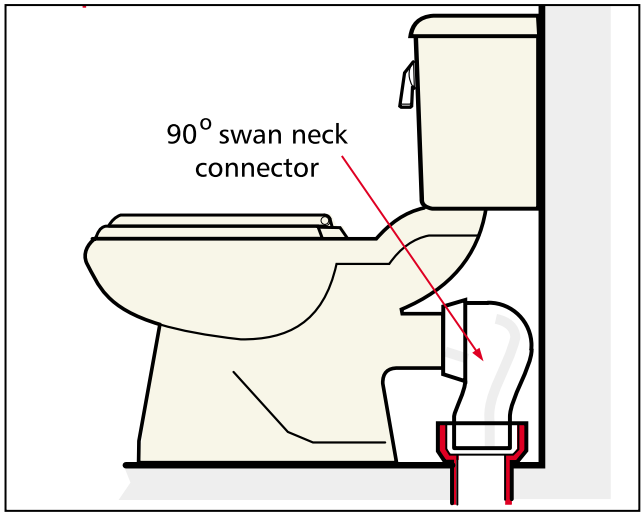
HOW-TO

HOW-TO REPLACE A WC SYSTEM



This How-To guide shows you how to fit a replacement WC pan and cistern, as well as how to take out the old one. Whether you want to replace a broken pan or just have a change of style or colour, fitting a new WC system, thanks to modern materials and fittings, is a project well within the capabilities of most DIY enthusiasts.

MATERIALS

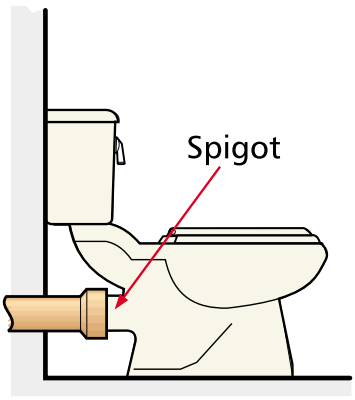
- WC pan, cistern and seat
- Copper or plastic pipe and fittings
- Plastic overflow pipe and fittings
- Plastic pipe cement
- Isolating valve
- Double-acting non-return valve
- Wire wool, '0' grade
- Powerflow flux for soldering
- Solder (lead free)
- Silicone sealant
- Silicone grease
- PTFE tape (gas quality)
- Screws to suit the pan and cistern
- Wall plugs
- Kitchen towels

TOOLS

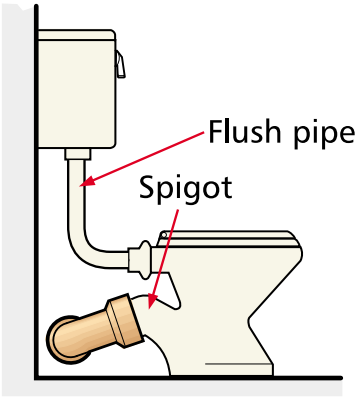
- Hammer-action electric drill, plus masonry and HSS twist bits
- Mini pipe cutter for pipes from 8mm to 22mm
- Plastic/vinyl pipe cutter (if plastic water pipes are used)
- Blowtorch
- Heat shield pad
- Small brush for paste flux
- Frame gun for silicone sealant
- Round file, medium cut
- Half round tapered file, medium cut
- Junior hacksaw
- Pozidrive No.2 screwdriver
- Flat-bladed screwdriver, 8mm
- Adjustable wrenches, 250mm, 200mm
- Slip nose pump pliers
- Claw hammer, 16oz
- Club hammer
- Cold chisels, 6mm and 15mm
- Bradawl
- Spirit level, 600mm
- Steel brushes for cleaning inside copper tube and fittings, 15mm and 22mm
- Steel tape measure
- Combination try square
- Small hand or dental mirror
- Spirit-based pen, fine fibre point
- HB pencil
- Large sponge and bucket
- Knee pads
- Rubber gloves

