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INTRODUCTION

These step-by-step instructions will lead you through the workflow procedure in order to get familiar with the software environment. »Starter .dwg files« should be used.

Autopath is professional software for 3D/BIM swept path analysis and vehicle turning simulation. In this tutorial you will learn to use different types of vehicle swept path analysis, to customize vehicles by editing vehicle parameters, to run animation of the created vertical or horizontal vehicle swept path analysis and to draw a graph of a wheels turning angle.

1. CREATE ANALYSIS

Open the drawing »Autopath.dwg«.

1.1 EasyDrive

The EasyDrive analysis method provides continuous drive analyses and multiple vehicles swept path analyses for the same path. It calculates the horizontal turning curves and displays an interactive presentation of the route. In addition to easy input, this method includes very realistic simulation because it considers parameters such as vehicle speed, wheel turning speed, and road superelevation.

1. From the Ribbon under Autopath 3D tab, on Create analysis panel click EasyDrive.

2. In Set vehicle library and units dialog box, select;
   - Vehicle library: EMERGENCY_AASHTO
   - Drawing units: Meter
   - Speed units: km/h

3. Confirm with OK.

4. In New swept path analysis dialog box select vehicle: Fire vehicle – pumper and confirm with OK.

5. Easy drive dialog box opens. Select a vehicle starting point in the drawing. Vehicle direction is

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1.2 Horizontal Analysis

This command calculates horizontal vehicle curves by polylines or alignments.

1. From the Ribbon under *Autopath 3D* tab, on *Create analysis* panel click *Horizontal Analysis*.

2. In *New swept path analysis* dialog box select vehicle: Fire vehicle – pumper and confirm with OK.

3. Select vehicle route in the drawing (existing polygon line).
1.3 Vertical analysis

Autopath provides an adaptive vertical vehicle swept path analysis linked to centre line road edge or other user-defined lines, polylines, or alignments. Using this command, based on the selected vehicle and longitudinal road section, you can check the vertical vehicle movement. This feature can be useful for checking transportability of gates, garages, garage house entrances, etc.

Open the drawing »Vertical2.dwg«.

1. From the Ribbon under Autopath 3D tab, on Create analysis panel click Vertical Analysis.

2. In New swept path analysis dialog box select vehicle: Fire vehicle – pumper and confirm with OK.

3. Select vehicle route in the drawing (existing red polygon line).
2. VEHICLE AND SETTINGS

2.1 Vehicle library

Autopath contains a list of predefined vehicle design libraries: AASHTO 2011, Australia, New Zealand, UK, Germany, Poland, Hungary, Sweden and Norway, Croatian, Serbia, Slovenia, and Czech Republic standards. Use this command to see the parameters and edit the existing vehicles in the selected vehicle library. These can then be used in the Swept path analysis feature.

1. From the Ribbon under Autopath 3D tab, on Vehicle and settings panel click Vehicles.

2. In Vehicle library dialog box you have:
   - A list of all available libraries
   - A list of all available vehicles
   - Vehicle preview
   - Vehicle parameters

3. Here you can select any vehicle library and appropriate vehicle for swept path analysis.

2.2 Edit selected vehicle data

1. From the Ribbon under Autopath 3D tab, on Vehicle and settings panel click Vehicles.

2. In the drop-down menu, select the vehicle you want to modify. Press the button to open the Add Vehicle dialog box.
3. If you select a vehicle from the predefined library, define the new vehicle name. If you want to modify a vehicle that was previously added to the library, you can do so in the *Edit vehicle* dialog box.

4. The right side of the dialog box shows several vehicle parameters. Clicking on a parameter makes the chosen element appear in the image. Double-click on the parameter to edit its content.

![Edit Vehicle dialog box](image)

### 2.3 Default settings

This command is used to set default parameters for all types of swept path analysis.

1. From the Ribbon under *Autopath 3D* tab, on *Vehicle and settings* panel click *Default settings*.

2. In *Autopath settings* dialog box you can set the following defaults:
   - General
   - Horizontal report
   - Vertical reports
   - Manual driving
   - EasyDrive
3. For each report item, you can define color, line type or hatch pattern, and layer. Settings can be different for each analysis in the drawing.

For more information, please see the description of specific analyses in Autopath help file.

3. ANIMATION

The program allows simulating the vehicle course on the selected route. Various display options are supported for any single swept path simulation display, giving users unlimited possibilities to generate visually appealing multiple simulations.

Open the drawing »Collision detection.dwg«.

1. From the Ribbon under Autopath 3D tab, on Review panel click Animation.

2. Select existing swept path in the drawing. Animation dialog box opens.

   Start the animation with the button .
   Stop it with the button .
   Move the vehicle one step back with the button .
   Move the vehicle one step forward with the button .
   Guide your vehicle along the selected polyline with your mouse with the button .
Draw vehicle in the current step with the button. Open swept path settings with the button.

By moving the button you can move the vehicle along the polyline.

3. Speed[km/h]: you can manually set a random vehicle speed.

4. COLLISION DETECTION

The Collision Detection option detects the horizontal and vertical points of conflicts.

1. From the Ribbon under Autopath 3D tab, on Review panel click Collision Detection.

2. Select entities for collision detection analysis: left edge of the road. Press Enter.

3. Select existing swept path in the drawing.

4. Collision area is marked red.
The Report command draws a graph of a wheel-turning angle in the drawing. Input data includes vehicle type and a polyline/alignment representing vehicle trajectory.

1. From the Ribbon under Autopath 3D tab, on Review panel click Report.
2. Select existing swept path in the drawing.
3. Select insertion point.