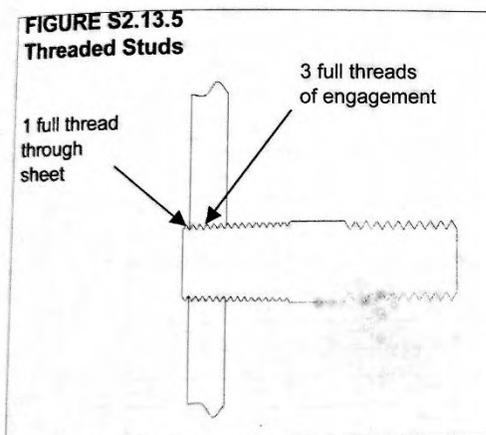


11) Dome Studs Welded

All of the dome studs have been seal welded in direct contradiction to NBIC Part 3 S2.13.5, the studs are no longer suitable for service. This in turn violates CFR49 Part 230.29 (b) (1).

§2.13.5 THREADED STUDS

- a) Studs threaded into the boiler or firebox sheets shall not be seal welded. (See NBIC Part 3, Figure S2.13.5).
- b) When studs are replaced, they shall extend at least one full thread through the sheet on the opposite side of installation. Replacement studs shall have a minimum of three threads of engagement.



12) Side Grate Bearers

The side grate bearers consist of thin steel fabrications. Standard practice dictates these to be heavy/solid iron castings of an appropriate alloy. This is required as steel will burn, warp, and quickly fail.



13) **Rigid Bolt Telltale Holes Drilled From Both Sides**

The telltale holes are drilled from both ends of the bolt, many do not lineup from one end to the other. Numerous bolts exhibit holes which are misaligned by $\frac{1}{2}$ of the hole diameter. This results in an inability to clear telltales in accordance with CFR 49 230.38 (c) as is evidenced by numerous broken drill bits left behind in the installed bolts. Bolts must be cleared so that when a bolt breaks, steam/water can be observed escaping.



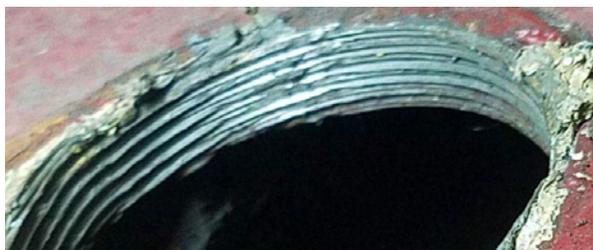
14) **Incorrectly installed Saddle Bolts**

The saddle bolts (bolts connecting the smokebox to the cylinder casting) are of incorrect design and installed incorrectly. Railroad standard practice calls for the saddle bolts to be of a taper fitted type bolt, these are commercially available, straight shank, black oxide bolts. The bolts were installed through dramatically oversized torch cut holes, versus the tight and machined fit standard practice calls for. Additionally, standard practice dictates that bolts be installed from the inside with nuts on the exterior, these bolts are installed upside down.



15) **Washout Plugs Of Incorrect Material, Holes Cross-Threaded**

All washout plugs are machined from a steel material. It is a well-accepted fact that steel plugs will seize in their threaded hole when utilized in locomotive boiler service, standard practice dictates the use of SB-61 bronze. Several holes are severely cross threaded.



16) **Dry Pipe Seal Welded To Front Tubesheet**

The front end of the drypipe has been seal welded to the front tubesheet. This is contrary to railroad standard practice as the drypipe is to be a removable component.

17) **Attachment Of Smokebox To Boiler Barrel**

The boiler and smokebox have been joined by generic/hardware store carriage bolts. Standard railroad practice calls for attachment via rivets. The exterior of the bolts were heated and driven with an air hammer, presumably to make them look more like rivets. This Joint will allow movement between the boiler and the smokebox which will ultimately lead to cracking in the frame.

