(*b*) The whole of the Single Line may form one Staff section or may be divided into a series of such Sections; in the case of there being two or more Staff Sections, they are numbered consecutively, No. 1 being at the Up end (the Melbourne end) of the Single Line.

(*c*) A Car Staff, which consists of a metal symbol, is provided for each Staff Section, and except as shown in clause (*b*), Instruction 93 or Instructions 97, 101, 103, and 104 no Car is allowed to enter on any Staff Section unless the Motorman is in possession of the Staff for such Section; each Staff is stamped with a distinguishing number corresponding to the number of the particular Section for which it is provided.

(*d*) Unless otherwise ordered Staff Tickets are provided for the Section, in order that, where necessary two or more Cars may run in the same direction on, or through, the Section before a Car travels in the opposite direction; in such case the Motorman of each of the Cars, except the last, shall carry a Staff Ticket and the Motorman of the last of the series of Cars shall carry the Staff and on its arrival at the other end of the Section, the Staff or Staff Tickets will be available for one or more Cars to enter the Section from that end.

93. (*a*) **Crossing Places.**—Crossing Places which are situate between Staff Sections, consist of a short length of double track on which Cars travelling in opposite directions may pass each other.

(*b*) When entering a Crossing Place, the Motorman must, unless otherwise ordered, travel on the left-hand road in the direction the Car is travelling.

(i.) When Cars that have to pass each other, are approaching a Crossing Place at, or about, the same time, the Car that is proceeding in the Up direction must have precedence, and the Motorman of the Down Car must not pass over the Facing Points at the entrance to the Crossing Place until he has seen that the Up Car has been brought to a stand clear of the fouling point at each end on the proper road.

During a fog or when from any similar cause the Motorman cannot clearly see a distance of 100 yards ahead, the Motorman of an Up or a Down Car must before entering a Crossing Place send his Conductor forward to see that the fouling points are clear and to prevent any Car from entering at the opposite end, until his own Car has been drawn in and is standing clear of the fouling point at each end on the proper road. If the Conductor of each Car meet at the Crossing Place precedence must be given to the Car proceeding in the Up direction, and the Conductor of the Down Car must take measures to prevent his Motorman from entering until the Up Car is standing clear on the proper road.

(ii) A Motorman must always be prepared to find a preceding Car standing outside a Crossing Place, and have his Car under such control as to enable him to stop clear of the obstruction.

(iii) Except as prescribed in section (iv) hereof no Car must be allowed to foul the Single Line by passing outside the fouling point from any Crossing Place or Terminal unless the Motorman be in possession of the Staff.

(iv) Should it become necessary for a Motorman to foul the Single Line for Shunting purposes, in the absence of the Staff, he must first arrange for, and see that the Conductor or some other competent employé is stationed a sufficient distance out, to stop any Car which may approach on the Line about to be obstructed.

94. (*a*) At the entrance to each Section, a Staff-box in which the Staff and Staff Tickets are secured, is fixed on a post designated the Staff Post. The Staff-box contains two drawers in which the Staff Tickets are placed. The Staff-box is fitted with a Special Lock of which each Motorman is provided with a key; the Staff forms the key for opening the drawer containing the Staff Tickets, so that a Ticket shall not be available unless the proper Staff for the Section is in the Staff-box.

(*b*) Unless specially authorised the Ticket-drawer must not be opened by any Key, instrument, or means, other than by the Staff for the Section to which the Tickets apply, and a Motorman must not use any Ticket as authority to enter any Section except one withdrawn by himself in the regular way by means of the proper Staff; the Ticket-drawer must be locked after each ticket is taken out.

(*c*) Staff Tickets must be detached and used in the order of their progressive numbers and only one Ticket must be taken from the Ticket-drawer at one and the same time. The Motorman must at once fill in and initial the Staff Ticket when he obtains it from the Staff-box; if a Ticket be taken out and not used it must be cancelled, marked with the words "Not used," and attached to a report explaining the circumstances to the Officer-in-Charge who must forward it with other Cancelled Tickets to the Block and Signal Inspector.

95. (*a*) Unless otherwise specially arranged the Motorman is responsible for Staff and Ticket Working, and in every instance of irregularity he must immediately communicate with the Officer-in-Charge on the Telephone and await instructions; if, however, he is unable to notify the Officer-in-Charge he must act as laid down in these Instructions.

(*b*) Except where Special Instructions are issued to the contrary, the Motorman is the sole person authorised to deal with the Staff and Staff Tickets, or open any Staff-box or Ticket-drawer.

(*c*) The Motorman must in every instance consult his Run Book and ascertain whether he should travel on the Staff or on a Staff Ticket.

96. (*a*) When a Car is ready to proceed into a Section and no other Car is intended to follow before the Staff will be required for a Car in the opposite direction on that Section, the Motorman must obtain the Staff for the Section and keep it under his observation on the Car bulkhead, until he arrives at the Crossing Place next in advance and except as shown in sub-sections (i) and (ii) hereof he must lock the Staff in the Staff-box at that end of the Section.

