

INSTRUCTIONS
TO DRIVERS
ON Z CLASS TRAMS

Operations Training Tram & Bus

1st. May 1989

OPERATION OF "Z" CLASS TRAMS

1. When running the tram out make sure that:-

- (a) No one is working in, around, or underneath your tram.
- (b) Front pole is under the hook and rear pole is on the wire using right hand rope only to move the poles.
- (c) Place key in entry switch, press to the right to open the door.
- (d) Open circuit breaker cupboard and check all green buttons are in.
- (e) Place key in control panel and turn to the right to open.
- (f) Turn battery switch on and forward/reverse switch to forward position.
- (g) Sound warning bell, push small black button to check panel lights.
- (h) Check all control panel equipment at each end, including sand.
- (i) Operate all doors, check that red panel light goes out when all doors are closed.
- (j) Adjust destination control at No. 1 end, check for point bar.
- (k) Press safety pedal halfway down with left foot, ring warning bell, press right foot gently on accelerator pedal and tram will move. Drive tram carefully out of shed, stop and examine for signs of recent damage. If any, report details to the Depot Starter.
- (l) When turning out of depot into traffic, sound warning bell, be ready to stop.

2. Changing ends at terminus

- (a) Set door operating switches for travel in opposite direction.
- (b) Turn forward/reverse switch off.
- (c) Close control panel lid.
- (d) Remove key, leave the tram through exit door.
- (e) Place pole carefully on the wire; rear vision mirror toward windscreen.
- (f) Place front pole under the hook; rear vision mirror into driving position.
- (g) Inspect tram briefly, unlock control panel, check exit door unlocked.

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- (h) Adjust destination and route number.
- (i) Conductor or driver to stay on tram at all times.

3. Running tram into Depot

- (a) Open entry door.
- (b) Turn forward/reverse switch off, then turn battery switch off.
- (c) Check all panel lights out, close and lock control panel lid.
- (d) Use key to close entry door by turning key to left.
- (e) Take key to office and report all defects on tram sign-off sheet.

4. No Power

If no power is available when trolley pole is on overhead wire, check circuit breaker box to make sure all circuit breaker buttons are in correct position.

5. Keys for Tram

Two keys are needed for the tram.

- (a) Control panel key, which opens doors and control panels.
- (b) Circuit breaker cupboard key, which opens door to circuit breaker.

6. Disc Button (BLUE)

When starting up-hill, push Disc Button to prevent tram rolling backwards. Then move acceleration pedal down and take finger off button. If tram rolls backwards, quickly push blue button again and tram will stop. Take foot off acceleration pedal. Then move acceleration pedal down and take finger off blue button.

7. Brake Release Button (BLACK)

To let tram roll down - hill, without moving acceleration pedal, push Brake Release Button. Brake pedal must be used to stop tram. Do not use Black Button if tram is on up-hill slope.

8. Turn Indicators

Push yellow arrow for direction of turn.

Push centre red button to turn off flashing lights.

Note: If any globe is defective, red button light will come on.

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9. Line Breaker Reset Button (WHITE)

If line breaker light comes on, push L/B Reset Button. If light stays on, open motor switch box under seat opposite exit door at No. 2 end. (Use 5 cent coin to open and close screw.) Move motor switch handle to left, then push L/B Reset Button. If Line Breaker light is still on, tell Radio Centre. If tram is running on only 2 motors, ask Radio Centre for another tram, and do not go faster than 25 k.p.h., because with a pair of motors cut out, there will be no dynamic braking and the tram will operate on the disc brakes instead.

Note:- "Z1" and "Z2" only

When the motor switch handle is in the central position, all motors are "in". When the handle is moved towards No. 1 end, motors 1 and 3 are cut out. When the handle is moved towards No. 2 end, motors 2 and 4 are cut out.

The motors are numbered in the bogies from No. 1 end, that is, motors 1 and 2 are in the bogie at No. 1 end of the tram, motors 3 and 4 are in the bogie at No. 2 end of the tram.