Pans and Cisterns

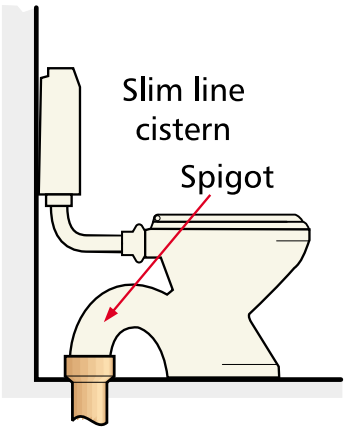
F1



A Close coupled pan with 90° spigot 'P' trap



B Low level cistern 'P' trap pan with 114° spigot



C Low level pan with 'S' trap

BEFORE YOU START

Unless you have more than one WC, you will need to do the changeover as quickly and efficiently as possible.

1. Investigate the existing installation.
2. Note the position, dimension and angles of the soil pipes.
3. Plan water supply and overflow pipe runs to suit new cistern.
4. Make sure you have the correct fittings you need, including a service valve and a double acting, non-return valve (required by water by-laws).
5. Lead pipes should be replaced with copper or plastic. You may feel you need the services of a professional plumber for this.
6. Check that the new units fit the available space.
7. The pan and cistern: only remove as much protective wrapping as will allow the appliances to be thoroughly inspected for colour match and damage. Check for cracks, chips, pinholes and faded areas of colour.
8. Check that all parts for installing the cistern are present.
9. Read the assembly instructions for the cistern.

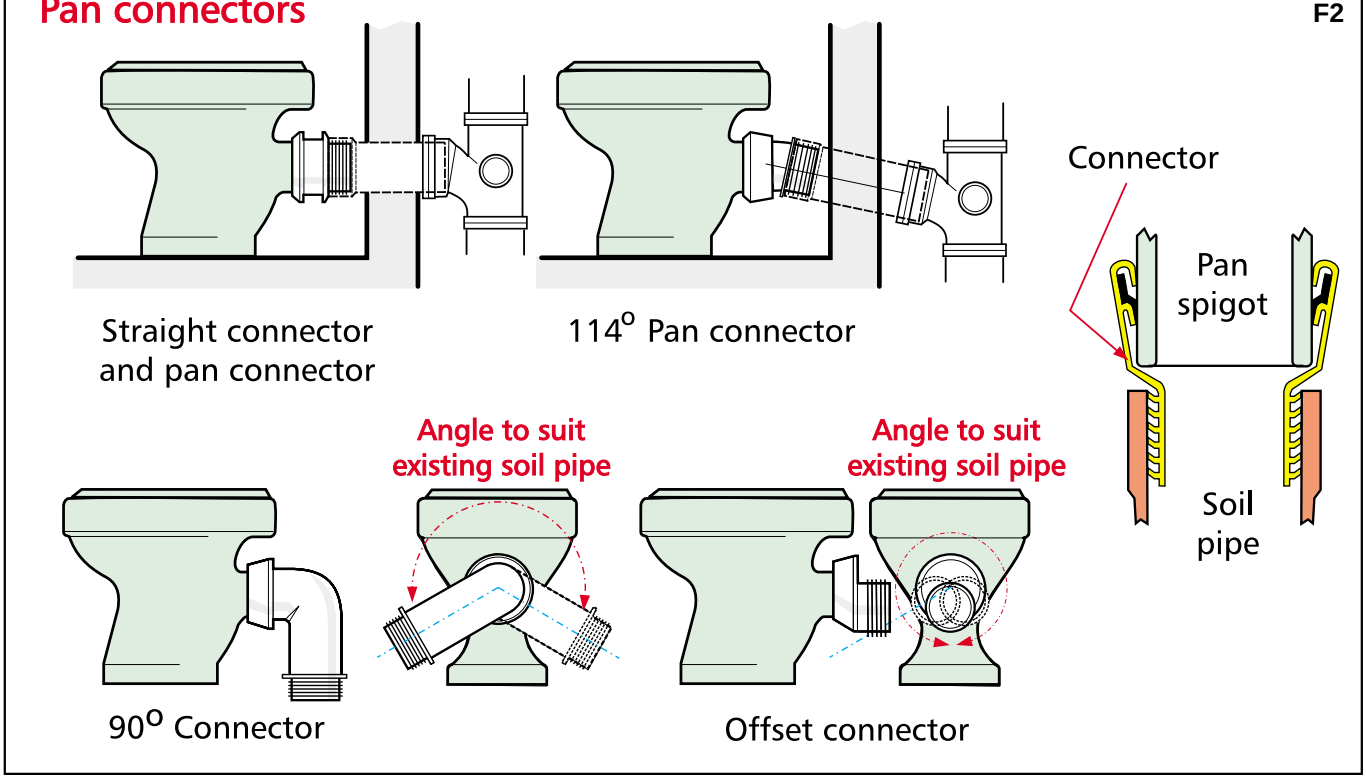
If anything is wrong, do not start work; return the items to the store.

