

Position a Tee, Cross, or Relevant Fitting Accurately

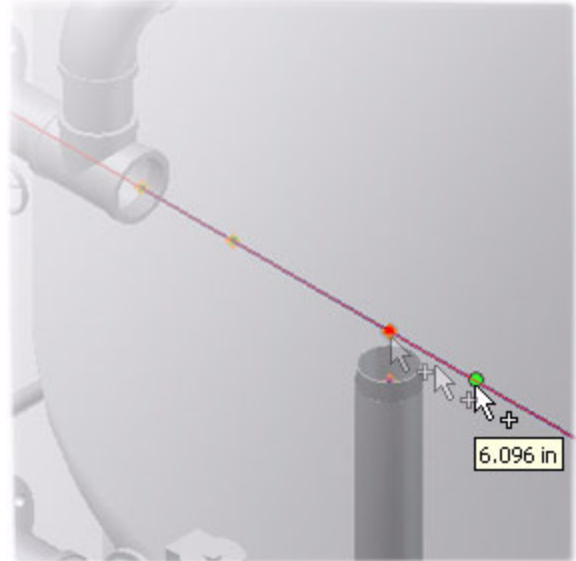
In This Exercise

Within a rigid route, other than conduit parts, only elbows and couplings are automatically generated from the Content Center based on the style. Your design may call for positioning a tee, cross, or relevant fitting at a specific location.

Autodesk Inventor Professional provides a variety of editing tools so you can make accurate adjustments on rigid route points for positioning fittings. Many tools give visual feedback on specific distances, but the feedback often varies.

This Skill Builder:

- Explains the distance values shown in the tooltips when using different editing tools.
- Illustrates how to accurately position a tee, cross, or relevant fitting on rigid piping and bent tubing segments using various editing tools.



Linear Dimension Precision

By controlling linear dimension precision, you can achieve a more accurate distance. The default precision is 0.123.

To change the current setting, click Tools > Document Settings > Units tab, and select an option from the Linear Dim Display Precision list.

Understanding Linear Distance Tooltips

Before you begin positioning fittings, it is helpful to understand the difference between the distances shown in the tooltips for the various route editing tools. The following sections compare the different behaviors.

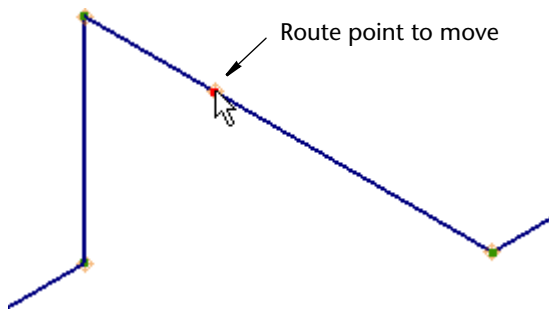
Route points that can be adjusted with the editing tools include intermediate route points on linear route segments and free end points.

Move Node

Using the Move Node tool to edit a route point, the tooltip represents the relative distance between the position of the preceding route point and the target position of the route point being moved. The calculation is based on the direction the route was created. In the following images, the route was created from left to right.

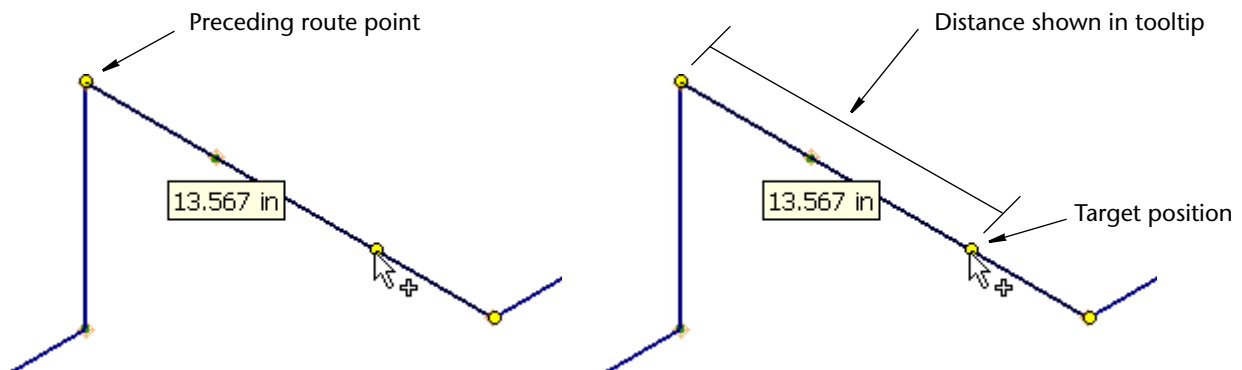
Let's examine the behavior of the tooltip.

