Low Emissions Locomotive Spotter's Guide

Compiled by Jody Moore

Spotting features of different low-emissions switchers, featuring Railpower's Green Goat and Green Kid hybrid switchers and RP20-series diesel and hybrid Road Switchers, NRE's two and three engine Genset switchers, and models by MotivePower.

Version 5.2
Updated Friday, June 8, 2007

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1.0 INTRODUCTION

In its original form, this document was created to differentiate the various models of Green Goat hybrid locomotives, and other Railpower models, from their contemporaries in the switching locomotive market. Due to the expansion of the scope of some of my other projects, this was also expanded to provide coverage to other low-emissions locomotives, specifically the so-called "Genset" multi-engine switching locomotives that are becoming commonplace in the market. As of the publication of this version, two builders are featured.

Railpower Technologies, Inc. of Montreal, QC is a builder of hybrid and low emissions diesel locomotives. Their conversions began in 2001, and have progressed since that time. The majority of Railpower's models are hybrid diesel switchers, but as of mid-2006 the company was moving into the road switcher market with a sequential diesel "genset" locomotive and a hybrid/sequential diesel model. In early 2007, Railpower increased its product line to focus more heavily on the genset concept.

National Railway Equipment Company (NRE) is headquartered in Mt. Vernon, IL. They first entered the Genset market with a two engine, center cab demonstrator in early 2005, and have begun producing both two- and three-engine models. A six-axle version is also planned. Locomotive manufacturing is only a small part of what NRE does. They are also active in the locomotive rebuilding markets, and have an extensive lease fleet in service all over North America. NRE has been building units in plants in Dixmoor, IL, Mt. Vernon, and Paducah, KY.

While Railpower is most commonly known as the builder of the "Green Goat" hybrids, the details of their production is a little less well known. Similarly, NRE is commonly associated with the "Genset" units. This spotter's guide is intended to help clarify the different models and the differences and similarities between them. Any errors or inconsistencies are not intended. This is not an official document, and is intended for recreational purposes only.

1.1 THE LOCOMOTIVES

Railpower's locomotives are actually conversions of existing locomotives. In most cases, the most obvious work done to the unit is from the frame line up, while they still retain their basic personality from the frame down. For the purposes of FRA designation, the Railpower units are classified as rebuilds, not as new units. They therefore retain their original FRA blue cards.

Railpower's catalog includes their well-known "Green Goat" hybrid switching locomotives, and their smaller "Green Kid" hybrid cousins. Railpower originally cataloged two different Green Goat models; the 2,000 horsepower equivalent GG20B, and the 1,000 horsepower GG10B. The Green Kids come only in the 1,000 hp GK10B model.

As of early 2007, Railpower model lineups no longer show the 1,000hp GK10B and GG10B models.

Railpower is focusing its present marketing efforts on a line of "Genset" road switchers. The first two models were 2,000 units. The RP20BD diesel road switcher uses three diesel engines in sequence for power, while the RP20BH hybrid road switcher uses two diesel engines and a battery bank for propulsion.

In 2007, the company added several models to its lineup, including the 1,400 hp, 2-engine RP14BD, and six axle RP20CD and RP27CD units, at 2,000 hp and 2,700 hp respectively.

National Railway Equipment's first genset locomotive was a two-engine model built on a retired SP MP15. The center-cab unit hasn't been duplicated. Production models include the two-engine, 1,400 hp 2GS14B, and the three-engine, 2,100 hp 3GS21B genset locomotives.

Unlike Railpower, NRE has chosen to build most of their locomotives on completely new frames. To date, all of the 3GS21B locomotives have been built on new frames, and several of the 2GS14Bs have been as well. A number of 2GS14Bs have been built on recycled frames.

In addition to the 2GS14B and 3GS21B, NRE is planning a six axle, three engine locomotive. The initial six to be produced are to be tested by Union Pacific on the hump in Roseville, CA. To date, none of the units have been built. Given NRE's model scheme, the units are expected to be classed as 3GS21C.

In addition to Railpower and NRE, several other locomotive manufacturers are expected to enter the genset market. Wabtec subsidiary **MotivePower** of Boise, ID is working on a three engine genset prototype. That unit is expected to be released in the later half of 2007.

In late 2006, **Brookville Equipment Co.** of Brookville, PA announced its CoGeneration genset locomotive design, capable of running off of batteries and catenary as well. Very few other details have emerged at this time. The first locomotives in the line are expected to be 11 for Metro-North commuter service, and four for the Staten Island Railroad. Those are expected in late 2007 and early 2008.

Though there hasn't been much interest in the hybrid market, **General Electric** of Erie, PA recently completed a mild hybrid road locomotive based on its ES44AC. There have been rumors of a hybrid switcher to come in the future, but nothing substantive as of yet.

