

Boulder Valley Models #354 Twin Schnozzer Engine Assembly Instructions

Before you begin: Wash resin parts, read notes on parts listing page, read instructions & consider your own preferences regarding painting, etc. prior to assembly.

Metric equivalents: 1" actual measure = 2.54 cm or 25.4 mm

1" (inch) scale measure = 0.53 mm * 1' (foot) scale measure = 6.35 mm



Preparation of Bachmann Chassis

★ Test run your Bachmann HO 45-ton loco prior to disassembly or modification in case any warranty work is needed. Break-in loco by running on a loop of track.

★ **Tip:** Wash the parts and allow those to dry while you prep the mechanism.

□ Remove coupler screws and couplers. Pull coupler boxes out thru ends of pilots. You'll find an extra zip bag in Pack #5 -- use this to store small screws, couplers, etc while working.

□ Remove four small screws under cab and set aside. Unplug handrails from cab and lift shell from mechanism. The shell is die-cast metal. It is separate from the deck and

may require some wiggling to remove. The Bachmann cab screws are not re-used in the On30 loco, however the couplers, boxes and screws WILL be re-used.

□ We replaced the deck-mounted grab-irons as shown on Pages 3-4. You can pull off the HO grabs or cut them off flush at deck to avoid having to fill the holes.

★ **READ & PLAN AHEAD!** You'll see there are a number of options as to which parts are painted individually and which are painted as parts or assemblies. If you have a single-color paint scheme, then you can paint all or nearly all of the body as a single assembly. For fancier schemes, review the photos and plan accordingly.

Add Grab-Irons and Door Latches to Cab Sides

★ **Handrail stanchions:** A neat little detail that might drive you nuts! There's a mixture of humor and reality there. We've provided some nifty little stanchions to give your loco a prototypical appearance ... and there are enough extra pieces to allow for the fact that a few of these tiny pieces might "disappear" during handling. These are probably the "trickiest" little bits in the kit -- good lighting, tweezers and patience are extremely helpful! **Alternative:** We suggest that you TRY the techniques suggested, but if you find the little pieces too troublesome, you can simply drill holes (#75) in the cab sides, bend pieces of fine wire to form grab-irons and glue those directly in place.

Practice: Since there are extra pieces, try drilling and trimming out two stanchions, glue these to a piece of scrap material with the holes aligned, test fit a piece of metal wire (Part V) and see how it goes!

★ **TIP for drilling handrail stanchions:** While stanchions are still on their thin backing, drill #75 holes thru the first row of stanchions, then trim as described below. (Hole is drilled in dimple as shown at right. Pre-drill each row before removing from backing.)



★ **TIP for trimming handrail stanchions:** Drill holes in one row of stanchions, cut that group away from the others. Place on rubber cutting mat and use a hobby knife to make

cuts around the base of each stanchion. Diagram at right shows a black circle to represent the base of stanchion. The blue octagon suggests a series of straight cuts made around the base of stanchion to remove backing. Use tweezers to hold part while making the last few cuts. The tiny "points" left around the base of stanchion may be sanded off, but if you make enough cuts around the base, the points will be small enough to "disappear" on the finished assembly.



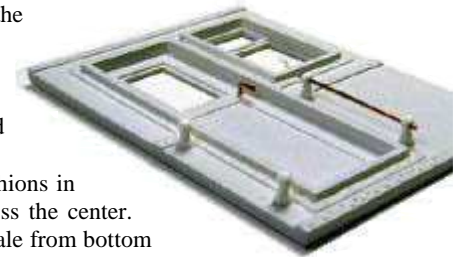
□ The length and placement of grab-irons may be varied. Mark desired location of stanchions on cab sides

(Parts B, C). We placed the upper stanchions in the corner created by the rivet rails across the center. We placed lower stanchions about 10" scale from bottom of cab side (about 7" above rivet band).

□ Drill and trim out two stanchions as described above. Glue in place as shown, being sure to orient holes to align vertically. Repeat for two more stanchions on opposite side of door.

