

Reading "65" pneumatic-tired oil-electric, providing double-end operation.

THE READING "65" was designed to meet the exacting requirements of a special suburban service. In it are combined conditions of operation hitherto not thought to be reconcilable. It has the adaptability of a trolley car and yet a performance suitable to main line operation. Double-end operation, one-man control, Diesel electric drive, great strength with light weight, all make for an usually low cost of operation. With a capacity of forty-seven seats, the operating expense is covered by a load of six passengers at three cents per mile. All of this has been realized in a vehicle offering traveling comfort never before found in a public conveyance. Reading Railway engineers sensed the requirements—Budd engineers, working with them, created Reading "65." Its favorable acceptance by the traveling public seems assured.

Performance

This car has an acceleration of 2 M.P.H. per second and a high speed of from 50 to 55 M.P.H. The ability of the car to decelerate quickly is much greater than will ever be necessary under normal conditions, but is available in case of emergency. The car will turn safely on a 55-foot

radius curve, making it possible to turn city street corners if used as a street car.

Dimensions

The car is fifty-one feet overall in length. The inside width is nine feet with twenty-six inch aisles, and the headroom inside is seven feet five inches. Large vestibules at both ends make for quick loading and unloading of passengers and leave room for light luggage.

Seating Capacity

Forty-seven passengers. Seats are reversible, sturdy and durable. Steel tubing, high grade leather rubberized hair upholstery and drop forgings have been combined in a comfortable unit weighing about fifty-two pounds.

Heating, Ventilating and Lighting

The car is heated by hot water from the engine, regulated by thermostats. Two fans with a capacity of 1,200 cubic feet per minute supply forced ventilation uniformly distributed through floor ducts. The air is exhausted by



Interior, showing reversible seats, indirect lighting.

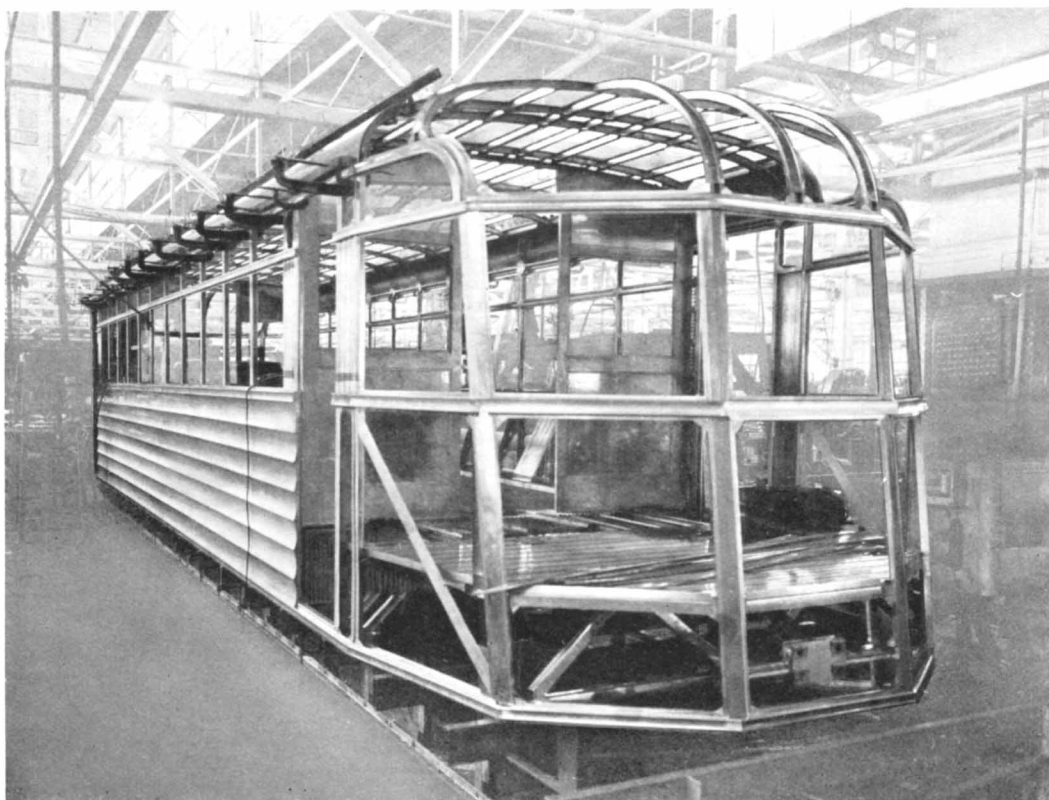
means of a ceiling conduit, which also accommodates the lighting fixtures. An unusual effect is created by reflection of the lights against the sides of the head-lining. Ample reading illumination is provided without the objectionable glare from the source and with a saving of electricity of about seventy-five per cent over standard equipment.

