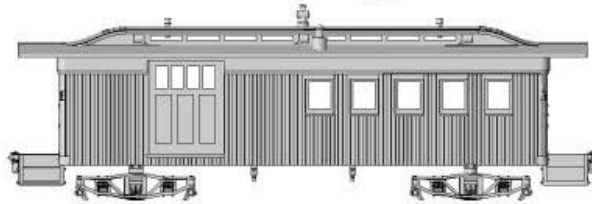


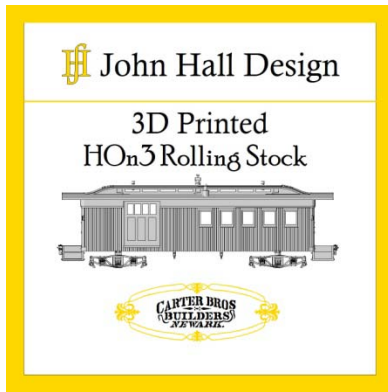
 John Hall Design

3D Printed  
HO<sub>n</sub>3 Rolling Stock



# Catalog and Assembly Instructions

Nov. 2021



## Welcome to John Hall Design.

John designed these **HO<sub>n3</sub>** models for use on his 1886 South Pacific Coast model railroad. He is offering his designs to the model railroad community and receiving no compensation in order to share his enjoyment creating the models.

The models can be ordered directly from this PDF Catalog. **Click on each image** to take you to **Shapeways** where you can purchase that model. The models are available with no markup, only the Shapeways cost to print it. On the Shapeways page click on the 3D icon in the upper right corner of the model image. This will give you a rotatable zoomable 3D view of the car.

These models are recommended only for experienced modelers. They are **NOT** complete model kits. The **buyer must supply**: wheelsets, couplers; screws; brakewheels; truss, grab, and end rail wire; glue; paint; decals; etc. Brief assembly instructions are provided at the end of the catalog.

**Before purchasing a model please read this entire catalog, including the instructions, to understand the complexity of these models.**

**Historical Accuracy:** These models were designed to represent South Pacific Coast Railroad rolling stock prior to the transfer of the railroad to the Southern Pacific Railroad in July 1887. The designs are accurate so far as could be ascertained from: photographs; existing drawings; and measurements of Carter Bros. car parts that exist in the collection of the [Railroad Museum at Ardenwood](#). Some specifications have been standardized in order to keep the design time to a minimum. This includes the passenger car width which was kept constant throughout the series. The passenger car interiors are based on preserved equipment, roof vents from photos, newspaper reports of inside details, and the January 1903 SP car roster documenting side or cross seats. The limits of the 3D printing process determined the level of detail.

The cars do not meet NMRA standards for coupler height or car weight. The cars are designed to be lightweight with a stable 3-point suspension so that a train of 6 passenger cars can be pulled up a 22" radius curve on a 2.5% grade by a HO<sub>n3</sub> 4-4-0 locomotive with [Bullfrog Snot](#) on one pair of drivers. The cars are close coupled and designed to negotiate a minimum 15" track radius when using the recommended couplers.

The available models are shown in this catalog. We do not do custom work.

The printing plastic that is used creates detailed models. However, the plastic is **fragile** and must be handled with care. In addition, the models need to be **kept from ultraviolet light** until they are painted. This includes sunlight and florescent light. However, unpainted models have been kept on a layout lit by LED strip lighting for over five years without any significant harm.

The parts require significant cleaning before the model is painted and assembled. Refer to page 9 for instructions.

Please share this PDF Catalog with anyone who might be interested.

# South Pacific Coast Railroad Equipment

All the models are HO<sub>n</sub>3 scale/gauge unless marked.  
Click on the images to see the prices and order the models.

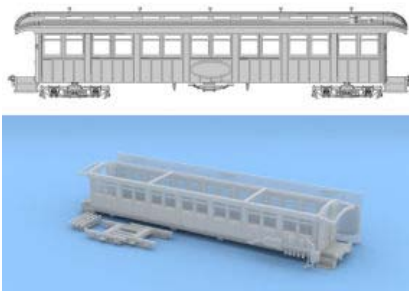
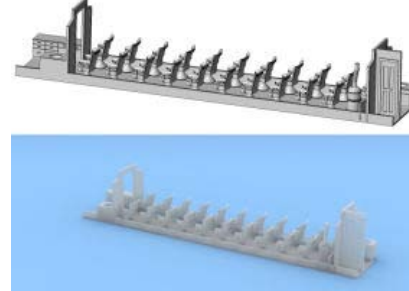

## Passenger Cars

All Passenger cars, unless noted, are models of Carter Brothers products. The roof snaps on and off the body. They come with the appropriate truck frames and brake beams. The **buyer needs to supply**: the wheelsets; 0.015" wire for truss rods and end railing; brake wheels; couplers; and 00-90-1/8" roundhead truck screws. The truck frames use *Precision Scale* 26 inch HO<sub>n</sub>3 wheelsets part #3240. The cars are designed for *MicroTrains* N scale 1025(001 02 011) couplers. All passenger cars and the caboose have platform railing and grab irons which must be modeled by the buyer. A brass wire bending jig is available on this page.

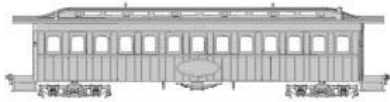
## Baggage Cars

 <p><b>Baggage Express cars 2-3,</b> built 1878. Duckbill roof.</p>	 <p><b>Baggage Mail Express cars 7-8,</b> built 1880. Duckbill roof.</p>	 <p><b>Interior for Combine 26.</b> See page 5.</p>
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## Parlor Cars

 <p><b>San Francisco or Santa Cruz</b> built in 1879 by Jackson &amp; Sharp Company.</p>	 <p><b>Interior for Parlor Cars</b></p>	 <p><b>Passenger Car Wire Bending Jig.</b> Used to bend wire for the grab irons and end railing. See page 12. <b>Use only brass wire</b></p>
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## Coaches



**Coaches 15-16** purchased 1879 through Commission Agents Davis, Howell & Co., SF. Duckbill roof.



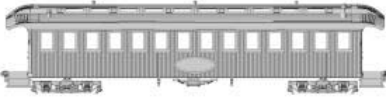
**Coaches 19-22** built 1879 as first class cars. Duckbill roof.



