

-Moving Loads-

Vehicles creation by User database editing.

(Autodesk Robot Structural Analysis 2011/2012)


If you want to create few vehicles it could be interesting to make this creation directly in a user database.

Indeed, the copy/paste functions don't work in the vehicle definition table in Autodesk Robot Structural Analysis, for each new vehicle you'll want to create, you'll have to enter again all the new vehicle parameters.

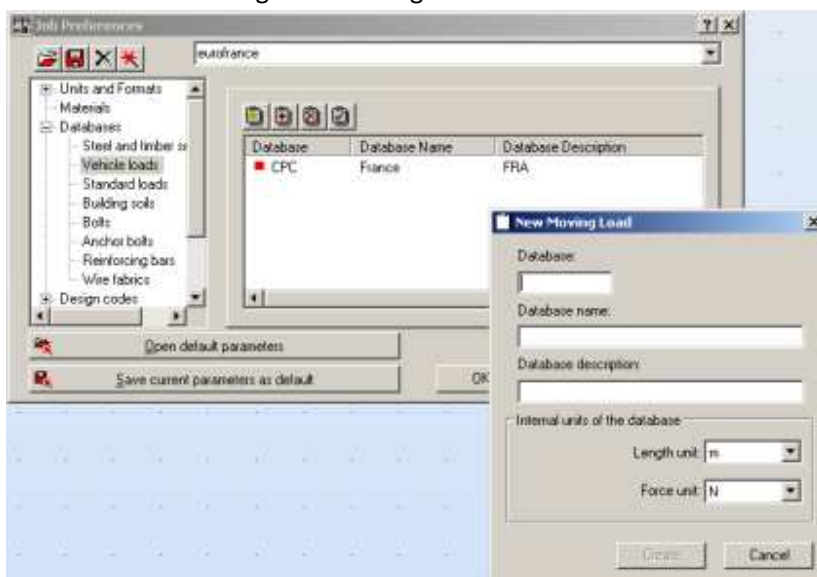
With a database editing you will be able to create many vehicles easily and quickly.

1-Vehicle user database creation

To create the database which will regroup all of your vehicles, scroll down the « tools » menu, click on « Job preferences » and select « Vehicle loads » in the tree « Database ».

Click on the button "Create new user's database" 

Fill the « New moving load » dialog box:



Catalogue : In the field "Database" Enter the name of your new user database. The software will automatically rename this database: "V_database name.xml" in the example against the database has been renamed "V_Roulante.xml".

Just after you'll click on the create button, the database will be created.

This database will be located:

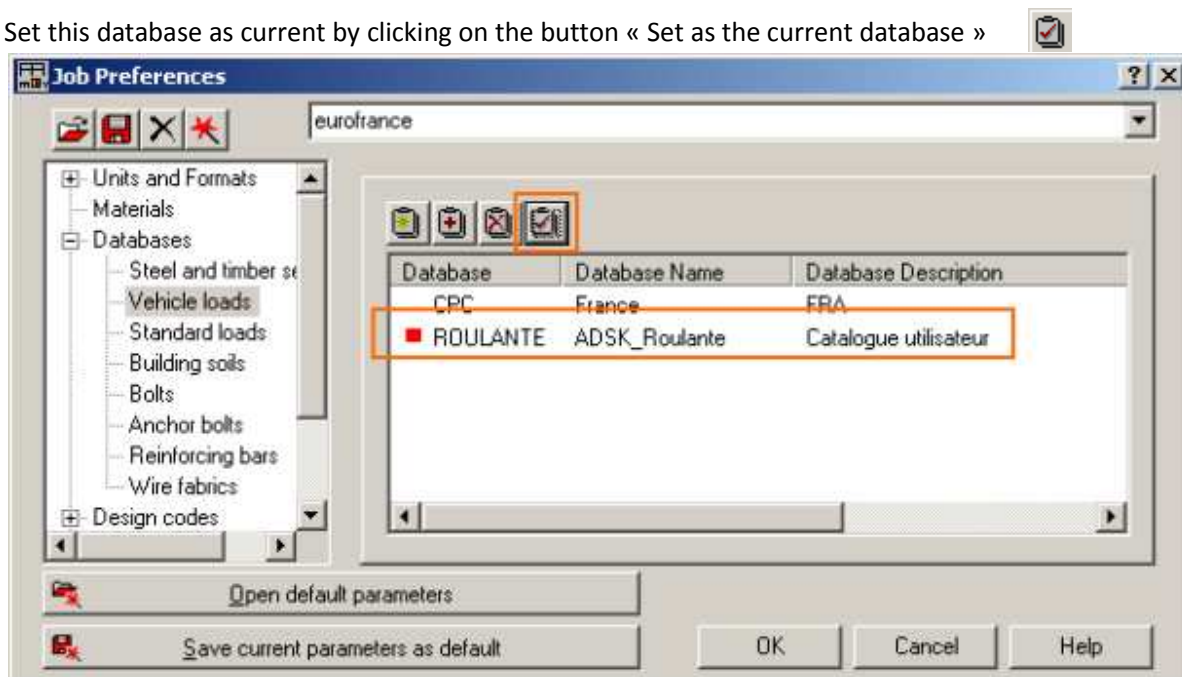
For Windows Xp :

