



ASSOCIATED EQUIPMENT COMPANY  
LIMITED

WALTHAMSTOW, LONDON, E.17.

“Builders of London's Buses”

◆ TELEPHONE: WALTHAMSTOW 780 (9 LINES).  
TELEGRAMS: 'VANGASTOW, WALTSTREET, LONDON'

15 AUG 1922





RAILLESS TROLLEY  
BUS  
SPECIFICATION



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## The A.E.C. Railless Trolley Bus.

**T**HE advantage of the Motor Omnibus lies in its flexibility ; its power to work its way through traffic, to use any part of the road, and to set down and take up its passengers near the pavement. The advantage of the tramcar is that, because it draws its power from a central station, the power bill is low. **The A.E.C. Railless Trolley Bus combines the merits of the two systems.** It is essentially a road vehicle, its flexibility being only limited by the length of the arms connecting it to the overhead wires. It can move close to the pavement to take up and set down passengers and on to the crown of the road for the purpose of passing slow moving vehicles.

Hitherto, the Trolley Bus has been too much regarded as a tramcar running without rails, whereas, it is, in fact, an electrically propelled road vehicle, taking its power from a central source instead of from a battery carried on the vehicle itself. The problems of chassis design and of maintenance are those that are familiar to and best handled by constructors of motor omnibuses.

Where tramway systems have fallen into disrepair and their continued existence involves the reconstruction of expensive tracks, the Trolley Bus offers an admirable solution of a financial difficulty, the overhead gear being already available.

Where roads are narrow and the inflexible tram is undesirable, this form of vehicle is a far less obstructive unit of traffic.

There is nothing experimental in it, constructed by an experienced motor vehicle manufacturer. The chassis is that of a





motor omnibus, the driver's control is simple and easily manipulated; the acceleration is steady and yet rapid; the undesirable dead weight of the heavy accumulators required on battery driven electric vehicles is avoided.

**In the event of a breakdown to a single vehicle, a Trolley Bus Service, unlike the tram service, is not held up.** The disabled vehicle can be passed by other Trolley Buses without difficulty.

It will be clear, then, that this type of vehicle has much to commend it in many instances. It will be equally clear that, if the best possible results are to be realised, it should be produced by manufacturers experienced in the production of Motor Omnibuses.

We, as builders of London's vast fleet of Buses, have therefore applied our unrivalled experience to this problem and produced a Railless Trolley Bus which is light in weight, simple from the standpoint of maintenance and driving control, and in every sense suitable to be operated in small or large numbers wherever regular services of passenger-carrying vehicles are required.

**Varying types of Bodies can be mounted to individual customer's requirements, and we have found that the most useful and popular form of Body is the Single Decker, providing seating capacity up to 40 Passengers.**





## ELECTRICAL EQUIPMENT.

In designing the electrical equipment, special attention has been paid to producing a vehicle having a high degree of acceleration coupled with very easy coasting, so that it is possible to run a high speed service with economy of current.

Engineers have been of two minds as to the relative advantages of two motor equipments with series parallel control, and a single motor with a purely rheostatic control.

The A.E.C. Trolley Bus is equipped with a single motor. On first looking at the problem the series parallel system would seem to be more economical.

After studying the problem, we decided to adopt the single motor equipment for the following reasons:—

[It should be mentioned that the electric motor replaces not only the petrol engine but its necessary adjuncts, including the radiator, clutch and gear box. The rest of the vehicle is more or less a standard A.E.C. petrol chassis ]

- (a) Simplification of chassis.
- (b) Lower maintenance charges.
- (c) The higher efficiency of one motor and one worm gear as against two motors and two worm gears.
- (d) Less running friction and therefore greater ability to coast.
- (e) With high acceleration and long coasting distance the economy compares well with series parallel control systems.





