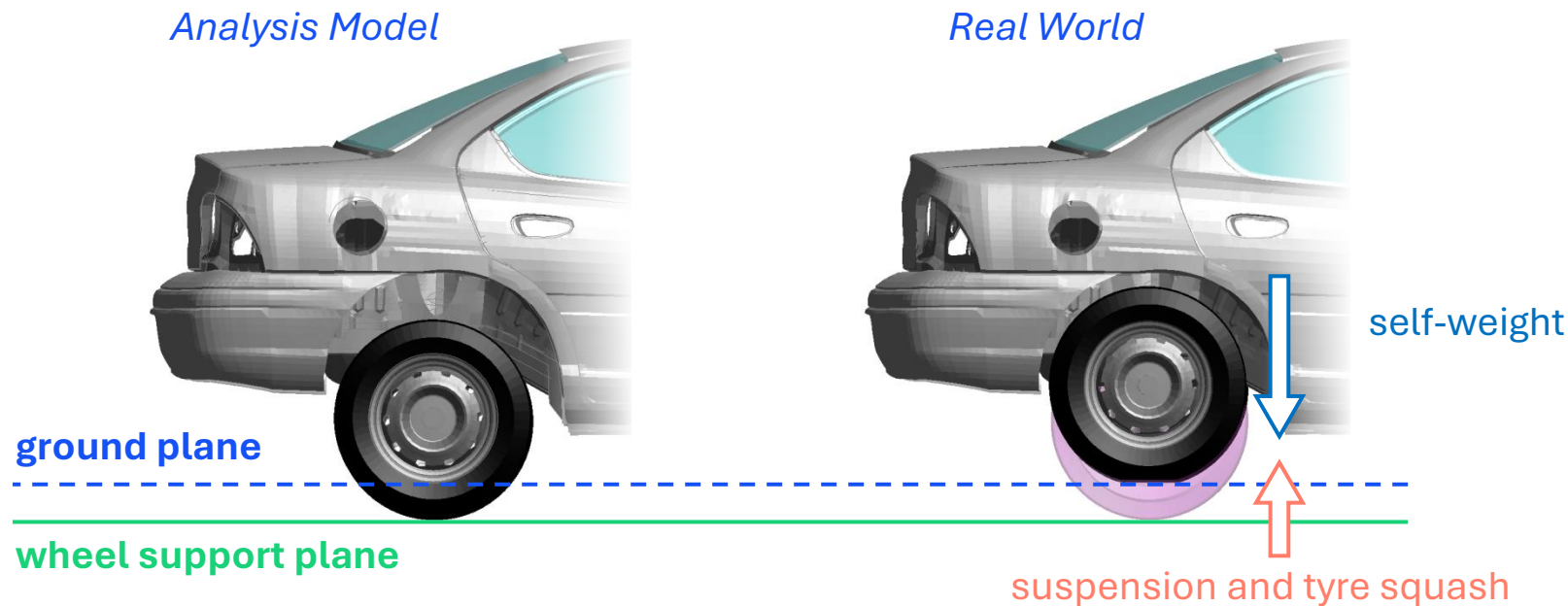
- Select a vehicle settings entry from the list and then click **Apply**
- The vehicle settings panels will now display the imported settings

## 2. Vehicle – Ground Position

More information about the ground plane and the wheel support plane can be found in the **vehicle settings panels** section of the **Appendix**

PRIMER

- In order to align barriers correctly you must define the **ground plane**
- For analysis purposes you will also need to define a **wheel support plane**
- It is important to understand the distinction between these two planes:



### Ground Plane

- The position of the ground in the real world (taking into account suspension and tyre squash)
- Not modelled physically in the analysis model

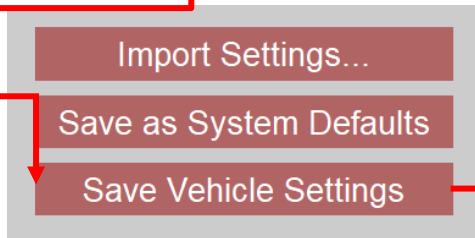
### Wheel Support Plane

- A `*RIGIDWALL_PLANAR_FINITE_ID` card
- Does not exist in the real world
- Positioned under wheels in analysis model

## 2. Vehicle – Save Vehicle Settings

- Once you are happy with the vehicle settings you can save them by clicking **Save Vehicle Settings** – this opens the Save Vehicle Settings window:

Click **Save Vehicle Settings** to **replace** an existing entry or to **save** a new one



By default, you will replace the currently selected entry unless you select a different entry to replace or enter a new, unique **Settings Name**.

Tick **Link entry to model file now** to link your vehicle to these settings so that when it is read into Primer in future, the settings can be imported automatically.

SETTINGS NAME	SETTINGS DESCRIPTION
<default>	default settings loaded when none previously saved for the mod
Front settings	Setting for QA test
Front settings	Setting for QA test
Neon	for use with "neon_demo_with_sets.key"
Neon - inclined ground plane	for use with "neon_demo_with_sets.key"
Neon - raised ground plane	for use with "neon_demo_with_sets.key"
Side settings	Settings for QA test
Side settings	Settings for QA test

Settings Name: Neon  
Settings Description: for use with "neon\_demo\_with\_sets.key"

User vehicle settings entries shown in black. Page 1/1  
System vehicle settings entries shown in blue. Showing 1 - 8 of 8 entries

Link entry to model file now: ☐ Save to user system settings Cancel Replace

**Useful tip:** give your vehicle settings entry a description to help you identify it in future

The **Replace** button becomes **Save** once you have entered a unique **Settings Name**

If you have write permissions for the system settings files you can choose to save the entry in the user or system settings. Otherwise, it will be saved in your user settings.

## 2. Vehicle – Link Model File

- When saving a vehicle settings entry, if you ticked **Link entry to model file now** then you will be asked to write out a copy of the vehicle master keyword file containing the linking information:

By default, you will overwrite the original vehicle keyword file unless you give it a new, unique name

Choose to write absolute or relative path names for \*INCLUDE cards in the master file

Write Master File

Model Write

Select directory: C:\Users\

Filename: crash\_test\_setup.key

Model title: Neon model for Primer Demo + seat\_17 + h350\_02 + Crash Test Setup sets

Absolute or relative include paths: Absolute Relative

The model will be linked to vehicle settings "Neon".

Abort Write

## 2. Vehicle – Link Model File

### Best Practice

The first time you use each vehicle in Crash Test Setup, do the following:

- Define the vehicle settings for **all** tests – this may involve creating new **node** and/or **part sets**
- Save the vehicle settings as a new entry – choose to **Link entry to model file now**
- Write out the master file with a new name – this master file will contain your newly created sets, as well as a link to the settings entry
- Now when you want to use Crash Test Setup again to set up a different test for the same vehicle, all the settings will be imported automatically **and** all of the part and node sets will be present

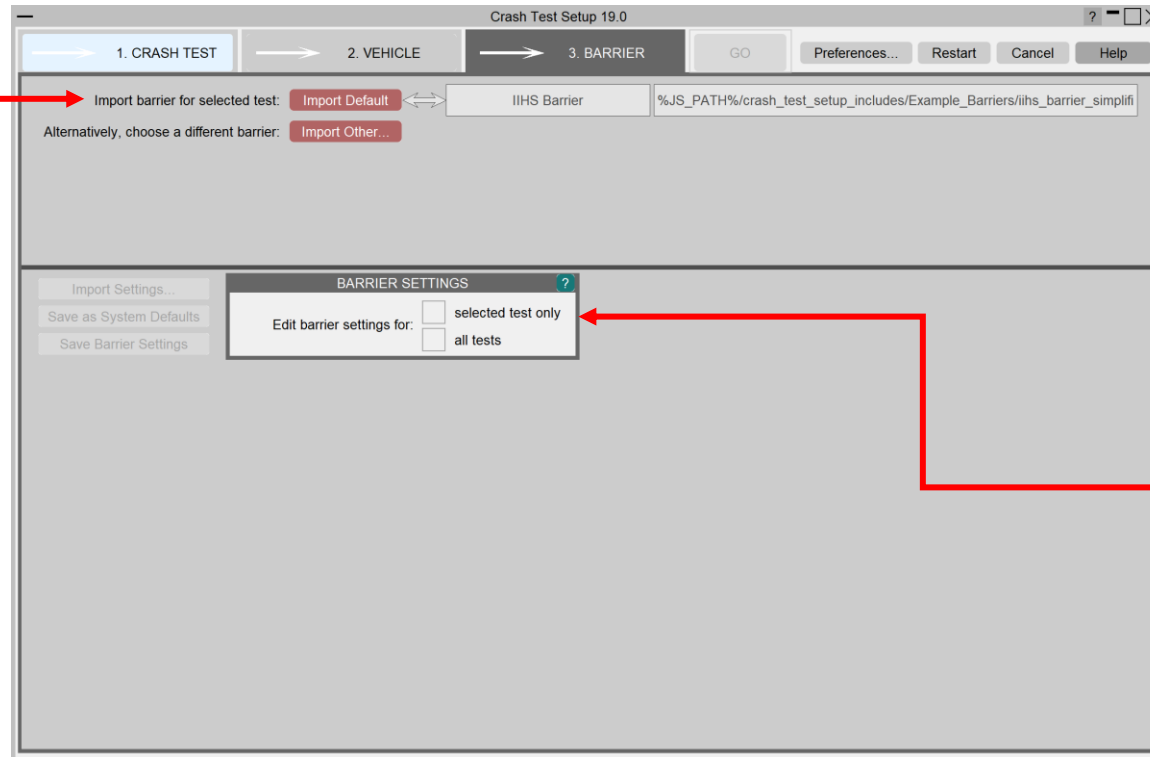


# 3. Barrier



### 3. Barrier – Import

- Once you are happy with the vehicle settings, move on to the Barrier tab – the first task is to choose a barrier model:



Click **Import Default** to import the default barrier for the selected test

The default barrier name and location are displayed here

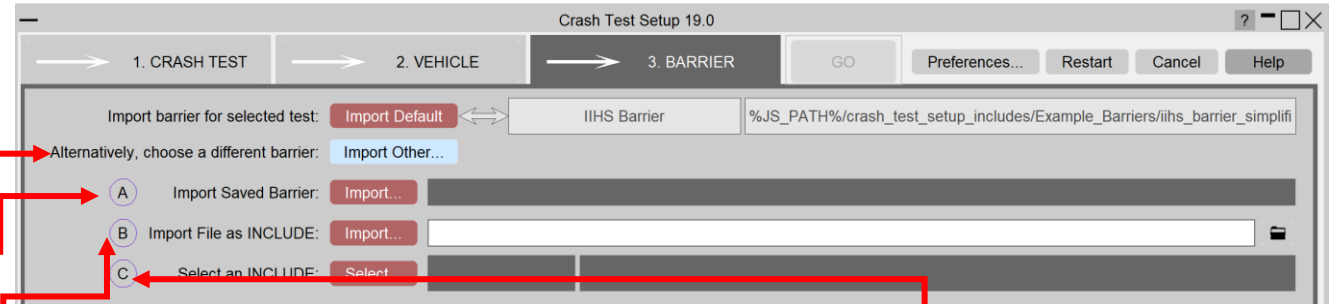
You cannot edit the barrier settings until you have chosen a barrier

# 3. Barrier – Import

- You may wish to choose a barrier other than the default:

- Click **Import Other...** to import an alternative barrier
- Three options will appear – choose one.

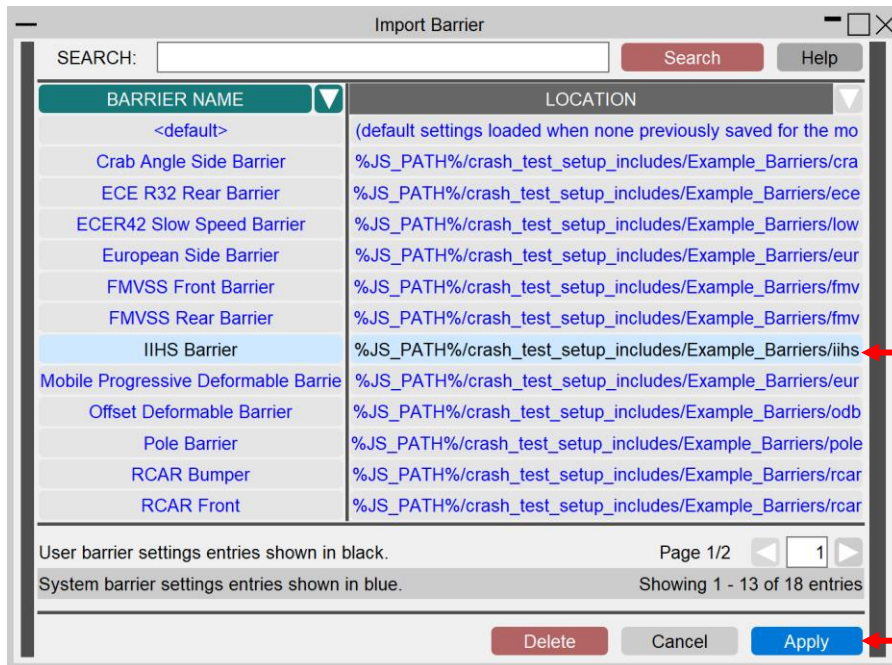
(A) Click **Import...** to import a previously saved barrier – this opens the Import Barrier window.



- (B) Import any barrier by browsing for a file and clicking **Import**
- The default barrier settings will be displayed
- If the barrier file is stored on a website, you can also enter a web address to download it

- (C) Select a barrier that is already an include file in the vehicle model
- This method is not recommended but can be used in cases where you have already imported the barrier and then had to restart Crash Test Setup
- The default barrier settings will be displayed.

Select a barrier from the list and click **Apply**. The barrier model will be imported along with its barrier settings.





### 3. Barrier – Label Numbering Offsets

- Crash Test Setup imports the barrier as an include transform – the **\*INCLUDE\_TRANSFORM** card refers to a **\*DEFINE\_TRANSFORMATION** card that will list the rotations and translations made to the barrier during alignment.
- When the barrier is imported there must be no clashes in label numbering between the barrier and the vehicle and so you are given the option to apply labelling offsets (These are shown on the next 3 slides).
- All the rotations and translations of the barrier are combined to result in only one line for rotations and one line for translations in the **\*DEFINE\_TRANSFORMATION** card.
- Note that in some cases more than one line for the rotations will be required when rotations are around different points.

```
*DEFINE_TRANSFORMATION_TITLE
Barrier Transformation
150001
ROTATE      1.0      0.0      0.0      914.5      381.0      0.0      25.0
ROTATE      0.0      1.0      0.0      914.5      381.0      0.0      5.0
TRANSL      1242.45055-1289.43022322.10357
TRANSL      -77.238495 411.67514-882.84003
```



```
*DEFINE_TRANSFORMATION_TITLE
Barrier Transformation
150001
ROTATE      .980254444.193053061-.04279883      914.5      381.0      0.025.4872919
TRANSL      1165.21205-877.755091439.26354
```

### 3. Barrier – Label Numbering Offsets

If you know that the barrier model numbering occupies a range left vacant in the vehicle model, untick the box and all of the offset values will be set to zero.

Import Include Transform

Apply label numbering offsets: ☐ ? Auto Manual TRANID: 110001 ?

IDNOFF 0	IDEOFF 0	IDPOFF 0	IDMOFF 0
IDSOFF 0	IDFOFF 0	IDDOFF 0	IDROFF 0

Abort Apply

- You must define a value for the transformation ID, or TRANID, which appears in both the `*INCLUDE_TRANSFORM` and the `*DEFINE_TRANSFORMATION` cards. By default, Crash Test Setup calculates a value for TRANID as follows:

$$\text{TRANID} = \text{IDDOFF} + 1$$

- However, you may enter any value that will not clash with another `*DEFINE_TRANSFORMATION` label in the model.

NO OFFSETS METHOD

### 3. Barrier – Label Numbering Offsets

#### AUTO OFFSETS METHOD

For definitions of **IDNOFF**, **IDEOFF**, etc. refer to **\*INCLUDE\_TRANSFORM** in the LS-DYNA Keyword User's Manual or click this help button.

Import Include Transform

Apply label numbering offsets: ☒ ?

Auto Manual TRANID: 110001 ?