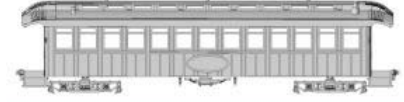
**Coaches 33-44** built in 1880 for Oakland and Alameda local commuter and excursion service. Duckbill roof.



**Coaches 49-51** built 1883 as first class cars. Ogee letterboard ends. Bullnose roof.



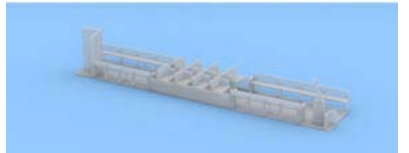
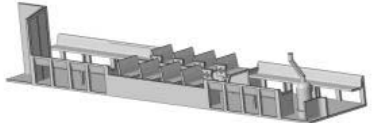
**Coaches 52-55** built 1883 as second class cars. Bullnose roof.



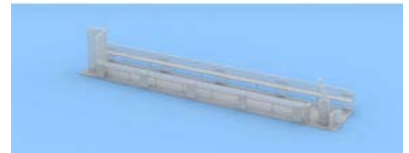
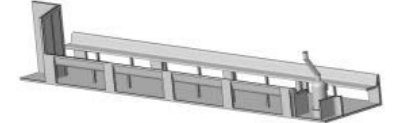
**Coaches 56-61** built 1884 as first class cars for through service between Alameda and Santa Cruz. Bullnose roof.



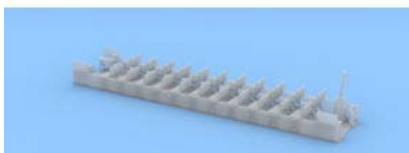
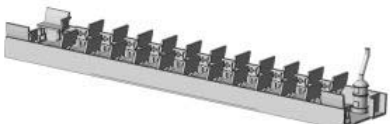
**Coaches 74-78** built 1887 as first class cars. Bullnose roof.



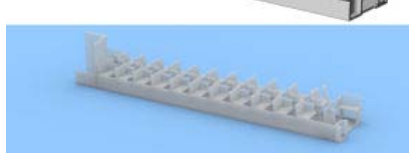
**Interior for Coaches 33-44 Cross and Side Seats** Also for Coaches 52-55



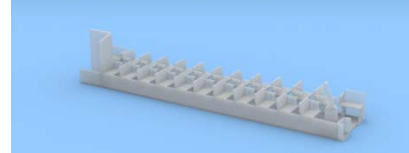
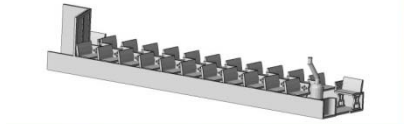
**Interior For Coaches 33-44 Side Seats**



**Interior for Coaches 74-78.** Cross seats.

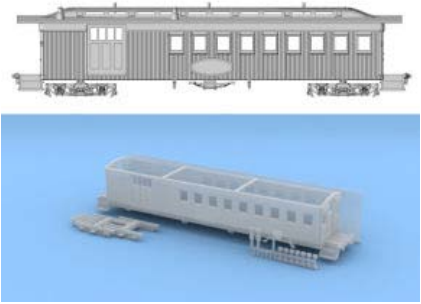

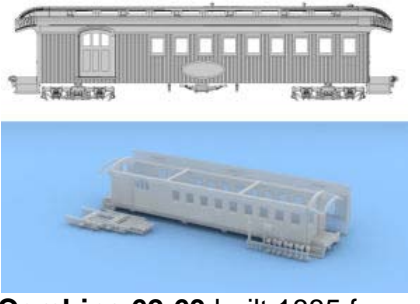
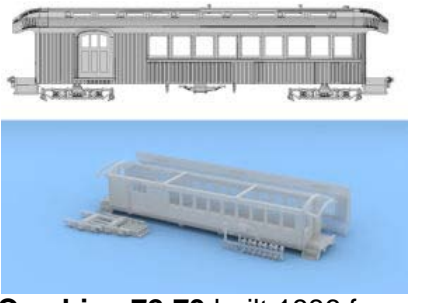
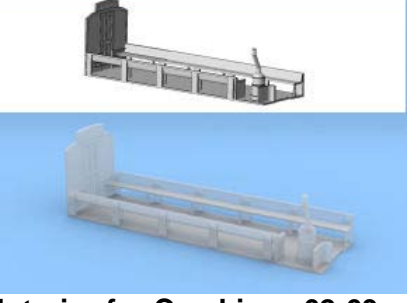
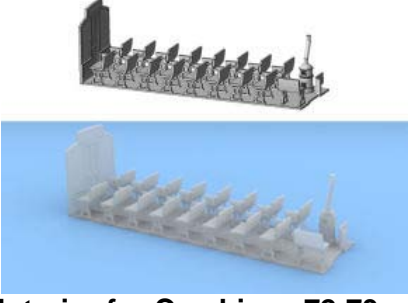


**Interior for Coaches 15-16, 56-61** cross seats



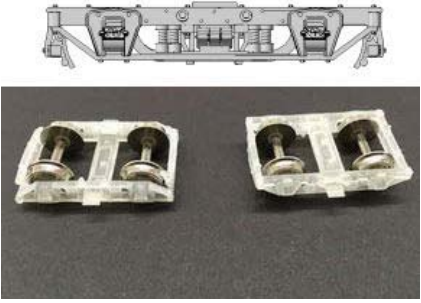
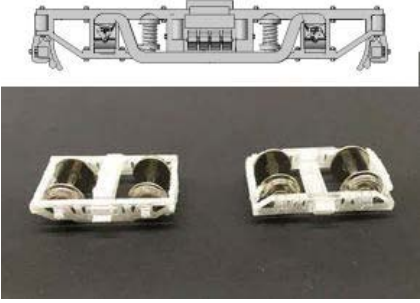
**Interior for Coaches 19-22, 49-51** cross seats

