



3rd Rail Pennsy Class O-1/O-1a Light Passenger Electric Locomotives

Review and Photos by George Brown

In the late 1920s, the Pennsylvania Railroad was preparing for electrification of its rail lines between New York and Washington as well as Philadelphia and Harrisburg. Designs and experimentation with new electric locomotives were also under way to replace the several classes of steam locomotives used in various types of service on these lines. In this plan, the Class O-1 with a 4-4-4 wheel arrangement (or 2-B-2 in lexicon of traction locomotives) was supposed to replace the E-6 4-4-2 steamer in light, fast passenger service. For heavy passenger service, the 4-6-4 Class P-5 (2-C-2) would substitute for the 4-6-2 Class K-4.

Pennsy's Altoona shops built four pairs of O-1 electric locomotives in 1930 and 1931 as experimental engines. Each engine weighed approximately 150 tons, and nearly half of that weight rode on the four 72" drivers. Each pair of O-1s comprised one of four subclasses, each with slightly different weight, drive gearing, and tractive effort: O-1, O-1a, O-1b, and O-1c. All of these boxcab engines rode on

roller bearings and used components from different manufacturers that were designed to Pennsy's standard specifications. For example, motors were from General Electric, Westinghouse, and Brown-Boveri and they could be interchanged between classes of engines. Each drive axle had two motors with quills and spring cups transferring power from the motor to the axle and wheels.

The heaviest class was the O-1a at nearly 155 tons and 14,900 lbs of tractive effort per unit. However, this tractive effort was less than half the pull of the E-6 that the O-1 was designed to replace. As a

result, O-1s of the same subclass, such as the O-1a, cab numbers 7852 and 7853, were paired together for normal operations. Even paired, the O-1s were slippery in starting, but once they were moving, they were swift with a top speed of 90 mph. As experimental locomotives, the O-1s proved their mechanical and electrical designs were successful with a number of the designs later employed in the famed GG-1. However, Pennsy's operating department quickly learned that engines specialized to a particular type of service was a mistake—a passenger engine must be able to handle any train assigned to it, light or heavy.

In spite of their lack-luster pull, the O-1s worked reliably over two decades pulling trains between Philadelphia and Harrisburg as well as between New York City and Newark. Shuttling empty passenger cars about Pennsy's Sunnyside Yard in New York closed out the 2-B-2 boxcabs' final years.

Our duo of 3-rail evaluation engines from 3rd Rail modeled the Pennsy O-1a, but they



Driver axles run in sprung journals. Although the equalizers move, they are non-functional.



Casting representing the MU cable receptacles are visible below the walkway. The large tinplate coupler inhibits installation of a pilot.

were pilot production models with both units numbered 7852. In a conversation with Scott Mann of Sunset/3rd Rail, he confirmed that all production units are numbered correctly with 7850 and 7851 for the Class O-1, and for the Class 0-1a they are numbered 7852 and 7853.

Construction and Features

In keeping with other products from 3rd Rail, the pair of O-1s is all brass with a sheet frame and built-up cab bodies and side frames. Etched sheet brass side and end panels for each body show realistic rivet relief with lost wax castings representing vent grilles, lamp housings, windshield wipers, multiple-unit (MU) connectors, train lines, and other small details. For the most part, manufacturing craftsmanship on these hand-built models appeared to be excellent as was the paint finish, lettering, and PRR keystone graphics. Unlike other 3rd Rail products, the O-1s were built in China

instead of in Korea.

Major dimensions of the model are 1:48 scale except for the deviations necessary for 3-rail operation. My only criticism relating to construction is the position of the classification and marker lamps. According to several photos of the O-1s, these lamps should be on the ends of each body and not on the sides.

Inside the glazed cab windows are seats and a control pedestal, but no figures representing the crew. Since the O-1s are bidirectional locomotives, my personal choice supports omitting crew figures rather than dealing with them riding at the wrong end of the engine during reverse operation.

On the roof, both pantographs raise and lower manually and are wired to carry power from an overhead catenary. For the traction modeler who has an operational catenary, a slide switch underneath each cab selects electrical pick-up from either the track or the catenary wire.

