

CAB CONTROL SIGNALLING

METROPOLITAN



TRANSIT

CHICAGO TRANSIT AUTHORITY
PERSONNEL DEVELOPMENT
REV. 4/74

WHAT IS A CAB CONTROL SIGNAL SYSTEM?

The cab control signal system is a signal system which (1) brings the signal into the cab of each train rather than having it at trackside, (2) continuously detects the status of trains and track ahead and continuously relays up-to-date information to the Motorman through his cab signal unit, and (3) automatically enforces speed restrictions by braking the train to a stop if speed restrictions are disregarded by the Motorman.

Cab control signalling operates by use of audio-frequency signals transmitted from equipment at trackside and picked up by equipment on the train. These signals are translated into audible and visual signals seen and heard by the Motorman in his cab.

TRAIN OPERATION WITH CAB CONTROL SIGNALLING

ASPECT PANEL

Each motor cab is equipped with an aspect panel containing the following items which are operative when the controller in that cab is made operative:

1. **SPEEDOMETER** - two basic types of speedometers are in use, the dial type and the digital type. On the dial type, appropriate segments of the dial illuminate to indicate the maximum speed allowed at any given time while a pointer indicates the actual train speed. On the digital type, digital aspects indicate both the maximum speed allowed and the actual train speed with illuminated numbers.
2. **SIGNAL ASPECTS (RED, YELLOW AND GREEN)** - indicate the following:

<u>Signal Aspect</u>	<u>Signal Indication</u>	<u>Speed Indication (Dial Type)</u>	<u>Speed Indication (Digital Type)</u>
Green	Proceed	0-65 or 70	70 or 55
Yellow	Proceed with caution	0-35, 0-25 or 0-15	35, 25 or 15
Red	Stop (after stop, aspect changes to Flashing Red)	0	0
Flashing Red	Proceed with Caution prepared to stop within vision	0-15 (flashing)	15 (flashing)

NOTE: Flashing red is given where low speeds are required, such as in yards or when closing in on trains ahead. Motormen must exercise extreme caution under this aspect.

Motormen must operate within the range of speeds indicated by the signal aspect and speedometer.

3. CAB SIGNAL CUTOUT LIGHT - Light "out" indicates that train is protected by cab control signalling; light "on" indicates that operation is on sight.
4. PARKING BRAKE SIGNAL LIGHT (Yellow) AND DOOR SIGNAL LIGHT (Green)

NOTE: These lights are not installed on aspect panels in Series 6000 cars on the North-South route; they are installed on aspect panels in Series 2200 cars but are not operative.

Yellow light "on" indicates that one or more parking brakes on the train is applied; yellow light "off" indicates that all parking brakes on the train are released.

Green light "on" indicates that all passenger doors are closed; green light "off" indicates that one or more passenger doors is open.

5. "BEEP" TYPE AUDIBLE ALARM - sounds to alert the Motorman whenever a train is exceeding the maximum speed allowed by the current signal aspect. This may be the result of (1) allowing train speed to increase beyond the allowed limit, or (2) a change of signal aspect to a more restrictive aspect.

Whenever the alarm sounds, the Motorman must move the controller handle to either the second or third point of brake WITHIN 2½ SECONDS or the train will be automatically braked to a complete stop. The alarm continues to sound until the Motorman brakes the train or, if the Motorman fails to brake the train, it sounds until automatic braking stops the train.

NOTE: Some aspect panels have a pulsating alarm while other panels have a steady alarm.

OPERATING PROCEDURES

NOTE: 1. The operation of cab control signals does not relieve the Motorman of responsibility for determining safe operating speeds under various operating conditions.

2. Where there are wayside signals or operational signs in cab signal territory, operation will be governed by the wayside signal aspect or sign indication as well as by the cab signal aspect.

IN YARDS

1. Aspect panel shows only flashing red aspect in yard.
2. Operation is "on sight" at restricted speed (as per rule 227).

ON LINE OF ROAD

- WHERE CAB SIGNALLING IS OPERATIVE -
(Cab signal cutout light "off", signal aspect lights operating).

Motorman must frequently observe aspect panel and operate within range of speeds indicated on aspect panel.