IDNOFF	IDEOFF	IDPOFF	IDMOFF
10030000	1360000	1020000	120000
IDSOFF	IDROFF	IDDOFF	IDROFF
1220000	330000	110000	120000

Abort Apply

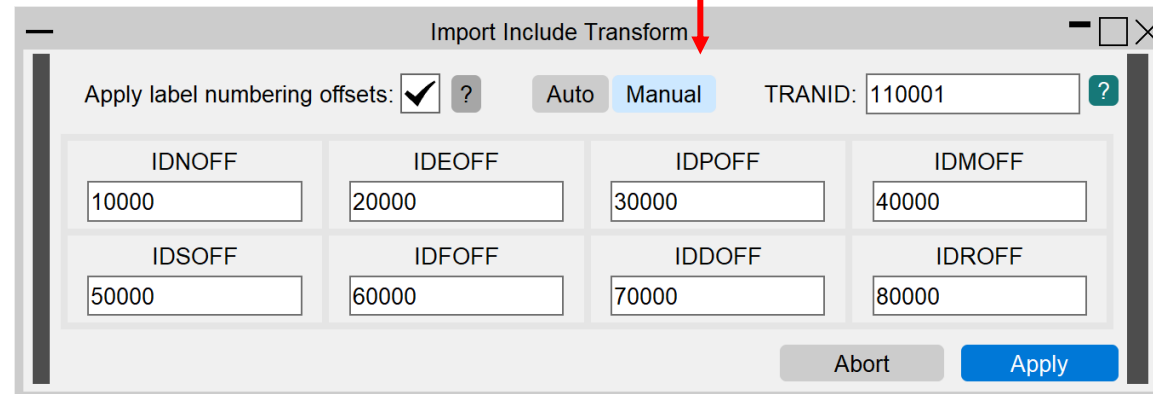
Otherwise, tick the box

- If **Auto** is selected, Crash Test Setup automatically calculates values for each of the **\*INCLUDE\_TRANSFORM** label offset categories
- You may edit them if you wish

### 3. Barrier – Label Numbering Offsets

#### MANUAL OFFSETS METHOD

- If **Manual** is selected, the values defined as part of the barrier settings (in barriers.xml) will be used for the **\*INCLUDE\_TRANSFORM** label offset categories and TRANID
- You may edit them if you wish



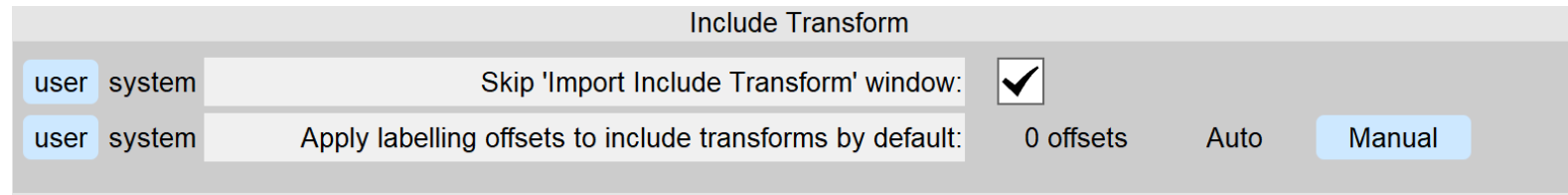
The screenshot shows a dialog box titled "Import Include Transform". It has a checkbox for "Apply label numbering offsets:" which is checked. There are two buttons: "Auto" and "Manual", with "Manual" being selected. To the right of these buttons is a text field for "TRANID:" containing the value "110001". Below this, there is a grid of eight input fields for different offset categories, each with a pre-filled value:

IDNOFF	IDEOFF	IDPOFF	IDMOFF
10000	20000	30000	40000
IDSOFF	IDFOFF	IDDOFF	IDROFF
50000	60000	70000	80000

At the bottom of the dialog are two buttons: "Abort" and "Apply". A red arrow points from the "Manual" button to the text box above it.

### 3. Barrier – Label Numbering Offsets

- If the **Skip 'Import Include Transform' window** preference is turned on, then the labeling offsets and the transformation ID will be set based on the mode selected for the **Apply labelling offsets to include transforms by default** preference.



The screenshot shows a dialog box titled "Include Transform". It contains two rows of settings. The first row has a "user" button, a "system" button, a text field containing "Skip 'Import Include Transform' window:", and a checked checkbox. The second row has a "user" button, a "system" button, a text field containing "Apply labelling offsets to include transforms by default:", and three radio buttons labeled "0 offsets", "Auto", and "Manual". The "Manual" button is highlighted with a blue background.

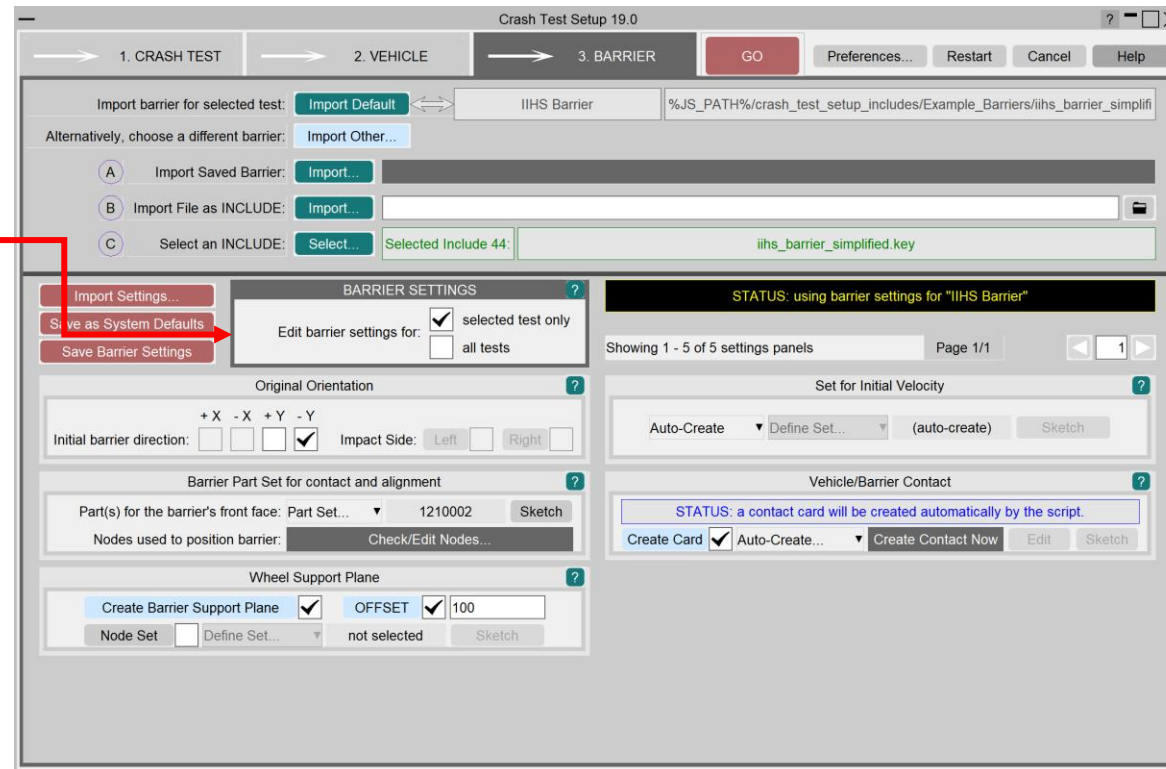
- If the **0 offsets** or **Manual** options are selected and **Skip the 'Import Include Transform' window** is turned on, but the TRANID set in the barrier settings is already used in the model, then a warning will popup when importing the barrier to give the option to overwrite with the auto-generated value. Another warning will popup if any of the offsets defined in the barrier settings cause conflicts with the vehicle model as the auto-generated values will be used instead.

### 3. Barrier

- Once you have chosen a barrier, the rest of the Barrier tab becomes active.
- When a new barrier is imported, previously imported barriers in current session are automatically deleted
- The barrier settings window gets reset when a different test is selected

- By default, only the barrier settings required for the selected test are displayed
- However, you may wish to tick “all tests” in order to define the settings for every possible test
- Then you can save all of the settings ready to be used in future for any Crash Test Setup involving this barrier model

All of the barrier settings panels are described in the *Appendix* section at the end of this guide.



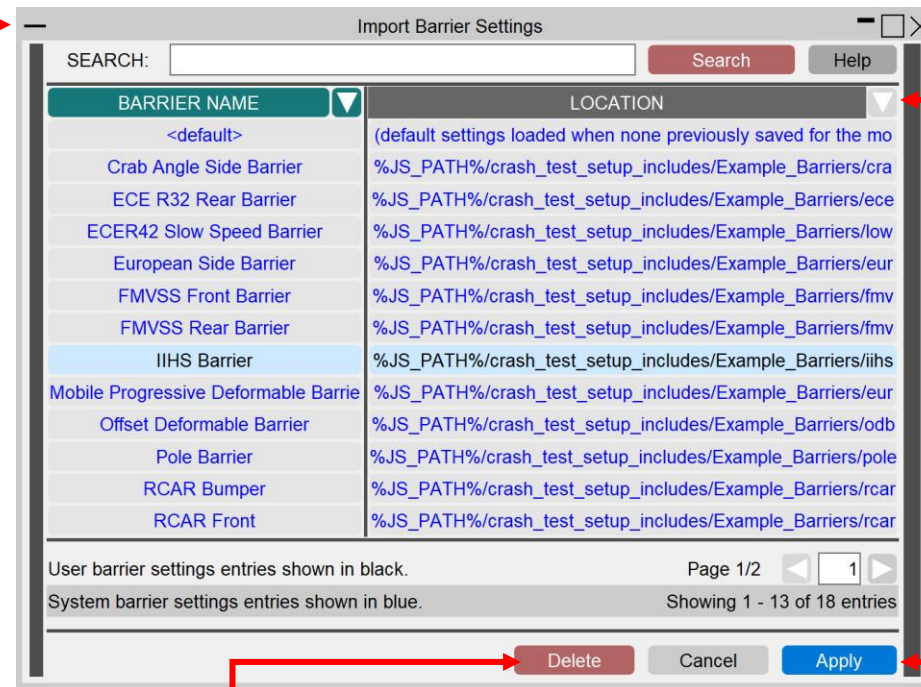
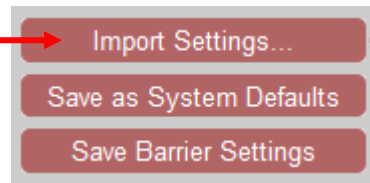
The chosen barrier include file you is displayed here

- If you imported the default barrier or a previously saved barrier, the barrier settings are automatically imported and displayed in the **panels**
- Otherwise, the default barrier settings are displayed

### 3. Barrier – Import Barrier Settings

- If your barrier model has not been saved before, you may wish to import previously saved barrier settings:

Click **Import Settings...**  
– this opens the Import Barrier Settings window



- Crash Test Setup will look at the barrier **location** when importing the barrier **model**
- When importing barrier **settings**, the location does not matter as it is only the settings being imported, not the barrier itself

- Select a barrier settings entry from the list and then click **Apply**
- The barrier settings panels will now display the imported settings

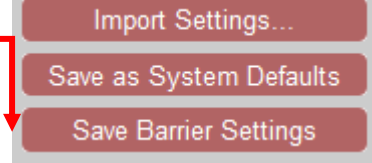
You can **Delete** barrier settings entries but note that changes are permanent



### 3. Barrier – Save Barrier Settings

- Once you are happy with the barrier settings you can save them by clicking **Save Barrier Settings** – this opens the Save Barrier Settings window:

Click **Save Barrier Settings** to **replace** an existing entry or to **save** a new one



By default, you will replace the currently selected entry unless you select a different entry to replace or enter a new, unique **Barrier Name**

Specify the **Barrier Location** – Crash Test Setup will look here when it tries to import the barrier in future

BARRIER NAME	LOCATION
<default>	(default settings loaded when none previously saved for the mo
Crab Angle Side Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/cra
ECE R32 Rear Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/ece
ECER42 Slow Speed Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/low
European Side Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/eur
FMVSS Front Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/fmv
FMVSS Rear Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/fmv
IIHS Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/iihs
Mobile Progressive Deformable Barrie	%JS_PATH%/crash_test_setup_includes/Example_Barriers/eur
Offset Deformable Barrier	%JS_PATH%/crash_test_setup_includes/Example_Barriers/odb

Barrier Name: IIHS Barrier

Location: %JS\_PATH%/crash\_test\_setup\_includes/Example\_Barriers/iihs\_barrier\_simplified.key

User barrier settings entries shown in black. Page 1/2  
System barrier settings entries shown in blue. Showing 1 - 10 of 18 entries

Save to: user system settings Cancel Replace

- The barrier location should be the absolute address of the barrier file on your system
- Alternatively, if the barrier is stored in the Primer JavaScript library, the barrier location should start with `%JS_PATH%` followed by the location within the JavaScript library

The **Replace** button becomes **Save** once you have entered a unique **Barrier Name**

- If you have write permissions for the system settings files you can choose to save the entry in the user or system settings
- Otherwise, it will be saved in your user settings



GO



## GO – Write Keywords

Once you have imported the barrier and you are confident that the vehicle and barrier settings are correct, click GO. You can then choose whether to write the created \*keywords to either the Master file, an existing include or a new include file.

If both **Left** and **Right** are selected in the test settings, a similar pop-up window will be displayed for each side and you can select a different option for each.

Write Keywords

You can add the newly created \*Keywords to the master file, a different include or a newly created include, please choose:

Master file    Save preference: ☒

Select include

Create include

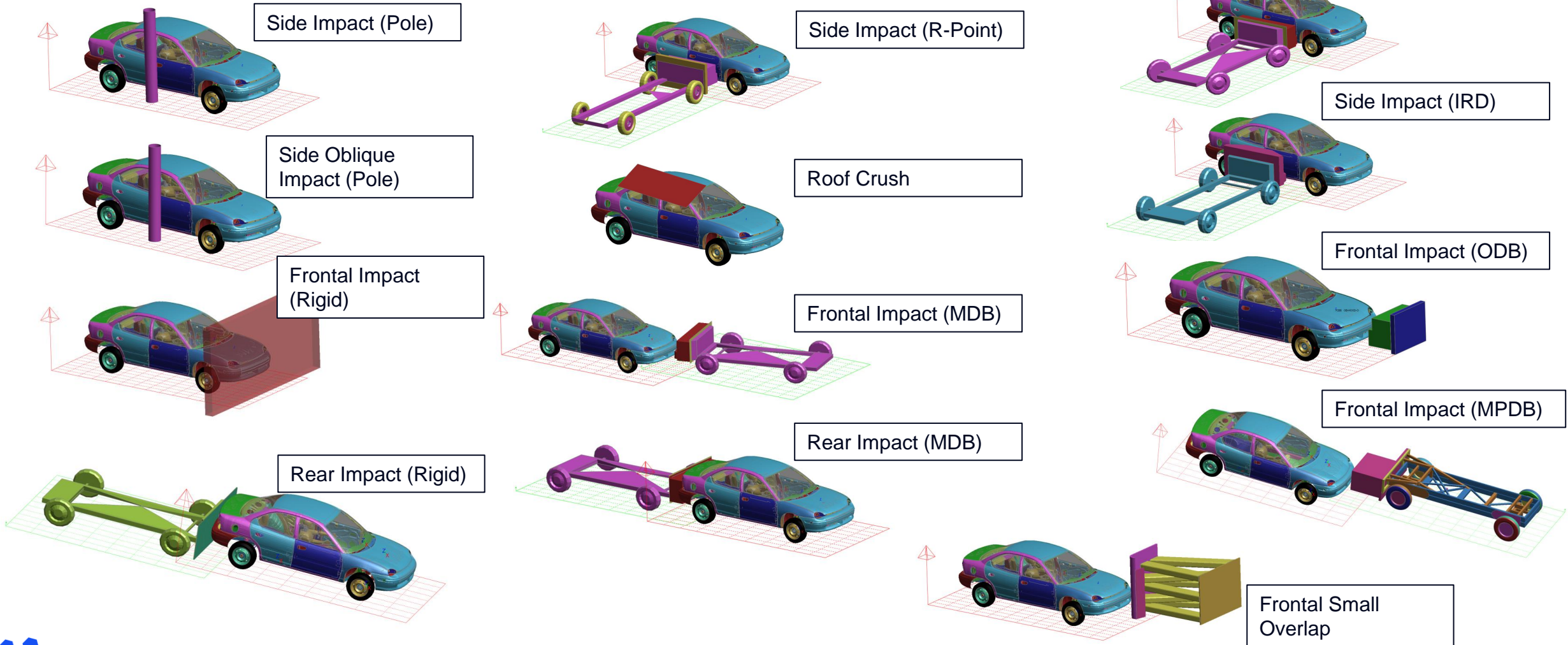
Apply

If the **Save preference** checkbox is pressed, the user preferences will be changed so that the \*keywords are always written to the master file in future sessions, which will skip the 'Write Keywords' pop-up window.



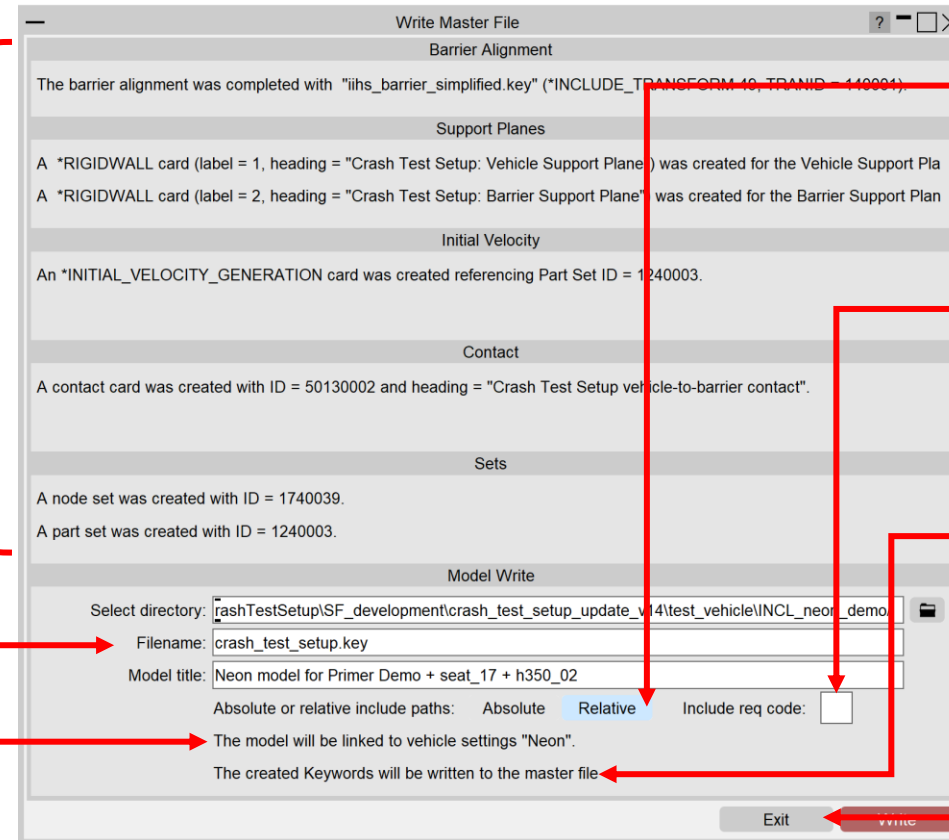
# GO – Barrier Alignment

Crash Test Setup will then complete the barrier alignment:



# GO – Write Master File

- After aligning the barrier, Crash Test Setup creates rigid walls, initial velocity, contact cards etc. as required
- Crash Test Setup is then complete – you have the option to write out a master file for the completed model:



All of the entities created by Crash Test Setup are summarised in this window

By default, you will overwrite the original vehicle keyword file unless you give it a new, unique name

The model will be linked to the vehicle settings imported for the Crash Test Setup.