Although both 3-rail units appear

COME SEE THE NEW KID ON THE BLOCK / INTERNET
WE ARE COMPETITIVE AND HAVE OR CAN ORDER WHAT YOU NEED
FOR SPECIAL ORDERS FROM N SCALE TO G SCALE
EMAIL SEANCHEV@DOHERTYSTRAINS.COM
VISIT DOHERTYSTRAINS.COM
AND OUR NEW ON-LINE STORE
 SECURE ORDERING PAYPAL VISA AND MASTER CARD 
TCA 92-34861
AUTHORIZED DEALERS FOR: LIONEL-MTH-ATLAS-MARKLIN-TRIX-LGB 

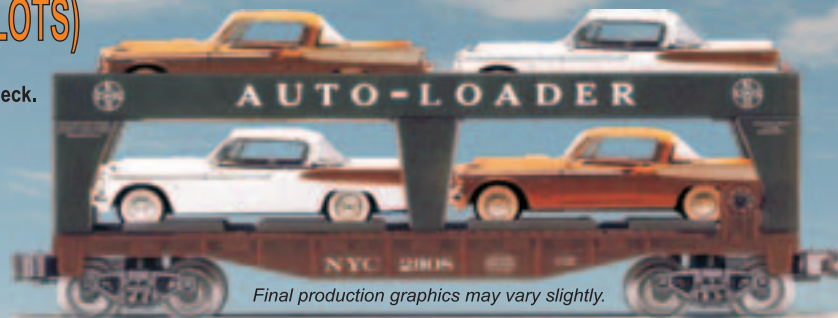
Lionel, NYC and Studebaker Collectors

Lionel Operating Train Society (LOTS)

- ~ 2008 Limited Edition Lionel Collector Car.
- ~ Black metal superstructure on a tuscan flatcar deck.
- ~ Traditional O Gauge (10 3/4").
- ~ Four removable Yat-Ming Die-cast 1:43 Studebaker Golden Hawk autos.
- ~ Die-cast metal trucks & operating couplers.
- ~ \$69.99 plus shipping/handling.

Deadline to Order: 3/15/08

Join LOTS and order our 2008 car by phone or online at:
 513-598-8240 (EST) or www.lots-trains.org



Final production graphics may vary slightly.

identical, the lower numbered one (7852 on the O-1a) is the control unit housing the electronics for the Lionel TrainMaster Command Control (TMCC), RailSounds 4.0, and coil-operated ElectroCouplers. This unit also has the requisite TMCC and RailSounds control switches under the cab. The other unit with the larger cab number (7853) and an attached eight-wire

interconnect cable functions as a motorized booster unit. This cable carries power to the booster unit's motor and lights. Both units operate in unison as an MU consist, but only the control unit can run independently. However, in 2-rail versions of the O-1s, both units can run independently.

A skew-wound Pittman motor in each unit powers the coined brass drivers via

3rd Rail's unique and patented Silent Drive mechanism. This mechanism uses a toothed drive belt between the motor and a parallel drive shaft that turns in ball bearings.

Lighting includes directional headlights, LED classification and marker lamps, and a constant brightness interior light inside the default forward end of each

On 3-rail O-1s, the control unit has coil couplers while thumbtack couplers are on the booster unit.



A manually operated retaining lever releases the operating and functional pantograph to the raised position.



EZ Scenes

17 inch high x 40 inch wide
Backdrop quality our highest resolution

<http://www.ezscenes.com>

sponsored by Backdrop Warehouse *World's Largest Digital Images* <http://backdropwarehouse.com>

4 NEW SETS! O SCALE WORKERS

Scenic Accents

- Action packed figures and accessories
- Superbly sculpted and hand painted
- Competitively priced

Workers with Forklift (A2744)

Chain Gang (A2745)

Factory Workers (A2746)

Rail Workers (A2747)

Available at your local hobby shop.

WOODLAND SCENICS P.O. BOX 98 LINN CREEK, MO 65052 • (573) 346-5555 • www.woodlandscenics.com

Genuine crushed granite BALLAST

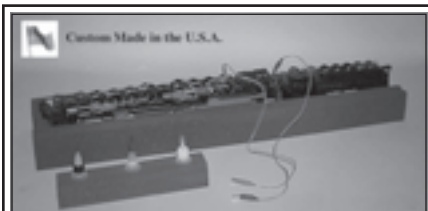
- For ultra realism ■ Natural gray blend
- The only product of its kind ■ 1:48 scale



5 lbs. only \$15⁹⁵

plus \$7.95 S&H
(add \$2.50 for each
additional 5 lbs.)

Mail check or money order to:
Brennan's Model Railroad
P.O. Box 520174 • Independence, MO 64052
www.brennansmodelrr.com • (816) 252-4605



Locomotive Service Cradle... Lube, test run and clean your wheels on the fly. Also great for repairs.