## ACCELERATION.

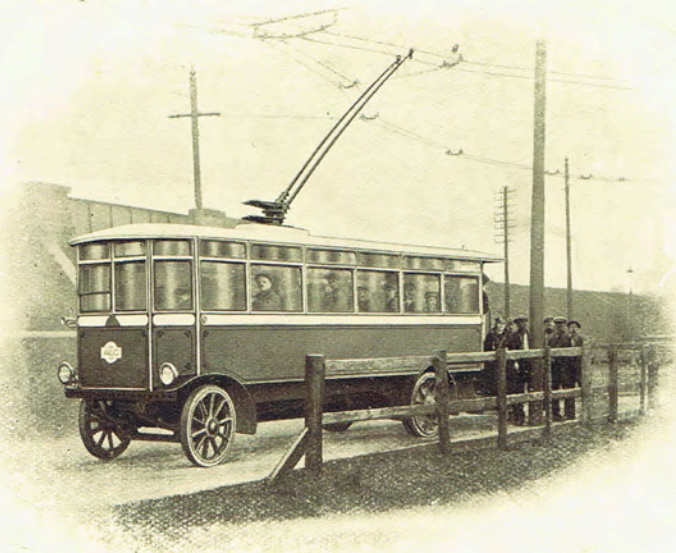
We claim that a control system has been developed on the A.E.C. Trolley Bus with acceleration and ease of operation as its main advantage.

## CONTROL SYSTEM.

The control system can be divided into two parts, both of which are covered by patents.

The first part consists of a foot operated drum controller, so designed that the forward motion accelerates the vehicle notch by notch on the controller. On releasing the foot the controller comes back to the off position by itself. It is prevented from going back into reverse position by an automatic locking lever. In order to reverse, the locking lever has to be removed by hand. The reverse is operated by a heel pedal which is positively connected to the forward speed pedal. It will thus be obvious that either pedal can be returned from its driving to neutral position

by foot pressure on the opposite pedal—this affords a safety device in the event of either return spring failing to operate.





The second part is entirely automatic and assists the acceleration greatly as will be seen from the curve shown on page 15.

It consists of a centrifugal governor mounted on the end of the motor shaft, this operates a switch at the speed at which the acceleration is normally falling. The switch, by means of a contactor, introduces a shunt resistance across the motor field winding.

Operating a shunt resistance by this method still leaves the motor capable of exerting its full torque at speeds below the cutting in speed of the governor, thus taking care not to overload the motor on steep grades.