1.2 RESOURCES

This document is a companion to two websites. The first, **Railpower Hybrid Locomotive Rosters**, and it's print companion, are found at http://www.trainweb.org/greengoats. The other, **Genset Locomotives Rosters**, is at http://www.trainweb.org/gensets. The **Low Emissions Locomotive Spotter's Guide** is stored in archived form at the **Railpower Green Goats Discussion Group**, found at http://finance.groups.yahoo.com/group/greengoats/.

Railpower Technologies' corporate website can be found at http://www.railpower.com. National Railway Eqiupment's corporate website is http://www.nationalralway.com. MotivePower's website is http://www.wabco-rail.com, and Brookville Equipment's site is http://www.brookvilleequipment.com.

2.0 RAILPOWER GGS2000D "GREEN GOAT" PROTOTYPE

The GGS2000D is a one-of-a-kind model, built in 2001 by Railpower in New Westminster, BC. This is the prototype unit is numbered RPRX 2001, and named "Emerald". It has many features that are different from later production models.

The most noticeable difference in the RPRX 2001 is the very low long hood, which stands at roughly half the height of later productions models. The newer units have larger diesel generator sets and more batteries.

The 2001 also has a slightly different cab shape than production models, most notably the flat face where the front and rear windows are located. (On production models, the cab face has a slight but pronounced peak to it.) The 2001's rear cab windows are also much larger than the production models. Also the nose and end of the long hood are of a slightly different shape when compared to production models.

The car body sides don't have any louvers like other versions do. Instead, the batteries are vented from the top. Also, the locomotive uses an impeller-type air compressor located in an access hatch in the frame above the fuel tank.

The GGS2000D was originally built with a 90hp diesel generator, but was later fitted with a larger 130hp genset to meet switching demands. The unit provides an equivalent of 2,000 horsepower.

Figure 1, RPRX 2001 (GGS2000D).

3.0 RAILPOWER GG20B "GREEN GOAT" SWITCHER

The production 2,000 hp equivalent Green Goat switching locomotives are given the model GG20B by Railpower. They use a 300hp Cat diesel generator, coupled to a battery bank. Production has taken place in Calgary, AB; Boise, ID; Longview, TX; Lachine, QB; and Schenectady, NY.

The GG20B is built on a recycled locomotive frame, most commonly an EMD GP7 or GP9. Because of variations in frame configuration on the donor units, dissimilarities in frame layout is not a distinguishing factor between models. Also, the majority of the locomotives converted for Union Pacific were built on GE frames, and are covered in section 3.4, GG20B Variations.

The GG20B layout is similar to the other Railpower hybrid products. The short hood is used for storage, followed by the cab with the big windows. The batteries are stored in the long hood behind the cab, followed by the electrical cabinet, air compressor and diesel generator set at the end of the long hood.

The GG20B cab differs from the prototype in having a distinct angling of the windows toward a center peak in the front, and having a single, narrow window in the rear rather than the larger windows of the same size as the front windows.

The GG20B (and all other production Railpower units) also has a taller long hood, and a slightly flatter front and rear shape to the nose and hood. The best evidence to show this feature is in the orientation of the headlights, which are vertical on the prototype and horizontal on the production units.

3.1 ROSTER INFORMATION

As of early 2007, I can confirm that a total of 55 GG20B's have been built or are on order, broken up as follows:

Bechtel	1
BNSF	4
Canadian Pacific	6 (6 returned to Railpower, 1 resold to Amtrak, 2 to RPRX, 1 to BNSF, 1 to USAX, 1 to Arco/BP)
Kansas City Southern	2
Lubrizoil	1
Modoc Rail Academy	1
Railpower	5
Railserve	10
Union Pacific	21
US Army	4

3.2 PHASE II GG20B

Note: I am going along with popular convention here when I reference the first production GG20B's as Phase II locomotives. I believe the so-called Phase I model would be the GGS2000D prototype.

The Phase II GG20B encompasses all models built between 2004 and early 2006. It is most easily distinguished from later versions by the rows of vertical louvers along the sides of the long hood. Louver count is also a spotting feature between the GG20B and GG10B models, but we'll cross that bridge in the next section.

The diesel generator unit is housed at the end of the long hood, where the horizontal louvers are located. There is a small exhaust stack on the top of the hood, along with nine small round vents centered on the top of the hood above the batteries.

Figure 2, KCS 1869 (GG20B ph II).

3.3 PHASE III GG20B

Following an effort by Railpower to standardize and compartmentalize the GG20B design, the so-called Phase III GG20B was introduced at the beginning of 2006. The biggest difference between the ph. II and ph. III units are the lack of vertical louvers on the long hood, and the inclusion of much larger air vents on the top of the hood over the batteries.

I am not sure if it is a specific spotting feature or just an option on specific units, but all of the Phase III units built so far have only one window in the cab doors. Most (but not all) of the Phase II units have a second, smaller window below the larger one in both doors.

