

INTRODUCTION

Add a radiator to your central-heating system to provide extra heat.

A radiator can be teed into any part of the central-heating flow-and-return pipes, but it is important that adding a radiator doesn't rob existing radiators of their share of the boiler output. Once you have established where to join the new pipes to the circuit, you can set about hanging the radiator on the wall. The best direction to work in is from the radiator to the heating circuit. Only when you reach the existing pipework do you need to drain down and cut the pipes.

SKILL LEVEL ●●●●●

Basic plumbing skills are needed to cut and join pipes. You also need to know about your heating system and how to drain it down

SAFETY FIRST

Check for pipes and electric cables before drilling. Always make certain you have identified the pipe properly before cutting it. Know where to turn off the gas, water and electricity before you start work. If you use plastic pipes or fittings to join metal pipes, make sure you link the metal with an earth wire.

TO COMPLETE THIS PROJECT YOU WILL NEED...

- Adjustable Spanner - Open Ended
- Compression Tees (15mm)
- Copper Pipe (15mm)
- Double Radiator
- Masonry Drill Bits
- Power Drill (corded)
- PTFE Tape
- Radiator Valves x 2
- Screwdriver
- Single Radiator
- Small Handsaw
- Spirit Level
- Tape Measure
- Try Square
- Wood Hole Cutter (18mm)

HOW TO: ADD A RADIATOR

2 - WHERE TO CONNECT

Working out flow rates in pipes can be complicated but as a rule of thumb, a 15mm (1/2in) flow and return should serve no more than three radiators. If the radiators are more than 1000mm (40in) across or the pipe runs to the radiators are more than 4 metres (13ft) then the number of radiators served must be reduced to two. This means that any 15mm (1/2in) heating pipe serving more than this must not be used to connect an additional radiator. Instead, you need to go back to the 22mm (3/4in) section of pipe or extend the 22mm (3/4in) run so it takes in one of the excess radiators. If you follow this advice your radiators will heat up efficiently. ❶

3 - WHAT SIZE RADIATOR DO YOU NEED?

Radiator outputs are given in British Thermal Units and Kilowatts. Select a radiator to suit the heat you require. A 4m x 3m (13ft x 10ft) living room with two outside uninsulated cavity walls needs around 3kw to give 21oC when it is minus 1oC outside. The bedroom above it needs just 2.2kw because it doesn't need to be as hot and there is some gain from the heated room below. It is customary to add 10% to the figures above for exposed sites or very cold weather. If you select a radiator with a larger output, it can be controlled with a thermostatic radiator valve.

A very rough rule of thumb is: the volume of the room in cubic feet multiplied by 5 = temperature requirement in BTUs.

4 - POSITIONING A RADIATOR

Radiators work best in the coldest part of the room. Ideally this will be on an outside wall, usually under a window where the cold air drops to the floor. If you have long curtains or don't want to put a radiator beneath a window, it is perfectly acceptable to place one where it will suit your furnishing arrangements. Modern convector radiators with fins at the back will still work well in any position. If you haven't got enough room for the right-sized radiator, choose two smaller ones and spread the heat more evenly.

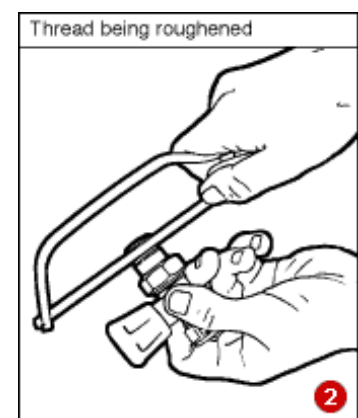
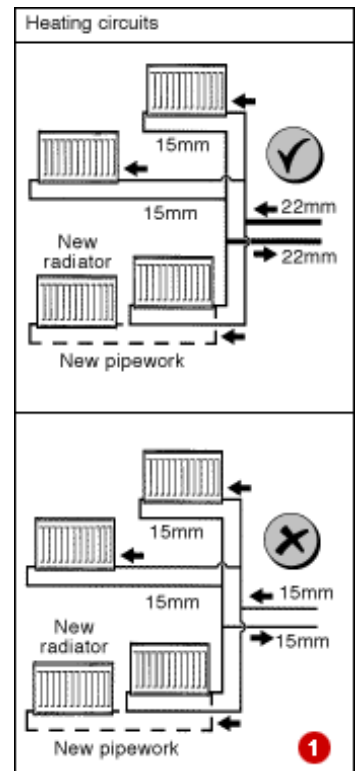
5 - FITTING THE VALVES

Fit the valves before you hang the radiator so you can see where the pipes will come up through the floor. If the valve is directly above a floor joist you might be able to move the position of the radiator slightly to one side in order to miss the joist. If you can't do this you will have to bend the pipe.

Remove the protective plugs from the radiator. Wrap at least five turns of PTFE tape around the threaded tails of the valves and screw them into the radiator. Some valves require a large allen key to screw them in, others have flat sections for a spanner. Screw the valve tails tightly into the radiator.

Make sure the PTFE tape stays on the thread rather than just running along it as you tighten. If it does run, undo the valve and roughen the thread slightly with a hacksaw blade then re-tape the thread more tightly. ❷

When the tails are tight attach the valve bodies. One valve will have a lockshield head and the other will have a knob for turning the valve on and off.