### **THE MOTOR.**

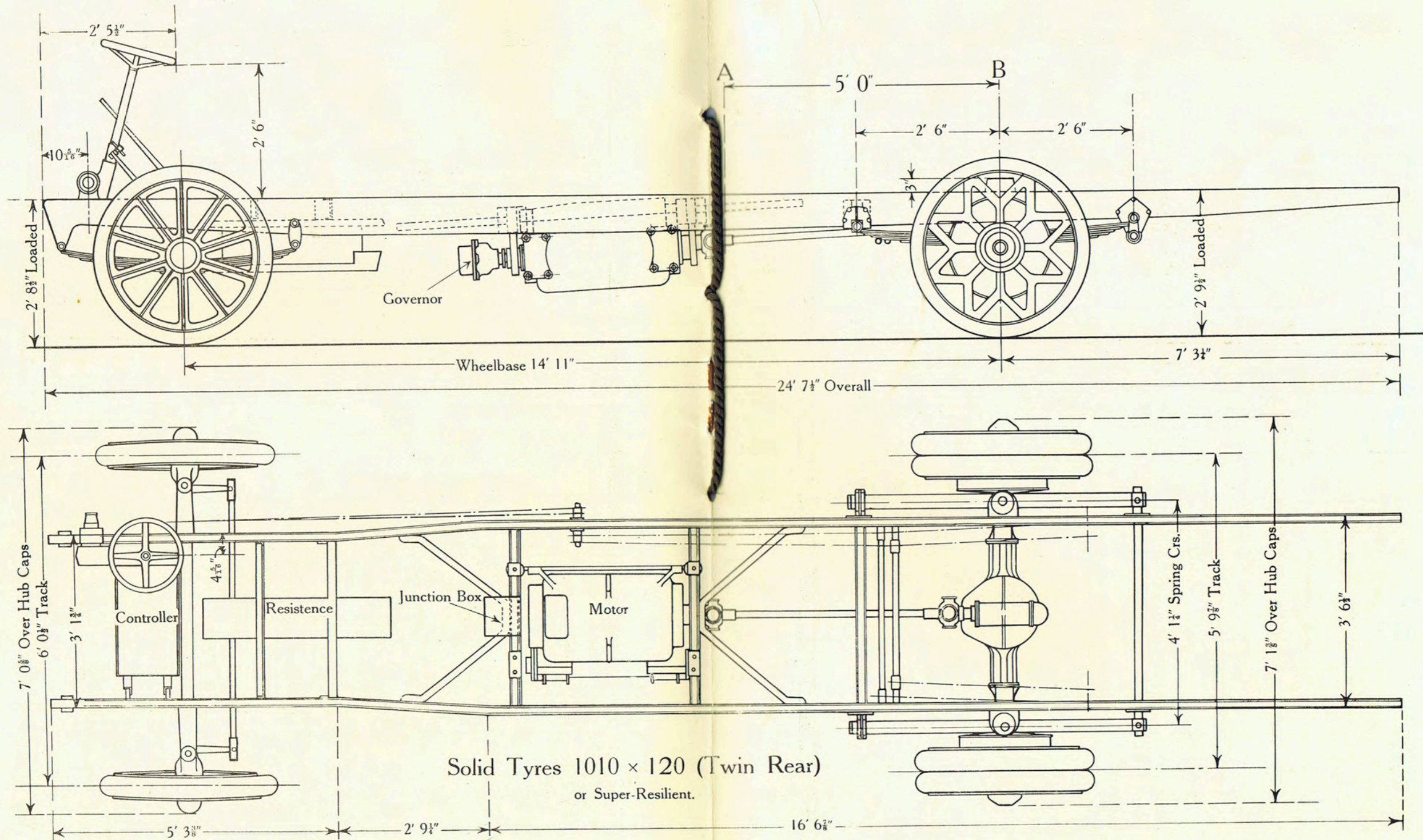
Rapid acceleration calls for a reliable motor not limited by sparking at the commutator. This calls for a commutating pole type of machine with good ventilating ducts.

The A.E.C. Motor is made by the G.E. Co. (supplied by the B.T.H. Co.) and is known as G.E. 247A Ventilated Type, and rated at 33.5 B.H.P. at 500 volts at the hour rating.

The motor is spring suspended in the chassis and fitted with ball thrust bearings.







SCALE 1/4" TO 1'

### CHASSIS ARRANGEMENT.

CHASSIS WEIGHT 3 TONS 5 CWTs.



### **THE RHEOSTAT.**

This is of the unbreakable grid type, spring supported. It is fixed to the chassis and is protected from road splash and rain by a suitable tray so arranged as to not impede the ventilation.

### **THE WIRING.**

Between motor controller and rheostat the wiring is made with high grade rubber insulated and braided cables, heavily taped together and supported on the chassis with hard wood blocks.

### **THE TROLLEYS.**

The two trolley booms are mounted on a ball bearing base, both booms swinging from a common centre. They are balanced by heavy external springs which are adjustable to give the necessary contact pressure on the trolley wires.





## Brief Specification of A.E.C. Railless Trolley Bus Chassis.

- Frame** Flitch Type, ash filling with 3% nickel steel flitch plates.
- Front Axle** H section stamping in medium carbon steel suitably heat-treated. Swivels in chrome vanadium steel. Wheels, steel castings running on large roller bearings.
- Steering** Worm and nut type of ample proportions.
- Rear Axle** Worm driven rear axle of A.E.C. standard design as used with every success on our heavy lorry chassis.  
Gear ratio to suit customers requirements, either  $6\frac{1}{4}$ ,  $7\frac{1}{4}$  or  $8\frac{1}{4}$  to 1.  
Road wheels running on roller bearings.
- Brakes** Hand and foot brakes operate on drums directly attached to rear wheels. Both brakes are of internal expanding type and have compensated operating gear.





**Springing** Specially long, wide flexible road springs are fitted. Auxiliary volute springs are fitted over the rear axle which prevent excessive rolling and provide a comfortable suspension over the whole loading range.

