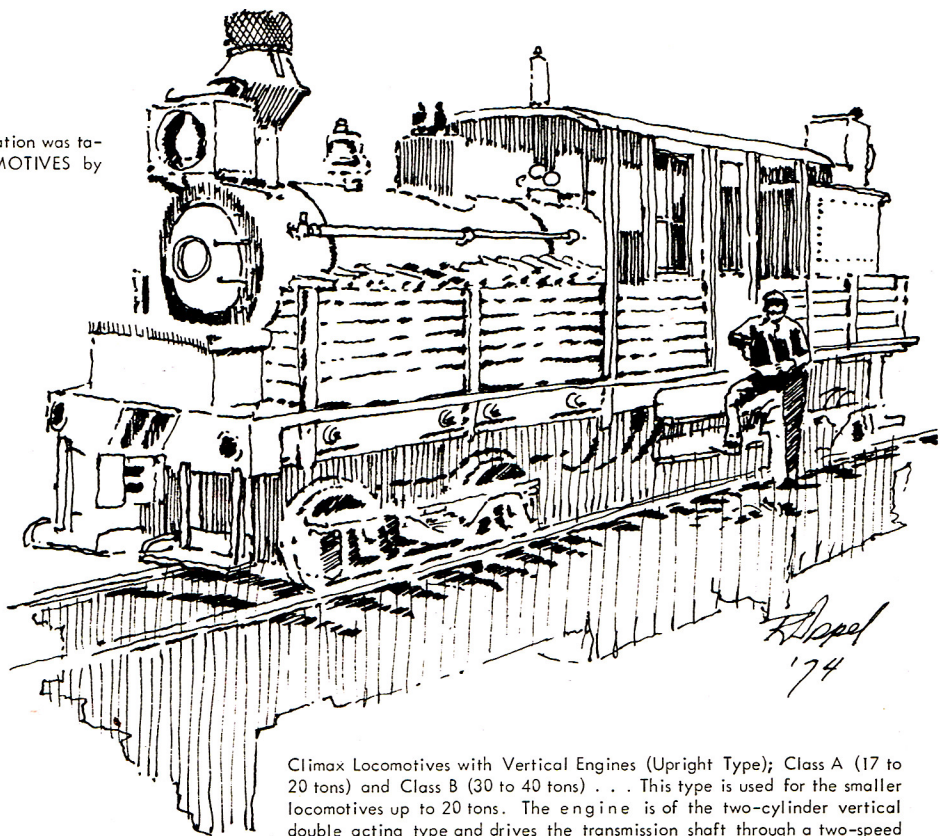


THE CLIMAX LOCOMOTIVES

The following brief history and general information was taken from the book *ARTICULATED LOCOMOTIVES* by Lionel Wiener (a Kalmbach publication).



HISTORY

The Climax locomotive was built by the Climax Manufacturing Co., Corry, Pennsylvania (U.S.A.). Its outstanding difference from the Shay locomotive is that the transmission shaft is located on the center axles, transmitting power through to the center of the axle; whereas, the Shay locomotive is powered on the right side of the power truck.

Transmission — A transverse crankshaft is driven by the engine through the intermediary of connecting rods with universal joints. This shaft has a master gear which transmits the power through the longitudinal shaft. This latter further transmits it to each axle gear through the truck pinions.

Gearing — A bevel gear is keyed to each axle, which meshes with a corresponding pinion on the transmission shaft. The gears are located alternately to the right and left of the transmission shaft. Special attention has been given to the springing of the trucks so as to overcome difficulties which may be caused by irregularities in the permanent way. There are springs under the ends of the bolster as well as the usual springing of the axles.

The transmission system is not designed for high speeds. The gear ratio for freight service allows a maximum speed of 12 miles per hour. A ratio of 2:1 is used for locomotives intended for passenger service, which permits a maximum of 20 miles per hour.

Frame — The main frame carries the boiler and the cab, with the fuel bunker and water tank at the rear. It is secured at its ends to the two trucks.

Firebox — This can descend freely between the trucks, but very deep fireboxes are not needed in this type of locomotive.