Figure 3, LZRC 2006 (GG20B ph III).

3.4 PHASE IV GG20B

In late 2006, Railpower made a minor change to the GG20B model at the behest of Canadian Pacific, equipping it with a larger diesel generator, rumored to be 500kW as opposed to 250kW in the other production models. The result was what I have called the Phase IV GG20B.

The most noticeable difference between the ph. III and ph. IV models is an enlarged section at the end of the long hood that houses the larger generator. There are also two exhaust stacks over the generator in the models built so far.

As of late 2006, Railpower had constructed two of these units, CP 1704 and CP 1705, both at Alstom Calgary. Because of the termination of the CP contract, neither unit was delivered. The 1705 has been repainted green and given the number RPRX 1705, while the 1704 has been returned to Railpower (along with ph. III CP1701-1703) for resale. A third unit, to be 1706, was under construction at the time of the termination of the contract in early December, but was disassembled and shipped out of Calgary, presumably for finishing in either Lachine, QB or Glenville, NY.

Figure 4, CP 1704 (GG20B ph IV).

3.5 FUELCELL-HYBRID GG20B

In 2007, Railpower stripped former CP 1704 and sent the shell to BNSF's Topeka, KS shops for completion of conversion to hydrogen fuelcell hybrid. This is a one-off conversion test bed being developed by the Fuelcell Propulsion Institute and BNSF, among others. The unit, BNSF 1205, is expected to be completed in late 2007.

In its present state, it looks like GG20B ph. IV without a fuel tank. Once conversion is complete, it is expected to have hydrogen storage tanks for the 250kW fuelcell on top of the long hood. The fuel cell will be located where the genset is normally found.

Figure 5, BNSF 1205 (Fuelcell GG20B, incomplete).

3.6 GG20B VARIATIONS

Several variations on the GG20B theme have been built, most notably the first four units built for BNSF in late 2005. (See figure 6 below.) All four units are phase II GG20B's.

Figure 5, BNSF 1211 (GG20B ph II without cab).

The BNSF units were built as remote control platforms, and don't have cabs per se. The electrical panels on the units are still in their original locations inside the "cab", and a small portion of the cab is retained for that purposes. There is even a cab door on the front face of the enclosure.

Because a portion of the original cab was retained, each of the units has a distinctive look. BNSF 1210 and 1211 were built from rebuilt GP7's that have Santa Fe's distinctive sloped "Topeka" cab, while the 1212 and 1213 were built from rebuilt GP10's that retained their original cab shapes. All four BNSF units also retain their original GP9-style noses.

Figure 7, UPY 2311 and 2310 (GG20B ph III on GE frame).

Another variation is the locomotives built for Union Pacific (UPY 2300-2319) Those locomotives were converted using retired General Electric B30-7 and B30-7A locomotives, which are slightly longer than EMD's GP9.

They also have the very distinctive GE two axle trucks rather than some variation of the Blomberg truck that the other units ride on.

The UPY units are split up between two orders. UPY2300-2309 are phase II units built in 2005, while the 2310-2319 are phase III units being delivered in 2006. (As of Nov, 2006, all ten units were confirmed to have been delivered.)

4.0 GG10B "GREEN GOAT" SWITCHER

The GG10B is a 1,000 horsepower version of the Green Goat switching locomotive, and shares numerous features with its GG20B cousins. While I am not aware of the specifics, I believe the unit has about half the batteries of a GG20B, and probably a smaller diesel generator as well. I am working to get more details in that regard.

It is also my theory that the GG10B shares many of the same innards as the GK10B, covered in section 5 below. The major difference is that the GG10B still uses a recycled EMD GP or similar frame, as with the GG20B, while the GK10B is built on an EMD SW-type frame. But I'm getting ahead of myself again.

4.1 ROSTER INFORMATION

To date, only six GG10B locomotives have been recorded, all built for Railserve in their shops in Bodie, TX. If other GG10B units have been built, I am not presently aware.

4.2 PRODUCTION GG10B

The GG10Bs built so far have the same cab and hood configurations as a Phase II GG20B. The biggest spotting difference between the two is found in the vertical louvers on the sides of the long hood. The GG10B has seven sets, while the GG20B has 14. Also, the GG10B has five vents on the top of the long hood, directly above the batteries, while the GG20B has nine.

Figure 8, RSSX 106 (GG10B).

5.0 GK10B "GREEN KID" SWITCHER

The GK10B is a smaller cousin of the GG20B and GG10B switchers. As they are called Green Goats, then the smaller ones logically would be Green Kids, right?

