

## Historical/Hobby Boiler Internal and Hydro Check List

Tag Number            Make            Year            Engine No.

Owner

Heating Surface            Design Pressure

Current Operating Pressure

Safety Valve(s) Setting            Total Safety Valve Capacity

As a minimum, the inspection shall include consideration of the following:

### A. Smoke Box Front Tubesheet

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- Check condition of front tubesheet and thickness around handhole openings.
- Check condition of threaded openings and plugs.
- Check condition of rivets between front tubesheet and barrel.

### Tubes

- Are tubes beaded back to the tubesheet?
- Are there signs of leakage?
- Check condition of smoke box shell (especially around lower surfaces).
- Check inside condition of barrel and outside diameter of tubes for corrosion and scale.
- Check back side of tubesheet (especially area in contact with handhole gasket and area where tubesheet joins barrel).
- Check tubesheet supports (through stays, supports or strong backs).
- Check inside rivet heads on lap or buttstrap joints, if possible.
- Check front bolster (front axle) attachment points inside barrel. Note thinning of the lower smokebox section of the barrel is critical if the steering bolster attaches fully or partially to this thinned area.

### B. Barrel (shell)

- Check front bolster attachment points on the outside of the barrel, both within and without the present boundary.
- Check condition of tubesheet rivets on outside of barrel.
- Check condition of threaded openings and plugs in openings.
- Check radius rod attachment point.
- Check attachment points of studs, castings, brackets, accessories, etc.
- Check piping and nozzle openings on shell (feedwater nozzles, steam outlet, water column, etc.).
- Check handhole openings in barrel.

### C. Lap seam or buttstrap

- Check for leakage around riveted seams and joint rivets.
- Confirm joint efficiency based on number of rows of rivets and type of joint.
- Identify and check any external contour that does not appear normal.

#### **D. Insulation or Insulation Jacket (lagging)**

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- Does jacket cover any critical areas or make them difficult to observe? (Normally the jacket will need to be removed for inspection of the barrel.)
- Is barrel pitted or corroded under jacket?

#### **E. Wrapper Sheet**

- Check handhole openings (material thickness, gasket area, etc.).
- Check for seepage around attachment points (wing sheets, axle supports, etc.).
- Check condition of riveted seams joining wrapper to throat sheet and rear head.
- Check condition of riveted seams joining throat sheet to barrel.
- Check external shapes or contours that do not appear normal.
- Check for seepage around staybolt heads.
- Check condition of staybolt heads.
- Check condition of threaded openings. (May need to remove nipples and plugs.)
- Check internal surfaces for cracks, pits, material thickness, and scale.
- Check staybolt thickness and condition.
- Check for scale and mud buildup in waterlegs and wet bottoms.
- Check for buildup of dirt and grease between or behind attaching brackets such as wing sheets.

#### **F. For dry bottom boilers**

- Check riveted seams at bottom of waterlegs in ash pan area (ogee ring).
- Do you need to remove ash pans and grates to observe above seams?
- Check condition of grate support brackets.

#### **G. For wet bottom boilers**

- Check ash pan area for pits and staybolt head condition.
- Check inside bottom of wrapper and staybolt condition.
- Check condition of lap seam in wrapper.
- Check condition of ash pan drain tube if present.
- Check condition of drain plug and plug threads.
- Check condition of studs, especially studs holding hitches to the bottom sheet.
- Check for condition of blowdown valve. Check for size and type.

#### **H. Steam Dome**

- Check for condition of drain back holes in shell if possible.
- Check condition of main steam stop valve.
- Check condition of piping on the steam dome and the condition of the steam outlet piping on the steam dome.
- Check condition of the steam dome seams and seams between the steam dome and the boiler shell.
- Is seepage present?
- Can interior seams be observed?

#### **I. Check the condition of pressure gage.**

- Is there a siphon and what is its condition?
- Is the gage readable from the operator's position?
- Has the gage been calibrated or checked against another gage?
- If a shutoff valve is present, its handle shall indicate open position.
- Gage checked for correct range and pressure.

**J. Check for condition of safety valve.**

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- Does the safety valve have its own inlet/outlet piping with no intervening block valves and no possibility of isolation?
- Check that the inlet pipe size is not smaller than the valve inlet size.
- Check that the outlet pipe size is not smaller than the valve outlet size.
- Is the safety valve a National Board capacity certified, ASME "V"/National Board "VR" stamped valve of proper set pressure and capacity rating for the boiler heating surface?
- Does the safety valve have a try lever (hand lifting lever)?
- Is the safety valve sealed with factory seals at the top pressure adjustment cap and at the blowdown ring adjustment point?

**K. Water Column and Gage Glass**

- Is the gage glass calibrated to the level of the crownsheet?
- Check condition of try cocks, gage glass stop valves, gage glass drain valve, and water column drain valve.
- Check condition of gage glass (cracks or scratches).
- Check the upper and lower gage glass packing for signs of leakage.

**L. Firebox**

- Check for bulging between staybolts and warping of the boiler plate (What caused this?).
- Check riveted seams around the fire door.
- Check for sediment buildup over the fire door opening at the rear head.
- Check for sediment buildup over the peephole opening in the wrapper sheet (where applicable).

**NOTES:**