Choose to write absolute or relative path names for **\*INCLUDE** cards in the master file.

You can include the requirement code of the selected test in the model title

A message will indicate to which include file the created Keywords will be written

If you need to make further changes to the model, click Exit and use Primer to write the model later

# GO – Write Master File

- Selecting both **Left** and **Right** in the test settings will create a copy of the selected model resulting in two models with similar \*keywords/labels, one for each side.

Both models will contain the same labels for all selected/created elements with the exception of the vehicle contact part set which can be different for each side.

The barrier alignment was completed with "crab\_angle\_side\_barrier\_simplified.key" ("INCLUDE\_TRANSFORM 49, TRANID =

Support Planes

A \*RIGIDWALL card (label = 1, heading = "Crash Test Setup: Vehicle Support Plane") was created for the Vehicle Support Pla

A \*RIGIDWALL card (label = 2, heading = "Crash Test Setup: Barrier Support Plane") was created for the Barrier Support Plan

Initial Velocity

An \*INITIAL\_VELOCITY\_GENERATION card was created referencing Part Set ID = 1240003.

Contact

A contact card was created with ID = 50130002 and heading = "Crash Test Setup vehicle-to-barrier contact".

Sets

A node set was created with ID = 1240003.

A part set was created with ID = 1240003.

Model Write (Left impact)

Select directory:

Filename:

Model title:

Absolute or relative include paths: Absolute ☒ Relative ☐ Include req code: ☐

The model will be linked to vehicle settings "Neon".

The created Keywords will be written to the master file

The Keywords for the right impact test will be created after clicking Exit/Write

Exit Write

The keywords are created/saved in the following order:

*Left side impact keywords created -> 'Write Master File' window for left side impact -> Right side impact keywords created -> 'Write Master File' window for Right side impact*

The 'Model Write' panel in the 'Write Master File' window will indicate which impact side test is being written.

# APPENDIX



# Preferences



# Preferences

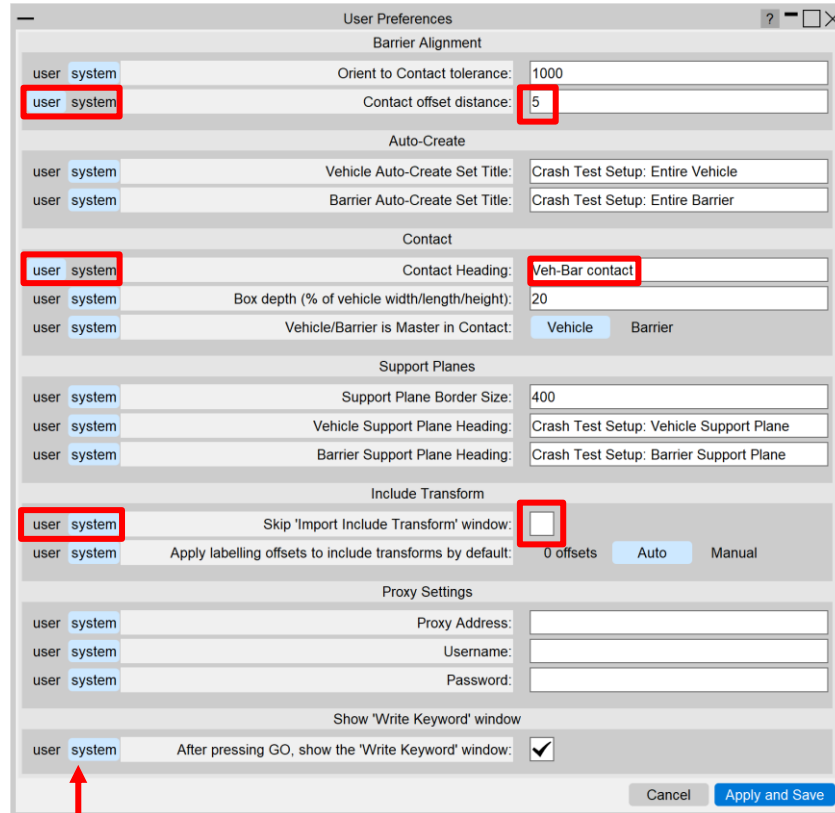
- The Crash Test Setup **Preferences** allow you to customise various aspects of the script
- There are two sets of preferences:
  - **User** Preferences
  - **System** Preferences
- If you have write permissions you can edit both, otherwise you can only edit your User Preferences





# Preferences

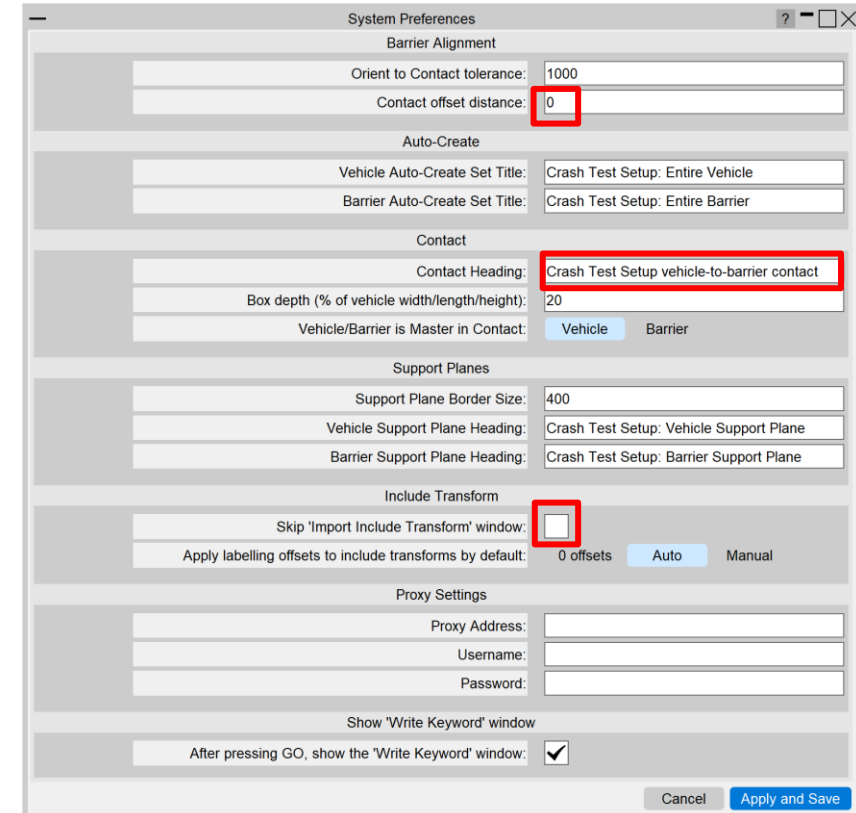
## User Preferences



The User Preferences dialog box is shown with various settings. Red boxes highlight the 'user' selection for 'Barrier Alignment' and 'Contact', and the 'system' selection for 'Include Transform'.

Category	Field	User	System	Value
Barrier Alignment	Orient to Contact tolerance:			1000
	Contact offset distance:			5
Auto-Crete	Vehicle Auto-Crete Set Title:			Crash Test Setup: Entire Vehicle
	Barrier Auto-Crete Set Title:			Crash Test Setup: Entire Barrier
Contact	Contact Heading:			Veh-Bar contact
	Box depth (% of vehicle width/length/height):			20
	Vehicle/Barrier is Master in Contact:			Vehicle
Support Planes	Support Plane Border Size:			400
	Vehicle Support Plane Heading:			Crash Test Setup: Vehicle Support Plane
	Barrier Support Plane Heading:			Crash Test Setup: Barrier Support Plane
Include Transform	Skip 'Import Include Transform' window:			<input type="checkbox"/>
	Apply labelling offsets to include transforms by default:			0 offsets
Proxy Settings	Proxy Address:			
	Username:			
	Password:			
Show 'Write Keyword' window	After pressing GO, show the 'Write Keyword' window:			<input checked="" type="checkbox"/>

## System Preferences



The System Preferences dialog box is shown with various settings. Red boxes highlight the 'system' selection for 'Barrier Alignment' and 'Contact', and the 'system' selection for 'Include Transform'.

Category	Field	User	System	Value
Barrier Alignment	Orient to Contact tolerance:			1000
	Contact offset distance:			0
Auto-Crete	Vehicle Auto-Crete Set Title:			Crash Test Setup: Entire Vehicle
	Barrier Auto-Crete Set Title:			Crash Test Setup: Entire Barrier
Contact	Contact Heading:			Crash Test Setup vehicle-to-barrier contact
	Box depth (% of vehicle width/length/height):			20
	Vehicle/Barrier is Master in Contact:			Vehicle
Support Planes	Support Plane Border Size:			400
	Vehicle Support Plane Heading:			Crash Test Setup: Vehicle Support Plane
	Barrier Support Plane Heading:			Crash Test Setup: Barrier Support Plane
Include Transform	Skip 'Import Include Transform' window:			<input type="checkbox"/>
	Apply labelling offsets to include transforms by default:			0 offsets
Proxy Settings	Proxy Address:			
	Username:			
	Password:			
Show 'Write Keyword' window	After pressing GO, show the 'Write Keyword' window:			<input checked="" type="checkbox"/>

The System Preferences always take precedence unless the user selects **user** next to a particular preference  
The user can revert to the system preference by selecting **system**

# Preferences

## Barrier Alignment

**Orient to Contact tolerance** – when the barrier is aligned with the vehicle, Crash Test Setup uses Primer's **orient** to contact tool to bring the barrier into contact with the vehicle. This tolerance defines the distance to which the barrier is moved before it is oriented to contact.

**Contact offset distance** – after orienting the barrier to contact, Crash Test Setup can move the barrier away again by this offset distance

## Auto-Correct

**Auto-Create Set Titles** – the titles given to node sets automatically created for use in initial velocity cards.

## Contact

**Contact Heading** – the default contact heading name.

**Vehicle/Barrier is Master in Contact** – choose which is the master and which is the slave in the contact.

## Support Planes

**Support Plane Border Size** – the distance to which support plane is extended beyond the footprint of the vehicle/barrier.

**Support Plane Headings** – default names for vehicle and barrier support planes.



## Include Transform

**Skip 'Import Include Transform' Window** – choose whether to display the 'Import Include Transform' window or not. If this is turned on, then the labeling offsets and the transformation ID will be set based on the mode selected for the 'Apply labelling offsets to include transforms by default' preference.

**Apply labelling offsets to include transforms by default** – default mode used to set the \*INCLUDE\_TRANSFORM label offset categories and TRANID.

## Show 'Write Keyword' window

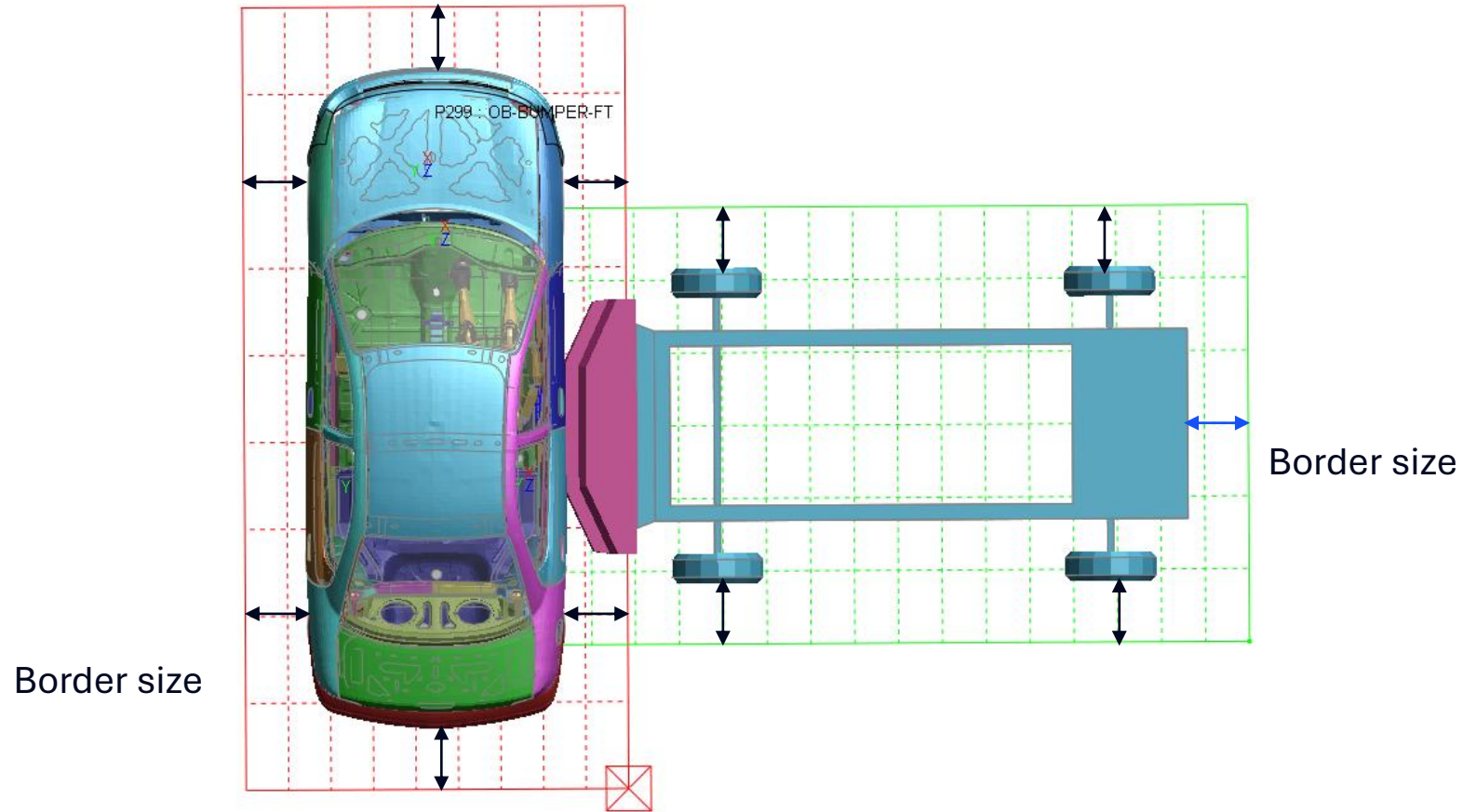
Choose whether to show the 'Write Keyword' window or not. If this option is not selected, the newly created keywords will always be written to the master file.

## Proxy Settings

It is possible to read barrier files from internet locations by specifying a URL rather than a file path. Some remote locations may require a proxy address. Enter the proxy address (along with a username and password if necessary) in the Preferences to allow access.



# Preferences – Support Planes



# Test Options



# Test Options – Angled Side Impact

## Left/Right Impact

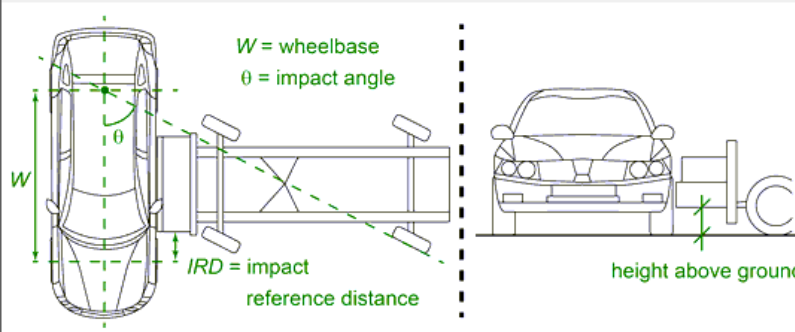
Choose between the barrier hitting the left or the right-hand side (or both sides) of the vehicle by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

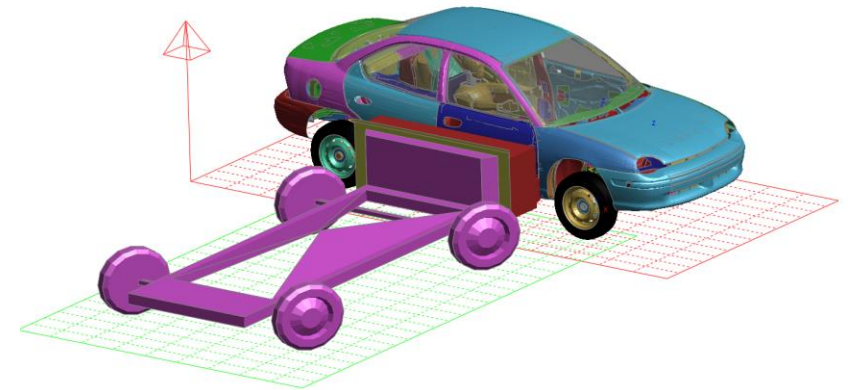
## Impact Angle

The impact angle is the angle of incidence between barrier and vehicle, and affects the velocity components in an initial velocity card (if created).