The GK10B is a 1,000 horsepower equivalent hybrid locomotive, pairing a small diesel generator with a battery bank in a configuration that appears to be similar to the GG10B listed above. The biggest difference between the GK10B and the GG10B is the platform – where the Green Goats are built on an EMD GP9 frame, the Green Kids are built using an EMD SW or similar style switcher as a base.

5.1 ROSTER INFORMATION

There is a fair amount of evidence to suggest that more Green Kids have been built than I have recorded, however, I have confirmed for sure that four GK10B's have been built, as follows:

Railpower	3
Railserve	1

Two of the three Railpower units have been sold to switching contractors, while a third (prototype RPRX 2003) was donated to the Canadian Railway Museum in St. Constant, Quebec.

5.2 GK10B PROTOTYPES

The first three GK10B's were built from ex-Canadian Pacific SW1200's, and retained a very EMD SW-like appearance, including the rounded switcher cab on the end of the unit, and the same overall height of the long hood.

Figure 9, IDC 001 (early GK10B).

About the only thing to distinguish the early Green Kids from their EMD SW counterparts is the lack of louvers in the long hood, and the lack of large exhaust stacks on the top of the hood. The

early Green Kids also lack the SW's taper at the cab-end of the hood, and the radiator fan housing at the other end.

5.3 PRODUCTION GK10B

Railpower's Green Kid model came of age in late 2005 with the delivery of Railserve 356, the first "production" GK10B built. The unit, built on a former BN (ex-Frisco) SW9, basically looks like a shortened GG10B. (See Figure 10 below.)

Figure 10, RSSX 356 (Production GK10B).

Railserve 356 features a similar (if not the same) cab as the GG-series locomotives, and a shorter but similar long hood. Like the GG10B, the GK10B has seven rows of vertical louvers by the batteries, and the four rows of horizontal louvers by the diesel engine. The nose is also similar, but shorter. Like the GG conversions, the Green Kid retains a lot of its SW personality from the frame line down.

5.4 PHASES

RSSX 356 is so far (to the best of my knowledge) a one-off unit, but I anticipate that more will be built in the future. When it was built, GG20B production was still using the phase II design, and the 356 reflects many of the same spotting features.

So far, I haven't assigned phases to the units, nor have I seen phases assigned to the design. But I would anticipate that if future models were built, they would follow the phase III practices that the rest of the production units have. If so, I would propose assigning phases as follows: Phase I to the GK10B prototypes and any other similar "switcher body" units built, Phase II to the 356 and other similar units if they were built, and Phase III to 2006 and newer units if they reflect changes similar to the GG20B's.

6.0 RP20BD DIESEL ROAD SWITCHER

The prototype RP20BD was unveiled in Schenectady, NY in early May of 2006. A total of 98 other RP20BD's are on order for Union Pacific. After undergoing testing in Erie, PA, the prototype was sent to CAD Rail in Lachine, QB.

The RP20BD is the only locomotive built by Railpower that is not hybrid. Rather than using a diesel generator and a bank of batteries to achieve its propulsion, the RP20BD uses three Deutz TCG2015 667-hp diesel gensets in sequence, starting and shutting down each one as needed.

The carbody design of the RP20BD shares several features with the other Railpower models, including very similar cabs and short hoods, and similar styling in the long hood.

The RP20BD units are designed to be built atop a larger EMD road switcher type frame, including the GP30, GP35, GP38, GP40, GP50, etc. Conceivably, they could be built atop a GE B30 or similar frame as well. The prototype was built on an ex-Canadian National GP40-2.

Figure 11, RPRX 5400 (RP20BD Prototype).

6.1 PRODUCTION RP20BD

Union Pacific received the first production RP20BD locomotives in late Sept. 2006. The units vary from the prototype in several aspects. First of all, the UP units lack the large radiator section at the end of the long hood. In lieu, it appears that the radiators are incorporated into each motor assembly. They also have a much sharper angle to the nose and short hood sections in front of the cab. The UP units were also built on former GE locomotives. As of this writing, heritage information was still being sought.

Figure 12, UP 2613 (Production RP20BD).

6.2 RP20BD VARIATIONS

Norfolk Southern has two RP20BD's build from kits by Thoroughbred Mechanical Services in Altoona, PA. The locomotives are similar to other production RP20BDs, but feature the single larger radiator section at the back of the long hood, similar to the prototype RPRX 5400. These units are also the only production RP20BDs built so far on EMD frames, another feature they share with the 5400.

Figure 13, NS 100 (RP20BD).

