CRE 2-6 **Electricity Supply Department**

To accompany letter dated 29/ 9/47
to— **Engineer & Manager.**
from **Manager:Geelong Branch.**

GEELONG ELECTRIC TRAMWAYS.

LOCAL INSTRUCTIONS ISSUED IN CONJUNCTION WITH COMMISSION'S RULES GOVERNING EMPLOYEES.

Issued March, 1939.

1. Motormen and Conductors are required to be conversant with the By-Laws of the State Electricity Commission relating to tramways.

2. Preparing Tram for Traffic.

Motormen must examine the tram allotted to them for any defects, The lighting circuit must be texted; examine sanding device and see that the sand containers are filled; the air pressure gauge must be checked to see that a full working pressure is present in the reservoirs. See that the tram is equipped with two point shifters, point scraper, gong punches, switch stick, draw-bar, angle iron, insulated cable, lifting jack, oil lamp, 2 spare fuses (lighting and compressor) and 2 spare lamps, as motormen are held responsible for tram equipment after the tram leaves the Depot.

Motormen may ascertain the number of tram allotted to them, and its position in the Depot by inspecting the Tram Roster Board on the east wall. The disc indicating the number of the tram must be removed from "Cars in Depot" side of the Board and placed over the corresponding disc on the "Cars for Service" side of Board.

3. Departure and Duty before moving tram in Depot.

Motormen and Conductors must be ready to leave Depot at Schedule time. Before moving the tram, motormen must be careful to first ensure that no member of the Depot staff is working either in, on, or under the tram. In addition to this precaution, the foot gong must always be sounded as a general warning before tram is moved.

4. Speed of Trams Running to the Depot at Night.

Motormen are warned against driving trams at excessive rate of speed when going to the Depot at night. Trams must be left in the Depot with the hand-brakes firmly applied.

5. Cutting Out Defective Motors.

If a tram develops a fault which causes the automatic switch to open when series power is applied, usually No.1 motor should be cut out of circuit in the controller, and if the switch opens when parallel power is applied, No.2 motor should be cut out. See that the automatic switch is open before opening the controller case to make the necessary adjustment.

Trams Nos. 1. to 10., and 16. to 26., are equipped with W.H. controllers, and motors are cut out of circuit by lifting one finger on the reversing drums which number 1. or 2. as the case may be. Care must be taken to see that the small catch on the finger holds it from contact position. These trams start on the first parallel notch with only one motor in circuit.

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Note No 6. Revised as shown 28/1/47

5. Cutting out Defective Motors (ctd.)

Trams Nos. 14, 15, 27, 28, 29 and 30 (Birney Cars) are equipped with G.E. controllers. In the bottom right hand side of controller are two knife switches, the top one marked No.2 and the bottom No.1. To cut out either motor withdraw switch blade from existing contact, swing over and press into opposite contacts.

With either motor cut out the tram would travel on series positions of controller only.

6. Brakes.

The following defines the brakes available on all trams:-

Service Brake	Hand Wheel brake
	Air brake
Emergency	Full Air brake.

Revised 28/1/47

In the event of the failure of the air brake and there being insufficient time to bring the tram to a standstill with the hand brake, it is possible to stop the tram electrically.

Pull the reversing key back so that it is pointing in the opposite direction to that in which the tram is travelling and apply power on the first notch in series, and, in any case, not beyond the second notch. Should the retarding effect not be sufficient through the wheels spinning too fast, cut the power off and apply again, and repeat this process, if necessary, until the tram stops.

Should the circuit breaker open through the reversal of the motors, throw the power handle round to the last parallel position and leave it there until the tram is brought to a standstill. Remember! This operation is useless when a motor has been cut out.

In each of these two cases, sand should be applied until the tram comes to rest. It is important to note that in each of these two cases the reversing key must be pointing in the opposite direction to that in which the tram is travelling and neither of these two means will hold the tram in a stationary position, so that, having been brought to rest when the wheel brake is useless, it would be necessary to put something in front of the wheels to prevent the vehicle from moving unless on level track.

7. Birney Trams.

The emergency air brake on these trams can be applied either by removing the hand from the controller handle or moving the brake valve handle quickly to the emergency position, which is at the extreme right. Should it become imperative to stop in the shortest possible time and distance, the brake valve handle should be moved quickly to the emergency position and left there. Whilst the brake valve handle is in the emergency position, the hand should be removed from the controller handle.

8. Release after Emergency use on Birney Trams.

To release the brakes and restore normal conditions after emergency action, see that the brake valve handle is in Release Position on the extreme left, and hold the controller handle down until 50 lbs. pressure is reached in the main reservoirs, as indicated by the gauge.