Body Structure

The Reading '65' has been designed with the most careful scientific analysis of stresses incidental as well as accidental. Great economy of weight has resulted through the use of stainless steel Budd "Shotweld"ed into sections skillfully adapted to resist the loads imposed. Economy of operation is largely accomplished by light weight without sacrifice of strength or ability to withstand fatigue. The stainless steel used in this car is "cold-worked" to a tensile strength of 150,000 lbs. to the square inch—three times that of aluminum alloys or low carbon steels. Stainless steel rusts not nor does it corrode. No protective coatings nor maintenance are necessary to its useful life. The main structural members in the body weigh about nine hundred pounds. An instance of the



Driver's Seat—Perfect vision; few instruments to watch; four levers to operate; airbrake on right; throttle in center; electric controller on left, with the door operating lever below and the dead-man's control pedal and bell button on the floor.



The body of stainless steel Budd "Shotweld"ed into one unit—no possibility of loosened parts or creaks and squeaks.

weight economy incident to this material and method is the floor beam, which, though capable of carrying the entire passenger load uniformly distributed, weighs but twelve pounds. The body weighs about nine thousand pounds, including some thirty-seven hundred pounds of stainless steel which are welded into a homogeneous unit.

The Power Truck

In no department has more radical design been initiated than in the trucks. The engine, generator and storage batteries are mounted in the power truck, the framing of which is of stainless steel. The engine is installed so low in the truck that but a slight elevation of the floor above permits complete clearance of the engine and makes available every square foot of the body itself. For inspection purposes the floor above the engine is constructed in sections, quickly removable. This unconventional mounting of the engine in the truck itself possesses inherent advantages in elimination of noise, vibration and odor, besides affording a low center

of gravity. The power plant is rendered accessible by the fact that the front end of the car may be lifted and the entire power unit rolled out for maintenance purposes, all wiring and piping being easily disconnected from the body. Repairs, if need be, and motor tests can be effected without removing the engine from the truck. The axles are mounted on Timken bearings and support the truck through a single large diameter spring operating in a conventional slide.

The Driving Truck

The motor is mounted in the rear truck beneath the center plate, its shaft extending in each direction to differentials in the front and rear axles. Sand boxes are located on this truck with valves to sand the rails ahead of the driving wheels in either direction.

Motive Power

The engine used is a Cummins 6-cylinder 4-cycle Diesel of 125 horse-power at 1,800

R.P.M. It is started by the power generator energized from storage batteries. No. 2 fuel oil is used and accounts for another element of economy in operation, and the fire hazard is eliminated.

Brakes

Bendix-Westinghouse brakes are used on four wheels of each truck. Emergency application is effected by hand operation through Tru-Stop brakes operating four wheels of the driving truck only. Brake drums are in conformity with the best automotive practice with brake shoes—American Brake Block.

Tires and Wheels

Wheels are of Budd design to accommodate the Michelin-Goodyear rail car tire exclusively furnished to this company. Interest, of course, centers about these tires as they contribute so largely to the comfort and quietness of the car. The common questions are, "What happens if there is a puncture?" and "How long do the tires last?" The answer to the first is "Nothing," for in case of puncture a ring inside of the

