



Altair

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**HyperWorks**

Altair MotionView 2019 Tutorials

MV-8500: Using the Truck Library

# MV-8500: Using the Truck Library

## Introduction

The purpose of this tutorial is to walk you through the process of how to build a full truck model with advanced drivers and how to add events to the model built. The new event user interface is supported only for models with advanced drivers. Files can be edited or updated in the event editor. Sixteen event types are supported. To learn more about the events, see the *Full vehicle with Advanced Drivers* topic.

The process involves:

- Launching MotionView
- Building a Full Truck Model with Driver
- Adding Events to the Model
- Viewing Reports

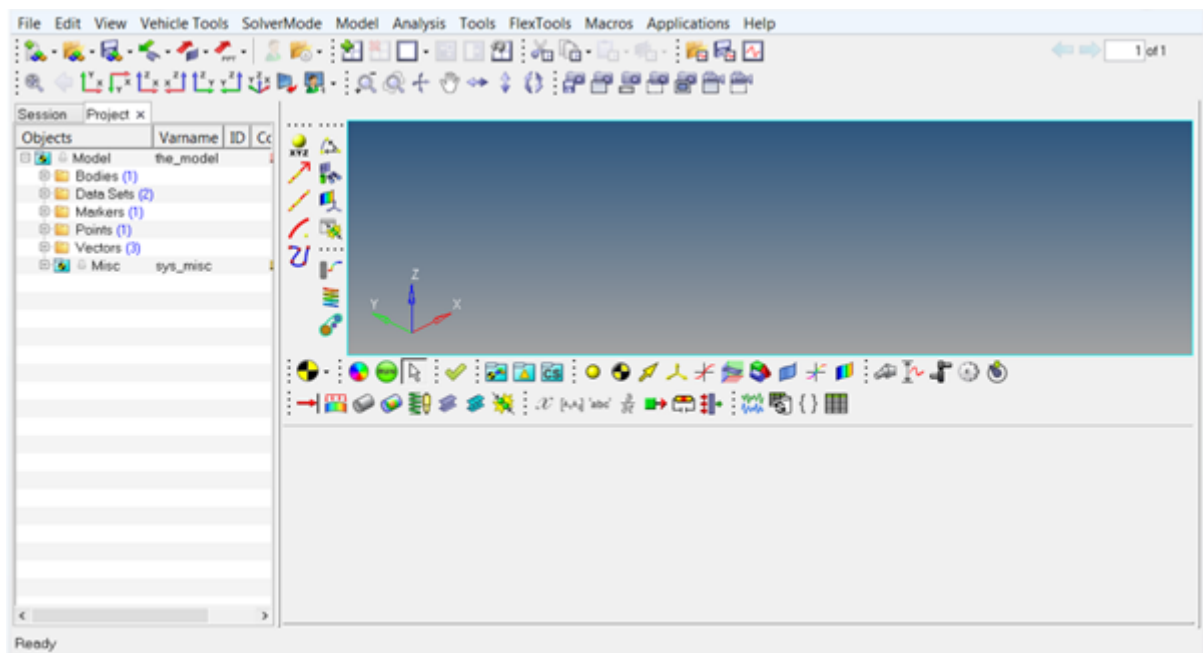
## Step 1: Launching MotionView.

In MotionView, models are assembled from libraries of pre-defined systems using the **Assembly Wizard**. The *Assembly Wizard* dialog guides you through the assembly process, ensuring that your selections are compatible.

**Note** The MBD Vehicle Dynamics Tools preferences must be loaded before using the event builder. Select **File > Load > Preference File > MBD-Vehicle Dynamics Tools** from the MotionView interface.

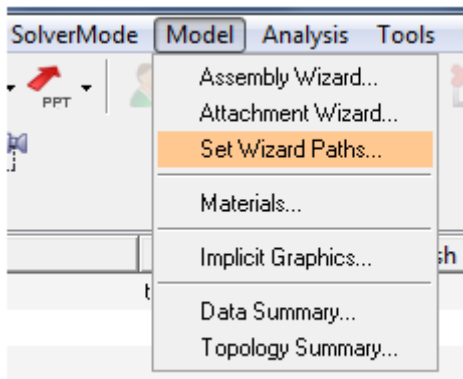
1. Start a new MotionView session.

The MotionView window is displayed.