(i) If when the Motorman arrives at the other end of the Section the Staff is immediately required by the Motorman of a Car about to proceed in the opposite direction, the Motorman arriving with the Staff may hand it to the Motorman of the other Car, but this will not relieve the latter of responsibility for compliance with clause (*c*) of Instruction 95.

(ii) Before disposing of the Staff as laid down above, the Motorman must see that the full number of vehicles (if one or more trailers should be attached) comprising his load has arrived complete.

(iii) The Motorman of the last Car to pass over any Section at night, must not leave the Staff for such Section in the Staff-box, but must deposit it in the authorised receptacle at the Depot for safe custody overnight; the Motorman of the first Car in the morning must distribute the various Staffs properly, with due regard to the proper running of Cars.

97. (*a*) If a Car is to be followed over the Section by another Car before the Staff can be returned, the Motorman must carry a Staff Ticket (see Specimen Form at end of this Instruction) indicating that the

Staff is following, but before entering the Section he must see that the Staff applicable to such Section is in the Staff-box; he must then replace and lock the Ticket Book in its proper drawer, and securely lock the Staff in the Staff-box. On arrival at the Crossing Place next in advance the Motorman must at once cancel the Ticket by writing the word "Cancelled" across the face, and attach the Cancelled Ticket to his Run Sheet.

(i.) A Staff Ticket must not be used for any Section or direction other than that printed thereon, nor for more than one journey.

(ii.) Motorman must observe whether the supply of Tickets for any Section is likely to become exhausted, and, if so, must immediately communicate the circumstances to the Officer-in-Charge.

(*b*) The Officer-in-Charge must see that all such Staff Tickets are checked with the schedules, and forward them to the Block and Signal Inspector daily.

(*Specimen Form of Staff Ticket referred to in Clause* (*a*) *of Instruction* 97.)

Down. Progressive No.....

ELECTRIC STREET RAILWAYS.

STAFF TICKET.

Sandringham to No. 1 Staff Post.

No. 1 Section .....Down.

Date ..... Time ..... Run No. .....

Motorman's Initials .....

This Ticket must not be used for any Section or direction other than that printed hereon, and must be cancelled by the Motorman and attached to his Run Sheet immediately after use.

98. (*a*) The Motorman must not overcarry the Staff beyond the Staff Post at which, ordinarily, it should be left, and any breach of this Instruction will be considered as serious neglect.

(*b*) In the event of a Motorman overcarrying a Staff beyond the Staff Post at which, ordinarily, it should have been left, he must communicate with the Officer-in-Charge for instructions immediately on arrival at the Staff Post in advance; if, however, he is unable to gain the attention of the Officer-in-Charge, he may hand the overcarried Staff to the Motorman of a Car proceeding in the opposite direction (who, however, must be in possession of the proper Staff or Ticket for the Section he is about to enter) and draw special attention to the overcarried Staff before handing it over, and both Motormen must report the circumstances.

The Motorman in whose charge the overcarried Staff has been placed must not enter the Section to which the overcarried Staff applies, until instructed to do so by the Officer-in-Charge.

99. If, after having passed into a Section, the Motorman should find that he omitted to obtain the Staff for the Section, or that he is in possession of another Staff, he must exercise due care for the protection of his Car in the advance direction, and instruct his Conductor to do likewise in the rear; the Motorman may, however, drive the Car towards the Crossing Place in advance or in the rear according to his schedule or as may be advisable, but he must travel cautiously, making frequent use of his Gong, and send his Conductor to precede the Car when approaching or passing around any curve at which his view of the Line ahead is obscured.

In the event of the Motorman having a wrong Staff, he must, as soon as possible, arrange for it to be despatched to its proper Staff Post. See Instruction 98.

100. If on arrival at a Crossing Place the Motorman should find that the Staff for the Section in advance is not at the Staff Post when, according to the Schedules, the Staff should be available for his Car, or should he find a Staff for another Section at such Staff Post, he must at once communicate with the Officer-in-Charge. See Instruction 104.

101. (*a*) **Car Staff Lost or Damaged.**—If the Staff for the Section should be lost, arrangements must be made to work the traffic over the Section by Pilotman. The Officer-in-Charge will institute and supervise the Working by Pilotman in accordance with the directions contained in Rule 14 of Appendix II., Book of Rules and Regulations; the Forms referred to in such Rule, altered, in ink, as required, may be used for the Electric Street Railways. A sufficient supply of such Forms must be kept on hand at the Depot by the Officer-in-Charge.

102. **Disabled Car.**—(*a*) In the event of a Car that is carrying the Staff breaking down between the Staff Posts, the Motorman must (if the disabled Car can be moved by another Car) hand the Staff to his Conductor and instruct him to take it in the direction whence Relief can most expeditiously be obtained. The Conductor must fully explain the circumstances to the Motorman of the Relief Car, hand him the Staff, and ride with him to the point at which the disabled Car is standing.

(*b*) If the Motorman of the disabled Car be in possession of a Staff Ticket, he must, unless Relief can be more readily obtained in advance, arrange Relief by sending his Conductor back to stop the next following Car; the Conductor must fully explain the circumstances to the Motorman of such Car, and ride with him to the point at which the disabled Car is standing.