1. Create a simple rigid route similar to the one shown below. On the Route panel bar, click the Move Node tool, and in the Model browser or graphics window, select a route point to move.



2. Drag the cursor to move the route point back and forth along the segment.

Notice how the value in the tooltip represents the distance between the preceding route point and the target position.



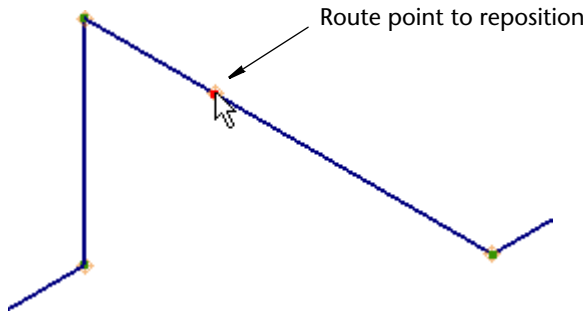
3. Click to set the position.

TIP To verify the distance, click Tools > Measure Distance and select two points, the preceding route point and the target position.

Edit Position

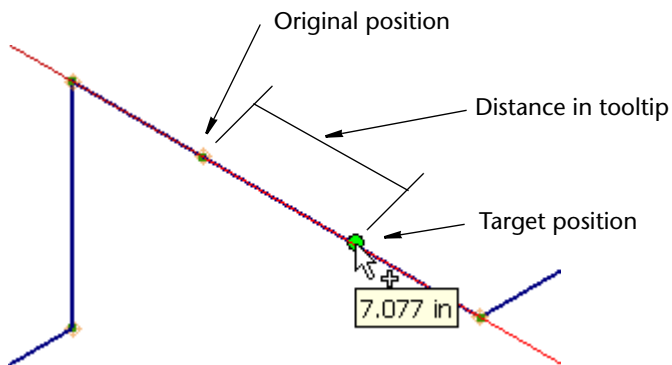
Now let's look at the tooltip when using the Edit Position tool to edit a route point. In this case, the tooltip represents the relative distance between the original position and the target position of the route point being moved.

1. Using the same simple route as before, select a route point to reposition.



2. Right-click the route point and select Edit Position.
3. Move the cursor along the red axis.

Notice how the value shown in the tooltip represents the distance between the original position and the target position.

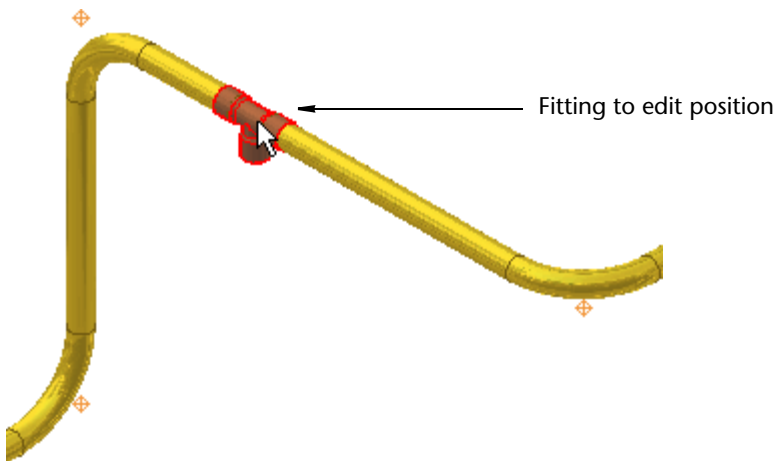


Edit Fitting Orientation

Using this tool to reposition a fitting, the tooltip represents the relative distance between the closest route point in the moving direction and the target position of the route point associated with the fitting. The route creation direction does not affect the tooltip in this case.

The following images illustrate the distance tooltip using the Edit Fitting Orientation tool when a pipe run is activated.