Types of WC pan spigot

The angle of the spigot (the large soil-carrying pipe on the back of the pan – **F1**) on the existing WC will affect the position and angle of the soil pipe.

You will need to check the angle and direction of the spigot relative to the soil pipe at the rear of your WC. Most modern WCs have a 'P' trap with a near 90-degree spigot **(F1A)**. Older 'P' traps tend to be between 7 and 14 degrees off horizontal **(F1B)**. 'S' traps **(F1C)** are also common.

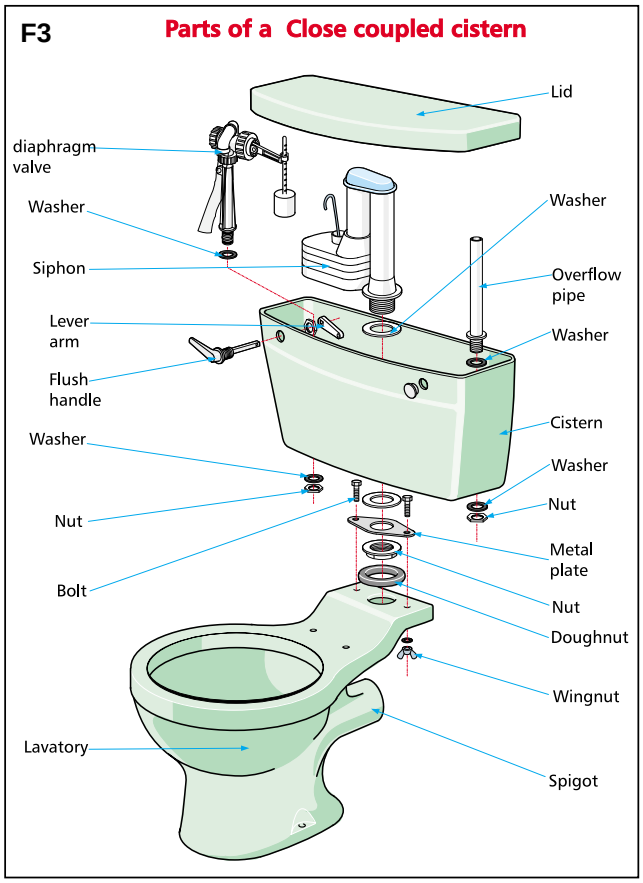
Soil pipes might pass through wall behind the pan, to one side of the pan or through the floor **(F1)**.