10. Defective Doors

When a door becomes defective the driver must carry out the following procedure:

- (a) Check the stepwell for foreign objects (e.g. drink can) by standing on the second step and move foot around stepwell under the second step.
- (b) After checking stepwell, reset door by pressing red button on door motor for 5 seconds and then close door flap.
- (c) If the door still will not operate check circuit cupboard.
- (d) If all circuits are in and door still will not operate (generally due to door motor overheating) activate over-ride switch to make the tram mobile. If possible after 5 - 10 minutes try to reset the door again.
- (e) If the door cannot be made to operate ring Radio Centre or see the Line Inspector and arrange for a changeover.

Drivers are reminded that the over-ride switch at the driving end, over-rides left hand doors only.

To cancel "next stop" sign when over-ride is activated, over-ride switch must be switched to "Off" position and then to "On" while passengers are alighting.

When a tram is run in and has its over-ride seals broken, please sign tram off "Over-ride seals broken".

11. Track Brake

The left pedal operates the track brake. For normal driving the pedal must be kept halfway down. If the foot is taken off the pedal or the pedal is pushed hard against the floor, the track brake will go on.

The track brake is a severe brake and MUST NOT be used for normal braking.

If the track brake does operate, it can be taken off by putting the left pedal to normal driving position (half-way down). If track brake stays down, take foot off the left pedal, turn battery switch "off", then "on", then put the left pedal half way down.

12. Lights

To turn lights inside tram, turn light switch on control panel to the right. To turn lights off, switch is turned to the left.

If lights do not come on (with trolley pole on overhead) check circuit breaker in cupboard.

If trolley is not on overhead, and battery switch is "on", there will be no inside lights, except two small lights over each door, and headlights and tail lights.

13. Automatic Points

To set points for straight track, take foot off acceleration pedal and allow tram to coast under overhead wire contactor.

To set points for curved track, take foot off acceleration pedal and push green points button on control panel while coasting under overhead line contactor.

If points do not change, use point bar.

14. Loud Speakers (P/A - Public Address)

Loud speakers are to be used in a sensible way and not used unless needed.

There are 2 positions for the P.A. Switch:-

(a) "EXIT" - for outside use.

(b) "INT" - for inside use.

The switch must be held in either positions while speaking into the microphone. Speak quietly and clearly, do not shout, and have microphone about 4 inches away from mouth.

Before entering safety zones and coming to other stops where there are passengers, use the outside loud speaker to tell passengers to "please board the tram at the front door and have your fare ready, thank you."

The outside loudspeaker can also be used to politely request a motor vehicle driver to keep to the left of the tram lines.

The inside loudspeaker is to be used to tell passengers information about requests for stops, and other things.

15. Safety

A tram must not be stopped closer than $1\frac{1}{2}$ metres (4 ft.) from a tram or other vehicle in front.

When travelling at more than 20 k.p.h. the tram MUST BE NOT LESS THAN 3 pole lengths (100 metres) from the tram in front.

The tram must at all times be kept under proper control.

16. Hot Weather

To make trams as cool as possible during hot weather, temperature control switch is to be set on AUTO. The Auto setting will switch fans on when the tram starts to heat up.

Please report if fans are not operating.

Temperature control is to be checked before running out and after running in to make sure control knob is set on Auto.

Another method to help keep trams cool is to open all vents and windows and pull down the sun blinds on the side affected by the sun (if passengers will leave them down).

17. Design Changes on Tram No. 5

1. The line breaker on this tram does not pick up until the Dead Man Pedal is put into the driving position. If line breaker light comes on while tram is in motion, normal procedure to reset is carried out.

2. An extra circuit breaker is now fitted at the bottom of the circuit breaker panel. If the tram becomes stationary this circuit is to be checked. If the switch is not in the top position, push switch down to bottom position then up to top position. If the tram is still stationary after carrying out this procedure Radio Centre is to be notified immediately.

"Z3" TRAM

The procedure for operating the "Z3" is similar to the "Z1" and "Z2" with a few exceptions.

Drivers please read the following procedures carefully as you will be required to know them to operate the "Z3".

PREPARING A "Z3" FOR THE ROAD

Same procedure as the "Z1" and "Z2" with the following additions.