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6 - HANGING A RADIATOR

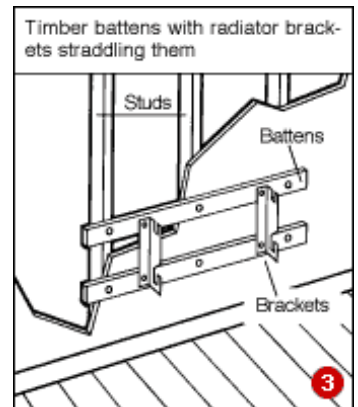
The radiator is supplied with brackets, but you must choose the right plugs and screws to suit your walls. 50mm No12 wood screws with ordinary wall-plugs will be fine for brick or block walls. For plasterboard-covered timber-stud walls, you need to select special heavy-duty plasterboard fixings and limit the size of the radiator so it doesn't exceed the permitted weight for the fixings. If possible screw into timber supports. ③

Place the radiator on the floor in the position you want to hang it. Check the top is level and if necessary pack up one side to level it. Draw a pencil line on the wall along the top of the radiator. Look at the back of the radiator and draw two vertical marks directly above the centre line of the bracket straps. You now have two crosses on the wall to position the tops of the wall brackets.

Take care when lifting large radiators. You will need help to lift them onto the brackets. Wear strong shoes to protect your toes and, better still, keep your feet clear when lifting heavy objects.

Place the radiator to one side and line up the brackets with the marks, so you can drill a hole through the slot of each bracket. Screw the brackets on the wall and hang the radiator. Check it is level. If it is, you can remove the radiator and drill through the round holes in the brackets to keep them in position. If the radiator wasn't quite level, tap one of the brackets to compensate.

There is no need to tilt the radiator towards the air release point. The air can always be removed from a level radiator.



7 - MARKING HOLES FOR DRILLING

There are two ways to run pipes - from beneath the floor or along the surface of a wall. If the pipes are coming from beneath a wooden floor, you need to mark and drill holes. ④ The best way to do this is with a right angle of some kind. Hold a try square in line with the centre of the valve in two positions and mark the points on the floor. Where the lines cross on the floor indicates the centre line of the valve. Remove the radiator from the wall brackets so you can drill the floor. Use an 18mm wood bit (or larger) to allow clearance around the pipe. If the hole is too small the pipes will creak.

Check that there aren't any pipes or cables where you want to drill. Once the holes are drilled, you can insert two lengths of copper pipe to protrude beneath the floor.

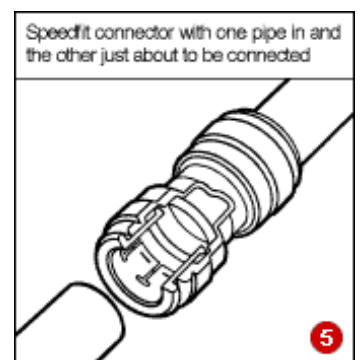


8 - CONNECTING PIPEWORK

There are several ways to join pipes. Where access is restricted it is often easier to use push-fit joints. ⑤ These are reliable, provided the pipe ends have been cut evenly so they can't damage the rubber seals when the pipes are pushed in. Use a pipe cutter rather than a hacksaw to make sure you get a clean smooth cut. Avoid getting dirt on the pipe ends and in the fittings.

9 - SOLDERING

If you prefer to use solder joints, make sure you have a heat resistant mat to protect the surrounding area from the flame. If possible make up two lengths of pipe with elbows and solder them outside. You should then be able to push them through the holes and into the radiator.



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Where it is impossible to pre-fabricate pipe runs with joints, you can solder the joints in situ using fittings with integral solder.

Smear a small amount of self-cleaning flux to the pipe ends and push them into the fittings. Apply gentle heat until you see a ring of solder appear around each mouth of the joint. If the solder forms all the way round the joint is sound. Don't disturb the joint until it cools.

Use a small plant spray to damp down any wood before soldering and again afterwards.

Run the pipes back from the radiator to the main flow-and-return arteries, finishing them ready to tee in.

Drain the system and, when you are sure all the water has gone, cut the pipes with cutters or a junior hacksaw. Be ready to catch a small amount of residual water from the pipes.

You need to cut out a section of pipe just large enough to fit a tee in. If there is enough movement in the pipe you might not need to make two cuts in each pipe - just slide it along.

Because solder won't run properly if there is even the slightest trace of water in the joints, it is often easier to use compression fittings. If the pipes are old imperial 3/4in (20mm) pipes, buy some substitute rings for the 22mm rings fitted in the compression fittings.

10 - BENDING PIPES

Pipes can be bent by inserting a bending spring of the correct size and gently bending the pipe over a rounded object. Slightly over-bend past the angle and then bend back to release the spring ⑥.

If you want to make the job a lot easier, use plastic heating pipe which can be threaded under floorboards.



11 - DRAINING DOWN THE SYSTEM

Turn off the water supply to the feed and expansion tank which is the smaller of the two cold tanks in the loft. If there isn't a valve to turn it off, tie up the float valve arm to stop the tank refilling as you drain it.

Turn off the heating system at the mains electricity supply. It is not enough to turn off the programmer because many systems have an override function. Attach a hose pipe to a drain point lower than the point you want to tee into, and run it out to a drain - the lower the better.

If you can't find a drain-off point, you can drain through a radiator by turning off the valves and removing a radiator. If all else fails, buy a self-tapping washing-machine valve and screw it into a heating pipe at the lowest point on the system. You can then attach a hose pipe to the valve.

Open the drain cock and let the water out. It will speed things up if you can open some of the venting points on the radiators, but remember to shut them again afterwards so you don't have lots of open points when you come to refill the system.

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Fill the system with cold water and check for leaks before turning on the boiler. You can run the heating with the boiler turned off. This will allow you to remove air from radiators without the risk of being scalded.

12 - REFILLING

Let water back into the feed and expansion tank and the system will fill. You will need to bleed all the radiators.

If you have a sealed system or combination boiler, turn on the filling loop and let water into the system until the pressure gauge reads 2 bar, then go round and bleed the radiators. You will have to top up as you go by opening the filling valve, but eventually you need a cold pressure of around 1 bar which will rise slightly when the system heats up.