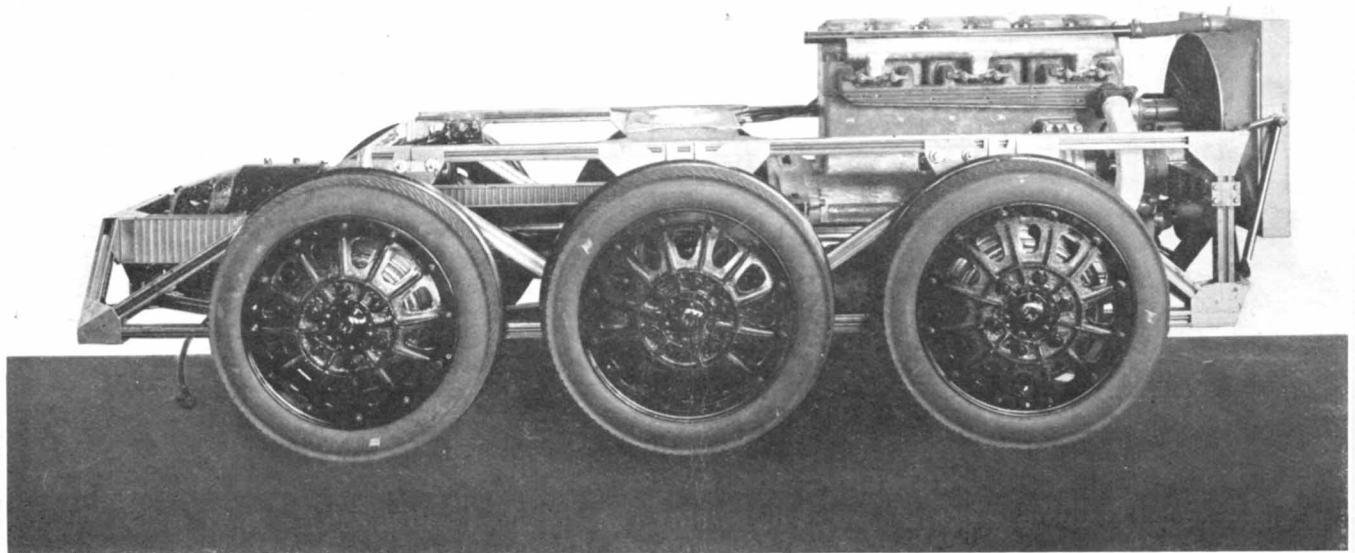
tire shoe supports the tire and keeps the wheel flange above rail obstructions. The tire life under normal operation is about 20,000 miles.

Safety Devices

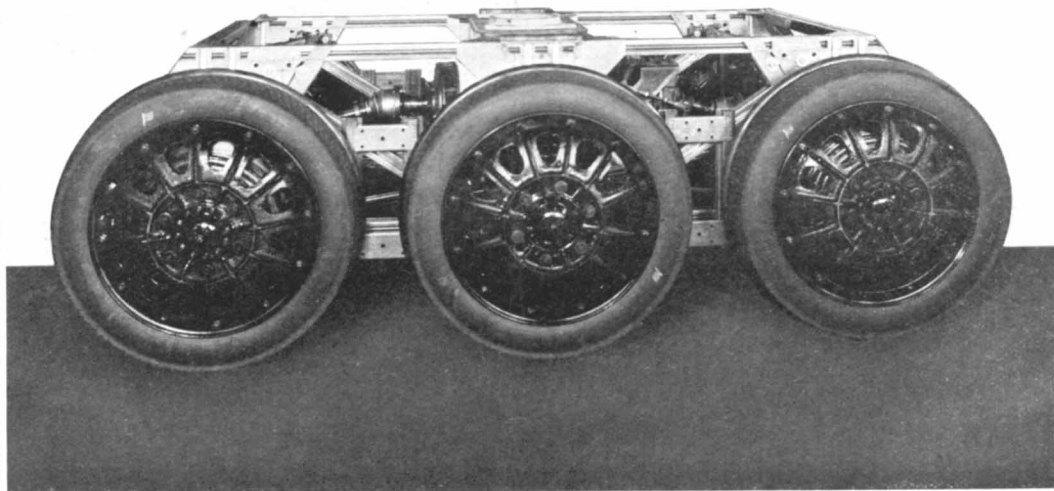
The Reading "65" is provided with standard head and signal lights. Since the pneumatic tires insulate the car from the tracks, all types of railroad signals are operated through a unique system composed of four pairs of rocking brushes energized by an auxiliary current. This equipment was developed by Budd engineers with the cooperation of the Union Switch & Signal Company. The doors, traps and steps operate by a single air lever.

Cost of Operation

The operating cost of this car is about 12c. per mile, including interest on the investment, depreciation, all maintenance costs and replacements, fuel oil and lubrication without crew. In the operation of a similar car over a period of a month in regular service, 2,181 passengers were carried; the car traveled 2,150 miles at a total lubricating and fuel cost of \$24.96!