18" \$19.95, 24" \$24.95 & 36" \$39.95

Please visit our Web site or call for more info.

Collectors Choice Trains.com

15105 Metcalf, Overland Park, Kansas
913-681-6830

www.collectorschoicetrains.com

TRAIN ENAMEL

**MATCHED COLORS FOR
OLD ELECTRIC TRAINS**

SEND \$1.00 FOR
A COLOR LIST

CHARLES C. WOOD & CO.

P.O. BOX 179
HARTFORD, OH 44424
330-772-5177
E-MAIL: CHAS327@AOL.COM
WEB SITE: www.trainenamel.com

cttrains.com

Specializing in O-Gauge Trains!

Let us be your source for MTH non-cataloged regional items.

We are an Authorized Dealer for Lionel, MTH, Atlas-O, Gargraves and Ross Custom Switches.

Items shipped UPS usually the same day.
Browse our complete on-line inventory then give us a call.

C.T. McCORMICK HARDWARE

147 South Main Street
Zelienople, PA 16063
724-452-6130 Fax 724-452-6139



The control unit can run independently without the booster unit.

unit. Classification and marker lamps are always illuminated with green LEDs at the default forward end of each unit and red at the back.

At Trackside

Over the past many years of reviewing O gauge products, I found most brass

locomotives usually needed several hours of break-in before they ran smoothly. Not so with our O-1s. Out of the box the pair ran well whether deadheading or pulling each of several different lengths and weights of trains, including our standard test train of aluminum passenger cars identified in the performance sidebar. And like its prototype, our pair of 1:48 scale O-1s with tall drivers was fast and, with its sound shut off, very quiet. The pair negotiated O42 and O54 curves with the same grace and agility it displayed on O72 curves.

Unlike 3rd Rail locomotives that I've previously reviewed, the O-1s do not have the Engineer-On-Board speed control. Their throttle response was not only excellent using either the original TMCC and CAB-1 or the new Legacy system with CAB-2, it was also predictable. Small throttle changes resulted in small adjustments in speed, and large changes—well, they too were quite predictable, and thank goodness for flywheel-equipped motors during a hasty shutdown. As a side note, experience has taught me to set the stall voltage on new TMCC engines that do not have speed control. Setting the stall voltage on the O-1s did slightly improve the pair's start and stop performance, but since performance was already good, I didn't expect much of a change. I had a lot of fun easing the O-1s with an eight-car Pennsy mail train in tow into my passenger depot for a mail stop. Departures from the depot were equally enjoyable as I worked the throttle for smooth and realistic starts.

Although I prefer using the CAB-1 or CAB-2 to run TMCC locomotives, I experienced no unexpected surprises running the 3rd Rail boxcabs using the Digital Command System from M.T.H. Electric Trains.

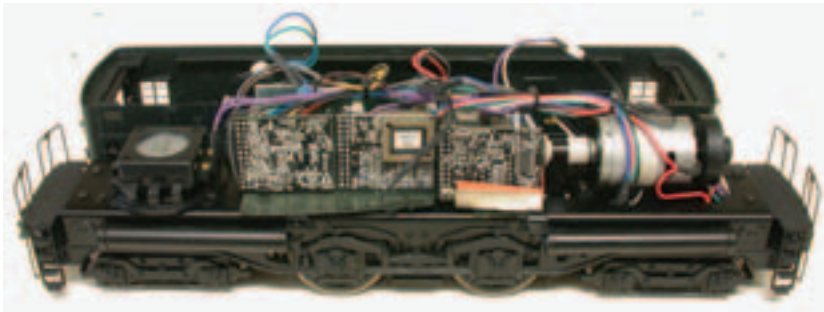
When running the O-1s together, the booster unit with its thumbtack style of couplers is factory-configured as the trailing unit. Since the trailing unit normally couples to the train, uncoupling the engines using the command remote is not possible unless the engines are run in reverse. In fact, to me the 2-B-2 boxcabs actually ran better in reverse order with the control unit coupled to the train, especially on tight O54 and O42 curves. If they were my engines, I would likely make the necessary changes to the lights, motors, and coil couplers to run the booster as the lead unit and the control unit in trail.



