

# DRY CREEK MODELS

HISTORIC DESIGNS FOR CALIFORNIA RAILROADS

## SP W-50-3 HART CONVERTIBLE GONDOLA

AS-BUILT, 1910 - 1926 AND LATER

MODEL 100: OPEN CENTER DOORS.

MODEL 101: CLOSED CENTER DOORS.



### Contents:

- freight car body, primed
- freight car end
- 2 end bulkheads
- K-style brake cylinder
- 4 2-56 plastic screws
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### Not included:

- 0.010 brass wire for grab irons
- 0.015 brass wire for brake wheel shaft.
- brake wheel
- Kadee 509 Andrews trucks
- Tichy #3039 straight stirrup steps.
- Builders in Scale #250 chain (for hand brake)
- 1x4 styrene for brake lever
- styrene channel for bulkhead supports.

### Tools Needed:

- X-acto knife for cleaning body casting
- Pin vise, #76 and #78 drills for grab irons
- Flush cutting side cutters for wire and for cutting screws flush with body
- File for fitting car ends.
- Paint
- Super glue (ACC)
- Model putty for fixing gaps.

**Background:** The Hart Convertible Gondola was a Transformer toy for early 20th century maintenance-of-way crews. Designed by the Rodgers Ballast Car Company, the Hart patented design used movable side and floor partitions to turn the car into a gondola, center-dump car, or side-dump car. With the hopper doors open, ballast could be dumped between the tracks. With the hopper doors shut, plows pulled through a line of cars and across bridge plates could push dirt out the side doors for fill. With the hopper doors closed and bulkheads in place, the car could be used as a gondola, hauling rail or ties. Many Hart gondolas were sold to different railroads with a huge range of designs. Rodgers never actually build freight cars, but instead allowed other manufacturers to license the patent, then customize the design to match the needs of particular railroads.

Your model is for the Southern Pacific's variant on the Hart Gondola as-built. 300 cars were built in 1910 and 1911 by American Car and Foundry. This design was purchased during Harriman control; additional

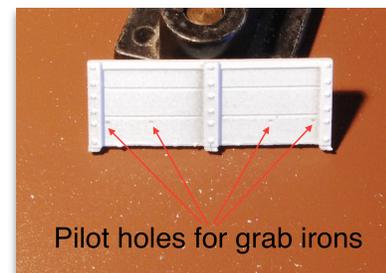
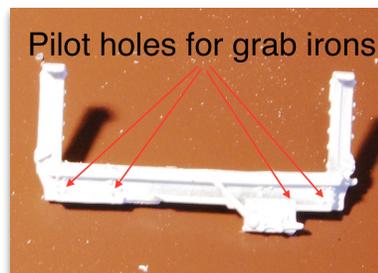
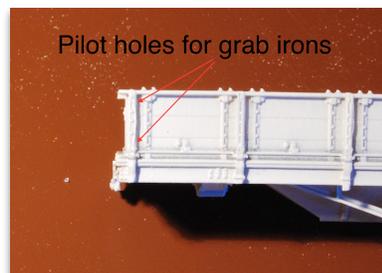
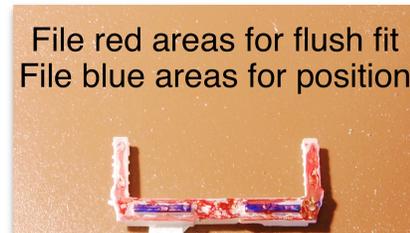
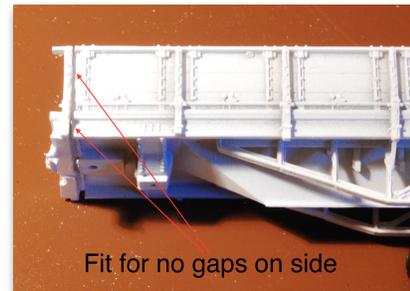
cars went to the Union Pacific and Oregon Short Line. 50 similar cars also went to the Pacific Electric in 1911.

In 1926, the Southern Pacific began removing the side dump doors and instead placed solid boards the length of the car. At this time, the railroad added standard grab irons on the car side, and removed the bar that held the doors shut as well as the latches on each door. However, they did not remove the castings that held the locking bar in place on each post. Most photos after 1929 show the cars with the side dump doors removed. With the modifications, some cars served into the 1950's.