If, however, Relief can be more readily obtained from the Staff Post in advance, the Motorman of the disabled Car must fill in an "Emergency Relief Order" (see Specimen of Form at end of clause (*c*) hereof) and hand it to his Conductor with instructions to proceed to the Crossing Place in advance and deliver it to the Motorman of the Car which is to be used for Relief purposes; the Conductor of the disabled Car must ride with the Motorman of the Relief Car to the point at which the disabled Car is standing.

The "Emergency Relief Order" is sufficient authority (when filled in) for the Motorman of the Relief Car to enter the Section for Relief purposes—

(i) In the cases referred to in clauses (*a*) and (*b*) of this Instruction the Motorman of the Relief Car, when proceeding on the obstructed Section, must proceed cautiously, and, if starting from a Crossing Place, he must first communicate the circumstances to the Officer-in-Charge and receive instructions as to the disposal of the disabled Car.

(ii) At night or during foggy weather the Motorman of the disabled Car must see that a Red Light is showing on the front and rear of his Car.

(iii) The Emergency Relief Order must be retained by the Motorman of the Relief Car until the obstruction has been removed and the Section is clear, after which he must write the word "Cancelled" and his signature across the face of the Order, and attach it to his Run Sheet with a report to the Officer-in-Charge, who, after investigating the circumstances, must forward the Order and reports to the Block and Signal Inspector.

(iv) The Motorman of the disabled Car must not allow his Car to be moved until the Relief Car arrives, unless satisfactory arrangements have been made to prevent the Relief Car from coming to his assistance, and when a written order has been issued, until

the man to whom the order was given has returned and handed the order back to the Motorman.

(*c*) The disabled Car must be dealt with as expeditiously as possible, consistent with these Instructions, but unless the Motorman be in possession of the Staff, or otherwise arranged by the Officer-in-Charge, the disabled Car must be taken to the Crossing Place in advance.

(*Form referred to in clause* (*b*) *of Instruction* 102.)

ELECTRIC STREET RAILWAYS.

EMERGENCY RELIEF ORDER.

Date ..... Time .....

To Motorman of Car at ..... Staff Post.

You are hereby authorised, as per clause (*b*), Instruction 102, to enter Section No..... for the purpose of Relieving Car No. ..... which is travelling on Staff Ticket from ..... Staff Post to ..... Staff Post, and which is disabled and stationary near ..... street. I will not allow my Car to be moved until the arrival of your Relief Car.

Signed .....

Motorman of Disabled Car No. .....

Countersigned .....

Motorman of Relief Car No. .....

103. Section Obstructed.—(*a*) If, due to an accident, repairs, or obstruction, traffic is likely to be stopped for a considerable time, special arrangements must be made for working Cars to and from the Staff Post on each side of the point of obstruction; the Staff must be obtained to work Cars between the point of obstruction and the Staff Post on one side, and, on the other side, the traffic must be conducted by Pilotman. The Officer-in-Charge will institute and supervise the

working of traffic on each side of the obstruction in accordance with the directions contained in Rule 18 of Appendix II., Book of Rules and Regulations; the Forms referred to in such Rule, altered, in ink, as required, may be used for Single Lines on the Electric Street Railways. A sufficient supply of these Forms must be kept on hand at the Depot by the Officer-in-Charge.

(*b*) During any period of darkness or fog, the person in charge of the obstruction must see that a Red Light is exhibited on each side of the obstruction.

104. "Suspension of Staff Order."—(*a*) In any instance in which the Staff for a Section is at the opposite end to that from which a Car is required to be despatched, and there are no means of transferring the Staff in time to avoid serious delay, the Officer-in-Charge may suspend Staff and Ticket Working for one Car, in accordance with the following instructions:—

(i) The Motorman of the Car that requires to be so despatched must inform the Officer-in-Charge of the circumstances, and give his name, the number of the Car, and the trip (Up or Down) as contained in the Run Book, and the Officer in Charge will personally instruct the Motorman as to what course to pursue, according to the circumstances.

(ii) In the event of the Officer-in-Charge deciding to suspend the Staff and Ticket Working by the issue of a "Suspension of Staff Order," he must first communicate personally with the Motorman or other responsible employé at the end of the Section opposite to that from which the Car is to be permitted to proceed, and definitely ascertain that the Car Staff for the Section is locked in the Staff Box at that end. He must then prepare the "Suspension of Staff Order" (See Specimen Form at end

of this Instruction), have it countersigned by another official at the Depot, and issue it either by personally handing the Order to the Motorman, or by telephoning it to him. In the event of the order being telephoned the Motorman must fill in a copy of the Order and repeat the message back to the Officer-in-Charge, after which both the Motorman and the Conductor must sign the Order in the space at the bottom of the Form. The other official at the Depot and the Conductor must each listen to the messages, and if necessary have them corrected before countersigning. The Motorman may then run the Car through the Section at a reduced speed, and at every curve or other place where the view is obscured, he must arrange for the Conductor to go forward before signalling the Car ahead.

