

Event #10: Fastener Flushness Inspection

2 team members required.

Within the allocated 15 minutes, complete tasks in order:

- 1) Evaluate Fastener Flushness using Traditional Method
 - 2) Evaluate Fastener Flushness using fastCHECK
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Task #1: Evaluate Fastener Flushness using Traditional Method

Provided Tools

- 1) Depth Gauge
- 2) Dot Stickers (Blue & Red)



(Figure 1)

Task Process

Step 1: Determine ‘out of limit’ suspects by finger test

- Perform touch test on all fasteners among the panel to identify the ‘too high & too low’ candidates (Figure 2). Exact number of fasteners to be inspected will be announced on event day.
- Label these fastener candidates with dot stickers (Figure 3)
 - o Red dot for too high
 - o Blue dot for too low
- Record the location (coordinate) of these fasteners in the Task Card

Step 2: Determine the High point (H)

- Zero out the depth gauge with the provided Calibration Block
- Using the provided tripod depth gauge, measure the height at 4 locations on the fastener head – 12 o'clock, 3 o'clock, 6 o'clock and 9 o'clock and record these measurements on paper
- Pick the highest measurement among 4 numbers and record the High (H) measurement (in inches) on the Task Card (4 decimal points)

Step 3: Determine the Low point (L)

- From the paper that contains the measured height at 4 locations on the fastener head – 12 o'clock, 3 o'clock, 6 o'clock and 9 o'clock, pick the lowest measurement among 4 numbers and record the Low (L) measurement (in inches) on the Task Card (4 decimal points)

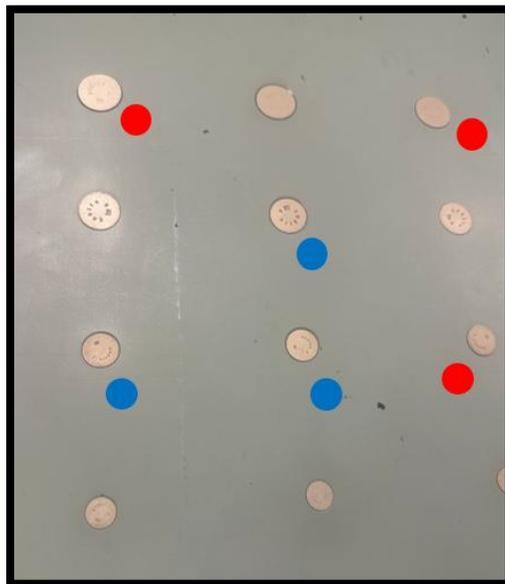
Step 4: Determine Conformity of each fastener using High (H) and Low (L) measurements.

- A conformity/flushness tolerance spec will be provided during the competition.
 - If High point (H) is above a certain threshold (For example $H > 0.002$ "), then the fastener is "Too High"
 - If Low point (L) is below a certain threshold (For example $L < -0.006$ "), then the fastener is "Too Low"
- Re-Mark all the out of limit fasteners (too high) with red dot stickers
- Re-Mark all the out of limit fasteners (too low) with blue dot stickers
- Take a photo of the marked fasteners with a camera
- Update the fastener map on the task card