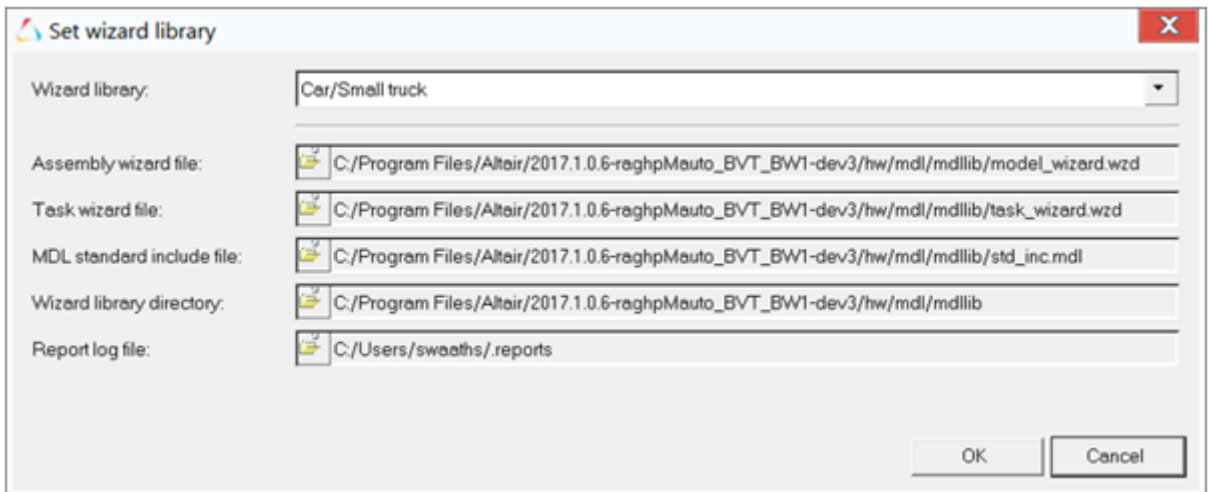


**Note** Set the required truck wizard paths to start assembling the model through **Assembly Wizard** dialog.

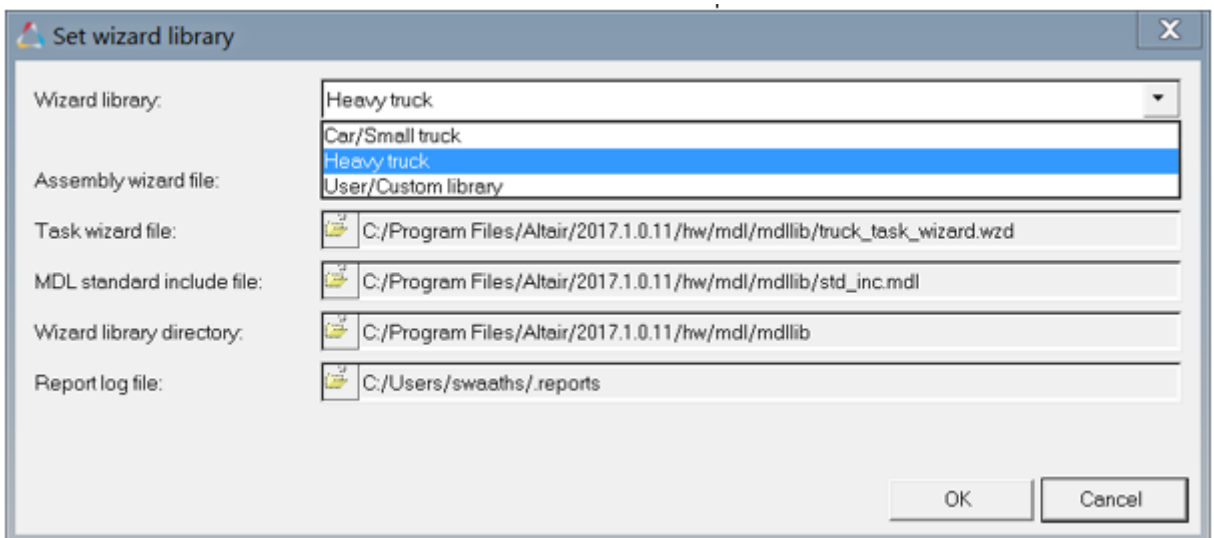
2. Click **Model > Set Wizard Paths**.



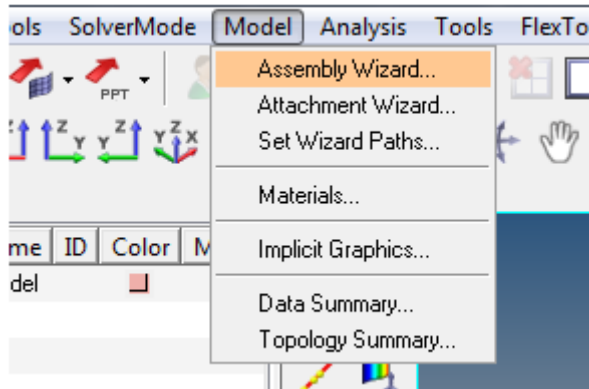
The **Set wizard library** dialog is displayed.



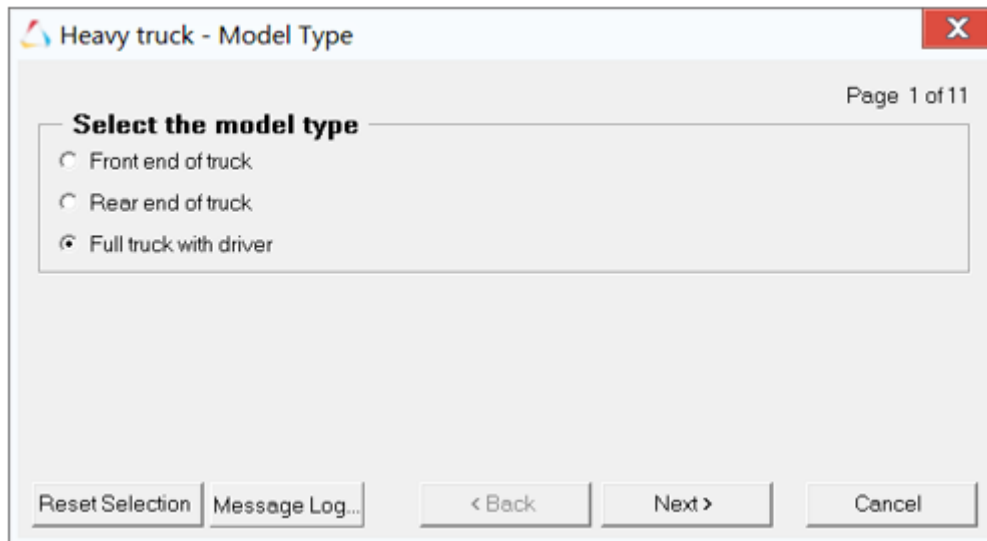
3. From the **Wizard library** drop-down menu, select the **Heavy Truck** option. Browse and locate the required paths from the installation folder and click **OK**.



4. Click **Model > Assembly Wizard**.



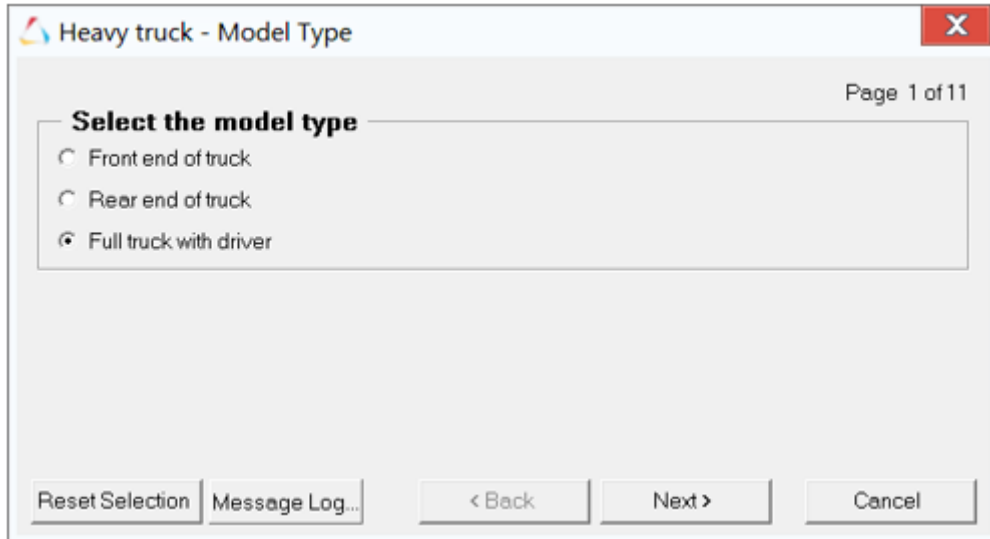
The **Heavy truck - Model Type** window is displayed.