6.3 ROSTER INFORMATION

Union Pacific placed the first order for RP20BD locomotives late last year, ordering 80 models before the prototype was even constructed. And additional 18 units were added. Those units were originally ordered as RP20BH models. So far three railroads have ordered the RP20BD, which Railpower expects to become its most popular model, according to a report to shareholders made earlier in 2006. The breakdown of confirmed orders as of right now is:

BNSF	5 (5 not built)
Norfolk Southern	2
Railpower	6
Union Pacific	98 (Approx. 20 not yet built)

7.0 RP20BH HYBRID ROAD SWITCHER

The RP20BH is Railpower's hybrid version of its 2,000 horsepower road switcher. It uses a pair of 667hp Deutz diesel enignes, each paired with a generator, and a smaller bank of batteries for propulsion. The prototype for the RP20BH was built at Super Steel in mid-2006, and is presently at CAD Rail in Lachine, QB.

Externally, the RP20BH is very similar to the RP20BD. The most obvious difference between the two is the RP20BH's pair of vents over the battery compartment at the front of the long hood. Because the BH has two diesel engines and the BD has three, the configuration of stacks on top of the hood is different as well.

Like the RP20BD, the RP20BH is to be built using retired second-generation EMD GP-series road switchers as platforms. Union Pacific has placed the first orders for RP20BH's. 18 of them were announced late last year, though it has recently come to light that they are to be built as RP20BD units Y2682-Y2699.

Figure 14, RPRX 5401 (RP20BH prototype).

7.1 ROSTER INFORMATION

When UP placed its order for RP20BD units, they also ordered 18 RP20BH's. Those RP20BH orders have since been converted to RP20BD orders. So far, no other orders for the model have been confirmed, and the RP20BH prototype continues to be the lone example.

Railpower	1

8.0 OTHER RAILPOWER MODELS

In addition to the locomotives covered above, Railpower has announced or cataloged several additional ones. In this section we will provide details of what is in the catalog, but has not yet been built.

8.1 RP14BD YARD SWITCHER

Railpower's answer to the two engine 2GS14B (detailed in section 9.0) is the twin engine RP14BD. The locomotive will be built on a smaller GP or SW platform, and will feature a pair of Deutz 667-hp diesel engines. Norfolk Southern placed the first orders for the RP14BD. Like their RP20BDs, these units will be assembled from kits at TMS in Altoona, PA.

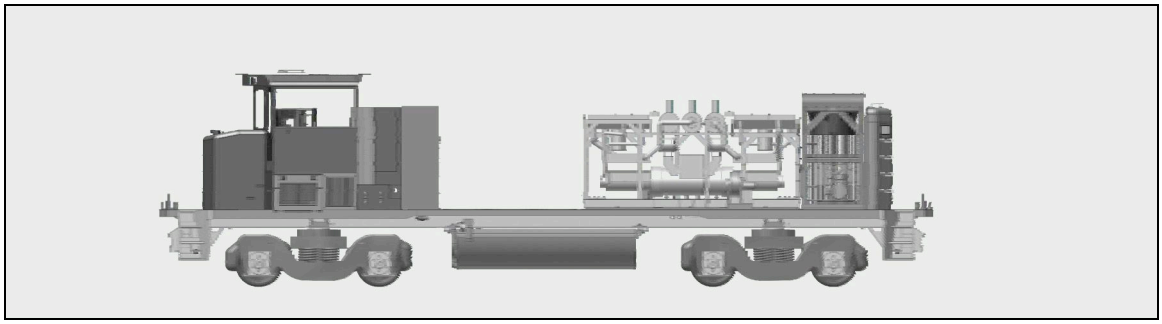

Figure 15, RP14BD Illustration.

8.2 RP20CD AND RP27CD ROAD SWITCHERS

Railpower plans to enter the six-axle market with two genset models. The first is the RP20CD, which will feature three Deutz 667-hp diesel engines, while the other is the more hefty RP27CD, which will feature four Deutz engines for a total horsepower of 2,700. Both units will be built on recycled SD40 or similar platforms.

As of this writing, no formal announcement of production has been made, but it is believed that Norfolk Southern will be getting the first models, based on retired SD50's.