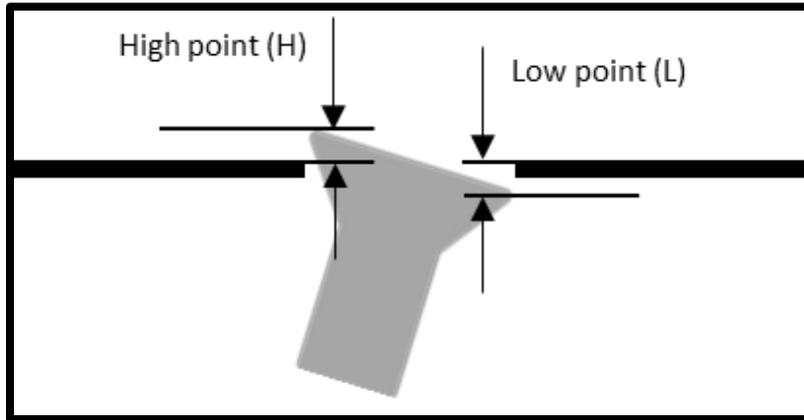
Figure Guides



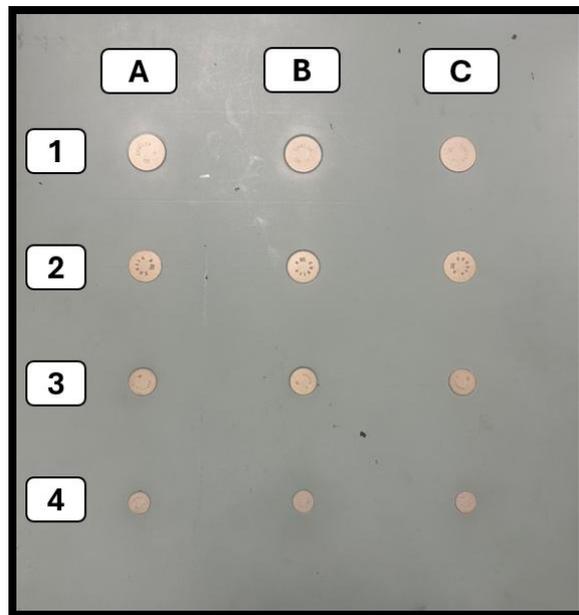
(Figure 2) – Competition panel will be revealed at event



(Figure 3)



(Figure 4)



(Figure 5)

Task #2: Evaluate Fastener Flushness using fastCHECK

fast ✓CHECK[®]

Provided Tools

1) fastCHECK Inspection Tool

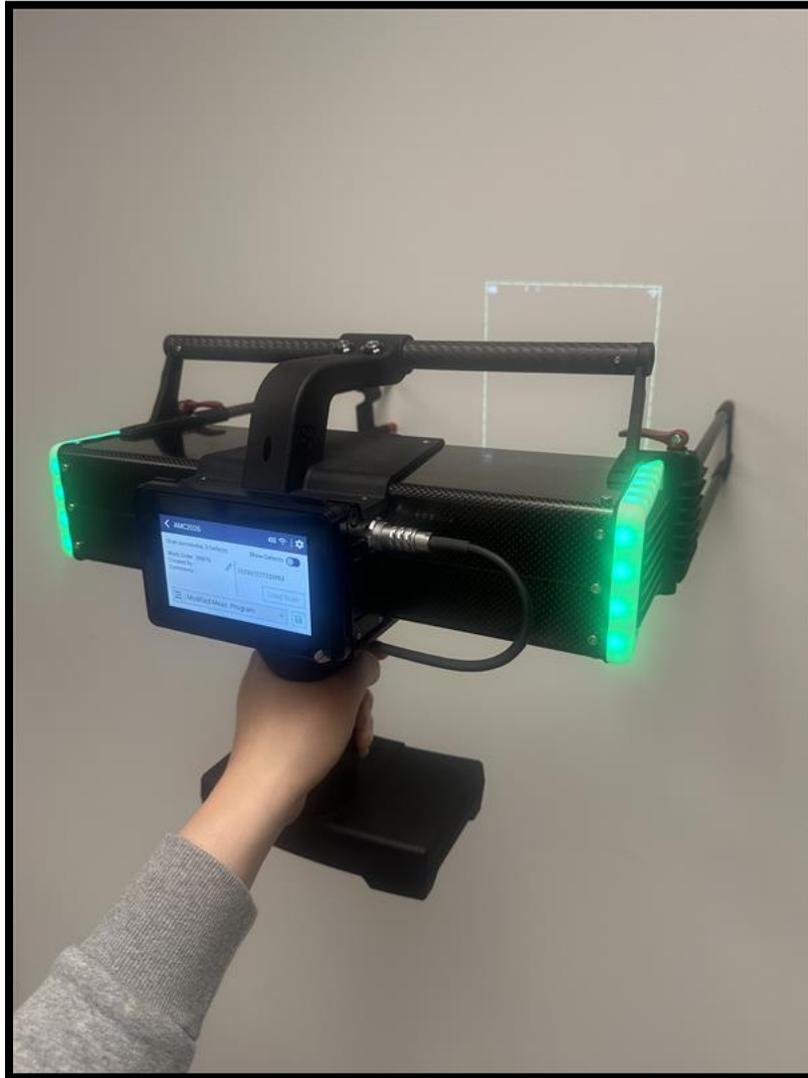


Figure 6

Task Process

Step 1: Take a Scan using fastCHECK

- Position the fastCHECK tool by leaning the tip(s) of the positioning frame on the fastener panel. (Figure 7)
- Take a scan by pulling the trigger. (Figure 8)
- After taking a scan, pay attention to the following:
 - While the blue lights are flickering on the panel, the user must hold fastCHECK stable (~200 milliseconds)
 - Approximately 2 seconds after the blue flickering light, the fastener measurements will be projected on the surface of the panel skin
 - Ensure that the fastener head is measured correctly. A “Save successful” message will appear at the top of the results image.
 - You will see an image with 3 colors (Figure 9):
 - Green circles → Fasteners are within tolerance
 - Red circles → Fasteners are “Too High”
 - Blue circles → Fasteners are “Too Low”
 - You will also see the High (H) and Low (L) points measured by fastCHECK