## Combines

 <p><b>Combines 17-18</b> built 1879. Duckbill roof.</p>	 <p><b>Combine 26</b> built as a coach 1879. Later converted to Combine. Duckbill roof. For interior see page 3.</p>	 <p><b>Combine 62-63</b> built 1885 for use on the Boulder Creek Branch. Bullnose roof.</p>
 <p><b>Combine 72-73</b> built 1886 for use on the Almaden Branch. Bullnose roof.</p>	 <p><b>Interior for Combines 62-63</b> Side seats</p>	 <p><b>Interior for Combines 72-73</b> Cross seats</p>

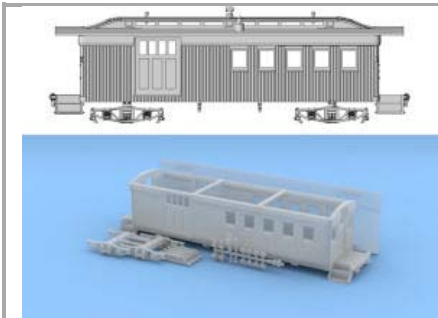
## Carter Bros. Passenger Car Truck Frames

The above coach kits include the truck frames and brake beams to assemble one pair of trucks. Individual trucks may be purchased from the links below. The **buyer must supply** the wheelsets. The trucks are designed for *Precision Scale* 26 inch HOn3 wheelsets part #3240. The Original truck frames were used on the South Pacific Coast Railroad passenger coaches 1 thru 44, 49-55, 62-63, and all baggage cars. The Patent truck frames were used on the South Pacific Coast Railroad passenger coaches 56 thru 61 and 64 thru 78. These kits included the truck frames and brake beams to assemble one pair of trucks.

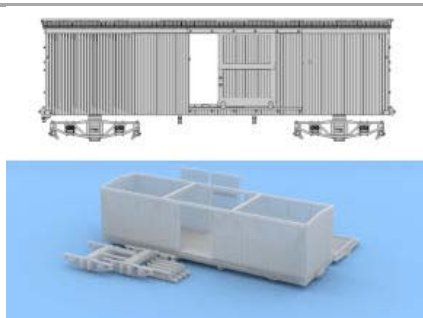
 <p><b>Original</b> Passenger Truck Frames. One pair</p>	 <p><b>Patented</b> Passenger Truck Frames. One pair</p>
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# Freight Cars

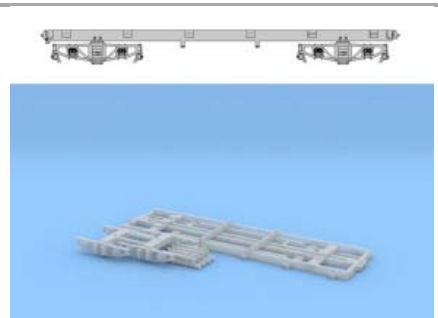
All freight cars are models of Carter Brothers products. They come with the appropriate truck frames and brake beams. The **buyer needs to supply**: the wheelsets; 0.015" wire for truss rods; brake wheel; couplers; 00-90-1/8" roundhead truck screws; and wood and a ratchet-and-pawl detail for the deck of the flat cars. The truck frames use *Precision Scale* 26 inch HOn3 wheelsets part #3240. The cars are designed for *MicroTrains* N scale 1025(001 02 011) couplers. For ratchet-and-pawl use *Precision Scale* #31803 or similar. A brass wire bending jig is available on this page for the boxcar grab irons and door handles. The grab iron jig for the caboose is is on page 3.



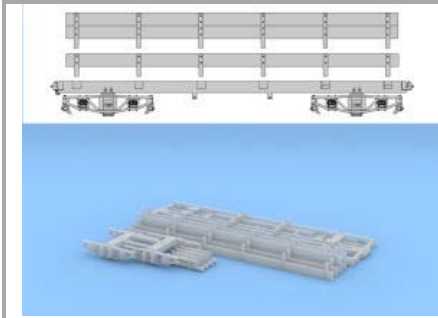
**Cabooses 45-48**, built 1882.



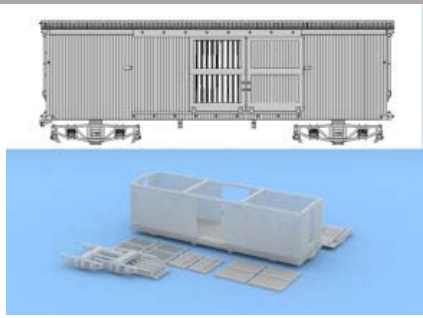
**28' Boxcar 2-102, 180-236 even**, built various years.



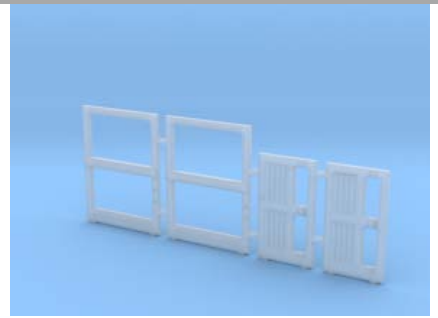
**28' Flatcar 1-579 odd**, built various years.



**28' Flatcar 1-579 odd**, built various years. Includes gondola sides.



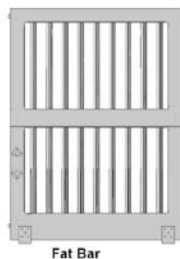
**28' Ventilated Boxcar 104-178 Even**, built various years. See below.



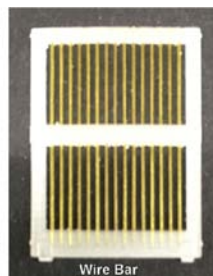
**Ventilated Boxcar Wire Door Frames**. Not recommended. See page 12.



**Boxcar Grab Iron Bending Jig**, includes door handle bending jig. See page 13. **Use only brass wire.**



Fat Bar



Wire Bar

**The Ventilated Box Car** comes with fat bars on the ventilated doors because the printing process cannot print scale size bars. The **Wire Door Frames** above do not have printed bars but instead have holes in the frame for the modeler to insert 0.0112" wire rods to represent scale size bars. See page 12.