C:\Documents and Settings\%user%\Application Data\Autodesk\Structural\Common Data\2012 (or 2011 depends on the version you are using).

For Windows Vista and Seven :

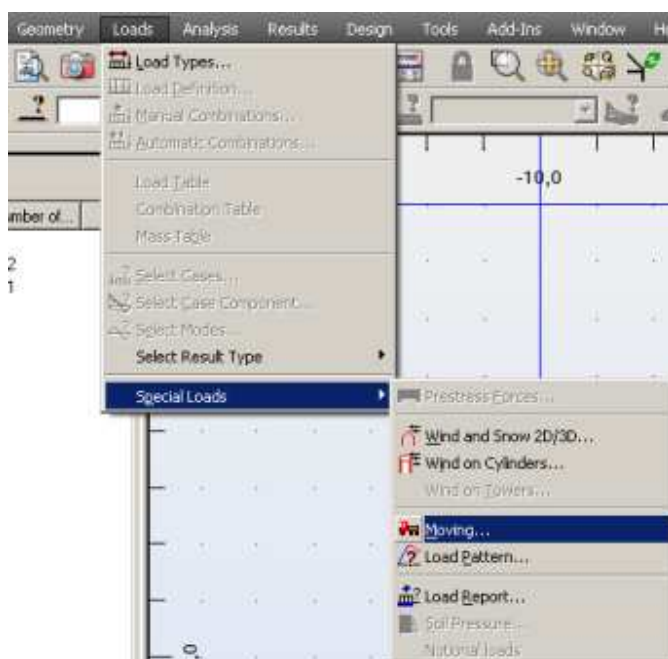
C:\Utilisateurs\%user%\AppData\Roaming\Autodesk\Structural\Common Data\2012 (or 2011 depends on the version you are using).

Set this database as current by clicking on the button « Set as the current database »



2-Vehicle creation and database Editing:

We strongly suggest you to create the first vehicle as usual by using the new vehicle creation interface of Autodesk Robot Structural Analysis .