W = wheelbase  
 $\theta$  = impact angle  
 IRD = impact reference distance  
 height above ground

TEST OPTIONS	
Left Impact <input checked="" type="checkbox"/>	Right Impact <input type="checkbox"/>
Override IRD calculation <input type="checkbox"/>	Create Initial Velocity Card <input checked="" type="checkbox"/>
IRD: 939.8	Magnitude: 33.5 mph
Impact angle (degrees): 63	Height above ground: 279.4



# Test Options – Angled Side Impact

## Left/Right Impact

The corner of the barrier face nearest to the front of the vehicle is positioned an **impact reference distance** from the front axle position. The IRD is calculated as follows ( $W = \text{Wheelbase}$ ):

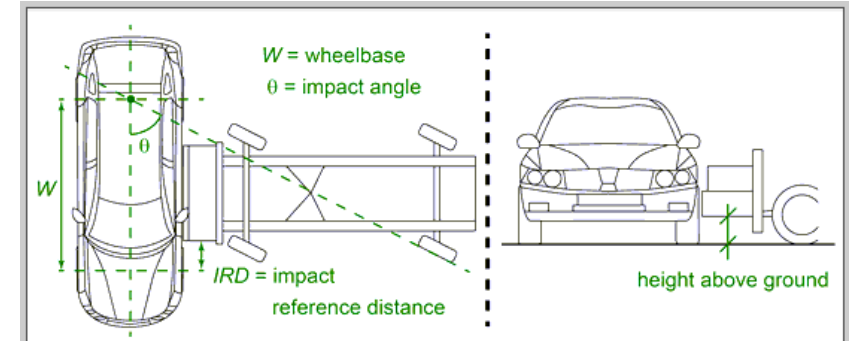
- if vehicle is an MPV, truck or bus:

$$\text{IRD} = \begin{cases} 0.508m & W < 2.489m \\ (0.5W - 0.94)m & 2.489m \leq W < 2.896m \\ 0.508m & W > 2.896m \end{cases}$$

- if vehicle is a passenger car:

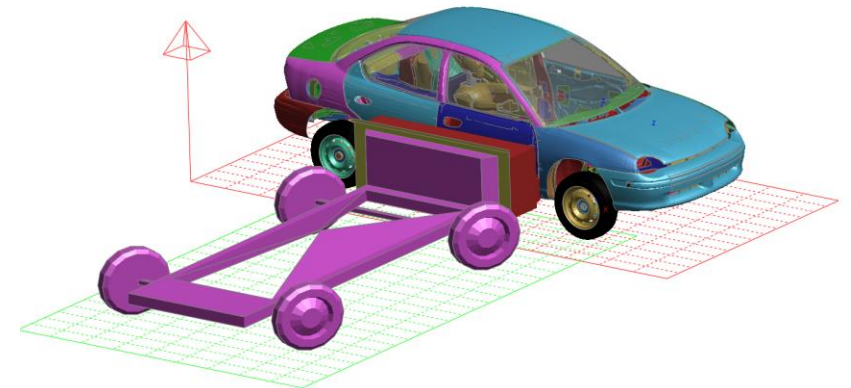
$$\text{IRD} = \begin{cases} (0.5W - 0.94)m & W < 2.896m \\ 0.508m & W > 2.896m \end{cases}$$

Alternatively, you can override (ignore) this calculation by checking the button in the test options panel and manually entering a value.



TEST OPTIONS

Left Impact <input checked="" type="checkbox"/>	Right Impact <input type="checkbox"/>	Create Initial Velocity Card <input checked="" type="checkbox"/>
Override IRD calculation <input type="checkbox"/>		Magnitude: 33.5 mph
IRD: 939.8		Height above ground: 279.4
Impact angle (degrees): 63		





# Test Options – Frontal Impact (MDB)

## Left/Right Impact

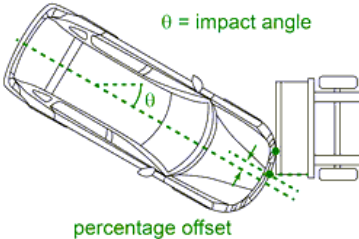
Choose between the left or right-hand side (or both sides) of the moving deformable barrier hitting the vehicle by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

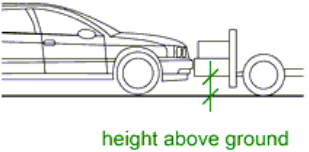
## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly



$\theta$  = impact angle

percentage offset



height above ground

TEST OPTIONS

Left Impact ☒ Right Impact ☐

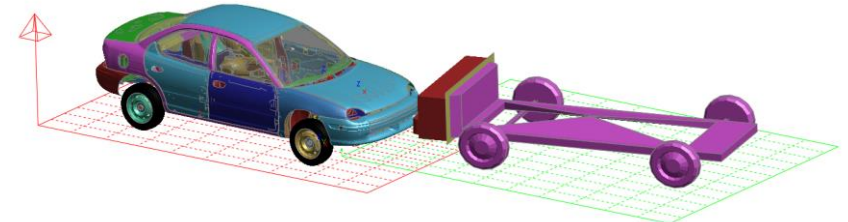
Impact angle (degrees):

Offset (%):

Create Initial Velocity Card ☒

Magnitude:  km/h

Height above ground:





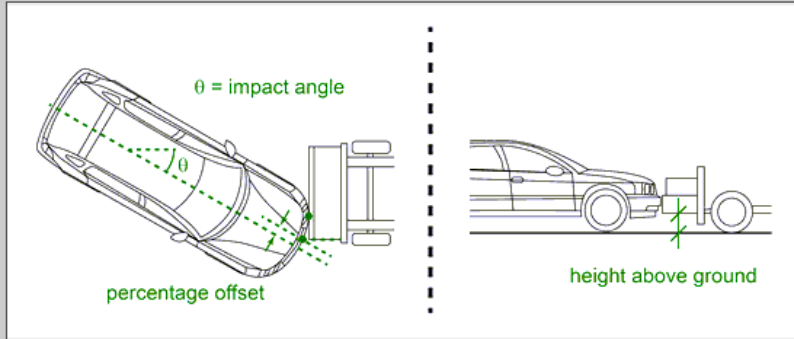
# Test Options – Frontal Impact (MDB)

## Offset

The position of the right-hand edge of the barrier in a Left impact (or the left-hand edge of the barrier in a Right impact), as a percentage of the width of the vehicle, measured from the projection of the barrier edge on impact to the vehicle Centre Line.

## Impact Angle

The angle at which the barrier impacts the vehicle.



TEST OPTIONS

Left Impact ☒ Right Impact ☐

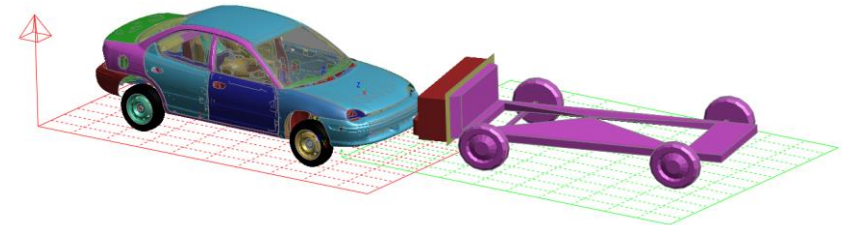
Impact angle (degrees): 15

Offset (%): 35

Create Initial Velocity Card ☒

Magnitude: 90.1 km/h

Height above ground: 229



# Test Options – Frontal Impact (MPDB)

## Left/Right Impact

Choose between the left or right-hand side (or both sides) of the vehicle hitting the offset deformable barrier by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

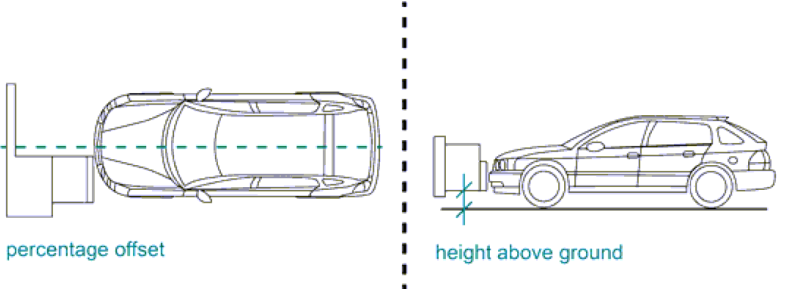
If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.

## Percentage Offset

The position of the centre-most edge of the barrier, as a percentage of the width of the vehicle, measured from the side of impact (left/right).



percentage offset

height above ground

TEST OPTIONS ?

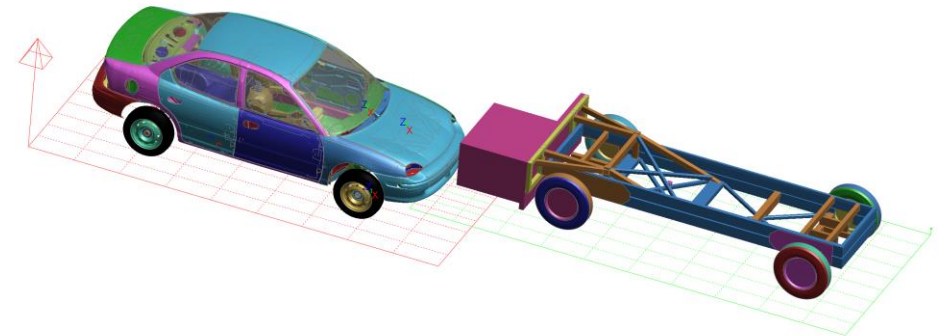
Left Impact ☒ Right Impact ☐

Create Initial Velocity Card ☒

Magnitude: 64 km/h

Offset (%): 40

Height above ground: 200



# Test Options – Frontal Impact (ODB)

## Left/Right Impact

Choose between the left or right-hand side (or both sides) of the vehicle hitting the offset deformable barrier by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

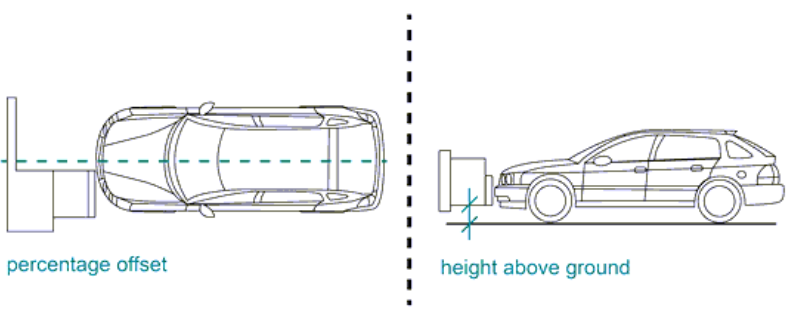
If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.

## Percentage Offset

The position of the centre-most edge of the barrier, as a percentage of the width of the vehicle, measured from the side of impact (left/right).



percentage offset

height above ground

TEST OPTIONS

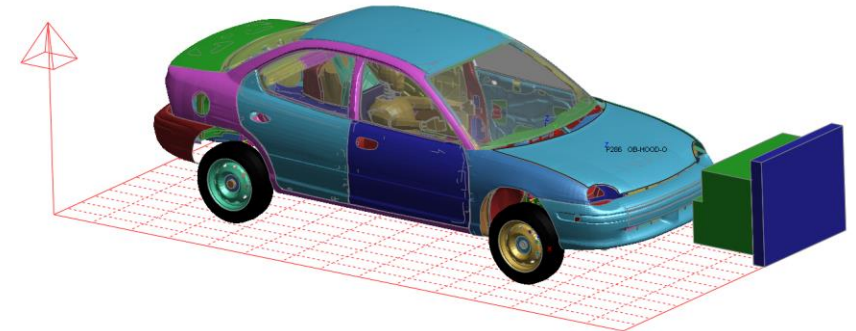
Left Impact ☒ Right Impact ☐

Create Initial Velocity Card ☒

Magnitude: 40 mph

Offset (%): 40

Height above ground: 200



# Test Options – Frontal Impact (Rigid)

## Impact Angle

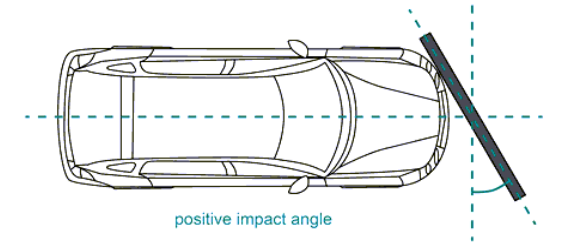
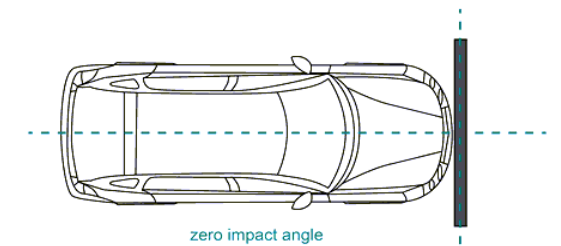
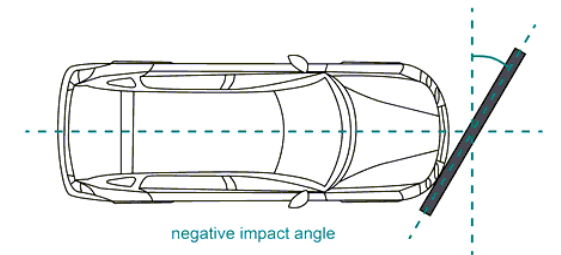
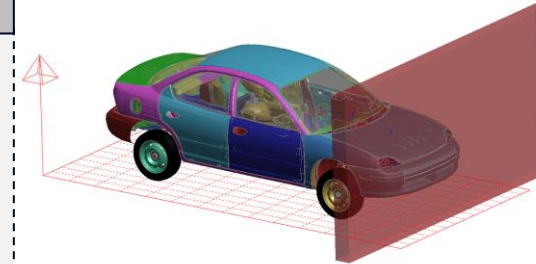
Define the angle of the rigid barrier (measured in degrees from a line perpendicular to the vehicle's driving direction). A positive number for the angle will result in the left-hand side of the vehicle hitting the barrier first; a negative number will result in the right-hand side hitting the barrier first.

## Initial Velocity Card

If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Rigid wall

If you select **Use RigidWall**, a \*RigidWall keyword will be used to represent the barrier instead of an imported barrier model. You can choose to import/select your own \*RigidWall barrier in the barrier settings panels.



TEST OPTIONS	
Impact angle (degrees): <input type="text" value="0"/>	Create Initial Velocity Card <input checked="" type="checkbox"/>
	Magnitude: <input type="text" value="56"/> km/h
Use Rigidwall: <input type="checkbox"/>	

# Test Options – Frontal Small Overlap

## Left/Right Impact

Choose between the left or right-hand side (or both sides) of the vehicle hitting the small overlap barrier by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

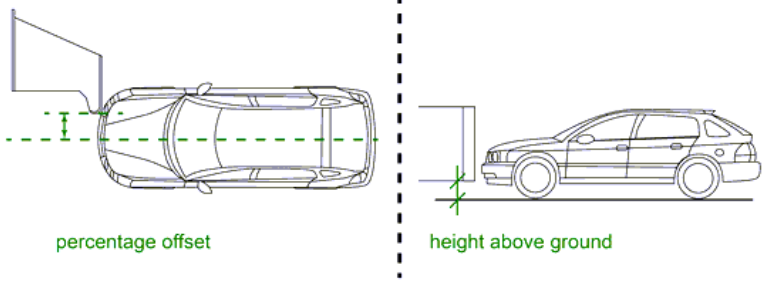
If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.

## Offset

The position of the centre-most edge of the barrier, as a percentage of the width of the vehicle, measured from the vehicle Centre Line.



percentage offset

height above ground

TEST OPTIONS

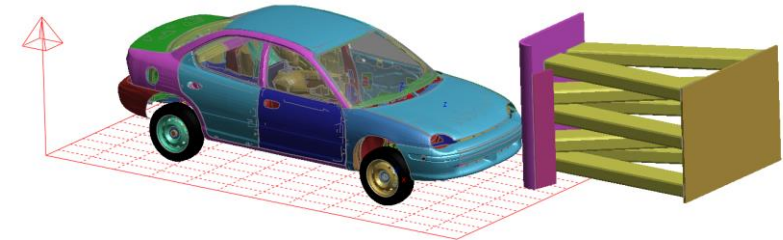
Left Impact ☐ Right Impact ☒

Create Initial Velocity Card ☒

Magnitude: 64 km/h

Offset (%): 25

Height above ground: 0



# Test Options – Rear Impact (MDB)

## Left/Right Impact

Choose between the left or right-hand side (or both sides) of the moving deformable barrier hitting the small vehicle by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

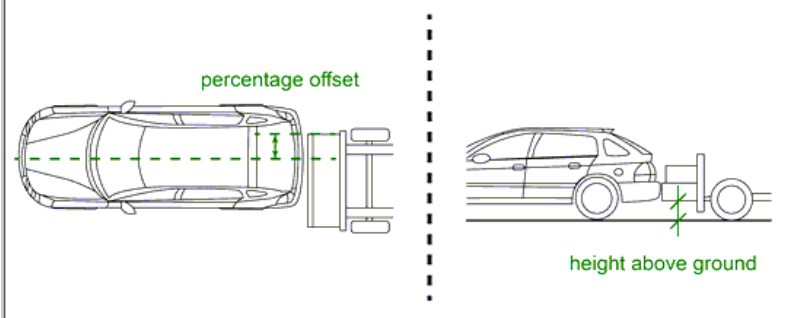
If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly

## Offset

The position of the right-hand edge of the barrier in a Left impact (or the left-hand edge of the barrier in a Right impact), as a percentage of the width of the vehicle, measured from the vehicle Centre Line.