□ Cut fine wire (Part V) slightly longer than needed, so a little bit protrudes beyond each stanchion. You can remove burrs on the ends of wire with a fine emery board. Test fit; enlarge bottom hole slightly if needed for alignment. Use a toothpick to apply a tiny drop of ACC where the wire meets each stanchion. Repeat for second grab. Then repeat these steps on the opposite cab side.

□ Drill a #75 hole in door as shown. Use small pliers to make a 90-degree bend in a piece of fine wire about 6" scale from end; cut off long piece so the bit measures about 4x6" scale. Handle may be oriented horizontally or vertically as shown. Hold door latch with tweezers, touch end to ACC then press into hole. Repeat for door on opposite side.



Cab Assembly

★ **Important:** Test fit sides and ends together before gluing. Note that the sides fit *between* the ends! The rivets on the edge of cab front will be visible when cab is assembled. Also note that the rivet surfaces on the cab sides will align with the rivet surfaces on the edge of the cab fronts. (Both ends are "fronts" on this loco!)

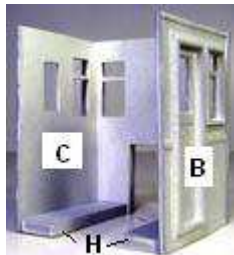
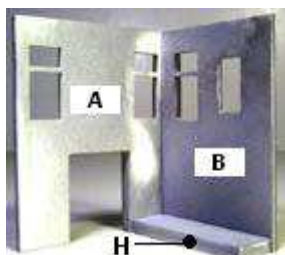
★ **Beginners:** Use 5-minute epoxy to allow extra time to check alignment of parts!

★ **Oops!** It's much easier to place grab-irons and door latches *before* cab is assembled -- forgot to do that for these photos.

□ Test fit cab right (Part B) to back surface of one cab front (Part A) as shown. See how the rivets along the top and bottom edges of cab side will align with the rivets on the edge of cab front. Glue parts together as shown and check alignment before set.



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- Glue cab floor piece (Part H) in place as shown (above left).
- Glue cab left (Part C) in place as shown (above center), check alignment of rivet bands before set. Add second cab floor.
- When adding the second cab end, it's best to glue to only one cab side at a time. This allows time to properly align parts. Apply ACC or 5-minute epoxy as shown in green (above right), then add second cab front (Part A). Check alignment and allow to set.
- Flex out second cab end as shown at right. Add glue along the edge of cab side; check alignment and let set.

★ **Optional PC board cover (Part G):**



- We've included this piece to hide the circuit board when looking in the cab windows. If you're planning to change the decoder or add sound, you might want to use a temporary adhesive like rubber cement or poster tack to install this part after painting.
- If you're going to use the factory-installed electronics, you can add Part G as shown. Notice that the smooth side faces cab roof ... and the side with ridges should face the cab floor. Photo at right shows bottom view.

★ **Important:** The roof insert (Part D) is designed to allow the roof to press-fit into the cab, but remain removable. Read carefully, and do not glue the roof insert into cab!

- Do NOT glue roof insert into cab!** Loosely test fit roof insert (Part D) in cab as shown. Keep in mind that the cab walls and roof insert will become slightly thicker when painted. If the roof insert is too snug, file down edges as needed.



Test fit only. Do NOT glue!

- Remove insert from cab and lay on bottom of roof (Part F) as shown. You may wish to make marks on bottom of roof to help alignment when gluing. The roof insert should be centered side-to-side and front-to-back. We recommend using 5-minute epoxy or slow-setting ACC to allow alignment. Glue roof insert to bottom of roof as shown.



★ Do not place roof assembly on cab until glue is fully dried.

Add the Hoods and Details ... or paint separately

- Plan ahead for your paint scheme!** The easiest way is to add the majority of parts and paint the body as a single assembly ... but if you're using a fancier paint scheme as we've shown here, it may be a lot easier to paint some of the parts and assemblies separately. Read thru the following steps and decide accordingly.

