

**INSPECTION PROBLEM**

Interior components of a vehicle, such as the instrument panel and trim, are inspected for fit by the manufacturer and inspected after they are assembled in vehicles. Measuring gap and flush on these parts is difficult because of the unusual surface contours and nominally small gaps. Mechanical tools are almost impossible to use because of the flowing contours and the small to non-existent gaps. Manual tools like feeler gauges depend too much on the operator's individual abilities.



**REQUIREMENTS**

**Measurements** – Interior gaps can be as large as 6.0 or 7.0 millimeters and as small as no gap at all. The gap design can have square-edges or very large radii and the panels can be flat, curved or at a 90 degree angle to each other. Flush measurements are difficult because of the complex surfaces at the joints. The measurement instrument must be flexible in its methodologies to accommodate all these features.

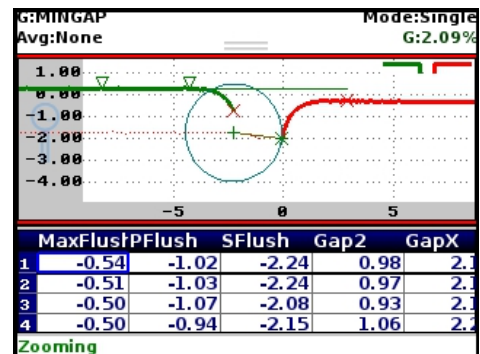
**Instrument** – Inspection of the entire instrument panel or of all assemblies in interior needs to be done at one time for efficiency. One inspection routine should contain all the measurements required, and the operator should be able to follow the routine without confusing the locations of the measurement points. Each measurement must be tracked to a unique identifier or label and recorded in a data file.

**LASERGAUGE® SOLUTION**

**MEASUREMENTS**

Flexible Virtual Gauges allow features to be measured according to several different methodologies. Once each point's appropriate methodology is identified, it is incorporated in the inspection routine and runs automatically when the point is inspected.

Virtual gauges can emulate mechanical tools such as calipers, without the physical limitations of trying to get the prongs down into a 0.5mm gap, or they can be set to return measurements more consistent with design criteria.

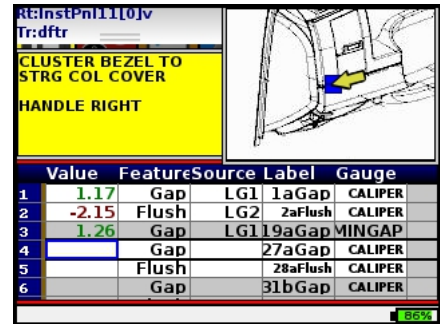


**LASERGAUGE® SENSORS**

Depending on the largest gap expected on the interior components, the TS800 sensor with either a 0.5" or a 1.0" field-of-view is recommended. This sensor is smaller and can fit into tighter spaces than the larger HS702 sensor. They also have a shorter standoff and view the gap from a closer angle, which means that they can see more points in and around the edges of a smaller gap.

**LASERGAUGE® CONTROLLERS**

A graphical controller, such as the LG5000 or larger screen LG7000, guides the operator through the routine by showing the location of each measurement point on an image of the part. One gap and flush measurement at the same point takes less than three seconds. Results are immediately displayed in the data table. The surface profile is plotted to the screen as the measurement is being taken, giving the operator immediate feedback on the contour of the feature and the method of measurement.



**ADVANTAGES REALIZED**

**Fast & Accurate** – Measurements are made quickly, repeatably and according to documented methodologies. Inspection routines guide the operator from one measurement to the next, minimizing the potential for error. Measurements are displayed immediately, and out-of-spec conditions can be flagged for operator verification.

**Traceable Measurements** – Data files from inspection routines are saved automatically and are available for subsequent retrieval to a PC or into the plant's data management system. Profiles of gap and flush features can be saved and provided as documentation of out-of-spec conditions.