percentage offset

height above ground

TEST OPTIONS

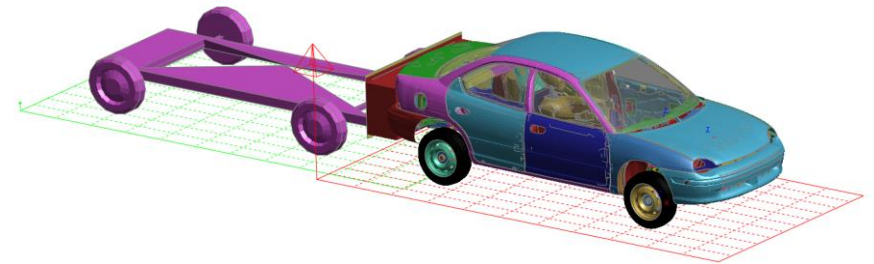
Left Impact ☒ Right Impact ☐

Create Initial Velocity Card ☒

Magnitude: 79.3 km/h

Offset (%): 20

Height above ground: 229





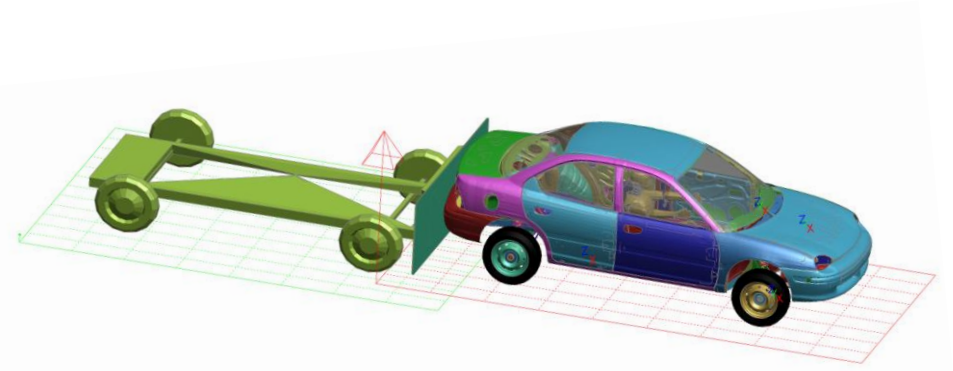
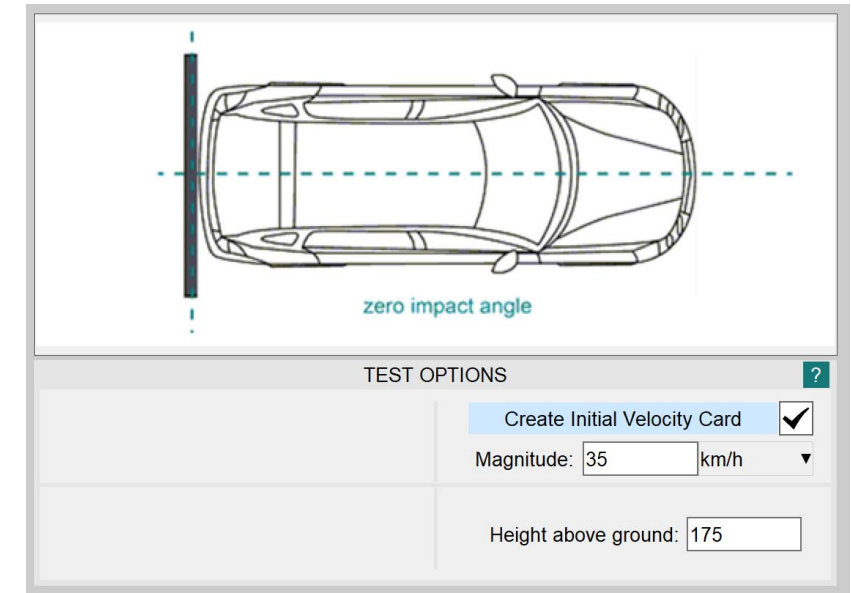
# Test Options – Rear Impact (Rigid)

## Initial Velocity Card

If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.



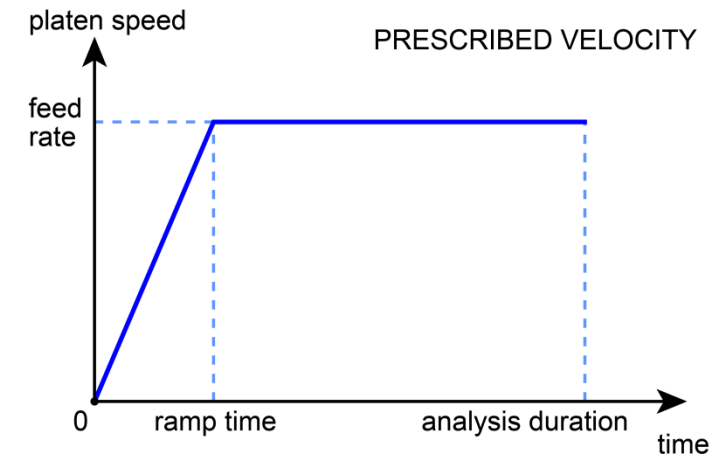
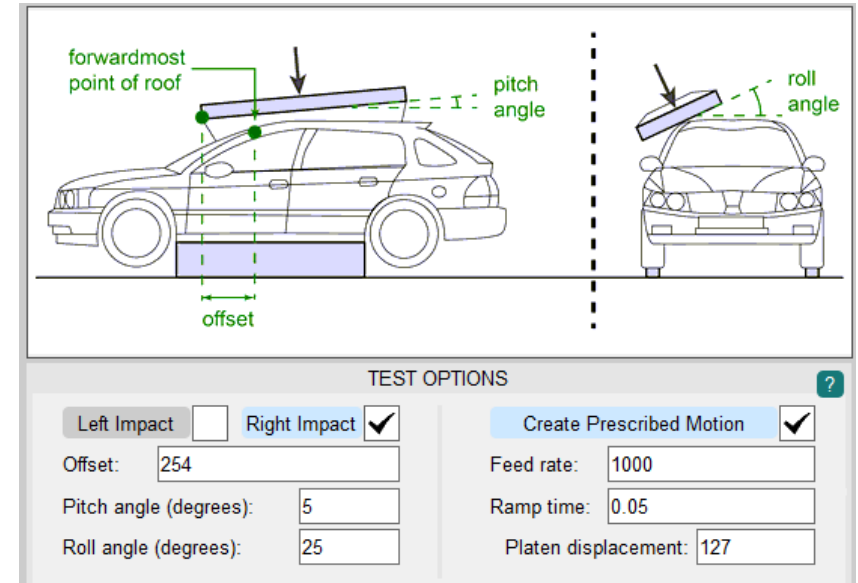
# Test Options – Roof Crush

## Prescribed Motion Card

If you choose to create a prescribed motion card, the script determines the correct velocity direction components from the pitch and roll angles, the impact side and the vehicle driving direction. Three **\*PRESCRIBED\_MOTION\_RIGID** cards are created, one for each cartesian velocity component. The prescribed motion cards all act on a rigid part contained in the **Barrier Part Set**. Each card refers to a load curve that defines the velocity component. The velocity increases linearly from zero to the feed rate during the ramp time, and then remains constant at the feed rate until the user-defined platen displacement has been reached. The prescribed motion duration is therefore equal to:

The graph on the right illustrates the form of the prescribed motion load curves and their salient points:

$$Duration = \frac{Platen\ Displacement - 0.5 \times Feed\ Rate \times Ramp\ Time}{Feed\ Rate} + Ramp\ Time$$





# Test Options – Roof Crush

## Left/Right Impact

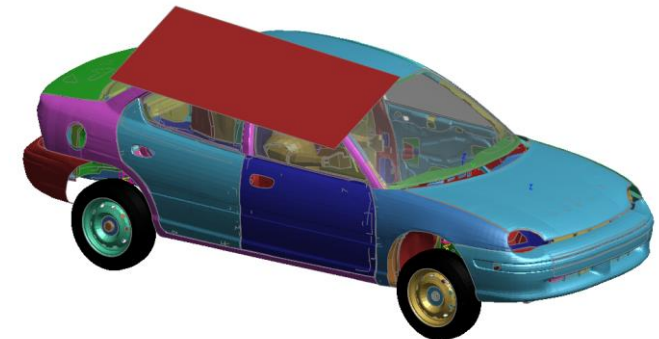
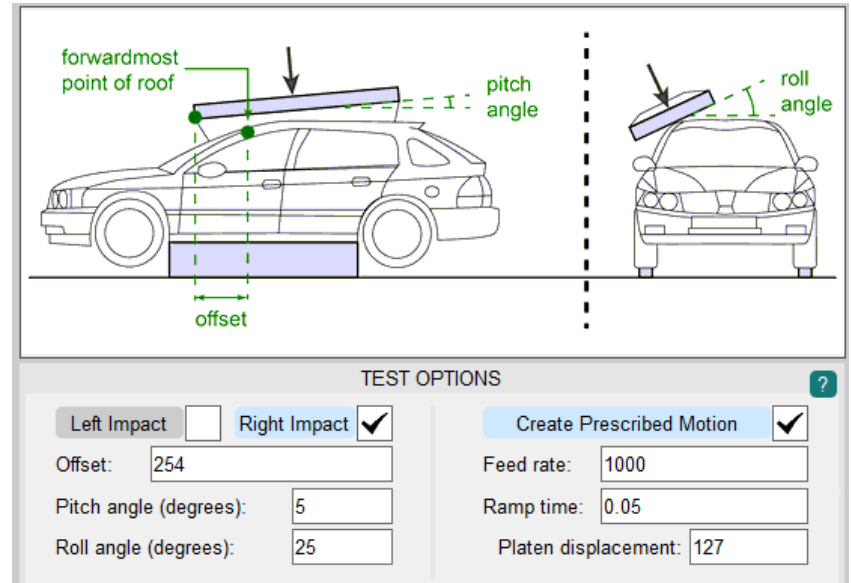
Choose between the roof crush platen hitting the left or the right-hand side (or both sides) of the vehicle by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Offset

The **Offset** value is the distance from the **forward-most point** of the roof to the front edge of the roof crush platen. The forward-most point of the roof is defined in the vehicle settings.

## Pitch and Roll Angles

The **pitch angle** and **roll angle** define the incline of the roof crush platen relative to the horizontal.



# Test Options – Side Impact (IRD)

## Left/Right Impact

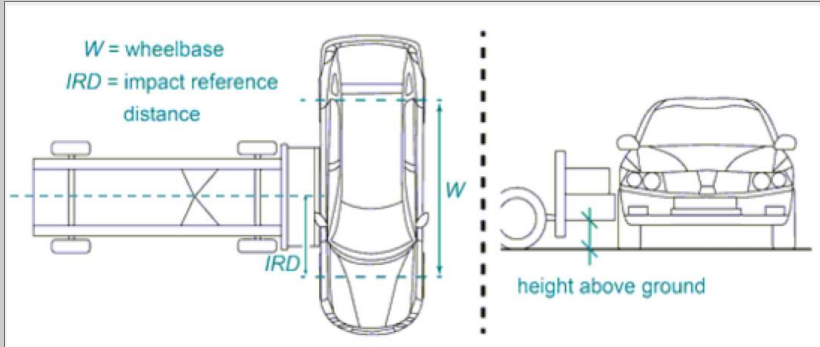
Choose between the barrier hitting the left or the right-hand side (or both sides) of the vehicle by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.



W = wheelbase  
IRD = impact reference distance

height above ground

TEST OPTIONS ?

Left Impact ☐ Right Impact ☒

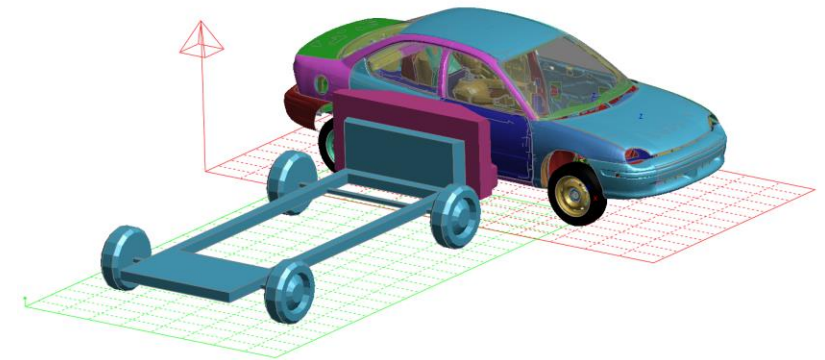
Create Initial Velocity Card ☒

Magnitude: 60 km/h

Override IRD calculation ☐

IRD: 610

Height above ground: 350



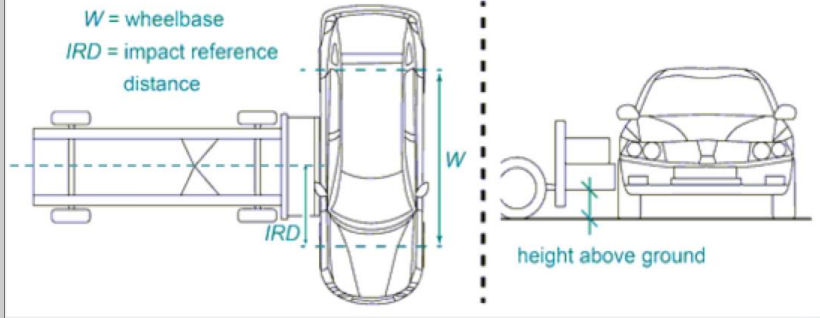
# Test Options – Side Impact (IRD)

## Impact Reference Distance

The corner of the barrier face nearest to the front of the vehicle is positioned an **impact reference distance** from the front axle position. The IRD is calculated as follows ( $W = \text{Wheelbase}$ ):

$$IRD = \begin{cases} 0.61m & W < 2.5m \\ (0.5W - 0.64)m & 2.5m \leq W < 2.9m \\ 0.81m & W > 2.9m \end{cases}$$

Alternatively, you can override (ignore) this calculation by checking the button in the test options panel and manually entering a value.



W = wheelbase  
IRD = impact reference distance

height above ground

TEST OPTIONS

Left Impact ☐ Right Impact ☒

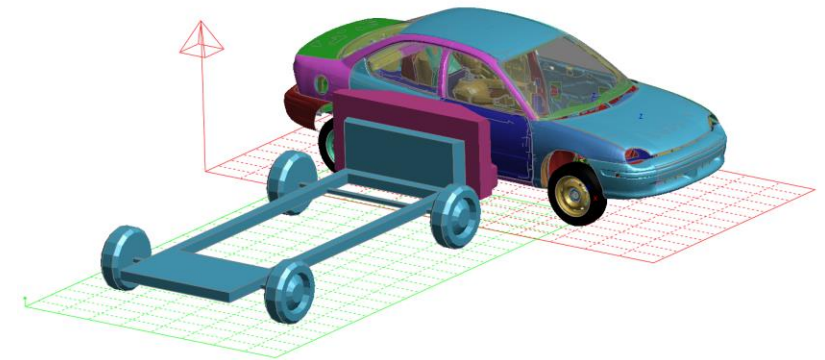
Create Initial Velocity Card ☒

Magnitude: 60 km/h

Override IRD calculation ☐

Height above ground: 350

IRD: 610



# Test Options – Side Impact (R-Point)

## Left/Right Impact

Choose between the barrier hitting the left or the right-hand side (or both sides) of the vehicle by checking the appropriate button. The preview image is updated to show the corresponding alignment.

## Initial Velocity Card

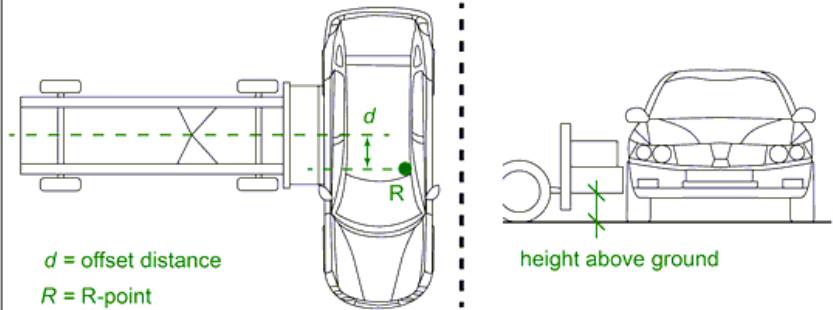
If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Offset

The position of the centre line of the barrier measured as a distance rearwards of the R-point.

## Height Above Ground

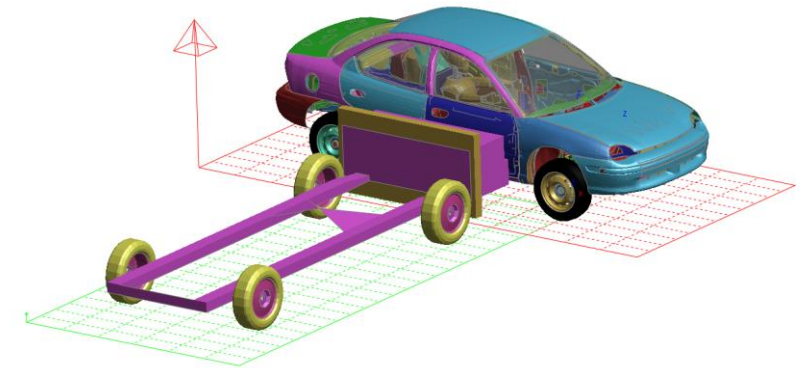
This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.



$d$  = offset distance  
 $R$  = R-point

$height\ above\ ground$

TEST OPTIONS	
Left Impact <input type="checkbox"/>	Right Impact <input checked="" type="checkbox"/>
Create Initial Velocity Card <input checked="" type="checkbox"/>	
Magnitude: 50 km/h	
Offset (distance): 250	Height above ground: 300



# Test Options – Side Impact (Pole)

## Left/Right Impact

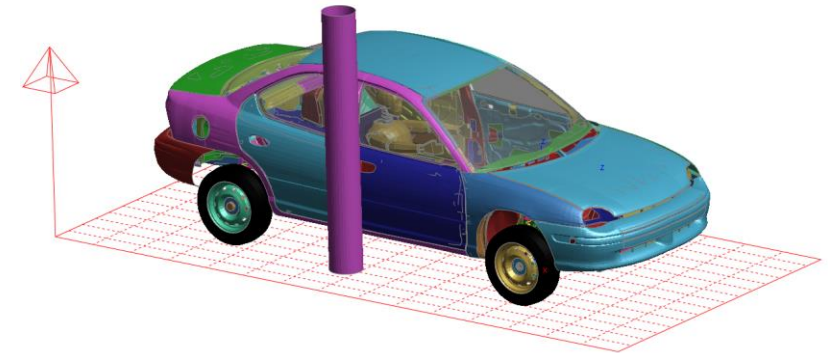
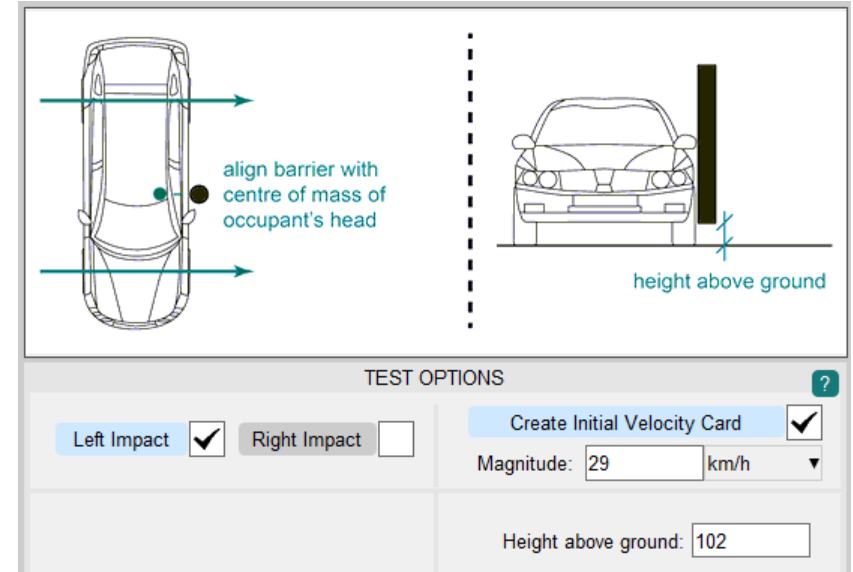
Choose between the barrier hitting the left or the right-hand side (or both sides) of the vehicle by checking the appropriate button.

