



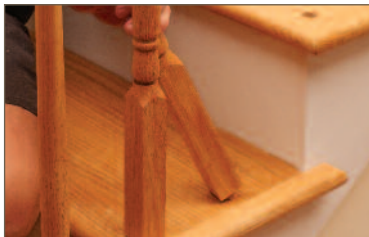
Guide to installing forged iron balusters.

Knee wall staircases.

The following installation requires the same installation methods on treads and landings.



1. Cut the old balusters with a circular saw or reciprocating saw.



2. Remove the old balusters from the previous installation to reveal the installation holes in the tread and the underside of the handrail.



3. Be sure to remove any dowels, debris and any screws or nails from the previous installation holes.



4. Previous hole size may vary, but are usually 3/4". If smaller, re-drill them with a 3/4" spade bit. If the holes are larger than 3/4", cut your own custom sized dowel to fit the hole.



5. The 3/4" holes need to be plugged with the included dowels. Measure the depth of the hole to ensure the dowel will fit up to 1/16" below the tread surface. **Example:** Insert a rod into the hole and mark off above the recommended depth (See # 9 for installation).



6. Now glue around the inside of the hole and insert the supplied dowel plug. We recommend Crown Heritage 15 Minute Epoxy for its strong bonding characteristics.



7. Tap the dowel into the 3/4" hole and make sure the dowel sits flush with the tread or no more than 1/16" below the surface.



8. If need be, use an implement, such as the rod shown in the photo, to tap the dowel plug below the surface level.



9. This picture shows how the dowel plug should be correctly installed—flush with the surface or no more than 1/16" below. **Let the epoxy glue set and cure.**



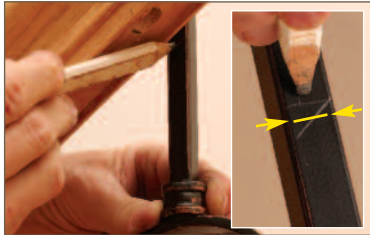
10. Now drill a 13/64" vertical pilot hole into the center of the dowel plug. **Note:** The 13/64" drill bit size will be critical to the success of your installation.



11. Use a crescent wrench* (as shown) to screw sockets into each dowel hole on the treads. The sockets must sit flush with the tread.
***It will be easier to use a 3/8" socket wrench with the Crown Heritage socket driver.**



12. Now measure the baluster for cutting. It is important to **invert** the baluster and place it into the socket.



13. With the baluster against the handrail, mark off the height of the baluster. **Note** that the baluster must be cut in the **middle** of the marked angle. **EVERY** baluster must be measured and cut this way.



14. Cut the baluster at the point shown in # 13. We recommend renting a portable band saw for the cutting process. **TIP:** Always cut balusters slightly longer and adjust the cut shorter to avoid wasting a baluster.



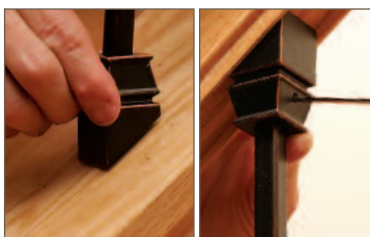
15. Before installing the 30" knee wall baluster, position the Top Angle Shoe and Base Angle Shoe on the baluster so that they each match the angle of the handrail and baseplate.



16. Insert the baluster into the handrail hole using a 5/8" bushing when replacing 1-1/4" balusters. Use a 3/4" bushing when replacing 1-3/4" balusters.



17. With the baluster raised into the handrail hole, insert the baluster support axle into the socket. Firmly tighten the socket set screw. Then, with both hands turn the baluster counterclockwise to back it securely into the handrail hole (See # 23).



18. Drop the Base Angle Shoe down to the knee wall baseplate, tighten the set screw with a 2.5 mm allen wrench. Then slide the Top Angle Shoe up to the handrail, tighten the set screw to secure the shoe to the baluster.



19. Re-install the numbered fillets into the handrail. You may need to trim the fillets to fit. Drill a small pilot hole and hammer a finishing nail into the fillet and handrail or use a nail gun. **Caution:** The power of a nail gun may crack the fillet.



20. **Landing Installation:** You will need to install 44" balusters on landings. Drill 3/4" holes, if there are previous holes and they are larger than 3/4", cut a custom sized dowel to be fitted and glued into the hole.



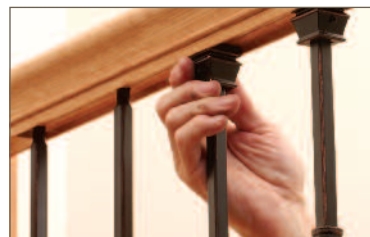
21. The 3/4" holes need to be plugged and glued with the included dowels. Check that the hole depth exceeds the dowel plug by about 1/16". Drill a 13/64" size vertical hole into the center of the dowel.



22. Insert a support axle into the socket then insert the baluster. Ensure the Top and Base Flat Shoes are on the baluster for installation.



23. Firmly tighten the set screw on the bottom socket to secure the baluster. With both hands turn the baluster counterclockwise to back it securely into the handrail hole.



24. Slide the Top Flat Shoe up to the handrail and tighten the set screw. In the same way secure the Base Flat Shoe against the landing.



25. Re-install the numbered fillets into the handrail per # 19.