Valve Gear — Walschaert valve gear is used on locomotives weighing 45 tons or more.

TYPES OF CLIMAX LOCOMOTIVES

There are two types of Climax locomotives, one with vertical and the other with an inclined horizontal boiler.

Climax Locomotives with Vertical Engines (Upright Type); Class A (17 to 20 tons) and Class B (30 to 40 tons) . . . This type is used for the smaller locomotives up to 20 tons. The engine is of the two-cylinder vertical double acting type and drives the transmission shaft through a two-speed gear. The engine is located behind the boiler which is of the wagon-top type. The transmission shaft is provided with universal joints. These locomotives can be used on wooden rails if required.

Inclined Cylinders (Horizontal Type); Class B (30 to 60 tons) and Class C (70 to 100 tons) . . . This type is used for all the larger locomotives, which reach 30 to 60 tons for those with two four-wheeled trucks, and 90 tons for those with three such trucks. It more closely resembles an ordinary locomotive than the previous type.

Boiler — The boiler is of the wagon-top type. The water level is sufficiently high to insure that the fire tubes are not uncovered on any gradient. The steam dome is located at the center of the boiler so that a supply of dry steam is given whether the locomotive is running in forward or reverse gear.

Steam Piping — The live steam pipes leading from the dome to the cylinders have universal joints and pass through the smoke-box saddle. The exhaust pipes have similar joints.

Utilization of Climax Locomotives . . .

Like the Shay locomotives, the Climax locomotives are much used for logging railways, as also for other services where the gradients are severe, the curves sharp, and the permanent way inferior.

Climax Locomotives With Two Motor Trucks . . .

This is the most familiar type, and is built to a series of standard designs ranging from 20 to 60 (short) tons.

Climax Locomotives With Three Motor Trucks (Class C Climax) . . .

This type is built to a series of standard designs of 70, 80, 90, and 100 (short) tons (67 tons 14 cwt. to 89 tons 6 cwt.). The Jerome Railway (Arizona), a mineral line, uses the most powerful climax locomotives yet built, which weigh 90 (short) tons (80 tons 7 cwt.).



**KIT BASHING THE ROUNDHOUSE DIESEL LOCOMOTIVE KIT
#2800 SERIES**

Roundhouse recognizes the art of "Kit Bashing" as a means to add unusual and different types of motive power to the model railroader's roster.

One of the most unusual endeavors tried was the Climax locomotive of the late 1800's. This locomotive was chosen because the original steam engine, like our diesel, used "power trucks", unlike other steam engines which were powered by driving wheels connected with side rods.

Kit Bashing is not necessarily a new idea in model railroading, but for you it might be a "first". Therefore, we will try to explain in simple terms the steps in which to accomplish this project.

Each major step is illustrated with a picture and descriptive writing which describes each drawing.

Before starting any project such as this, you will need some special tools and additional parts. That's what "scratch" builders use and when you do "Kit Bashing", you're a sort of scratch builder too; a person changing a model from one thing to another. In this case, our diesel to a steam locomotive.