## Initial Velocity Card

If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.





# Test Options – Side Oblique Impact (Pole)

## Left/Right Impact

Choose between the barrier hitting the left or the right-hand side (or both sides) of the vehicle by checking the appropriate button.

## Initial Velocity Card

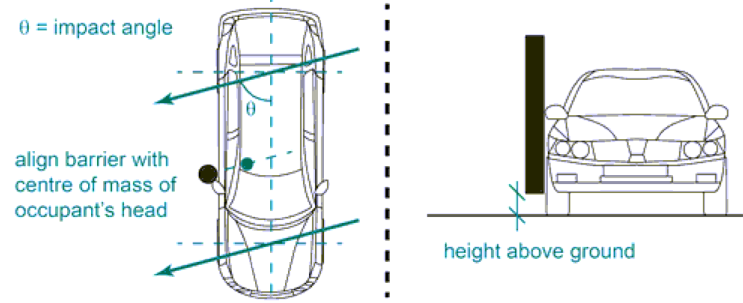
If you choose to create an initial velocity card, the script determines the correct velocity vector components from the final barrier direction and the magnitude specified in the text box. The set ID for the initial velocity card is defined later in the vehicle and barrier settings panels.

## Height Above Ground

This is the height above ground of the bottom edge of the barrier face. It is used to position the barrier correctly.

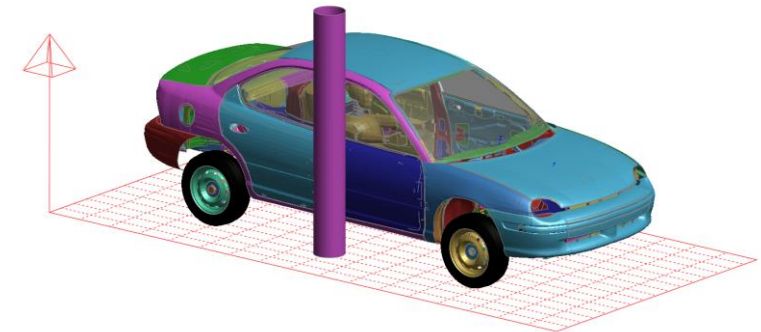
## Impact Angle

The angle of incidence between barrier and vehicle. Used to align the pole correctly with the centre of mass of the occupant's head, and affects the velocity components in an initial velocity card (if created).



TEST OPTIONS

Left Impact <input type="checkbox"/>	Right Impact <input checked="" type="checkbox"/>	Create Initial Velocity Card <input checked="" type="checkbox"/>
Magnitude: 32 km/h		
Impact angle (degrees): 75	Height above ground: 102	



# Vehicle Settings Panels



# Vehicle Settings Panels

## Orientation

You must define which direction the vehicle is facing so that barriers are aligned correctly. If the driving direction of the vehicle is in the positive X-axis direction, tick **+X**. If it is in the opposite direction, tick **-X**.

Crash Test Setup does not accommodate vehicle models with any other orientation. Rotate vehicle models in Primer to face positive or negative X-direction before using Crash Test Setup

## R-Point

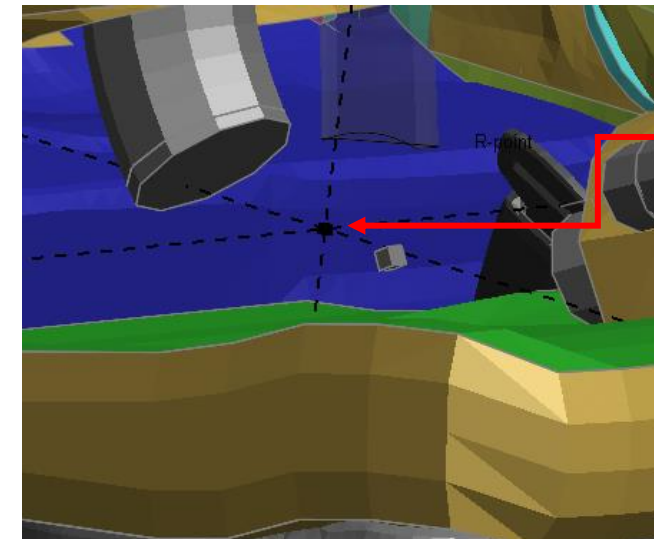
In European side impact tests the barrier is aligned with the vehicle's R-point. The R-point is a fixed point on the vehicle defined by the theoretical hip point of the occupant in the standard seat position. In many vehicle models, the R-point is marked by a particular node. To define the R-point coordinates, select this node by clicking **Select Node**.

Alternatively, if you know the R-point coordinates you can enter them in the text boxes. To check that you have defined the R-point correctly, click **Sketch R-point**.

The image on the right illustrates the position of the R-point on an example vehicle – it is sketched with red cross-hairs.

Orientation ?

Vehicle driving direction: ☒ + X ☐ - X



R-Point

R-point ?

	X	Y	Z	
Coordinates:	2413.8	-374	621.3	<input type="button" value="Select Node"/> <input type="button" value="Sketch R-point"/>



# Vehicle Settings Panels

## Occupant's Head – Centre of Mass

In Side Impact (Pole) and Side Oblique Impact (Pole) tests the barrier is aligned with the centre of mass (COM) of the occupant's head. In many crash test dummy models, the COM location is marked by a particular node. To define the COM coordinates, select this node by clicking **Select Node**.

Alternatively, if you know the COM coordinates you can enter them in the text boxes. To check that you have defined the COM correctly, click **Sketch Point**.

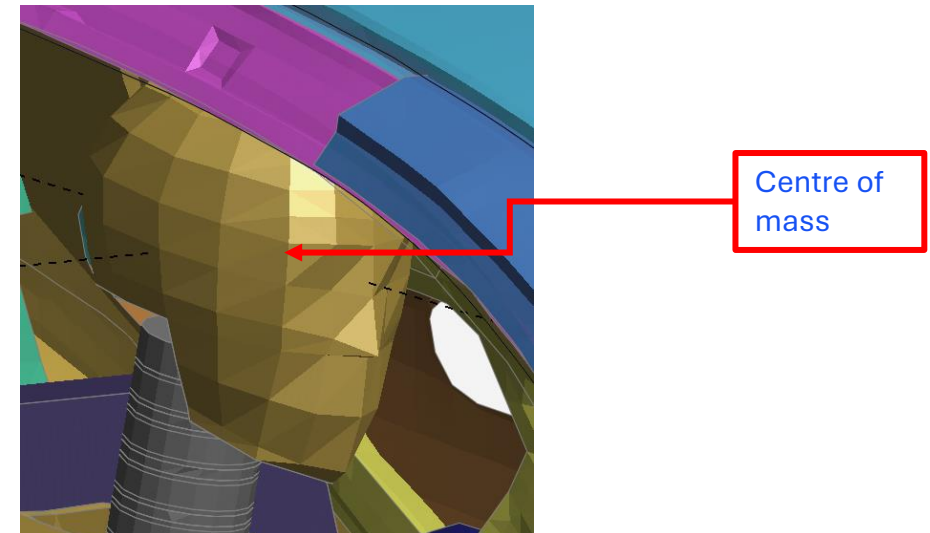
The panel allows you to set three individual head positions. If more than one head position is defined and active, the script will do the barrier setups for the different head positions simultaneously. This will create a copy of the selected model for position resulting in multiple models with similar keywords/labels, one for each selected head position. You can name each head position using the label column, this will help to distinguish between the different setups.

The image on the right illustrates the position of the COM on an example vehicle - it is sketched with red cross-hairs.

Occupant's Head - Centre of Mass ?

Set Occupant's head coordinates. If more than one is active, multiple setups will run.

	Label	X	Y	Z		
<input checked="" type="checkbox"/>	Position 1	2275.1	-374	1253.2	Select Node	Sketch Point
<input type="checkbox"/>	Position 2				Select Node	Sketch Point
<input type="checkbox"/>	Position 3				Select Node	Sketch Point



# Vehicle Settings Panels

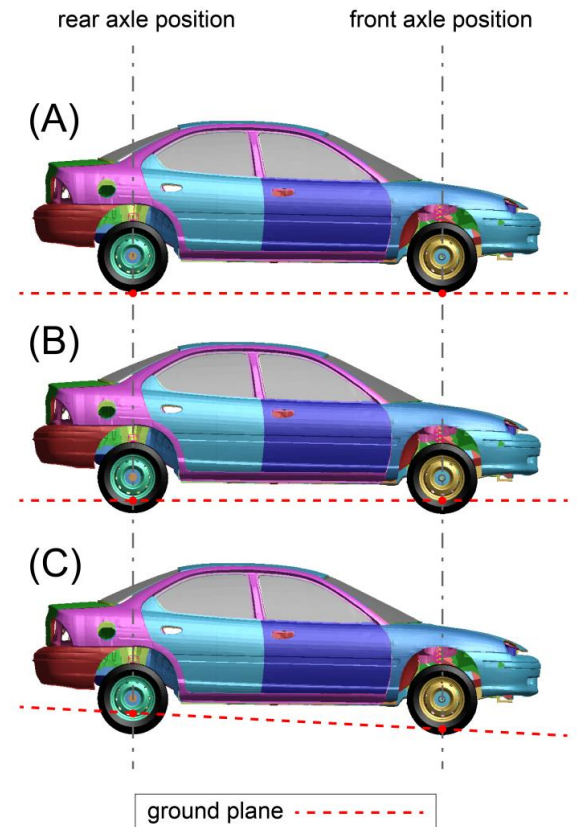
## Ground Plane

You must define the real-world ground plane so that the barrier is aligned correctly with the vehicle. Define the appropriate ground plane by specifying the Z-coordinates of the ground plane at the front and rear wheel axle positions. You can do this by either entering values into the textboxes or selecting nodes found at the correct heights. Check that you have defined the ground plane correctly by clicking **Sketch Plane**

**Note: in order to correctly define the ground plane it is necessary to complete the Wheel Axes panel too.**

Typically during design, the position of the vehicle is never changed. The wheels and suspension are modelled in a particular position, but this may not represent the compression of the suspension or the tyre squash found in a real crash test as a result of the vehicle's weight.

Ground Plane (for barrier alignment) ?			
Front wheel ground z-coord:	<input type="text" value="0"/>	Select Node	Horizontal plane? <input type="checkbox"/>
Rear wheel ground z-coord:	<input type="text" value="0"/>	Select Node	Sketch Plane



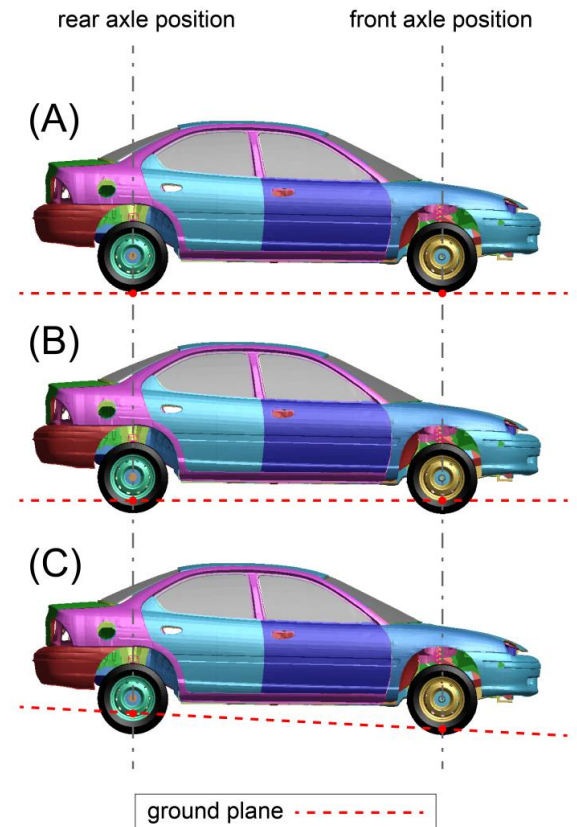
# Vehicle Settings Panels

## Ground Plane

Rather than reposition the wheels and/or the vehicle relative to a fixed horizontal ground plane, the ground plane is defined relative to the fixed vehicle position as follows:

- If the vehicle is modelled exactly as it would be in the test (with suspension compressed etc.) then the ground plane will be in line with the lowest edge of the wheels, as in image (A).
- More commonly, the suspension and tyre squash mean that the real-world ground plane position is at a slightly greater height relative to the wheels in the model, as in image (B).
- In addition, if the mass distribution in the vehicle is skewed towards one end of the vehicle (e.g. if there is a greater than normal load in the boot/trunk), then in the crash test the vehicle chassis would be inclined from front to rear. The ground plane is defined at a corresponding incline, as in image (C).

Ground Plane (for barrier alignment) ?			
Front wheel ground z-coord:	<input type="text" value="0"/>	Select Node	Horizontal plane? <input type="checkbox"/>
Rear wheel ground z-coord:	<input type="text" value="0"/>	Select Node	Sketch Plane



# Vehicle Settings Panels

## Vehicle Support Plane

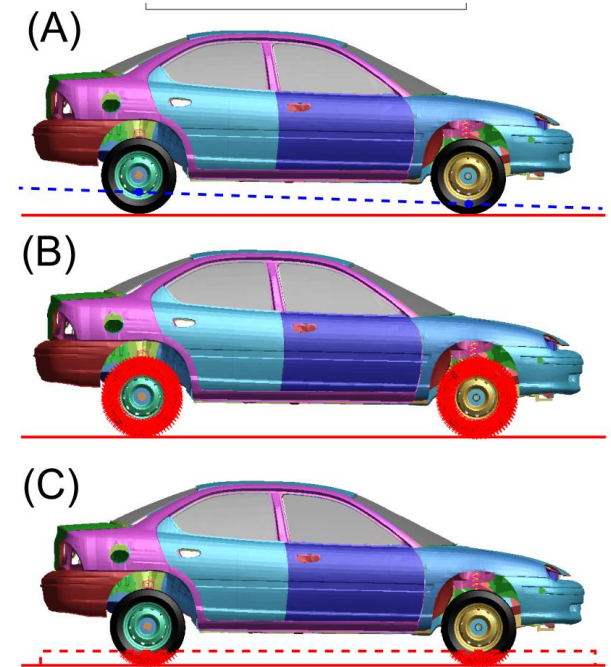
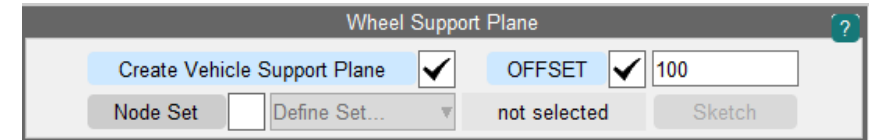
The Vehicle Support Plane is used to support the vehicle during the analysis. Unlike the Ground Plane, it does not necessarily represent the real-world ground and can be in a different position, as in image (A). The Vehicle Support Plane is always positioned in contact with the lowest surface of the vehicle's wheels.

If you choose to create a Vehicle Support Plane, a **\*RIGIDWALL\_PLANAR\_FINITE\_ID** card is created. The extent of the finite planar rigid wall is defined by footprint of the vehicle, plus the **Support Plane Border Size**, which can be set in the **Preferences**.

If you choose the **Node Set** option, define a node set containing all of the nodes that will be checked for penetration with the rigid wall during analysis. For example, you might want to define a node set containing all of the nodes in the tyres, as in image (B).

Alternatively, or in addition, you can choose the **OFFSET** option and define an offset value in the textbox. All of the nodes found within the offset distance from the rigid wall will be checked for penetration during analysis, as shown in image (C).

If you choose neither option, Crash Test Setup will define a node set containing all of the nodes in the vehicle, and so all nodes will be checked for penetration during analysis.



ground plane - - - - -  
support plane —————

# Vehicle Settings Panels

## Wheel Axes

Define the X-coordinates of the wheel axes by entering appropriate values or selecting nodes anywhere on the vertical plane that passes through each wheel axes (as illustrated).

The wheel axes coordinates are used:

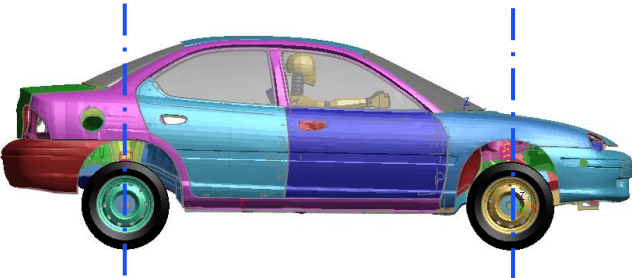
- to define the ground plane
- to align barriers in Side Impact (IRD) and Angled Side Impact tests.

