

"Rail Bus"

For Sale!

American Car & Foundry Co.

417
The Alaska Railroad
RECEIVED
JUN 8 1935
OFFICE OF
General Manager

Anchorage, Alaska,
June 8th, 1935.


COLONEL O. F. OHLSON:

With the return of the attached description of Norfolk Southern "Rail Bus":

The arrangement makes a nice, clean space covering the entire length of the car for passengers and baggage; but has the objection of placing the gasoline engine under the car, which is objectionable in this country in that during the summer operation the motor and radiator are down in the dust, and in some cases the grass clogs up the radiator if it is allowed to grow between the tracks. As the fine tube radiator is placed under the middle of the car behind the engine, it would naturally be hard to get at this engine to do some kinds of work on it. This engine, I note, drives on only one axle.

In a fairly warm country, free from snow and dust, this car should give far better satisfaction than in a country like this, where the snow and cold weather would interfere with the operation of the gasoline motor.

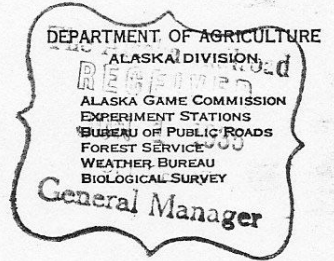
This must be a fairly large motor to deliver 176 H.P., and as it only operates on one axle the chances are that in cold, icy weather there would be slipping in order to start up the car.

✓

W. L. Kinsell,
Sup't. Motive Power & Equipment.

WLK:S

DEPARTMENT OF THE INTERIOR
THE ALASKA RAILROAD
ALASKA ROAD COMMISSION
OFFICE OF INDIAN AFFAIRS
TERRITORY OF ALASKA
ALASKA REINDEER SERVICE

UNITED STATES
DEPARTMENT OF THE INTERIOR
CONSOLIDATED PURCHASING AND SHIPPING UNIT
441 FEDERAL OFFICE BUILDING
SEATTLE, WASH.
May 24, 1935



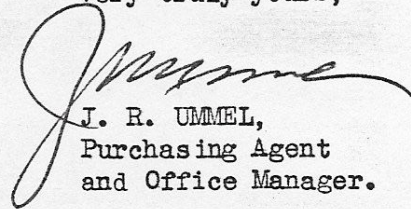
IN REPLY REFER TO

Colonel O. F. Ohlson,
The Alaska Railroad,
Anchorage, Alaska.

Dear Colonel Ohlson:

Herewith, for your information, is letter
of May 22 from the American Car and Foundry Company,
together with reprint referred to therein.

Very truly yours,


J. R. UMMEL,
Purchasing Agent
and Office Manager.

*Mckinnell
what do you think
of this car?
JRO 6/3-35*

Norfolk Southern Railroad Light-Weight Rail Motor Cars

designed and built by

A.C.F.

with

Hall-Scott Horizontal Motor Entirely Under Floor

(Reprinted from Railway Mechanical Engineer, April 1935)

The idea of presenting a single unit light-weight low priced mechanical drive rail car, powered with a horizontal engine mounted under the floor, thus utilizing the entire floor area for revenue, was proposed by A.C.F. three years ago.

Four of these rail units were built for operation in Uruguay, S. A., where the performance has been excellent.

The Norfolk Southern has had two units in operation for several months and two additional units are nearing completion. The actual operating costs as proven out on the Norfolk Southern are much lower than anticipated.

American Car and Foundry Company

New York, N. Y.

Chicago, Ill.

St. Louis, Mo.

Light-Weight Motor Cars On the Norfolk Southern

TWO light-weight rail motor cars, designed for single-unit operation, were delivered to the Norfolk Southern by the American Car and Foundry Company near the end of 1934. These cars, which are known as "rail buses," weigh about 41,400 lb. each and are driven by 176-hp. gas engines through mechanical transmission. They are 56 ft. 7 in. long by 9 ft. wide; 10 ft. 4½ in. in height overall, measured from the rail; provide seats for 53 persons in two passenger compartments, and have a baggage room 12 ft. 11 in. long. The approximate weight distribution is as follows: Body, seats and fittings, 21,500 lb.; power equipment, 5,000 lb.; trucks, 14,900 lb.; passenger and baggage load, 10,000 lb.