## Step 2: Building a Full Truck Model with Driver.

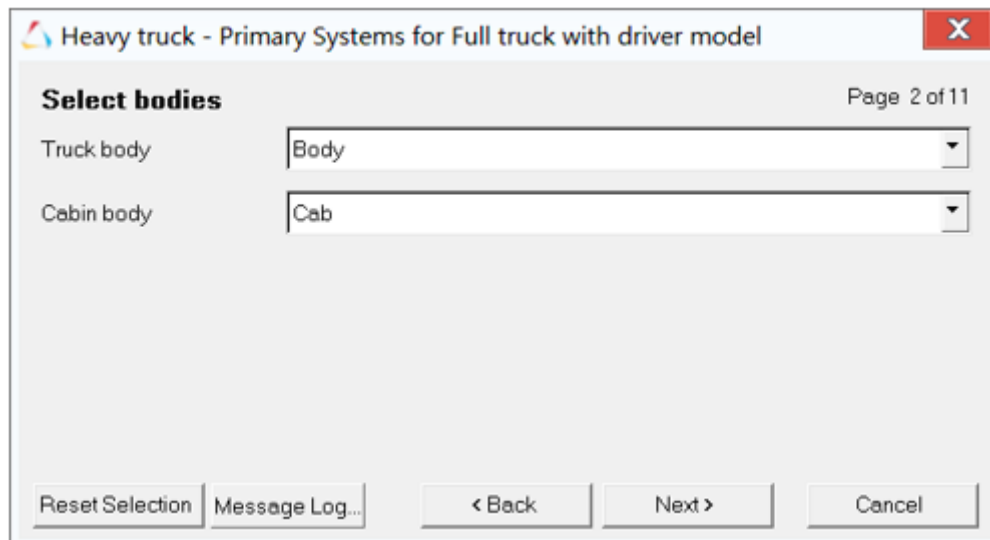
In MotionView, truck models are assembled from libraries of pre-defined systems using the **Heavy Truck library**. It guides you through the assembly process, ensuring that your selections are compatible. The **Full truck with driver** model type builds the model with steering, front suspension, rear suspension, powertrain, driveline, and driver signal generator.

1. Select the **Full truck with driver** option and click **Next**.

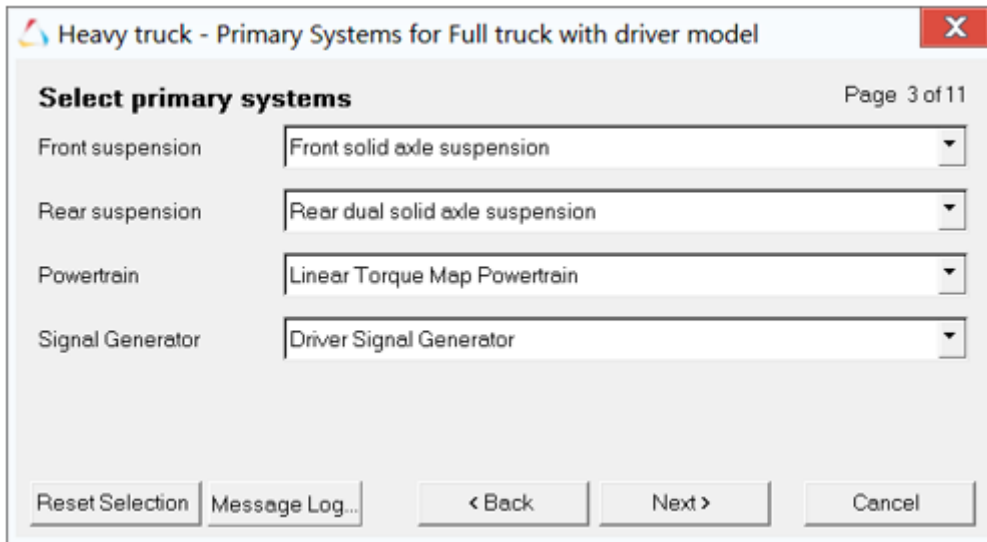


### Primary Systems Selection

2. Select the **Body** and **Cab** from the **Truck body** and **Cabin body** drop-down menus respectively and click **Next**.

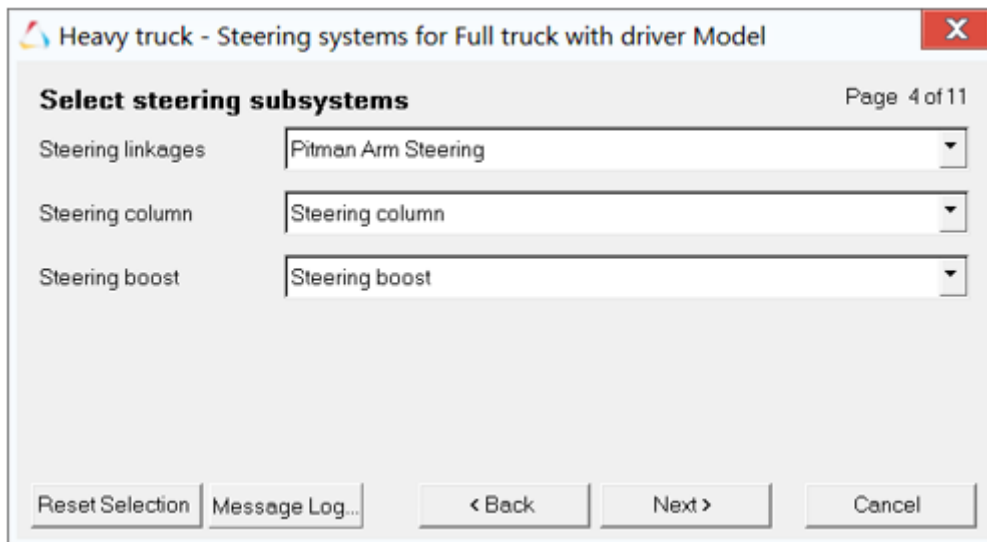


3. Select **Front solid axle suspension** for the **Front suspension**, **Rear dual solid axle suspension** for the **Rear suspension**, **Linear Torque Map Powertrain** for the **Powertrain**, and **Driver Signal Generator** for the **Signal Generator** and click **Next**.