**Building 3D Printed Models:** Your Hart Gondola kit is made by 3d printing the entire body in one piece, giving you a detailed model with little construction work. The resin material used hardens in sunlight or UV light. Now that it's finished and painted, it should be insensitive to light. However, like any plastic model, keep out of strong sunlight and heat to avoid warping and other damage. The 3d printing resin is a bit more brittle than styrene, and is similar to cast resin models or plexiglas. If you need to modify the body or trim flash, use a file or side cutters to remove material. Be very careful trimming with an X-acto knife; don't expect to carve it like styrene.

**Building Your Model:** The model comes mostly complete as a single casting, so almost all the work is done for you. You will need to do some additional work to complete the model.

- 1) Check the 3d printed parts - the body, the car end, and the bulkheads - for flaws. Trim extra material with files, side cutting pliers, and X-acto knife as needed. In case of any voids (such as on the gussets joining the truss to the side sills), use modeling putty to fill the voids.
- 2) On car end sill casting, remove nubs left from 3d printing process, and file back side flat so it will fit flush against car body. On car body casting's A (flat) end, lightly file and trim to remove nubs. Test fit car end against car body; two raised section on back side of car end will be flush against bottom of car body floor. File top edge of bulkheads to remove printing nubs.
- 3) Test that holes for attaching trucks and couplers are clean and threaded for 2-56 screws. Re-tap these holes if needed.
- 4) Test fit car end into body. File end as needed for a good fit. Glue car end to car body with super glue. Use model putty to fix any gaps.
- 5) Drill #78 in pilot holes in car sides (vertical grab irons on last post on each side), end sill (two horizontal grab irons on each side), and end bulkheads (two grab irons on each bulkhead).
- 6) Drill #76 hole for brake rod. Drill two holes: one through ratchet on top of car side, and one through car floor at corner. There is a pilot hole in the ratchet;
- 7) Make grab irons by bending 0.010 wire and gluing into holes. The typical approach for resin models would be to drill the holes through the side, apply glue from the back,, then cut and file the extra wire



off the back after the glue dries. If your grab iron is not horizontal, try bending the two legs of the grab iron in opposite directions, and reinserting.

- 8) If your model has the hopper doors open, the end bulkheads are placed towards the center of the car, just beyond the ends of the doors. If your model has the hopper doors closed, end bulkheads can be placed at the ends of the car, set at the sockets towards the center of the car, or left off entirely. Decide on position of end bulkheads. If placing the doors in the center of the car, test fit of end bulkheads into the body. File sides of bulkhead as needed. Cut the styrene channel in half to make right angle supports for the top of each bulkhead.

- 9) **EXTRA CREDIT:** Add opening mechanism for hopper doors. The two ratchet mechanisms on each end of the car connected to a rod that ran the length of the car. Chains wrapped around each rod stretched to the hopper door on the opposite side. Turning the rod loosened the chain and caused the doors to open.

The brackets for the rod have been cast into the body. The turnbuckles where the chains connected are cast into the door on the opposite side of the car. Insert a 0.015 wire through the brackets, then wrap 8 pieces of chain around the rod and stretch each to the turnbuckle. We never figured out a way to do this neatly, but would love to hear if you figure out a way!