★ **Optional Bells:** We've included these for both ends of cab, as this seems the most appropriate warning device for a little industrial critter. You may add or substitute headlights, horns, etc.



- Bell prep and/or installation:** Pre-drill #60 holes in brackets (Part T), then carefully trim from backing material. Lightly sand bottom of bells (Part S) to thin backing material, then trim out bells and sand edges. Set bells aside to paint separately. Brackets may be installed as shown or painted separately.

★ **Funky hoods!** As you test fit the radiators, hoods and cab, you'll see that we've made the hoods a little bit "wonky" or "cattywampus" (ie, crooked) to reflect the abuse that often left these hinged panels crooked or askew. The effect is different on each side of the hood, so it looks different when viewing the two hoods on one side.



★ **Weighted castings:** You'll also notice that the hoods have a "speckled" appearance. The spots are tiny steel balls cast into the resin to add weight. Avoid drilling into those, as it's likely to break small drill bits.

- Add grab-handles to hoods:** We made ours about 12" scale wide. Use pliers to make a 90-degree bend near end of fine wire, then another 12" away. Trim wire. Mark center of hood with pencil, then mark and drill two #75 holes. Glue handle in place. Repeat for opposite side.
- Repeat above steps for second hood.



★ **Planning a paint scheme like ours?** Glue the cap or ornament to radiators as described below, then paint the hoods, radiators and cab as separate pieces.

- Test fit radiator against hood. Notice that the little indent for the radiator cab should align the hinge on center of hood. You can see the side panel "off killer" at right here:



- Glue radiator to front of hood, or set aside to paint separate.
- Optional radiator cap or ornament:** Two types are provided (Parts L and M) and illustrated on the parts list. We assembled our model with the ornamental version (Part M). Trim these from backing using the technique described for the stanchions. (See image, top right on Page 1)
- These are tiny parts, so extras are provided. Trim carefully. Hold with tweezers and touch bottom to a droplet of ACC. Then set in place on top of radiator. Repeat for second cap and radiator.

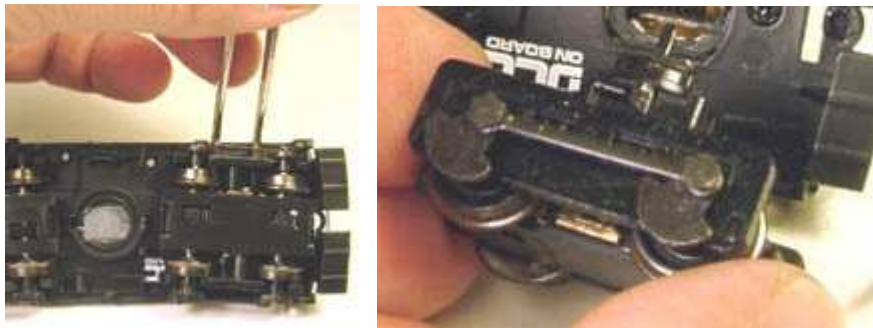
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- Test fit hood against cab as shown. Again, keep in mind that hinged panels are off-kilter (askew). We suggest using 5-minute epoxy or slow-setting ACC on a large joint like this to allow time for adjustment before glue sets. As photo suggests, we glued hoods in place after the parts were painted. This made it much, much easier to paint the cowl behind the hood a contrasting color ... and also made it much easier to handle the cab to do the intricate trim work with a fine brush.
- If you plan to paint the hoods and body in a single color, carefully align parts as described above. Glue hoods to cab.