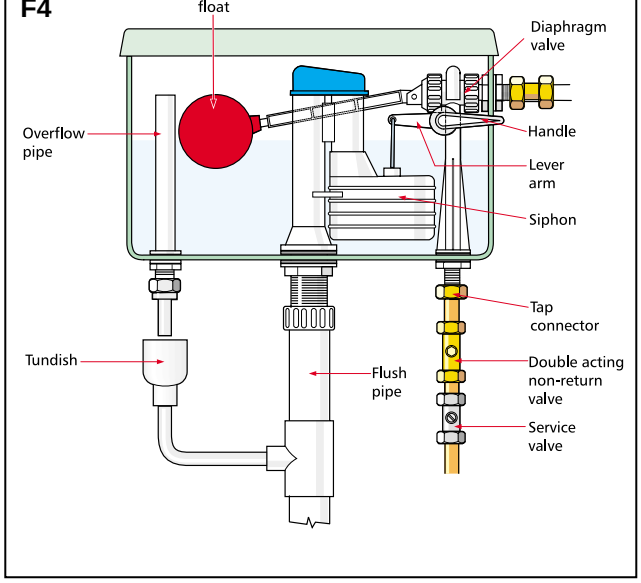


Pan connectors

The problem of connecting new 90-degree pans to other configurations of soil pipe is overcome with plastic pan connectors and adaptors **(F2)**. These rely on push-fit flexible watertight seals. It is important that the seals are a tight fit, both over the pan spigot and into the soil pipe.

The connectors will fit most pan spigots with 90-110mm diameters. Outlet seals for new houses will need to fit 110mm pipe. In some older houses, the inside soil pipe diameter will be 90mm; this is for iron or stone pipes.





WC cisterns

Modern cisterns may be either close coupled **(F1A)** or low level **(F1B)**. To save room, low-level cisterns are available as slim line with a flushing plunger on the top **(F1C)**.

Low-level cisterns are fixed to the wall above the WC pan and have a flushing pipe whereby water is conveyed from the cistern to the WC.

Close-coupled cisterns are attached by means of a metal clamp and rubber seal (doughnut) onto the back of the WC pan **(F3)**.

Water supply

Both cisterns require a water feed and an overflow pipe. Most modern cisterns have these connected through the base **(F4)**. The feed points are interchangeable.

The water supply is connected to the cistern water-inlet pipe with a tap connector **(F4)**.

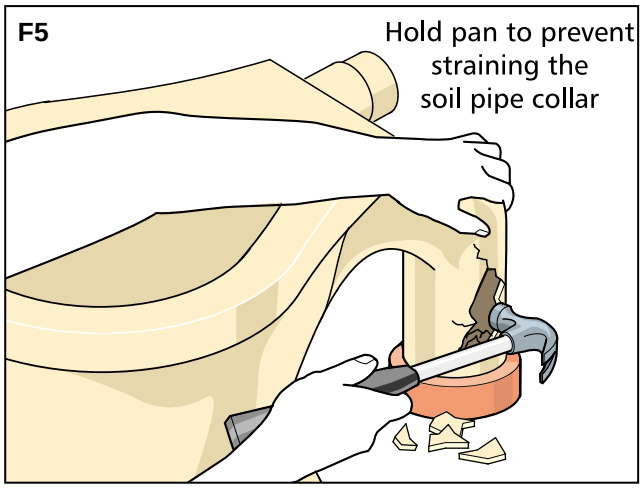
In order to stop contamination of the water by back-syphonage, a double acting, non-return or double check valve must be fitted **(F4)**. For easy maintenance, a service valve should also be installed.

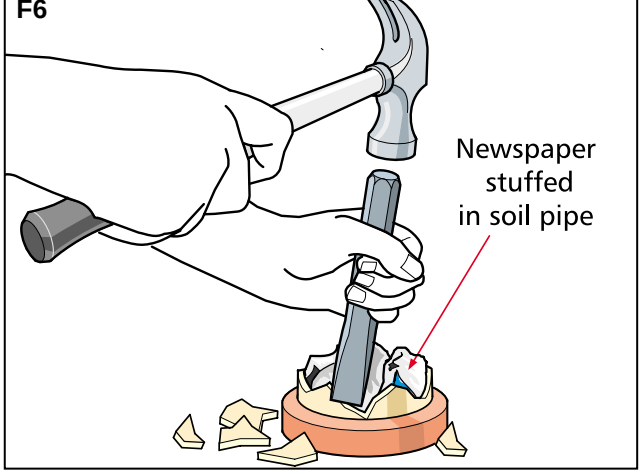
If the supply pipe is lead, it should be replaced, as lead is toxic. You may wish to ask a professional plumber to do this.