These cars were designed after an extended study by the railroad of the requirements for meeting competition by vehicles on highways owned and maintained by the state. They provide a service at low car-mile cost which can be maintained on attractive schedules without excessive first cost.

The Car Structure

The cars have a streamline front end, and the rear end, while presenting straight lines in plan, is curved and sloped vertically. The sides are vertical below the windows and slope inward slightly from the window sills to the roof. The corners at the rear are well rounded.

In the construction of the cars liberal use has been made of Cor-Ten steel and aluminum to keep down weight. In general, Cor-Ten steel is used where its added strength or corrosion-resistance warrants its use. Carbon steel is used where weight or size is determined by stiffness or other considerations than strength and corrosion resistance.

The design of the cars for operation as a single unit



Looking toward the rear end of the car from the forward passenger compartment

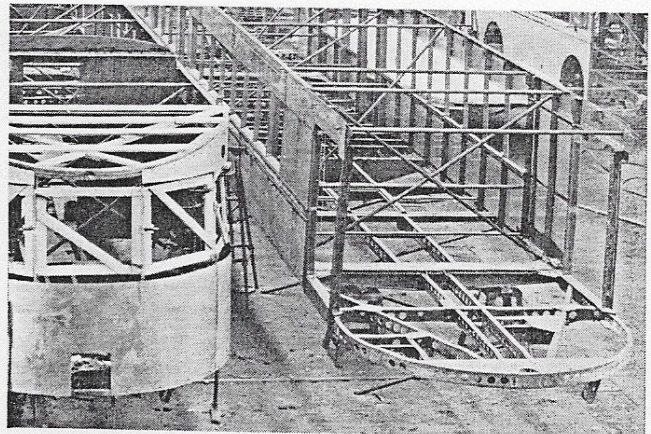
The "Rail Bus" is designed for single-unit operation. The 176-hp. gas engine provides a high horsepower-weight ratio for the 41,400-lb. vehicle which seats 53 passengers and has a small baggage room

has obviated the necessity for including a stiff center-sill member. For the underframe and body frame members both rolled and pressed sections are employed as well as some members in truss form. The photographs show clearly how the underframe members have been reduced in weight by cutting away part of the webs of pressed-steel sections. The sides extend below the sill line to within a height of about 12 in. above the rail. The roof is of the plain arch type of wood construction covered with Mulehide roofing and supported by pressed steel carlines. The side sheets and letter panels are of 52S aluminum alloy.

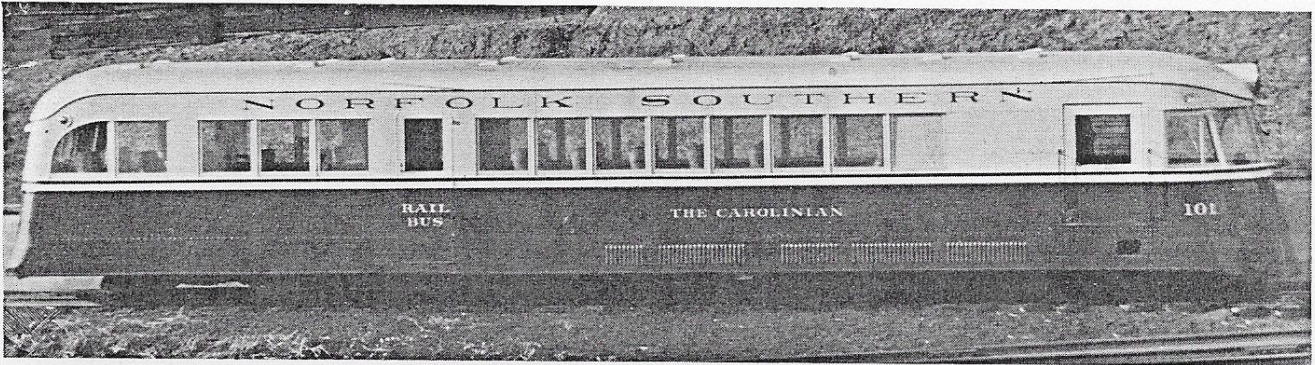
The ceiling is panelled in composition board applied in sections joined at the carlines. It is arranged with an interior monitor effect. Grilles are provided in the side of the false monitor opening into ducts to the Electric Service Supplies Company aerating type ventilators.