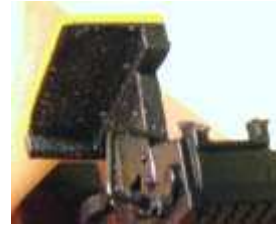
Optional: Remove deck for painting and add grab-irons

- ★ **Beginners:** If you're not comfortable disassembling the chassis as described below, you can use acrylic paints and/or weathering pigments to color the deck without removing it from the mechanism. Likewise, you can add grab irons to the deck while it is in place.
- ★ Pry cap off air tanks to reveal speaker cavity, which may be useful if you plan to add sound! Looks like 1/2" speaker will fit. We set aside the air tanks to paint separately. Keep the metal plug (weight) for reinstallation.
- ★ **EASY DOES IT!** In order to remove the deck, it is necessary to remove the trucks. Do **NOT** pinch the trucks from the sides, as this may distort the side rods.
- ★ **Truck removal:** We used a pair of angled tweezers to gently pry out each truck. They are held in place with snap-fit pins. Please work **carefully** to avoid causing mechanical damage. Again, do **NOT** pinch side rods! **Grasp truck from ENDS as shown below.**

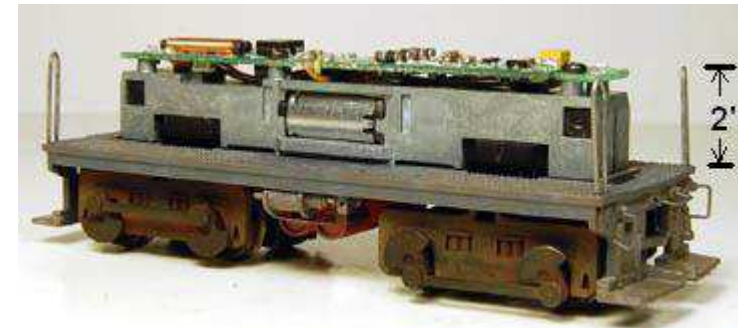


- Carefully pry off trucks. Grasp from ENDS to avoid damaging side rods.

- Remove two screws indicated by yellow arrows at right to release deck. Remove deck and replace screws in mechanism for safe keeping.
- Cut away the tiny HO bell from underside of deck. It's hard to see in the photo, but the location is indicated by the white arrow at center.
- **Optional / Cut away corner steps:** While the heavy-duty HO platforms on the end of the deck make nice pilot steps for an On30 model, the little steps in the corner seem just too small and unnecessary for a dinky little critter like this. Steps are indicated by blue arrow in photo at right.



- We used wire cutters to clip off the steps as shown above left, then used a hobby knife to carefully trim away the unwanted portions as shown above right.



- ★ **Optional / Add grab-irons to the deck:** These may be varied to suit your taste. We decided on the looped-style shown above, with one in each corner. Each one extends about 2' scale above the deck, which seems a good height for a person standing on the end platform. Forming and installation is described on the next page.
- ★ **Important:** If you decide on any arrangement that connects between the body and deck, each grab-iron **MUST** be removable at one end. Why? Because the body is removed from the top and the deck is removed from the bottom. If you need to get inside to service the motor, mechanism or electronics, the grab-irons can **NOT** be permanently mounted between body and deck.

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★ In each corner of the deck, there are five holes where the HO railings were originally placed. The photo at right shows how we used the two closest to each corner for placement of our grab-irons. Then we filled the remaining three holes in each corner with small sections of .020" styrene rod (Part W).

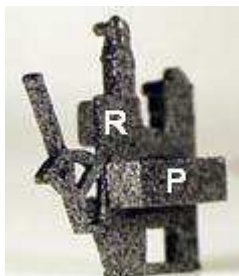


- **Forming grab-irons:** Find a drill bit or small cylindrical object that fits between the two holes. This will be used to shape the rounded end. Use a Sharpee or fine marker to make a mark about 5/8" from the end of a piece of fine wire (Part V). Use pliers to make a slight bend at that point, then wrap the wire around the drill bit to make a loop. Remove the drill bit and squeeze a little to tighten the loop. Cut the long end of wire even with the short end and test fit in deck. It may be necessary to enlarge the holes slightly with a #75 drill. Check the height -- we used 2' over deck as shown on previous page. Trim ends of wire if needed and glue in place. Repeat to form three more grab-irons.
- **Fill holes in deck:** Test fit styrene rod (Part W); enlarge holes with #75 drill if needed. Insert rod from underside of deck and press until end is flush with top of deck. Cut off excess beneath deck. Apply styrene cement to set. Repeat to fill all of the holes. There should be three in each corner -- indicated by the white styrene rod ends in photo above.