## Carter Bros. Freight Car Truck Frames

**HOn3** truck frames can be purchased by the pair. The **buyer must supply** the wheelsets. The trucks are designed for *Precision Scale* 26 inch HOn3 wheelsets part #3240.

The **Fn3** caboose truck has an operating swing motion movement, both up and down and side to side. Assembly required. **Wheelsets and screw hardware not included.** Printed in tough nylon plastic. The truck was designed for Sierra Valley 26" Fn3 wheelsets.



## SPC Locomotive Stack

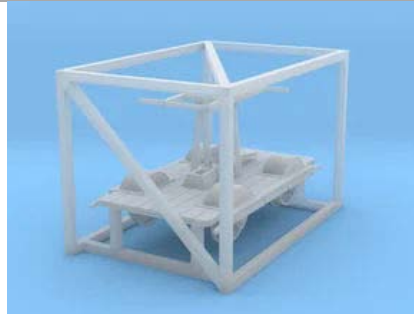
The smoke stack was designed by SPC Master Mechanic Evan L. Reese in 1881-1882 to minimize the risk of grain field fires that were being caused by cinders from the original Radley-Hunter stacks. Locomotives 1 thru 13 were converted to this stack. Locomotives 14-17 had these stacks included in the Baldwin Locomotive Works order. The stacks are offered in multiple scales. The HOn3 version requires a clean out cover, buyer supplied, *Precision Scale* part #3113.



## Handcar

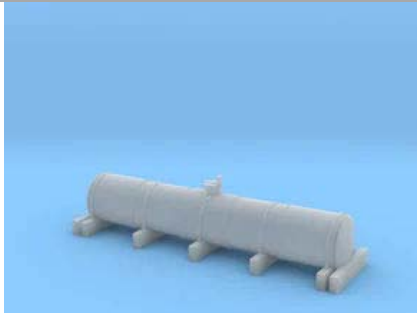


**HOn3 Hand Car** used on the SPC. Wheels and handle move.

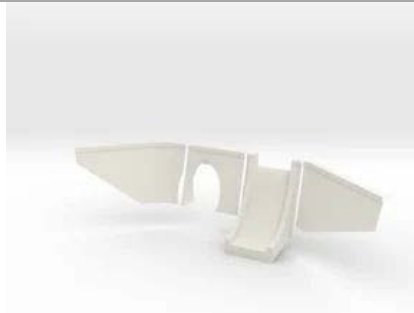


**Sn3 Hand Car** used on the SPC. Wheels and handle move.

## Misc. Equipment



**HOn3 SPC Oil / Molasses Tank**  
A flatcar load first used by the Pacific Coast Oil Works in Alameda then used to transport molasses to United Distilling at Agnew's.



**HO Wright's 1893 Tunnel Portal.** Usable for both narrow and standard gauge railroads.



**HO SPC Campbell's Depot**

## Assembly Notes

These instructions are for the John Hall Design partial kits available above from Shapeways.com.

**These models are recommended only for experienced modelers. They are NOT complete model kits.**

These instructions are brief and are not intended to provide a step by step instruction for completion of the model.

The passenger and freight car kits include the body, roof, truck frames with brake beams, and some details. The **modeler will need to supply:** wheelsets, couplers, truck screws; grab irons; railing; brake staff; brake wheel; truss rods; glazing material; paint; decals; etc. The truck frames are designed for Precision Scale 26" HOn3 wheelsets, part #3240. The cars are designed for Micro-Trains N scale couplers 1025 (001 02 011). A Precision Scale Ratchet and Pawl #31803 or similar is needed for the flat car.



The printing plastic that is used creates detailed models. However, the plastic is fragile and must be handled with care. Broken pieces can be repaired with CA. In addition, the models need to be kept from ultraviolet light until they are painted. This includes sunlight and florescent light. However, unpainted models have been kept on a layout lit by LED strip lighting for over five years without any significant harm.

## Cleaning the Model.

The parts received from Shapeways must be cleaned before assembly and painting. The printing process uses a wax to support the openings and overhangs of the model. That wax can leave a frosted look on a clean and dried model. Shapeways runs the model through a cleaning process that includes a hot oil bath. However sometimes it does not remove all the wax and it leaves a oily residue that must be removed prior to painting. The cleaning method outlined below has worked for the most troublesome models.

First go over the model with a dental pick removing any noticeable wax. Then clean out any of the holes for hand grabs, truss rods, end railing etc. using a #78 (0.016" 0.406mm) drill bit or a piece of 0.015" (0.381mm) wire. After the excess wax is removed, gently scrub the outside of the car body with toothpaste and a extra soft micro bristle toothbrush. Be careful of small details. Next, the parts are cleaned in a heated ultrasonic cleaner with a mixture of hot water and *Dawn* detergent for 20 to 30 minutes of ultrasonic agitation at approximately 70°C (158°F). Rinse in plain warm water.

The 3D printing process creates a micro ribbed surface which retains water. It will take a long time to air dry. An airbrush (just air) can be used to blow off the retained water.

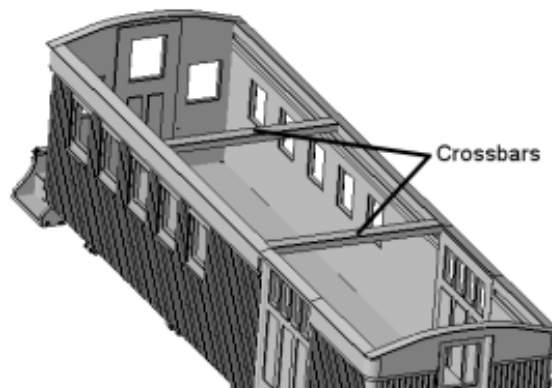
After drying you will notice two surface textures. One smooth and the other frosted white. The frosted white is where the supporting wax touched the plastic. Once the part is thoroughly dry and if the frosted white surface has spots that look damp it may still have some absorbed oil. Repeat the ultrasonic cleaning process to remove the leftover oil.

Once dry, the frosted surfaces can be partially polished if necessary using the toothpaste and brush. Brush the narrow board siding up and down. Be careful of small raised details. Rinse and dry again.

A tutorial from Shapeways on [Cleaning and Painting](#) the plastic describes a similar cleaning process.

