

THE CAR OPERATOR'S POCKET GUIDE

The C.S.L.

Handy  
Reference  
Leaflet

ALWAYS CARRY YOUR COPY

This *Car Operator's Pocket Guide* is intended as a guide to early symptoms of trouble and to the handling of emergencies on our older types of streetcar equipment.

It should be studied thoroughly as the instructions contained herein will probably save valuable minutes and make the job easier.

It should be noted that the Madison Street P.C.C. equipment and the new All-Electric Surface-Liners are not mentioned. Present instructions for operating this type of equipment will be revised and issued in similar form.

W. A. HALL

Sup't. of Transportation



## STREETCAR SERIAL NUMBERS

<u>Car Numbers</u>	<u>No. of Motors</u>	<u>Car Numbers</u>	<u>No. of Motors</u>
101- 499 *	4	3322-3381 FECE	4
500- 610	4	5001-5665	4
611-1100	4	5703-5827 NS	2
1506-1720	4	5900-5999	2
1721-1735	4	6000-6137	2
1800-1999	2	6138-6145	4
2701-2780	4	6146	2
2904-2922 Safety	2	6147-6154	4
3000-3089	2	6155-6198	4
3093-3118 Safety	2	6199-6279 MU	2
3119-3201	4	6280-6319 FECE	4
3202-3321 MU	2		

The above list embraces the various series of cars now being operated, (except P.C.C. and Surface-Liners).

In most instances the instructions in this leaflet apply to all types of cars but when important differences require special instructions for certain car series these car numbers will be shown in boxes at beginning of paragraphs.

\* - 101-499 means cars 101 to 499 including both 101 and 499.

When changing cars - make a terminal trade rather than a pull-in whenever possible. It's easier for you, and it's easier for the passengers.

## HANDY REFERENCE LEAFLET

The inspection, overhaul and repair of rolling stock is a large item in the total cost of operation - around 10% of the total annual operating expense of the system.

A factor which contributes substantially to this item is equipment damage caused by operators' failure to recognize the early symptoms of major mechanical, electrical and air braking troubles and take steps to avoid more serious damage.

Another important factor in high maintenance cost and frequent failures in service is the operators' neglect to report trouble or early indications of trouble on the "sign in" sheet at the end of your run. Many of these weaknesses cannot be observed by repairmen when the car is standing in the depot, hence, when not reported by the operator last using the car, they frequently cause a complete breakdown in service later.

Remember:

1. Watch for early indications of trouble and take prompt precautions to avoid excessive and costly damage to the equipment.
2. Report all defects, troubles or indications of impending trouble on the "sign in" sheet at the end of your run.

REPORT THESE ITEMS EVEN IF YOU ARE RELIEVED WHILE THE CAR STAYS ON THE STREET, AS WELL AS IF YOU PULL THE CAR INTO THE DEPOT YOURSELF.

This pocket leaflet will assist you in locating the more common troubles which occur in the older type streetcars and it will help you prevent excessive and costly damage. The 83 P.C.C. cars and the new Surface-Liners are not covered in this leaflet.

CHANGE CARS - Throughout this leaflet the words "CHANGE CARS" are used to indicate that a car is disabled to the point where it should be replaced. When failures occur and cars must be pulled in usually the passengers and the crew will be best served by trading cars with a "pull-in" at the terminal, if a pull-in is available.

If a terminal trade is not available you must phone the station for another car and make the trade at the customary trade-off point for your line.

Remember on long lines that when a sudden emergency makes it necessary to immediately pull in a car with an outer terminal destination, action must be taken to maintain service to this outer terminal. If a "Short Line" car follows, the "Thru Car" crew will change cars with the "Short Line" crew and continue their trip to the outer terminal, while the "Short Line" crew pulls in the disabled car, gets a good order car and switches into place on the street.

SIGN IN - It is very important that all minor defects, troubles or indication of impending trouble which do not require a CAR CHANGE or immediate pull-in be reported on the "sign in" sheet at the completion of your run. Throughout this leaflet such items are referred to by the words, "SIGN IN".

When you have car trouble always tell the first supervisor you meet.

1. He may suggest a remedy.
2. He may arrange a trade of your car with a pull-in.
3. He may phone for another car, thus saving your time.

When pullins are available always trade your faulty car at the terminal. It is easier for both crew and passengers if the change of cars is made at the terminal rather than mid-way in the line.

