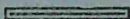
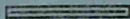


**MELBOURNE AND METROPOLITAN
TRAMWAYS BOARD.**

EASTERN SYSTEM.



**Instructions to Motor-
men and Conductors
on Efficient Operation
of Tramcars and
Tramcar Equipments.**



1920.

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November, 1920.

Safety First

INSTRUCTIONS TO MOTORMEN AND CONDUCTORS ON EFFICIENT OPERATION OF TRAMCARS AND TRAM- CAR EQUIPMENTS.

GENERAL PRINCIPLES.

Savings in power required for operating tramcars are directly proportional to the amount of coasting, i.e., running with power and brakes off, done during the trip.

If the amount of coasting is increased by 10 per cent., the amount of power used is reduced by 10 per cent. Increasing the amount of coasting is the only way within their control, in which the motorman and conductor can decrease the amount of power used.

The factors affecting the amount of coasting that can be done are:—

1. Operation of controller.
2. Time taken at stops.
3. Time taken in stopping the car.
4. Prevention of unnecessary delays caused by—
 - (a) Neglect to get away from terminus and stopping places promptly.
 - (b) Slackness in relieving crews on time at change of shift, meal relief, etc.
 - (c) Inattention to trolley pole at curves and special work.
 - (d) Running over special work and sharp curves at too high a speed, or with brakes on, thus causing delays through derailments and the trolley leaving the wire.

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1.—CORRECT OPERATION OF THE CONTROLLER.

Modern tramcar motors are designed to allow of notching up to full parallel on a level grade in from 9 to 10 seconds.

On an up-grade, the time taken should be increased, but to not more than 14 seconds, according to the steepness of the grade.

On a down-grade, the time taken may be decreased to any time down to 7 seconds, according to grade. On a steep grade no power at all will be required. Gravity may be used to do the acceleration.

When notching up to full parallel, do not dwell on the series running notch. Treat this notch as an ordinary notch, and give it only its portion of the total time to full parallel.

Motormen should train themselves with a watch in front of them till they are operating the controller properly, viz., taking not more than 10 seconds to full parallel on a level track, and giving each notch its part of the total time, i.e., on an eight notch controller, $1\frac{1}{4}$ seconds to each notch.

When leaving certain stopping places, where there is a steep down-grade—lists of such places are given for each route—motormen should notch up only to series, and then cut off, as the down-grade will quickly give them all the speed required. At certain points—also specially mentioned—no power should be used.

Remember that gravity does not cost anything while power costs $1\frac{1}{2}$ d. for every unit used.

When the motorman knows that he is to stop at the next stopping place, and the distance is not more than five to six pole lengths, he should not notch beyond series.

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The motorman should endeavour to keep his car going at a good even pace.

The motorman should coast and have car well under control when coming up behind traffic, which is blocking the road.

Motorman will see that it is much safer to be running with power off wherever possible. There are less things to do to get the car stopped, so as to avoid a collision.

Do not run right up, with power on, to a vehicle blocking the road, and then jam your brakes on. That is the trick of a fool trying to commit suicide. Your brakes may fail.

A motorman will improve his driving by checking himself against the road, i.e., when cutting off after notching up he should do so a little sooner than he did it at the same place on the last trip, arriving finally at the highest coasting obtainable without running late.

When cutting off for an insulator or frog, this should be done as late as possible before the trolley wheel reaches the insulator or frog, and power switched on again immediately. If this is done, the controller may, when being cut in again be swung round to full series or full parallel notch, according to whether the car was running at series or parallel speed. If the car is on an up-grade, however, judgment should be used, and the handle swung round to the notch corresponding to the speed of the car at the time of applying power again.

When waiting at a stop on a grade for the signal to start, the motorman should have his right hand on the hand brake or air brake handle, as the case may be, and his left hand on the controller handle, ready to release brake, and start the car immediately he gets the signal. On a level grade, the brake should be off.

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2.—STOPPING TIME.

Time wasted at stops is also a fruitful source of increased power consumption.

If 40 stops be assumed on an eight-mile trip, and each stop takes two seconds longer than it should, the total is 1min. 20secs. running time lost per single trip, or on 20 trips per day 27min. in a 16-hour day.

The motorman can cut down the stopping time by stopping his car with an entrance immediately opposite those intending to board, and by starting his car promptly on the signal.