Overflow

Water by-laws demand that the overflow pipe be fitted in such a way as to cause inconvenience when the water overflows. This is to ensure that malfunctions are noticed and can be corrected.

The overflow pipe (22mm) must run with a ‘fall’ (downward slope) to the outside of the house or it may discharge into the WC pan 150mm above the rim. Alternatively, it may discharge into a ‘tundish’ **(F4)**, which is a small, open pot adjacent to the cistern. This in turn discharges into the flush pipe or into a waste water pipe.





REMOVING THE OLD WC AND CISTERN

Read **How-To: Understand your hot and cold water system**. This explains the different types of water supply systems and shows you where to look for control valves and what they look like.

Turn off the water supply to the cistern. If no service valve is fitted, use the following procedures.

A Direct systems with a combination boiler:

1. Turn off the boiler.
2. Turn off the mains cold water supply at the stop valve where the rising main enters the house. This will stop water flowing to all taps.

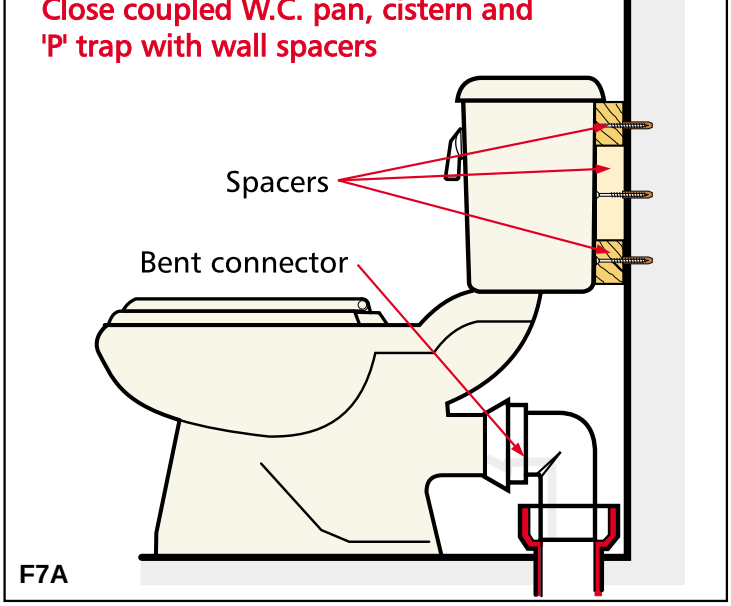
B Old direct cold water system with indirect hot water:

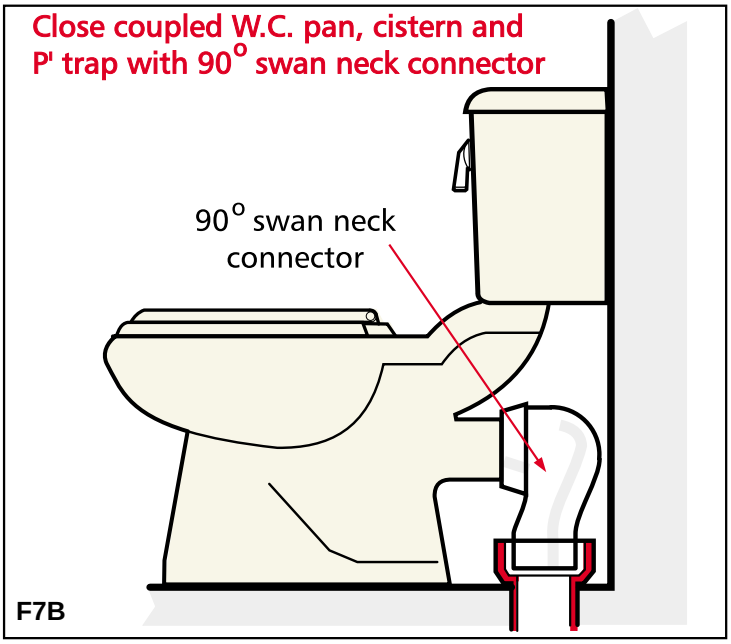
1. Turn off boiler.
2. Turn off mains stop valve.