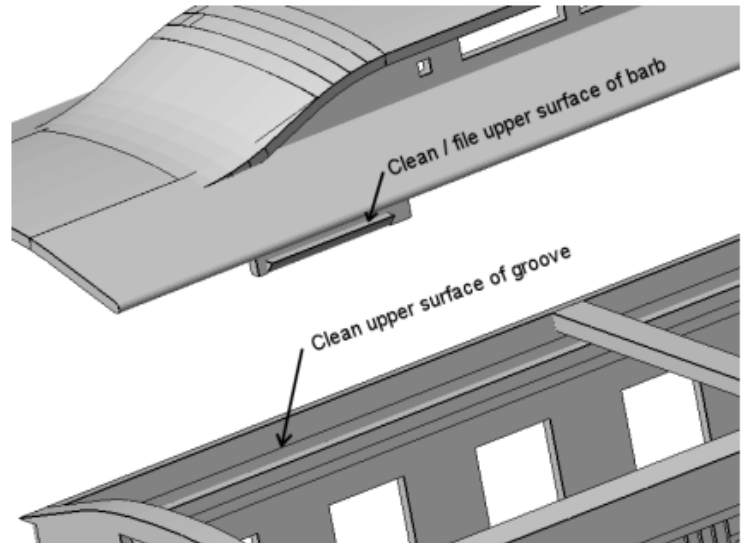
### Crossbars

There are two crossbars between the tops of the walls of the passenger cars, caboose, and box cars. They are there to minimize warping during the printing and cleaning process. On all cars except the boxcars the crossbars can be left in place or removed as desired.



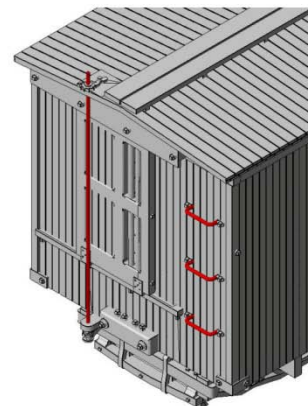
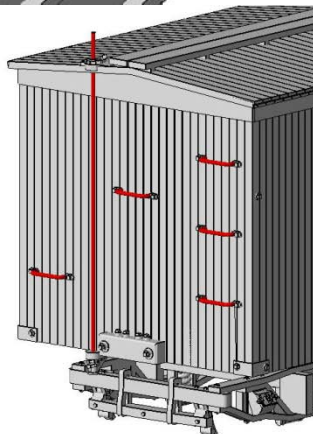
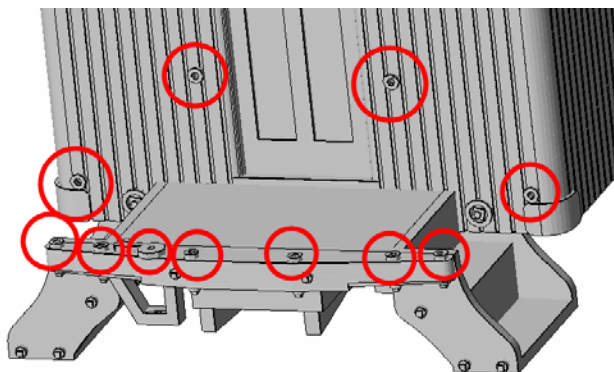
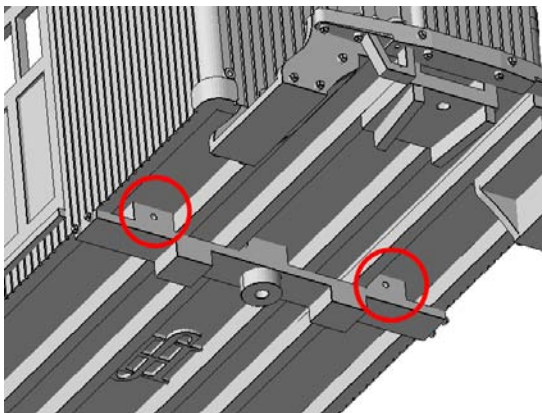
### Duckbill and Bullnose Roofs

The roof is designed to snap into the body and be released by a gentle squeeze of the roof sides near the tabs. This allows for future interior modeling, lighting, etc. Careful cleaning is necessary in order for the roof to snap together with the body. The top surface of the small barb on the roof tabs should be cleaned and or filed as needed for a snug fit. Also clean the upper surface of the groove in the body side. Refer to the illustration. Squeeze gently when attaching and removing the roof. The plastic is fragile.



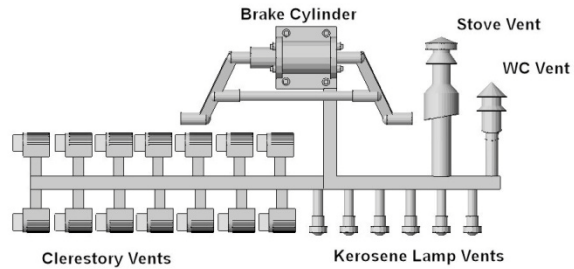
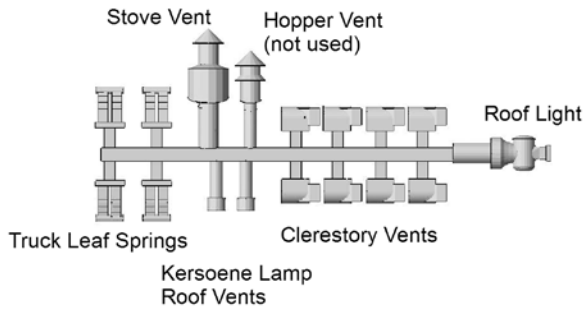
### Holes

The car bodies have numerous small holes for receiving 0.015" (0.381mm) wire for platform railing, grab irons, brake staff and truss rods. These holes are typically filled by wax which should be removed prior to washing. Refer to the illustrations below for locations of the holes. A piece of 0.015" (0.381mm) music wire or #78 drill bit can be used for cleaning. The holes for the platform railing do not go all the way through. The brake staff, truss rod, and grab iron holes go through the plastic.