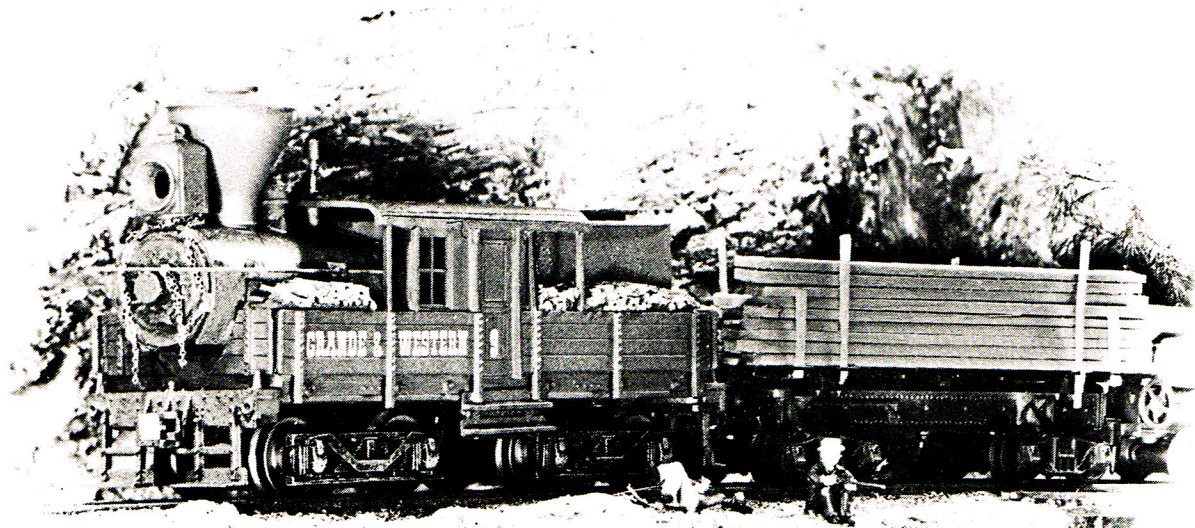
The Roundhouse Diesel can be made into any number of specialized locomotives. This project is an "idea starter" to get modelers, like yourself, interested in "Kit Bashing".

For more interesting ideas, send today for a copy of the Roundhouse Products NEW 64-page catalog, showing all of the new steam locomotives, modern and old timer rolling stock, and accessories. Please enclose \$1.00. Mail requests to Model Die Casting, Inc., 3811-15 W. Rosecrans, Box 926, Hawthorne, California 90250.

Roundhouse can supply only the diesel locomotive kit and the photos and drawings; the modeler supplies everything else, especially his imagination. Your model can be completely different, and should be, because you can put any kind of boiler or smoke stack and add details on your locomotive that you already have at hand.

Listed below are the tools and supplies you should have to start this project:

- 1) For modifying the diesel body . . . Jewelers saw (uses a wire-like saw blade). Exacto makes an excellent one; obtainable at your hobby shop.
- 2) Glue for styrene plastic: Tester's tube glue and liquid glue
- 3) Sheet styrene plastic (.020) thick
- 4) Spray enamel flat paint (color your choice)



