In this issue of Scale Rails, the NMRA is pleased to announce the debut of a series of new or revised Data Sheets. The initial Data Sheets, covering early American Locomotive Co. (Alco) diesel-electric switching locomotives, are the work of noted diesel authority and modeler Jerry T. Moyers. Jerry’s highly detailed diesel drawings have appeared in Railroad Model Craftsman, and he has also worked closely with a number of manufacturers and importers to improve the accuracy of their products.

Noted author Louis A. Marre has provided the reader with detailed captions to augment his choice of the quantity photographic documentation included in the Data Sheets. The Data Sheets will include prototype information about a specific manufacturer, specifications for the particular locomotive(s) featured, and an in-depth discussion of models thereof. Readers with expertise concerning other locomotive models or builders are invited to contact the editor. – Ed.

Top left: Boston & Maine Phase 1 1102 is an ex-Alco demonstrator 602, with the cab as front, shown at work in Boston on September 1, 1951. This unit dates from May 1934 as Alco 602. B&M also purchased a stock unit and numbered it 1101. Note that B&M “reversed” the controls and now the long end is marked as F-1 for front end. No. 1 1951.

Bottom left: Lackawanna bought Phase 1 examples of the earliest high hood configuration, oriented with the cab as front. Lackawanna 323 is seen here at the end of a long career. Its bell has been removed from the simple bracket next to the headlight, but otherwise it is intact after 30 years of hard service. The unit was at the Jersey City enginehouse, where these units spent their entire careers, on September 21, 1963, when they had recently been retired by actual owner Erie Lackawanna — whose number this unit carries.

Above: Many high hood purchasers were interested in diesels because of anti-smoke ordinances. Illinois Central met its Chicago obligations with eight HH600s among other purchases. The long end was front by 1935 when these units were delivered. The 9007 shows the left side details, including the rounded-off and cleaned-up front end of the Kuhler design. The photo was made in Chicago, naturally, on September 25, 1949.

Below: Peoria & Pekin Union 100 Phase 2, its first diesel, is a 1936 version of the HH600, not notably different from other Kuhler modifications. This one does have the truck chains firmly in place. The box on the walkway beneath the radiator is an owner modification, probably a toolbox. Long end is front. The photo dates from September 3, 1938, when the unit was just two years old.
The American Locomotive Company of Schenectady, New York, long a mainstay on the American railroad locomotive scene with its excellent line of steam engines (external combustion), began delving into the internal combustion business in the early 1920s. Initially, Alco teamed up with GE-Ingersoll-Rand in the development and sale of boxcab locomotives. From that point until 1929, Alco’s diesel locomotive efforts were varied.

That all changed in 1929 when Alco acquired the McIntosh & Seymour (M&S) Engine Company of Auburn, New York. While M&S cataloged a large variety of diesel engines, none met the requirements for locomotive application. M&S therefore began the development of its line of locomotive diesel engines. M&S had long been the producer of carbureted gasoline engines for the H. J. Brill Company.

Ironically, the development of the locomotive diesels was actually based on that gasoline engine. This was, of course, after the Brill patents had expired. The M&S-proposed designs became Alco Model 330, a 300 hp, six-cylinder, 9½ x 10½-inch (bore and stroke), 700 rpm, 75 psi bmep engine; and Alco Model 531, a 600 hp, six-cylinder, 12½ x 13-inch 700 rpm, 75 psi bmep engine.

“Brake mean effective pressure” (bmep) is a very effective yardstick for comparing the performance of one engine to another, and for evaluating the reasonableness of performance claims or requirements. Bmep is defined as the average (mean) pressure...
that, if imposed on the pistons uniformly from the top to the bottom of each power stroke, would produce the measured (brake) horsepower output. The bane is purely the theoretical and has nothing to do with actual cylinder pressures. It is simply an effective comparison tool.

Both of the M&S designs were four-stroke cycle engines that were the precedent for virtually all Alco engine designs. The Alco marketing concept at the time, was to develop a standard line of switching locomotives as follows:

- 300 hp, 66-ton, B-B end-cab boxcar
- 300 hp, 66-ton, B-B end cab
- 600 hp, 66-ton, B-B end cab.

Let’s follow the progression of Alco switching locomotives from the unit equipped with the Model 531 engine through its derivatives: the turbocharged (turbo-supercharged) Model 531-T, Model 538, the turbocharged Model 538-T.

### ALCO DEMONSTRATORS

Alco’s first demonstrator, which truly launched locomotive production, featured the first Model 330 M&S 300 hp prime mover. Released in January 1931, it was a 66-ton, double-ended boxcar numbered 300. Number 300 was significant in several ways:

1. It first utilized the distinctive “Blunt” truck, named for designer James G. (Jerry) Blunt, an Alco mechanical engineer who ran a parallel for his creation in October 1924. And it was the only Alco boxcab demonstrator. This unit was later sold to the Jay Street Connecting Railroad.