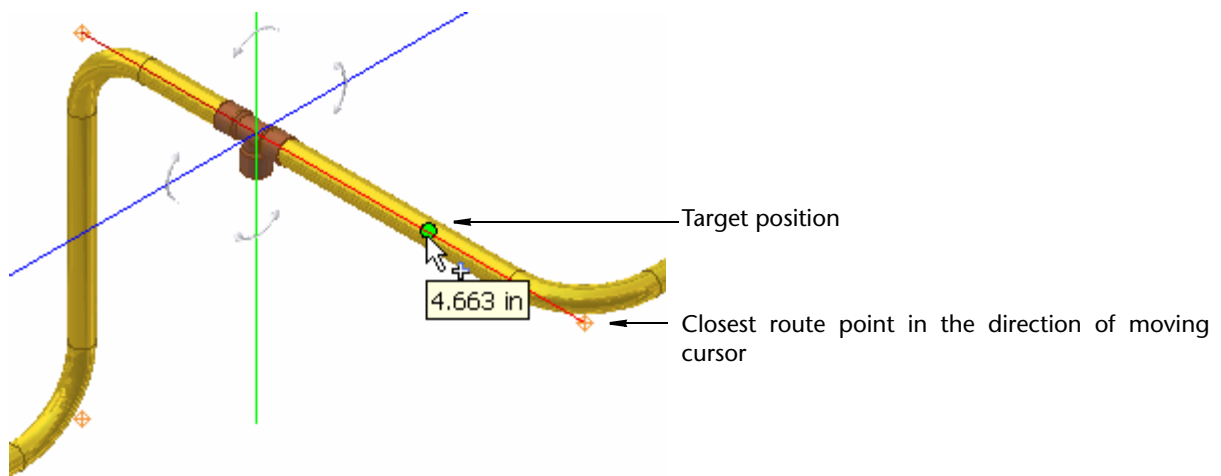
1. Select a fitting to edit the position.



NOTE This route was created from left to right.

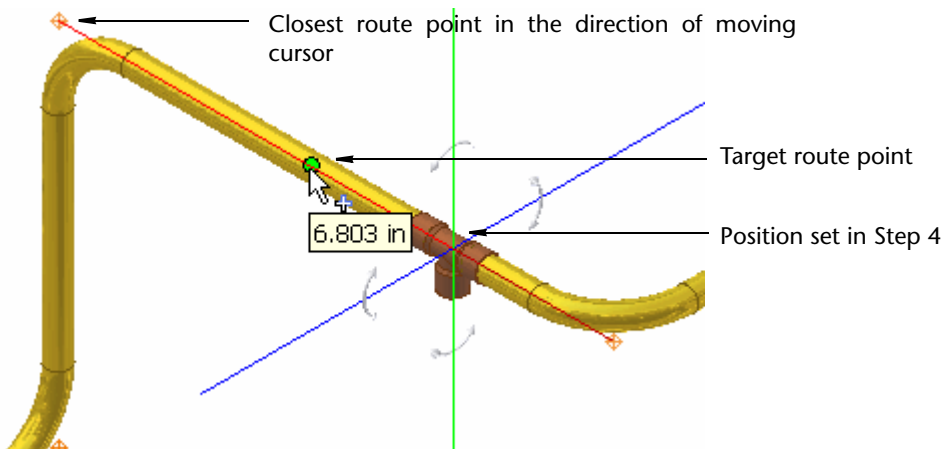
2. Right-click the fitting and select Edit Fitting Orientation.
3. Move the cursor along the red axis in the direction shown.

Notice how the tooltip shows the relative distance from the target position to the closest route point in the direction of the moving cursor.



4. Click to set the fitting position.

5. To compare, move the repositioned fitting in the opposite direction.



Again, the tooltip represents the relative distance between the target route point and the closest route point in the direction the point is being moved.

TIP With the Edit Fitting Orientation tool active, you can also right-click the red axis and select Enter Distance to set an accurate value. With the green preview route point displayed, you can begin typing a value and the Enter Distance dialog box automatically appears with your value.

Positioning a Fitting in the Route Edit Environment

Now that you understand the differences between the editing tools and the distances in the related tooltips you can use them to accurately place a tee, cross, or relevant fitting when creating a rigid route. Use the Insert Node, Move Node, and Edit Position tools (for pipe routes and runs) or 3D Move/Rotate tool (for tube routes and runs) to set an accurate position for a new route point. Once the fitting position is set, populate the route and use the Find in Content Center and Replace tools to locate the desired fitting from the Content Center library.

If you are positioning a tee, cross, or relevant fitting on a populated rigid route, these tools are available when you activate the route edit environment.

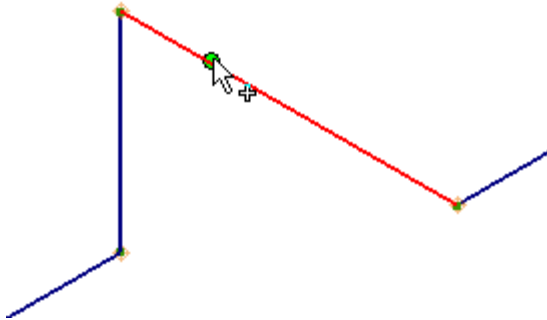
The following exercise gives an example of a rigid piping route.