The frieze panels, pier panels and upper corner panels are of aluminum. Below the belt rail the inside lining is of composition board applied over a layer of felt insulation. The baggage compartment is lined with Masonite Presdwood below the windows and the door guards are of light-gage, flat sheet steel. No interior lining is applied to the ceiling, the roof boards showing. The baggage compartment is fitted with the customary hardwood chafing strips, secured to the steel lining with Parker-Kalon screws.

All side windows have single lift type sash set in easily removable guides. The sash have metal frames, each adjustable and designed to be rattle-proof and easy to operate. Six windows are provided around the front



Front ends of two cars showing construction framing

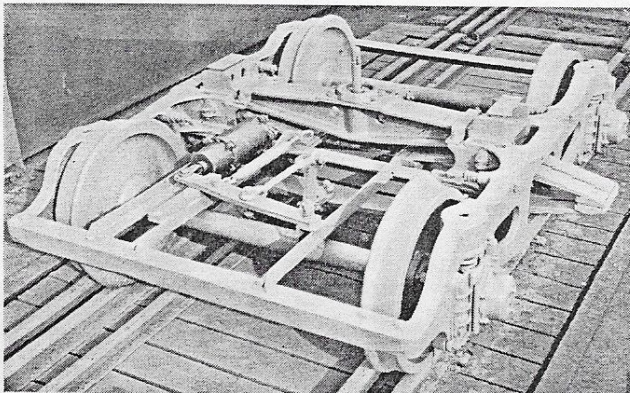


The Norfolk Southern "Rail Bus" built by the American Car & Foundry Company

end of the car, all except the one on the operator's right having stationary lights set in the body frame. A single drop sash is provided at the operator's side. Two large windows with a vertical dividing rail in the center are provided at the rear of the car. The right-hand window is set stationary in the body frame, while the left window is in two parts, one section adjacent to the center rail being arranged to slide across the other section. The sliding window is provided with a lock designed to hold it dust-tight when closed. The windows directly in front and at the right of the operator are glazed with laminated safety plate glass. All side windows in the passenger compartments are fitted with double faced Pantasote roller curtains.

The passenger entrance doors are located on each side somewhat back of the middle of the car body. The doors are of the automotive parlor-coach type which open outward and, when closed, are flush with the body side sheathing. The floor is $37\frac{1}{4}$ in. above the rail. A stationary step in a well is provided on each side of the entrance platform with low barriers at the step well which end at the aisle in a vertical stanchion of 1-in. aluminum-alloy pipe. The car is floored with $1\frac{1}{16}$ -in. yellow pine throughout. The flooring in the passenger compartments, the platform and the step wells are covered with Armstrong linoleum, an embossed pattern in the aisle and a smooth green tone under the seats. The saloon partitions are of solid sheet steel with hardwood swinging doors. The side doors in the baggage room are push-mounted, sliding type, each 5 ft. 4 in. wide.