2. The 300 was the first of Alco's high-hood locomotives, a design dating from 1931. The right side high-angle view of NH 0924 shows the simple roof details of the early high-hood design, as well as its owner’s fondness for air-operated steam-type whistles instead of single-bell air horns. The grab-iron ladder up the right side of the nose is an Alco feature, not an owner modification.

3. Alco did not originally refer to its locomotives as HH600s. The shorthand designations were presumably created by railroaders and/or railfans, Jerry A. Pinckpuck, editor of the Diesel Spotters Guide, implies that he coined the designation of “HH” or High Hood for the HH600. Alco subsequently did use this form of reference, but not until much later. Alco produced demonstrators 304–306 in 1932, fitted with the 300 hp engine and drop-equalized trucks. These units were designated as Alco Model 404-0E-114 (57-ton). They were sold to the U.S. Navy in 1935.

4. The end-cab configuration had become the standard for both 300 hp and 600 hp production units. Initially, Alco declared the cab end of its locomotives as the front, with the control stand mounted appropriately. The first end-cab demonstrator, with the control stand mounted appropriately, was Alco Model 330-0E-114 (57-ton). This group of locomotives has long hood. These locomotives, like the Phase 1 and features the characteristics that we now know as the HH600 or “High Hood” series.

Following the completion of the Locomotive Phases

Seven additional units were ordered in 1932 by Lackawanna and completed in 1933. Like the 401, these units featured vertical side sheets on the long hood, a flat end plate culminating in square corners on both sides and a featheredge at the curved top, enclosed air brake equipment, fuel tank, and Blunt trucks, which were now the accepted standard. It’s assumed that these were Model 404-OE-200. This group of locomotives has been designated as Phase 1 and features the characteristics that we now know as the HH600 or “High Hood” series.

- 600 hp, 66-ton, B-B end cab locomotive, demonstrator No. 600, was completed in June 1931 and designated as Alco Model 404-OE-200. The convention at the time was to mount the engine/generator on top of the platform and over the mainframe longitudinal members. Due to the higher profile of the six-cylinder 531 engine, the top of the hood then reached almost to the top of the cab, so it might be considered the first high hood. It was quickly purchased by New Haven and renumbered 0900.

This unit continued the practice of having the area under the cab open for easy access to the air brake equipment, and fuel tank, sloping hood sides, and drop-equalized trucks. For reason known only within Alco (possibly for better weight distribution on the trucks or to move the main generator away from potential radiator leaks), the positions of the engine and generator were reversed so that the generator was at the end of the hood, furthest from the cab, and the cab sides extended down to completely enclose the air brake equipment. Exactly when these changes took place has yet to be determined; however, demonstrator No. 603 had the generator at the front of the hood and the area under the cab enclosed. It was also equipped with Blunt trucks. The 603 was sold to Delaware, Lackawanna & Western as its 401.

### TERMINOLOGY

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[Image 632x401 to 991x660]
Railway of Chicago as that railroad’s No. 300. This locomotive was also the first unit to be completely built with Westinghouse electrical equipment. The hood end was designated as the front on this and subsequent switcher production. This series of locomotives has been designated as Phase 2.

By 1935, it was apparent that to compete with the rebuilding Electro-Motive Corp. (later the Electro-Motive Div. of General Motors, or EMD), it would be imperative that Alco increase the rating of the 531 engine to at least 900 horsepower. It appeared that there were two basically workable solutions: increase the 531 to eight cylinders, or incorporate the Buschi system of turbo-supercharging the six-cylinder engine, a project that Alco had been corporately experimenting with for some time. The supercharger was the less expensive and most readily available solution.

The first 531-T unit (Phase 1) was delivered to Philadelphia, Berkshire & New England in early 1937. Birmingham Southern also received a 531-T unit in 1937. The last 531 switcher (600 hp, Phase 3) was delivered in June 1938. Also in 1938, Auburn completed an upgrade on the 531 prime mover, which increased the horsepower from 600 to 660 on the turbocharged 531. These engines were redesignated Models 538 and 538-T.

The first 538 (660 hp, Phase 1) unit, designated Model DL-199, was released in August 1938. The carbody underwent several significant external changes. Gone were the slotted air inlets at the bottom of the hood, being replaced by rectangular, louvred openings toward the bottom of the hood doors that covered impingement air filters. Access to the platform was now from the top of the hood, which was not seen on the 531. The brake cylinder should lean out—an easy fix for the fastidious modeler. The inside diameter of the exhaust stack is too small, which results in the stack walls appearing too thick, another easy feature to correct with a drill bit.