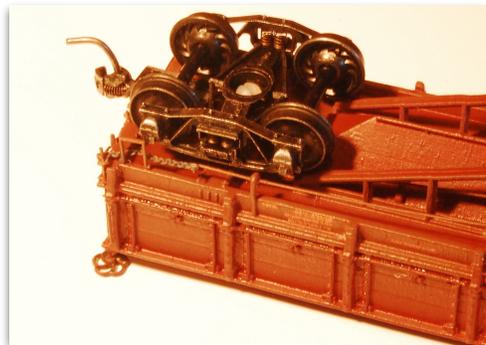
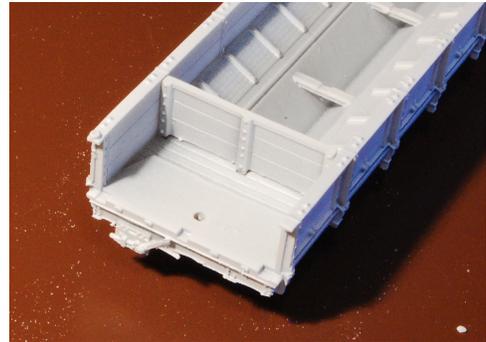
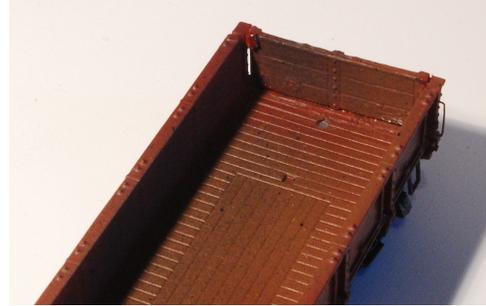
- 10) Stirrup steps were also on the prototype car, attached to the bottom of the side sills just below the grab irons. Find the pilot holes on the underside of the car, drill these holes with a #74 drill, and glue the Tichy stirrup steps into the holes. The steps will need to be bent out a bit to clear the wheels. Some cars had shorter steps; Tichy #3040 can be substituted for more clearance.

- 11) Attach a 4" piece of channel to the gusset just in front of the brake cylinder to serve as a place to mount the brake lever. A depression has been cast into the depression to identify the correct location.

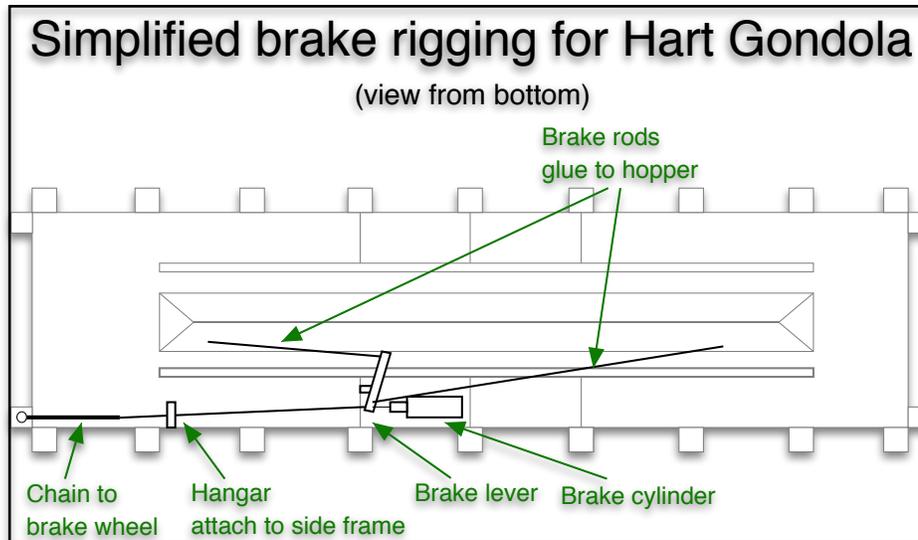
- 12) Attach the brake cylinder to under frame of car along one side frame.

- 13) Add additional brake details as needed. Possible options include having only the brake cylinder, adding a brake lever, or adding rodding for hand brake and/or rods to trucks. You can make a brake lever from 1x4 styrene (round the ends, then drill holes to provide a physical connection to wire brake rods. Add two brake rods heading towards both trucks. Also add a brake rod at the far outside, attached to chain going around the brake wheel. Use 0.015 brass strip to make a hangar for the brake rod leading to the brake wheel.

- 14) Note that the top boards extend a little past the sides on one end. These boards supported a brake wheel mounted at a corner of the car, rather than at the usual traditional place on the end of the car. The brake wheel is mounted on a piece of wire which passes through the top board and car frame. Drill hole #76 hole in corner of top board as marked, and insert wire with brake wheel on top. Brake wheel should be 6 scale inches above top of car.



**Painting Your Model:** We already primed your model with Tamiya Fine Surface Primer for UV protection, and to help detail show up better. We've had very good luck airbrushing Tru-Color Paint's Oxide Brown (TCP-211). After we applied decals to the car, we oversprayed the entire car with the base color to make the lettering look faded. We also weathered with a gray-brown dirt color from above, and weathered black color from above to simulate ash and other dirt.