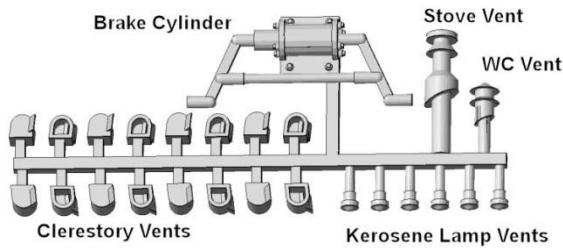


### Car Detail Clusters

Parts on the Detail Cluster are identified in the illustration below. Do not use the toothbrush on the details.



### Caboose Details



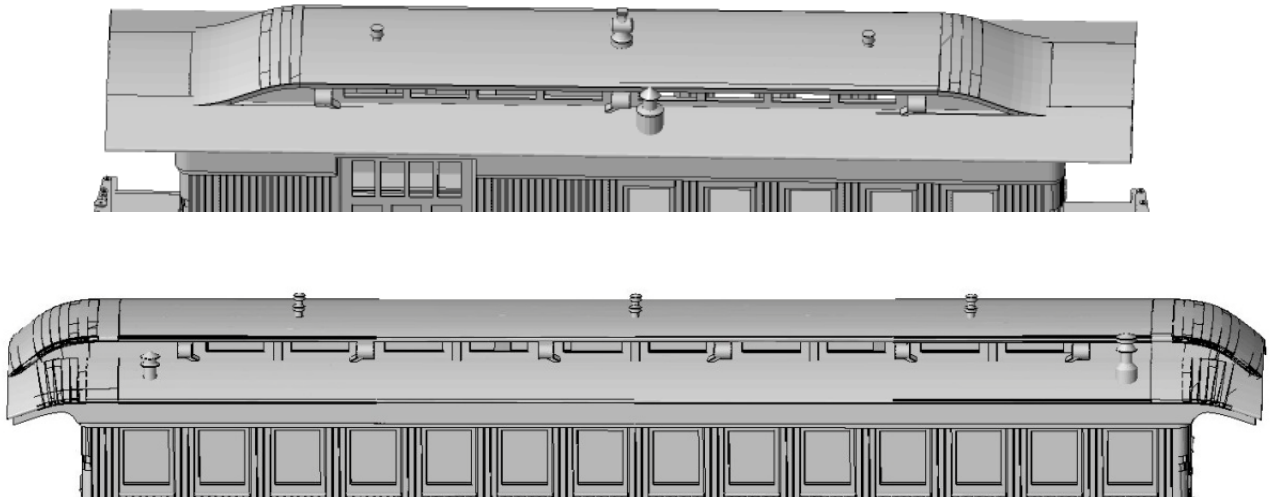
### Duckbill Passenger Details

### Bullnose Passenger Details

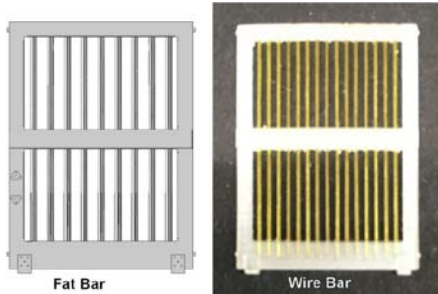
## Assembly

### Roof

The roofs are pre drilled for the appropriate stove vent, WC vent, roof light, kerosene lamp vents and the clerestory vents. The clerestory vents are fragile and need to be carefully fitted into the clerestory sides. Enlarging the square vent holes may be necessary to easily fit the vent posts into the clerestory sides. The images below show the orientation of the clerestory vents. Not all of the details are used on all cars. Some have WCs, while others may have only stoves.



## Box Car Doors

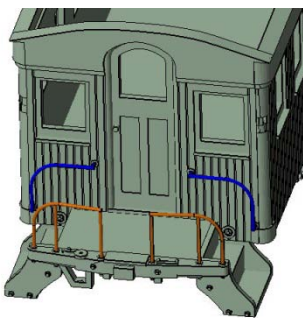


The ventilated boxcar kit comes with the ventilated door bars printed as Fat Bars because the printing process cannot print scale size bars. Although **not recommended**, the modeler may purchase another set of doors that have no bars printed but with holes provided to insert 0.0112" (0.248mm) wire rods to represent scale size bars. This wire bar version requires delicate control to first clean out any wax from the holes (#80 drill) and then thread the wire rods (not supplied) thru the appropriate

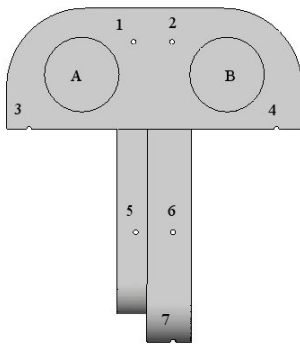
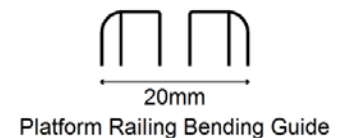
holes. The holes must be cleared of wax before any other cleaning is done. The modeler needs to be very careful not to crack the delicate plastic of the tiny 0.65" (16.2mm) wide by 0.031" (0.8mm) thick door.

The boxcar doors are movable and held on by the bottom rail on the car with the top retainer attached to the roof. To install the doors place each one on the rail and masking tape it to the car side or car end, keeping the top clear of tape. After all the doors are taped in place put the roof on making sure each door is under its retainer. Remove the tape and slide the doors.

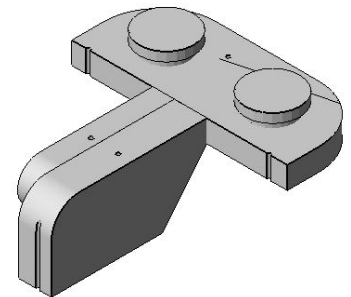
## End Rails and Grab Irons



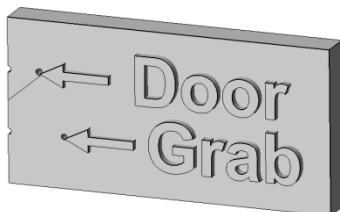
The passenger car platform end rails and grab irons need to be formed out of 0.015" (0.381mm) wire. The illustration on the right can be used as a guide for the platform railing. The grab irons have a similar curve to the outer shape but connect to the end walls with a right angle bend in the wire at each end. Print this page from the pdf file at 105% for proper size.