The Association of American Railroads mandated the adoption of the Commonwealth Steel Co. truck as the universal switcher truck (AAR Type A), supposedly for commonality purposes. The truck, of totally different suspension technology, had a rigid bolster, double-drop suspension system of turbo-supercharging the six-cylinder engine, a project that Alco had been corporately experimenting with for some time. The supercharger was the less expensive and most readily available solution.

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The late 600 hp units shared some common features with both. The late 600 hp units shared some common features with both. The supercharger was the least expensive and most readily available solution.

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Looking Ahead

This concludes our overview of early Alco diesel switcher production. The diesel switcher Data Sheet series will continue with the better-known Alco switchers beginning with the 51 (53) series.

Alco’s “Blunt” Switcher Truck

The Alco “Blunt” truck was the invention of, and named for, Alco mechanical engineer James G. (Jerry) Blunt. A patent for this unique truck was applied for on September 18, 1923, and patent 1,512,576 was granted October 21, 1924.

The truck was first applied to Alco 66-ton, double-ended onbonc demonstrator No. 100 released in January 1931. The demonstrator was later sold to the Jay Street Connecting Railroad as its 300. The next application was on 600 hp end-cab demonstrator 601 built in 1932. The 601 later became Lehigh Valley 105. An additional unit, 600 hp end-cab demonstrator 602, was constructed and sold to Boston & Maine as its 1102. Based on extensive field (yard) experience gained from other units, this unique truck’s amazingly flexible floating bolster and its ability to equalize the locomotive weight on each of the four wheels over unbelievably rough track established it as the standard Alco two-axle, two-motor switcher truck.

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HH600

Prototype manufacturer: American Locomotive Company (Alco)
Manufacturer’s identification: Model 404-OE-132
Popular identifier: HH600

The prototype HH600 was produced in three different carbodies or configurations or phases. There are no known models of the Phase 1. William K. Walther’s produced a sand-cast brass body shell of a quasi Phase 2 HH600 back in the 1940s or 1950s. A mechanism was available to fit with the body shell. Current availability is limited to just prototypes occasionally being offered for sale on eBay.

The brake cylinder should lean out—another easy feature to correct with a drill bit. An interesting detail is the roof vent, which appears to be an automotive-style ventilation hatch of the type found on most American automobiles on the hood centerline immediately in front of the windshield prior to World War II. An additional but seldom seen detail replicated by Atlas is the extension on the right front (engineer’s side) of the cab roof, presumably to reduce sun glare under certain conditions.

A significant Alco switcher feature long overlooked by model manufacturers until recently is the fact that the rear cab corners are radius-ed, not square. The Atlas HH model cab corners have this characteristic radius, and the cab sides extend slightly beyond the platform edges, which is also prototypical. The model correctly reproduces the louvre-covered impingement carbodies filters on the lower portion of the hood doors, which replaced the covered ventilation slots of the Phase 1 and 2 switchers.

The overall quality of the die work and attention to detail has provided the HO modeler with an outstanding replica of the prototype.

The initial release of the HH600 was painted and lettered for Elgin, Joliet & Eastern, and the HH600 is painted for Erie, New Haven, Maine Central, and South Pacific. Each is offered in two road numbers, plus undecorated.

HH660

Prototype manufacturer: American Locomotive Company (Alco)
Manufacturer’s identification: Model 404-DE-199
Popular identifier: HH660
Model manufacturers: HO – Atlas

The Atlas model represents the last carbodies, Phase 3, utilized by the

The sand cast HH600 was produced by W. K. Walther in the 1940s. This shell occasionally can be found on eBay or at swap meets. The model correctly reproduces the louvre-covered impingement carbodies filters on the lower portion of the hood doors, which replaced the covered ventilation slots of the Phase 1 and 2 switchers.
HH600. An identical carbody housed the later 660 hp HH660. See HH600 comments above.

HH900
Prototype Manufacturer: American Locomotive Company (Alco)
Manufacturer's identification: Unknown.
Popular identifier: HH900
Model manufacturer: None known.

HH1000
Prototype Manufacturer: American Locomotive Company (Alco)
Manufacturer's identification: Unknown.
Popular identifier: HH1000
Model manufacturer: None known.

The prototype was produced in only one carbody phase. The basic difference between the HH660 and the HH1000 is in the size, height, and width of the radiator section, and the presence of two louvered doors above the existing hood end doors. This provides Atlas with the possibility of revising HH660 body shell dies to produce the HH1000 and, in the interim, the kit-basher with an interesting project.