IDEA STARTER

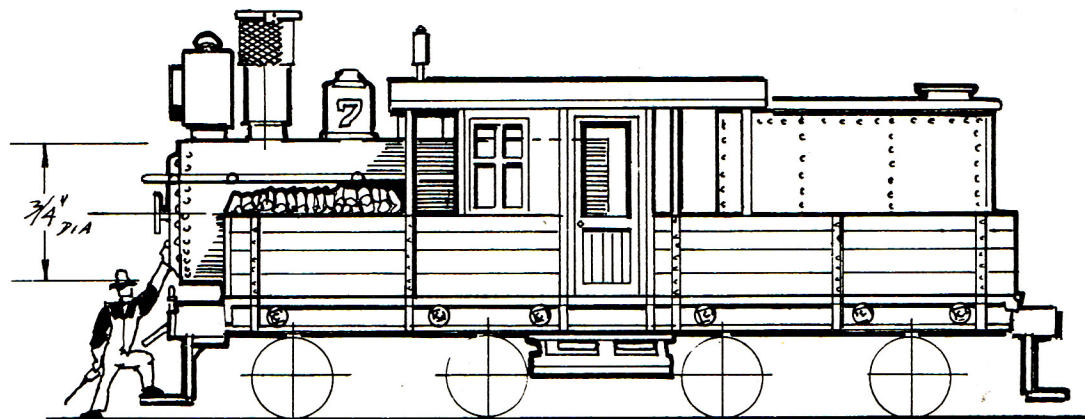
Class B 30 ton CLIMAX Locomotive

Kit Bashing Project
Flywheel Diesel
Kit #2801

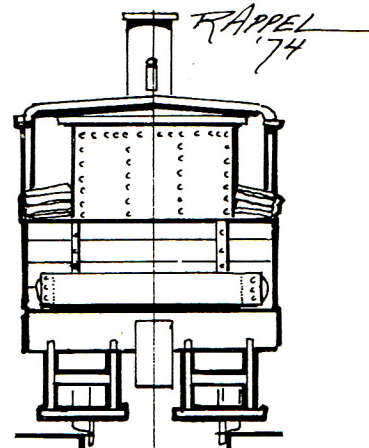
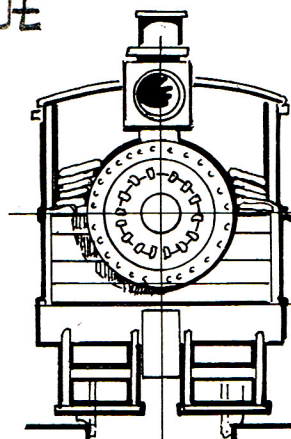
Working scale drawing
H-O Scale



Class B Climax Locomotive
construction drawings
and text ©



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PRINCIPAL DIMENSIONS OF CLIMAX LOCOMOTIVES

Type		CLASS A	CLASS B	CLASS C		
No. of Trucks		17-20 TONS VERTICAL BOILER	30-60 TONS 2-TRUCK VERTICAL BOILER	70-100 TONS 2- & 3-TRUCK HORIZONTAL BOILER		
Cylinders, diameter	ins.	7-3/4	9-1/8	12-1/4	12-7/8	12-7/8
Cylinders, stroke	ins.	11	12-1/4	14-1/4	14-1/4	16-1/4
Boiler Pressure	lbs/sq in.	160	160	160	172	172
Wheels, diameter		2' 5-1/4"	2' 4"	2' 7-1/4"	2' 7-1/4"	2' 7-1/4"
Wheelbase, truck		2' 3-1/4"	3' 8-1/4"	4' 0-1/8"	4' 0-1/8"	4' 3-1/4"
Wheelbase, total		19' 0"	20' 4"	26' 0"	26' 7"	26' 11"
Overall Length		29' 8"	26' 11"	32' 4"	33' 6"	34' 6"
Overall Height		10' 10"	11' 3"	12' 3"	12' 0"	13' 6"
Water Capacity	cu ft.	67	81	159	187	201
Coal capacity	tons cwt.	1-0	1-0	1-10	1-19	2-9
Wood Capacity	cu ft.	32	64	95	110	127
Weight, Empty	tons cwt.	17-16	16-17	28-16	34-12	39-12
Weight, In Service	tons cwt.	17-16	17-16	31-12	40-11	44-10

* The data as to loads drawn are those furnished by the builders.

INSTRUCTIONS

Drawing 1 . . . Illustrates the diesel body and the dotted lines represent portions of diesel body that will be removed using jeweler's saw.

- (A) Cut along front and sides at window level
- (B) Cut down to window level

After making cuts (A) and (B), sand all rivets and old paint off body until it is smooth.

- (C) Area cut for boiler.

Drawing 2 . . . Illustrates the climax body as it should look after cutting and sanding.

- (A) Roof - Fill all holes with plastic filler and sand smooth. Next, using a steel ruler and your knife, scribe lengthwise lines to simulate boards on the roof.
- (B) Snap body back over power chassis and make parts 1 through 4 using .020 styrene sheet plastic. Note: Parts 1 and 4 must be cut to go around power pick-up mounting nuts. Parts glue inside the cut edges; mount flush with sides.

Drawing 3 . . . Illustrates the boiler and water tank.

- (A) Boiler - This is the hardest item in this project. You can use any (styrene plastic tube) that will fit over the flywheel. Roundhouse makes a boiler and boiler front that will do the job: 5L-200 (boiler & front) @ \$5.00 . . . 2L-211 (Hand Rail Posts) @ \$1.20/doz . . . 2L-218 (Hand Rail Wire) @ \$.35/foot.

If you are going to "scratch build" your boiler from styrene and add cal-scale smoke stack and domes, the metal parts can easily be epoxied onto the styrene.

- (B) Water Tank - Used to cover motor. Using your dividers, lay out two sides (1) & (2), one end (3), and top (4). Make from styrene sheet plastic. You can put rivets into plastic by using divider points; just dimple dots into the plastic. Glue these parts into place as shown in drawing. Next, attach and glue the top to the sides and back to enclose the tank. For a final touch, add a filler cap.