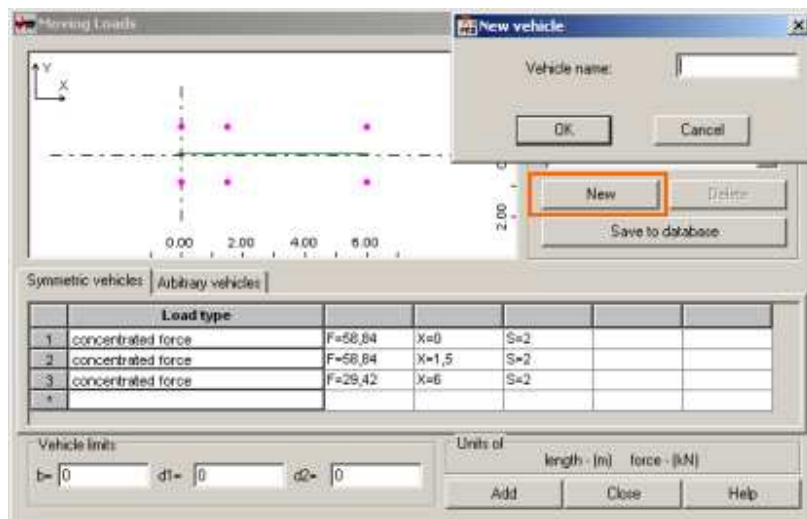


Scroll down the “Loads” Menu then select “Special loads” and “Moving...”:

In the « Moving Loads » dialog box click on the « New vehicle » button (see below):

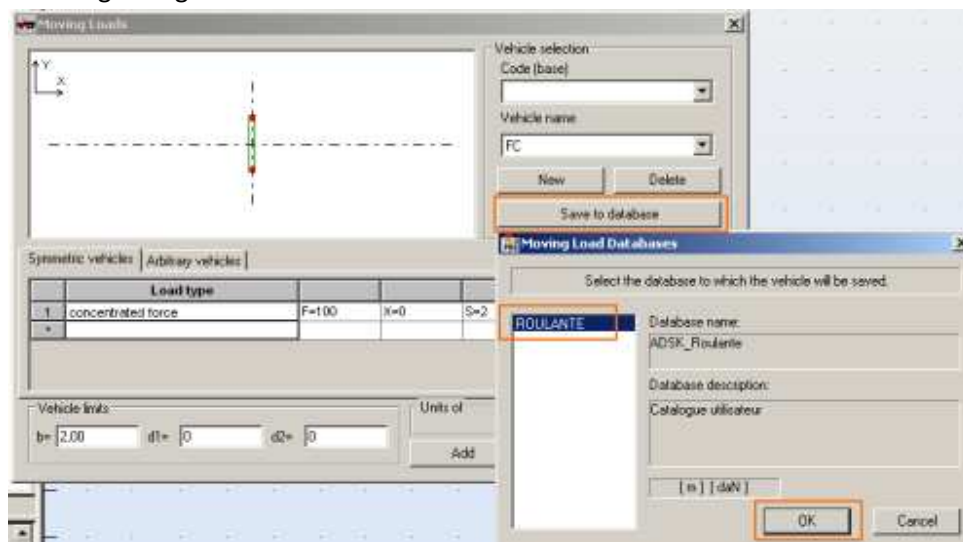


In the new «Moving loads» dialog box, click on « New » and enter a name for your new vehicle.



Correctly set your first vehicle with the definition table. For the example, a symmetric vehicle has been created.

Once the vehicle has been correctly set, click on the button « Save to database » and click « Ok » on the following dialog box:



At this stage your User database contains one vehicle.

Close all the dialog boxes concerning the moving loads then access to the user database (see paths indicated on the first page of this document)

To correctly and easily edit your *.xml database we strongly suggest you to use an *.xml editor.

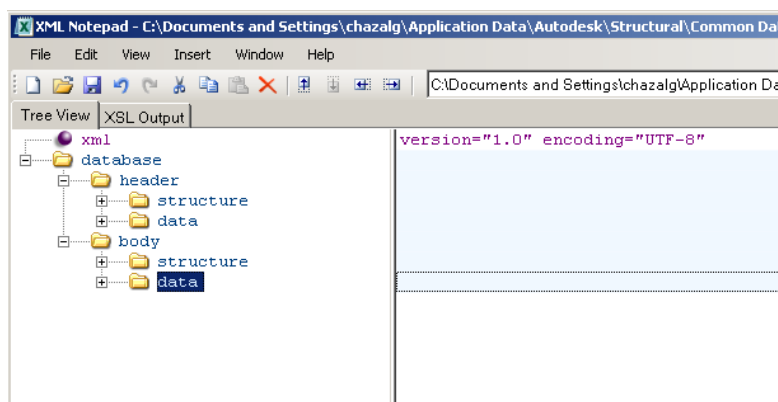
This will allow you to visualize the *.xml file in a structured way.