(*b*) In any instance in which a "Suspension of Staff Order" is issued, the Staff for the Section must not be released until the Car travelling on the authority of the Order has reached the Staff Post, at which the Staff is secured, and on arrival at such Staff Post the Motorman must cancel the "Suspension of Staff Order" by writing the word "cancelled," together with the date and time, over the face, signing his name, and obtaining the signature of the Conductor under the word "Cancelled." The Motorman of the first Car waiting to proceed in the opposite direction must see the cancelled "Suspension of Staff Order" before releasing the Staff, subject to the exception that if the Car travelling on the "Suspension of Staff Order" become disabled on the Section and require assistance from the front, the Motorman of the disabled Car may issue an "Emergency Relief Order" and send it forward by the Conductor to the Motorman of the Car at the Staff Post in advance; the latter may then release the Staff and give the necessary assistance. The

Conductor of the disabled Car must ride with the Motorman of the Relief Car and point out where the disabled Car is located.

(*c*) Unless the "Suspension of Staff Order" is issued, the ordinary Instructions must be adhered to; failure to obtain communication with the Officer-in-Charge or to obtain a satisfactory reply will not justify any departure from the ordinary Instructions.

(*Specimen of Form referred to in section* (ii) *clause* (*a*) *of Instruction* 104.)

ELECTRIC STREET RAILWAYS.
CAR STAFF AND TICKET SYSTEM.

SUSPENSION OF STAFF ORDER.

Date ..... Time .....

To Motorman .....

at .....Staff Post.

The Staff for the Section No. ..... is locked away in the Staff-box at ..... Staff Post and I hereby suspend Staff and Ticket Working for Staff Section No. ..... in order that you may proceed over that Section on the authority of this Order and in accordance with Instruction 104. On arrival of your Car at..... Staff Post, the Staff and Ticket Working must be resumed.

Signed ..... Officer-in-Charge.

Countersigned ..... Depot Witness.

Signatures of Motorman and Conductor ..... Motorman.

Receiving this Order ..... Conductor.

..... Time received.

On completing the journey over the Section the Motorman must write the word "Cancelled" on the face of this Order, and both he and the conductor must sign their names underneath.

Every Motorman must carry three of these Forms when on duty.

AIR BRAKE ORDERS.

105. (*a*) **General Description of and Instructions Relating to the Air Brake Apparatus.**—The arrangement of this Air Brake equipment is shown on diagram No. 1. The chief appliances are specified hereunder:—

Compressor Cut-out Switch and Fuse.
Air Governor.
Compressor Motor.
Air Compressor.
Reservoir.
Reservoir Safety Valve.
Pressure Gauge.
Motorman's Brake Valve.
Conductor's Brake Valve.
Brake Cylinder.

(*b*) **Compressor Cut-out Switch and Fuse.**—This is a single-pole switch connected in the power circuit on the Trolley side of the Circuit Breaker, and, when closed, it supplies power to the Compressor Motor, provided the contacts of the Air Governor are closed.

The Fuse is provided for the protection of the electrical equipment of the Compressor Circuit in the event of a short circuit or an excessive overload. Under normal Conditions the Compressor Cut-out Switch must be kept closed.

(*c*) **Air Governor, Compressor Motor, Compressor and Reservoir.**—The Air Governor is an air-operated switch connected between the Compressor Cut-out Switch and the Compressor Motor; the Air Governor automatically controls the operations of the Compressor Motor, and thus governs the working of the Air Compressor. When owing to an application of the Brake or due to leakage the Air-pressure in the Reservoir falls below a predetermined limit (60 lb. per square inch) the contacts of the Air Governor are closed automatically, which completes the circuit through the Compressor Motor and starts the Air Compressor. When by the operations of the Air Compressor the pressure in the Reservoir is increased to

70 lb. per square inch, the contacts of the Air Governor are automatically opened, the Compressor Motor is de-energised and the Air Compressor stops.

(*d*) **The Reservoir Safety Valve.**—The function of the Safety Valve is to prevent the pressure in the Reservoir from exceeding a predetermined maximum in the event of the Air Governor or Motor Compressor failing to automatically cut-out. The Safety Valve is provided with means for adjustment in order that the Blow-off pressure may be varied according to requirements; under normal conditions the adjustment is set so that when the pressure exceeds 70 lb. the Safety Valve will open, and thus limit the pressure in the Reservoir.

(*e*) **Pressure Gauge.**—The Pressure Gauge, one of which is fixed in each Driving Compartment, indicates to the Motorman the pressure of air in the Reservoir.

(*f*) **Motorman's Brake Valve.**—The operating handle of this Valve has four separate positions, viz:—(i) Service Application; (ii) Emergency Application; (iii) Neutral Position and (iv) Release Position.

(i) **Service Position.**—When the handle is in the Service position, a small Air port admits air from the Reservoir to the Brake Cylinder, producing a gradual application of the Brake for an ordinary stop. See clause (*b*), Instruction 111.

(ii) **Emergency Position.**—When the handle is placed to the Emergency Application Position, a large port is opened, and the air passing from the Reservoir to the Cylinder applies the Brake almost immediately. For other forms of Emergency Braking, see Instruction 106.