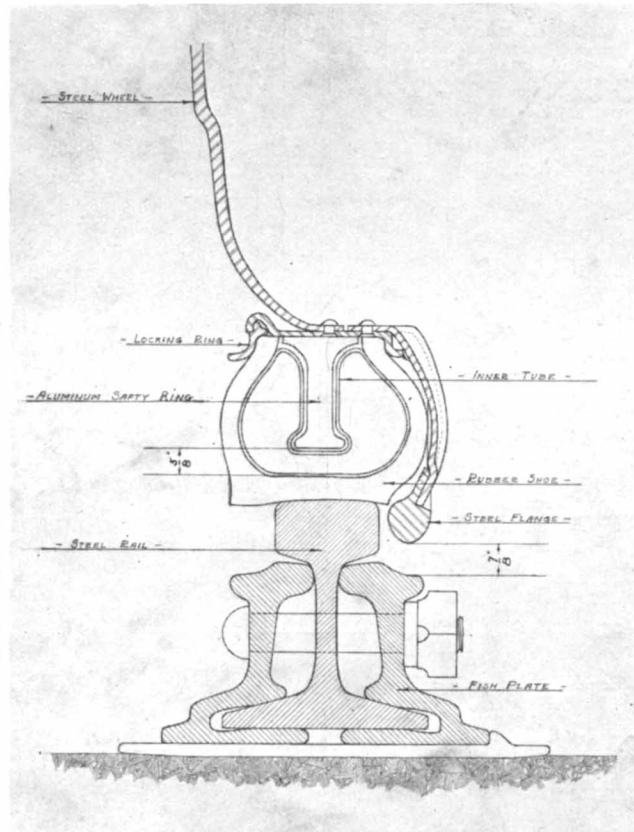
Power Truck—stainless steel frame in which is installed a Cummins Diesel motor in the one end, balanced by the generator in the other.



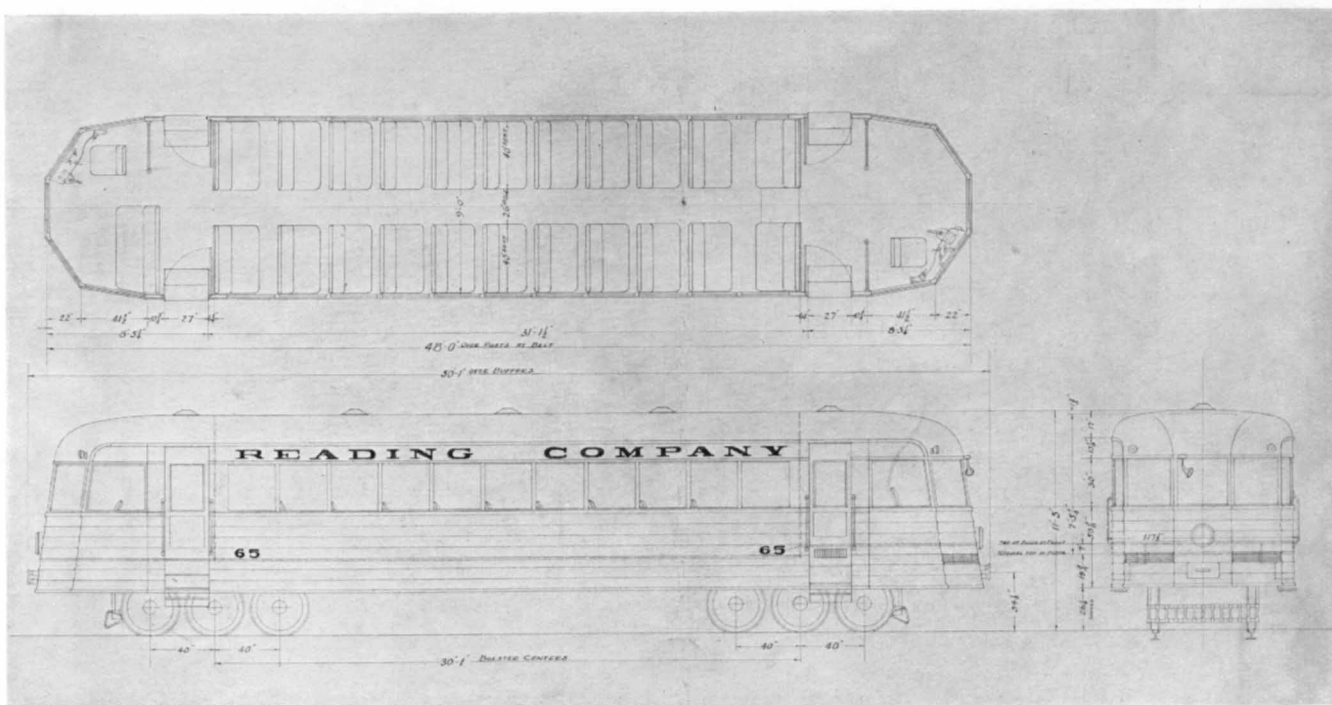
Driving Truck with electric motor beneath the center plate, driving front and rear wheels through differentials.