Indeed, this kind of file could be opened and edited with any text editor (as notepad for instance), but the reading and the editing will be really complicated.

To create this tutorial, we used a free *.xml editor « XML Notepad ».

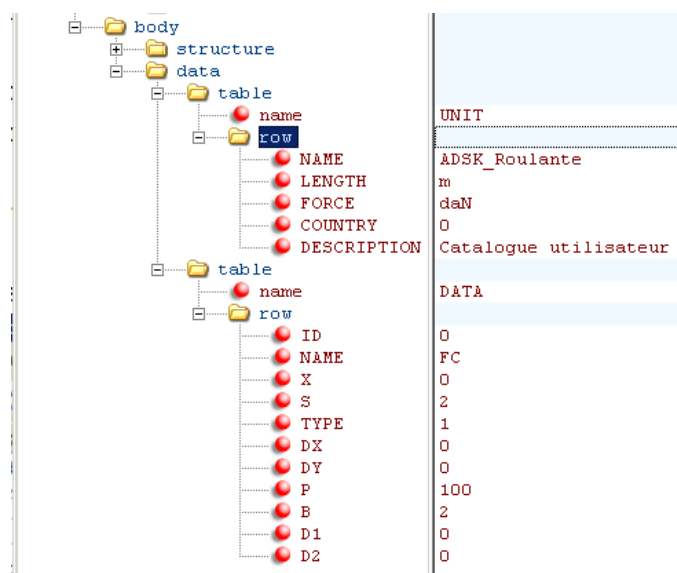
A search on internet will allow you to find other ones if you wish.

Open your vehicle database with the xml editor you chose.
The xml database has two nodes « header » and « body »:



Each node has two other nodes « Structure » and « data ». In our case, only the node “data” of the node “body” is interesting.

The node « data » has only two tables as we created only one vehicle:



The first one is the table « UNIT » in which you’ll be able to edit length and forces units if necessary.

The second one is the table “DATA” which contains all the vehicles of the database (in this case only one). Each node “Row” (could be different, depends on the xml editor you chose) contains all the parameters for one vehicle or part of a vehicle, each nodes also contains all the parameters necessary to create any vehicle type.

- ID : This value will always be equal to zero (0).
- NAME : Vehicle name you want to create:
- X : Load position on the X path’s axis.
- S : Spacing between forces in case of symmetrical vehicle or Y coordinate of the loads in case of arbitrary vehicles
- TYPE : Allow you to indicate which type of vehicle you want to create:
 Type=1 → « Concentrated forces » symmetric vehicle type.
 Type=2 → « Linear loads » symmetric vehicle type.
 Type=3 → « Surface loads » symmetric vehicle type.
 Type=10 → « Concentrated forces » Arbitrary vehicle type.
 Type=11 → « Linear loads » Arbitrary vehicle type.
 Type=12 → « Surface loads » Arbitrary vehicle type.

- DX :** Linear load length in direction X or, in case of surface vehicle, length of the side of the surface load in the direction X, or load intensity according the X direction for an arbitrary vehicle with concentrated loads
- DY :** Linear load length in direction Y or, in case of surface vehicle, length of the side of the surface load in the direction Y, or load intensity according the Y direction for an arbitrary vehicle with concentrated loads
- P :** Load intensity in Z direction.
- B :** vehicle width.
- D1 :** Distance between the load and the vehicle contour (from the vehicle front)
- D2 :** Distance between the load and the vehicle contour (from the vehicle back)

For example we will create with the xml editor the 2 vehicles below :

1-Symmetric vehicle with two linear loads $Q=120\text{daN/m}$, loads length= 1.50meters , space between loads= 2 meters

2-Arbitrary vehicle composed of the following concentrated loads:

At point 1 (0;1) : $F_z=100\text{daN}$, $F_x=66\text{daN}$, $F_y=50\text{daN}$

At point 2 (0.5;-1) $F_z=150\text{daN}$, $F_x=100\text{daN}$, $F_y=75\text{daN}$

1-Symmetric vehicle creation :

We know that each node « row » contains all the data for each kind of vehicle.