(iii) **Neutral Position.**—When the handle is at Neutral Position all air ports are closed, and any air then in the Cylinder is retained therein and the Brake is thus held on.

(iv) **Release Position.**—When the handle is placed to this position a port is opened through which the compressed air exhausts from the Brake Cylinder to atmosphere, and the Brake is thus released. This is the normal position whilst running.

(*g*) **Conductor's Brake Valve.**—The Conductor's Valve is provided on Bogie Cars only. By opening this Valve an Emergency application is produced; it must not be opened whilst the Car is in motion except the Conductor become aware that the Motorman is from any cause incapacitated, or any similar case of emergency.

106. Emergency Braking.—(*a*) There are various forms of Emergency Braking, some of which may be actuated independent of air pressure or power from the overhead conductors—

(i) On Bogie Cars, there are two separate forms of Emergency Braking. See Instruction 107.

(ii) On Single-truck Cars, there are four distinct forms of Emergency Braking. See Instruction 108.

(*b*) In the event of failure of the First Emergency Brake the Motorman must operate the Second; if the Second fail he must (on a Single-truck Car) apply the Third and if the Third fail he must adopt the Fourth method. If all the Motorman's methods of Emergency Braking fail he must signal to the Conductor to open the Conductor's Brake Valve.

107. Bogie Cars.—(*a*) In the Bogie Car equipment the separate forms of Braking are as shown hereunder:—

(i) **Service Brake.**—By an ordinary application of the Air Brake or (if the Air Brake be inoperative) Hand Brake. See clause (*b*).

(ii) **First Emergency Brake.**—By Air Emergency Application. See clause (*c*).

(iii) **Second Emergency Brake.**—By using the Motors as Generators. See clause (*d*).

(*b*) **Service Brake.**—This application, which is used for general purposes, consists of an ordinary application of the Air Brake Apparatus. To apply the Brake the Motorman, after placing the Controller to the Off position, must place the handle of the Brake Valve to the Service Application position, and when the desired effect has been produced, he must place the handle to the Neutral position; if the Motorman finds that his application is insufficient he must make another, but lighter, application, and again turn the handle to the Neutral position. These operations must be repeated until sufficient pressure has been applied to gradually bring the Car to a stand; the Air Brake must be released before the Car is actually stopped. See also clause (*b*), Instruction 111.

(*c*) **First Emergency Brake.**—The Emergency Air Brake is applied by placing the handle of the Brake Valve to the Emergency Application position, and applying sand to the rail.

(*d*) **Second Emergency.**—The Second Emergency Brake can only be applied by means of the "K35 Y2" type of Controller. The Motorman must place the handle of the Controller to the Off position and then place the handle of the Reverser to the position in which an application of power will oppose the motion of the Car; the handles must be left in above-mentioned reversed positions until the Car has been stopped.

This application is not dependent on the supply of power from the Trolley, and, as it is likely to damage the electrical equipment, must not be used except in cases of extreme urgency.

108. Single-truck Cars.—(*a*) In the Single-truck Car equipment the separate methods of braking are as shown hereunder:—

(i) **Service Brake.**—By an ordinary application of the Air Brake or (if the Air Brake be inoperative) Hand Brake.

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(ii) **First Emergency Brake.**—By Air Emergency Application.

(iii) **Second Emergency Brake.**—By Rheostatic.

(iv) **Third Emergency Brake.**—By Reversing.

(v) **Fourth Emergency Brake.**—By using the Motors as generators.

(*b*) **Service Brake.**—This application consists of an ordinary application of the Air Brake Apparatus, and, except as shown in section (i) hereunder, is used for general purposes. The Motorman, after placing the Controller to the Off position, must turn the handle of the Brake Valve to the Service Application position, and, when the desired effect has been produced, he must turn it to the Neutral position; if the Motorman find that his application is insufficient, he must make another, but lighter, application and again place the handle to the Neutral position. These operations must be repeated until sufficient pressure has been applied to gradually bring the Car to a stand; the Brake must be released before the Car is actually stopped. See also clause (*b*), Instruction 111.

(*c*) **First Emergency Brake.**—The First Emergency Air Brake is applied by placing the handle of the Brake Valve to the Emergency application position, and applying sand to the rail.

(*d*) **Second Emergency.**—To use the Second Emergency (the Rheostatic Brake) the handle of the Controller must be turned backwards from the Off position to bring the braking notches into action; the movement of the handle of the Controller to the first braking notch couples the motors so as to act as generators and short circuits them through the Rheostats, which are gradually cut out by the handle being moved to the full braking notch. This produces a considerable braking effect whilst the Car is moving rapidly. This application is not dependent on power from the Trolley, and may, therefore, be used even if the Trolley-pole be lowered, and it will operate (though

less effectively) when one motor is cut out. When applying this Brake, the same care must be exercised when passing over Brake Notches as when passing over the Power Notches, and the handle of the Reverser must be set for the direction in which the Car is running; the handle of the Controller must not, however, be moved too rapidly, as such a course may cause damage to the equipment, or skid the wheels.