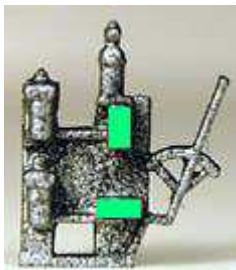
Assemble control unit to fit in cab

★ **Careful!** The control unit pieces are delicate, so we've included an extra set. If you break off a little control lever or pipe, you can use a scrap of the fine wire to replace it. A #75 drill can be used to make a hole for mounting fine wire if needed.

- **Trimming out parts:** First, use a sharp knife to clean out the center openings in the control units (Parts Q-R). Then carefully trim out each part. Lay part on a rubber cutting matt. Lightly trace around the part with a knife, then repeat the tracing motion to trim out part.



- Glue spacer (Part P) to back of rear control unit (Part R) as shown in upper photo.



- Add dabs of ACC to face of rear unit (Part R) as shown at right (green blocks). Then attach front unit (Part Q) as shown at far right.



Painting -- Any color(s) you like!

- ★ **Body components** -- At this point, we painted the following items separately: cab assembly, roof assembly, hoods, radiators (with caps), control unit, bells, brackets, cab steps and control unit.
- ★ **Frame components** -- We painted the following separately: deck with grab-irons installed, air tanks and couplers. Well, actually, we forgot to paint the couplers and didn't realize that until the photos had been taken (oops!) ... a light spray of dark gray or brown paint won't disturb coupler operation and makes them look better.
- ★ **Trucks:** You can leave these alone ... or brush-paint (lightly!) or drybrush with acrylics or enamels. We used weathering chalks to color ours ... and toned down the rust a bit after the photos were taken! (Use dark gray or black over colors to subdue.)
- ★ **Patience!** A good paint job takes time. Even though spray paints may be dry to the touch in half an hour, it's best to let one side cure for 24 hours before flipping parts (especially those held on masking tape) to paint the other side.
 - **Don't forget the cab steps:** Trim steps (Part N) from backing; paint with other parts.
 - **START with a GOOD PRIMER COAT:** We recommend a solvent-based primer like Krylon or Rust-Oleum automotive primer. After that, you can use spray paints, acrylics or whatever you like for a color coat. Use several light coats to cover the parts or assemblies. The first coat will be thin enough to let the white resin show thru. Let that dry for 15-30 minutes, then apply a second light pass followed by a third after another drying period. Allow parts or assemblies to cure for 24 hours, then flip and prime second side.
- ★ **Our sample / Body colors:** We used Krylon #4291 Ultra-Flat Camouflage Khaki, and, of course, you can use any color you like! The rivet bands and cowls (behind the hoods

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on cab front) were brush-painted with Model Master #4749 Engine Gray (acrylic). The doors were brushed with Polly S #414296 Stainless Steel with a touch of the Engine Gray added to make the color a bit dingy. Likewise with the radiator louvers and hood ornaments. The bells were sprayed with Testor's #1250 Flat Red.

- ★ **Our sample / Frame colors:** We used Model Master #950 Panzer Gray (FS36076) spray paint on the frame, then dry-brushed with some medium grays and earth tones. The Model Master #4749 Engine Gray (acrylic in bottle) is a very close match for this color. We brush-painted the end steps with Polly S #404073 MOW Gray. The air tanks were sprayed with Testor's #1250 Flat Red. The brake cylinder and the air lines were brush-painted with Polly S #414296 Stainless Steel.
- ★ **Our sample / the "Fancy Trim Work":** We used a 10/0 shader brush to paint the rivet bands with Model Master #4749 Engine Gray. This takes a steady hand and a bit of patience, but it's a nice touch! A scrap of small stripwood comes in handy for gently scraping away the occasional stray bit of paint. Speaking of patience, it did take a couple of hours to do the trim work by hand ... with several breaks to stretch, wash the brush and freshen the paint. (Paint tray washed out and fresh drops of paint added.)
- ★ **Our sample / Window frames:** These were painted using a 10/0 spotter brush and Polly S #414296 Stainless Steel.
- **YOUR COLORS:** Take your time and build colors in light coats as noted above. If you want to duplicate the "idea" of our trim work, but don't feel 100% confident with fine painting, choose a second color with LOWER CONTRAST. This will make any wiggles or stray bits less obvious. And, if you use acrylics as we did, you'll have an opportunity to use a clean, wet brush and/or scraps of stripwood or flat toothpicks to clean up stray bits of paint. We look forward to seeing photos of your paint scheme!

