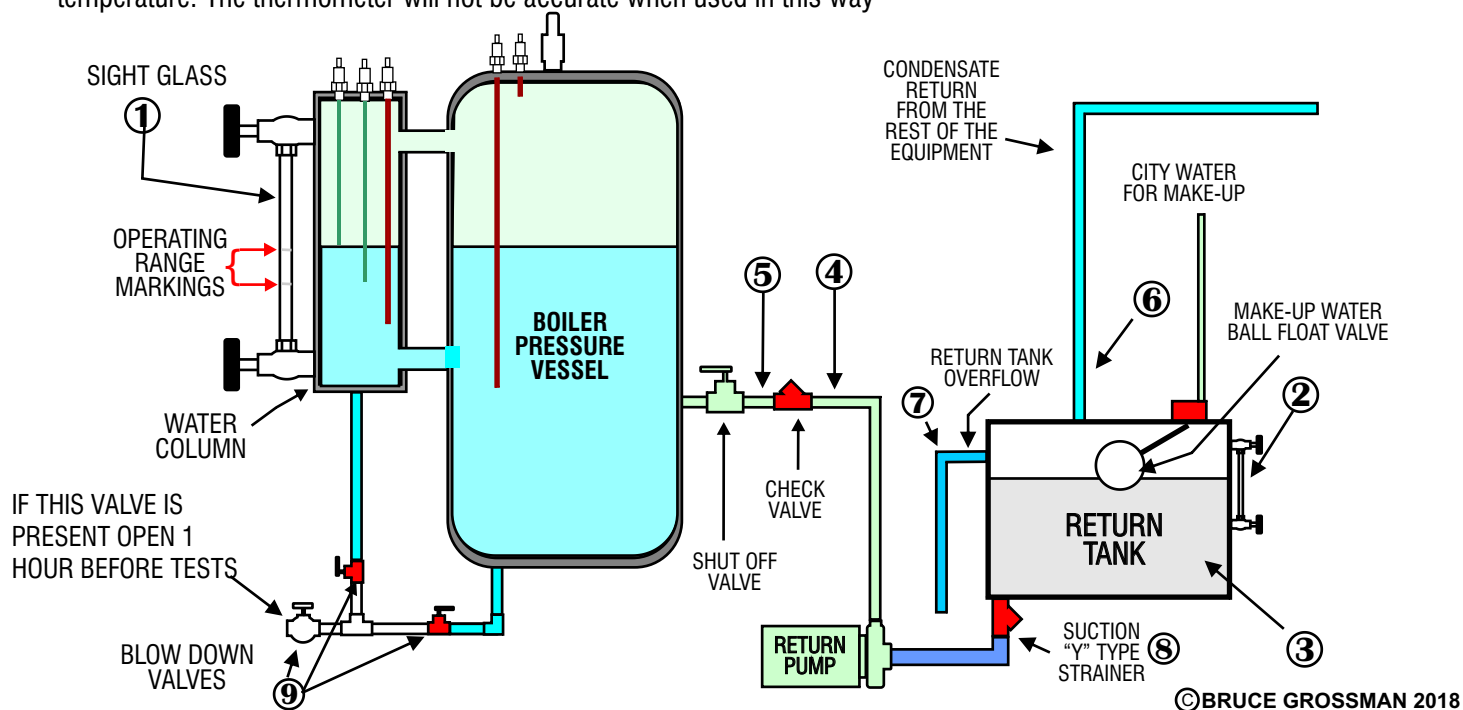


BOILER OPERATION TEMPERATURE CHECK LIST

USE OF THE LASER THERMOMETER

You likely bought a laser thermometer to test steam traps, found it unsuitable for that purpose and haven't picked it up since. Well, I've got good news for you, that thermometer is great for use in troubleshooting boiler and return problems. First, a short explanation of the operations of the thermometer. The wavelength of infrared radiation (a form of light) being emitted by an object is dependent on the temperature of the object. A sensor in the thermometer measures that wavelength and translates it into numbers in degrees that correspond to what we call temperature. However, the infrared sensor doing that measuring has its limitations.

1. The surface of the target should NOT be a highly reflective color like silver or white or have a highly polished finish like chrome or stainless. If it does, take a black Sharpie marker and blacken an area about the size of a quarter, use this blackened area as the target spot on the surface to be tested.
2. The laser pointer is used to select the target area and illuminates the center of the sensed area. Since the sensor itself measures all of the infrared energy entering the lens it becomes progressively more accurate the closer you place the sensor to the target area. When using the laser thermometer to run the tests shown on this chart be sure to position the lens of the thermometer slightly above the surface of the area being measured, don't just aim it and use the laser pointer to take the temperature. The thermometer will not be accurate when used in this way