(*e*) **Third Emergency.**—To apply the Third Emergency Brake, the Motorman must perform, in the order named, the following operations:—

(i) Place the handle of the Controller to the Off position.

(ii) Place the handle of the Reverser to the position at which an application of power will oppose the motion of the Car; and

(iii) Turn the handle of the Controller to First Series, and, if necessary, to (but not beyond) the Second Series notch.

If the Controller be turned beyond Second Series the Motors may lose their braking power, and the equipment may be damaged.

This application, whilst dependent for its action on power from the Trolley, will operate (though less effectively) when one Motor is cut out.

(*f*) **Fourth Emergency.**—To apply the Fourth Emergency Brake the Motorman must perform, in the order named, the operations specified hereunder:—

(i) Place the handle of the Controller to the Off position.

(ii) Place the handle of the Reverser to the position at which an application of power will oppose the motion of the Car; open the Circuit Breaker; and

(iii) Turn the handle of the Controller to the Full Parallel position, and hold it at such position until the Car has been stopped.

This Application is not dependent on power from the Trolley; nevertheless its action is likely to cause serious damage to the electrical equipment, and it must not be used except in a case of extreme emergency.

109. (*a*) **Use of Sand.**—The Motorman must frequently stir up the sand in the boxes, see that the sand gear works properly, and keep a sufficient supply of sand in the boxes whilst the Car is in traffic. Any defect of the sand gear must be noted in the Repairs Book; baskets, cans, etc., must not be carried in the sand boxes. In any instance in which it is necessary to use sand for Emergency Braking purposes, the Motorman must start the sand before applying the Brakes.

The Motorman must not use sand on or near any points unless such a course be necessary to avoid an accident.

(*b*) **Hand Brakes.**—The Motorman must Signal the Conductor to apply the Hand Brake where necessary when the Car is in motion. Except as provided in clause (*e*) of Instruction 64, or to prevent accident, the Conductor must not apply the Hand Brake unless he receive the signal from the Motorman to do so.

110. (*a*) **Preparing Car for Service.**—Before taking a Car into Service, the Motorman must perform, in the order named, the testing operations specified hereunder. He must—

(i) See that the Trolley-wheel is on the proper Contact Wire, that the Circuit Breaker and the Compressor Cut-out Switch are closed.

(ii) Ascertain the pressure-reading on each Pressure Gauge, and, if the pressure indicated is less than the maximum, see that the Air Compressor is working and that it produces the required pressure of 70 lb. per square inch.

(iii) Apply the Air Brake from No. 1 end of the Car by placing the handle of the Brake Valve to the Service application position; then place the handle to the Neutral position and examine the Brakes to see whether they have applied satisfactorily; and, if so,

(iv) Proceed to No. 2 end of the Car and release the Air Brake by placing the handle of the Brake Valve at that end to the Release position, and see that the Brake Blocks are released.

(v) Apply the Brake from No. 2 end by placing the handle of the Brake Valve to the Emergency Application position; see that the Brake applies satisfactorily; note whether the Air Compressor operates; and, if so, place the handle to the Neutral position.

(vi) Return to No. 1 end and release the Brake; and

(vii) Apply the Brake from the Conductor's Brake Valve, if one be provided.

(*b*) If the Air Compressor should fail to operate satisfactorily, or the Brakes fail to apply and release in the respective tests, the Car must be regarded as unfit for Service, and the Motorman must at once notify the Depot. See also clause (*b*), Instruction 57.

111. (*a*) **General.**—The Motorman must devote attention to the condition of the Air Brake, and at once investigate any indication of defect in any portion of the Apparatus. He must, by means of the Hand Brake, counteract unsteadiness due to defective Rheostats, but must not, otherwise, start the Car whilst the Brake is on.

(*b*) **Service Braking.**—Due care must be exercised in operating the Service Brake, which, for an ordinary stop, must be applied gradually and released. To avoid causing discomfort to passengers, and unnecessary strain on the equipment or needless loss of compressed air, a light application should be made at a sufficient distance

before reaching the stopping place; when the Car has been brought nearly to a stand the Air Brake should be released, and, where necessary, the Hand Brake must then be applied.

The Motorman must exercise due care to avoid wasting compressed air due to heavy application of the Brake for a Service Stop.

(i) When from any cause the Air Brake is inoperative, the speed of the Car must be limited to a rate at which the Car may be controlled, or, where necessary, stopped by means of the Hand Brake alone; in such circumstances the Hand Brake will form the Service Brake, but in cases of emergency the Motorman must make use of the Emergency Brake. See clause (*b*), Instruction 106.

(ii) The handle of the Controller must always be at the Off position when a Service Brake is applied.

(iii) The Air Brake must not be relied on to secure a Car on any gradient.

(iv) In order that the Hand Brake shall be thoroughly effective, it must be fully applied immediately after the Air Brake has been released.

(*c*) **Emergency Braking.**—When an Emergency Brake is used, the Hand Brake must not be applied until the Car has almost stopped; excessive braking causes the wheels to skid, which defeats the object in braking.