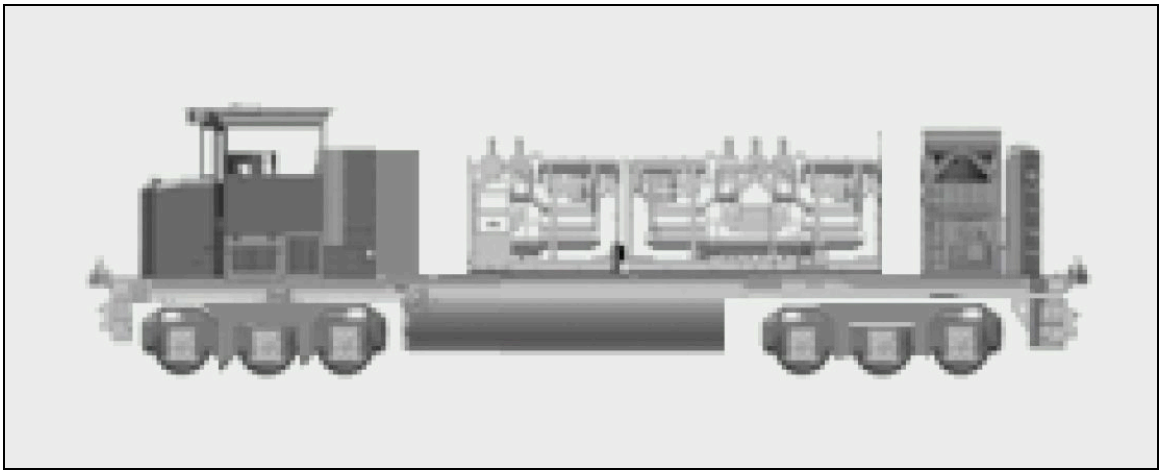

Figure 16, RP20CD Illustration.

9.0 NRE 2GS14B GENSET SWITCHER

Though Railpower's RP20BD has gained a firm foothold in the sequential diesel engine "genset" switcher market, they're not the only player. While Railpower was still dabbling with the hybrid locomotives, National Railway Equipment introduced its two engine 2GS14B. There are several variations of the model, but all of them use a pair of Cummins QSK-19 700-hp diesel engines, for a combined total of 1,400 hp. While most of the 2GS14Bs have been built on recycled frames, a few have been built on new frames as well.

9.1 PROTOTYPE UPY 2005

In early 2005, National Rail Equipment (NRE) delivered a twin-engine switcher, called in various places a Truck Engine Switcher or Genset Switcher. The latter name seems to have stuck, and been applied to other similar locomotives as well.

Figure 17, UPY 2005 (NRE 2GS14B).

The prototype, UPY 2005, was built on the frame of former Southern Pacific SW1500 no. 2690. It features a center cab, and Canadian-style shrouds over the headlights and number boards on both ends. Power is provided by a pair of 700-hp Cummins QSK19 diesel engines, giving the unit a 1,400 hp rating. So far, only one of the 2GS14B's has been built in this configuration.

9.2 2GS14B ON EMD FRAMES

In late 2007, NRE released a second 2GS14B, this one built on a retired GP locomotive, and having an appearance much more similar to the production 3GS21B (discussed in section 10 below) than the prototype. Two others have been built for the Fort Worth and Western Railroad.

The cab design is very similar (if not identical) to the cab fitted on the UPY 2005, but is placed closer to the F-end of the locomotive in a more traditional road switcher configuration. The long hood has the Canadian-style shroud over the headlight and number boards.

The most reliable spotting difference between the 2GS14B and 3GS21B is the number of stacks on the long hood — the 2GS14B has two, while the 3GS21B has three. The 2GS14B also has only two pairs of air intakes alongside the gensets, where the 3GS21B has three.

Figure 18, NREX 2007 (NRE 2GS14B on EMD frame).

9.3 2GS14B ON NEW FRAMES

Though many of the 2GS14Bs have been built on recycled frames, at least two (as of mid-2007) have been produced on completely new frames, with new fuel tanks and remanufactured trucks. On this variation, the new frame has a very distinctive appearance, most notably the completely straight bottom edge of the outer member, lacking fuel fills (which are on the tank itself). The new frames also have the battery box between the trucks, just forward of the fuel tank.

Figure 19, DGNO 141 (NRE 2GS14B on new frame).

10.0 NRE 3GS21B GENSET SWITCHER

The cornerstone of NRE's N-ViroMotive locomotive line is the three-engine, 2,100 horsepower 3GS21B. In contrast to the 2GS14B model mentioned above, has gained a lot more popularity. NRE is building 60 of the models for Union Pacific, and is also building units for BNSF and Norfolk Southern.

Unlike the Railpower units and the 2GS14B's built so far, The 3GS21B is built on a completely new frame, in a little more conventional configuration and design, with the three generator units under the long hood, and the cab on the end of the unit, with a small short hood as well.

Like the RP20BD, NRE's 3GS21B uses three diesel engines for propulsion. Operation is very similar to the RP20. The first 60 units built are for the Union Pacific for use in Los Angeles, CA, where the twin-engine prototype 2GS14B can also be found. The very first unit, UPY 2701, was delivered in late December 2006.

Figure 20, BNSF 1221 (NRE 3GS21B).

Unlike Railpower, which uses stripped locomotive frames for its conversions, the 3GS21B is built on an all-new frame, though the first units built appear to be using recycled Blomberg trucks. The locomotive has a radically different cab configuration than the Railpower units, with much smaller windows, and a much taller short hood.

The 3GS21B has a different louver pattern on the side of the long hood, and can also be distinguished from the Railpower RP20BD by the taller exhaust stacks on the each engine. The NRE unit also has the Canadian-style shrouds over the headlight and number boards on the end of the long hood.