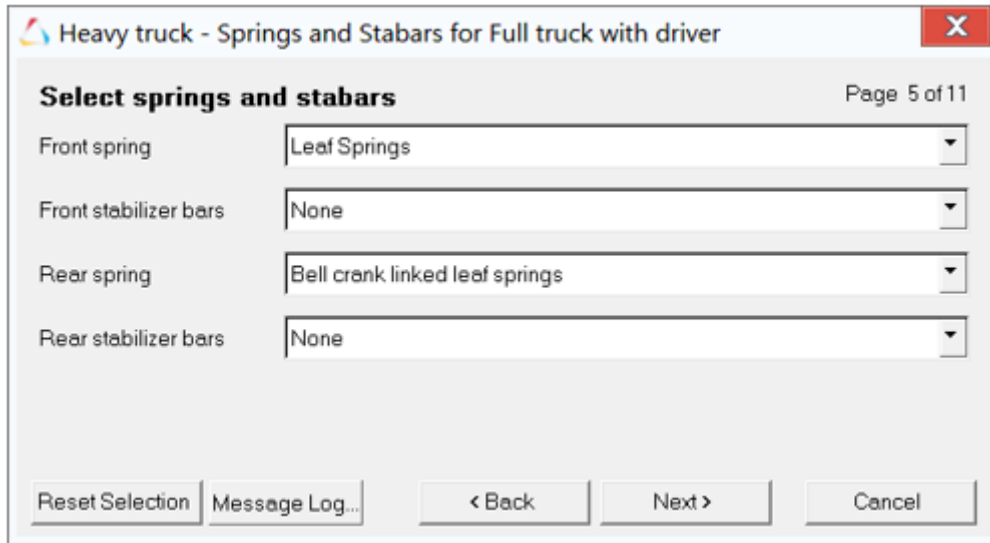
### Steering Systems for a Full Truck Model

4. Select **Pitman Arm Steering** for the **Steering linkages**, **Steering column** for the **Steering column**, and **Steering boost** for the **Steering boost** in the steering subsystems page.



### Springs and Stabars for a Full Truck Model

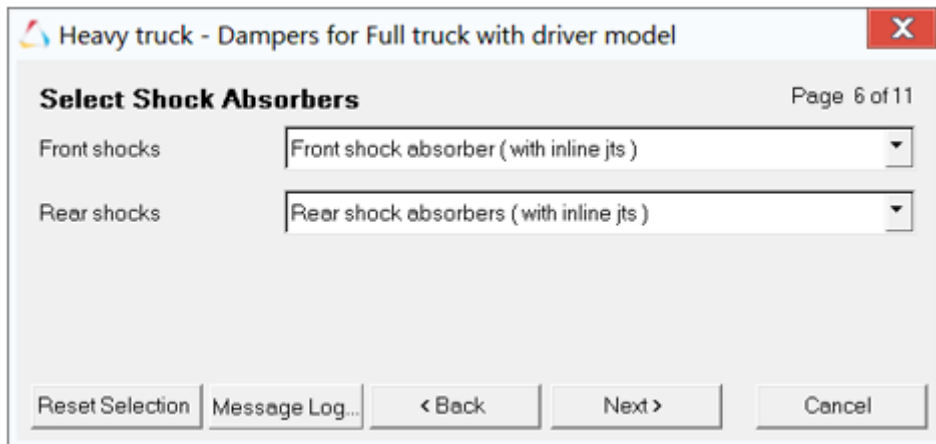
5. Select **Leaf springs** for the **Front spring** and **Bell crank linked leaf spring** for the **Rear spring** for the model and click **Next**.



**Note** Based on the suspension type selected for the **Front suspension** and **Rear suspension**, the **Front spring** and **Rear spring** options are modified accordingly.