Final Assembly ... getting ready for action!

- **Replace deck and air tanks:** Remove two screws stored on chassis. Replace deck on chassis from bottom. Replace screws. Replace metal weight in speaker cavity and snap air tanks in place. (See last photo on Page 3.)



- **Replace couplers:** Photo at left shows how the parts should be oriented as viewed from bottom of loco. Photo at right shows parts replaced on loco. It's a bit tricky, as you have to sandwich the parts together, hold them with tweezers and slide into opening on pilot; then replace screw. Repeat for second coupler.
- **Replace trucks:** Each truck has an opening at one end, where the gears are visible. The open end on

each truck should face the pilot end of loco. Carefully snap trucks in place.

- ★ **NOTE:** Following steps will vary depending on how much assembly was done before painting!
- **Bells & brackets:** Mount these parts to ends of cab as shown on Page 2 (top of second column).
- **Hoods and Radiators:** Please re-read second column of page 2 regarding alignment of these parts. Mount radiators to hoods. Mount hoods to cab ends.
- **Mount control unit:** Determine "front" of cab -- for this purpose, the doors are at the "back" and the side windows are at the front. The spacer on the back of the controls should butt against the cab end. Glue control unit in cab as shown.
- **Mark and drill for mounting screws:** Place body assembly on deck and check alignment front-to-back and side-to-side. Invert body and mechanism as shown above and re-check alignment. Use a pin or fine pencil to mark the location of the four mounting screws. These will be placed using the same screw holes used to mount the original HO body. They can be seen as light tan dots around the four corners of the air tanks at right. **Remove body from mechanism.** Use a pin, tack or tiny drill bit to make a starter dimple at each mark. Then drill a #60 hole at each location.
- Tap one screw (Part X) into each hole as shown below. It may help to support the screw with tweezers when making the initial turns! Remove screws and check bottom of the cab. You'll likely see a ridge around each screw hole. Use a chisel blade to scrape this away.
- **Screw body in place:** Place body on mechanism again and invert. Place screws thru hole in underside of deck and tighten just barely snug.
- **Add window material:** Cut pieces of window stock (Part U) to fit inside cab. Use a clear-drying adhesive like Micro-Scale Kristal Kleer or a thin coat of white glue (PVA) applied with a damp brush to mount. Allow to dry.
- **Add cab steps:** Invert loco and glue one step centered beneath each cab door. We saved this for last since these parts are delicate. Use care when handling loco!
- **Engineer (not included):** We found that the Artista #1406 Brakeman Holding On makes a handy figure for this loco.
- **Place cab roof:** Just drop in place ... do NOT glue!



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- ★ **PLEASE SEND PHOTOS!** We'd love to share photos of your finished Schnozzer on our web site. It gives me a big thrill to see the models completed, and your fellow modelers will enjoy the ideas and inspiration they find by checking out your paint scheme, weathering, detailing or any other personal touches you might add.
- ★ We hope you'll have lots of fun running your Twin Schnozzer engine!
- ★ Boulder Valley Models is owned & operated by Dallas Mallerich -- an On30 modeler who shares your interests and enthusiasm. Please feel free to write or email with any questions or ideas that you may have!
- ★ Thank you for your continued support, interest, ideas and encouragement! -- *Dallas*

Boulder Valley Models

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