The conductor can cut down the time wasted at stops by assisting elderly passengers, by keeping gangways clear if the car is not overcrowded, by politely asking passengers to hurry on or hurry off, by giving the starting signal promptly, and by being generally alert and attentive to his duties.

In doing all this, however, the conductor should take no risks of starting the car while passengers are alighting or boarding the car.

3.—BRAKES.

A fast rate of braking can be attained with air brakes without discomfort, provided the brakes are partly released before the car comes to a standstill. This enables the car to be stopped in a shorter time, and results in increased coasting, i.e., running at a higher average speed than during braking.

4.—UNNECESSARY DELAYS.

- (a) Cars should leave termini on time.
- (b) Relieving crews should be awaiting their car outside the Depot ready to take the car over promptly. It is not a fair deal that crews should not leave the mess-room to relieve a crew until a car stops at the Depot gate.

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- (c) If a conductor omits to watch the trolley round sharp curves and through special work, serious delays may be caused by the pole coming off and damaging the overhead.

Remember: Delays mean increased power consumption. Your car becomes late, and has to pick up more than its fair share of passengers. This means longer stops and increased delay and extra work for the conductor.

Running on time reduces overcrowding to a minimum. If your car is running late, you pick up passengers that belong to the car following.

If a motorman runs his car through curves or special work at too high a speed, or with brakes on, not only may he cause serious delays through accidents such as derailments, and the pole leaving the wire, but he causes serious damage to every part of the equipment.

All braking should be done before entering sharp curves or special work. The car should be slowed down to the right speed, and allowed to enter the curve or special work with brakes off. Having brakes on is a fruitful cause of derailments, especially with bogie cars, as the trucks are prevented from swinging freely.

5.—GENERAL.

Apart from power-saving, proper operation results in decreased damage to all parts of the tramway cars, car equipments, track and overhead. It prevents accidents, and is in all ways on the side of safety.

Faulty operation of the controller, resulting in failure to cut off power at frogs, section insulators, and splice ears, causes serious damage to the overhead fittings and wire.

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Report promptly any car which is in any way defective. Report the car which seems to start too slowly, or which does not run freely. Report defective or weak brakes. Report dragging brakes. Such reports will make for greater safety and better economy in operation.

Report any sections in the run or places at which you regularly meet obstructions or have to run slow due to low voltage or for other reasons. **Further avoid arriving at your destination or meeting point ahead of Schedule time. The only way you can have done this was to have used more power than was necessary.**

The conductor should give the motorman a clear signal just as soon as he is ready to have him start.

As soon as the car starts, he should call out in a clear voice the name of the next street or stopping point, so that as early as possible passengers may signify their desire to stop. A bell in time will often prevent the motorman from throwing his controller handle over to the parallel position unnecessarily, and so you will have helped to save power.

Hereunder are tables setting out the manner in which the controller should be operated on down grades so as to ensure no unnecessary use of power.

HAWTHORN LINES.

(Routes 16 to 21.)

Burke Road to Wattle Park.

Pole 22, Derby St.	Series to Pole 23, then cut off and coast to Railway Loop.
Through Railway Loop	Series to crossing, then cut off, and coast to Pole 34.
Middlesex Road	Series to Pole 79, then coast.

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Wattle Park to Burke Road.

From Terminus	Series for one pole length, then coast.
All Stop marks to Pole 85 Pole 65	Coast, using no power.
Wattle Valley Loop	Coast to Wattle Valley Loop.
All stop marks to Willow Grove	Series Cutting off at Pole 59.
All stops from Trafalgar Road to Burke Road Junction.	Series cutting off after one pole length, and coasting.
	Series, cutting off after one pole length, and coasting.

Burke Road to Burwood.

Bellett St., Pole 255	Series, cutting off at Pole 524, and coasting.
All stop marks to Hartwell Loop	Series, cutting off after 1 pole length, and coasting.

Burwood to Bowen Street.

Alfred Road, Pole 338	Series, cutting off at Pole 337, and coasting from that point.
All stop marks from Through Road to Burwood Loop	Series, cutting off after 1 pole length, and coasting.

Bowen Street to City.

From Stop at Pole 245 (Rowell Avenue)	Series.
From stop at Pole 404 (Tooronga Road)	Series for 2 pole lengths, then coast.
From stop at Pole 164 (Fordholm Road)	Series for 1 pole length, then coast.
From stop at Pole 152 to Section (Power St.)	Coast all the way.