There is a certain logic to NRE's designation system. The first number (2 or 3) designates the number of gensets used in the locomotive, then GS for genset, and two numbers designating the horsepower of the locomotive in hundreds (2,100 or 1,400), and finally B for 2 axles trucks, presumably to be replaced by C for six axle trucks when the six axle model is released.

Figure 21, NREX 2008 (NRE 3GS21B Demonstrator).

10.1 ROSTER INFORMATION

As of mid-2007, NRE had firm orders for or had delivered a total of 77 3GS21B locomotives, including one demonstrator. The orders are broken down as follows:

BNSF	14
Norfolk Southern	2
NRE	1
Union Pacific	60

11.0 OTHER NRE GENSET MODELS

11.1 NRE 3GS21C HUMP UNIT

National Railway Equipment and Union Pacific are working together to develop a six-axle genset locomotive as an alternative to the SD38-2 locomotives used in hump service. Sacramento and Placer County Air Quality Management Districts also filed for a Moyer grant to help fund the development. No timetable for production has been announced, but the conversion program may involve as many as six units.

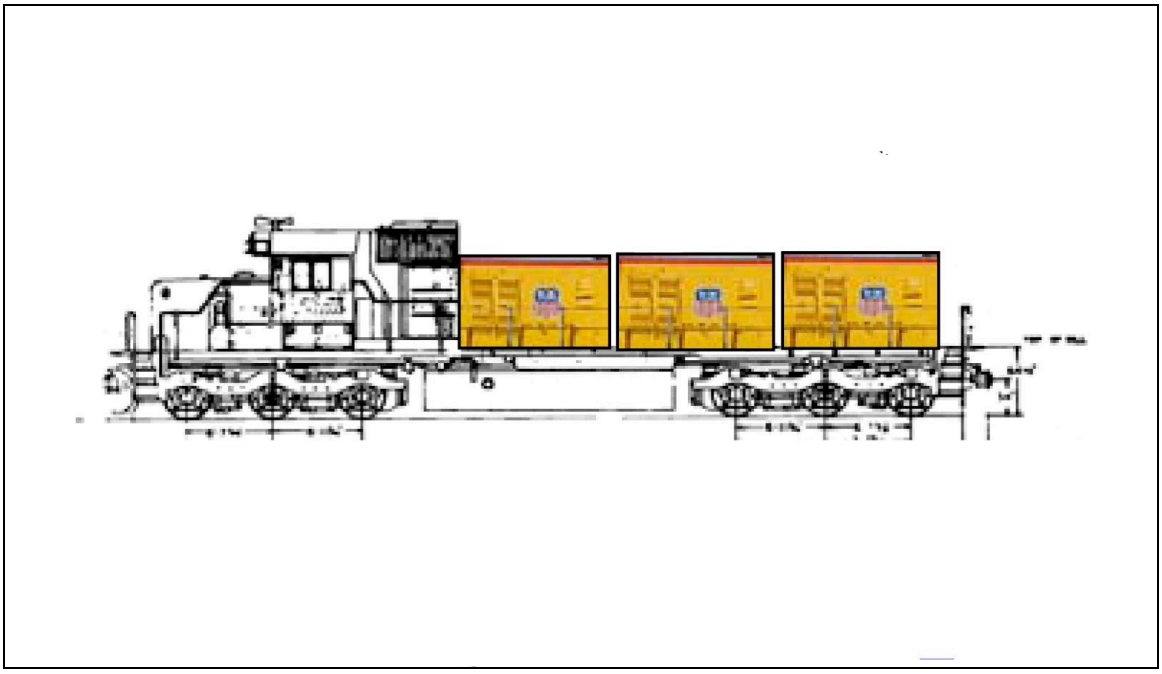

Figure 22, NRE 3GS21C Illustration.

12.0 OTHER GENSET SWITCHER BUILDERS

The idea of a multiple engine, sequential diesel switching engine has really gained acceptance inside the industry. As such, there are more and more manufacturers entertaining the concept. Ironically, the two major locomotive makers, EMD and General Electric, have both shunned the idea. As such, the technology has fallen into the realm of the smaller manufacturers. Here are the two stated contenders right now.

12.1 MOTIVEPOWER/WABTEC

Though most commonly associated with LNG and larger single engine locomotives (see Section 13 below for more details) Wabtec subsidiary MotivePower Industries of Boise, ID is in the process of preparing a three-engine genset switcher for the market. The MPI/Wabtec version will be similar in appearance to the Railpower RP20BD (which should help muddy the waters up a little more in the spotting department...) but will use a trio of 700 hp Caterpillar engines, for a combined total of 2,100 horsepower. The prototype is expected to be completed by mid to late 2007, with production scheduled for early 2008.

