

**Theme 3: Removal of Crack Orientation Codes**

Invalid Data	Description
BBPM	Bolster Bottom Cover Plate Parent Metal
BCPM	Bolster Top Cover Plate Parent Metal
BPPM	Bolster Pad Parent Metal
BWPM	Bolster Web Parent Metal
HPM	Headbrace Parent Metal
OTH	Other
PPM	Pad Parent Metal
SCPM	Side Cover Plate Parent Metal
SDPM	Saddle Parent Metal
SKPM	Skid Parent Metal
SPM	Sill Parent Metal
SUMP	Sump Parent Metal
TPM	Tank Parent Metal
WAP	Weld (Angle-to-pad)
WAS	Weld (Angle-to-Sill)
WBBC	Weld Bolster Bottom Cover
WBSC	Weld Bolster Web-to Side Cover
WBSW	Weld Bolster Stiffener-to-Web
WBTP	Weld Bolster Web-to-Pad
WBTS	Weld Bolster Web-to-Sill
WLBL	Longitudinal Backstop Weld
WPT	Weld (Pad-to-Tank)
WTK	Weld Toe-to-Skid
WTSD	Weld Toe-to-Saddle
WTU	Weld Toe-to-Sump
WUBC	Weld U-Brace-to-Cradle Pad
WUBF	Weld U-Brace-to Bottom Flange
WUBS	Weld U-Brace-to-Sill
WXBC	Transverse Weld Backstop-to-Cradle-Pad
WXCF	Weld Backstop-to-Bottom Cover Plate

**Theme 3: Addition of Crack Orientation Codes (plus remaining pre-existing codes)**

"WFF"	"WFF", "Weld Fillet Face"
"WTA"	"WTA", "Weld Toe-to-Appurtenance"
"WTH"	"WTH", "Weld Toe-to-Headbrace"
"WTP"	"WTP", "Weld Toe-to-Pad"
"WTS"	"WTS", "Weld Toe-to-Sill"
"WTT"	"WTT", "Weld Toe-to-Tank"

"No exceptions found"	"No exceptions found", "No exceptions found"
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### Theme 3: New/Renamed Failure Types for Shell/Sill section

- **Removed:** "Buckle (also Bent)"
- **Renamed:** "Repaired Fire Damaged Tanks" to "Fire or Heat Damage"
- **Renamed:** "Dent" to "Dent or Buckle (Also Bent, Twisted, Bulged)"
- **Added:** "Burst"
- **Added:** "Erosion"
- **Added:** "Improperly Sized Weld"
- **Added:** "Linear Indication"
- **Added:** "Weld Defect other than Crack"

### Failed Component/Failure Type Chart

"Tank Shell Interior"	"Blister", "Burst", "Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Bathtub Ring", "Corrosion - Girth Weld Seams", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Corrosion - Vertical Grooving", "Fire or Heat Damage", "Erosion", "Improperly Sized Weld", "Linear Indication", "Scores and Gouges", "Weld Defect Other than Crack"
"Tank Shell Exterior"	"Blister", "Burst", "Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Girth Weld Seams", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage", "Erosion", "Scores and Gouges", "Wheel Burns", "Weld Defect Other than Crack"
"Tank Head Interior"	"Blister", "Burst", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Corrosion - Bathtub Ring", "Corrosion - Girth Weld Seams", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Corrosion - Vertical Grooving", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Scores and Gouges", "Weld Defect Other than Crack"
"Tank Head Exterior"	"Blister", "Burst", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Girth Weld Seams", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage", "Erosion", "Scores and Gouges", "Wheel Burns"
"Center Sill Web (Full Sill)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage", "Erosion", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Center Sill Flange (Full Sill)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage", "Erosion", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Center Sill Both (Full Sill)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage", "Erosion", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Bolster Pad (Tank Cradle Top Cover Plate BCPM)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage", "Erosion", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Inboard Tank Reinforcement Pad"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"UF (Sill) Web Inbd of Bolster"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"

"Brake Support"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Tank Bolster"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Other"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Scores and Gouges", "Weld Defect Other than Crack"
"Stub Sill Web"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Weld Defect Other than Crack"
"Stub Sill Top Flange"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Stub Sill Bottom Flange"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Head Brace"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Head Pad"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Manway Nozzle"	"Burst", "Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Safety Valve Nozzle"	"Burst", "Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Top Fittings Nozzle"	"Burst", "Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Girth Seams / Butt Welds", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Manway Nozzle Reinforcement Pad"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Safety Valve Nozzle Reinforcement Pad"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Top Fitting Reinforcement Pad"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Turnbuckle Brackets"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Reinforcement Bars"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Skid Attachment to Pad or Tank"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", Linear Indication", "Weld Defect Other than Crack"
"Tank Anchor Pad (Full Sill Cars)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Weld Defect Other than Crack"

"Tank Anchor Web (Full Sill Cars)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Weld Defect Other than Crack"
"Miscellaneous Attachment Welds"	"Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Tank Stiffener Horn (Full Sill Aluminum Car)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Bolster Web (BWPM)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Bolster Bottom Cover Plate (BBPM)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Bolster Web Stiffener (WBSW)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Fire or Heat Damage"
"Splice Plates"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Wing Bars"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Sill Center Filler (Above Center Plate)"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Miscellaneous Tank Pad"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Weld Defect Other than Crack"
"BOV Skid"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Weld Defect Other than Crack"
"Sump"	"Burst", "Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"BOV Mounting Saddle"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Wash Out"	"Dent or Buckle (Also Bent, Twisted, Bulged)", "Crack - Parent Metal", "Crack - Weld Not on Templates", "Corrosion - Grouped Pits", "Corrosion - Random Pits", "Erosion", "Fire or Heat Damage", "Improperly Sized Weld", "Linear Indication", "Weld Defect Other than Crack"
"Fittings/COVER Plate"	"Corrosion - Grouped Pits", "Corrosion - Random Pits", "Scores and Gouges", "Fire or Heat Damage"