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From stop at Section Series round curve, and
(Power St.) coast to Depot Gates.

From stop at Church St. Series only.
to Docker St.

From stop at Lennox St. to Series only.
Richmond Station

City to Burke Road.

Richmond Station to Len- " "
nox Street

Brighton St. Cut off at crest of Hill

Pole 143 to Section (Power Series.
St.)

Pole 171, Glenferrie Road E. Series to Pole 173, then
coast.

Depot to Bridge Road.

Do not go beyond series
anywhere

From stop at Pole 44 Series for one pole length,
(Lisson Grove) then coast.

From stop at Pole 25 Series for one pole length,
(Morang Road) then coast.

From stop at Pole 11 Series for one pole length,
then coast.

Bridge Road to Depot.

From stop at Pole 11 Series for one pole length,
(Church St.) then coast.

From stop at Pole 16 Series for one pole length,
(Yarra St.) then coast.

From stop at Pole 33 Series for one pole length,
(Manningtree Rd.) then coast.

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MALVERN AND KEW LINES.

Grange Road to Elsternwick.

(Route No. 11.)

From stop at Pole 154 Work Controller to parallel
(Laura St.), then coast
from Pole No. 152.

From stop at Pole No. 148 Series two pole lengths, then
(Kambrook Rd.) coast.

From stop at Pole No. 143 Series two pole lengths, then
(Griffiths St.) coast.

From stop at Pole No. 100 Work controller to parallel,
(Kooyong Rd.) then coast.

From stop at Pole No. 86 Work controller to parallel,
(Victoria St.) then coast from Pole No.
84.

Elsternwick to Point Ormond.

(Route No. 11.)

From stop on West side of No power, release brakes,
Station (Elsternwick Sta- then coast to St. Kilda St.
tion)

From stop at Pole No. 54 Series one pole length, then
(Pt. Nepean Rd.) coast.

From stop at Pole No. 42 Work controller to parallel,
(St. Kilda St.) then coast from Pole 40.

Point Ormond to Elsternwick.

After leaving terminus Work controller to parallel,
(Point Ormond) then coast from Pole No.
9 to Broadway.

Safety First.

Darling Road to Glen Huntly Road.

(Route No. 10.)

- From stop at Pole No. 13 Series two pole lengths, then
(The Avenue) coast.
From stop at Pole No. 59 Work controller to parallel,
(Park Crescent) then coast from Pole 56.
From Stop at Pole No. 39 Work controller to parallel,
(Healstead St.) then coast from Pole 37.
From stop at Pole No. 21 Work controller to parallel,
(Caulfield Town Hall) then coast from Pole 19.

Glen Huntly Road to Darling Road.

(Route No. 10.)

- From stop at Pole No. 21 Work controller to parallel,
(Caulfield Town Hall) then coast from Pole 26.
From stop at Pole No. 134 Work controller to parallel,
(Balaclava Junction) then coast from Pole 139.
From stop at Pole No. 151 Work controller to parallel,
(Bambra Rd) then coast from Pole 154.
From stop at Pole No. 45 Work controller to parallel,
(Finch St.) then coast from Pole 40.
From stop at Pole No. 38 Work controller to parallel,
(Burke Rd.) then coast from Pole 36.
From stop at Pole No. 31 Series two pole lengths, then
coast.
From stop at Pole No. 8 Series for two pole lengths,
(Hughes St.) then coast.

Deepdene to Glenferrie Road.

(Route No. 12.)

- From stop at Pole No. 135 Series two pole lengths, then
(Warroo) coast.
From stop at Pole No. 95 Series one pole length, then
(Broadway) coast.

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- From stop at Pole No. 91 Series one pole length, then
(Cookston St.) coast.
From stop at Pole No. 87 Series one pole length, then
(Mayston St.) coast.
From stop at Pole No. 87 Series one pole length, then
(Mayston St.) coast.
From stop at Pole No. 47 Series one pole length, then
(Myrning Gr.) coast.
From stop at Pole No. 41 Series one pole length, then
(Anderson St.) coast.
From stop at Pole No. 22 Series one pole length, then
(Violet Farm) coast.
From stop at Pole No. 82 Series two pole lengths, then
(Belmont Av.) coast.
From stop at Pole No. 178 Series one pole length, then
(Osborne Av.) coast.

Glenferrie Road to Deepdene.