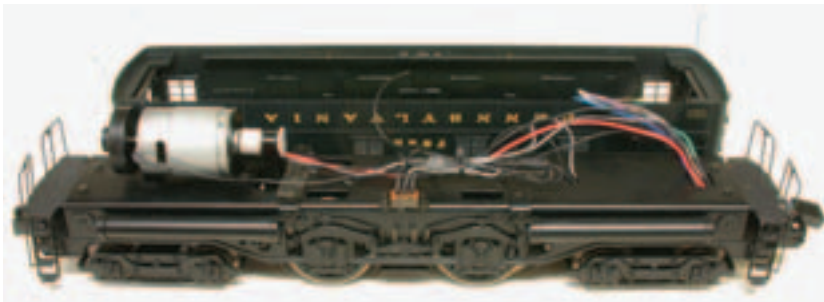
Each 3-rail unit has two pick-up rollers and traction tires on one pair of drivers.

At the End of the Run

If you're a fan of brass locomotives as well as Pennsy electrics, the two-unit O-1 or O-1a could be a good candidate for your roster. I found them to be a handsome set of locomotives for pulling my 60' Pennsy passenger, baggage, or mail cars, especially on tight curves that preempted running my GG-1.



TMCC and RailSounds electronics fill the control unit's cab.



Only the motor, interconnect cable, and pantograph select switch occupy the booster unit.

PRR Class 0-1/O-1a light passenger electric locomotives

Two powered units, TMCC with RailSounds 4.0; 3-rail, O42 curve, 2-rail, 48" radius; length including coupler 27-1/4"

Price: \$999.95

Made in China by 3rd Rail Division of Sunset Models, 37 S. Fourth St., Campbell, CA 95008

408-866-1727; www.3rdrail.com

3rd Rail Class 0-1 Performance

(sound: on)

Weight on Driving Wheels (control unit): 4 lbs, 4 oz

Weight on Driving Wheels (booster unit): 3 lbs, 13 oz

Tractive Effort (conventional control): 2 lb, 5 oz @ 11.8 VAC, 5.1 A, 60.2 W

Minimum Sustained Speed (command control): 8 scale mph @ 18.1 VAC, 3.0 A, 54.3 W

Maximum Tested Speed (command control): 60 scale mph @ 18.0 VAC, 3.3 A, 59.4 W

Test Train

Eight-car streamlined passenger; train weight 13 lbs; pull to move train 12 oz;
0 scale aluminum cars (amps for interior lights subtracted from all performance data)



TIMKO'S REPAIR DEPOT

349 Grange Hall Rd. • Beavercreek, OH 45430
REPLACEMENT FLYWHEEL MOTORS
"Make your old engine run better than new"

Williams, Weaver E8, Scale GG1,
 American Flyer Steam

\$29.95 each
plus shipping

Custom Installation
 UCUB, Sound, MTH DCS
937-429-1461
 FTimko@SBCGlobal.net



SCAG'S
Electric Train Shop



MEGA STATION
TRAINING RESOURCES

O Gauge & Tinplate Traditions

Low Prices and Great Service
 Pre-Order Specialists
"We Do PS2 Upgrades"

• **MTH Authorized Service Center** •


114 Victory Blvd. (718) 727-7373
 Staten Island, NY 10301 FAX: (718) 727-5183
www.e-zcatch.com

Genuine Limestone
HIGHBALL BALLAST
a solid track record

- For all scales: Z, N, HO, S, O, 1, G
- Send SASE for catalog

HIGHBALL PRODUCTS CO.
 P.O. Box 43276 • Cincinnati OH 45243-0276

"I now have 20/20 sharpness" - says Pedro Pinhole



FRICKO PINHOLE LENS

- In focus from 3 inches to infinity.
- For miniature photos, gives dolls' perspective, photos can be taken looking up at models, perfect focus of foreground and background, no vertical line distortion, makes models look real.
- Available for 35mm SLR cameras: CANON, EOS, KONICA, MINOLTA, NIKON, OLYMPUS, MAXXUM, PENTAX K, PENTAX S, YASHICA, CONTAX

Send SASE for information. A.J. Fricko Co.,
 P.O. Box 43276, Cincinnati OH 45243-0276

TWO TRAINS

Run **TWO** trains on **ONE**
 track with **ONE** ATX controller.

Check our website for ATX
 details, layout ideas, and a
 controller for your layout's
 every need. Questions to:
Info@Three-Rail.com



Three-Rail Innovations, Inc.
 6096 South Lima Street (303) 741-6135
 Englewood, CO 80111
www.Three-Rail.com