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9. Changing Ends (Birney Trams only).

Preliminary to changing ends, the brake must be fully applied, when the brake valve handle and the controller handle can be removed. This brake application is required to prevent emergency action, which would otherwise occur upon removal of the controller handle, and it ensures that the tram will stand still during the time required to change ends. If the handles are not replaced in their proper positions within a reasonable time, to guard against excessive brake cylinder leakage, emergency action will automatically occur.

10. Reporting Use of Electrical Braking.

Motormen are required to always report the use of any electrical braking on the "Daily Report as to condition of Tram" form.

11. Reporting Tram Defects.

Motormen are required to fill in a "Motorman-Conductor's Daily report as to Condition of Tram" form intelligently and completely, whenever faults develop, and so enable speedy location of the defects by the Depot Staff.

12. Reporting Roadway Excavations.

Motormen are required to report to the first Inspector met, or to the Track Foreman, any instances of road excavations being made on or adjacent to the tram tracks.

13. Delays.

Delays of more than 3 minutes duration should be reported on the "Running Journal", time and cause given.

14. Compulsory Stopping Places.

Motormen are required to be familiar with the compulsory "All tram Stops" throughout the system, these are distinguished by a 3 inch white band around the pole in the centre of the red section in the service stop sign. All trams must be brought to a standstill at these stops.

15. Sectional Insulators.

Motormen are required to be familiar with the location of all sectional insulators throughout the system, and must switch off power when passing through, so as to avoid excessive arcing.

16. Absence of Relief.

In the event of a relief man being absent at the appointed time, the motorman or conductor is required to carry on until relief is obtained.

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17. Derailments.

In the event of a serious derailment, it is the duty of the motorman concerned to 'phone the Tram Depot from the nearest telephone. All derailments must be reported in writing to the Senior Traffic Inspector.

18. De-wirements.

The motorman must report to the first Inspector met, or Overhead Foreman all instances of the trolley pole leaving the overhead wire.

19. Standing by Trams.

When circumstances require the detention of trams for extra traffic or such causes, Motormen and Conductors must not leave their trams, and must be ready to respond immediately to signals or instructions.

20. Conductors.

The conductor shall not enter into conversation with the motorman while the tram is in motion. When not collecting fares his position is on the rear platform.

21. Processions etc.

Militia, Funerals, Ambulances and Fire Brigades always have the right of way, and when they are approaching or passing, trams must be kept under complete control. When a procession of any kind is crossing a tram track, trams must not proceed beyond the building line or near side of street down which the procession is passing.

22. Trams with Pole at each End.

The two poles must not be on the trolley wire at the same time when the tram is in the vicinity of a sectional insulator. When the tram is standing in a position which allows the two trolley wheels to be on the wire - one on each side of the sectional insulator - a bridge is formed and a section which is deemed to be "dead" will be made "alive".

The danger in connection with carelessness regarding this instruction cannot be too strongly emphasised, and it might result in serious injury

23. Railway Level Crossing, Melbourne Road.

All trams travelling in either direction must be brought to a stand-still not closer to the crossing than the concrete block placed in the track centre at approximately 40 feet from the crossing. No attempt shall be made to move a car beyond the aforesaid concrete block until the conductor from centre of crossing gives the "all clear" signal. When a train or part thereof is being operated in the vicinity of the crossing, the tram must be kept stationary until the railway vehicle has been brought to a stand-still and the man in charge signals that all is clear by waving his arm, or, at night, his hand lamp. The speed of trams when crossing the railway line must

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23. ctd. not exceed a walking pace. Conductors must not give the signal to proceed until they know all is clear.

Motormen-Conductors on one-man operated trams, after stopping, must look both ways and satisfy themselves that all is clear before proceeding across the railway line.

24. Public or Private Telephones.

When a public or private telephone is used to report an accident or unusual occurrence, and a fee for using same has to be paid, Motormen or Conductors may take the amount, which is usually 2d., from their change and will be reimbursed on making application to the Office.

ELECTRICITY SUPPLY DEPARTMENT - Phone No. 5941
with connection to residences of :-

Tramways Inspector (through the switchboard)
Senior Traffic Inspector - (Phone 5278)
Depot Foreman. (through the switchboard)
Overhead Foreman (through the switchboard
Overhead Sub-Foreman (through the switchboard)

25. Automatic Signalling Apparatus.

Signal boxes have been placed on the north-east corner of Aberdeen and Pakington Streets, north-east corner of Autumn and Pakington Streets, West Geelong Route, also on the centre poles in the McKillop Street and Viaduct loops, Belmont Route.