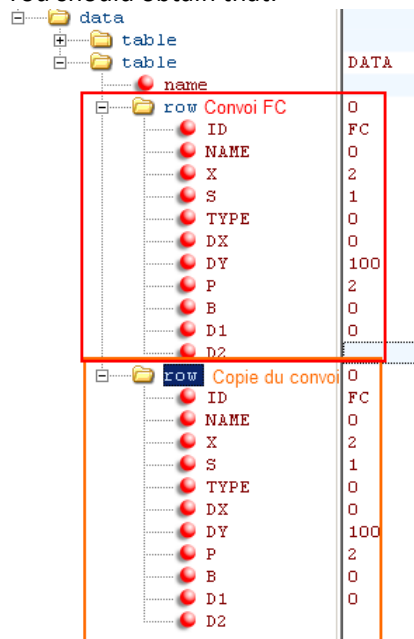
So we will simply duplicate the existing vehicle into the database.

To do that, right click on the node that contains the vehicle you want to copy then select « copy ».

Select the table node «DATA» that contain the vehicles data then right click and select «paste».

The screenshot illustrates the XML editor interface. On the left, the 'Tree View' shows a hierarchical structure: 'xml' contains 'database', which contains 'header', 'body', 'structure', and 'data'. 'data' contains two 'table' nodes, each with a 'name' and 'row' child. The right pane shows the 'XSL Output' for the 'DATA' table, displaying a list of rows with values for 'FC', 'name', and 'ID'. A context menu is open over the 'row' node, with 'Copy' selected. Another context menu is open over the 'table' node under 'data', with 'Paste' selected. An arrow points from the 'Paste' option in the second menu to the 'table' node.

You should obtain that:

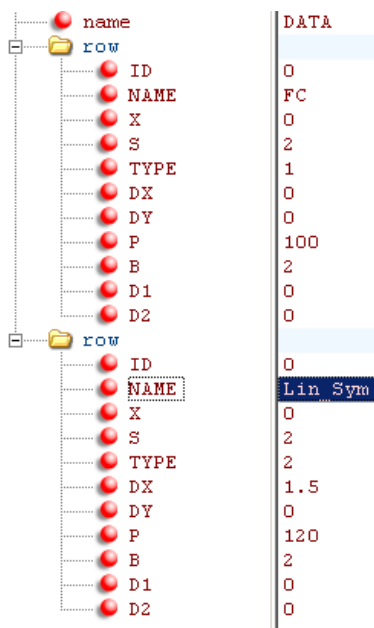


In the second node « row » which is the copy of the original vehicle, we will now editing our new vehicle settings.

Double click on the attributes « NAME » and rename the new vehicle from « FC » to, for instance, « Lin_Sym » .

Modify the same way the following attributes « TYPE », « DX », « P » et « B » with Type=2, DX=1.50, P=120 et B=2.

You should obtain that:



Save the file.

2-Arbitrary vehicle creation.