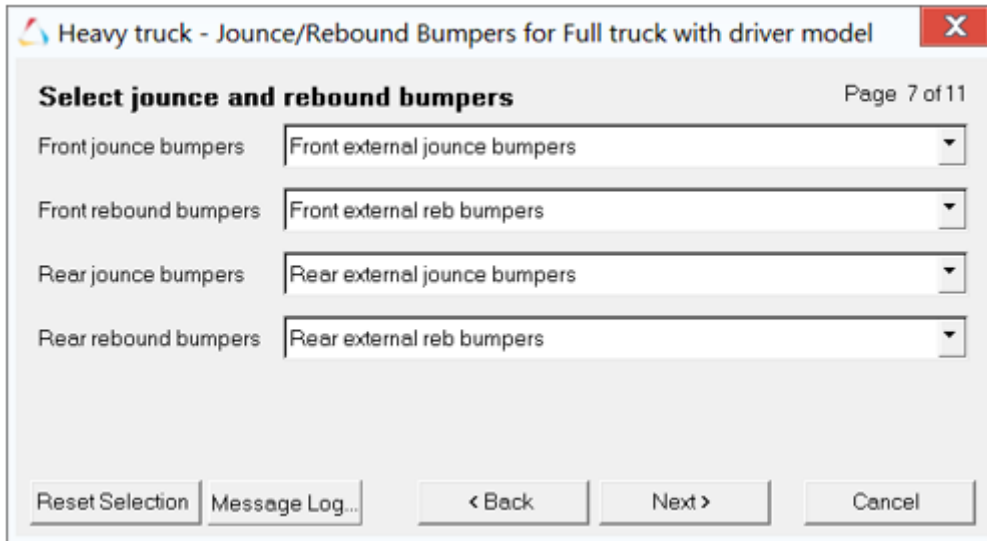
### Shock Absorbers

6. Select the required shock absorbers from the **Front shocks** and **Rear shocks** drop-down menus and click **Next**.



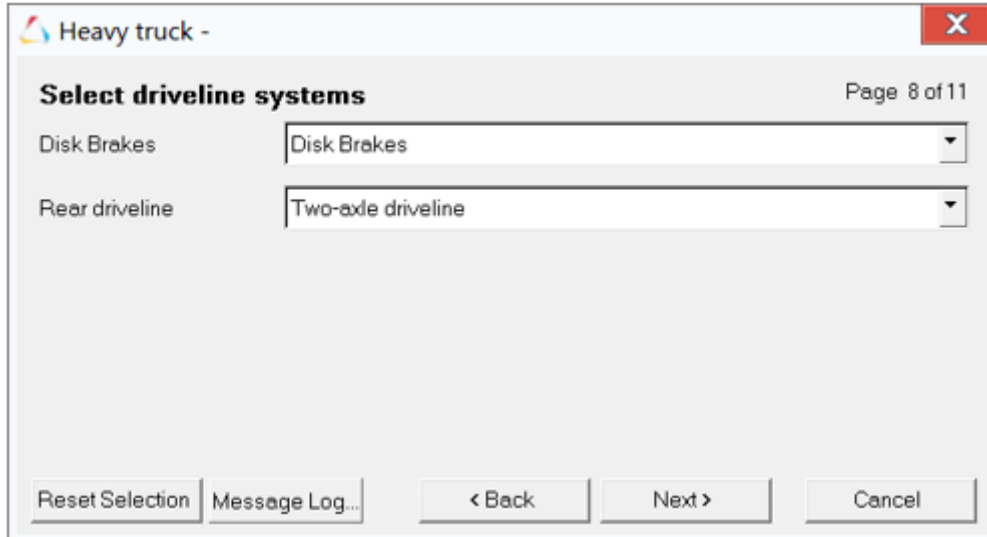
### Jounce/Rebound Bumpers

7. Select the following options for the Front and Rear Jounce/rebound bumpers and click **Next**.



### Driveline Systems

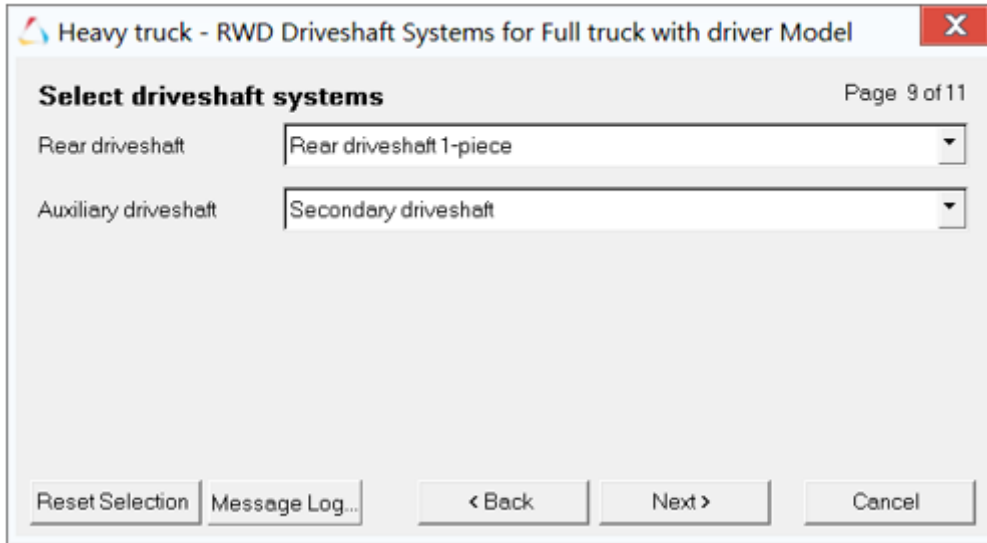
8. In the next page, select **Disk Brakes** and **Two-axle driveline** from the **Disc Brakes** and **Rear driveline** drop-down menus respectively and click **Next**.



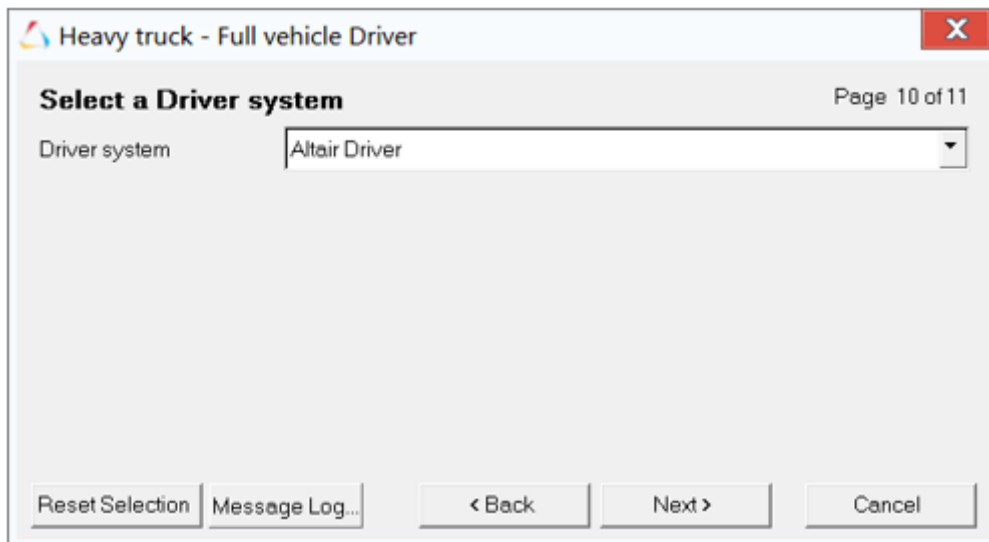
**Note** Based on the suspension type selected, the **Rear driveline** options are modified accordingly.