#### WHEN YOUR CAR WILL NOT OPERATE:

- 1st. Make the trolley power check.
  - a. Try the lights for trolley power - if no power, see that pole is not on a circuit insulator.
- 2nd. Make the trolley to ground checks.
  - b. Try the overhead circuit breaker or reset switch.
  - c. Check the ribbon fuse.
  - d. At terminals your ground connection may be broken by sand on the rail. PULL THE TROLLEY

d. (con't.) POLE, then using the switch iron, clean a small area ahead of one wheel. Insert the switch iron in the cleaned area between the wheel and rail. Then raise the trolley pole and see if the lights burn. If so, pull the car over the switch iron to clean rail.

Before moving the car, see that no person is holding the iron (danger of electric shock) or standing nearby (danger of being hit by flying switch iron.)

# SYMPTOMS OF TROUBLE AND PRECAUTIONS TO AVOID EXCESSIVE DAMAGE TO EQUIPMENT

## I. MOTOR TROUBLE

- I. IF CIRCUIT BREAKER BLOWS THREE TIMES IN  
SUCCESSION  
IF RIBBON FUSE BLOWS FREQUENTLY  
IF CAR WILL NOT START ON 1ST POINT - CAR  
MAY ACT AS IF BRAKES ARE SET

## GENERAL PRECAUTIONS

Before opening the controller case for any reason always protect yourself by throwing the canopy switch off.

Always pull trolley pole before replacing ribbon fuse.

101-1100, 1506-1785,  
3119-3201, 5001-5665,  
5703-5827, 6155-6198

First, open the large motor cut-out switch and resume operation. If blowing continues,

close the large switch and open the small switch.

1800-1999, 3000-3089,  
5900-6137, 2904-2922,  
3093-3118

Open large motor cutout switch in controllers on BOTH ends and resume operation. If blowing

still continues, close the large switches and cut out the small switch at BOTH ends.

3202-3321, 6199-6279,  
(M. U.)

Pull trolley pole and  
open one motor cut-out  
switch under car at

center. Cut-out switch must be pulled out and  
down. Make contacts firm. Replace pole and  
test. If this does not remedy trouble, pull  
pole again, cut switch back in and cut out  
other switch.

3322-3381, 6280-6319,  
(FECE)

Pull trolley pole and  
open motor cut-out  
switch under body of car

at rear. Cut-out switch must be pulled out  
and down. Make contacts firm. Replace pole  
and test. If this does not remedy trouble,  
pull pole again, cut switch back in and cut  
out other switch.

3341, 3343, 3344, 3345,  
6281

Motor cut-outs on these  
cars are located under  
the long seat at motor-

man's left. Be sure your contacts are firm  
when it is necessary to use them.

NEVER PLUG OR HOLD AN OVERHEAD CIRCUIT BREAK-  
ER. It is a protective device - if you pre-  
vent its normal operation it may cause ex-  
cessive damage to the motors, controls or re-  
sistance, may cause a fire on the car and you  
may receive a bad burn. NEVER CLOSE THE CIR-  
CUIT BREAKER WITH THE CONTROLLER ON. Even on  
only one point it may cause a dangerous arc  
and start a fire.

2. IF CIRCUIT BREAKER OR FUSE BLOWS NEAR  
TOP SPEED, OR WHEN CONTROLLER IS FED  
UP TO FULL "ON" POSITION
-

Proceed as instructed in the first paragraphs above, depending on the type car you are operating. CHANGE CARS.

### 3. IF CIRCUIT BREAKER BLOWS ON 1ST POINT ON EITHER END

Cut out motors as instructed in item (1) above. If trouble persists, call Dispatcher for Trouble Truck.

## II. RESISTANCE TROUBLE

### 4. IF CONTROLLER DOES NOT ARC ON SERIES POINTS AND CAR WILL NOT START BELOW FULL SERIES POSITION

Unload passengers, cut out one pair of motors, (1 motor in case of 2 motor cars) operate from full series position and proceed to station. If car leaps too much when power is applied hold a little air as you start.

(The term "full series" means the series running point commonly referred to as the "half speed running point" or "5 points" although not always the 5th point)

## III. CONTROLLER TROUBLE

### 5. IF CONTROLLER STICKS - CANNOT BE ADVANCED TO FULL RUNNING POSITION

<p>All cars except M.U. &amp; FECE</p>
--

Pull down the trolley pole, open the controller and adjust the fin-

gers if possible. If this cannot be done,

discharge the passengers and operate the car in reverse from the opposite end (except 5703 to 5827). If this is not possible, call the Dispatcher for Trouble Truck.

