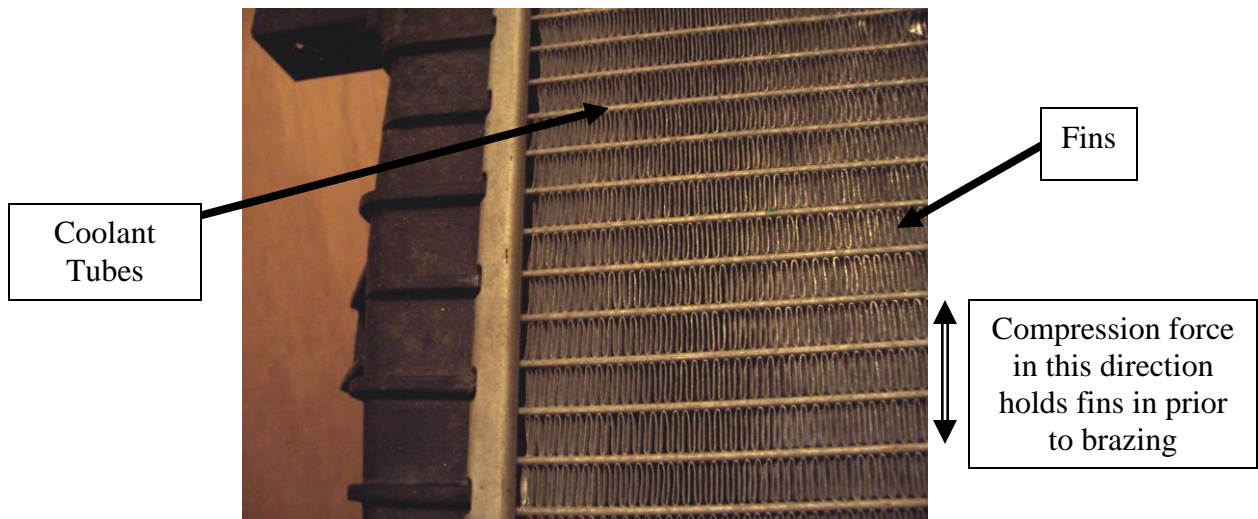


**Category:** Process Development, Problem Solving, and Other

**Example:** Finding & fixing root cause of defect in Ford Mustang radiator production

**Situation:** Radiators manufactured at Ford/Visteon facility in Plymouth, Michigan

**Problem:** Scrap on Mustang radiator had risen to significant levels due to “high fin” problem: heat radiation fins would get knocked loose from between flat coolant tubes by the pre-braze wash process. These defects would not be detected and would be brazed out of position, creating a scrap radiator.



**Action:**

1. Had end-of-line operator save all Mustang radiators with this problem
2. “Multi-var” analysis showed no apparent pattern in location or time
3. Used fishbone diagram to map out possibilities with colleagues; identified dimensional variation as likely cause
4. Measured dimensions creating force holding fins in place; all had high CpK except fin heights – dimensions analyzed were:
  - Fin heights
  - Flat coolant tube heights & center-to-center distance
5. Used laser scanner to map fin heights in detail; observed cyclic pattern
6. Did “best fit” sine wave and found pattern repeated every 26 fins; Maintenance Technicians said fin-forming “star wheel” had 26 teeth
7. Examination of machine found bearing problem, creating eccentricity in wheel position during rotation

**Result:**

1. Replacement of “star wheel” eliminated high fin defects
2. Identification of root cause prevented severe machine damage had bearing failed entirely