Set an accurate position for a tee fitting

1. Activate the route.
2. If the fitting has been already inserted on to the route segment, a route point is added. Otherwise, do the following to add a new route point.



On the Route panel bar, click the Insert Node tool and add a new route point on a segment. The position of the route point is not important.



- Use the Move Node tool to set a new position for the route point. In this case, set the point at a specific distance from the preceding route point.



On the Route panel bar, click the Move Node tool and reposition the route point.

When the value in the tooltip shows the distance you need, release the mouse to set the position.

Right-click and select Done.

- Assume that this position is not appropriate and you must reposition the route point a specific distance from the existing route point.

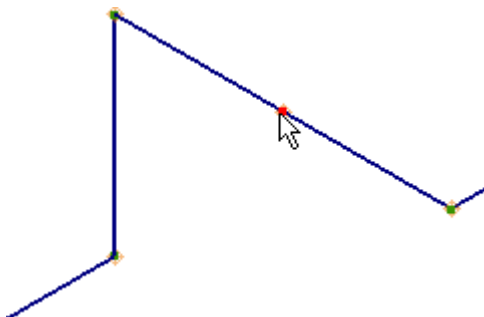


In the Model browser or the graphics window, right-click the route point and select Edit Position.

Set the new position using one of the following ways:

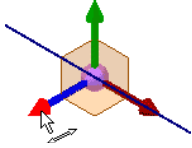
- Drag the cursor and click to set the position when the tooltip shows the needed distance. In this example the route point is set to a position that is 4.663 inches from the closest node point in the direction moved.
- Right-click and select Enter Distance to set a value.
- Start typing the distance when the green preview route point displays. The Enter Distance dialog box automatically prompts and displays the value.

Right-click and select Done.

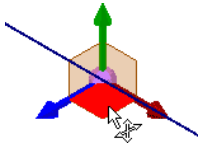


For bent tubing routes, right-click the route point and select the 3D Move/Rotate tool. Click the triad sphere and do not release the mouse, you can free drag the route point to a rough position. Do any of the following and enter an accurate value in the 3D Move/Rotate dialog box:

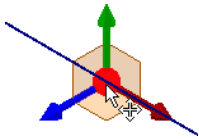
- To define an accurate move along an axis, click a triad axis arrow head.



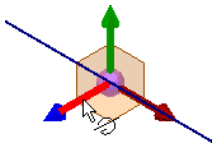
- To define an accurate move in a plane, click a triad plane.



- To define an accurate unrestricted move, click the triad sphere.



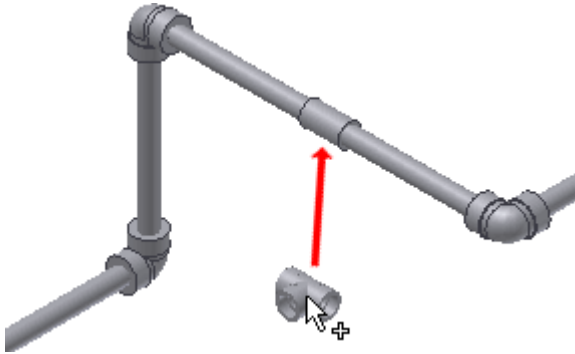
- To define an accurate angle around an axis, click a triad axis segment (not arrow head).



NOTE Using free drag, it is difficult to get an accurate position as the triad segment value boxes are grayed out. For detailed instructions on how to use the 3D Move/Rotate tool, refer to the Index entry of *3D move or rotate* in Autodesk Inventor Help.

5. Right-click in the graphics window and select Finish Edit.
6. If the route is not already populated, click the Populate Route tool on the Tube & Pipe panel bar.
A coupling is generated on the inserted route point conforming to the style criteria.

7. With the pipe run active, use one of the following tools to replace the coupling with the appropriate compatible tee, cross, or relevant fitting:
 - Content Center tool on the Tube & Pipe panel bar, Insert button
 - Find in Content Center on the right-click context menu, Replace button



8. To change the fitting orientation, refer to the Index entry of *library fittings, change orientation* in Autodesk Inventor Professional Tube and Pipe Help.
9. Right-click in the graphics window and select Finish Edit.