The signal system is operated by the contact of trolley wheel with insulated strips called contactors; those in the position of a tram about to leave a loop are known as setting contactors, and those near the entering end of the loop are restoring contactors. The necessity for the trolley wheel remaining in contact with the trolley wire when running through the contactors requires that the speed of the tram shall not exceed 6 m.p.h., and, to avoid arcing, power should be cut off at controller.

The arrangement of the signal is such that when a RED light is showing at one end of a single track section, there must be a GREEN light showing at the other end, and vice versa. It is necessary for motormen to clearly understand that these signals are a self operated system and give only an indication of the condition of the section of single track concerned. When no light is showing it indicates that the section is empty of trams. When a RED light is showing it indicates that there is a tram in the section moving towards the RED signal. When a GREEN light is showing it indicates that there is a tram in the section moving away from the GREEN signal.

It is to be understood that a motorman arriving at a loop finding a RED or GREEN light showing, is not free to proceed any further until the tram in

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25. Automatic signalling Apparatus. (Ctd.)
the section concerned restores the signal to blank (no lights). When the signals are blank (no lights), the movement of the tram under the contactor near the leaving end of the loop gives the GREEN signal and the motorman is then all clear to proceed to the next loop. A Motorman must not proceed into a section of single track controlled by signals unless he himself sets the GREEN (all clear) signal.

The location of contactors and signal boxes is arranged so that should the GREEN signals not be obtained or a RED signal light up, the tram can be stopped before arriving at the points at the leaving end of the loop. In the former instance, no light would indicate one of the two faults:-

1. Trolley wheel did not make the necessary contact with contactor.

2. That the signal circuit is out of order.

To prove which fault exists, the car must be reversed so that the trolley wheel runs back into the contactor. If still no signal, this would indicate a fault in the signals. In this case word should be sent at once to the traffic office, then proceed with extreme caution, keeping in mind where other trams are to be expected.

If, in passing over the contactor, a RED signal appears, this indicates that another tram has entered into the section from the opposite end first, and, inasmuch as the tram has passed the setting contactor, it will be necessary to return to the contactor so that a signal be obtained as soon as the other tram arrives and clears the RED signal.

In connection with trams running in duplicate, such as to and from the depot, in which case the first tram will operate and clear the signal, the general rule to be observed is that no Motorman will follow another tram through a single track section unless he is within 80 yards of the preceding tram and has advised the Motorman of the preceding tram accordingly. If a greater distance separates trams, the second tram must wait until the first tram clears the signal before it enters and obtains its own proceed signal. Thus the showing of a GREEN light does not give "all clear" unless it is switched on by the tram entering the section, or, as stated, the second tram is within 80 yards of the tram which did operate the signal.

If power goes off, all signals are immediately put out, and in this respect the resumption of power requires special consideration as follows:-

When a tram is in a signal controlled section and power goes off, the motorman must realise that the RED signal will not be showing at the loop he is approaching, and with continuous use of gong around any curves and blind spots, and by extremely cautious driving he will resume his progress through the section. There must be no attempt at this juncture to make up any lost time.

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25. Automatic Signalling Apparatus (Ctd.)
Similarly the Motorman of any tram not in a signal controlled section when power goes off, must, upon resumption and approach to signal controlled section, make as certain as possible that there is no tram in the section he is about to enter by referring to time schedule, and as to where other trams are normally passed, then proceed very cautiously, and, by use of gong and reduced speed in blind areas, be prepared to stop at the shortest notice.

In order that all Motormen be aware that power has been off, the power, if interrupted, will not be restored in less than 1 minute in day-time.

26. Automatic Indicator at West Terminus.

An Indicator which is automatically controlled, both for the switching on and off, is placed on the Telegraph Bridge adjacent to the West terminus. The object of this Indicator is to acquaint people on the east side of the bridge with the fact that a car is approaching, or waiting at the terminus.

In addition to the automatic switches, a Pistol Switch is installed on the pole at the Hotel corner, and the motormen will be expected, whenever time permits, to switch the light off at this point. A stick for operating this switch will be kept on each car.

It will be readily seen that switching off the light by hand serves a two-fold purpose. In the first place the light will be switched off before the car actually leaves, and, in the second place, it enables the motormen to see anybody who may be coming.

Method of stopping trams when out of control.

In the event of a motorman suffering from a seizure of any kind and having fallen across the controller and the controller handle on a Birney tram, the conductor or conductress must -

Birney Trams.