Wheel Axes

Front wheel x-coord:	3716.895	Select Node	Part Centroid	Sketch Axis
Rear wheel x-coord:	1069.033	Select Node	Part Centroid	Sketch Axis

rear axle position

front axle position

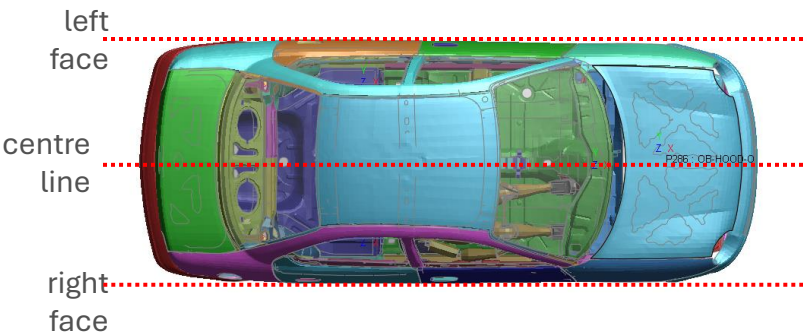


## Central Line

The left face, centre line and right face of the vehicle are used to align barriers in Frontal Impact tests. Enter Y-coordinate values in the textboxes or, if you have already defined **Part Set (LEFT) for contact and alignment** and **Part Set (RIGHT) for contact and alignment**, click **Use vehicle parts** and Crash Test Setup will automatically calculate the coordinates from the parts on the left and right faces respectively.

To check that the left face, centre line and right face are defined correctly, click **Sketch**.

**Note:** make sure that you have selected the correct vehicle driving direction in the **Orientation** panel before clicking **Use vehicle parts** – otherwise the left and right face coordinates might be the wrong way around.



Centre Line

Sketch	Left Face	Centre Line	Right Face	Auto: from geometry
Y-coordinates:	885.446	24.840	-835.767	Auto: vehicle parts



# Vehicle Settings Panels

## Part Set (LOCATION) for contact and alignment

The vehicle **Part Sets** are used:

- in the contact definition between the vehicle and the barrier
- to align the barrier with the vehicle

In addition, the **LEFT** and **RIGHT** vehicle parts can be used to define the centre line coordinates (refer to the **Centre Line** panel).

Using the drop-down menu, either select an existing part set for the relevant area of the vehicle, or create a new one.

For the purposes of aligning the barrier with the vehicle, it technically doesn't matter how many parts are in the part set, as long as the parts that the barrier will touch are included. However, if you select a large number of parts it will increase the computation time required to align the barrier.

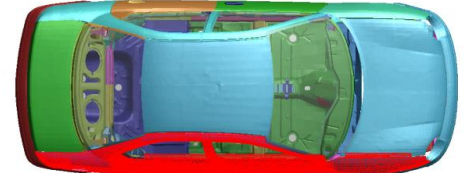
For the purposes of the contact definition between vehicle and barrier, it is necessary to include all of the parts with which the barrier will come into contact during the crash test.

The images on the right are sketches of suitable part sets for each area (**LEFT**, **RIGHT**, **FRONT**, **REAR** and **ROOF**) on an example vehicle.

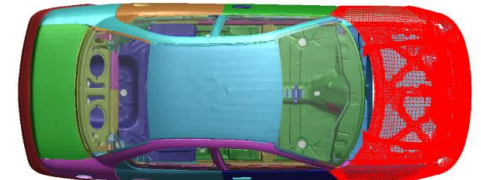
LEFT



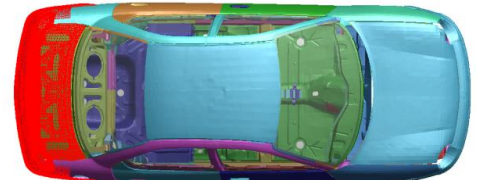
RIGHT



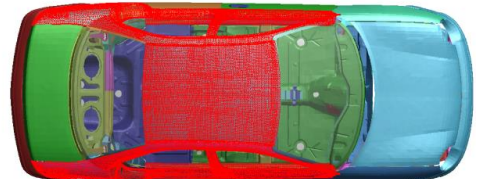
FRONT



REAR



ROOF



Part Set (FRONT) for contact and alignment



Auto

Manual

Part Set...

not selected

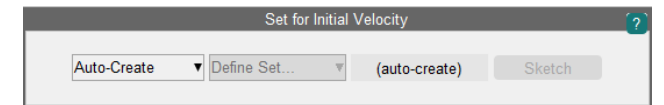
Sketch

# Vehicle Settings Panels

## Set for Initial Velocity

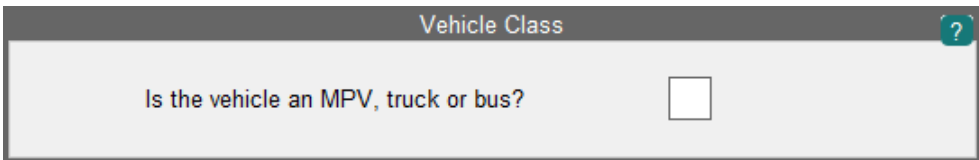
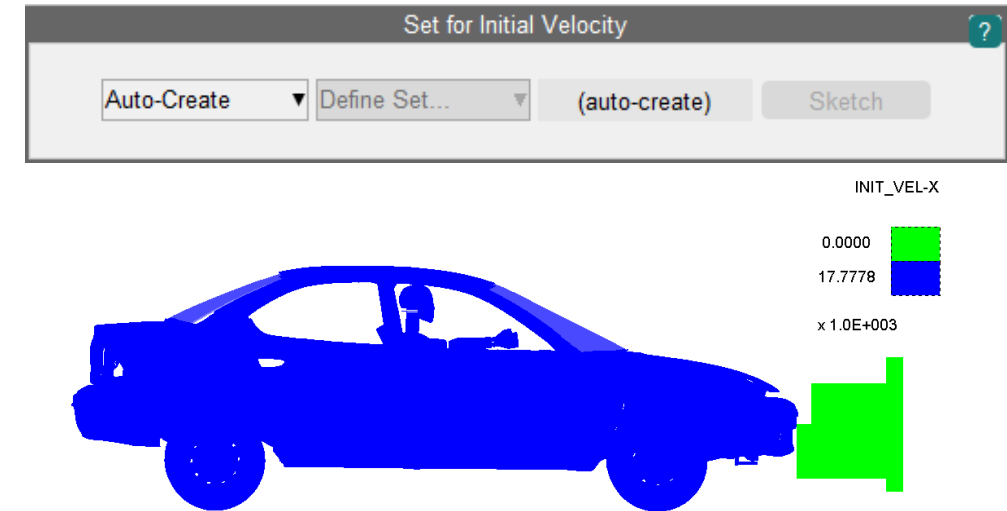
Crash Test Setup allows you to define the initial velocity of the vehicle. In some tests, the vehicle moves into the barrier, in which case you need to define the initial velocity here (in the vehicle settings). If the barrier is moving, complete the barrier settings panel instead. Choose **Auto-Create**, **Node Set** or **Part Set**:

- **AUTO-CREATE** (recommended)  
If you choose Auto-Create, when you click **GO**, Crash Test Setup will automatically create a new part set containing all of the parts in the vehicle. It will then create an **\*INITIAL\_VELOCITY\_GENERATION** card referencing this set.
- **PART SET** (choose this option if you want to use an existing set, or if you want control over how the part set is created)  
If you choose Part Set, define a part set by creating a new part set or selecting an existing one. Crash Test Setup will then create an **\*INITIAL\_VELOCITY\_GENERATION** card referencing this set.
- **NODE SET** (choose this option if you want to use **\*INITIAL\_VELOCITY** instead)  
If you choose Node Set, define a node set by creating a node set or selecting an existing one. Crash Test Setup will then create an **\*INITIAL\_VELOCITY** card referencing this set. Crash Test Setup will also create a new part set containing all of the parts in the vehicle. The **IRIGID** field of the initial velocity card will contain this part set ID.



# Vehicle Settings Panels

Set for Initial Velocity	Vehicle Class
<p>Whether an <b>*INITIAL_VELOCITY</b> or <b>*INITIAL_VELOCITY_GENERATION</b> card is created, the IRIGID field will reference a part set. Initial velocities defined in <b>*PART_INERTIA</b> cards for parts in this set will be overwritten.</p> <p>In this illustration, the zero initial velocity assigned to the occupant via <b>*PART_INERTIA</b> is overwritten, and so the entire vehicle model is given an x-velocity of <math>17.7778 \times 10^3</math>.</p>	<p>According to FMVSS 214D, the formula used to calculate the position of the barrier relative to the vehicle varies depending on whether the vehicle is either:</p> <p>A passenger car or an MPV, truck or bus</p> <p>If your vehicle class is the latter, tick the checkbox on this panel to ensure that Crash Test Setup uses the correct formula.</p>





# Vehicle Settings Panels

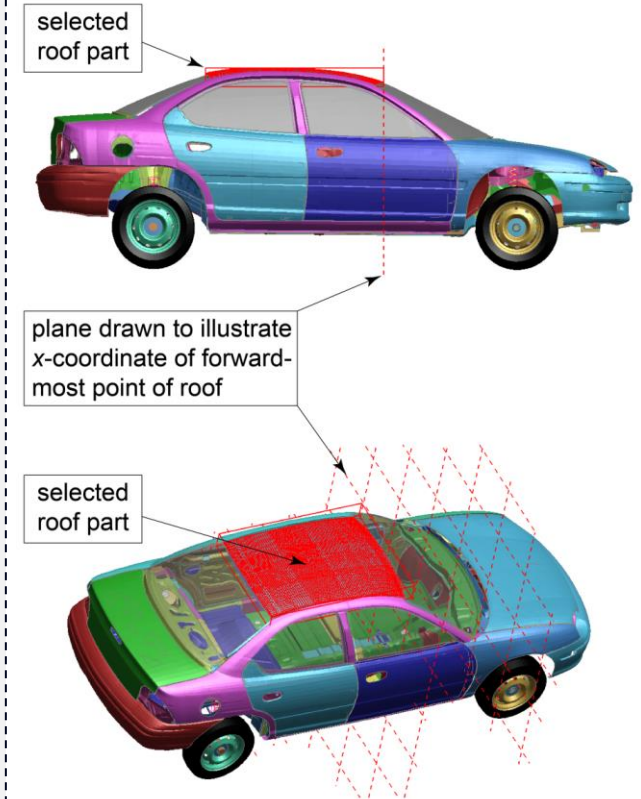
## Forward-most Point of Roof

The forward-most point of the roof must be defined to allow correct alignment of the roof crush platen.

- The forward-most point is defined purely as an x-coordinate, which you can enter into the textbox.
- Alternatively, click **Select Node** to select a node. The forward-most point of the roof will then be defined by the x-coordinate of the selected node.
- The easiest way to determine the forward-most point is to click **Select Parts** and select one or more roof parts. The forward-most point of the roof will then be defined by the most extreme x-coordinate of the part(s) in the vehicle's driving direction (make sure this is set correctly first - go to the **Orientation** panel).

To check that the forward-most point is defined correctly, click **Sketch Position**. A vertical plane is drawn on the x-coordinate of the point.

The images on the right show a typical roof part selection and the resulting x-coordinate plane illustrating the position of the forward-most point of the roof.



Forward-most Point of Roof	
Define by:	<input type="button" value="Select Parts"/> <input type="button" value="Select Node"/>
X-coordinate:	<input type="text" value="2748.961"/> <input type="button" value="Sketch Position"/>

# Vehicle Settings Panels

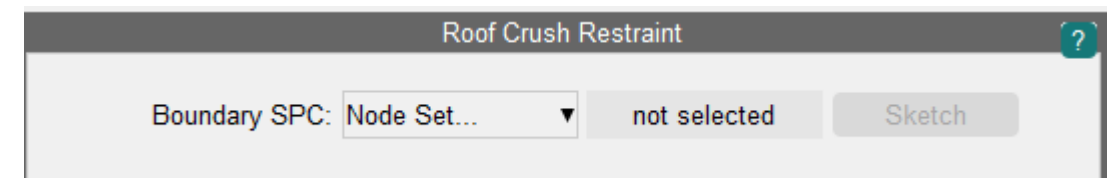
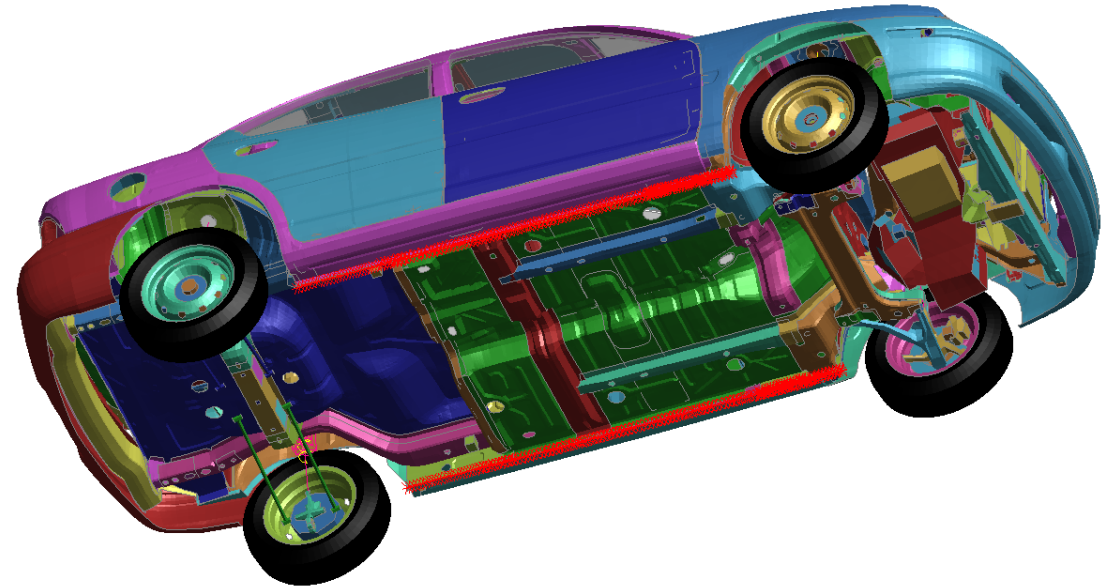
## Roof Crush Restraint

During a Roof Crush test, the sill along each side of the test vehicle is secured to a rigid, horizontal surface.

This is modelled by defining a node set containing the nodes that will be restrained in all degrees of freedom via **\*BOUNDARY\_SPC\_SET** cards. The restraint will provide a reaction force against the downward motion of the roof crush platen.

Define a node set for the roof crush restraint by using the drop-down menu to select an existing set or create a new set for the vehicle model. An example node set is sketched in red in the image on the right in which all of the nodes along the sill on each side of the vehicle have been selected.

To check that the node set has been defined correctly, click **Sketch**.



# Barrier Settings Panels



# Barrier Settings Panels

## Original Orientation

You must define which direction the barrier is **initially** facing so that barriers are aligned correctly. Tick **+X**, **-X**, **+Y** or **-Y** to define the correct direction.

Depending on which test you selected in the Crash Test tab, some directions will be disabled because, for example, side impact barriers should either face  **$\pm Y$**  and front impact barriers should either face  **$\pm X$** . Other tests (e.g. Roof Crush, Frontal Impact (Rigid), Side Impact (Pole), etc.) do not require an original orientation to be defined and so all tick boxes will be enabled for those tests.

For the Frontal Small Overlap test, the barrier is asymmetric and so an impact side (Left or Right) should be defined. The default impact side will be selected by default. Crash Test Setup will then check that this selection matches the Impact Side selection in the test options in the Crash Tab, and warn the user if there is a contradiction.

Original Orientation ?

Initial barrier direction:

+ X

- X

+ Y

- Y

☒
☐
☐
☐

Use default Impact Side:

☒

Impact Side:

Left

☐

Right

☒



# Barrier Settings Panels

## Vehicle/Barrier Contact

Crash Test Setup will create a **\*CONTACT\_AUTOMATIC\_SURFACE\_TO\_SURFACE\_ID** for the vehicle/barrier interface if you select **Create Card**.

The master and slave sides of the contact are defined by part sets. The barrier side of the contact uses the Barrier Part Set. The vehicle side of the contact uses either the ROOF, LEFT, RIGHT, FRONT or REAR part set, depending on which is appropriate for the test type. You can define whether the vehicle or the barrier is the master in the Preferences.

Choose **Auto-Create**, **SELECT...** or **CREATE...** :

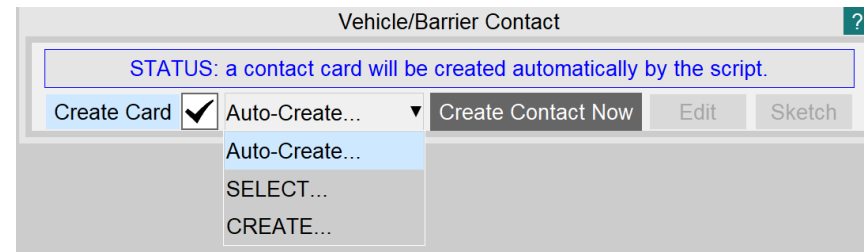
- **AUTO-CREATE** (recommended)

If you choose Auto-Create, when you click **GO**, Crash Test Setup will automatically create the contact card using the imported settings. A contact card will be immediately created in the model and you will be allowed to modify the card if you click on **Create Contact Now**.

- **SELECT...** (choose this option if you want to use an existing contact card)

- **CREATE...** (choose this option if you want to create a new contact card)

The 'Edit' button applies to all three options. If you subsequently click **Save Barrier Settings** in the Barrier Tab, your modified contact properties will be saved as part of that entry and will be imported when you use the barrier in future.



