

# Annual Low Pressure Boiler Inspection -Review List -

Review List serves as a reference when performing an annual boiler inspection and completing the BO-9: DOB Boiler Inspection Report

<b>1 Purpose and Intent</b>
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It is the purpose and intent of the inspection to require that a boiler shall be of such quality throughout and shall have such protective and control devices and shall be maintained and operated as to provide practical assurance against its being or becoming defective. NYS Rule 4-1.4

<b>2 Jurisdictional Inspection Requirement Reference Materials</b>
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1. New York State Department of Labor, Division of Safety and Health Boiler Safety Unit - [http://www.labor.ny.gov/workerprotection/safetyhealth/DOSH\\_Boiler\\_SAFETY.shtm](http://www.labor.ny.gov/workerprotection/safetyhealth/DOSH_Boiler_SAFETY.shtm)
2. Low Pressure Boiler - New York State Boiler Rules - Code Rule 4 <http://www.labor.ny.gov/workerprotection/safetyhealth/sh4.shtm>  
Effective March 31, 1965
3. ASME Boiler & Pressure Vessel Code Sections I, II, IV, IX
4. **Current** ASME CSD-1 edition for boilers installed until current (2014) NYC Building Codes

<b>3 Imminent Hazard</b>
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A dangerous condition such as but not limited to large gas leak, large oil leak, carbon monoxide, fumes, high pressure device over 50 BHP with no attendant, operating without relief/safety valves, boiler being over fired, etc. Have the operator or another employee shut down the device. If that is not possible and the conditions warrant call 311 immediately. Send an email to [boilersinfo@buildings.nyc.gov](mailto:boilersinfo@buildings.nyc.gov) or fax the notification to 212-566-5764 for Department of Buildings follow up.

<b>4 Boiler Room</b>
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**Requirements:**

The room must be located in a one hour fire rated enclosure with no unprotected openings to the interior. 27-793 (from 1968-2009) and the Building Code Chapter 3 for boilers permitted after 7/1/2009. Exception: sealed combustion devices may be located in living space except for areas that may be used for sleeping purposes. FGC 303 The door must be 30” wide minimum if constructed prior to 3/31/1965 and 36” wide if constructed after that date. If the room is larger than 500 square feet, a second means of egress must be provided. The second means of egress may be an inclined ladder. The doors must be self-closing. NYS Code Rule 4-6.8

The boiler must have clearance for proper operation, maintenance and inspection. NYS Code Rule 4-6.3

Clearance between any component on the side or rear of a boiler and any wall or partition of the building in which it is installed shall be not less than 24” where the capacity is less than 5 million btuh and 36” where the capacity exceeds 5 million btuh. NYS Code Rule 4-6.4

Ladder: Where the distance from the floor to the top of the boiler exceeds eight feet, a permanent ladder shall be provided to give safe access to permit access to and exit from the boiler top. Where two or more boilers are operated in battery, two remote means of exit shall be provided. NYS Code Rule 4-6.6

Platform: Where the main stop valve, a safety valve, or a relief valve is located on top of a boiler more than six foot high unless the top of the boiler is flat. The platform must be not less than 24” wide. NYS Code Rule 4-6.6

A clearly labeled emergency switch must be installed adjacent to the door(s) that will halt the fuel supply to the fuel consuming devices. ASME B&PVC section IV HG 634 Exception: For doors on the exterior, or hallway where nuisance operation may be a problem, the switch may be installed just inside the door(s).

No combustible or flammable storage may be present in the boiler room. Fire Code 315.2.3

The ceiling over the boiler, hot water heater and flue in an open basement must be covered with sheet rock 8’ around the devices.

**4 Boiler Room**

**Recommendations:**

The doors must open in the direction of egress. NYS Code Rule 4-6.8 Exception: If the door is existing and cannot open out due to fixed structural conditions, it may be approved by the DOB boiler division.

The emergency switch is not labeled.

There is not sufficient lighting in the boiler room.

There are open junction boxes in the boiler room. NYS Code Rule 4-7.5

A floor drain or funnel drain must be provided for relief/safety valves, and drains. Boilers located in basements may use sump pits. 27-16 P111.1(8), MC 1004.6, MC1006.6, MC1008.2.

Exposed wood beams in ceilings must be covered with fire rated material in all commercial, mixed use and three family and larger buildings. Building Code

**5 Boiler**

**Requirements:**

The boiler must have a nameplate with the year built, serial number and applicable ASME construction code stamp. ASME code "HLW" stamped devices may not be used to provide any space heating. NYS Code 4-1.15

If the nameplate is missing or cannot be read, a document may be prepared by the inspectors. The document must include the make, heat input, and maximum allowable working pressure. It must be signed and sealed.

City water feed lines may not be directed connected into a boiler. For steel boilers the makeup/feed water shall not be discharged directly into any part of the boiler exposed to radiant heat. NYS Rule 4-13.4 (d)

For cast iron boilers the feed water shall not be introduced through openings or connections used for relief, water column, or water level gage glass. NYS Rule 4-13.4 (d), 4-14.4 (b) and 4-5.9

A check valve shall be installed in a city water feed line for steam boilers. NYS Code 4-5.9

Spill switches and roll out switches when installed as part of the manufacturer's equipment or when added shall be installed to meet the manufacturer's requirements. NYS 4-7.2 The spill switches on a breeching for multiple devices should be wired in series. Where a strong negative pressure is observed within the building due to large air exhausts (common for restaurants) spill switches and roll out switches should be listed as recommendations.

Welded repairs that have been performed by an unlicensed individual or are of poor quality are not acceptable NYS Code 4-6.1, NYS Code Rule 14-3.2

Stop valves are required in the supply and return piping when two or more boilers are connected to a common system. The valve shall be indicating valves for sizes over 2". NYS Rule 4-13.4

Stop (isolation) valves are required for all boilers installed under the 2014 Code. Exception: No isolation valves are required for a single low pressure steam boiler having an output of 350 mBtuh or less. MC 1005.1 Flanges are accepted in lieu of valves for a single low pressure steam boiler.

If possible, inspect combustion chamber for missing or damaged refractory.

Bottom blow off valves are required to be connected to the lowest water space possible. The drain must be piped to a safe location. NYS Code 4-6.1

Leaks on the boiler, boiler tubes, tube sheets, and near boiler piping to the first valve on the heating system are to be noted. NYS Code 4-7.4

**5 Boiler****Recommendations:**

Dirty sight glass or slight leaks to site glass.

DOB registration number must be in 2" high numerals written on the boiler.

Boiler is not registered with DOB. Boilers that have a six digit boiler number starting with an "8" or are listed in BIS with the status as temporary have never been accepted by DOB. These boilers must be permanently registered or subject to a violation form the agency. MC 1011.1

Where the current registered device is used strictly for domestic hot water and has heat input under 350mbtuh, advise **DOB Boiler Division** by email to void the boiler number. Similarly, if the device heats a strictly residential 1-5 family dwelling, or an individual dwelling unit within a building advise DOB by email to void the boiler numbers.

**6 Modular Boilers**

In addition to the items listed under boilers, a close inspection of modular boiler should be performed. It is common for installed to add valves with or without operating handles between modular sections. Where isolation valves exist between sections, separate LWCO's, reliefs, and isolation valves are required. A four section modular boiler with internal isolation valves is considered to be four boilers by the New York City jurisdiction.

**7 Breeching****Requirements:**

The annual boiler inspection shall include the connection to the chimney. Admin Code 303.2. Where the breeching goes horizontally through a wall, the inspection includes the horizontal run. Breeching that penetrates a fire wall must be double wall or covered with fire rated enclosure. (Listed fire rated insulation is acceptable). Where the breeching passes vertically through a floor, the inspection includes the breeching up to the point it passes through the floor. MC 803.10.4

If the horizontal breeching is not accessible outside of the boiler room, it must be noted as a defect on the inspection report (not accessible).

The breeching shall be well supported to avoid dips and bends. Holes or cracks shall be reported. Plastic vent pipe must be supported at least every 4' to avoid stress and bending. PC 308.5 and manufacturer's recommendations. Inspect plastic joints near the boiler for softening, sagging, and cracking.

The breeching must be sealed at the chimney entrance. MC 803.10.3

Masonry chimneys must have a clean out at the base. For existing chimneys, a tee as close as possible with an access door is acceptable. The door must be tight fitting. For metal vent systems, a tee must be located at or near the base if it bends and rises vertically. MC801.12 & 801.13

Oil fired systems must have cleanouts located every 15'. Gas fired vent systems must have a cleanout for inspection where the breechings changes by 45 degrees or more in the vertical direction.

Barometric damper shall be free swinging and installed to meet the manufacturer's requirements.

Draft hoods shall be open and clear. FGC 503.12.3

Spill switches shall be wired to shut down all fired equipment on the breeching.

Smoke alarms (opacity monitors) shall be installed on all oil fired boilers capable of firing 20 gph or dual fuel burners capable of burning 30 gph. DEP Code.

Natural draft gas fired devices should be connected to the chimney with a separate breeching. The gas connection should be above the larger oil connection. Where that is not possible, the gas vent may be connected to the main breeching as close as possible to the chimney entrance. A spill switch must be added at opening and wired in series to shut down the power to all devices on the breeching.

**8 Chimney**

**Requirements**

Draft inducers must be wired and interlocked with burners. FGC 503.3

**Recommendations**

If the chimney is inspected, verify the clean out is open and free of debris.

For gas fired sites with masonry chimneys, verify that a lining exists. A chimney cap is required for 20" diameter chimneys and where the heat input is up to 2million btuh input for natural draft devices.

**9 Burner**

Burners installed must have a UL or other nationally recognized testing laboratory label on the burner. Oil fired burners with heat input over 350mbtu must have a DAR kit installed at the burner. DEP Code  
If the burner has been replaced, the boiler must be brought up to current code (two LWCO's and isolation valves must be in place if required). The burner must be permitted and inspected on all oil fired boilers (new 16A form). Gas fired power burner replacements must have a DOB boiler inspection where they have heat input of 800mbtuh and larger.

Inspect for fuel leaks and proper sealing of the burner at the boiler.

The burner must have adequate support and a shut off switch within site.

**Recommendation:** If the burner UL or other label is painted over, list paint removal as a recommendation.

**10 Combustion Air**

**Requirements:** Combustion air shall be provided. FGC 304 & MC 701

Mechanical combustion air supply shall be interlocked to prevent operation of the burner when the supply air is not in operation. The interlock shall be proof of air flow. FGC 503.3 & 304.9.2

Louvers and grills shall be fixed in the open position. Motorized dampers shall be interlocked to verify the open position. FGC 304.10 & MC 709.

Combustion air ducts shall be galvanized steel (or equivalent material) and serve a single enclosure FGC 304.22 & MC 708.

**Recommendations:**

Combustion air intakes shall be located at least 30" above grade to avoid snow and debris.

A fire damper is required if the louver is below 30' from grade.

**11 Controls**

**Requirements:**

All controls must be mounted, wired and operational. All equipment used for generation of heat shall be maintained in good operating condition NYS Rule 4-7.4 (a)

The lowest safe water line shall be not lower than the lowest visible part of the water glass. NYS Rule 4-15 (a)

The pressure control on steam boilers shall be installed to prevent steam pressure from rising above 15 psig. NYS Rule 4-5.12

A high limit pressure control with manual reset shall be installed to stop the burner should steam pressure rise to 5 psi above the MAWP. NYS Rule 4-5.17 a, c, e, f

The pressure controls shall be protected by a siphon loop or equivalent. A siphon loop provided in the common line to gages and controls is considered equivalent. ASME B&PVC section IV HG-605C.

In addition to the operating control, each automatically fired hot water boiler shall have at least one high temperature control that will prevent the water temperature from exceeding the maximum allowable water temperature. Functioning of this control shall cause safety shutdown and lock out. ASME CSD-1-2006 and NYS Rule 4-5.17

For boilers installed under the 2008 Building Code the device must meet ASME CSD-1.

**12 Gages**

**Requirements:**

A steam gage shall be installed in all steam boilers. It shall be protected with a siphon or equivalent. The scale shall be evenly graduated in one pound increments from zero to not less than 30 psig. Only a cock or lever valve near the gage is permitted. NYS Code 4-5.5. The gage connections shall be at least ¼” inside diameter except when steel or wrought tubing is used it shall be not less than ½” diameter. NYS Rule 4-5.7

Steam boilers shall have one or more water gage glasses attached to the water column or boiler with valve fittings, with the lower fitting provided with a drain valve of straight away type with opening not less than ¼” diameter. NYS Code 4-5.7

Hot water boilers shall have a pressure or altitude gauge connected to its flow such that it cannot be shut off from the boiler except by a cock with tee or lever valve placed in the pipe near the gage. The scale on the gage shall be not less than 1-½ times the maximum allowable working pressure. The connections shall be of nonferrous composition when smaller than one inch pipe size and longer than five feet between the gage and point of connection to the boiler. The size of the nonferrous pipe or tubing shall not be less than ¼”. NYS Code 4-5.5

Each hot water boiler shall have a thermometer so located that it shall be easily readable when observing the water pressure or temperature at or near the boiler outlet. NYS Rule 4-5.11

**13 Low Water Cutoff Control**

**Requirements:**

Boilers permitted after 7/1/2009 shall have dual low water cutoffs. MC 1007. The lower LWCO shall be a manual reset device. ASME CSD-1 Steam boilers installed under the 2009 code shall have at least one float type LWCO. ASME CSD-1

Boilers permitted prior to 7/1/2009 shall have at least one low water cutoff. 27 RS 14-5A

Boilers using a float type LWCO shall have a drain and be piped with a vertical straightaway valved drain pipe at the lowest point in the water equalizing pipe connections by which the bowl and the equalizing pipe can be flushed and the device tested. NYS Rule 4.15

A second low water cutoff is not required on packaged wall mounted hot water boiler heating a single residence within a building.

**Recommendations:**

For every steam boiler and every hot water boiler with heat input over 350mbtuh installed under the old code, recommend a second low water cutoff with one manual reset.

If a site employee is available, they should be advised to blow down the LWCO at the time of the inspection.

**14 Relief/Safety Valves**

The safety/relief valve(s) shall have a total nameplate capacity such that the heat generating equipment operating at maximum shall not increase steam pressure over 5psig above the maximum allowable working pressure or 20 % above the maximum allowable water pressure in a hot water boiler. The nameplate pressure on the valve shall not exceed the boiler maximum allowable working pressure. NYS Rule 4-5.2 &3

The pressure relief/safety valve must be installed in the upright position NYS Code 4-5.4

When installing or replacing a safety/relief valve the use of bushings on the boiler is not recommended. A nipple with reducing coupling or flange is recommended.

The valve shall have a substantial lifting device which shall positively lift the disk from the seat at least 1/16” when there is no pressure on the boiler. For boilers over 8’ in height, a pulley and chain must be installed to allow for testing of the valves. NYS Code 4-5.2 &3

There shall be no means of shutoff between the boiler and safety/relief valve NYC 4-5.4 (g)

The discharge pipe from the safety/relief valve shall be full size with no threaded end, supported and pitched to avoid any possible lodging of water in the device or piping, and be piped to a safe location that will pose no danger of scalding persons or damaging equipment. NYS Code Rule 4-5.4 (i) and (j).

**15 Fuel Oil Systems**

**Requirements:**

Separate oil tank rooms are not required to be inspected as part of the annual boiler inspection.

No visible oil leaks are present.

A shut off valve must be installed at the burner.

Cast iron fittings are not permitted on fuel oil piping. MC 1303

Fuel oil lines shall be protected from physical damage.

A portable 20 lb. Type B-C fire extinguisher shall be provided in the boiler room with oil fired equipment. MC 1301.8

**Recommendations:**

If the oil tank is within the boiler room, it should be inspected for leaks as part of the annual boiler inspection.

Fuel Oil tanks over 660 gallons in size shall have containment. MC 1304.13

An anti-siphon device shall be located on the oil tank except for tanks using #6 oil. MC1301.4

**16 Heating System Piping**

**Requirements:**

Steam and heating hot water pipes are well supported from the boiler to the first shut off valve.

No leaks other than minor drips from boiler to first shut off valves. NYS Rule 4-7.4

The potable city water supply shall have backflow protection. For steel boilers and any boiler that uses water treatment, a reduced pressure principle backflow preventer complying with ASSE 1013 or CAN/CSA B64.4 or AWWA C511. PC 608.16.2. For other boilers, a backflow device meeting ASSE 1012 or CAN/CSA B64.3 in the Plumbing Code section 608.16.2 is required.

Expansion tanks are required for hot water systems. MC 1009

Closed type expansion tanks shall be installed in accordance with the manufacturer's instructions. An isolation valve is required on the tank. A pressure relief valve is required except for tanks with an internal bladder.

**Recommendations:**

Drips, corrosion, on heating lines

Poor support, leaks on piping beyond the first isolation valve.

**17 Tankless Domestic Hot Water Heater**

A submerged domestic hot water tempering coil installed in a boiler shall have a tempering valve on the discharge line from the boiler. Plumbing Code 504.4.

A pressure/temperature or relief valve shall be installed in the domestic water piping for the coil. It should be installed on the cold water side to minimize scale build up.

Leaks on tankless coil to first isolation valve. NYS Rule 4-7.4

**18 Other**

**Recommendations:**

Friable asbestos loose in boiler room.