(Route No. 12.)

- From stop at Pole No. 138 Work controller to parallel,
(Glenferrie Rd.) then coast from Pole 137.
From Pole at stop No. 142 Series one pole length, then
(Plant St.) coast.
From stop at Pole No. 149 No power, release brakes,
(Elizabeth St.) then coast.
From stop at Pole No. 155 Work controller to parallel,
(Bonview Rd.) then coast from Pole 157.
From stop at Pole No. 3 No power, release brakes,
(Gardiner Station) then coast.
From stop at Pole No. 59 Series one pole length, then
(Seymour Av.) coast.
From stop at Pole No. 63 Series one pole length, then
(Inglesby Rd.) coast.
From stop at Pole No. 66 Series one pole length, then
(Campbell Rd.) coast.

Safety First.

Glenferrie Road to St. Kilda Road.

(Route No. 12.)

- | | |
|--|---|
| From stop at Pole No. 114
(Kooyong Rd.) | Work controller to parallel,
then coast from Pole 111. |
| From stop at Pole No. 106
(Densham Rd.) | Series one pole length, then
coast. |
| From stop at Pole No. 99
(Clandon St.) | Work controller to parallel,
then coast from Pole 96. |
| From stop at Pole No. 76
(Mathoura Rd.) | Series one pole length, then
coast. |
| From stop at Pole No. 67
(Williams Rd.) | Series two pole lengths, then
coast. |
| From stop at Pole 61 (Hob-
son St.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 56
(Cromwell Rd.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 20
(Punt Rd.) | Work controller to parallel,
then coast from pole 16. |

Wattletree Road to Windsor.

(Route No. 8.)

- | | |
|--|--|
| From stop at Pole No. 72
(Kooyong Rd.) | Work controller to full paral-
lel, coast from Pole 69. |
| From stop at Pole No. 61
(Waiora Rd.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 56
(Hampden Rd.) | Series one pole length, then
coast. |
| From stop at Pole No. 49
(Orrong Rd.) | Work controller to full paral-
lel, coast from Pole 45. |
| From stop at Pole No. 41
(Irvine Av.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 26
(Williams Rd.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 15
(Westbury St.) | Series two pole lengths, then
coast. |

Safety First.

Burke Road to St. Kilda Road.

(Route No. 1.)

- | | |
|---|---|
| From stop at Pole No. 16
(Finch St.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 22
(Westgarth St.) | Series one pole length, then
coast. |
| After rounding curve at the
Town Hall | Coast from Pole No. 122. |
| From stop at Pole No. 111
Hunting Tower Hotel) | Series one pole length, then
coast. |
| From stop at Pole No. 73
(Koonwarra) | Series two pole lengths, then
coast. |
| From stop at Pole No. 62
(Joycé St.) | Series one pole length, then
coast. |
| From stop at Pole No. 56
(Williams Rd.) | Series two poles length,
then coast. |
| From stop at Pole No. 10
(Punt Rd.) | Series two pole lengths, then
coast. |

Town Hall to Glen Iris.

(Route No. 2.)

- | | |
|---|---|
| From stop at Pole No. 133
(Northbrook) | Series one pole length, then
coast. |
| From stop at Pole No. 138
(Spring Rd.) | Series one pole length, then
coast. |
| From stop at Pole No. 143
(Park St.) | Series one pole length, then
coast. |
| From stop at Pole No. 157
(Tooronga Rd.) | Series two pole lengths, then
coast. |
| From stop at Pole No. 190 | Series one pole length, then
coast. |

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Glen Iris to Town Hall.

(Route No. 2.)

- From stop at Pole No. 185 Series round loop, then
(Burke Rd.) coast.
From stop at Pole No. 180 Series one pole length, then
(Scott Gr.) coast.
From stop at Pole No. 176 No power, release brakes,
(Victor Rd.) and coast.

Town Hall to Cotham Road.

(Route No. 4.)

- After leaving Town Hall Work controller to parallel,
then coast from Pole 44.
From stop at Pole No. 54 No power, release brakes,
(Malvern Rd.) then coast.
From stop at Pole No. 73 Series one pole length, then
(Toorak College) coast.
From stop at Pole No. 84 Series one pole length, then
(Toorak Rd.) coast.
From stop at Pole No. 91 No power, release brakes,
(Mernda Rd.) then coast.
From stop at Pole No. 97 No power, release brakes,
(Kooyong Station) then coast.
From stop at Pole No. 134 No power, release brakes,
(Riversdale Rd.) then coast.
From stop at Pole No. 143 Series one pole length, then
(Urquhart St.) coast.

