

## CHAPTER SIX

# Troubleshooting Flow Charts



### How to use.

- Troubleshooting charts are divided into the common problems for the different areas of the system.
- Find the problem that is most closely related to the symptoms of the system you are working on.
- Work your way down the flow chart.
- Refer back to the pages listed in the flow charts for theory and diagrams relating to the problem.



### What to look for.

- Observe the gauge glass. Boiler has to be clean before troubleshooting. See [page 34](#).
- Get out of the boiler room to see the whole system.
- If steam, air, or water are in parts of the system that they are not supposed to be, that is part of your problem.
- If steam, air, or water are not where they are supposed to be, what is blocking the path is part of your problem.



### What to ask.

- How long has the problem been occurring?
- Has anything in the system been changed lately?
- In what areas of the building or system is the problem occurring?
- Has the fuel usage increased?



### Bonus Feature

Page 153

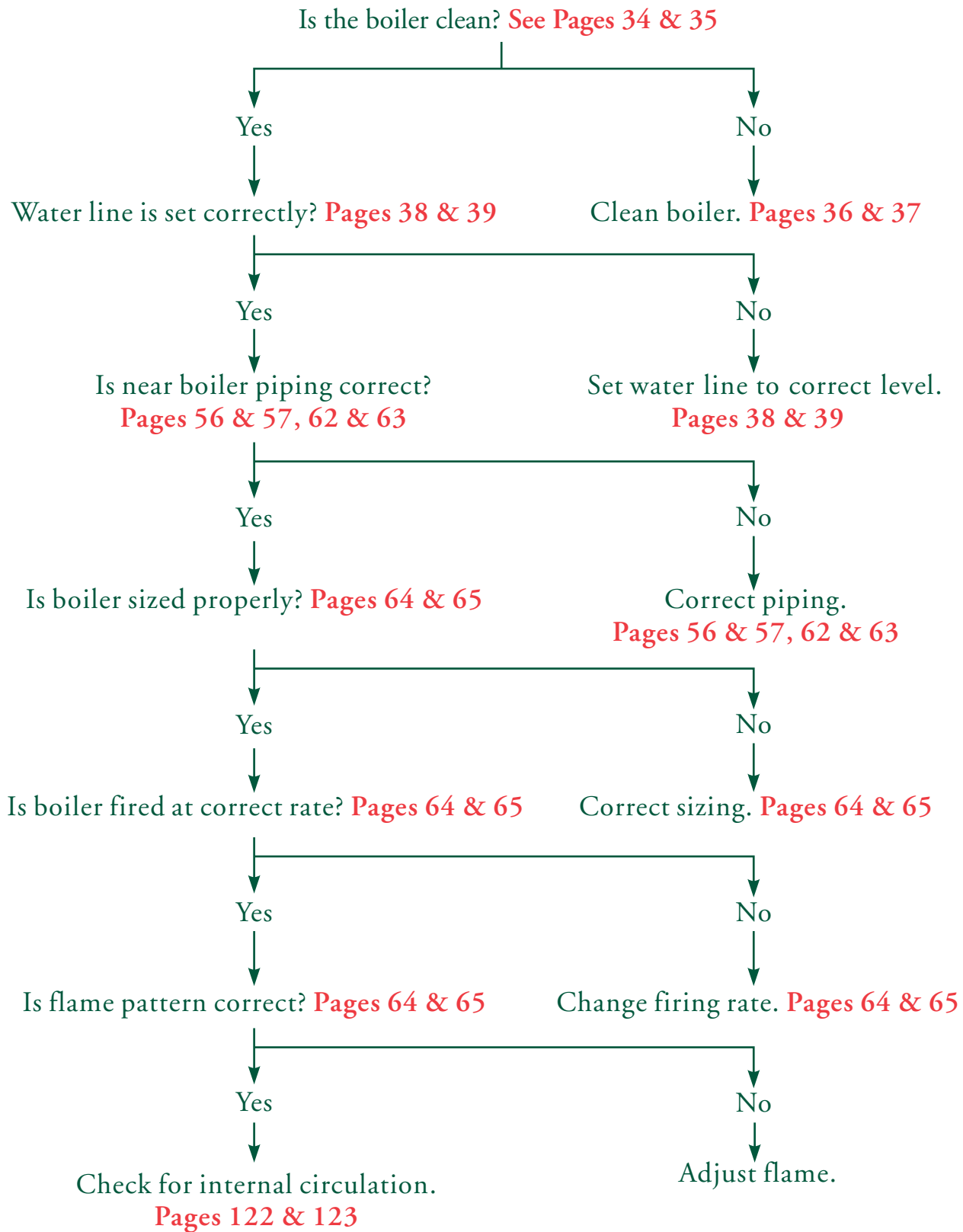
15 tips for top performance  
and low fuel bills  
for steam systems.



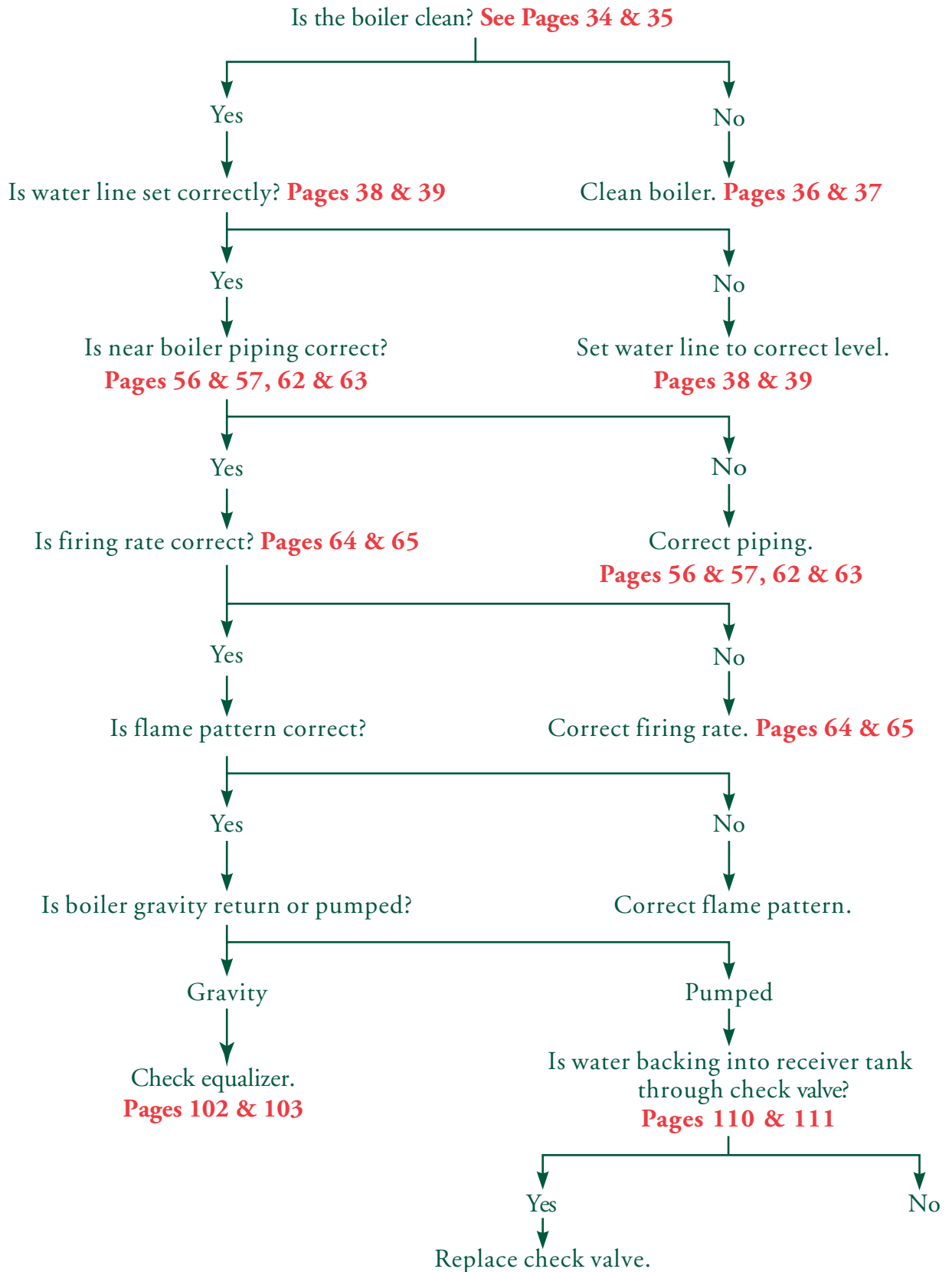
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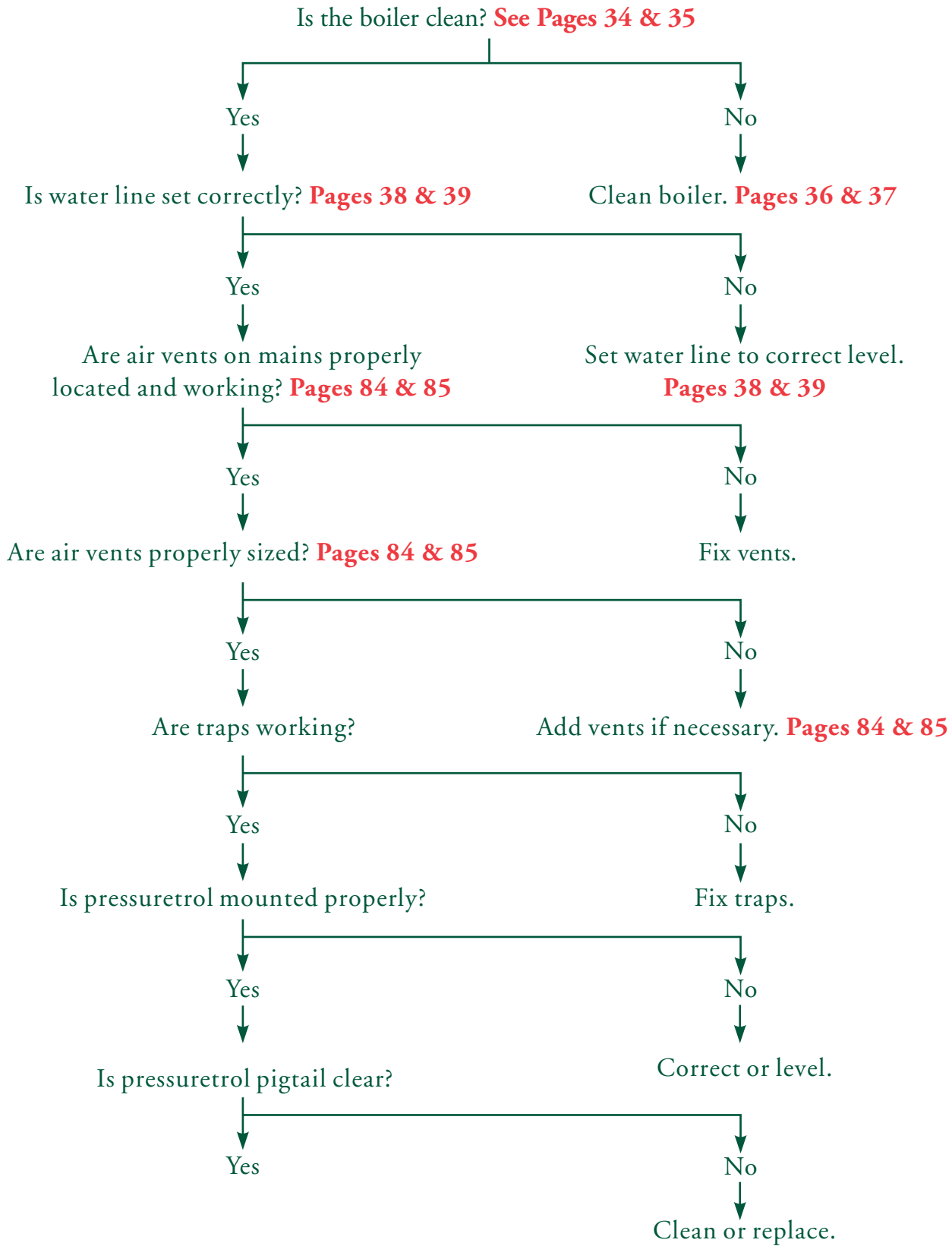
**Unsteady or Bouncing Water Line**



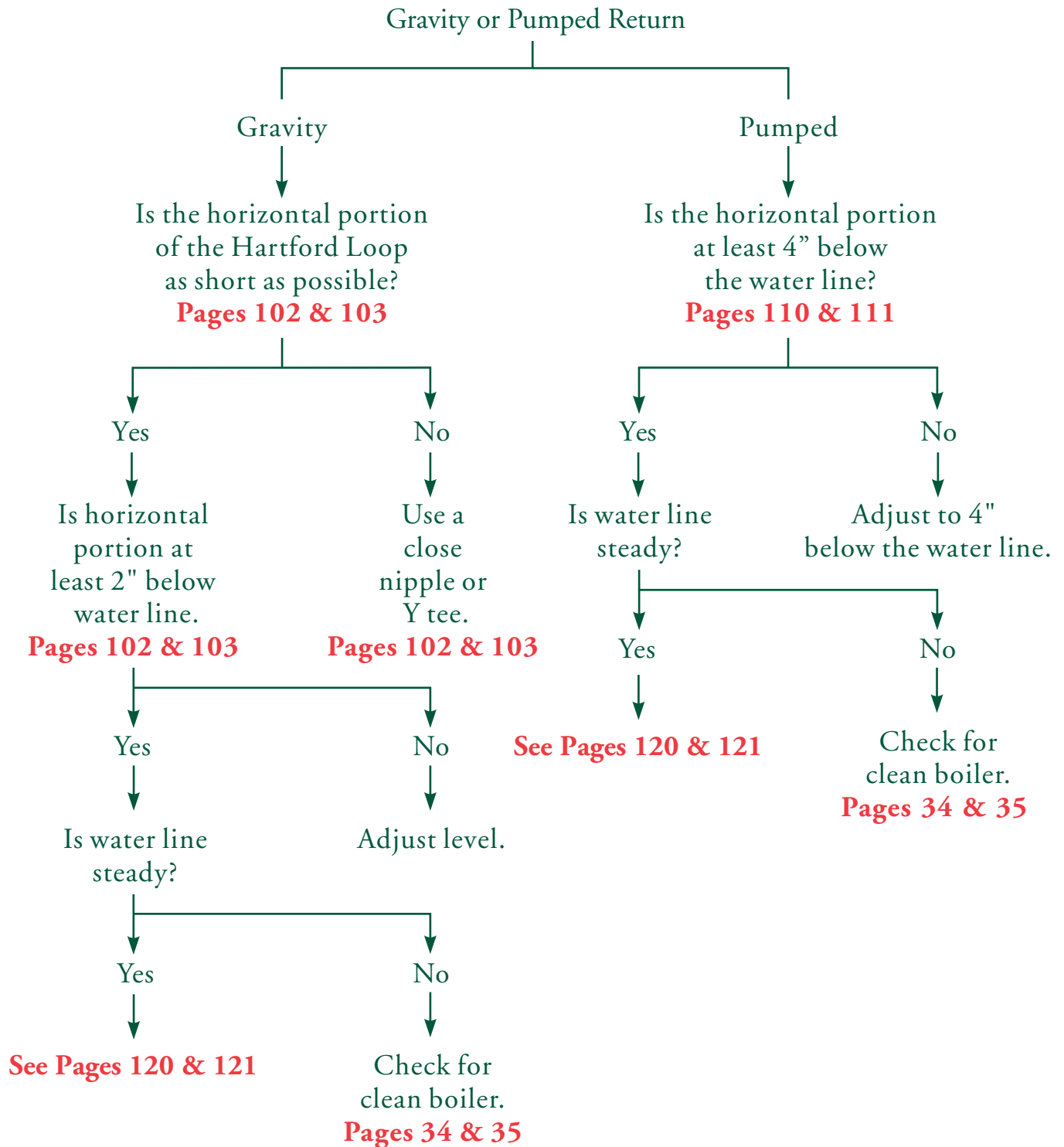
**Water Suddenly Leaves Gauge Glass**



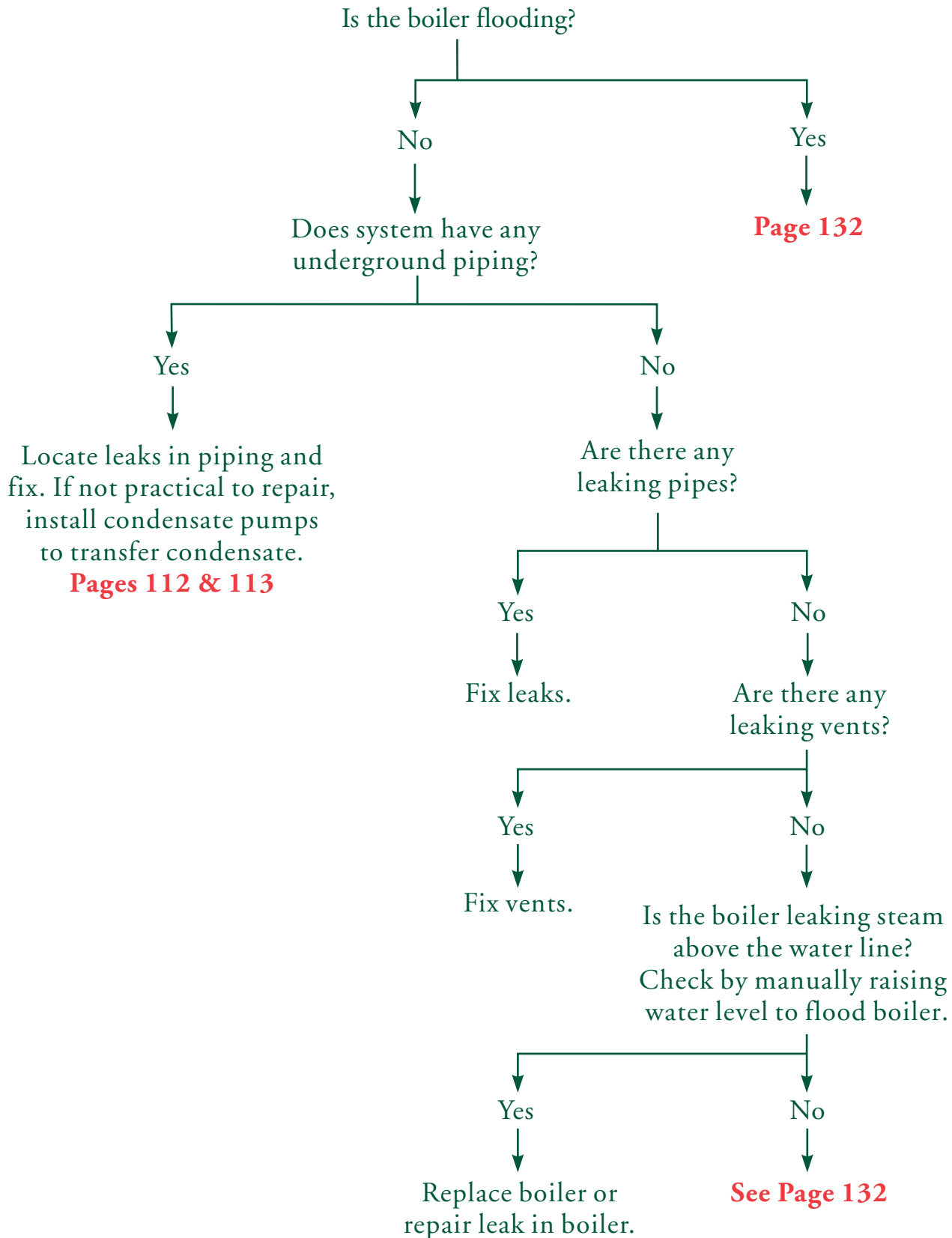
**Pressure Builds Up Quickly, But Steam Does Not Circulate**



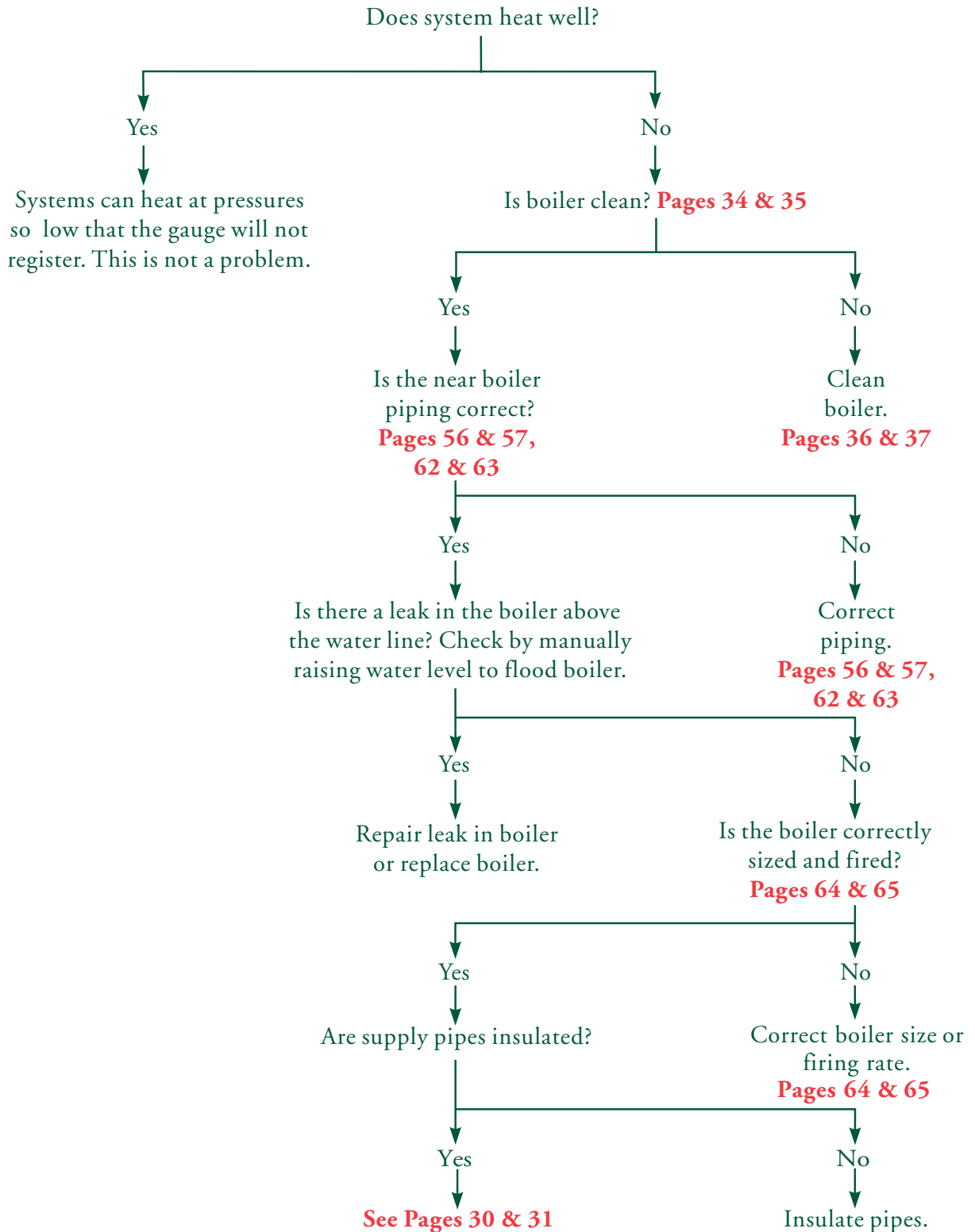
**Water Hammer in Hartford Loop**



**Boiler Takes on a Lot of Make-up Water**

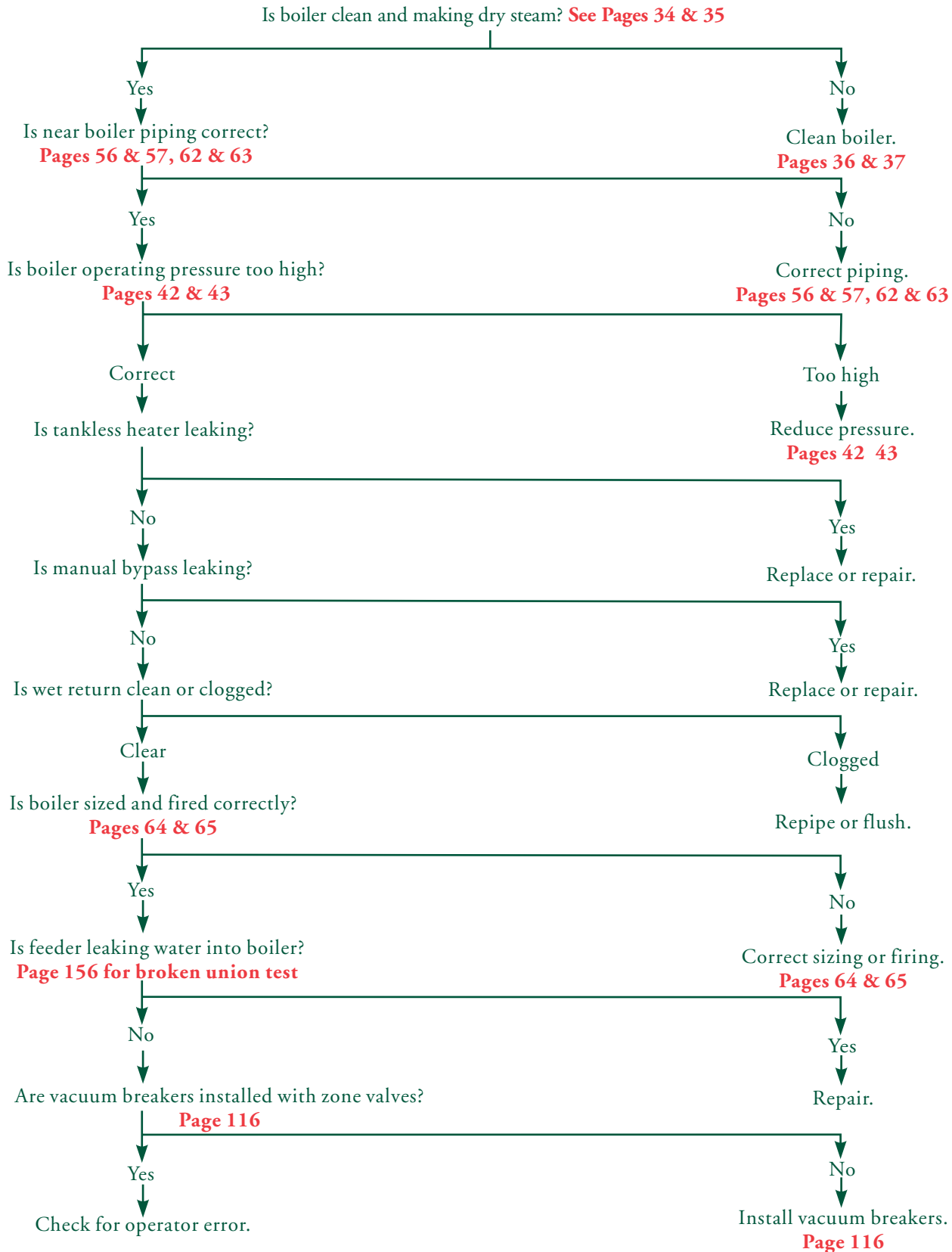


**Boiler Does Not Build Up Pressure on Gauge**

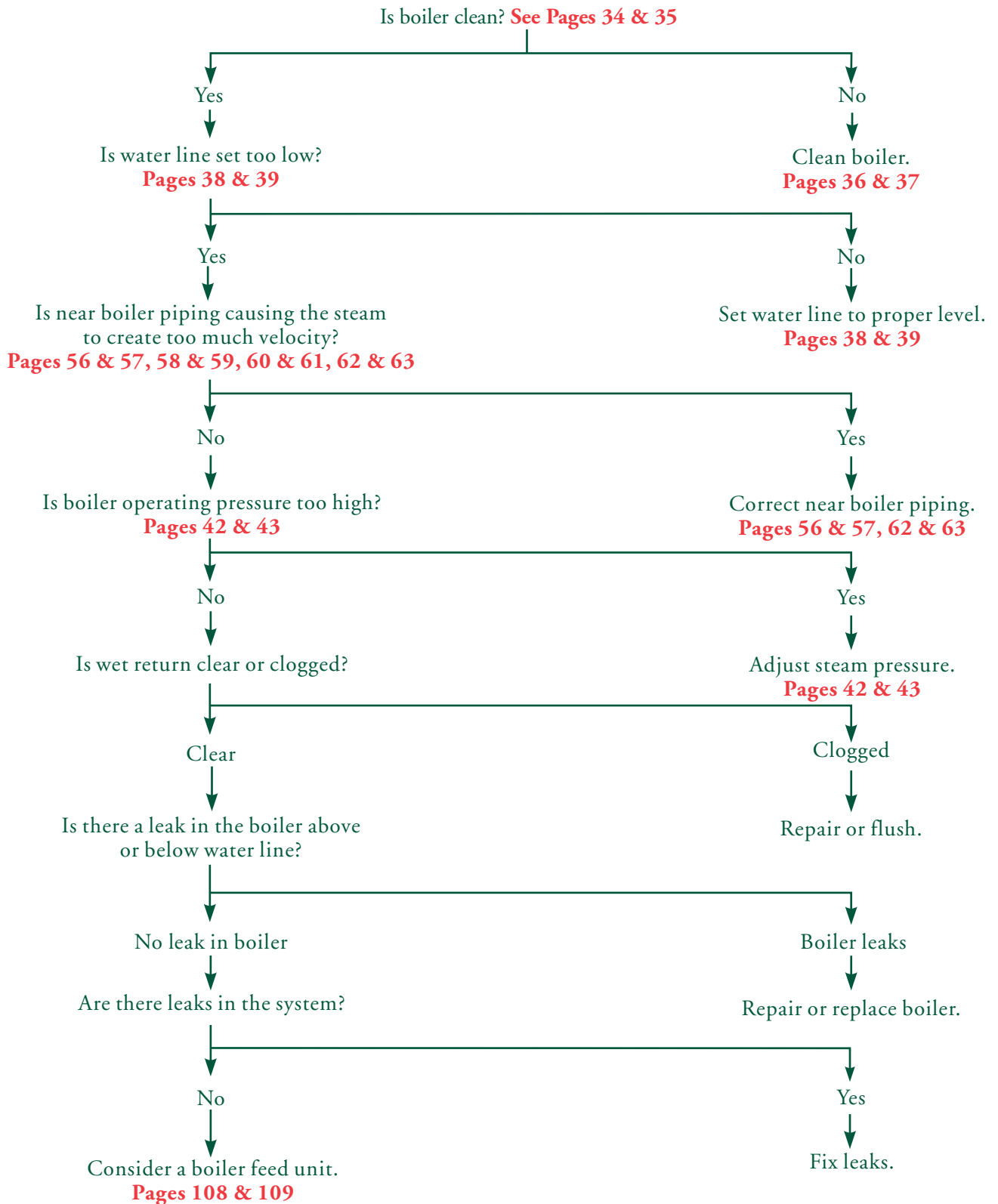




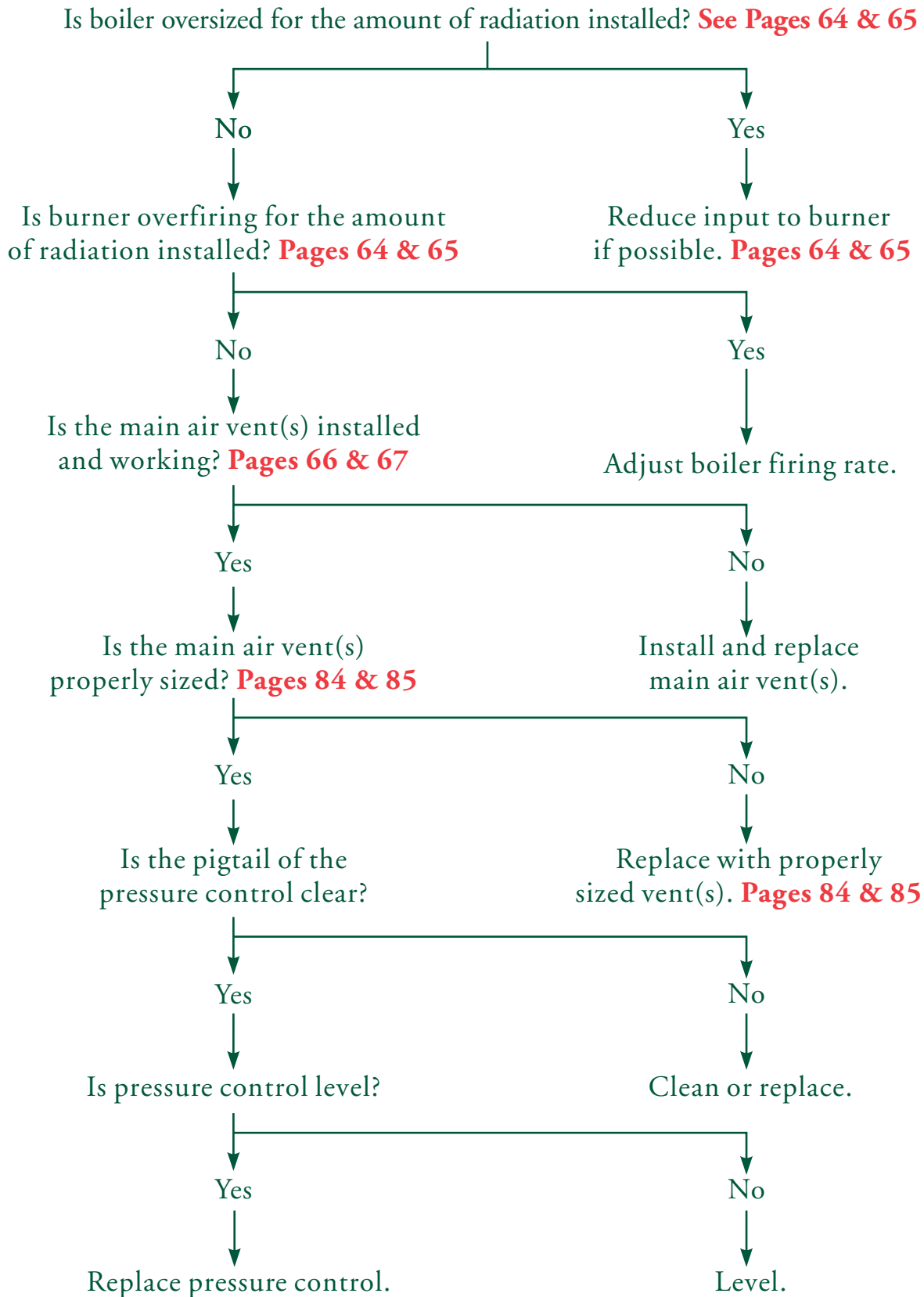
## Boiler Is Flooding



**Burner Shuts Off on Low Water**



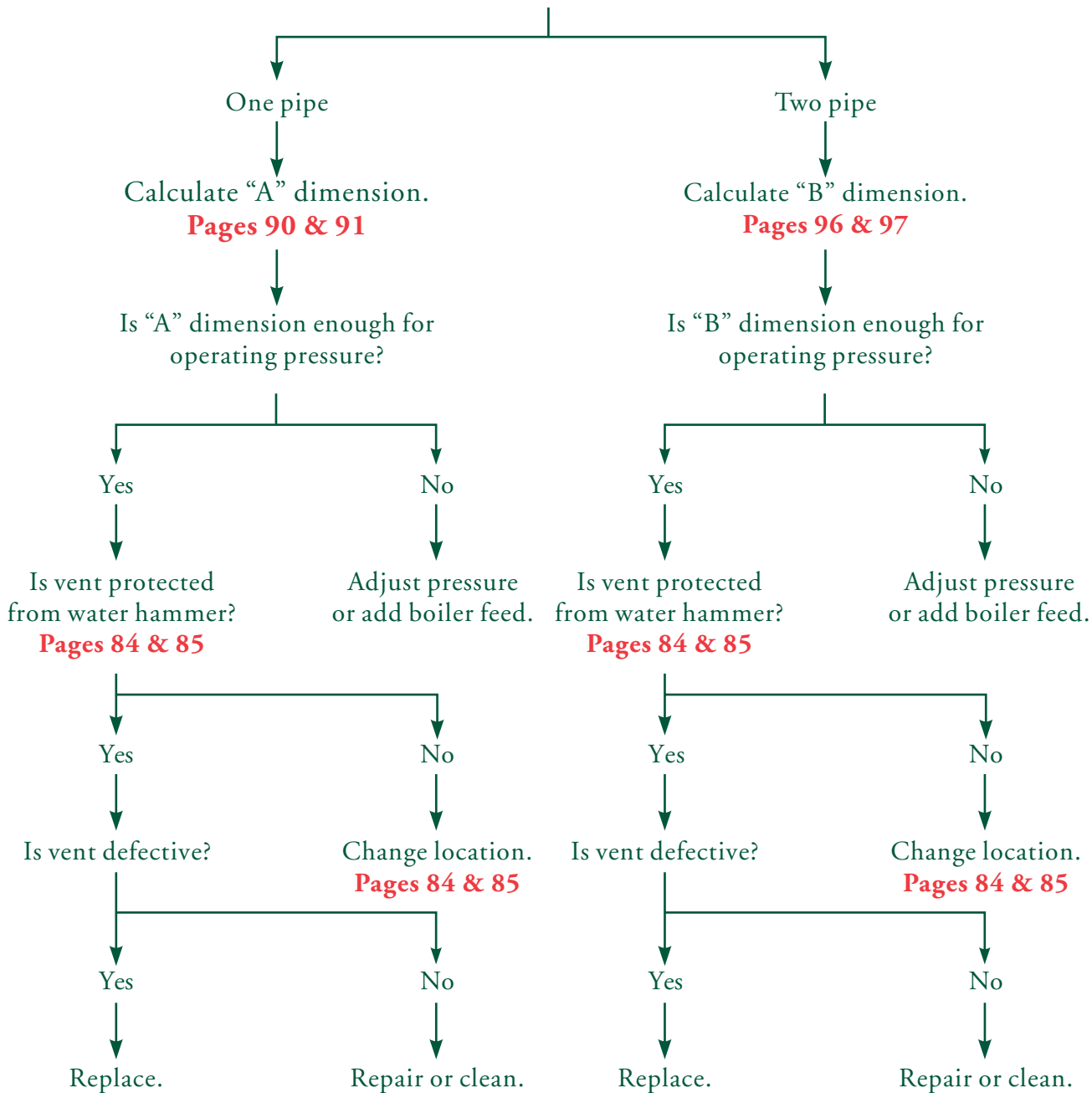
**Boiler Shuts Off on Pressure**



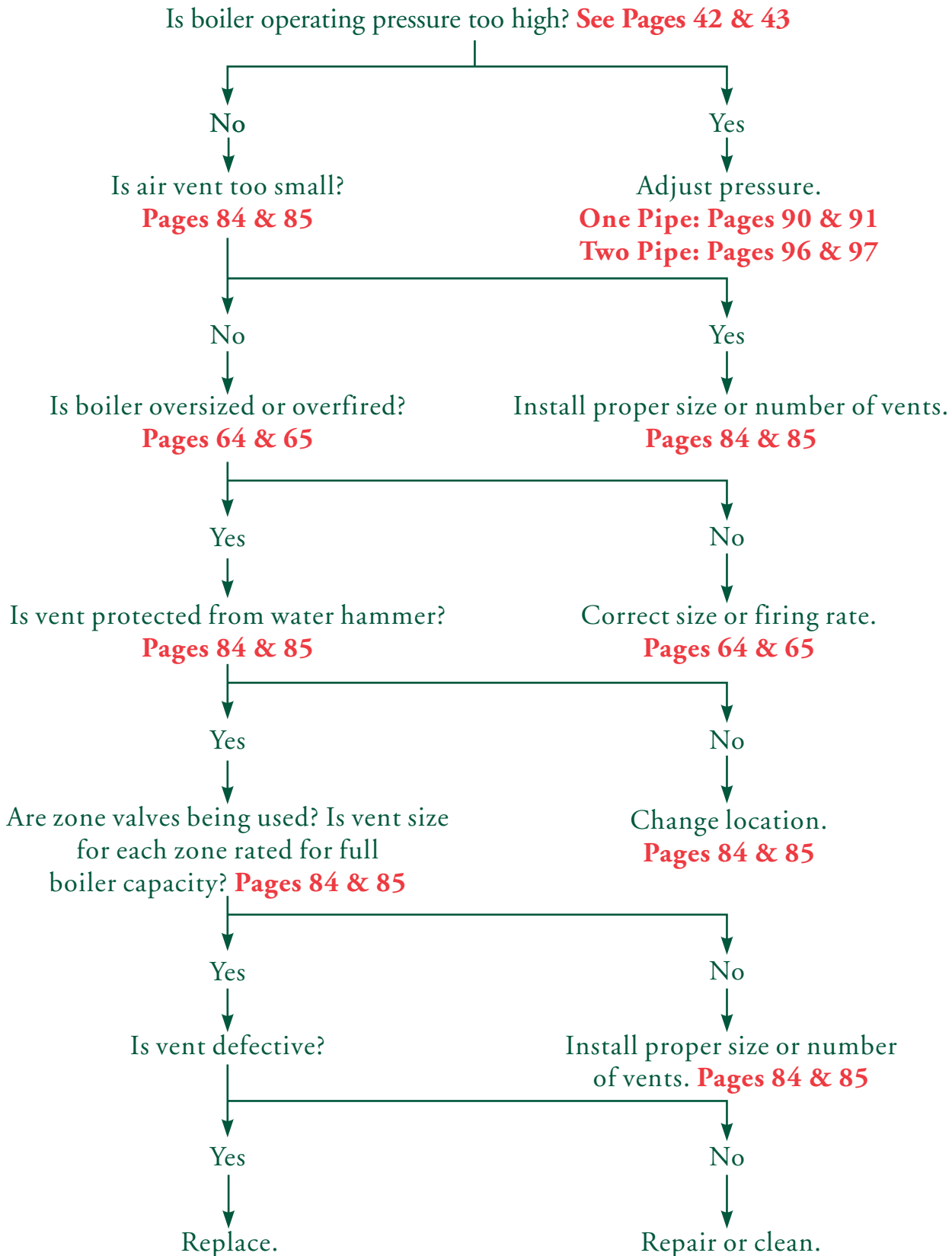
## Spitting Main Air Vent

Is the system one pipe or two pipe?

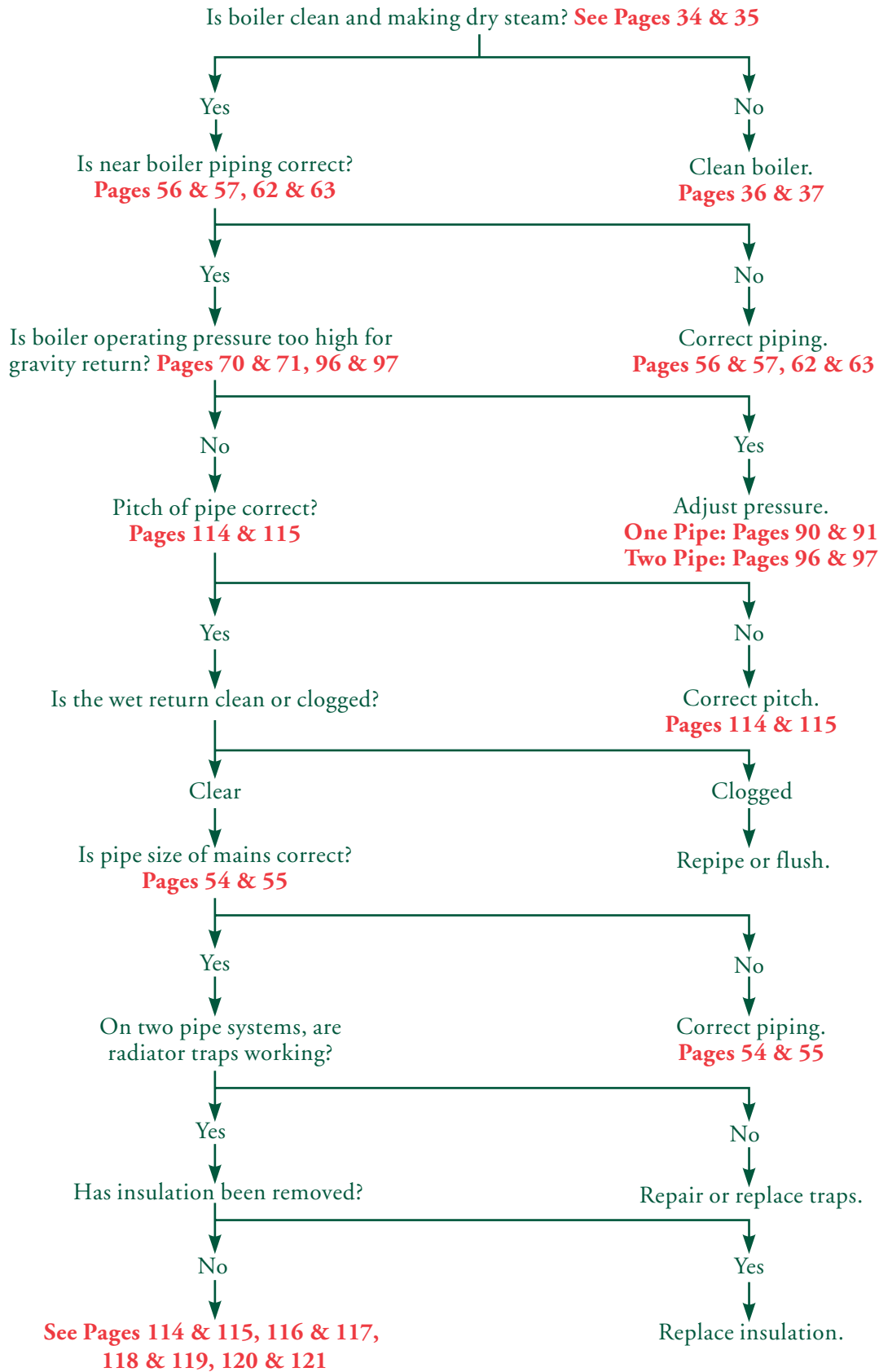
See Pages 46 & 47, 48 & 49



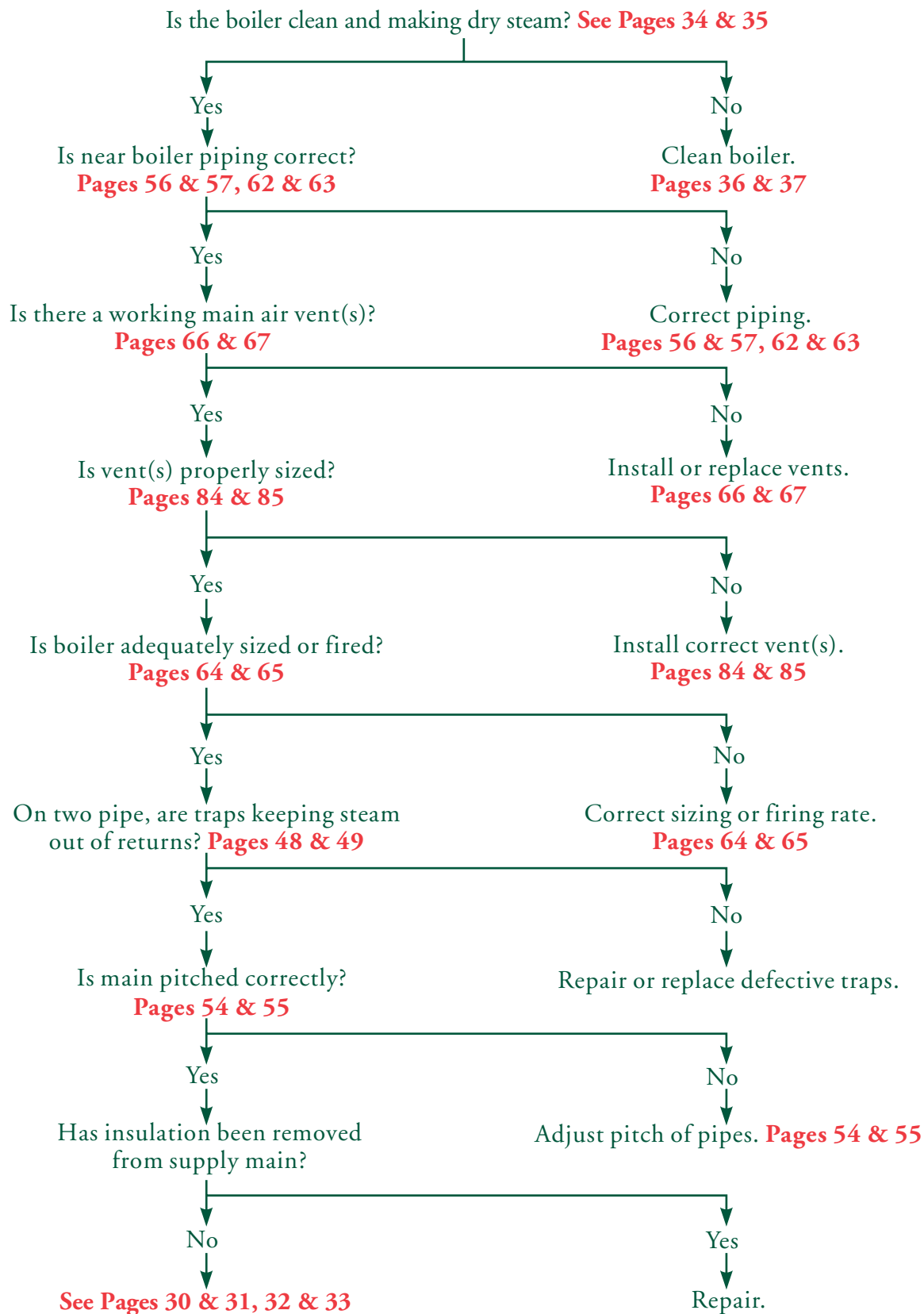
**Main Air Vent Leaks Steam**



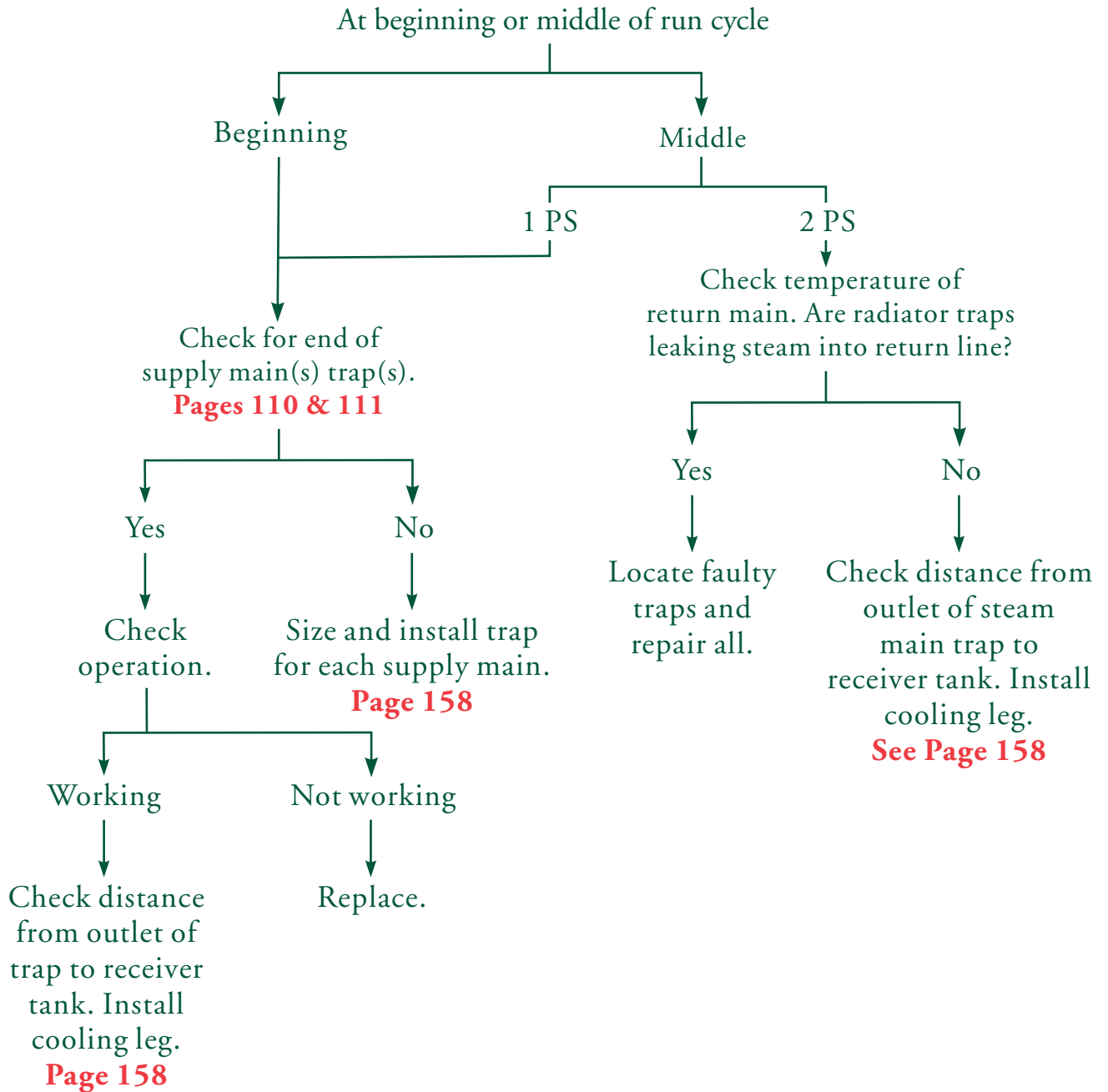
**Water Hammer in Mains**



**Steam Does Not Reach End of Main**

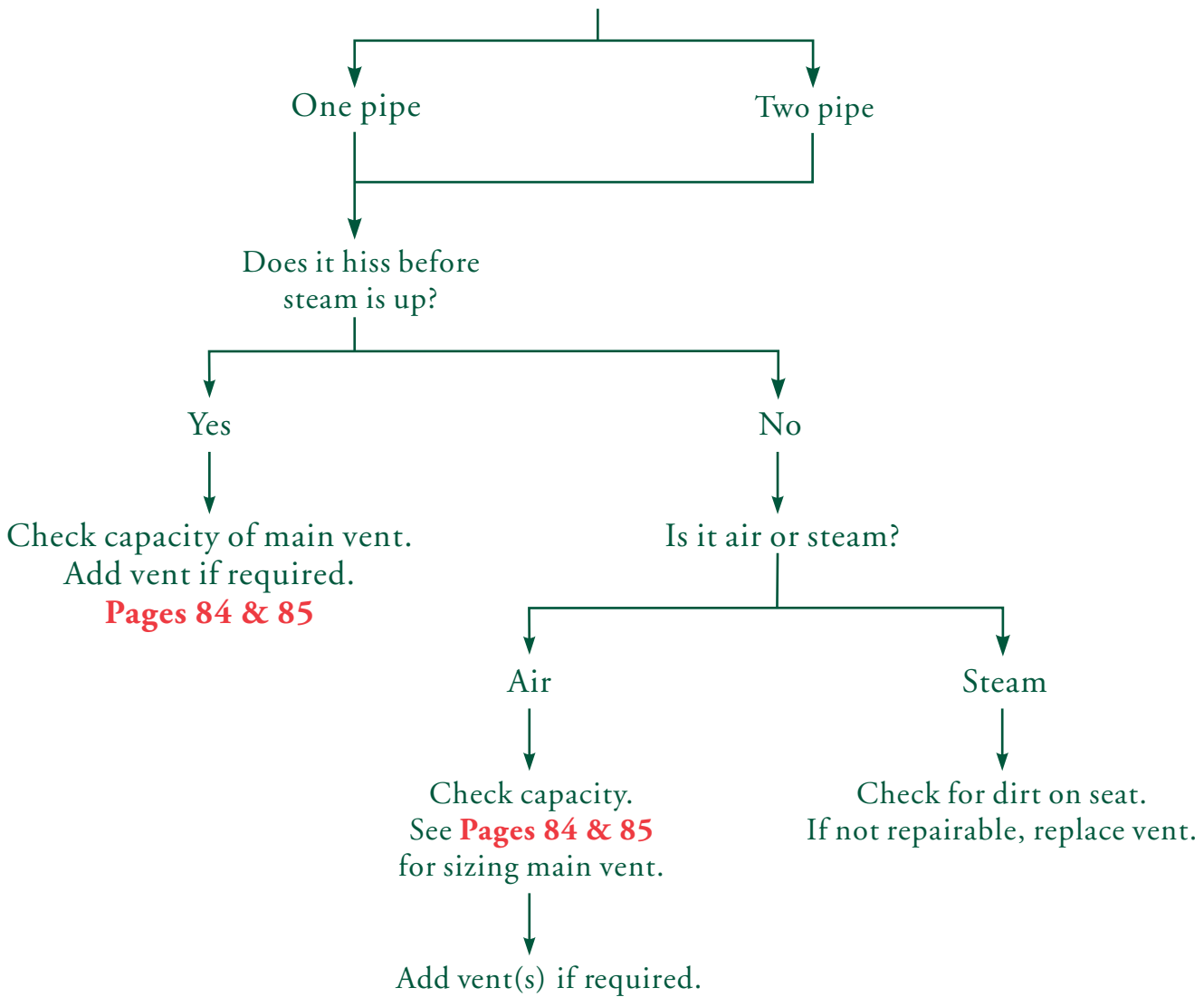


**Steam Coming Out of Vent on Condensate, Vacuum, or Boiler Feed Units**

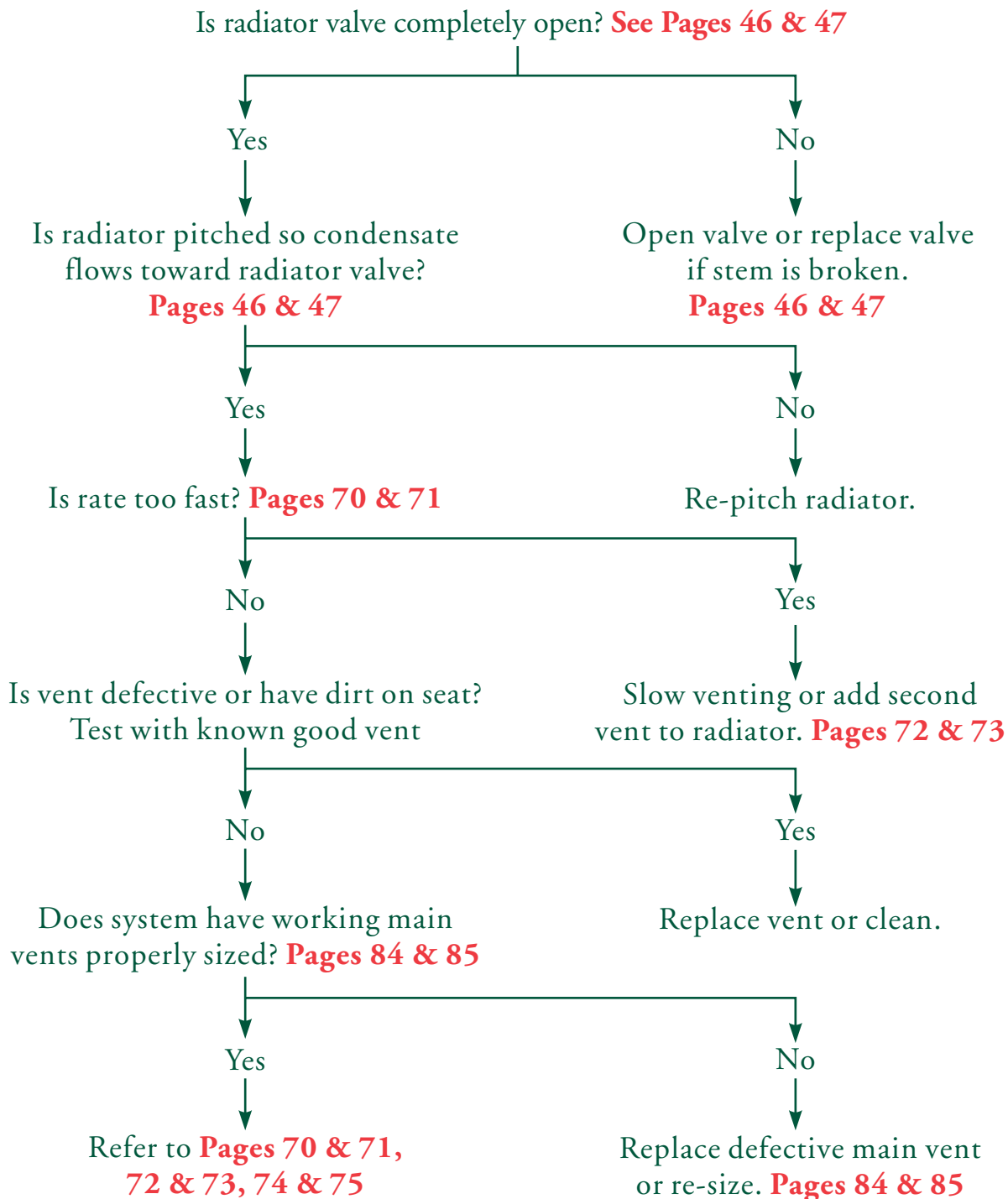




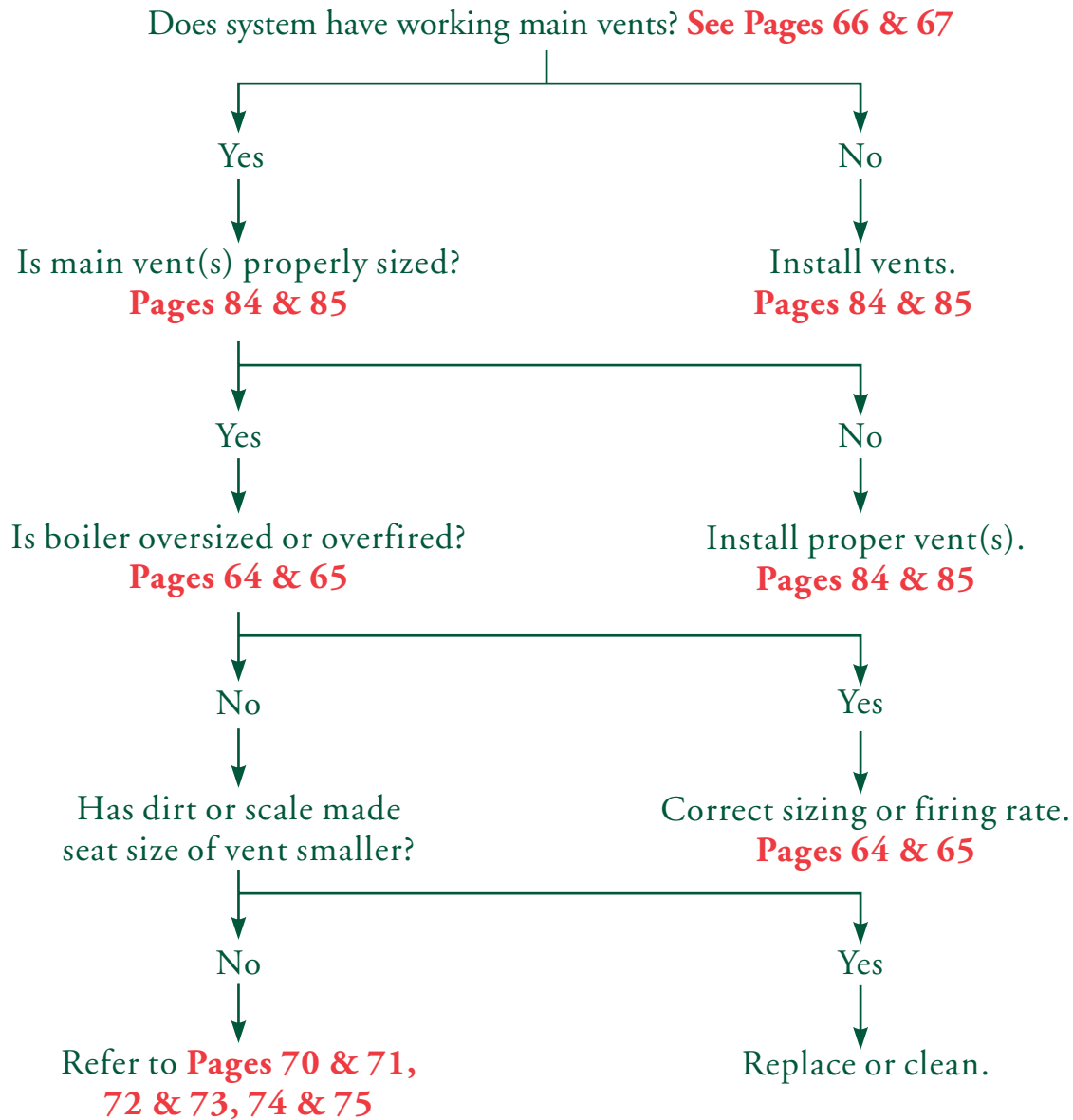
## Hissing Main Air Vent



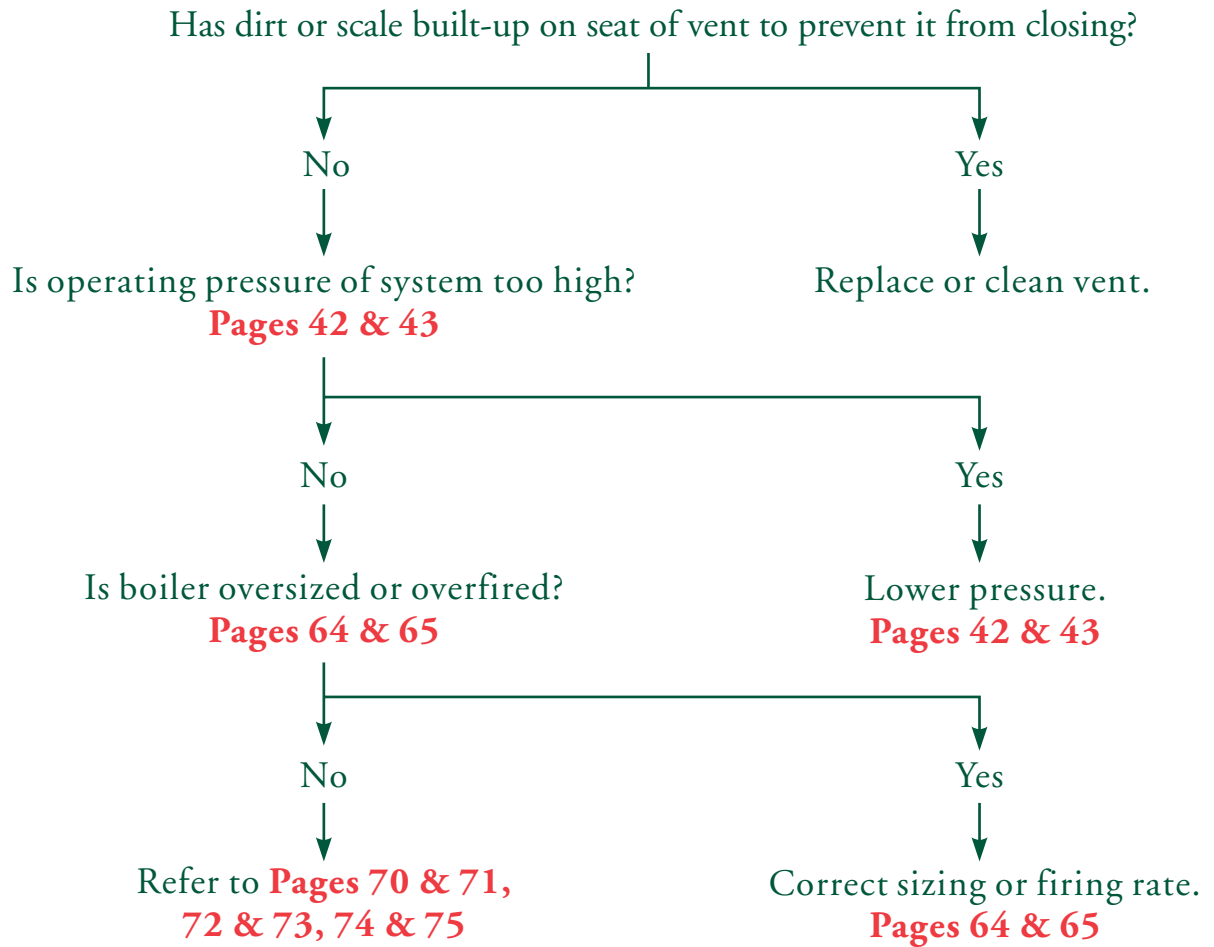
## Spitting Radiator Air Vent



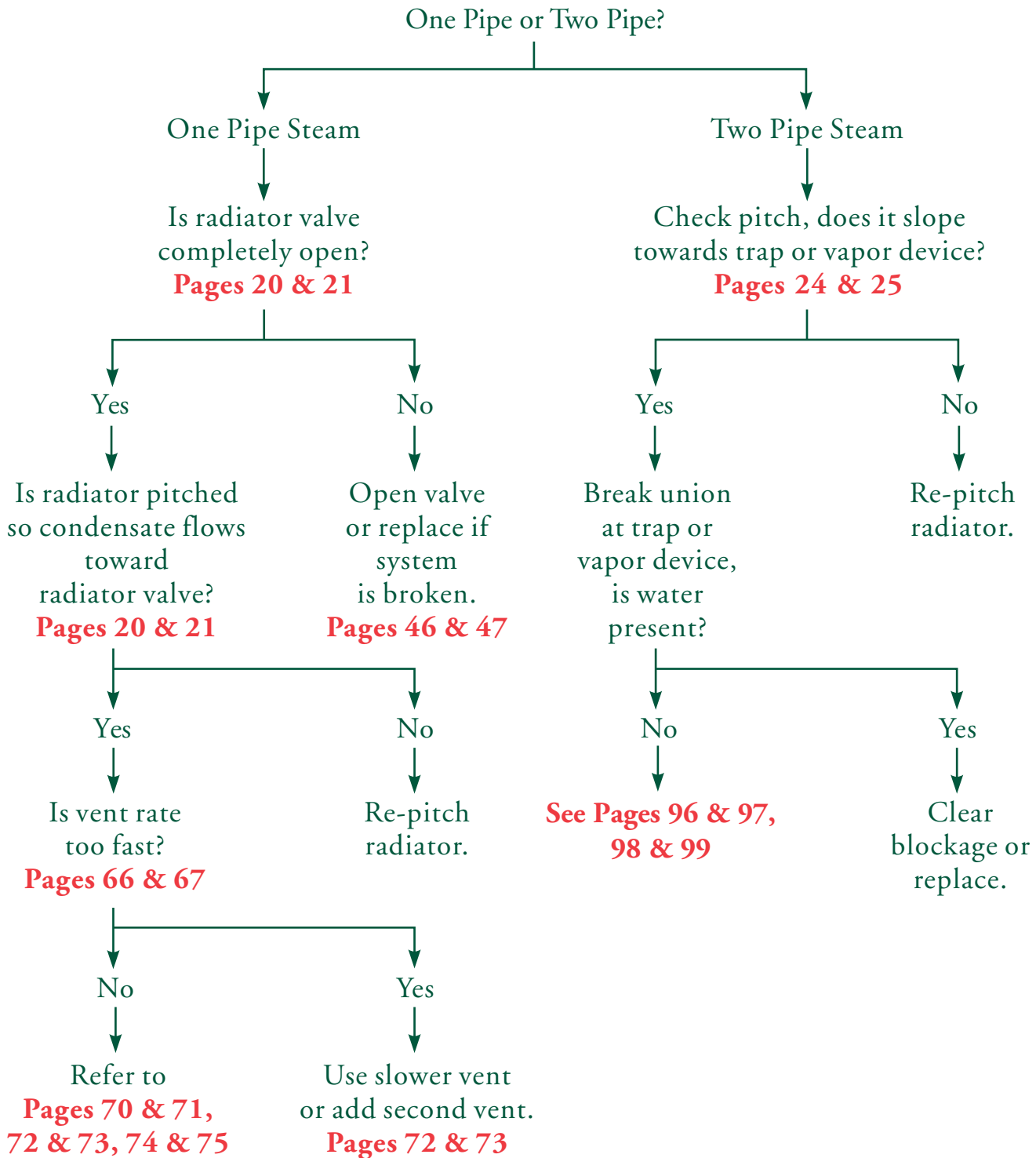
## Hissing Radiator Vents



### Radiator Vent Leaks Steam



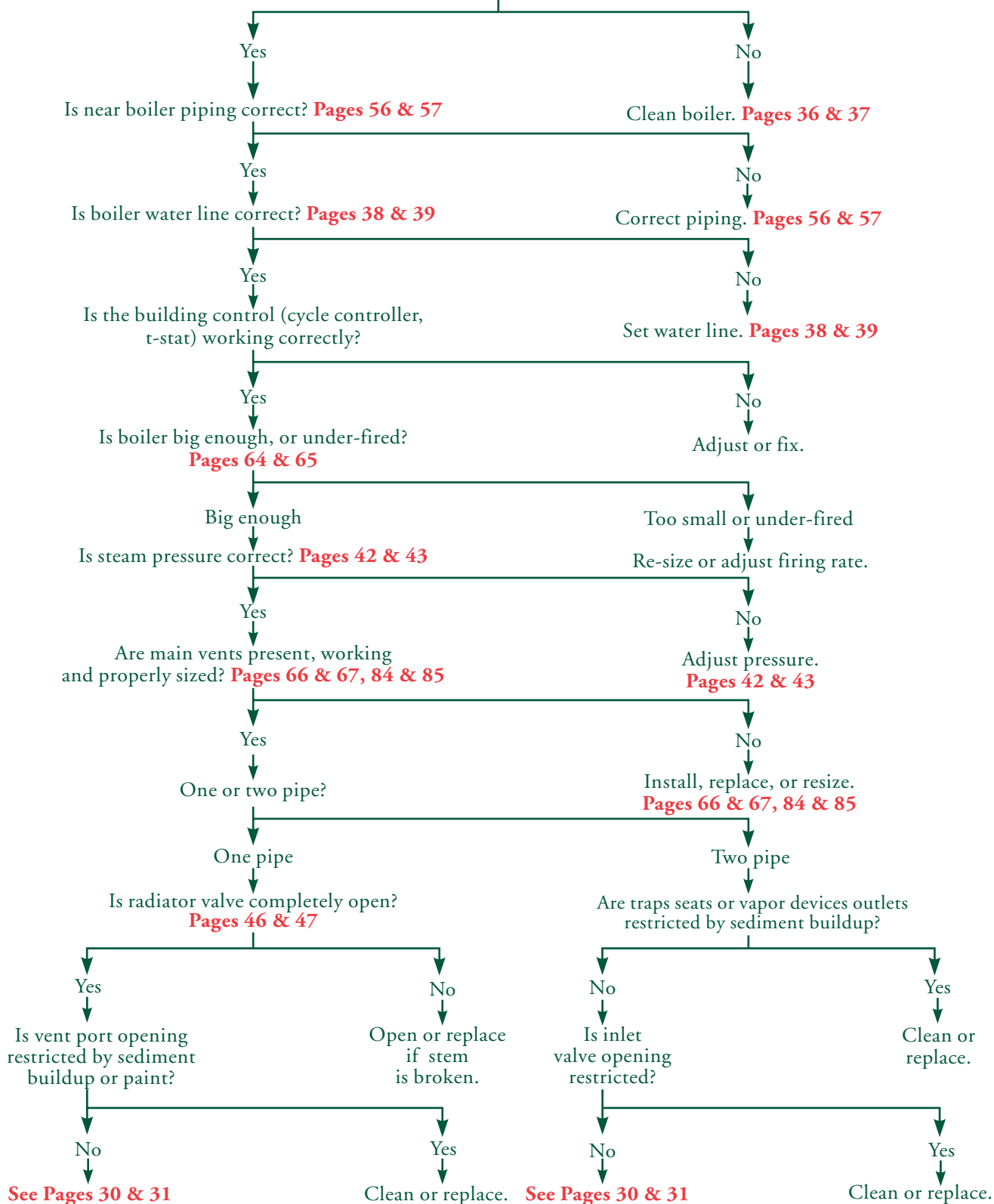
**Water Hammer in Radiator**



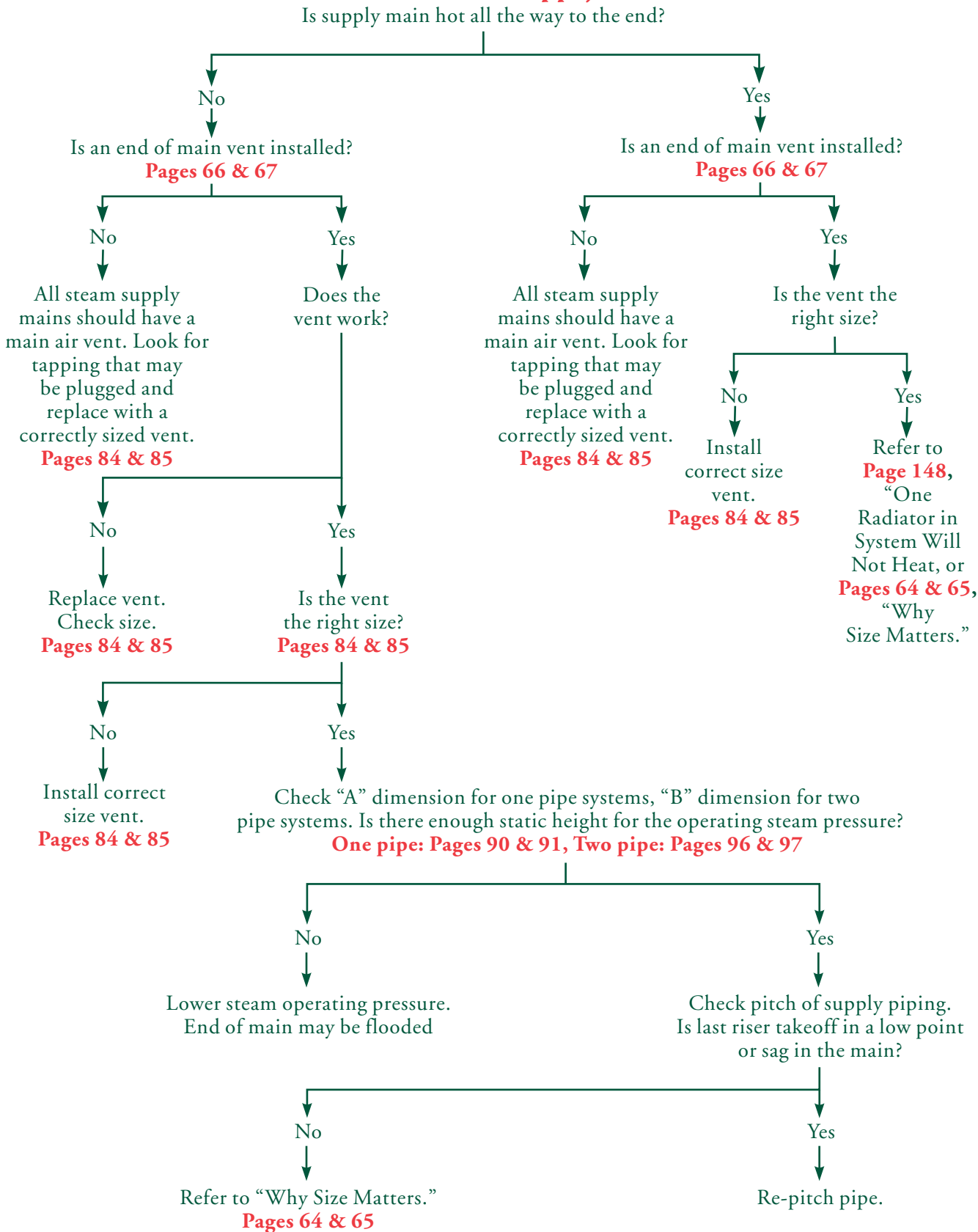
## Radiator Does Not Completely Fill with Steam

(System does not heat completely on cold day)

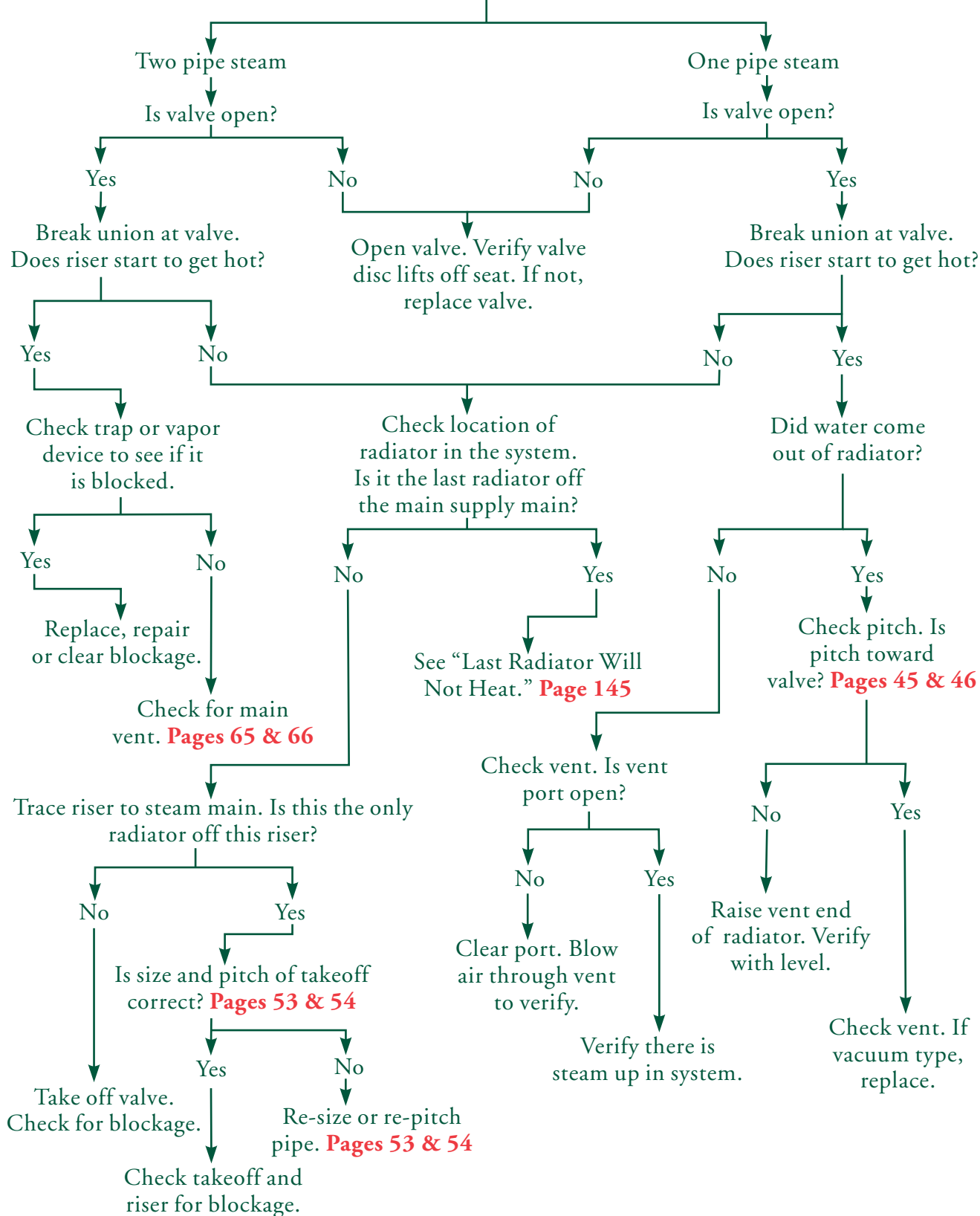
Is the boiler clean and making dry steam? See Pages 34 & 35



## Last Radiator or Radiator Off Supply Main Will Not Heat



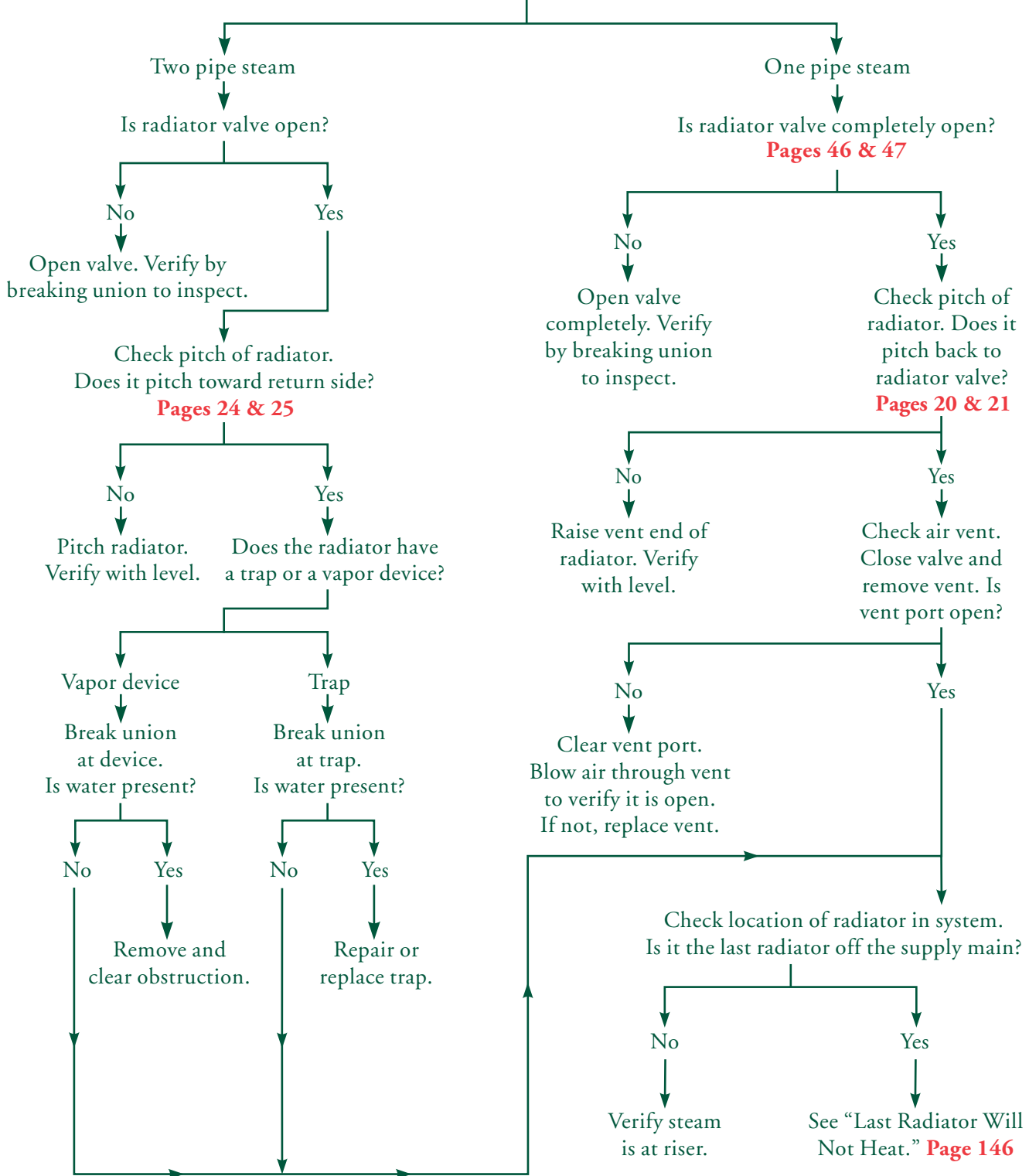
## One Radiator in System Will Not Heat (No steam at riser)



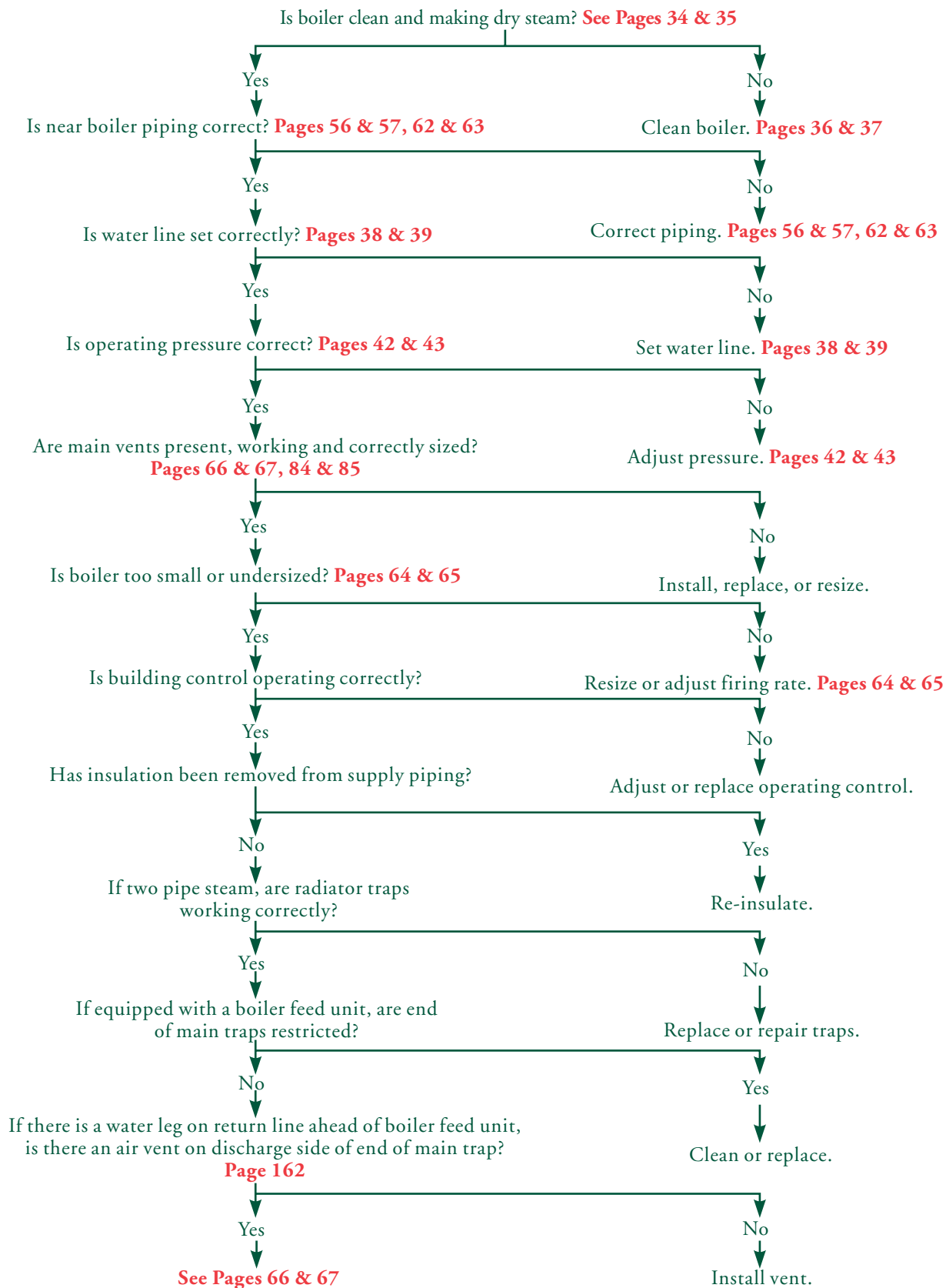


**One Radiator in System Will Not Heat**

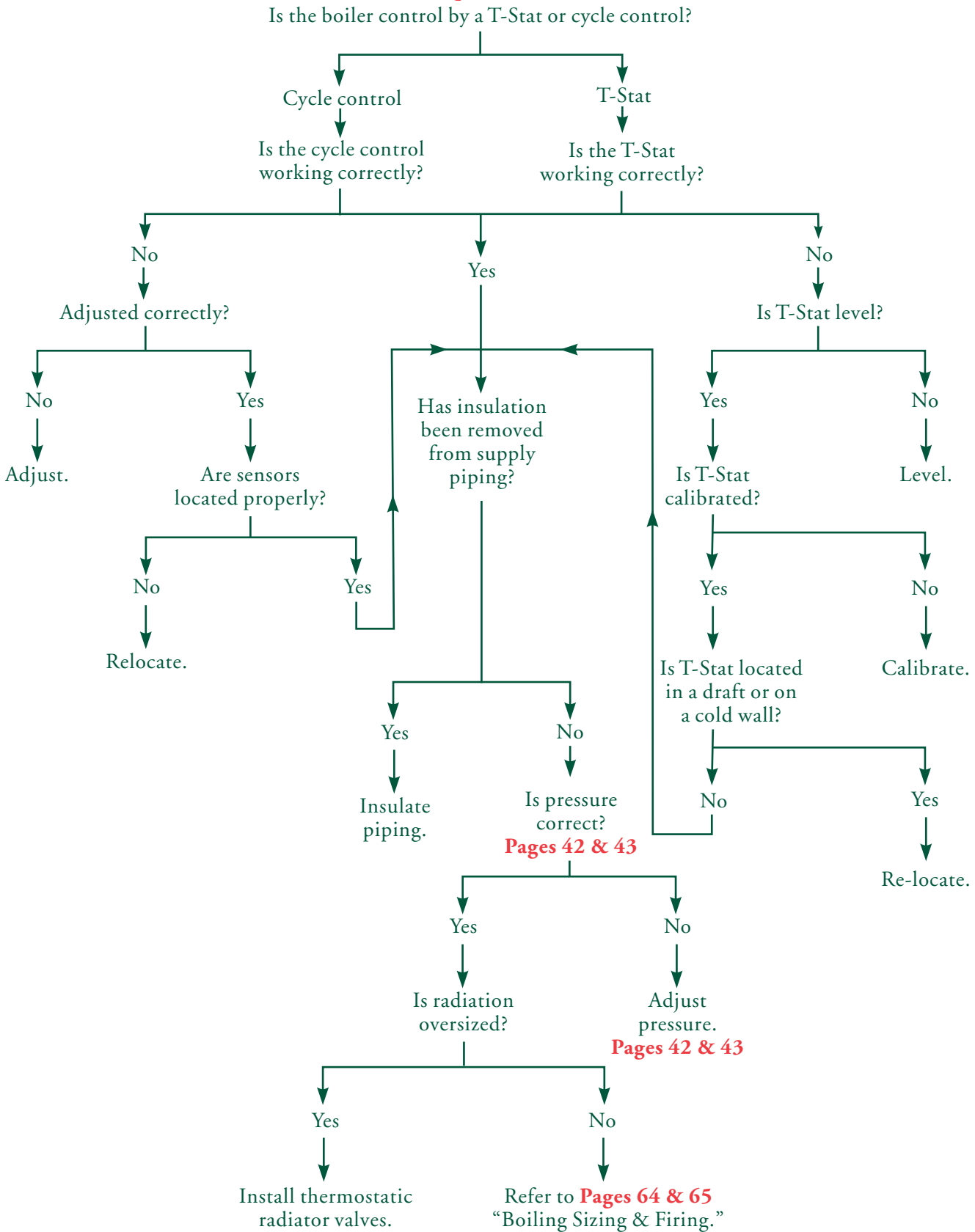
**(Steam is at riser)**



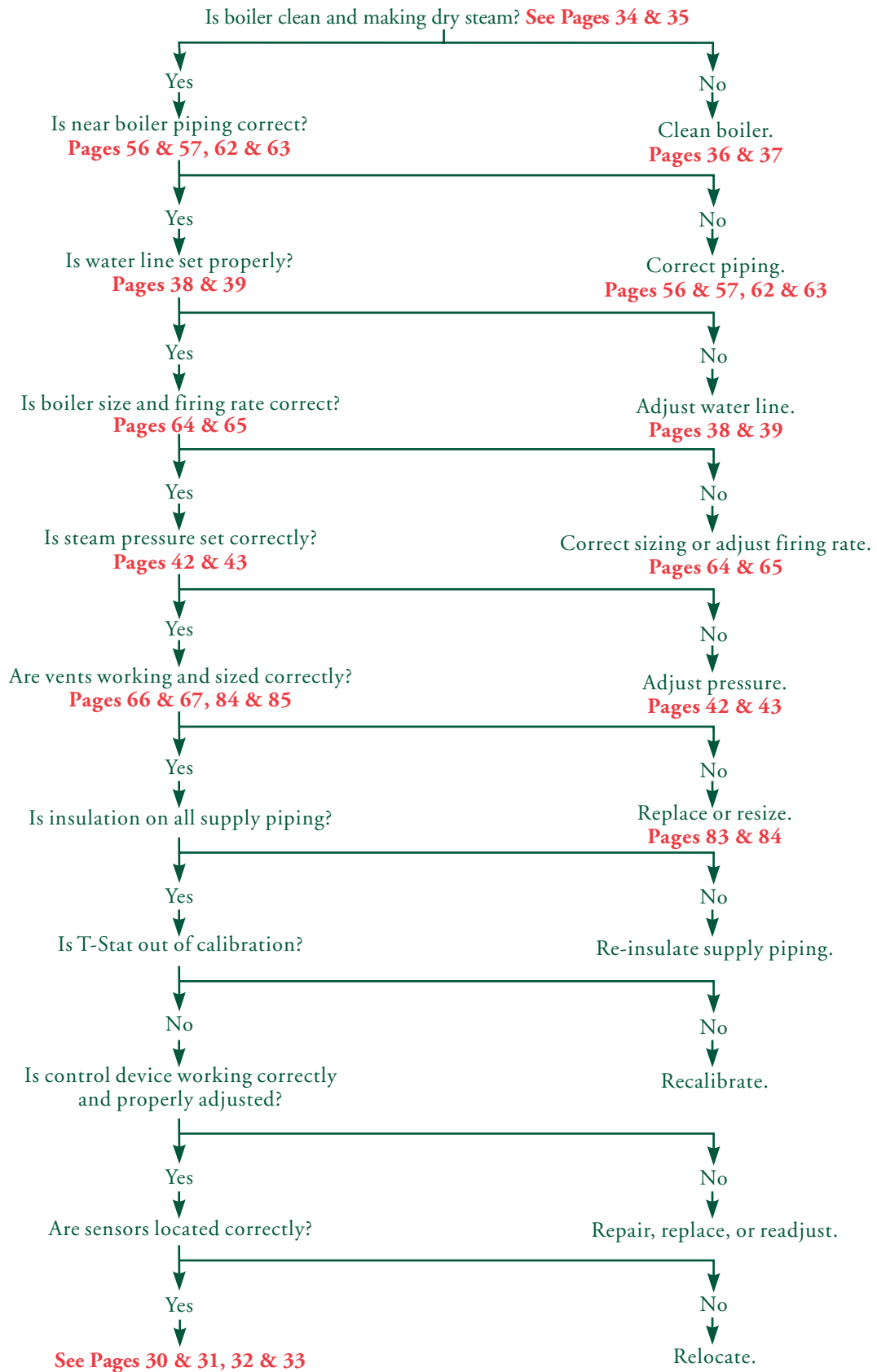
## Building Heats Unevenly



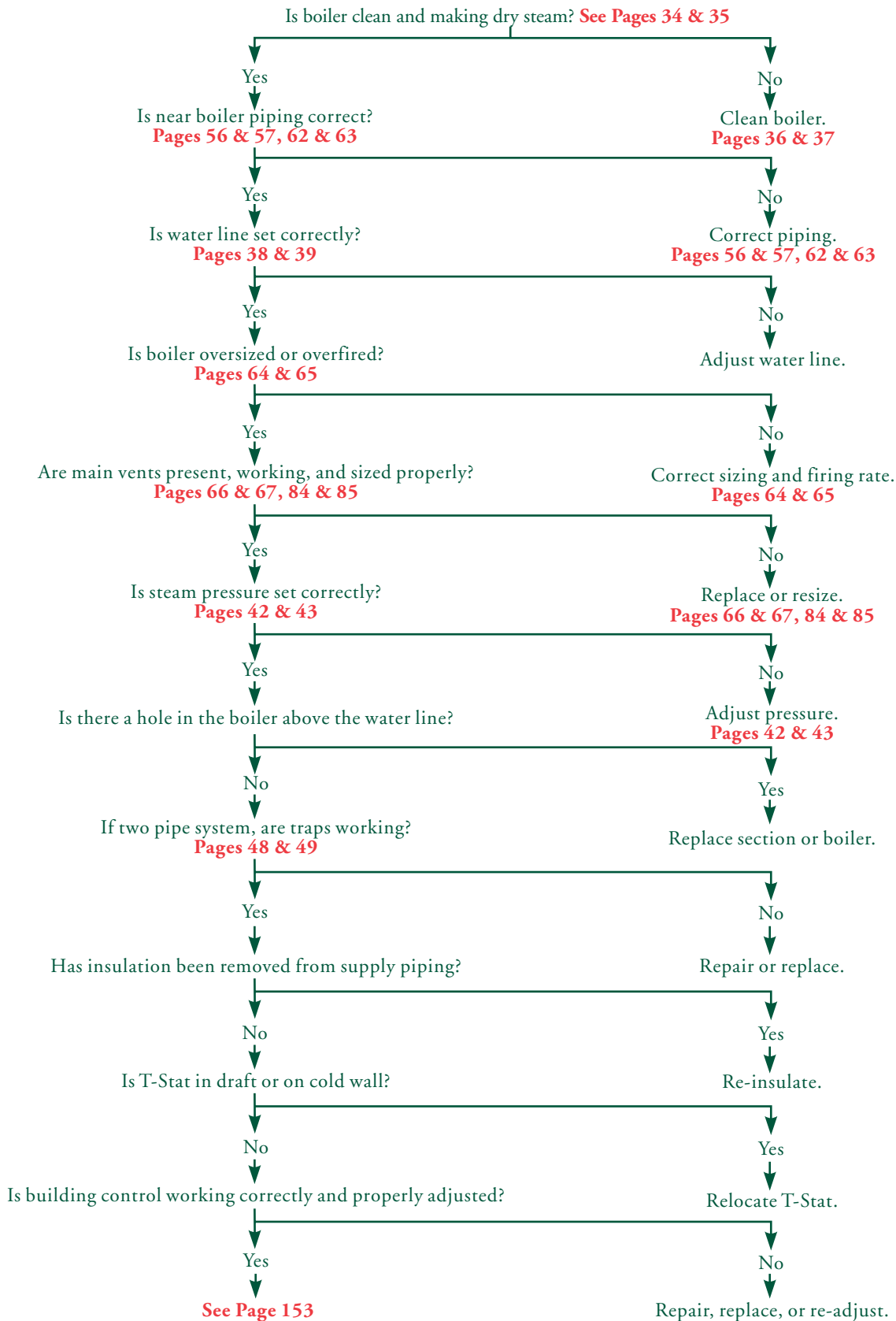
## Building Is Too Hot



## Building Is Too Cold



## High Fuel Bills



## FOR ALL SYSTEMS

1. Make sure boiler is clean, [page 34](#). A dirty boiler is the cause of so many problems and affects the quality of steam.
2. Make sure main vents are installed and working properly, [page 66](#). Main vents have to be there to have even distribution of the steam along the main.
3. Check steam pressure control setting, [page 42](#). It is the simplest adjustment to make, but has a major effect on the system.
4. Check water line position, [page 38](#). Normal water line position has a huge impact on the production of steam.
5. Check the main vent(s) size, [page 84](#). The bigger the opening is in the main vent, the faster the system will heat.
6. Check near boiler piping for proper size and orientation, [page 56](#). This has to be right to get dry steam.
7. Check for the amount of combustion air that is available to burner. The burner has to have enough air to fire optimally.
8. Perform a combustion analysis to fine tune the burner. Record the results so they can be compared at next check
9. Insulate or re-insulate all the supply piping, including the near boiler piping. This may be the best investment to reduce the fuel bill.

## FOR SYSTEMS OVER 500,000 BTU/HR

10. Install a boiler feed unit, [pages 108, 110 and 158](#). A steady water line equals peak performance.
11. Install a cycle rate type control that senses both outdoor temperature and return water temperature. They are not cheap, but they have a great payback.

## FOR ONE PIPE SYSTEMS

12. Make sure all radiator valves are fully open or closed, [page 46](#). Partially closed valves slow condensate return.
13. Replace all radiator vents throughout system with one common size vent, [page 72](#). The same size port on each vent proportions the steam flow for even heating.

## FOR TWO PIPE SYSTEMS

14. Make sure all the radiator traps are working correctly, [page 48](#). If traps are failed open, steam is being wasted and system will heat unevenly.
15. Install thermostatic radiator valves on each radiator, [page 50](#). They will balance the flow of steam similar to the metering systems.