

information with the WHY-WHY diagram conclusion that hole alignment was critical for smooth installation during assembly narrows the search for a root cause. Unfortunately, the team still doesn't know why the holes are not properly aligned. They decide to create another cause-and-effect diagram that focuses on causes of improper hole alignment.



### Assignment

Create a second cause-and-effect diagram that focuses on the root causes of improper hole alignment.

## PART 5

At this point in the problem-solving process, it would be appropriate to use statistical information to determine whether the holes are truly not properly aligned. The team would confirm their suspicions during the next production run by having the press operator take samples and measure the angle between the centers of the holes for each sample. This data would then be utilized to create a histogram and compare the process performance with the specification for the angle between insert hole A and insert hole B of 0.00 mm with a tolerance of  $\pm 0.30$ . Hole alignment problems are confirmed through the use of histograms in Case Study 4.2, should you choose to use it. Histograms are one of the problem-solving techniques discussed in Step 6.

### Determining Possible Causes

Assuming that hole alignment problems exist and are measurable, the team continues with their investigation. By studying the process, they determined that the fixture that holds the flat bracket in place during the bending operation does not securely hold the bracket in place. Changing the bracket fixture will be a relatively expensive undertaking. Although the engineers feel this change would eliminate the root cause of a problem as part of Step 7. Do: Selecting and Implementing the Solution, the team has decided to create a force-field analysis before going to management to request funding to make the change.



### Assignment

Create a force-field diagram that describes the forces driving the change to the fixture as well as the forces preventing the change from happening. Use your imagination; problem-solving is never as simple as "spend money."



### Assignment

Describe the remaining steps that the team would take to finish the problem-solving process and ensure that the problem does not return.