Cotham Road to Town Hall.

(Route No. 4.)

- From stop at Pole No. 200 Series one pole length, then
(Wellington St.) coast.
From stop at Pole No. 195 Series one pole length, then
(Kelndah) coast.

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- From stop at Pole No. 191 No power, release brakes,
(Fitzwilliam St.) then coast.
From stop at Pole No. 184 Series one pole length, then
(Barker's Rd.) coast.
From stop at Pole No. 155 Series one pole length, then
(Burwood Rd.) coast.
From stop at Pole No. 129 Series one pole length, then
(Clere Mont) coast.
From stop at Pole No. 125 No power, release brakes,
(Woodcliff) then coast.
From stop at Pole No. 120 No power, release brakes,
(Callantina Rd.) then coast.

Esplanade to the Town Hall.

(Route No. 4.)

- From Esplanade to Barkly Street Series.
From stop at Pole No. 96 Series one pole length, then
(Labassa Gr.) coast.
After leaving Kooyong Rd., Work controller to parallel,
then coast from Pole No. 117.
Pole No. 114

Town Hall to the Esplanade.

(Route No. 4.)

- From Town Hall to "Series," and coast.
Goldblo. Rd.
From Goldblo. Rd. to "Series," and coast.
Wattle tree Rd.
From stop at Pole No. 93 Series around curve, then
(Dandenong Rd.) coast.
From stop at Pole No. 62 No power, release brakes,
(Arthur St.) then coast.
From stop at Pole No. 114 Series one pole length, then
(Kooyong Rd.) coast.

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- From stop at Pole No. 90 (Orrong Rd.) Series one pole length, then coast.
- From stop at Pole No. 78 (Koala) Series two pole lengths, then coast.
- From stop at Pole No. 73 (Alexander St.) Series two pole lengths, then coast.

East Kew to Post Office.

(Route No. 14.)

- From Terminus. Series around curve, then coast.
- From stop at Pole No. 109 (Adeney Av.) Series one pole length, then coast.
- From stop at Pole No. 67 (Parkington St.) No power, release brakes, then coast.
- From stop at Pole No. 63 (Peel St.) Series one pole length, then coast.

Kew Post Office to East Kew.

(Route No. 14.)

- From stop mark at Pole No. 72 (Charles St.) Series one pole length, then coast.
- From stop at Pole No. 75 (Derby St.) Series one pole length, then coast.
- From stop at Pole No. 80 (Disraeli St.) Series one pole length, then coast.
- From stop at Pole No. 85 (Gladstone St.) Series one pole length, then coast.
- From stop at Pole No. 89 (Hartington St.) No power, release brakes, then coast.
- From stop at Pole No. 95 (Bright St.) No power, release brakes, then coast.

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Victoria Bridge to Mont Albert.

(Route No. 15.)

- From stop at Pole No. 17 (Findon St.) Series one pole length, then coast.
- From stop at Pole No. 24 (Kent St.) Series one pole length, then coast.
- From stop at Pole No. 7 (Railway Crossing) Series one pole length, then coast.
- From stop at Pole No. 30 (Maleela) Series one pole length, then coast.

Mont Albert to Victoria Bridge

Route No. 15.

- From Terminus "Series" to Brenbeal Street Loop.
- From stop at Pole No. 46 (Power St.) Series one pole length, then coast.
- From stop at Pole No. 26 (May St.) Series round loop, then coast.
- From stop at Pole No. 72 (Mont Victor Rd.) Series one pole length, then coast.
- From stop at Pole No. 42 (Adeney Av.) Series two pole lengths, then coast.
- From stop at Pole No. 20 (Glenferrie and Cotham Rds.) Series two pole lengths, then coast.
- From stop at Pole No. 13 (Charles St.) No power, release brakes, then coast.
- From stop at Pole No. 53 (Princess St.) Series around curve, then coast.
- From stop at Pole No. 41 (Stevenson St.) Series one pole length, then coast.
- From Stop at Pole No. 36 (O'Shannesy St.) Series one pole length, then coast.
- From stop at Pole No. 8 (Harrison St.) Series one pole length, then coast.