On rare occasions the controller may jam as it is being shut off. In this case shut off the power by throwing off the overhead circuit breaker.

Once you have notched to the last point, don't back the controller handle off several points and reapply power. THIS INCREASES YOUR WORK, WEARS THE CONTROLLER FINGERS AND DOES NOT INCREASE YOUR TOP SPEED.

Use a rapid motion in shutting off the controller. A slow motion gives the arcs more time to burn the fingers or contacts in the controller.

Do not adjust the controller fingers unless a finger is stuck or requires adjustment to eliminate a weak (sputtering) contact.

Never leave the car with reverse key attached. Take it with you at the terminal. Lay it on the controller after pulling in.

#### IV. AIR TROUBLE

##### 6. IF AIR PRESSURE DROPS OR COMPRESSOR WILL NOT OPERATE

---

Air compressor fuse may be blown. Pull trolley pole and replace air compressor fuse.

NEVER USE A RIBBON FUSE IN THIS LOCATION.

If this does not remedy the trouble, CHANGE CARS.

#### 7. IF COMPRESSOR OPERATES CONTINUOUSLY - SAFETY VALVE BLOWING

Governor may be stuck in the "On" position.  
CHANGE CARS.

#### 8. IF COMPRESSOR OPERATES CONTINUOUSLY - SAFETY VALVE NOT BLOWING

This indicates a leak in the motorman's valve or elsewhere. See that the motorman's valve at the opposite end is on "lap" or "neutral" position. It may be partly open since the handle was removed. NEVER HAMMER THE VALVE STEM OF AN AIR VALVE, THIS IS A VERY DELICATE PART OF THE EQUIPMENT.

Check the valve under the air tank - it may be partly open.

### V. MOVING CARS WITHOUT AIR BRAKES

#### 9. IF AIR BRAKES FAIL

When moving 4 motor cars with all motors operating but without air brakes, set up a small amount of braking on the hand brake and travel at low speeds. This is an EMERGENCY in which you may "buck" the motor, so use the reverse key without power for any additional braking required.

FECE cars, 3322-  
3381, 6280-6319

These four motor cars  
require a point of  
power to make the re-

motely controlled reverse effective when  
all motors are operating. When operated  
without air these cars can be moved only  
when the controller is on the first "switch-  
ing" point. TO AVOID OVERHEATING THE RE-  
SISTANCE, POWER SHOULD BE APPLIED FOR ONLY  
A FEW MOMENTS AT A TIME.

NOTE: Cars 3341, 3343,  
3344, 3345 and 6281 have  
controls which cannot be  
operated without air  
pressure. If air fails  
on these cars call the  
Dispatcher for help.

When moving 4 motor cars with 2 motors cut  
out, without air brakes, follow the proced-  
ure above except you must use a point of  
power to make the reverse effective.

When moving 2 motor cars without air brakes,  
apply the hand brake, to brake the car  
slightly. Operate at low speeds. Use re-  
verse key and apply a point of power to  
stop car when hand brake is not sufficient.

Whenever a car is stopped by reversing or  
"bucking" the motors even once, always re-  
cord this on the SIGN IN sheet at the end  
of your run.

Since motor failures often follow this rather abusive operation, the repair department should check the motors to avoid car failures in service later.

## VI. FROZEN AIR

### 10. IF AIR FREEZES

Indications of frozen air - the gauge usually forewarns by dropping to nearly zero when brakes are applied. Movement of the gauge hand will be sluggish and brakes will be very weak.

MU, FECE and Safety cars often go into "Emergency" braking when air is frozen.

When you have frozen air call the Dispatcher for the Trouble Truck to meet you at the nearest pocket or terminal or if near a station, CHANGE CARS.

3202-3321, 3322-3381,  
6199-6279, 6280-6319,  
2904-2922, 3093-3118

When MU, FECE or Safety cars go into "Emergency", drain both air tanks.

CHANGE CARS. The car should be removed from service promptly, since all alcohol has been lost and the air will freeze again soon.

## VII. LINE BREAKER WILL NOT CLOSE WHEN POWER IS APPLIED

### 11. IF LINE BREAKER WILL NOT CLOSE

500-610, 1721-1785, These cars have line

2904-2922, 3093-3118, 3119-3201, 6155-6198 breakers operated from a ratchet on the controller. The operator must pause on the first point for the breaker to pick up before notching further.

If the line breaker will not pick up on such a pause:

- a. Turn off the door control button and test operation.
- b. Pull the trolley pole, open the line breaker case and using the small wooden plug in this case wedge the line breaker closed. The line breaker cover should be kept on the platform until car is exchanged as a reminder to the repair men that the breaker is plugged. CHANGE CARS.