- If signal changes to a more favorable aspect, for example, from flashing red to yellow, Motorman may increase speed if, in his judgment, conditions warrant an increase.
- If signal changes to a more restrictive aspect, for example, from green to yellow, and train is operating faster than new maximum allowable speed
 - a. Alarm begins to sound.
 - b. MOTORMAN MUST BEGIN BRAKING WITHIN 2½ SECONDS, USING EITHER B2 OR B3 RATE AS TRACK CONDITIONS INDICATE.
 - c. Motorman must continue braking until speed of train is reduced to at least the maximum speed indicated on the panel.
 - d. Motorman must operate at or below indicated speed until aspect again changes. (If allowed speed is exceeded, alarm will sound and train must be braked.)
 - e. If Motorman fails to brake train within 2½ seconds after alarm sounds, train will automatically brake to a stop. After stop, Motorman must reset brakes before train can proceed. A report of the incident must be made.

- WHERE CAB SIGNALLING IS NOT OPERATIVE -
(Cab signal cutout light "on," no signal aspects.)
Operation is on sight or governed by wayside signals.

DEFECTIVE EQUIPMENT

If the cab control signal equipment becomes defective, the Line Supervisor must be notified immediately. Motormen must follow the instructions given by the Line Supervisor.

Following are some of the defective equipment conditions which could occur and which must be reported.

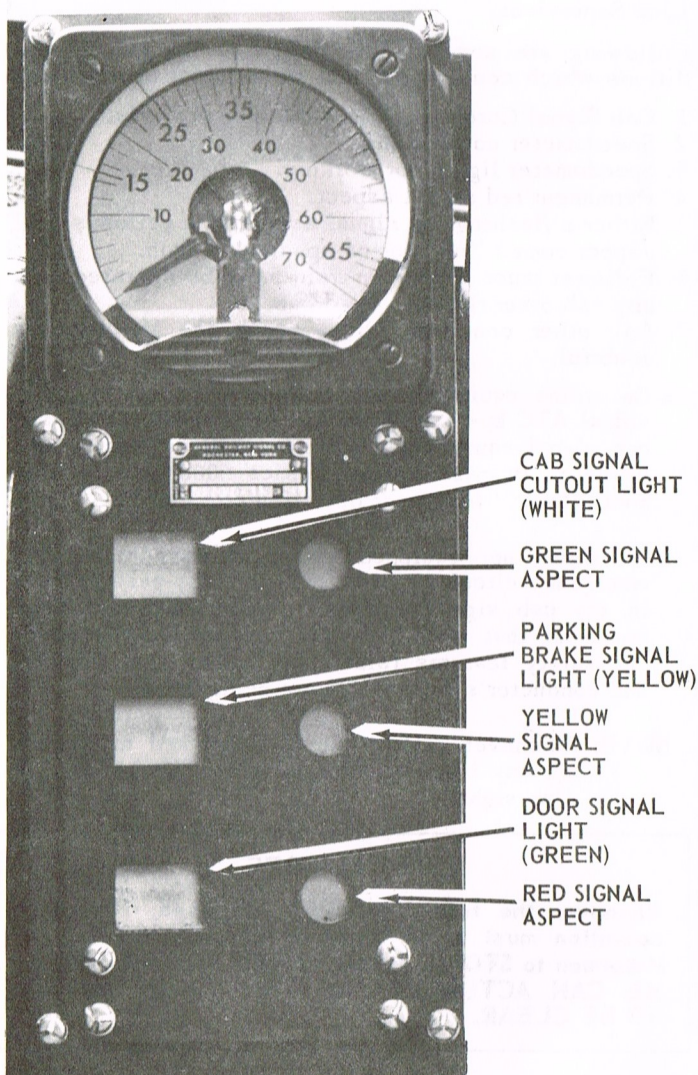
1. Cab Signal Cutout Light not working properly.
 2. Speedometer not working.
 3. Speedometer lights not working.
 4. Permanent red signal aspect.
 5. Either a flashing red signal aspect or a yellow signal aspect comes "on" for no apparent reason.
 6. Follower must couple or train must be operated from any cab other than the head cab.
 7. Any other condition about which the Motorman is doubtful.
- On trains equipped with a by-pass panel, an individual ATC by-pass is used to by-pass defects in the cab signal equipment. (Refer to folder "Employees' Guide to By-pass System, Series 6000 Cars, North-South Route" for proper operating procedure.)
 - On trains not equipped with a by-pass panel, the emergency circuit by-pass is used to by-pass defects in the cab signal equipment. The Motorman must remember that when the emergency by-pass is used, car safety features (side trip, "dead man" control and conductor's emergency) are being by-passed.