The two passenger compartments are separated by the entrance platform. The one toward the front of the car is for white passengers and seats 30 persons. The rear compartment is for colored passengers and seats 23 persons. The seats in both passenger compartments are Brill No. 309, two-passenger transverse type with indi-



Trailer truck of Norfolk Southern "Rail Bus"

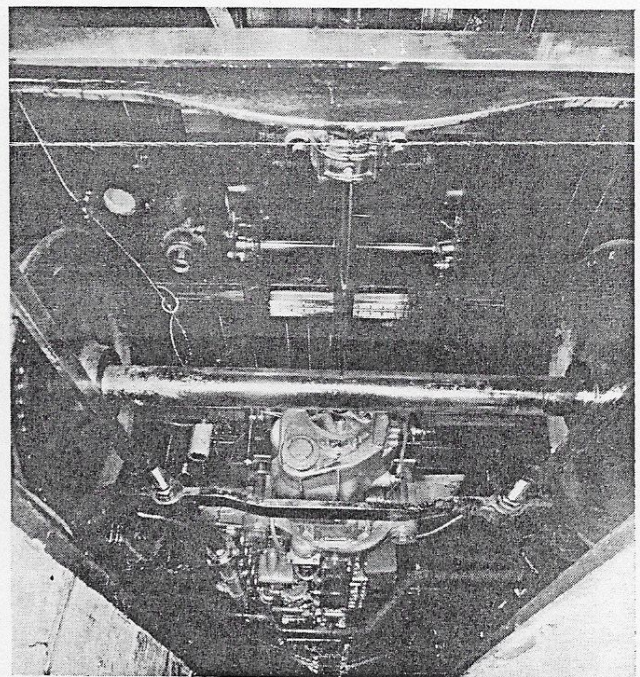
vidual head rests. A five-passenger transverse seat, similar in construction to the double seats, except that the head rests are omitted, is provided across the rear end of the coach. The seats are upholstered in a machine-buffed leather in a green tone.

There are two saloons, one at the front right-hand corner of the white passenger compartment and one at the front left-hand corner of the colored passenger compartment adjoining the entrance platform. The hoppers are of the Rex dry type. At each saloon is a Giessel water cooler complete with alcove faucet and drain, a Finback, Jr., paper-cup container and a receptacle for used cups.

The lighting is provided by 12-volt circuits. There are nine lamps in the white passenger compartment, seven in the colored passenger compartment, two in the center vestibule and three in the baggage compartment. The dome light fixtures in the passenger compartments have frosted diffusing lenses.

Power Plant and Trucks

The power plant of these cars is of unusual design. It consists of a six-cylinder, Hall-Scott Model 180 engine, with 5-in. by 6-in. horizontal cylinders, which develops a maximum of 176 hp. at 1,800 r.p.m. This



View from pit looking up—Hall-Scott engine is mounted entirely underneath the floor

engine is mounted entirely beneath the floor; in fact, no space is required above the floor for any of the mechanical equipment of the car, except for the controls adjacent to the operator's station. The carburetor is a Zenith balanced type, attached to a hot-spot manifold, and has a large oil-wetted type air cleaner. The starting motor is a 12-volt Bendix type. The generator is a 12-volt, 1,000-watt Delco-Remy unit. The engine drives through a Brown-Lipe three-speed, helical-gear, constant-mesh transmission and a Long double-plate clutch 14 in. in diameter to a single driving axle at the forward end of the front truck. A drive shaft and a propeller shaft lead from the transmission to the drive axle. The drive shaft is coupled to the transmission by a fabric disk joint and is supported at the rear end by a self-aligning ball bearing. The propeller shaft is provided with two needle type, universal and slip joints.

The driving axle is provided with a gear case in which are two free running bevel gears meshing with a common pinion. One or the other of the bevel gears is secured against rotation of the axle by shifting a large clutch operating on a splined center portion of the axle, thereby selecting either forward or reverse movement. The operator controls the car from his seat on the right side at the front of the baggage room, through a foot-operated clutch and hand-operated gear shift. The spark control is automatic and the throttle is controlled by foot-accelerator and auxiliary hand control.