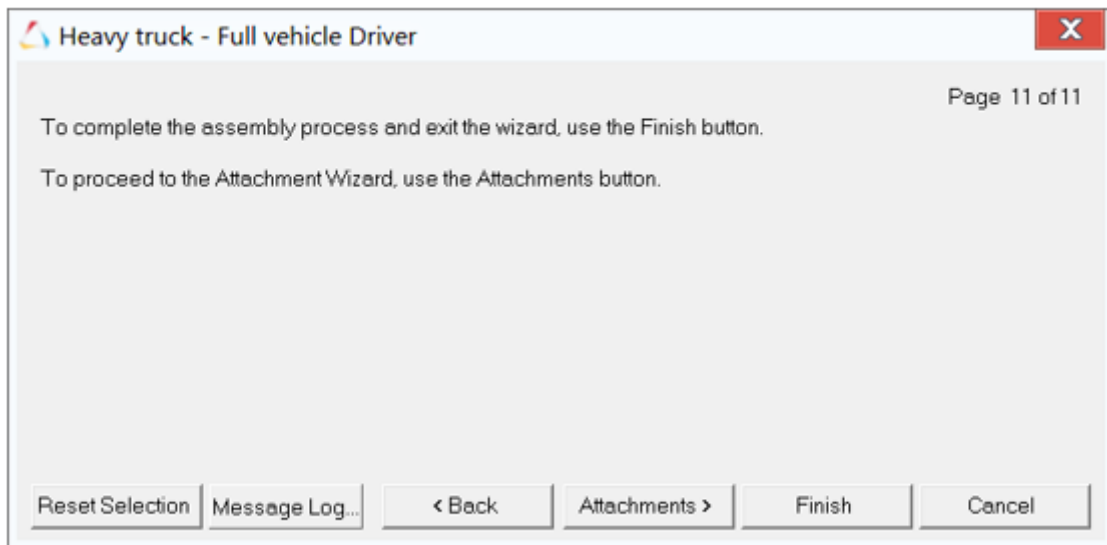
9. For a full truck with advanced driver, you have to select the required driveshaft systems from the **Rear driveshaft** drop-down menu as shown in the image below.



10. Select the required **Driver system** for the full truck model as shown in the image below.



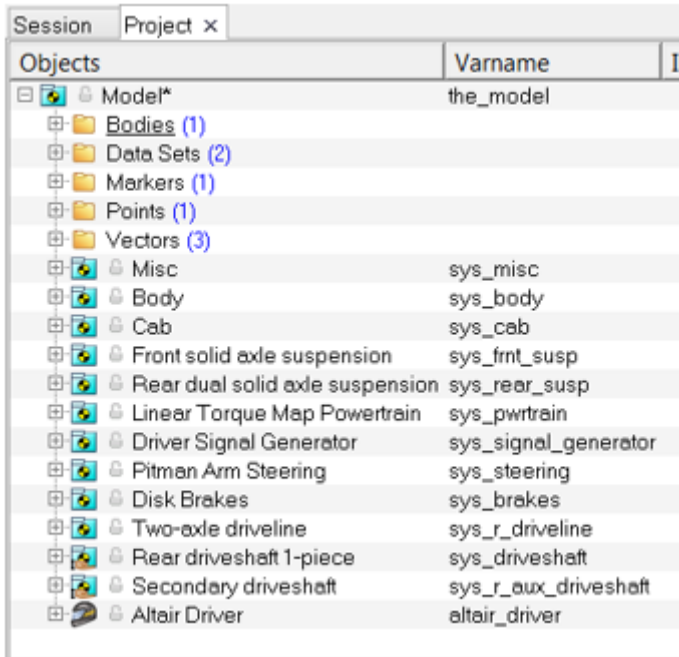
11. Now that you have selected all the required systems for the model, click the **Finish** button to complete the process and exit the custom library wizard.



12. The full truck with driver model is displayed in the MotionView window.



13. The subsystems that you have selected in the Custom library wizard to build the model are displayed in the **Project** browser.



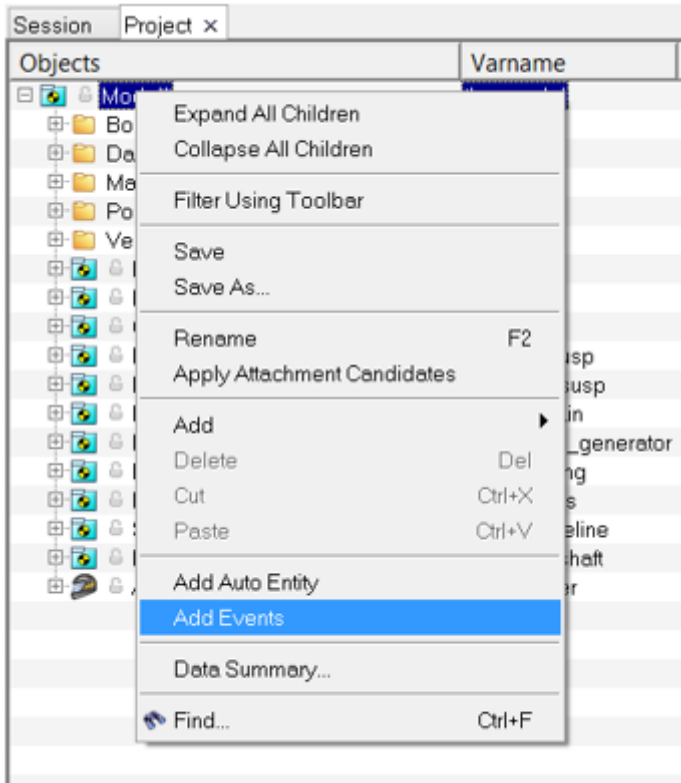
### Step 3: Adding Events to the Model.