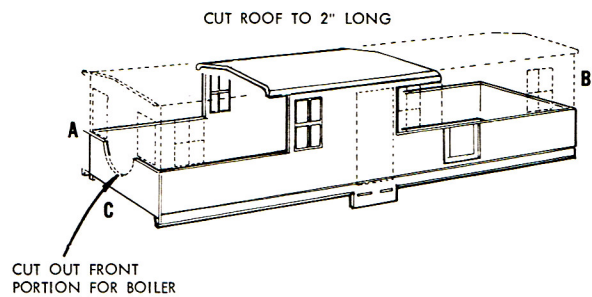
Drawing 4 . . . Illustrates the simulated wood sides. Made from our flat car kit, using the gondola sides. Kit #1450 @ \$2.50; you will need two kits.

As an alternate method, you can scratch build the sides using sheet styrene and scribe in the boards.

As a final note on detailing your finished Climax . . . The prototype engine was used in the woods for logging, and you can also add chains and accessories. Also, fill the wood bunkers with cut "toothpicks", to simulate firewood. (See photo.)

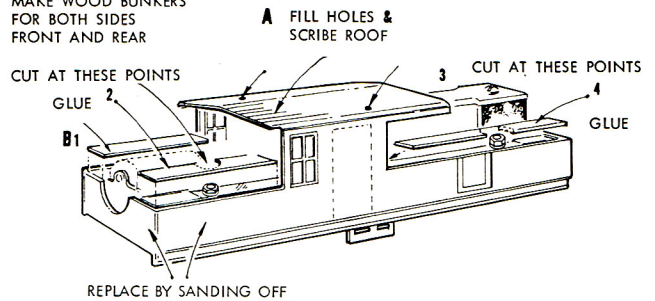
- HAND RAIL
- HAND RAIL POSTS
- SMOKE ARRESTOR
- MESH WIRE AND SCRAP
- BRASS (SOLDERED)
- BRASS WHISTLE
- ADD
- BRASS
- POP VALVES

1 SAW OUT FRONT AND REAR AREAS



2

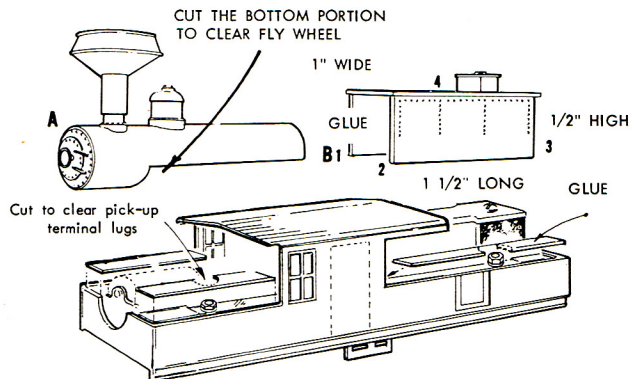
MAKE WOOD BUNKERS FOR BOTH SIDES FRONT AND REAR



3

BOILER DIAMETER DIA. 3/4"

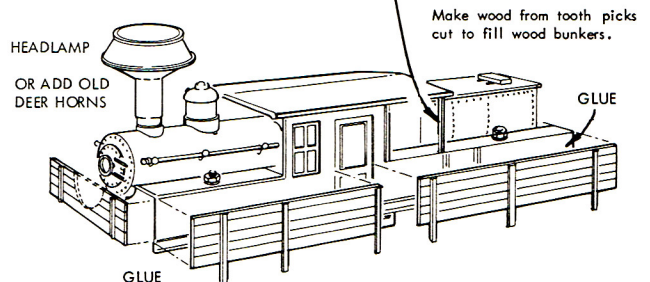
CONSTRUCT WATER TANK FROM .020 STYRENE



4

EPOXY STACK AND DOMES TO FINISHED BOILER

Make up-right posts from wood or styrene scrap.



SCRIBED WOOD SIDES (see text) or use .020 styrene

Make steps from styrene