1. Check that both motor circuits are in.
2. Check that the emergency drive switch is in the normal position.

Note: Circuits are in hip lockers next to door 4.

LINE BREAKER

When the line breaker light comes on, carry out same corrective procedure as you do with the "Z1" and "Z2".

HEATING AND COOLING

Heating and cooling on the "Z3" is automatic and cannot be adjusted by the driver.

DISC BRAKE BUTTON

The use of the disc brake button is the same as the "Z1" and "Z2" except if this button is depressed for 10 seconds when starting, the line breaker will drop out. If this happens, carry out line breaker re-set procedure.

SAFETY PEDAL

When driving the "Z3" safety pedal must be engaged before using accelerator or the tram will not drive.

ROPE CATCHER

The rope reel nearest the centre of the tram is a catcher. If the trolley pole comes off the overhead or when putting pole up too fast, the catcher reel stops spinning and holds rope and pole in a stationary position. To disengage catcher, pull rope down a few feet (to release the tension on the catcher), then slowly replace pole on overhead.

When placing pole on overhead, make sure the pole has a positive contact with the overhead wire and the catcher reel is not in the lock position.

SLIP INDICATION

If slip indication comes on, push sand button.

If the tram goes into dynamic slip the indicator light flashes continually and the buzzer keeps sounding, even when the tram has been stopped. To correct this, turn the forward switch to off and then back on again.

Note: When sand is being used manually or automatically, such as under slip conditions, the sand button lights up.

CHANGING DESTINATIONS

The destinations and route numbers are on rolls not flaps as in the "Z1" and "Z2".

To change the destinations and route numbers, push selector buttons to set up the numbers you require.

Push start button then take your finger off as the button does not need to be depressed all the time the destination and route numbers are changing.

As destinations and route numbers are rolling around, the passing destination numbers light up. When the selected destination is reached, the light in the start button and the digital numbers will go out.

Destination numbers to be set between 1 and 62 only.

To bring up blank in the hundreds, set on 0.

There are no blanks in the units and tens so set both on 0 when a route number is not required.

Note: On East Preston and East Brunswick routes the last city destination is CITY.

On East Burwood route the last city destination is CITY-LONSDALE.

If battery is turned off while destinations are changing, destinations will stop and button will have to be pushed again to re-start destination.

POWER LIMIT SWITCH

Drivers must switch the power limit switch to ON when arriving at Spring Street.

When changing ends at the city terminus put the switch back to OFF and when the other panel is opened put that switch to ON.

When leaving the city section put the power limit switch to OFF.

This switch can be used near a suburban terminus during the p.m. peak when voltage drops because of too many trams in the section.

The use of the power limit switch reduces the power from 550 amps to 350 amps with minimal effect to the vehicles acceleration and NO effect to the braking.

OVERSPEED

The "Z3" is governed at 75 k.p.h. If this speed is reached, the motors will cut out.

If the tram reaches 80 k.p.h. the service brake comes on automatically and reduces the speed of the tram to 7 k.p.h. before driving power can be obtained again. The emergency brake can still be used if required while the tram is braking automatically.

When the tram slows to 7 k.p.h. or below, the accelerator must be disengaged and re-applied before the tram will get driving power again.

Drivers are reminded that if the speeds mentioned in this section are obtained they are exceeding the 60 k.p.h. road speed limit.

STATIONARY "Z3" TRAM

When a "Z3" will not drive, carry out the following procedure to try and make the tram mobile.

1. Check doors and door switches as you do in the "Z1" and "Z2".
2. Check indicator lights on the panel.
3. Turn on interior lights; if they do not come on, check that the trolley pole is on the overhead wire.
4. If the lights are on, turn the forward switch to OFF and back to forward.
5. Turn the battery switch off and on again.
6. Check circuits in the hip locker.
7. Cut out No. 1 motor.
8. Put back No. 1 and cut out No. 2 motor.
9. Put motors back in and put emergency drive switch from Normal to Emergency DRIVE.
10. Emergency Drive switch on with No. 1 motor cut out.
11. Emergency Drive switch on with No. 2 motor cut out.