RUN THESE CHECKS LISTED BELOW AND RECORD THEM ON THE CHARTS ON PAGE 2

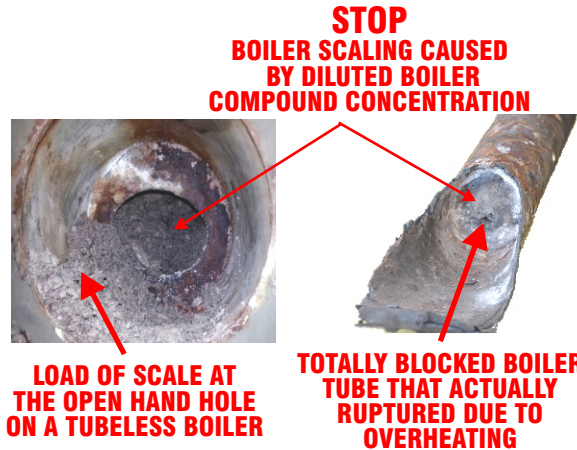
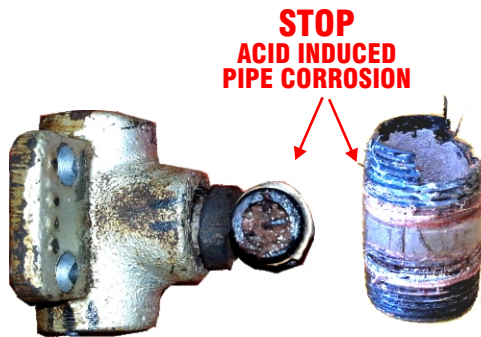
- A. WATER LEVEL IN SIGHT GLASS-** The water level should be between the PUMP ON and PUMP OFF marks on the water column sight glass 1.
- B. WATER LEVEL IN RETURN TANK-** The level of water in the RETURN TANK 2 should be within an inch of both the upper and lower ends of the sight glass. Higher or lower levels will usually indicate a faulty MAKE UP WATER BALL FLOAT VALVE.
- C. RETURN TANK TEMPERATURE-** The RETURN TANK temperature 3 should be 130-185 degrees F. (most pumps will start to cavitate at around 180 degrees F.). If the temperature is higher it's likely leaky CHECK VALVES or STEAM TRAPS blowing through.
- D. CHECK VALVE PERFORMANCE-** The difference in temperature between 4 and 5 should be at least 40 degrees F. If it's less the check valve is probably faulty.
- E. TEMPERATURE OF CONDENSATE RETURN LINE-** The temperature of the CONDENSATE RETURN LINE 6 should be under 205 degrees F. If it's above there are likely several steam traps blowing through.
- F. RETURN TANK OVERFLOW-** Visually check 7 to see if there is a continuous flow of water from the RETURN TANK OVERFLOW. If there is and the temperature is at about the same temperature as the return tank it's likely a leaky MAKE UP WATER BALL FLOAT VALVE. If it's higher it's likely several bad steam traps.
- G. SUCTION STRAINER-** Every three months the cap on the SUCTION STRAINER 8 should be removed and the strainer removed and cleaned.
- H. BLOW DOWN VALVE-** The temperature after the BLOW DOWN VALVES 9 should be less than the boiler room temperature plus 20 degrees F. If the temperature is higher it usually indicates a faulty blow down valve. The temperature will be higher closest to the faulty valve.

RECORD THE READINGS WHEN BOILER OK FOR A BASELINE TO COMPARE TO

READINGS WHEN BOILER OK		
	WHAT TO DO	RESULT
①	CHECK LEVEL	
②	CHECK LEVEL	
③	TAKE TEMPERATURE	
④	TAKE TEMPERATURE	
⑤	TAKE TEMPERATURE	
⑥	TAKE TEMPERATURE	
⑦	VISUALLY CHECK	
⑧	VISUALLY CHECK	
⑨	TAKE TEMPERATURE	

READINGS WHEN BOILER HAS A PROBLEM		
	WHAT TO DO	RESULT
①	CHECK LEVEL	
②	CHECK LEVEL	
③	TAKE TEMPERATURE	
④	TAKE TEMPERATURE	
⑤	TAKE TEMPERATURE	
⑥	TAKE TEMPERATURE	
⑦	VISUALLY CHECK	
⑧	VISUALLY CHECK	
⑨	TAKE TEMPERATURE	

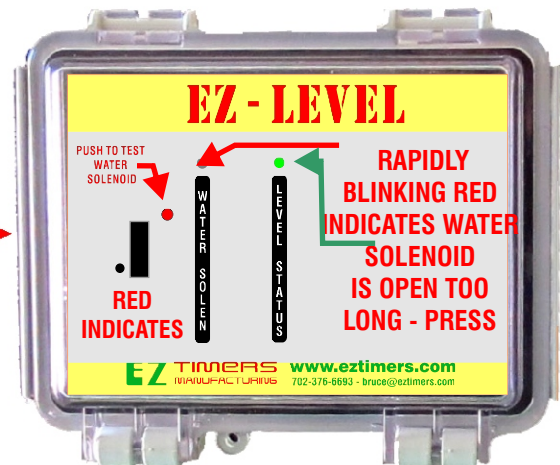
WANT TO STOP THIS DAMAGE?



REPLACE THAT TROUBLESOME BALL-FLOAT VALVE



WITH →



The **EZ LEVEL** prevents boiler scaling as well as premature piping failure by replacing that troublesome relic, the ball-float valve. The ball-float valve maintains the level of water in the return tank and are known for leaking and sticking open. This allows fresh water containing lots of oxygen to continuously leak into the return tank. This free oxygen combines with carbon dioxide to create carbonic acid. Carbonic acid destroys pipework and boiler internals. In addition this continuous leakage of fresh water dilutes the boiler compound resulting in scale formation.