C Indirect system:

1. Turn off the valve in the relevant supply pipes from the cold water storage tank.
2. When the water supply is isolated, flush the cistern several times to empty it. Remove remaining water with a sponge.
3. Use a sponge to remove water from the WC pan. It is sensible to wear disposable rubber gloves.
4. Disconnect the water supply and overflow pipe.
5. Disconnect the flush pipe and remove the cistern from the wall.
   Or, for close-coupled units **(AF1)**, disconnect the cistern from WC pan.
6. Undo the screws holding the pan or break away the cement using a cold chisel and club hammer.
7. If the pan spigot or connectors enter the soil pipe via the rubber seal, remove the pan.
   Do this before unscrewing the pan. If the spiggot is cemented into the soil pipe, break the pan on the trap bend **(F5)** using a cold chisel and hammer **very carefully**. Wear protective eye wear and take care not to damage the soil pipe.
8. Stuff a ball of newspaper into the soil pipe. This will stop rubble blocking the sewer.
9. Use a small cold chisel to remove the cement and caulking from the soil pipe collar. Be very gentle or the soil pipe collar might break. Work with the chisel blade pointing towards the centre of the pipe **(F6)**. Cut gradually down the collar in one place. The remaining china and caulking should break quite easily.

Now carry out any other work, such as cutting holes for pipes and re-tiling. It is easier to fix a cistern over tiles than to tile round a cistern.