If the above methods fail to move the tram, ring Radio Centre.

If a step between 7 and 11 is required to move the tram, also contact Radio Centre for instructions if an Officer is not at the scene.

GENERAL INFORMATION

Doors are numbered from the entrance doors back to small exit doors. No.1 end 1 - 3 - 5, No.2 end 2 - 4 - 6.

The hip lockers are located next to door 4 between door 4 and 2.

Driving with one motor cut out, the driving motor has both dynamic and disc braking. The cut out motor has only disc brakes operating. Track brakes still operate.

Driving on the emergency drive, disc brakes and track brakes only are operational.

The power limit switch is on the driver's panel in the top left hand corner.



"Z Class" FAULT FINDING

1. POWER ON TRAM WON'T DRIVE

1. Check safety pedal is engaged correctly
2. Check all switches are in correct position
3. Check red light is out and all doors are closed
4. Turn F/R off, battery off
5. Turn battery on, F/R on
6. Check circuit breakers are in
7. Repeat procedure other end
Z1, Z2 call FOC/Z3 Follow steps below
8. Cut out motor No 1-test for drive.
9. Tram still won't drive, cut motor 1 back in
10. Cut out motor No 2-test for drive
11. Tram still won't drive-cut motor 2 back in
12. Put emergency drive on-test for drive
13. Emergency drive on & cut out motor 1-test for drive
if Tram won't drive cut Motor 1 back in
14. Emergency drive on & cut out motor 2-test for drive
15. Tram still won't drive, contact FOC

2. CUTTING OUT MOTORS

1. Line breaker light comes on
2. Reset L/B by pressing L/B for 5 seconds
3. If L/B stays on, stop the tram
4. Turn F/R off, battery off
5. Turn battery on, F/R on & reset L/B
6. Check circuit breakers, and check other end
7. L/B stays on-cut out motor No 1-reset L/B
8. L/B stays on-cut motor 1 back in
9. Cut out motor No 2-reset L/B
10. L/B stays on-cut motor 2 back in
11. Put emergency drive on-reset L/B. (Z3 only)
12. L/B stays on-Emergency drive on with motor 1 cut
out. (Z3 only) L/B stays on put Motor 1 back in
13. Emergency drive on with motor 2 cut out. (Z3 only)
14. L/B stays on, contact F.O.C.

DO NOT exceed 20 K.P.H .No Dynamic Brake.

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"Z" Class FAULT FINDING

3. POWER OFF LIGHT COMES ON

1. Check Panto/Pole is in contact with overhead
2. Check for drive
3. Turn lights on , check if battery needle is in green
4. Check for dirty track, If dirty treat as insulated
5. Turn F/R off, battery off (panto down if applicable)
6. (panto up if applicable) Turn battery on, F/R on
7. Check circuit breaker, Check other end
8. Call FOC

4. DOOR WON'T CLOSE

1. Check (red) door light is off
2. Check: switches, flap and stepwell
3. Reset door by pressing red button on motor for 5
seconds
4. Close flap and check circuit
5. Use override switch and reset door after 5-6 stops
6. Isolate defective door
7. Call FOC

5. DOOR WON'T OPEN

1. Check stepwell & flap
2. Open door flap & raise unlock bar to
3. Close & open door from outside using key
4. Check circuit breaker
5. Call FOC

6. INSULATED TRAM

1. Warn passengers to remain on tram
2. Warn intending passengers to remain clear of tram
3. Turn lights on, lower pantograph.
If pole tram leave carefully & put pole down
4. Ask passengers to leave tram in a safe manner
5. If available-use water to clean track
6. Raise Panto (put pole up)
7. If lights burn, drive to clean track & reseat passengers
8. If lights do not burn, lower panto/pole
9. Call F.O.C.

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"Z" Class FAULT FINDING

7. DAMAGED PANTOGRAPH

1. If pantograph becomes entangled in overhead
DO NOT try to lower it Call FOC

8. BATTERY LIGHT COMES ON

1. Stop tram
2. Check battery needle is in green
3. Check battery light is off
4. Check needle at other end
5. Check circuit breaker
6. Call FOC

9. DISC BRAKE LOCKS ON

1. Check Disc Brake button is released
2. Turn F/R off, battery off, lower panto if applicable)
3. Raise panto (if applicable) turn battery on, F/R on
4. Check circuit breaker
5. Check for drive at other end
6. Call FOC

10. FORWARD/REVERSE SWITCH WON'T MOVE

1. Check Battery switch
2. Check key in correct position
3. Check F/R at other end
4. Check circuits
5. Call FOC

11. DAMAGED POLE

1. Tie damage pole down
2. Release front pole and both ropes
3. Both ropes and pole to off side
4. Other employee to hold one rope
5. Driver to throw other rope to near side
6. Driver & other employee to place pole on overhead
7. Tie ropes loosely inside tram & Contact FOC

Speed not to exceed 20 k.p.h

Cut off early for frogs/insulators

Treat Automatic points as manual

Stay at least one tram length behind tram in front

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"W" Class FAULT FINDING

5. DAMAGED POLE

1. Apply handbrake
2. Tie down damaged pole
3. Release front pole & both ropes
4. Ropes & pole to offside
5. Another employee to hold emergency rope
6. Driver to throw rope to onside
7. Place pole on overhead
8. Driver to throw rope to offside
9. Tie both ropes to offside grab rails
10. Call FOC

Cut off early for frogs & insulators / stay 1 tram length from tram in front / treat auto points a s manual

6. CHANGING LIGHT FUSE

1. Apply handbrake
2. Pull pole down
3. Remove cover from main light switch
4. Change 5 amp fuse & replace cover
5. Pole on overhead
6. Call FOC Do not drive at night without lights

7. COMPRESSOR GAUGE UNDER 60 LBS

1. Stop tram
2. Apply handbrake
3. Check pole on overhead & lights burning
4. Compressor switch making good contact
5. Change fuse with L/B (interchange method)
6. Call FOC

8. COMPRESSOR GAUGE OVER 90 LBS

1. Stop tram normal service application
2. Compressor switch off
3. Apply handbrake
4. Reduce pressure by fanning brake
5. Call FOC

9. STATIC CONVERTER LIGHT ON

1. Check pole is on overhead
2. Call FOC

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"W" Class FAULT FINDING

10. INSULATED TRAM

1. Warn passengers to stay on tram
2. Apply handbrake
3. If lights are off switch them on
4. Leave tram without touching metal
5. Pull pole down & ask passengers to alight
6. If available use water to clean track
7. Put pole up
8. If lights burn normally drive to clean track
9. Reseat passengers & call FOC
10. If lights do not burn pull pole down & call FOC

11. LOCKED CONTROLLER "ON" POSITION

1. Turn L/B off
2. Stop tram & call FOC

12. LOCKED CONTROLLER "OFF" POSITION

1. Check key is fully forward
2. Put key in neutral & call FOC

13. 24 VOLT LIGHTING FAILURE

1. Check Master Switch is on
2. Check circuit breaker No. 1 End
3. Check blown globes
4. Call FOC

14. BRAKES LOCKED ON

1. Check air pressure gauge
2. Check circuit breaker No. 1 End
3. Compressor switch off
4. Change fuse
5. Call FOC

15. LOW BATTERY VOLTAGE

1. Check circuit breaker No. 1 End
2. Call FOC

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OTHER INFORMATION

Motor cut out:

Z1, Z2 - under seat opposite Door 3
Z3 - in Circuit Breaker Box right of door 4
B class - No. 2 end Hiplockers (circuit breaker box)

Emergency drive:

Z3 - In Circuit Breaker Box Right of Door 4
B - No 1 end (circuit breaker box)

Override Switch:

Z1, Z2 - Circuit breaker box has 2 Switches
Z3 Hip locker Circuit Breaker Box
B class: No. 2 end Circuit Breaker Box

Motor Generator Circuit

Z1, Z2 Circuit breaker box
Z3 Located in the 2nd Hip Locker right of door 4

Power Limit Switch

Z3, B-Is located on the Left Hand Side of console