



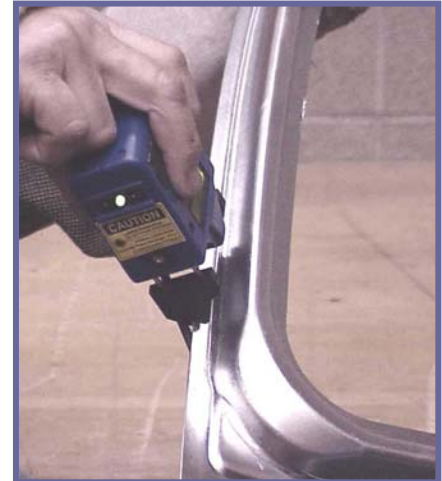
## Radius



### Inspection Problem

Automotive sheet metal parts must be stamped to exact dimensions for a vehicle to assemble properly. A radius stamped into the part and the location of the radius relative the part's edge, called the flange, must be precise for fit-up and aesthetic reasons.

Small inside radii are almost impossible to measure with mechanical radius gages. An inspector cannot always see the fit of the template gage against the sheet metal because of the design of the part. Measuring the length of the flange is equally difficult since the inspector cannot repeatably find the exact point that marks where the radius ends and the flange begins.

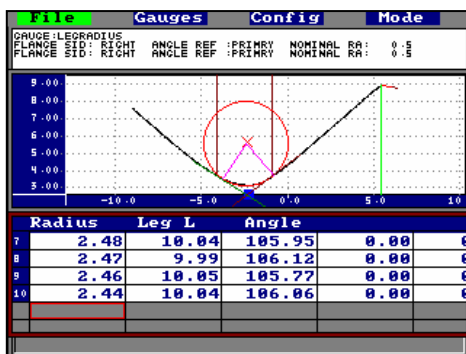


### Requirements

**Measurements** - Radii as small as 0.3 millimeters (mm) and as large as 5.0mm must be measured accurately and repeatably. The flange length must be measured from end point of the radius to the edge of the part and the angle of the flange relative to the surface on the other side of the radius must also be measured.

**Instrument** - Thousands of stamped parts are received each day at the plants for use in the assembly of vehicles. Inspection is done on a sampling basis but enough parts must be inspected to assure that there are no pervasive problems with the parts such as a worn die. Measurements must be made quickly and the results must automatically indicate any out-of-spec conditions.

### LaserGauge® Solution



**LaserGauge® System** - The HS610 sensor is uniquely designed to minimize potential reflection problems when measuring inside radii. Depending on the resolution required and the length of flanges that need to be measured, a sensor with either a .75" or 1.25" field-of-view is recommended. An LG1102 controller allows the operator to view the profile of the radius while taking the measurement and ensure that the sensor is focused on the correct radius when the part has several contours.

**Measurements** - Each measurement takes approximately two seconds to complete. SPC or tolerance limits can be specified and any measurements that are

outside the spec range are shown in red. The data table can be saved as documentation of the measurements taken.

## Advantages Realized

**Saves Time** - More parts can be inspected in less time than with any manual or mechanical gages.

**Saves Costs** - Problems are identified before the bad parts are used in the assembly. The measurements are accurate and repeatable.

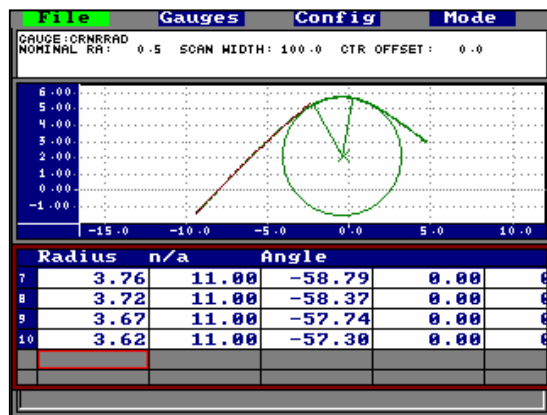
**Documented Results** - Out-of-spec conditions can be documented by saving the data table. As further documentation, the profile of a bad part can be saved and sent to the appropriate parties for viewing.

**Convenient** - Stamped parts are staged throughout an assembly plant. The lightweight, battery powered LaserGauge can be used by the operator in any area of the plant. Parts do not have to be transported to a central inspection room for the measurements to be made.

## Related Applications

**OUTSIDE RADIUS** - On stamped parts, assemblies and other components, an outside radius may also need to be inspected.

**LaserGauge System** - Depending on the range of radii being measured and the resolution required, either an HS610 or HS300 can be used. The HS300 sensor can have a field-of-view up to 3.5", so it can be used for measuring parts with very large radii. An LG1102 controller is recommended for use in measuring radii so the operator can view the profile while positioning the sensor.



**Features** - The surface profile as seen on the LaserGauge display can be captured and saved. This ASCII type file can be retrieved to a PC and plotted using any common spreadsheet application. Data files can be saved on the LaserGauge, retrieved to a PC and archived for documentation or subsequent analysis. Any number of common application programs can be used to view the ASCII type data file.

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