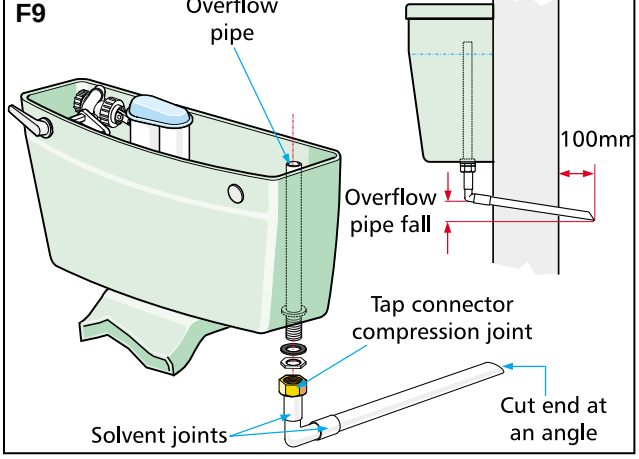




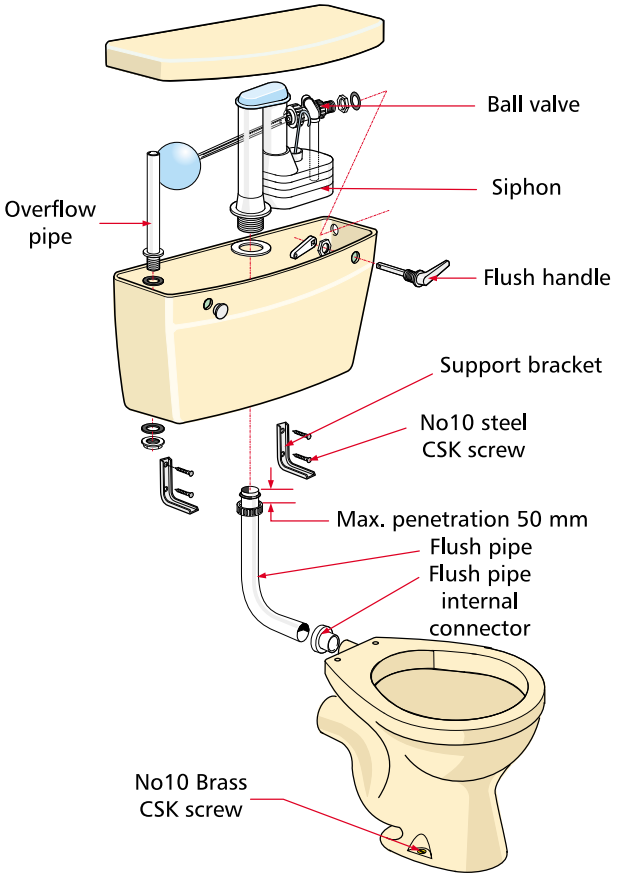
FITTING A NEW WC PAN AND CISTERN

1. Assemble the cistern according to the manufacturer's instructions.
2. Place the new pan in position.
3. Position the cistern and, if it is low level, fix it to the wall. Reposition the pan so that when the seat and cover are up, they rest against the cistern without falling down. If it is close coupled, adjust the pan so that the cistern sits snugly on the pan and is flat against the wall **(F1A)**.
   In some situations, the outlet pipe may be positioned so that a wooden spacer between the wall and cistern is required **(F7A)**. Alternatively, a 90-degree 'swan neck' pan connector may be used **(F7B)**.
4. Mark the pan position on the floor with a felt-tipped pen.
5. Mark the position of the pan-fixing holes onto the floor. Remember the angle.
6. Remove the pan and drill pilot holes for the screws. Hold the drill at the same angle as in point 5. If the floor is concrete, it must be drilled and plugged.
7. Replace the pan and insert the fixing screws. Don't drive these fully home yet.
8. Use a spirit level across the pan rim to ensure that it is level front to back and side to side.
9. On wooden floors, level the pan with slivers of wood or vinyl tile. On concrete floors, set the pan onto a thin bed of cement mortar.

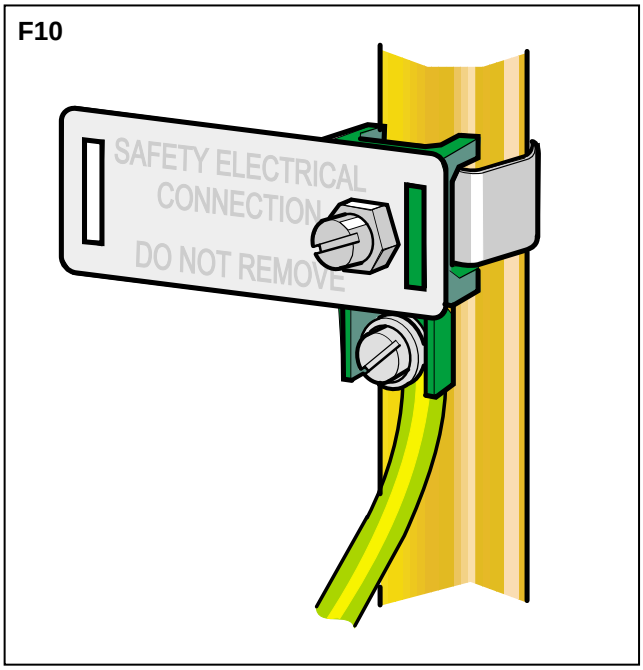
F9



F8 Low level cistern



F10



10 Inject silicone sealant into the gaps to steady the pan and make a firm base.

11 Tighten the screws. Don't over-tighten or you might break the pan.

12 Fit the pan connectors. Measure and fit any adaptor extension pieces as necessary. All connectors, other than the pan spigot connector, can be lubricated with silicone grease.

13 Measure, cut and fit the flush pipe to the low-level cistern. It must fit without being under tension **(F8)**.

14 Plumb the water pipe to the cistern, incorporating the double acting non-return valve and service valve **(F4)**.

15 Connect the overflow pipe **(F4 and F9)**.

16 Turn on the water and check for leaks. Check that the ball valve in the cistern is working properly, adjusting it as necessary.

17 After 24 hours, trim off any spacers under the WC pan.

18 Make sure that metal pipe-work is earth bonded **(F10)**.