A wire jig is available for bending the railing and the grab irons for passenger cars. **Use only brass wire.** Using the top section insert a wire into hole 1 for the left hand grab iron or 2 for the right hand grab iron. Bend the wire flat to the left or right depending on which hole. Then wrap the wire around the circular post A or B, 145 degrees and let it return to 90 degrees where it should fit into slot 3 or 4. Bend it down and cut off **both ends flush** with the bottom of the jig. Repeat for the B side.



For the end rails insert the wire in hole 5. Bend it down then wrap it all the way around the large bend. Remove from hole 5 and replace it in hole 6. Wrap it around the curve and into slot 7. Cut off **both ends flush** with the bottom of the jig. Solder or glue a straight piece in position for the third leg. The jig can be purchased on page 3.

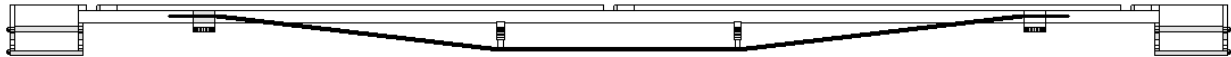


The boxcar has both grab irons and door handles that need to be created with 0.015" (0.381mm) wire. A jig is available to make this process easier. **Use only brass wire.** Insert a wire at the point of the arrow on the jig. Bend the wire in the direction the arrow points. Bend the wire back around the edge of the jig. Cut off **both ends**

**flush** with the back of the jig. The jig can be purchased on page 6.

### Truss Rods

0.015" (0.381mm) wire or fishing line may be used for the truss rods. Thread the wire or line through the holes in the bolsters. The passenger car truss rods are shown below. The freight car truss rods go through holes in the floor. Install flat car truss rods before adding **modeler supplied** flooring.



### Brake Staff, Brake Wheel, and Uncoupling Lever

The brake staffs and brake wheels are supplied by the modeler. For the passenger cars the brake staff slips into a hole in the ratchet and pawl molded onto the end beams. A Miller Platform uncoupling lever (not supplied) can be added through the slot in the platform end timber.

For the box cars the brake staff goes through the ratchet-and-pawl on the roof then down into the bottom bracket. The Boxcar roof needs to be aligned with the body so that the brake staff brackets are at the same end of the car.

The flat car brake staff goes into the bottom bracket. A ratchet-and-pawl detail needs to be **supplied by the modeler** to be placed on top of the flooring (Precision Scale #31803 or similar).

### Flatcar

The flat car is designed so that the **modeler supplies** and installs a wood decking. Be careful not to block the stake pockets. The stake pockets holes are best cleaned with a tiny square file to allow the gondola sides to be easily installed. The sides are installed after the flooring is installed. Be careful the stakes are fragile.

### Couplers

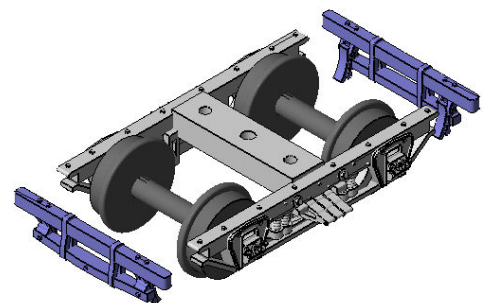
The models are designed to use MicroTrains N scale 001 02 011 (1025) couplers. Should you use a different coupler it may be necessary to remove the "ears" that retain the coupler box sides on the passenger cars. A 00-90 screw will self tap into the hole. Should a different coupler be used the cars may not safely traverse a minimum 15" track radius.

## Trucks

### Car Trucks

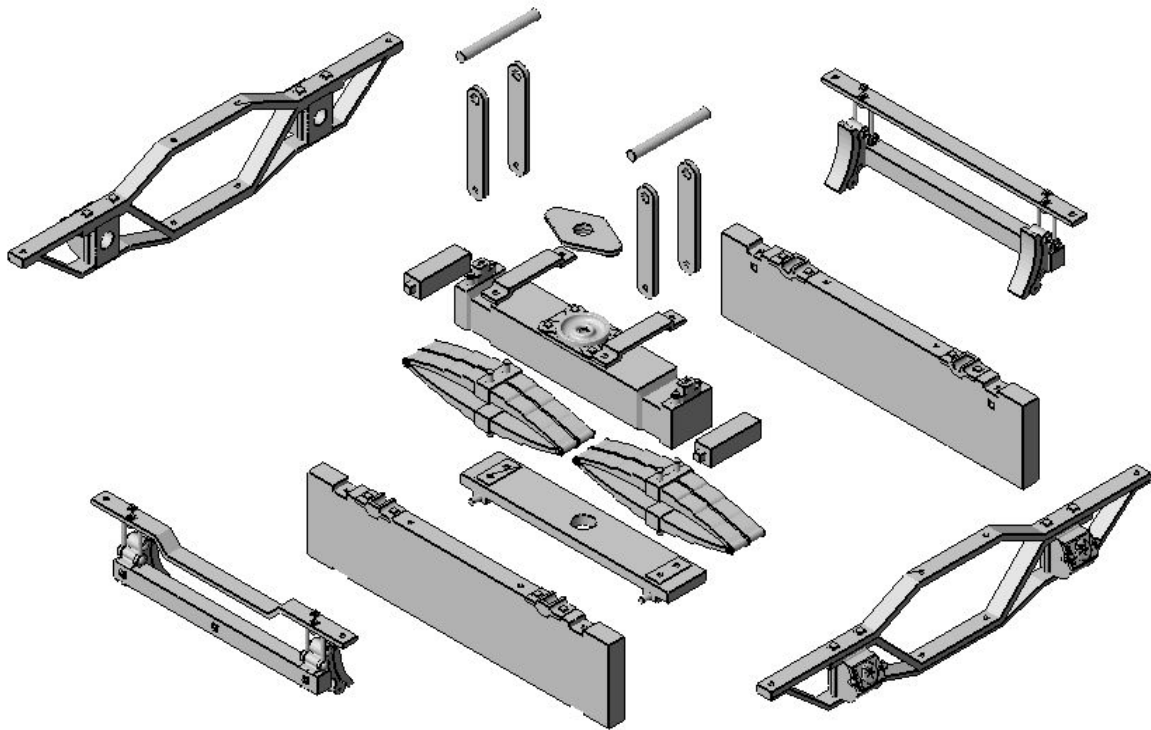
Remove the truck frames and brake beams from the sprues. Insert a brake beam in each side. Glue only one side of each brake beam. This will allow slight spreading of the truck sides to insert or remove the **buyer supplied** wheelsets. Be gentle the plastic is fragile. The trucks attach to the cars with a buyer supplied 00-90 1/8" screw that self taps into the car bolster center holes. The frames are designed for Precision Scale 26" HOn3 wheelsets, part #3240.

