# AIM Plate with Hole - Physics Set-Up

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## Physics Set-Up

### Specify Material

Select the Physics task in the workflow, then press **Material Assignmentss** under **Physics Definition**. AIM has automatically assigned Structural Steel as the default material. We could assign a different material here, if needed. The entire object is made of structural steel, so we can add our other constraints.

## Boundary Conditions / Forces

The pressure acting on both ends of the plate can now be added. Return to the **Physics** task, then go to **Structural Conditions** > **Add** > **Pressure**. Select the end of the plate face without the cut-out and apply the appropriate pressure. The problem specifies that the pressure be 1E6 psi, but since AIM defaults pressure to compressive, it must be negated in order to have a tensile pressure.

Return to the **Physics** task, then press **Structural Conditions** > **Add** > **Support**, select the back side of the plate as the Location, and change the **Type** to **User specified**. Change **Translation X** and **Translation Y** to Free. There should now be only one arrow pointing from the back of the plate to the front, constraining the direction normal to the surface. This symmetric boundary condition implies that there is zero translation normal to the symmetry surface, and there is zero rotation about the two axes orthogonal to the symmetry surface. Constraining the normal direction to the symmetry surface prevents both translation normal to the surface and rotation about the two orthogonal axes. In our problem, we will set up three symmetry surfaces by constraining the normal directions for the three surfaces as shown in the image below. Repeat this process for the remaining symmetry surfaces, setting the appropriate **Tr anslation** values to **Free** for each.

**Go to Step 5: Results**

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