The following steps outline how to add an event to the previously built model. Currently, sixteen event types are available in the advanced driver models:

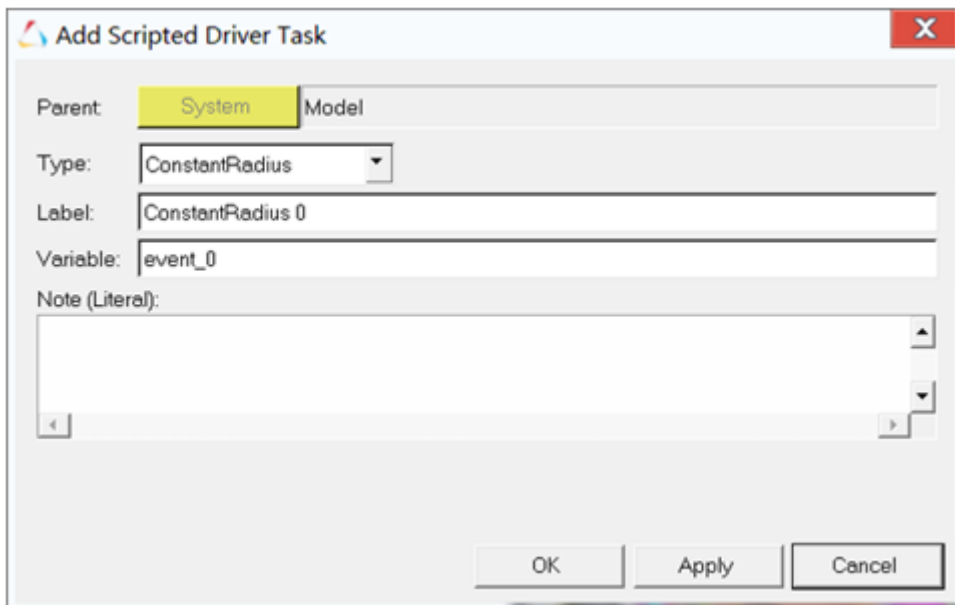
- Constant Radius
- Single Lane Change
- Double Lane Change
- Swept Sine
- Straight Line Acceleration
- Straight Line Braking
- Sinusoidal Steering
- BrakeIn Turn
- J Turn
- Throttle off cornering
- Swept Steer
- Pulse Steer
- Throttle off TurnIn
- Step Steer
- Power off In Straight Line
- Altair Driver File

Each event type has different options that needs to be addressed. For example, in the following steps **Constant Radius** is explained.

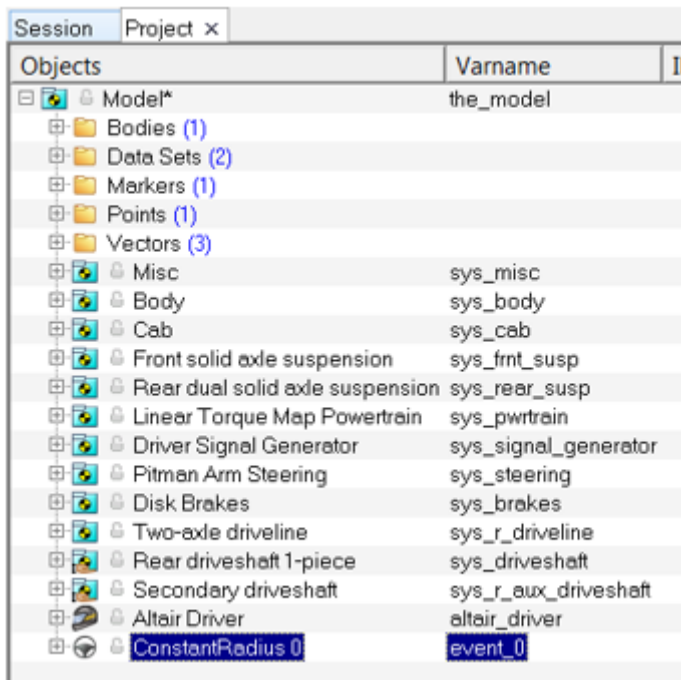
1. Right-click on **Model** in the **Project** browser and select **Add Events** from the context menu.



2. The **Add Scripted Driver Task** dialog is displayed.



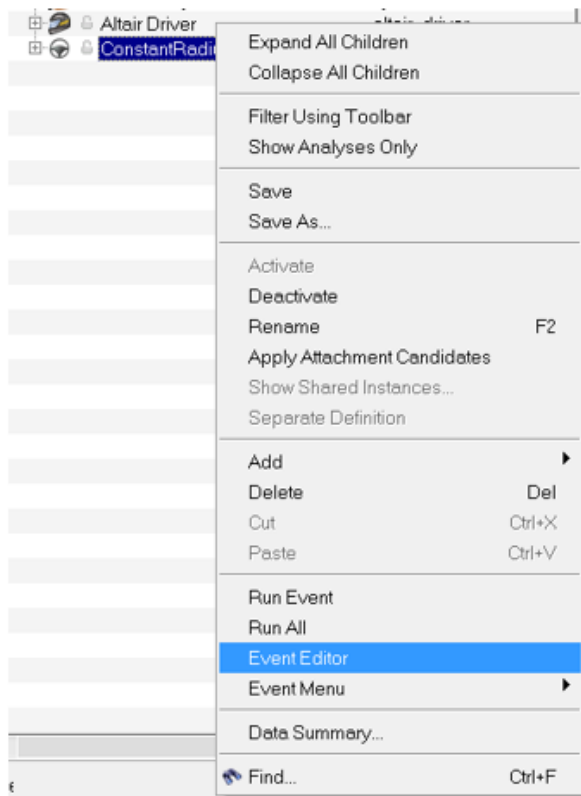
- From the **Type** drop-down menu, select the **Constant Radius** event and click **OK**.  
The **Constant Radius** event is added in the **Project** browser.



- The **Event Editor** is displayed in the panel area.



5. The **Event Editor** window can be invoked by right-clicking on the event type in the **Project** browser and selecting **Event Editor** from the context menu.

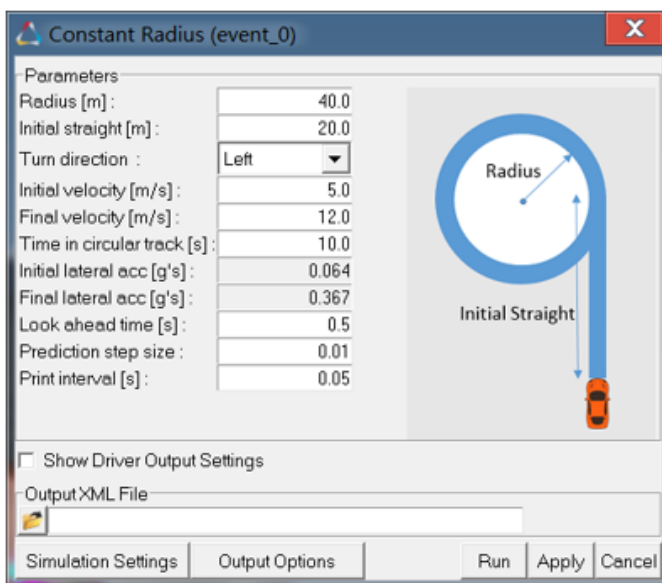


OR

– You can click on the **Event Editor** button in the panel area.