(i) An Emergency Brake may not stop a Car on a gradient, but it will reduce the speed of the Car to a low rate. If the Hand Brake be defective, the Motorman must take the necessary steps to scotch the wheels, or arrange for his Conductor to do so, where it is desired to bring the Car to a stand.

(ii) The Motorman must furnish a report to the Officer-in-Charge as soon as possible in every instance in which he uses an Emergency Brake. This clause will not, however, apply to the testing operations prescribed in clause (*e*) of Instruction 57.

(*d*) **Falling Gradients.**—When descending on any gradient the speed of the Car should be controlled by applying and retaining sufficient air in the Cylinder to prevent the Car from accelerating beyond the prescribed rates of speed; see Instruction 64.

For Special precautions when ascending or descending the gradient in Grey-street, St. Kilda, see clause (*e*), Instruction 64.

(*e*) **Skidding.**—The Motorman must endeavour to avoid skidding the wheels of the Car; the best effect in checking the speed is produced by retarding the rotation of the wheels without skidding. If the wheels skid whilst power from the overhead is applied, the Motorman must place the Controller to the Off position and apply power again in the regular way; if the wheels skid whilst the Brake is applied, he must apply sand to the rail, release the Brake sufficiently to allow the wheels to revolve, and again apply the Brake in such a way as to avoid skidding.

If, when the Conductor applies the Hand Brake, the wheels skid, he must release the Brake and, if necessary, apply it again.

(*f*) **Defects.**—In the event of any defect in the Air Brake or Hand Brake equipment, the particulars must be communicated to the Officer-in-Charge as soon as possible. If the Brakes on any Car in traffic are unserviceable, the Motorman must inform the Conductor, and the latter must arrange for all passengers to alight and to proceed to their destination by the next following Car; the defective Car must be run empty to the Car Shed.

The Motorman must, on each trip, frequently observe the indication on the Pressure Gauge.

(i) If at any time the indicator denotes that the pressure has fallen below 55 lb., the Motorman must bring the Car to a stand clear of Crossings and carefully note whether the Compressor is operating, and if the Compressor be working and the pressure indicator is not affected thereby, the Air Brake Apparatus must be regarded as unservicable; if, however, the Compressor be not operating the Motorman must see whether the Compressor Cut-out Switch is open and, if so, close it and note whether the Compressor is then actuated. If although the Compressor Switch is closed the Compressor is not working the Motorman after opening the Compressor Cut-out Switch, must renew the Fuse of the Switch, and, if the second and a third Fuse blow, the Air Brake Apparatus must be deemed to be unserviceable.

Note.—The Compressor Cut-out Switch must always be opened—i.e., placed to the Off position—before attempting to examine or change the Fuse.

(ii) If at any time the pressure rise above 75 lb. the Motorman must Stop the Car, and by applying and releasing the Brake endeavour to reduce the pressure in the Reservoir, and, if by these operations, the pressure be sufficiently reduced, he must, before starting, note whether the Compressor operates; if when the Air Pressure is reduced, the Compressor starts, but the Compressor is not automatically cut out when a pressure of 70 lb. is restored,

the Motorman must open the Compressor Cut-out Switch and regard the Air Brake Apparatus as unserviceable.

PERMANENT WAY AND WORKS AND OVERHEAD EQUIPMENT.

112. The Ganger must keep a register of the names and places of residence of all the men employed under him, so that in case of accident he may be enabled to summon them immediately to assist in any way that may be required. Should any obstruction take place, or other sudden emergency arise, he must immediately collect the number of men required.

113. Each gang of Trackmen or Labourers working on or adjacent to the Running Line must be supplied by the Ganger with a Permanent-way Gauge, a Red Flag, and two Green Flags and two Hand Signal Lamps. The Ganger will be held responsible for having the Hand Flags and Lamps maintained constantly in proper order and ready for use. The Flags must be used where necessary during daylight, and the Lamps after sunset and in foggy weather.

114. The Red Signal indicates danger, and must be used when it is necessary to stop Traffic. The Green Signal waved slowly from side to side by Trackmen indicates that Cars must reduce speed to five (5) miles an hour, or such other speed as may be prescribed, over the portion of the Line protected by such Green Signal.

115. (*a*) In any instance in which the track or overhead equipment is obstructed or unsafe, or in which it is necessary to carry out track or overhead repair work that will involve an obstruction to traffic (in which latter instance, due notice must be given to the Officer-in-Charge at the Depot) the Ganger must arrange for Danger Signals being plainly exhibited at a sufficient distance from the obstruction in both directions until the obstruction is removed or the defect remedied.

(*b*) The time for effecting any repairs that may involve the stopping of Cars must, as far as practicable, be selected so as not to interfere with the traffic more than is necessary.

(*c*) In the event of a Hand-signalman being stationed near the obstruction, he must be informed of its nature, and must protect the traffic until the obstruction has been removed.

For precautions to be adopted, and use of Permanent-Way or overhead Signals, during alterations or repairs, see Instructions 48, 49, *and* 50.

116. (*a*) No employé at work on the Permanent-Way must remain on any Running Line, nor between tracks, when any Car is approaching, but must at once move aside unless he can clearly see that he is in a position of safety and is not in danger from any other Car which may approach unobserved.