### VIII. M.U. CAR TROUBLES

#### 12. IF CAR FAILS TO START WITH TROLLEY AND TROLLEY POWER "ON"

---

Operate the reset switch and observe the flash, if there is no flash, replace control fuse.

#### 13. IF REVERSER FAILS TO OPERATE

If the reverser fails to operate from the master controller, it may be set by using reverse key on the shaft extending from the reverser box. Point the reverse key in desired direction of travel.

The reverser is in a square box under the car near the motor cut-

out switches. While the direction of car travel is determined by the position of the reverse key on the platform controller, the reverser under the car does not change position until one point of power is applied. Absence of the loud click will indicate that the reverser has not shifted and the car will not operate in the new forward direction.

#### 14. CONTACTOR TROUBLE

If the reverser is functioning but the car will not move you may have contactor trouble. A slight bump from your follower will sometimes cause them to resume operating. If this clears the trouble, SIGN IN at end of run. If it does not clear the trouble call the Dispatcher.

#### 15. EMERGENCY CORD PULLED

If a passenger pulls the "Emergency Stop Cord" push the lever up by hand and close valve.

#### 16. COMPRESSOR NOT OPERATING

If air pressure is low and compressor will not operate, turn on lights. If lights burn, replace air fuse. If lights do not burn, replace auxiliary fuse.

#### 17. CUTTING OUT MOTORS

Motor cut-outs on this equipment are under the car near the center. Switches are marked 1

16.

and 2. Always pull the pole before cutting out motors.

## 18. WHEN BRAKES SET

If brakes set in "Emergency" during non-winter months, bleed both air tanks. This usually clears the trouble but if not, call Dispatcher for the Trouble Truck.

If this trouble occurs in winter months, see Item 10.

Always order another car if this happens in the winter. When tanks are bled in winter all alcohol is lost and frozen air occurs again very soon.

## IX. F.E.C.E. DISABLED CARS

3322-3381, 6280-6319

Apply standard checks  
a to d (Page 5) plus

the following:

- e. Check control and door fuses, replace if blown.
- f. Turn door switch to off position and see if car will operate.
- g. Cut out one set of motors. If not helpful, replace this switch and cut out the other set. If these tests fail to clear the trouble call Dispatcher for Trouble Truck.

## 19. IF CAR BLOWS CIRCUIT BREAKER OR FUSE 2 OR 3 TIMES IN SUCCESSION

Cut out one set of motors. If the blowing continues cut these motors in and cut out the other set.

## 20. IF CAR LEAPS

Unload passengers, proceed to station if nearby, otherwise go to the nearest pocket and call Dispatcher for the Trouble Truck.

## X. MISCELLANEOUS

### 21. IF TROLLEY POLE IS BROKEN OR TROLLEY WHEEL IS LOST OR SPLIT

Double End Cars - place the broken rear pole under the hook or tie it down. Go to the front of the car, pull all trolley rope out of the catcher (cut rope here if necessary) then swing the front pole around and tie the rope on a side window screen. Call Dispatcher for the Trouble Truck to meet you ahead or at the terminal. When operating in this manner, STAY AT LEAST ONE CAR LENGTH BEHIND YOUR LEADER AT ELECTRIC SWITCHES - or you may throw the switch ahead of the rear truck of your leader.

NEVER OPERATE ON THE TROLLEY HARP ALONE. Call Dispatcher for the Trouble Truck immediately.

### 22. IF EQUIPMENT OR FOREIGN OBJECT IS DRAGGING UNDER THE CAR

Unusual noises should be promptly investigated. A clanking or scraping sound under the car

18.

may be caused by:

- A gear case dragging
- Part of brake rigging dragging
- Slat from basket fender, or from fender trip dragging
- Broken hand brake chain or cable dragging
- Some foreign object between the trucks and the street

Operators will use good judgment after their investigation has located the noise. In the first two cases above call for the Trouble Truck to meet you at the nearest terminal or pocket unless you are near a station. In the other cases, the Trouble Truck might or might not be necessary. But even if you find that you can safely continue in service, or if you cannot locate the source of the noise, report these facts on the SIGN IN sheet at end of run.

### 23. IF A WHEEL IS LOCKED OR AN AXLE IS BROKEN

Call Dispatcher for the Trouble Truck immediately - do not operate the car except in such instances as to move off a bridge, railroad crossing or from an intersection.