The Reading "65" is truly a versatile car. It is almost inconceivable that so much can be provided in a single vehicle weighing less than 22,000 lbs.—11 tons. One-man control, electric drive, ground or platform loading, railway safety requirements, reversible operation and a comfort factor never before associated with rail or road transportation are combined in this car. Pneumatic tires have made this possible. Stainless steel "Shotweld"ed has made pneumatic tires practical. These twin ideas offer food for thought in the problem of railroad economies and in the stimulation of passenger transportation.

The Budd-Micheline rail car is designed and built by the Edward G. Budd Manufacturing Company of Philadelphia, Pennsylvania, under exclusive license from Michelin et Cie. of France. It is protected by numerous pending United States patent applications and patents extending to all novel features, particularly the rubber-tired wheels, the relations of the wheels to the track, on the one hand, and to the trucks and body, on the other, the trucks, the drive, and the Budd "Shotweld" system of stainless steel construction.



Cross-section of the wheel, tire and flange showing the inserted ring which supports the wheel in case of deflation.



Outline drawings of the Reading "65."

General Specifications:

Length Overall, 50' 1"; width, 9' 11"; height, 11' 5"
 Passenger Compartment: Length, 30'; width 9'; height, 7' 5 1/4"
 Driving Compartment and Vestibule: Length, 8' 11 1/2"; width, 9'; height, 6' 10 1/4" front, 7' 5 1/4" rear
 Aisle, 26". Seats, 40" wide, spaced 32" apart
 Doors, 30" wide
 Truck Centers, 30' 1"
 12 Budd Demountable Steel Wheels, 33" x 4 1/2", pneumatic tires. Tire air pressure, 100 lbs.

Body:

Budd "Shotweld" Stainless Steel construction
 Passenger capacity (seated): 47
 Lighting: Indirect, diffused by head-lining, giving ample light with no glare
 Heating and ventilating: Forced air circulation, heating through hot-water radiators when desired
 Windows: Non-shatterable glass in ends
 Seats: Reversible, light weight, rubber hair cushions, upholstered in leather
 Interior trim: Insulated Formica, lacquer finish
 Floor: Cork inlaid on welded corrugated stainless steel flooring
 Bumpers: Spring bumper front and rear
 Signals: Air horns, foot gong, electric service lights, oil auxiliary lights
 Safety devices: Electric windshield cleaners, intercommunicating buzzer system, pilot lights, dead-man control, Budd system for signal operation
 Doors, traps, steps: Air operated by single lever

Weights:

Body	8,200 lbs.
Front truck and power plant	7,000 "
Rear truck	4,300 "
Controls, wiring and miscellaneous equipment	2,500 "
Total weight, dry	22,000 lbs.

Trucks:

Budd "Shotweld" Stainless Steel construction
 Front truck: Complete power plant, three idler axles, Timken roller bearings
 Rear truck: Drive through two Timken worm drive differential axles, Tru-Stop disc hand brake on motor shaft, one idler axle
 Tru-Stop hand emergency brake operating on four wheels
 Bendix-Westinghouse air-operated brakes on four wheels each truck
 Signal shoes for signal operation

Power:

125 H.P. Cummins Diesel, Westinghouse Electric transmission

Operation:

Double-end operation, one-man control
 Speed: 50 to 55 M.P.H.
 Braking: Stops 400 ft. from 55 M.P.H.

"THE BUDD-MICHELINE"

Pneumatic-Tired Rail Cars of Stainless Steel

FOR

Suburban, Main and Branch Line Use on
American Railways

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EDWARD G. BUDD MANUFACTURING CO.
Rail Car Division **PHILADELPHIA, PA.**

*Railway Pneumatic Tires used in this car
manufactured under exclusive license*

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