(*b*) In any instance in which overhead Repair-men or Trackmen are working at a place at which the approach of Cars cannot be heard or observed in sufficient time to ensure safety, the Ganger, or other employé in charge of the work, must appoint a Hand-signalman, on each side where necessary, to give the necessary warning to protect the gang.

(*c*) Alterations or Repairs that may affect any of the rail-bonds of the Permanent-Way must not be carried out unless the Ganger or other responsible employé has arrived and authorised such work.

(*d*) During foggy weather a rail must not be displaced, nor must any other work that may obstruct traffic be performed, unless it is essential to safety.

(*e*) In any instance in which, during alterations or repairs, it is necessary to use fire or lights, due care must be exercised to avoid any risk to the track equipment, rolling-stock, or adjacent property.

(*f*) Whenever the surface of the roadway is removed, proper signals must be exhibited to warn

vehicular and foot traffic; in addition, any necessary crossing places must be provided for street traffic, and every effort made to ensure the safety and convenience of the public.

(*g*) Disused material must be removed from the Running Lines as soon as possible and placed clear of the public roadways, and, unless othrwise ordered, it must be removed before sunset to the Depot.

(*h*) Tools, implements, sleepers and pieces of iron, wood or other material not actually in use must be kept clear of the tracks, and not within two feet of the nearest rail.

The Ganger is responsible for the custody and safety of all permanent-way material.

All tools and implements provided for repairs must, when not in actual use, be locked away in the building, truck, or box provided for such purpose, and the Ganger is responsible for its security.

117. (*a*) The Ganger or other appointed employé must travel over and examine the track once daily (exclusive of Sundays, unless otherwise specially ordered); he must note every irregularity in a pocket book provided for the purpose, and present such book daily to his superior officer, who will personally examine it and direct as to the carrying out of the ordinary repairs according to their order of importance, etc.; repairs that require urgent attention must, however, be promptly dealt with by the Ganger.

(*b*) The Ganger must see that sound material is substituted, with the least possible delay, for any broken rail, check rail, or sleeper, or any other defective material; every instance of a broken rail must be specially reported to the proper officer for subsequent investigation as to the cause of the breakage.

118. (*a*) The Ganger must see that the rails or guards do not at any point stand above the macadam or tar paving, particularly at Points, crossings, or

curves, and that the surface of the track between the rails, or immediately outside them, is not raised so high as to interfere with the mechanism of the Cars.

(*b*) The authorised super-elevation must be maintained on the outer rail of every curve.

(*c*) Unless otherwise ordered the Ganger must see that all Points are clean, lubricated, and in proper working order, and unless it is the duty of the track force to attend to cleaning, etc., of the Points, he must promptly communicate to the Officer-in-Charge at the Depot in every case in which the Points have not been cleaned, etc.

119. (*a*) The Ganger must see that every drain, rail, and rail groove is kept perfectly clean and free from obstruction, and must give special attention to this duty during and after any dust storm.

(*b*) In the event of heavy or continuous rain, he must examine carefully the action of the water through the streets, culverts, etc., on the track, and arrange for the track gang to clear the grooves of any rails which have a tendency to silt up. In any instance in which the Ganger apprehends danger to the Permanent-way, he must immediately signal Cars to proceed cautionsly or to stop, as necessity may require, and at once inform the Officer-in-Charge at the Depot by telephone or other means, and take all precautionary measures for securing the stability of the Permanent-way.

120. Any ladder, guy, scaffolding, or trastle, etc., must be kept at a proper clearance from the track during the erection or repair of any building, etc.

121. In any instance in which the Ganger notices any blasting or excavation which may be likely to interfere with the stability of the track, he must ascertain if the authority of the proper officer has been obtained; in either case he must demand that such operations shall be at once suspended, and immediately report the matter.

122. The Ganger must frequently check and examine the contents of the Emergency Tool Boxes and see that they are fully equipped and that the tools are in good order.

123. Every employé in charge of Points must examine them carefully, and clean and oil them every morning (unless this duty is otherwise provided for), and must at frequent intervals ascertain that they are in perfect order, and not damaged by the passage of cars or other vehicles. He must also test the Points occasionally by moving them to and fro, being careful to leave them set in the normal position; an obstruction between the Point blade and the rail must not be removed by the fingers.

124. (*a*) In the event of any defect in or damage to, or of any danger from adjacent wires coming into contact with the overhead electrical equipment, every employé must do all in his power to prevent injury to any person or damage to property, and full information must be telephoned to the Officer-in-Charge, who must at once notify the Substation Attendant and the Overhead Superintendent.

(*b*) The following are specified as some of the faults or irregularities likely to arise in the overhead construction and which should be reported by the most expeditious means.

(i) Wires hanging loose, that is, wires that are broken or appear to be out of position.
(ii) Any article hanging on the overhead conductor.
(iii) Steady rod attachments disconnected from the wire, or disconnected from the structure, and hanging on the wire.
(iv) Excessive flashing at some particular point or at switchgear.
(v) Bridge fittings or guards displaced.
(vi) Water flowing on the overhead conductors from verandahs, bridges, etc.