The creation principle is the same as previous but in this case we want to create an arbitrary vehicle (so non symmetrical) composed with few concentrated loads with different intensities at different locations. To do that we will simply create a new node for each new forces location in this cases there is two different locations, so we will copy the previous vehicle twice in the node DATA:

row	Convoi d'origine
ID	0
NAME	Lin_Sym
X	0
S	2
TYPE	2
DX	1.5
DY	0
P	120
B	2
D1	0
D2	0

row	Copie 1
ID	0
NAME	Lin_Sym
X	0
S	2
TYPE	2
DX	1.5
DY	0
P	120
B	2
D1	0
D2	0

row	Copie 2
ID	0
NAME	Lin_Sym
X	0
S	2
TYPE	2
DX	1.5
DY	0
P	120
B	2
D1	0
D2	0

Once the two new nodes are created, we need to rename the two attributes « NAME » (The NAME attributes should be the same in the two nodes as those two new nodes are parts of the same vehicle) we will rename those ones « FC_Arbi ». In the first node « FC_Arbi », we will now modify the vehicle type and the forces values;

modify the following attributes as proposed:

S=1; Type=10; DX=66; DY=50; P=100; B=2.

In the second node « FC_Arbi », modify the following attributes as proposed:

X=0.5; S=-1; Type=10; DX=100; DY=75; P=150; B=2.

You should obtain that:


row	
ID	0
NAME	FC_Arbi
X	0
S	1
TYPE	10
DX	66
DY	50
P	100
B	2
D1	0
D2	0

row	
ID	0
NAME	FC_Arbi
X	0.5
S	-1
TYPE	10
DX	100
DY	75
P	150
B	2
D1	0
D2	0

Save the file and close the xml data base editor.


3-Vehicle check in Autodesk Robot Structural Analysis :

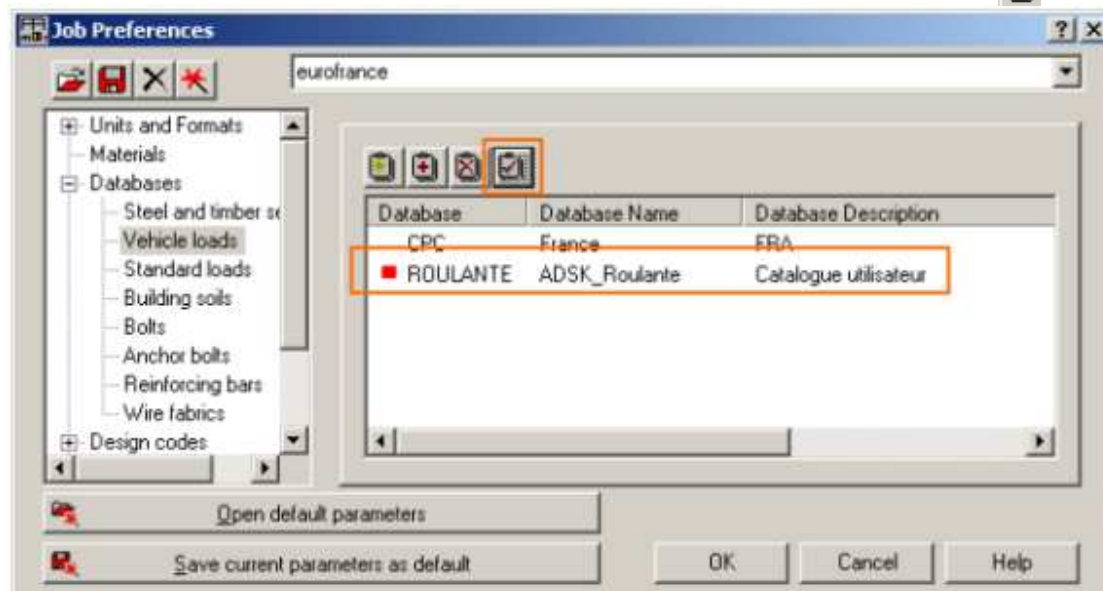
To check that the vehicles have been correctly created , open Autodesk Robot Structural Analysis and add in the job preferences your new vehicle database .

To do that, scroll down the « tools » menu, click on « Job preferences » and select « Vehicle loads » in the tree « Database ». Click on the button « Add new database to the list » 

In the new windows select your user database:



Set this database as current by clicking on the button « Set as the current database »  :



Then open the moving loads dialog box, below the results you should obtain:

