



Iron Pro™

INSTALLATION SUGGESTIONS

KNEEWALL APPLICATION

LIMITED WARRANTY

L.J. Smith, Inc. issues the following Limited Warranty:

The product(s) furnished hereunder are warranted to be free from defects in material and workmanship for a period of one year from the date of delivery. L.J. Smith, Inc. will, at its own expense and option, either repair or replace the defective product or refund the customer's money provided that the customer has notified L.J. Smith, Inc. and upon inspection, L.J. Smith, Inc. has found such product(s) to be defective and covered by such Limited Warranty.

Building Codes and other building requirements vary from location to location. Accordingly, L.J. Smith, Inc. makes no express or implied warranty that this product nor any of its installation suggestions shall comply with your local building codes or requirements and, therefore, bears no liability for any such compliance. Therefore, it is vitally important for you to ensure compliance prior to the installation. See Warranty Exclusions and Limitation of Liability at the end of this document.

NOTE: ALL PRODUCTS SUPPLIED BY L.J. SMITH, INC. ARE FOR INTERIOR USE AND INSTALLATION ONLY.

Before beginning, check local building codes to be certain that your newly designed stair balustrade will pass code, especially as it relates to Baluster spacing. L.J. Smith is not responsible for the quality of installation of these or any other components nor for their compliance with any building codes.

Tools Required (all may not be needed depending on the type of wooden balusters being replaced):

- | | |
|-------------------------------------|---|
| Power Drill | Hack Saw, Miter Saw w/metal cutting blade, or Portable Band Saw w/metal cutting blade |
| #2 Square Driver Bit and Extension | Hand Saw or Hand-Held Circular Saw |
| "L-shaped" 2.5mm Allen Wrench | Pliers |
| Construction Adhesive and Dispenser | Adjustable Wrench |
| Hammer | Masking Tape |
| Tape Measure | Box-cutter Knife |
| 8d Nail or Punch | 1/8" Drill Bit |
| 2' Level | 5/32" Hex Driver |
| Pencil | Light Oil |
| Sandpaper | |

View Photos A and B, below, showing the two different wood baluster types you could be replacing and identify whether yours is Pin Top or Square Top.

This 'kit' has been designed to quickly replace both baluster types, in both sizes and this system will automatically adjust to nearly any rail angle.

- 1 1/4" Baluster with 5/8" Pin Top
- 1 3/4" Baluster with 3/4" Pin Top
- 1 1/4" Square Top Baluster
- 1 3/4" Square Top Baluster

1 1/4" or 1 3/4" **Pin Top Balusters** are installed into flat bottom (non-plowed) Handrails



Photo A

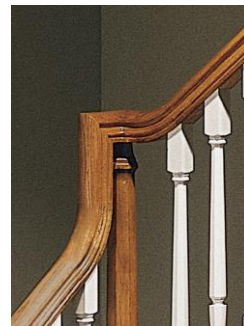


Photo B

1 1/4" or 1 3/4" **Square Top Balusters** are installed into the plowed section of plowed Handrails

Prior to starting, follow these basic job preparation procedures:

- Before removing existing Wood Balusters carefully cut the paint (if applicable), as close as possible, to both the top and bottom baluster sections. *(This will allow for clean removal, which will eliminate the need for paint touchup at the conclusion of the job.)*

NOTE: IT IS CRITICALLY IMPORTANT THAT THE CENTERPOINTS OF ALL THE SQUARE TOP WOOD BALUSTERS ARE FOUND AND MARKED. WITH THAT IN MIND, PROCEED, CAREFULLY, WITH THE FOLLOWING STEPS.

If the Wood Balusters to be replaced are Square Top then place a piece of Masking Tape along the edge of the Handrail very near the Wood Baluster (**See Photo #1**) and mark the center of each Wood Baluster on the masking tape as this will be the same location of the replacement Iron Baluster (unless the spacing will be changed either because of personal preference or due to code restrictions. (CHECK LOCAL BUILDING CODES). If Shoerail is in place on your stairway, repeat this step along the edge of the Shoerail (**See Photo #2**)



Photo #1



Photo #2

- Remove the existing Wood Balusters from the railing by cutting them in half. Remove any old nails or wood plugs. (A Hand Saw or Power Saw can be used. Clean & sand as needed.)

If the Wood Balusters to be replaced are Square Top, and the Handrail is “plowed/grooved” out on the underside, carefully remove the Fillet (wooden strips) that were likely in place between the Wood Balusters. Find the former center point of the now removed Wood Baluster. First, measure the width of the plowed section and divide the measurement by 2 to locate the centerpoint of the handrail. Mark that line along the length of the rail, then transfer the mark placed on the Masking Tape to the underside of the Handrail, within the plowed section Hint: use of a piece of the previously cut Wood Baluster makes this task simpler. **(See Photo #3)** The intersection of these two lines is the center point. Using the Hammer and a nail or Punch, gently “punch” a divot at each center point, as this will be the location of the Iron Baluster **(See Photo #4)**. If Shoerail is in place on your stairway, repeat this step within the “plowed/grooved” portion of the Shoerail. If no Shoerail is in place and the Wood Balusters were installed directly into the wood “Plate” (board), find and mark the former center point of the now removed Wood Baluster. Using the Hammer and a nail or Punch, gently “punch” a divot at each center point, as this will be the location of the Iron Baluster.

Note: If Fillet (wooden strips) were in place, more will need to be purchased. Please proceed to the location from which you purchased these components and purchase enough Fillet to fill all of the “plowed/grooved” portions of the Handrail and Shoerail on the stairway and on the level run sections (if applicable).

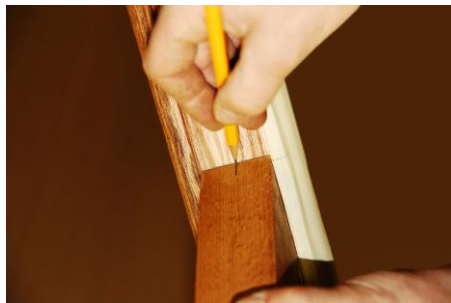


Photo #3



Photo #4

New Baluster Installation:

Note: For ease of installation, it might be simpler to begin with the 1st Baluster (which is the one at the bottom of the stairway) and work towards the top of the stairway. A low handrail height may require trimming the round top pin off of the iron balusters, making installation more difficult using IronPro.

Additional Note: Coating each Attachment Screw and Hanger Bolt with Paraffin wax or Candle Wax will allow it to drive into the wood more easily. It is also highly recommended to drill a pilot hole for each Attachment Screw and Hanger Bolt using a 1/8" drill bit. While the Screws are "combination head" we strongly recommend the use of a square drive bit to install them.

Very Important Note: Measure the vertical thickness of the handrail, in place; to be certain that the 2 1/2" Attachment Screw will not penetrate the top of the handrail. Purchase (shorter) replacement screws if the screw is long enough to protrude through the top surface of the handrail. Additionally, if the hole in the handrail is too deep to allow the Attachment Screw to "bite" into the wood and hold the Ball Adaptor, you will need to purchase 5/8" or 3/4" dowel (depending on the diameter of the hole), cut it to length, coat it with adhesive, and proceed.

- **Step 1) Pin Top Baluster:** Under the Handrail use the centering plug as a means to center the 2 1/2" Attachment Screw in the old baluster hole (5/8" & 3/4" diameter centering plugs are included in each kit but only one will be needed per baluster under the handrail). Adhesive can be used to secure the plugs but is not necessary. Coat the round end of the Ball Adaptor with a light oil to prevent marring the finish during installation. Before proceeding, see "Very Important Note" at the beginning of these instructions. While holding the Ball Adaptor, Rectangular or Round (your preference) Socket, and 2 1/2" Attachment Screw together as a unit, install the "unit" into the old baluster hole on the underside of the handrail. Wipe oil from finish. (as shown in Photos #5, #6, #7 & #8).



Photo #5



Photo #6

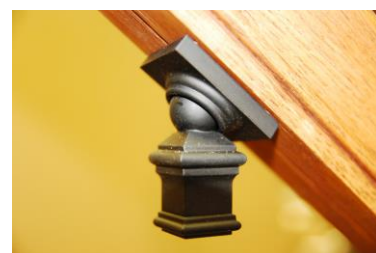


Photo #7



Photo #8

- **Step 2) Square Top Baluster:** Under the handrail, rotate the Rectangular Socket such that it fills the “plowed/grooved” portion of the underside of the handrail. Note that the socket can be rotated 90 degrees to properly fit the “plowed/grooved” portion. Coat the round end of the Ball Adaptor with a light oil to prevent marring the finish during installation. Before proceeding, see “Very Important Note” at the beginning of these instructions. While holding the Ball Adaptor, Rectangular Socket, and 2 ½” Attachment Screw together as a unit, install the “unit” into the precise location of the “punched” divot from an earlier step. Wipe oil from finish. **(as shown in Photos #9, #10 & #11).**

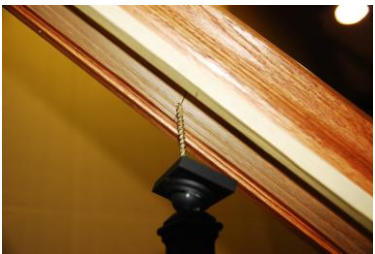


Photo #9



Photo #10



Photo #11

- **Step 3) In the Shoerail or into the “Plate”** (the board on top of the Kneewall): Liberally coat the threads of the pointed end of the Hanger Bolt with wax. Using a drill with a built in level and a 5/32” hex driver on the hex end of the Hanger Bolt (or chuck the hex end of the Hanger Bolt directly into the drill), drive the Hanger Bolt into the shoerail/plate at precisely the center point of the removed Wood Baluster (the point previously marked with a divot). The bolt must be installed plumb to a depth allowing ¾” of the machine threads exposed on the long side of the bolt. Take care to drive the Hanger Bolt in “plumb” in order to more easily install the eventual hardware **(See Photo #12)**. If the Hanger Bolt is not plumb, place a nut (not included) on the bolt and gently tap on the nut with a hammer to properly align the hanger bolt in a plumb position.

Note: If the removed wooden balusters were installed directly into the plate and the “footprint” left by their removal is too large to be covered by the Round or Rectangular Sockets, please consider purchasing Universal or Rectangular Socket Cover Plates from your supplier for each iron baluster being installed. The Universal Cover Plate (LI-PROPLT1) **(see Photo # 13)** is used under the Round Socket and the Rectangular Socket Cover Plate (LI-PROPLT2) **(see Photo # 14)** is used under the Rectangular Socket.



Photo #12



Photo #13



Photo #14

- **Step 4)** Measure the distance between the top of the Hanger Bolt and the bottom of the Ball Adaptor (under the handrail). (See Photos #15, #16 & #17) Subtract 1" from that measurement.



Photo #15



Photo #16



Photo #17

- **Step 5)** Using the figure from the previous step, and referring to the pin top portion of the Iron Baluster, measure from the shoulder (not the very end of the baluster) at the point where the baluster transitions from cylindrical (round) to square, make a mark, and cut the Iron Baluster to length. (See Photos #18, #19 & #20) While this measurement should be the same for all of the Iron Balusters to be installed onto the Kneewall, it is highly recommended that you double check, often, by repeating Step 4 before proceeding with any additional cuts, to ensure proper fit.