**Couplers and Wheelsets:** Holes for couplers and wheel sets have already been drilled for you and tapped for a 2-56 screw. We recommend nylon screws for the couplers; cut the screws flush with the car bottom once you've attached couplers and trucks, and use paint to hide the screw. Andrews trucks were used on the original cars. We use Kadee 509 Andrews trucks for our car, with Kadee #58 "old time" couplers in the standard Kadee #5 coupler box. Cut the "ears" off the box so it will fit flush in the rectangular depression at each end of the car.



Hart gondola decaled for 1929 lettering

**Decals:**

**Car Numbers:**

Southern Pacific

10880 - 10959: SP reporting marks, Central Pacific ownership.

12220 - ?: SP reporting marks, Central Pacific ownership. (At least through 12267)

? - 12519: SP reporting marks, Southern Pacific ownership.

Pacific Electric also had cars in the 6000-6049 range (later renumbered to 6200-6249).

**Weight:** The W-50-3 was a 100,000 lb capacity car, weighing around 40,600 pounds empty, and having a maximum capacity around 120,000 pounds.

Lettering style varied widely across the lifetime of these cars:

1913: (Southern Pacific Freight Cars v.1, p. 39, 41, and 42): Initials centered high on car side.



**Errata:** This version of the Hart Convertible Gondola is a work-in-progress. Here are some known issues.

- 1) Space between numbers in the large reporting marks is a bit too wide, and some car numbers (e.g. S.P. 12239) won't fit on the side sill between posts. Consider either choosing a car number that fits the space, or use 8" SP reporting marks from another decal set.
- 2) We have found no documentation on the brake gear on the Hart gondolas. If you have ideas about how the brake rods connected to the brakes, let us know.

3)

**Frequently Asked Questions:**

- 1) "How were these models made?" Your Hart gondola was printed on a Form One 3d printer. ([www.formlabs.com](http://www.formlabs.com)) The Form One uses a laser to harden a photosensitive resin, layer by layer. Read more about the process of making these cars here: <http://vasonabrand.blogspot.com/2015/02/printing-freight-car-hart-convertible.html>

**Original Photos:**

Anthony W. Thompson, "Southern Pacific Freight Cars Volume 1: Gondolas and Stock Cars", Signature Press, 2002:

p. 30: end photo of W-50-3.

p. 35: interior of W-50-1 showing floor panels, hopper, and end bulkheads

p. 37: end view of W-50-? used for rail delivery.

p. 38: detail view of end of Hart car showing apron. Shows brake wheel on wrong side. Also Car SP 12100 (W-50-1) in all positions. No center sill under floor panels.

p. 39: side doors open

p. 40: non-SP cars and plow removing dirt.

p. 41: SP 12380, 1910's paint job, details. Also long view of several cars with floor panels open.

p. 42: Pacific Electric 6000, builder's photo, 1911. Also SP 10912 showing brake gear, with brake wheel on right.

p. 43: Car sketch for PE car, detail of end and side of W-50-3 SP 12241, around 1937.

p. 44, several W-50-3 in ballast service, 1930. Brake wheel on right, brake gear visible. Side doors not operational. Also PE cars, 1947.

p. 53, SP 12227, 1929.

Historic Southern Pacific Cars: Wayner Publications, New York New York.

p47: SP 12380, side view. Older lettering centered on car side. Side doors operational. (Same as p.41 of SP Freight Cars, though higher contrast.)

Photos of non-SP Hart convertible gondola. <http://bigbluetrains.com/forum/viewtopic.php?f=35&t=6882>. Car differs from the SP version with steel side posts and a solid side truss, but the photos show the dump mechanism clearly.

**Drawings:**

Work Car Class W-50-3. Common Standard drawing C-1652, adopted Sept. 21, 1906. In collection of California State Railroad Museum. General drawing of entire car.

Siding, Work Cars. Drawing 17325, April 16, 1926. In collection of California State Railroad Museum. Shows removal of side dump doors in 1920's, as well as detailed side view, detail of doors, and end gate clip.

End Gate Tie Bolt Chain and Staple for Work Cars. In collection of California State Railroad Museum. Shows chain and staple used to secure end bulkhead. Drawing 11156, Feb. 8, 1927.

**Additional Information**

Southern Pacific Car Ledgers, 1912 and 1924. Shows builder, corporate owner (SP/CP), and notes on when cars were retired because of damage.