(1) Remove disabled motorman from off the controller in order to allow the emergency brake to operate.

(2) Then apply the hand brake firmly.

(3) Communicate with the Tramway Depot by telephone unless a Traffic Inspector is available.

On other class of trams the procedure is as follows:-

(1) Open the main switch on the rear platform, by placing the handle on the off position.

(2) Apply the hand brake firmly on the rear platform.

(3) Communicate with the Tramway Depot by telephone, unless a Traffic Inspector is available.

TRAMCAR EMERGENCY BRAKING.

The following is a brief description of the air-brake system and advice regarding all air and magnetic brake trams owned by the Commission.

(1) An electric motor compressor pumps air into two reservoirs where it is stored for use by the motorman as required.

(2) The governor, which is actually an electric switch, is automatically controlled for the "on" and "off" positions by the amount of air pressure in the reservoirs, so that when the pressure drops to the predetermined minimum figure the switch closes and the compressor motor starts up and when the predetermined maximum figure is reached, the switch opens and the motor ceases to pump. This governor, therefore, maintains the required pressure in the reservoirs under normal conditions.

(3) By the use of the motorman's brake valve handle (which can be likened to a tap) the motorman can, by turning the handle to the right, allow air to pass from the reservoirs to the brake cylinder, the piston of which through a system of levers forces the brake shoes on to the wheels.

(4) The gauge in each motorman's cabin indicates the air pressure in the reservoirs which is always the same in each, being connected by an equalising pipe. The importance of the motorman watching the gauge should be obvious and should the pressure drop below 50 lbs. the hand brake must be used until the tram is taken from service. It is important that motormen be familiar with details of the compressor electrical circuit so that they may rectify minor faults, such as replacement of fuse, etc.

(5) The hand brake is a mechanical means of applying the shoes to the wheel, and, although thoroughly reliable, it is slower and not so easy to apply as the air-brake.

(6) The maximum braking effect is obtained when the pressure on the shoes will almost skid the wheels under conditions that give the greatest grip between the wheels and the rails and our air-brake has been so designed as to give this required effect. This fact cannot be too strongly emphasised as some motormen have resorted to other means of stopping their trams with results which have been far from satisfactory.

(7) Continual daily practice in the intelligent use of the brake should fit motormen to deal with each situation of varying conditions that arise such as speed, load, and rail condition, but one outstanding feature may be stated with profit and we will treat the subject on the assumption that the rail condition is good at the time.

(8) The greater the speed the less risk of skidding the wheels; therefore, at high speed a heavier application of the brake can be made than when travelling at lower speed, and, as the speed decreases, the pressure on the shoes must be reduced by allowing some of the air to be exhausted from the brake cylinder through the brake valve by turning the handle to the left.

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Note. X Revised as shown. 28/1/47

(9) From the foregoing paragraph it will be seen that, in an emergency, in order to stop the tram as quickly as possible, the handle should be instantly turned to the right to an extent in proportion to the speed, that is, at full speed it should be turned to the full extent, which is the full emergency position.

(10) When driving a "Birney" tram and an emergency makes it necessary to stop as quickly as possible, turn the brake valve handle instantly to the emergency position, or, if the necessity arises, remove hand from controller handle and do not depress it again until the tram has been brought to a standstill.

(11) In case of emergency when the rails are slippery, a brake application must be instantly made to the maximum extent consistent with the rail condition. Should the wheels lock and skid, release the brake momentarily and instantly re-apply - but to a lesser extent than previously - and repeat if necessary until the tram is brought to a standstill or the danger is past. Sand must be applied throughout the period of braking.

X Revised 28/1/47

In the event of the failure of the air brake and there being insufficient time to bring the tram to a standstill with the hand brake, it is possible to stop the tram electrically.

Pull the reversing key back so that it is pointing in the opposite direction to that in which the tram is travelling and apply power on the first notch in series, and, in any case, not beyond the second notch. Should the retarding effect not be sufficient through the wheels spinning too fast, cut the power off and apply again, and repeat this process, if necessary, until the tram stops.

Should the circuit breaker open through the reversal of the motors, throw the power handle round to the last parallel position and leave it there until the tram is brought to a standstill. Remember! This operation is useless when a motor has been cut out.

In each of these two cases sand should be applied until the tram comes to rest. It is important to note that in each of these two cases the reversing key must be pointing in the opposite direction to that in which the tram is travelling and neither of these two means will hold the tram in a stationary position, so that, having been brought to rest when the wheel brake is useless, it would be necessary to put something in front of the wheels to prevent the vehicle from moving unless on level track.