### 24. HOT BOXES

A disagreeable burning odor coming from the journal indicates a hot box. When it occurs, arrange for a CAR CHANGE as soon as possible. Operation with a hot journal box will seriously damage the bearing and the packing will

soon break out in flame. In this emergency, water may be put on or in the journal box to prevent locking of the bearing before the car can be removed from service.

## 25. HEATER OR HEAT REGULATION TROUBLE

DON'T ATTEMPT TO ADJUST THERMOSTATS OR HEAT REGULATORS. They are delicate and cost from \$3 to \$10 each. SIGN IN any cars which over-heat. NEVER USE A RIBBON FUSE IN A HEATER CIRCUIT, you may burn yourself or your passengers and seriously damage the heating equipment.

## 26. IF SEAT BREAKS

If you have a broken seat which you cannot repair or one which will not reverse due to the seat back guides being out of their slots, arrange a CAR CHANGE.

## 27. IF GLASS BREAKS

Never allow broken glass to remain where it may injure passengers. Remove it immediately if hazardous. Report on SIGN IN sheet. CHANGE CARS if jagged glass can not be removed or if weather requires. NEVER PUT BROKEN GLASS IN THE SAND BOX.

## 28. SAND BOXES

NEVER PUT WET SAND IN A SAND BOX. Do not put transfers, newspapers, lamps, etc. in sand boxes. Such material in the sand may cause a bad accident.

## 29. OPERATING THROUGH SLUSH

Fast operation through slush or deep puddles often causes serious motor trouble due to water or slush being forced into the car motors through the ventilator openings.

OPERATE CAREFULLY THROUGH DEEP SLUSH AND PUDDLES TO AVOID EXCESSIVE SPLASHING.

## 30. IN FLOODED SUBWAYS WATCH THE HIGH WATER MARK

Depressed underpasses have a HIGH WATER MARK painted in yellow on the curb. When the water reaches the top of this mark, stop - it is no longer safe to operate through the subway.

If you are the first operator to reach a subway with the water above the high water mark call the Dispatcher for instructions at once.

## 31. MISCELLANEOUS PRECAUTIONS AT DEPOTS AND TERMINALS

Don't put the pole directly on wire until you know the controller is "Off". In the station always touch the wire lightly with the pole to be sure controller was not left in a "power on" position in either direction. NEVER STAND BETWEEN CARS WHEN CHANGING THE TROLLEY POLE - WORK THROUGH THE CAR WINDOW.

Don't move the car without sounding gong.

Don't pull trolley rope too tight when wrapping around trolley catcher or you may pull pole from under hook. Leave a little slack.

# OPERATORS' 1947 DAY OFF SCHEDULE

Date	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	F	D	B	G	E	D	B	G	F	C
2	F	E	C	A	F	E	C	A	F	D
3	G	F	D	B	G	E	A	B	G	E
4	A	G	D	C	A	F	E	C	A	F
5	B	A	E	D	B	G	F	C	B	G
6	C	A	F	E	B	A	G	D	C	A
7	D	B	G	F	C	B	G	E	D	A
8	E	C	A	F	D	C	A	F	E	B
9	E	D	B	G	E	D	B	G	E	C
10	F	E	C	A	F	D	C	A	F	D
11	G	F	C	B	G	E	D	B	G	E
12	A	G	D	C	A	F	E	B	A	F
13	B	G	E	D	A	G	F	C	B	G
14	C	A	F	E	B	A	F	D	C	G
15	D	B	G	E	C	B	G	E	D	A
16	D	C	A	F	D	C	A	F	D	B
17	E	D	B	G	E	C	B	G	E	C
18	F	E	B	A	F	D	C	A	F	D
19	G	F	C	B	G	E	D	A	G	E
20	A	F	D	C	G	F	E	B	A	F
21	B	G	E	D	A	G	E	C	B	F
22	C	A	F	D	B	A	F	D	C	G
23	C	B	G	E	C	B	G	E	C	A
24	D	C	A	F	D	B	A	F	D	B
25	E	D	A	G	E	C	B	G	E	C
26	F	E	B	A	F	D	C	G	F	D
27	G	E	C	B	F	E	D	A	G	E
28	A	F	D	C	G	F	D	B	A	E
29	B	G	E	C	A	G	E	C	B	F
30	B	A	F	D	B	A	F	D	B	G
31	C		G		C	A		E		A

**REPORT ALL MINOR  
DEFECTS, ETC.**

**Make your  
SIGN-IN SHEET  
complete**