Be careful not to confuse the passenger and freight truck brake beams. The freight beams are similar but shorter in height.

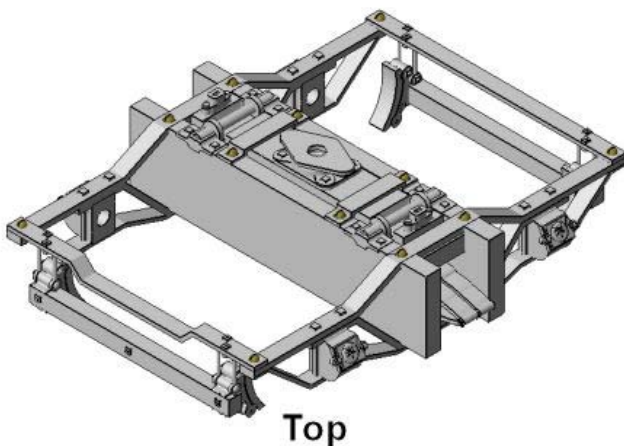


### Fn3 Caboose Truck

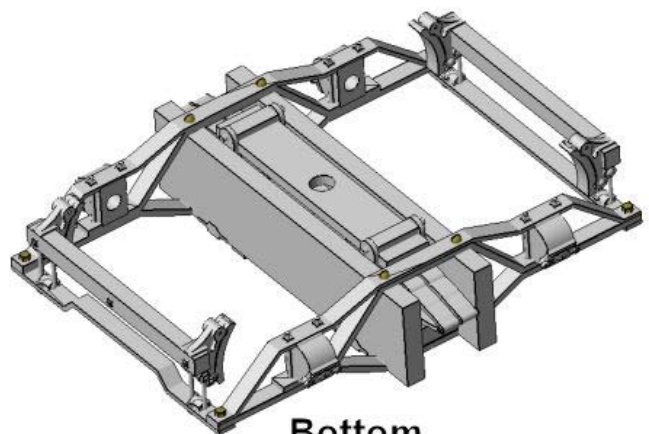
This kit is made with tough nylon plastic. The cleaning instructions above do not apply to this model. A simple wash in warm soapy water is sufficient. This kit includes all the parts shown below except for the screws and nuts. The kit makes only one truck. The Fn3 truck has an operating swing motion movement, both up and down and side to side. No glue is needed just nuts and bolts. The swing motion parts just press fit together to allow movement between them. The **buyer must purchase** the wheelsets, sixteen 00-90 1/8" screws and four 00-90 nuts. The screws self tap into the nylon plastic except for the attachment of the brake beams where the 00-90 nuts are required. The truck was designed for Sierra Valley 26" Fn3 wheelsets.



Exploded View of Parts

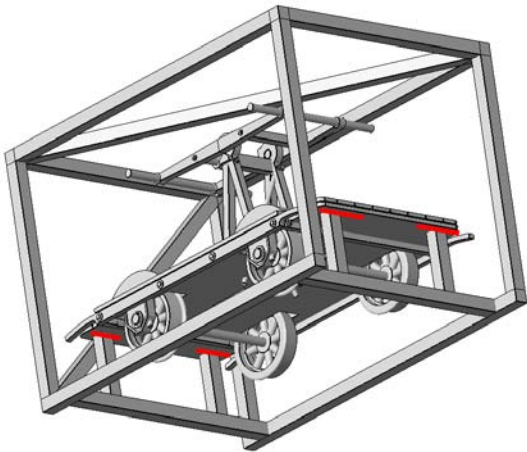


Top



Bottom

## Handcar

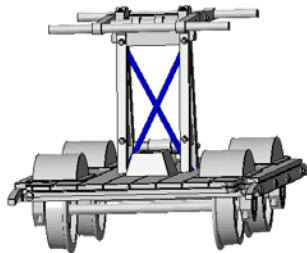
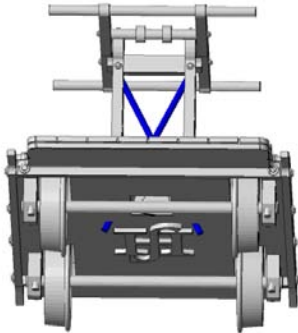


### Remove Cage

The cage is included to protect the handcar from damage during shipment and cleaning. After cleaning the wheels and pump handle should rotate. The cage should be removed. Using small flush cut nippers cut at the four connections shown in red. Be careful of the handles at each corner of the handcar deck. They are very delicate.

### Frame Braces

Add two pieces of 0.015" (0.381mm) or smaller wire (not included) through the holes in the floor and up to the holes in the frame just below the crossbar as shown in blue in the image below. Secure with CA. Cut excess wire flush with the bottom of the handcar floor.



### Connector Rod

Add a piece of 0.015" (0.381mm) or smaller wire (not included) to represent the connector rod between the handle and wheel gearing (not modeled). Bend the wire to fit over the handle crossbar. Drop the wire over the handle crossbar between the two ridges and through the opening in the floor. Squeeze the loop closed around the crossbar. See images below. Lower the handle on the connector rod side and clip the wire almost flush with the handcar floor bottom. It needs to be long enough so that when the handle is pushed down on the side opposite the connector rod the rod does not come out of the hole in the floor.