Photo #18



Photo #19



Photo #20

- **Step 6)** Tilt the top Ball Adaptor out and insert the pin top end of the Iron Baluster. (See Photo #21)



Photo #21

- **Step 7)** Place the Round/Rectangular Socket over the Hanger Bolt on the shoerail/plate. If desired, a small amount of construction adhesive can be applied to the cavity of the Threaded Ball Adaptor. Coat the round end of the Threaded Ball Adaptor with a light oil to prevent marring the finish during installation. Slide the Threaded Ball Adaptor onto the bottom of the Iron Baluster and “swing” the assembly until it is directly over the threads of the Hanger Bolt. Tighten the Threaded Ball Adaptor assembly onto the Hanger Bolt, being sure the Round/Rectangular socket seats properly with the Threaded Ball Adaptor during tightening. This might require holding the socket against the Threaded Ball Adaptor as the assembly tightens into position. Wipe oil from finish. **(See Photos #22, #23 & #24)**



Photo #22



Photo #23



Photo #24

- **Step 8)** Threaded Ball Adaptor can be rotated until the Set Screw is at the desired position by utilizing an Adjustable Wrench. Wipe oil from finish.
Hint: Protect the surface of the Iron Baluster from marring by wrapping the “jaws” of the Adjustable Wrench with Masking Tape. **(See Photo #25)**



Photo #25

- **Step 9)** Lift the Iron Baluster to fully insert the pin top into the Ball Adaptor (under the Handrail) and tighten the set screw to firmly secure the Iron Baluster into place. **NOTE:** Do NOT use power tools to tighten the set screws as this may strip the threads in the Ball Adaptor. **(See Photo #26)** The Ball Adaptor can be rotated until the set screw is in the desired position (this can only be done if the top pin has not been trimmed off of the iron baluster).



Photo #26

- **Step 10)** Tighten the set screw in the Threaded Ball Adaptor on the bottom of the Iron Baluster. **NOTE:** Do NOT use power tools to tighten the set screws as this may strip the threads in the Threaded Ball Adaptor. **(See Photo #27)**



Photo #27

- **Step 11)** Repeat the steps, above, for each of the Iron Balusters to be installed.

Note: If Fillet (wooden strips) were in place between the wood balusters, more fillet will need to be purchased. Please proceed to the location from which you purchased these components and purchase enough Fillet to fill all of the “plowed/grooved” portions of the Handrail and Shoerail on the stairway and on the level run sections (if applicable).

- **Step 12)** After all of the Iron Balusters are properly installed, measure the distance between each Baluster and cut a piece of Fillet to fill that space within the “plowed/grooved” portion of the underside of the Handrail (if applicable) and within the same on the Shoerail (if applicable). **(See Photo #28)**



Photo #28

- **Step 13)** Install the Fillet pieces within the “plowed/grooved” portion of the Handrail (if applicable) and Shoerail (if applicable) using Construction Adhesive. **(See Photos #29 & #30)**



Photo #29

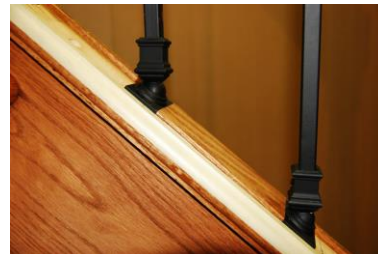


Photo #30

IronPro Level Kits (LI-PROLVL) are typically used on level run sections. However, **IronPro Kneewall Kits** *may* be used on level runs instead, if preferred.

WARRANTY EXCLUSIONS AND LIMITATION OF LIABILITY

The foregoing warranty does not cover and shall be void for: **(i)** defects or damages resulting from casualty, accident, misuse or abuse, neglect, alterations, service or repair by other than L.J. Smith, Inc. or its independent third party service providers, including without limitation by you; **(ii)** improper installation or de-installation, operation or maintenance, improper connections with peripherals or other causes not arising out of defects in the materials or workmanship of products; **(iii)** accessories; **(iv)** normal wear and tear; or **(v)** damage to or loss of repaired or replaced products during shipping by L.J. Smith, Inc. except when such damage or loss is caused by poor or inadequate packaging by L.J. Smith, Inc.

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