6. Click the **Event Editor** button from the panel area (or from the list).

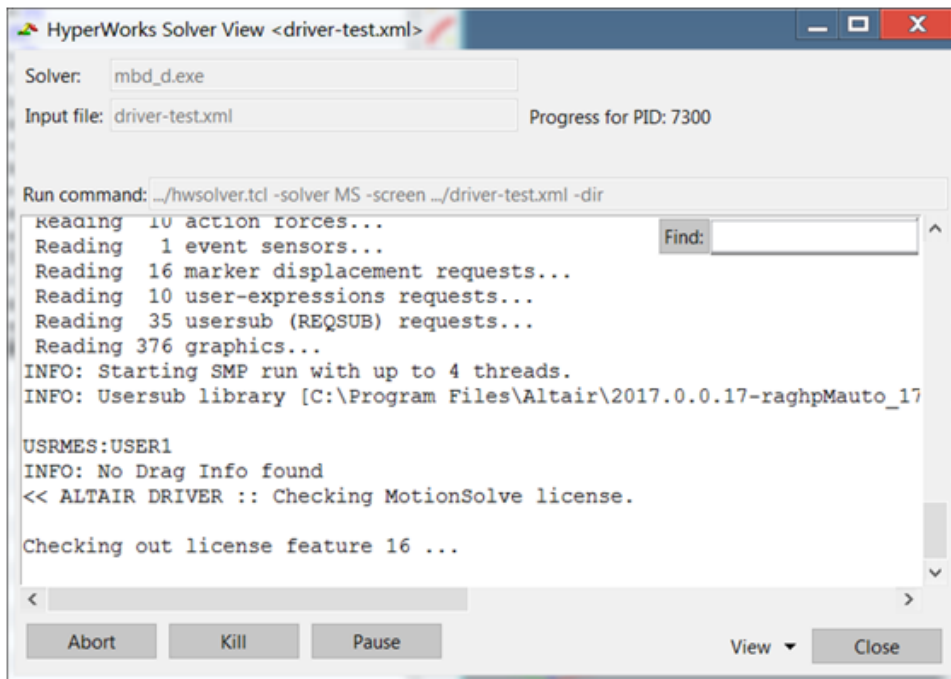
The Constant Radius event's parameter is displayed.



7. Enter the above information in the **Parameters** section and browse and locate the file path in the **Output XML File**.
8. After entering all the required data, the event is ready to run. Click the **Run** button.

**Note** An ADF (Altair Driver File) is generated with all the event parameters at the XML file path (**Output XML File**) location. The model is exported and MotionSolve starts to generate the result files.

Hyperworks MotionSolve is invoked in the background.

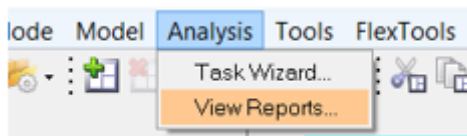


9. After the MotionSolve run is completed, close the window and return to the MotionView interface. The generated file types include: .adf, .plt, and .h3d files.

### Step 4: Viewing Reports.

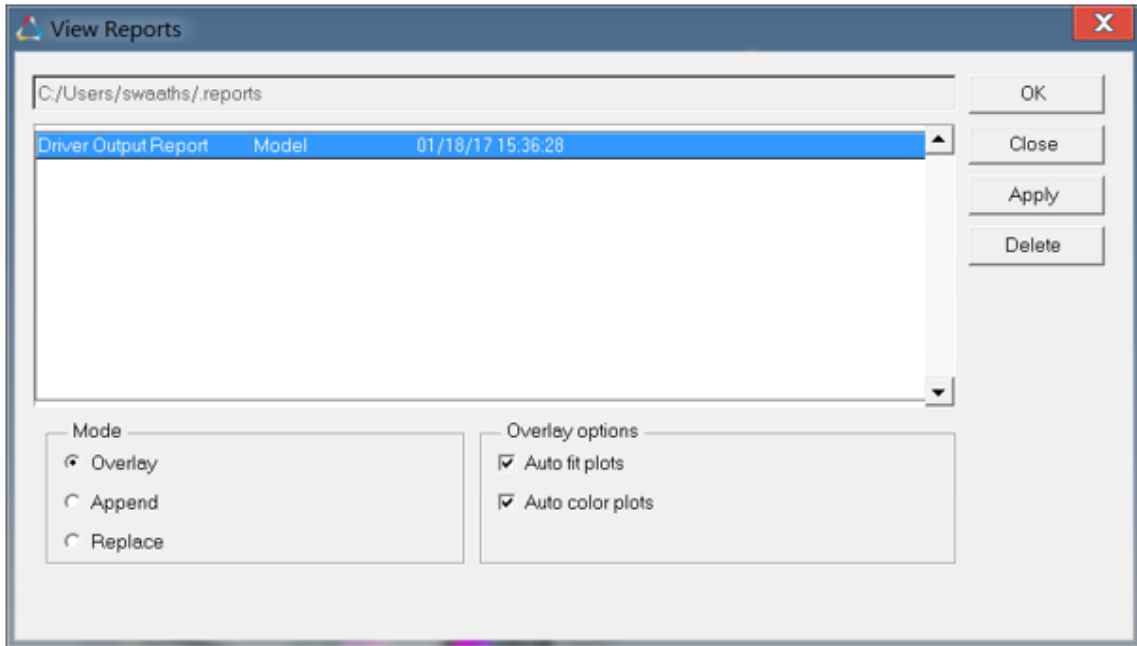
Report templates are a series of pre-defined plots that apply the standard set of plots required for an event. A report template generates all of the plots and properly labels them.

1. Click **Analysis > View Reports**.



The **View Reports** wizard is displayed.

2. Select the **Driver Output Report** option from the **View Reports** window and click **OK**.



3. A series of report templates are displayed in the **Plot** browser. You can select the required report template to view in detail.