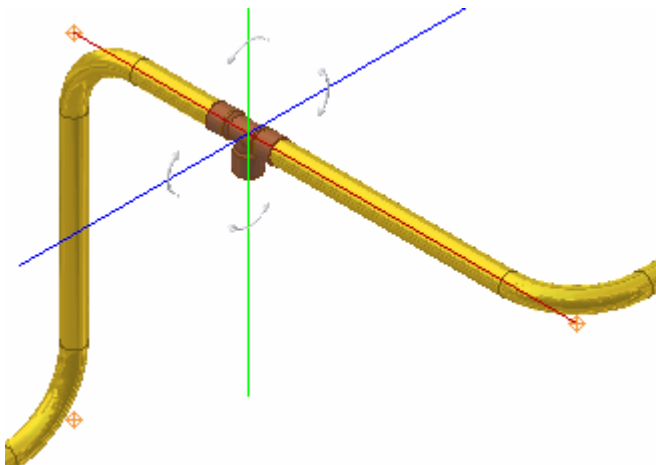
Positioning a Fitting at the Populated Run Level

When a tee, cross, or relevant fitting is already inserted on a populated rigid route segment but the position is not appropriate, you can activate the pipe run and use the Edit Fitting Orientation tool to define the route point position. The Edit Fitting Orientation tool works similar to the Edit Position tool.

Both rigid piping and bent tubing routes follow the same workflow. The following exercise gives an example of a bent tubing route with a placed tee.

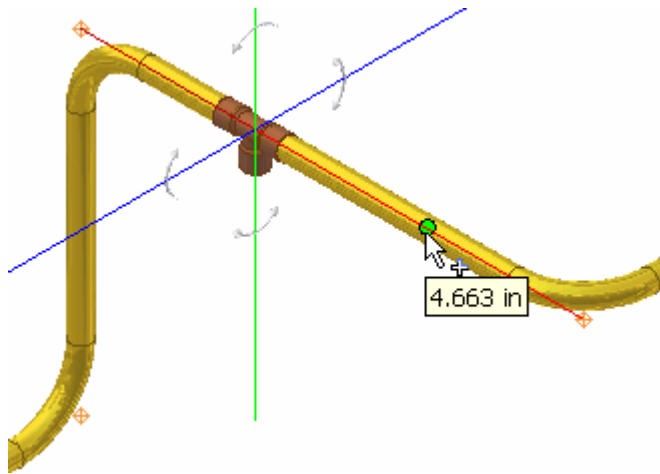
Set an accurate position for a placed fitting

1. Activate the pipe run.
2. Right-click the tee and select Edit Fitting Orientation.



3. Move the cursor along the rigid segment.

The green route point attached to the cursor previews the target position.



4. Set the new position using one of the following ways:

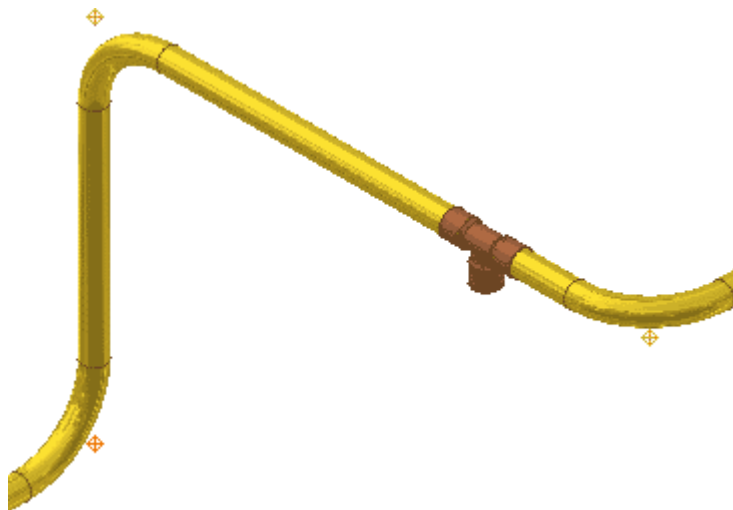
- Drag the cursor and click to set the position when the tooltip shows the needed distance. In this example the route point is set to a position that is 4.663 inches from the closest node point in the direction moved.
- Right-click and select Enter Distance to set a value.
- Start typing the distance when the green preview route point displays. The Enter Distance dialog box automatically prompts and displays the value.

5. To change the fitting orientation, press the space bar.

6. Right-click in the graphics window and click Done.

7. Right-click again and click Finish Edit.

The placed tee is moved to the exact location specified.



What You've Learned

For route creation, you learned about:

- The differences among the distance tooltips of the various editing tools.
- Two methods for positioning a fitting at an accurate location rather than using the default fittings in a generated route.