Step 2: Confirm Conformity

- With the help of your teammate, refer to the Task Card, and check if the conformity results from Task #1 (Evaluation with Traditional Method) are correct, using the red and blue result projection from Task #2 (Evaluation with fastCHECK)

Figure Guides

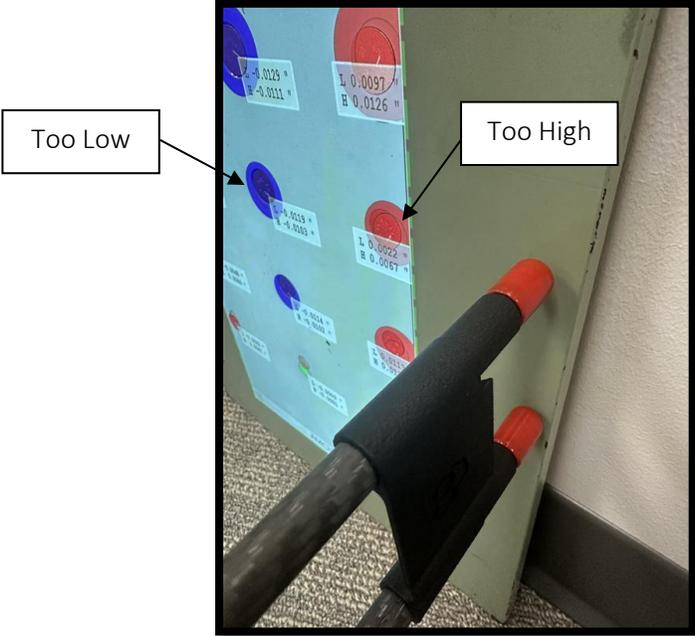


Figure 7



Figure 8

Figure Guides (Continued)

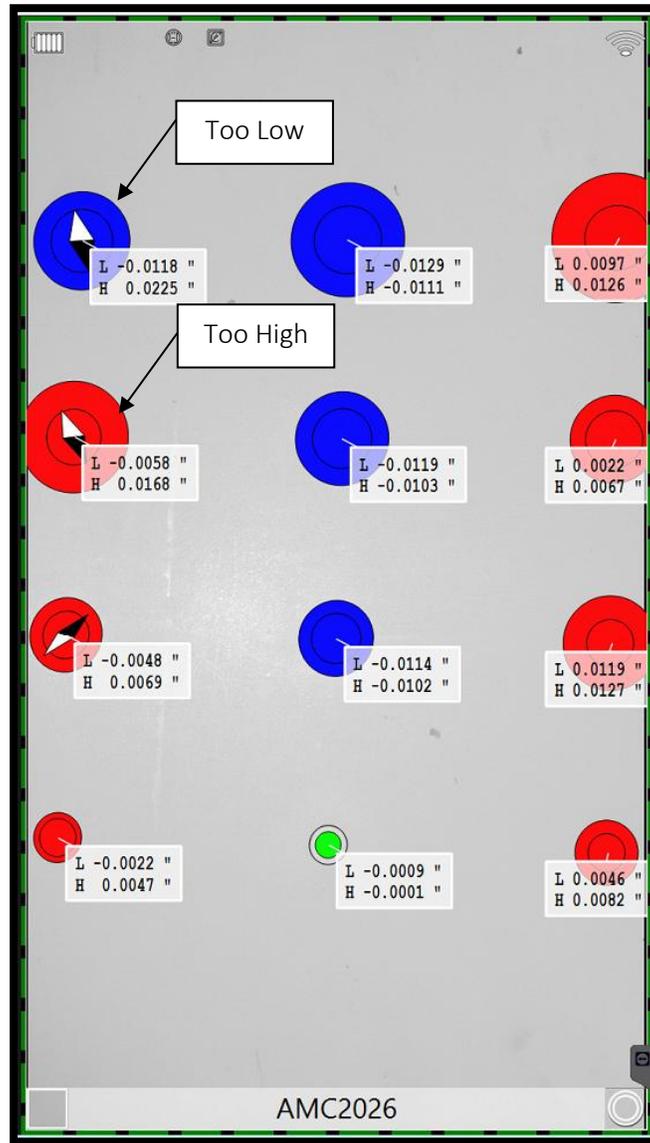


Figure 9