# Barrier Settings Panels

## Barrier Part Set for Contact and Alignment

Using the drop-down menu, select or create a part set containing the parts that make up the front face of the barrier (as illustrated in the top-left image where the part set is sketched in red). For the rigid barriers for the Frontal Impact (Rigid), Side Impact (Pole) and Roof Crush tests, there won't necessarily be a front face as such so just pick whichever part(s) will make contact with the vehicle.

As well as being used in the vehicle/barrier contact definition, the Barrier Part Set is used to align the barrier with the vehicle. Barrier alignment uses either:

- the Barrier Part Set
- the barrier positioning nodes (**lower left corner** and **lower right corner** nodes).

Frontal Impact (Rigid), Side Impact (Pole), Side Oblique Impact (Pole) and Roof Crush do not require barrier positioning nodes to be defined. Angled Side Impact, Frontal Impact (ODB), Side Impact (IRD) and Side Impact (R-point) require barrier positioning nodes to be defined.

Barrier Part Set for contact and alignment

Part(s) for the barrier's front face: Part Set... ▼ not selected Sketch

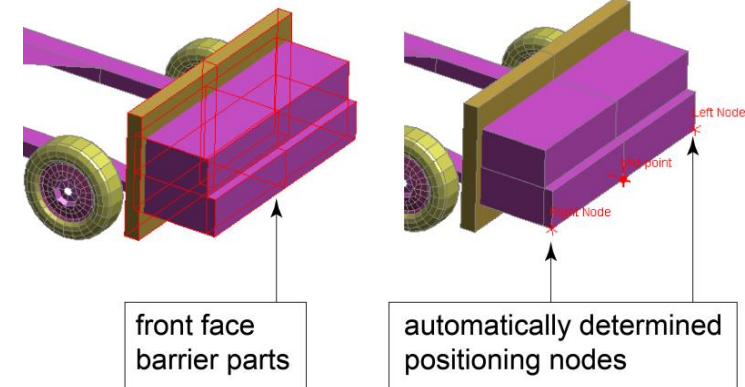
Nodes used to position barrier: Check/Edit Nodes...

# Barrier Settings Panels

## Barrier Part Set for Contact and Alignment

For those test types that require it, Crash Test Setup will determine the barrier positioning nodes automatically from the nodes in the Barrier Part Set, and based on the barrier's Original Orientation. For this reason, make sure that you have completed the Original Orientation panel correctly before selecting/creating the Barrier Part Set.

In the two images on the right, the Barrier Part Set of the European Side Barrier has been defined and the positioning nodes have been calculated automatically.





# Barrier Settings Panels

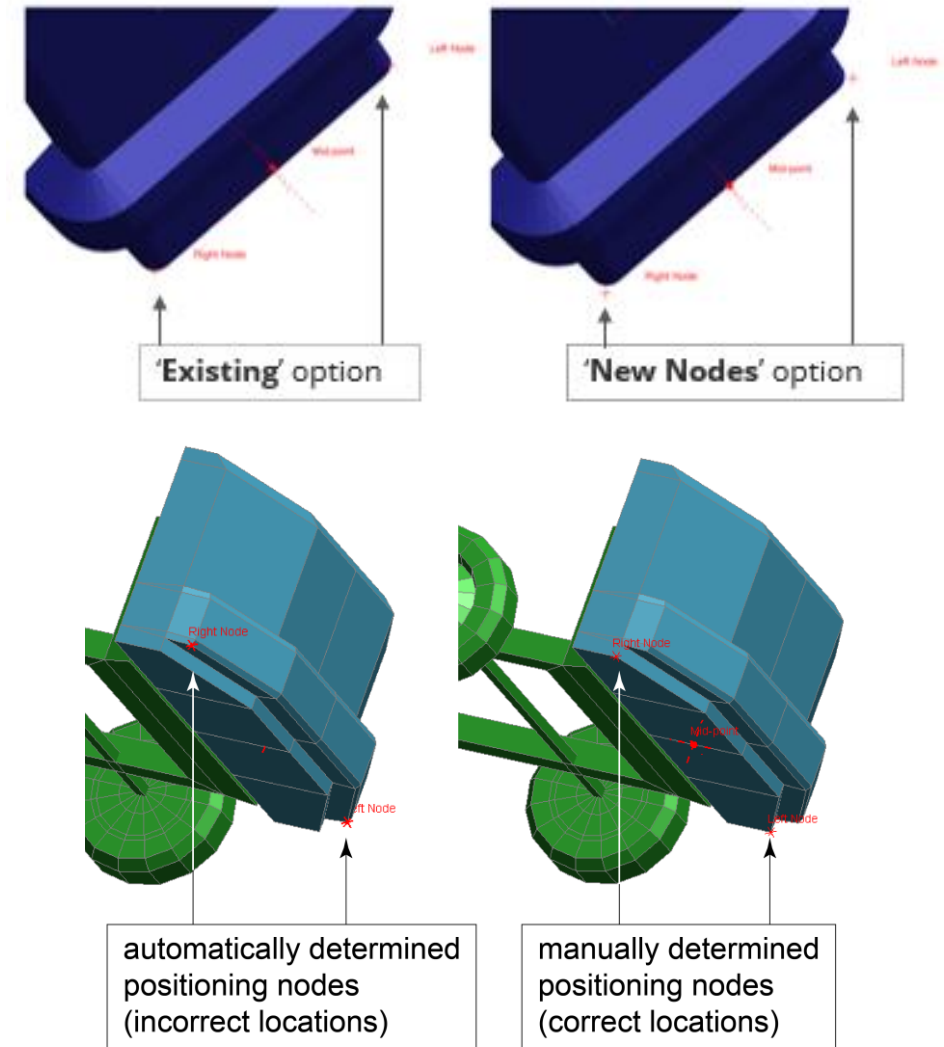
## Barrier Part Set for Contact and Alignment

When you select/create a Barrier Part Set, you will be given the opportunity to check and redefine the location of the barrier positioning nodes.

The upper two images show the ECER42 Low Speed Barrier, which has curved lower corners. In this case, the **New Nodes** option in the 'Check Nodes' window can be used to automatically create two new external nodes at the intersections of the lowest extreme edges and use them as the barrier positioning nodes.

The lower two images show the IIHS Side Barrier, which has a more complicated geometry. In this case, Crash Test Setup has not identified the correct locations of the positioning nodes. The positioning nodes should **always** be located on the **lowest** edge of the front face of the barrier.

Check Nodes		?	—	□	×
Lower Left Corner Node:	140033761	Change Node			
Lower Right Corner Node:	140033762	Change Node			
Use Default Nodes:	<input checked="" type="checkbox"/>	Existing	New Nodes		
(currently sketching nodes and mid-point)		Accept			



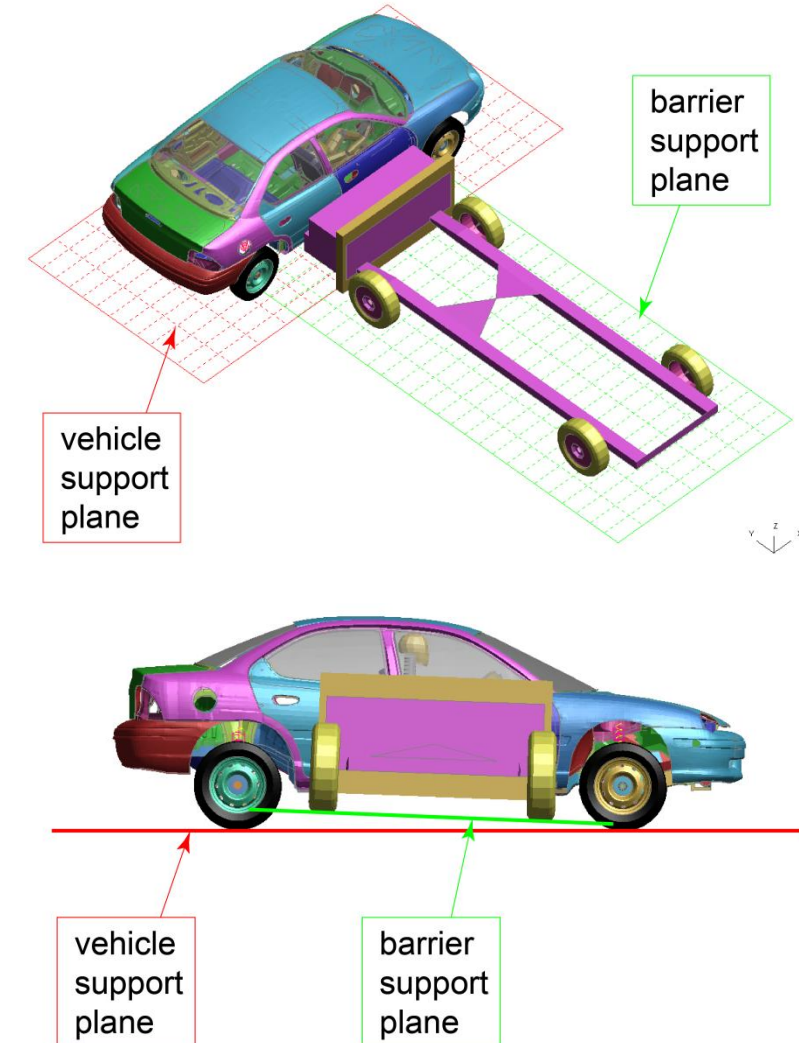


# Barrier Settings Panels

## Wheel Support Plane

The Barrier Support Plane is used to support the barrier during the analysis. Unlike the Ground Plane, it does not necessarily represent the real-world ground and can be in a different position. The Barrier Support Plane is always positioned in contact with the lowest surface of the barrier's wheels. This means that sometimes the plane is at an incline to the horizontal, if the barrier has been rotated during the setup.

If you choose to create a Barrier Support Plane, a **\*RIGIDWALL\_PLANAR\_FINITE\_ID** card is created. The extent of the finite planar rigid wall is defined by footprint of the barrier, plus the **Support Plane Border Size**, which can be set in the Preferences. If you choose the **Node Set** option, define a node set containing all of the nodes that will be checked for penetration with the rigid wall during analysis. For example, you might want to define a node set containing all of the nodes in the tyres.



# Barrier Settings Panels

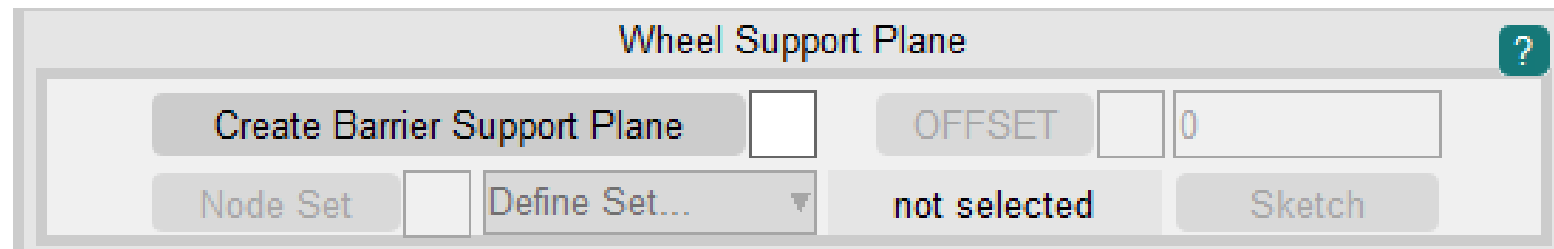
## Wheel Support Plane

Alternatively, or in addition, you can choose the **OFFSET** option and define an offset value in the textbox. All of the nodes found within the offset distance from the rigid wall will be checked for penetration during analysis.

If you choose neither option, Crash Test Setup will define a node set containing all of the nodes in the barrier, and so all nodes will be checked for penetration during analysis.

The top image on the right shows a EuroNCAP Side Impact (R-point) test with planes supporting the vehicle and barrier. The lower image illustrates an inclined Barrier Support Plane as a result of a rotated barrier.

For more help, refer to the descriptions of the Ground Plane and Wheel Support Plane **vehicle settings panels**.



The screenshot shows the 'Wheel Support Plane' settings panel. It features a title bar with a question mark icon. The panel contains two rows of controls. The first row has a 'Create Barrier Support Plane' button, a checkbox, an 'OFFSET' button, another checkbox, and a text box containing the value '0'. The second row has a 'Node Set' button, a dropdown menu showing 'Define Set...', a 'not selected' status indicator, and a 'Sketch' button.

# Barrier Settings Panels

## Set for Initial Velocity

Crash Test Setup allows you to define the initial velocity of the barrier. In some tests, the barrier moves into the vehicle, in which case you need to define the initial velocity here (in the barrier settings). If the vehicle is moving, complete the vehicle settings panel instead. Choose **Auto-Create**, **Node Set** or **Part Set**:

- **AUTO-CREATE** (recommended)

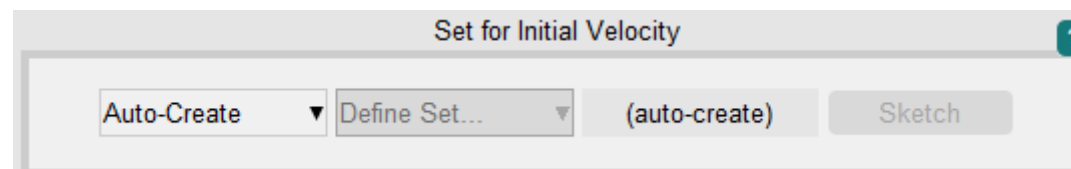
If you choose Auto-Create, when you click **GO**, Crash Test Setup will automatically create a new part set containing all of the parts in the barrier. It will then create an **\*INITIAL\_VELOCITY\_GENERATION** card referencing this set.

- **PART SET** (choose this option if you want to use an existing set, or if you want control over how the part set is created)

If you choose Part Set, define a part set by creating a new part set or selecting an existing one. Crash Test Setup will then create an **\*INITIAL\_VELOCITY\_GENERATION** card referencing this set.

- **NODE SET** (choose this option if you want to use **\*INITIAL\_VELOCITY** instead)

If you choose Node Set, define a node set by creating a new node set or selecting an existing one. Crash Test Setup will then create an **\*INITIAL\_VELOCITY** card referencing this set. Crash Test Setup will also create a new part set containing all of the parts in the barrier. The IRIGID field of the initial velocity card will contain this part set ID.

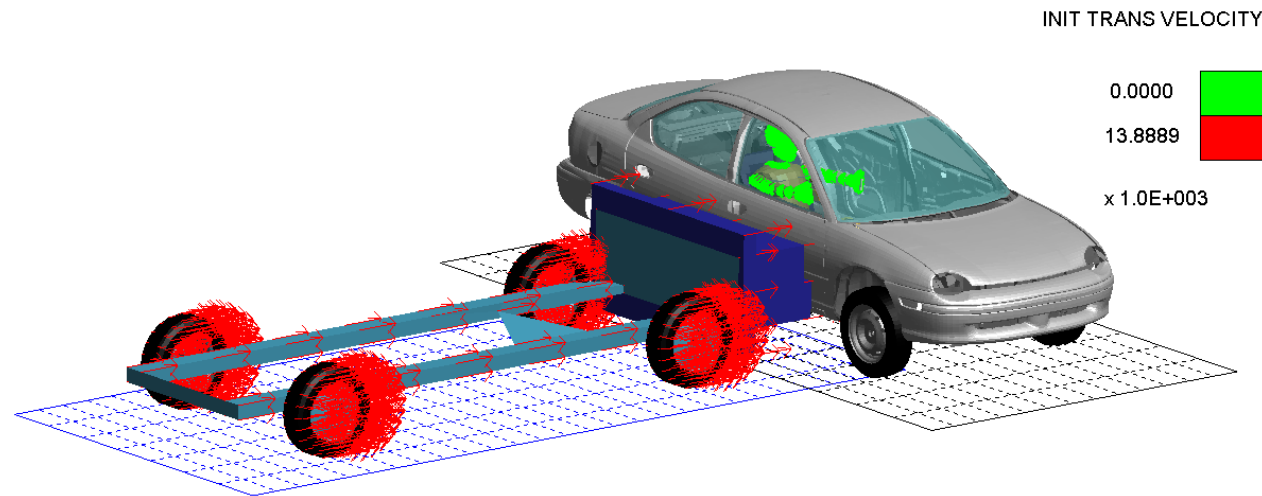


# Barrier Settings Panels

## Set for Initial Velocity

Whether an **\*INITIAL\_VELOCITY** or **\*INITIAL\_VELOCITY\_GENERATION** card is created, the IRIGID field will reference a part set. Initial velocities defined in **\*PART\_INERTIA** cards for parts in this set will be overwritten.

In this illustration, the zero initial velocity assigned to the occupant via **\*PART\_INERTIA** is unchanged because values are only overwritten for parts within the barrier.



# Batch crash test setup scripts



# Batch crash test setup scripts

- The BATCH Crash Test Setup script can be used set up multiple different load cases at once and write them to separate master files. This automates the setup process and makes it easier to generate many load cases.
- The test setups can be saved as an XML file so they can be reused and modified later using the script.
- Two scripts are available, one with a user interface to help the user generate/modify the test setups and to run them. A second script, with no UI can be used run the cases straight from the XML file.
- The batch scripts can run the all the predefined load cases, as well as user modified load cases and barriers. It also allows for different vehicle settings to be used.



# Batch crash test setup UI

- Select input vehicle model, crash test type, vehicle/barrier settings and name/location of the generated master file. The red light on the right indicates that the setup on this line is invalid.

	Vehicle Model	Crash Test	Vehicle Settings	Barrier Settings	Title Appended	Output Master File
<input checked="" type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...
<input type="checkbox"/>	<input type="text"/> Options...	<input type="text"/> Options...	<default> Options...	<default> Options...	Options...	Options...

Import Batch XML File:  Import

Read additional user preferences:  Read

Save Batch XML File:  Save

Cancel GO

- Previously generated batch test setups can be imported and modified.

- Additional test, vehicle and barrier settings can be read from preference files

- The batch test setup can be saved as XML files.

- The crash tests can be generated if the batch tests are valid

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