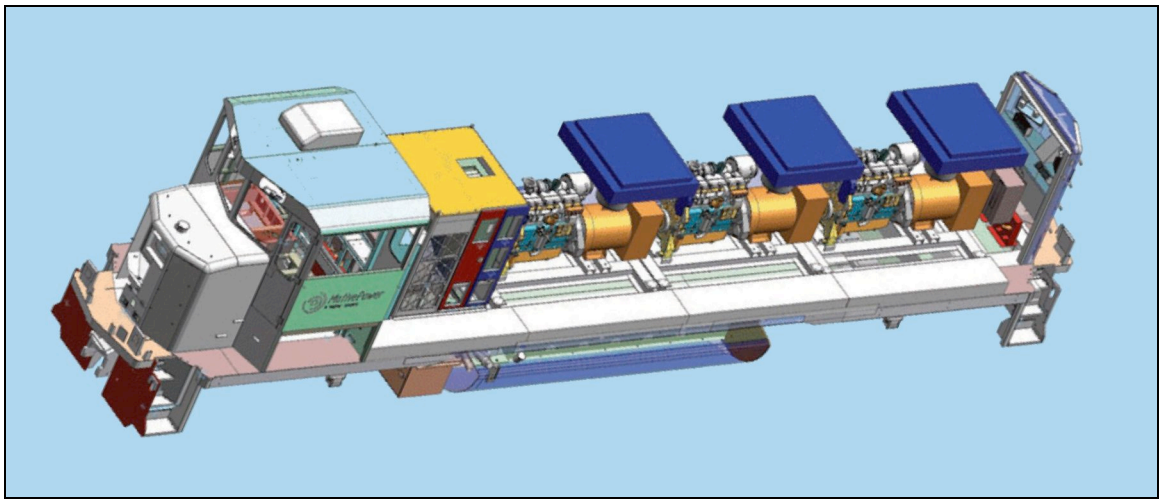

Figure 23, MotivePower genset switcher illustration.

12.2 BROOKVILLE EQUIPMENT COMPANY

Details of Brookville's CoGeneration line of multi-engine switchers has been slow to come. When first announced in late 2006, the line was to have the capability to run on batteries or catenary-supplied electricity. Other than a statement in Progressive Railroading that the unit would be a 2,100 horsepower model, design, or specifications has been made public.

So far, Brookville has announced an order for 11 CoGeneration locomotives for Metro-North commuter service, and four for the Staten Island Railroad. The units are expected to begin showing up in late 2007 and early 2008.

13.0 NOT RAILPOWER PRODUCTS

Despite the fact that it's a relatively new design, Railpower's locomotives invite comparison to some other market entries, most notably those of builder Morrison-Knudsen and its successors. It doesn't help that MK's present incarnation, MPI-Wabtec, was one of the assembly plants used by Railpower during it's first year of production. We've spent the majority of this document talking about what Railpower is. Now let's take a look at what it isn't.

13.1 MORRISON-KNUDSEN MK1200G

In the early 1990's, Liquified Natural Gas (LNG) was in vogue as an alternative to the emissions of diesel fuels. Several railroads experimented with LNG conversions, most notably the Burlington Northern railroad.

In the middle of this movement, Idaho-based MK turned out four prototype LNG-powered switchers, two for the Santa Fe and two for the Union Pacific. All four now work for the BNSF in the LA Basin. Though they were never duplicated, the MK1200G set a styling standard that is still recognizable today.

Figure 24, ATSF1201 (LNG-powered MK1200G).

The MK1200G stands out from the Railpower units by having the larger radiator and two fans at the end of the long hood, and the single large stack for the LNG-powered prime mover. The units also have very different patterns of air grilles on the side of the long hood, and some subtle differences in the cab shape.

13.2 MOTIVE POWER INC. MP 1500D & MP2000D

MK created a line of 1,500 horsepower and 2,000 horsepower Caterpillar-powered switching locomotives, classed as the MK1500D and MK2000D respectively. When the company changed its name to Motive Power, the model designations changed to MP1500D and MP2000D. The units bear quite a bit of similarity to the MK1200G, with the large radiator fans at the end of the

long hood. One common theme among all of these offerings is the recycling of retired first generation diesel frames. In many ways, the business model set by the MP1500 and MP2000 is similar to Railpower's conversion model of today.

Figure 25, NOPB 2003 (MPI MP2000D).

13.3 EMD/MPI GP15D & GP20D

In cooperation with MPI-Wabtec (MK's latest incarnation), EMD catalogs the 1,500 horsepower GP15D and the 2,000 hp GP20D. Both units are similar to the MP2000D in appearance. Like the MP2000D, the GP15D is easily distinguished from Railpower's units and other gensets by the large exhaust stacks and the two large radiator fans at the end of the long hood. Some variations of the GP20D also have dynamic brakes, which makes them look even less like Railpower units.

Figure 26, CEFX 2003 (EMD/MPI GP20D with dynamics).