**Motor** One G.E., 247A, ventilated series wound 500 volt D.C. Motor, made by the G.E. Co. The hour rating is 60 amperes or 33.5 B.H.P. with a temperature rise of 75°C. The continuous rating is 36 amperes or 20.5 B.H.P. with a temperature of 65°C.

**Controller** This consists of a B.T.H. controller operated by pedal so arranged that the pressure of the toe accelerates the motor notch by notch. The heel rests on an extension of the pedal and operates the reverse, but this cannot be operated without first removing a locking device by hand.

There are six forward steps on the controller giving a purely rheostatic control.

Two steps only are provided for the reverse.





**Controller**  
(continued)

The resistances are of the unbreakable grid type. Two circuit breakers are fitted in the trolley circuit. In addition to the foot control there is an automatic feature consisting of a contactor which closes a shunt circuit across the field winding of the motor to increase the speed. This takes place automatically during acceleration after the speed reaches 9 m.p.h.

**Trolley Arms**

Twin trolley pole collectors with swivelling trolley heads.

**Tyres**

Solid Dunlop (unless other make is requested) 1010 m/m. × 120 m/m. single on front wheels, 1010 m/m. × 120 m/m. twin on rear wheels.

**Weight**

Chassis weight, 3 tons 5 cwt. Unladen weight with single deck body to seat 36 passengers, 4 tons 18 cwt. approx.

**Wheelbase** 14 ft. 11 ins.

**Track** 5 ft. 10 ins.

**Width of Frame** 3 ft. 6½ ins.

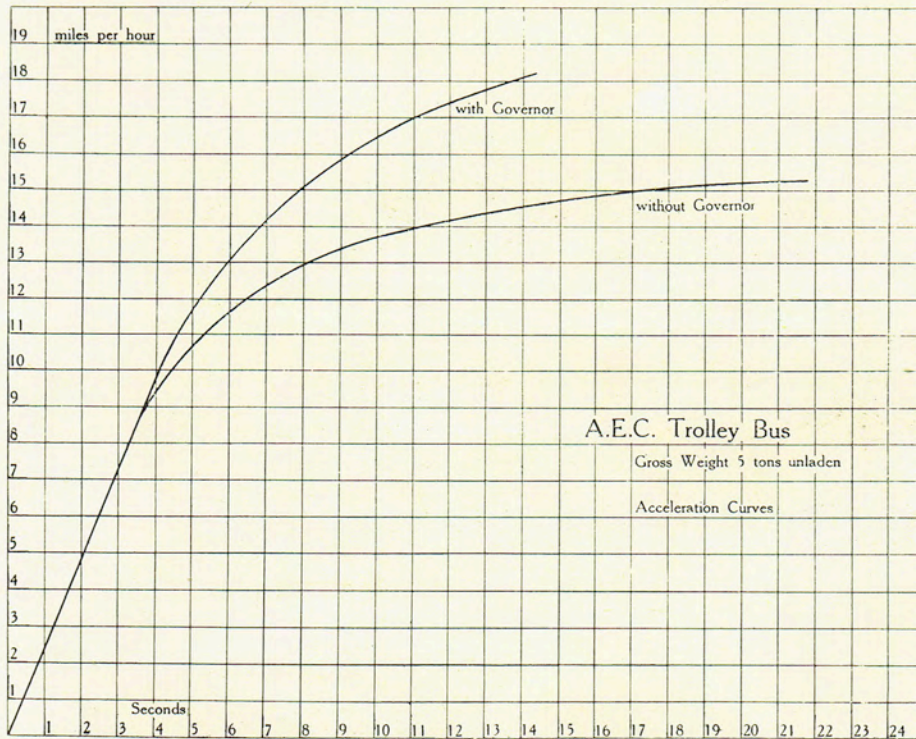






Exterior and Interior views of  
the A.E.C. Railless Trolley Bus.





ACCELERATION CURVE.

COMMERCIAL MOTOR VEHICLES

For Goods - - - 3, 4 & 5 Tonners

For Passengers - 28 to 57 Seating Capacity