Fuel is supplied to the carburetor by a pressure pump from a 100-gallon heavy gage tank under the floor.

A fin-tube radiator is mounted under the car floor beneath the center of the car and behind the engine. The major portion is cooled by draft created by a fan and the remainder by natural draft. The four-blade propeller-type fan is driven from the engine. The car is heated through light fin-tubing radiators along the sides of the passenger compartment, through which water from the engine jacket is circulated.

The trucks are both of A.C.F. design with 6-ft. wheel base and are carried on 30-in. One-Wear rolled-steel wheels. The axle for the driving wheels is heat-treated

alloy steel of special design to suit the driving mechanism. All the axles have Timken roller-bearing journals.

The trucks have cast-steel side frames with integral pedestals and cast-steel bolsters. The power truck is arranged with the bolster off center so that the driving axle carries about 59 per cent of the center-plate load and 34 per cent of the total car weight. A coil spring is inserted in each pedestal over the journal box. The journal boxes are guided in the pedestal by shear-type rubber blocks, one on each side of the box which, under normal operation, transmit all forces between the axle and the truck frame. In case of excessive lateral forces or high braking pressures, however, the rubber is deflected sufficiently to bring phosphor-bronze pedestal liners into play. Rubber inserts are also provided between the end clips of the elliptic bolster springs to insulate the top and bottom sections from each other.

The cars are equipped with Westinghouse SME type air brakes using a self-lapping brake valve arranged with both hand- and foot-operated safety control. Air is furnished by a 10 cu. ft. high-speed compressor driven directly from the engine shaft. The brake rigging is of the outside-hung type on the driving truck with the brake cylinder mounted on the car body. On the trailer truck the brakes are inside-hung with the cylinder mounted on the truck.

An A.R.A. standard pocket coupler is provided at each end of the car. The coupler heads are removable and intended for use in emergency only. Each coupler pocket is concealed by a cover flush with the sheathing.

The cars are fitted with air-operated sanders for movement in either direction and have a Westinghouse Simplex air-operated horn at each end. The E.S.S. golden glow headlight and backup light, as well as marker and classification lamps are all cowled into the car sheathing.

The cars are designed for a balancing speed of about 65 m.p.h. Their power-weight ratio is about 8.6 hp. per ton of vehicle, exclusive of paying load. This exceptionally high ratio insures rapid acceleration throughout the range of normal operating speeds.

AMERICAN CAR AND FOUNDRY COMPANY

RIALTO BUILDING

A.C.F.

SAN FRANCISCO, CAL

May 22, 1935

Mr. J. R. Ummel, Pur. Agent
The Alaska Railroad
Federal Building
Seattle, Washington

Dear Mr. Ummel:

In the latter part of last year we delivered to the Norfolk-Southern two self-propelled gas mechanical rail cars known as "Rail Buses." These are powered by a 176 HP Hall-Scott horizontal engine, mounted beneath the floor.

Due to this location of power plant, objectionable fumes do not enter the car and the entire area of the car is available for revenue load.

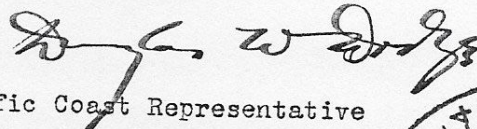
These cars are streamlined and by liberal use of Cor-Ten steel are relatively light. They are capable of quick acceleration and deceleration and high-speed of approximately 65 miles an hour, seating 53 passengers and providing a small baggage room.

By low operating cost, high-speed, attractiveness, comfort and safety, they are designed to hold or recover to the rail traffic that might go to transportation on the highway.

The enclosed reprint from the Railway Mechanical Engineer, of April 1935, describes this car. If you might desire further information about it, this office will be pleased to send you full details.

We have some information as to the operating costs developed in this service.

Very truly yours,



Pacific Coast Representative

DWD:GA
encl: 1

The Norfolk-Southern have since ordered two additional cars.