NOTE: Whenever a Motorman is instructed to operate on any by-pass, he must proceed with caution "on sight".

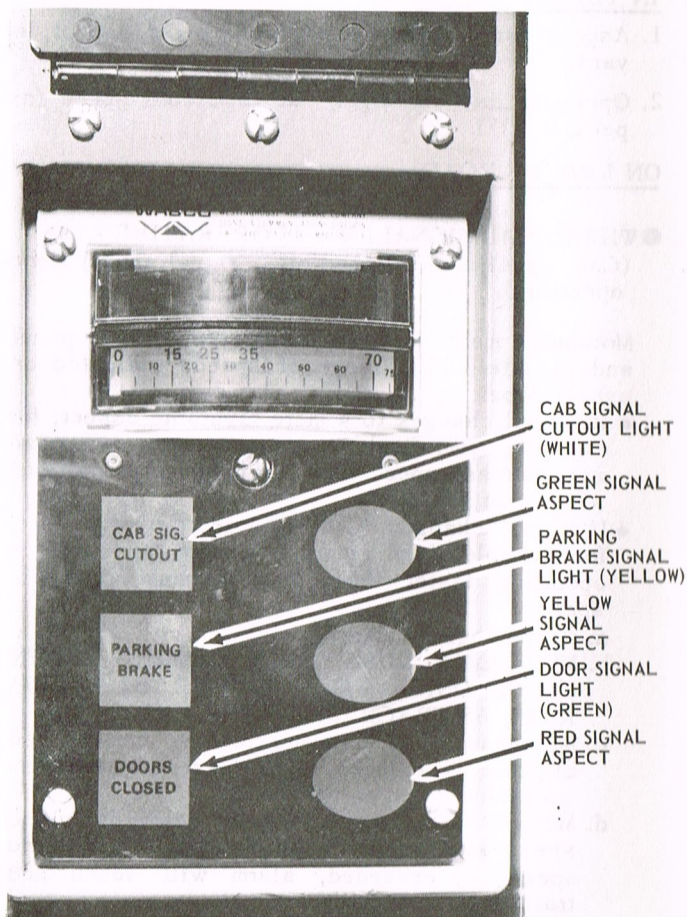
SPECIAL NOTE

Whenever the term "on sight" is used, it means operation must be at a speed that will enable the Motorman to STOP his train WITHIN THE DISTANCE HE CAN ACTUALLY SEE THE TRACK AHEAD TO BE CLEAR.

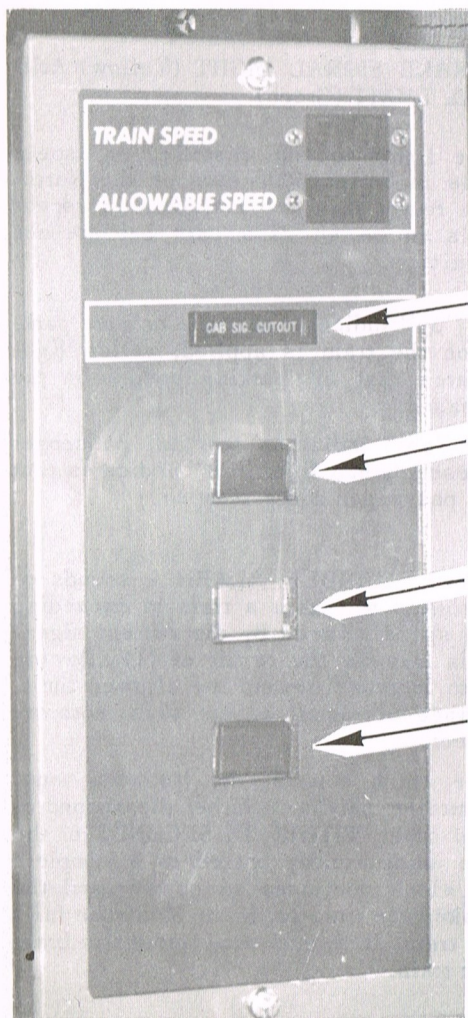
GRS DIAL TYPE SIGNAL ASPECT PANEL



WABCO DIAL TYPE SIGNAL ASPECT PANEL



GRS DIGITAL TYPE SIGNAL ASPECT PANEL



CAB SIGNAL
CUTOUT LIGHT
(WHITE)

GREEN SIGNAL
ASPECT

YELLOW SIGNAL
ASPECT

RED SIGNAL
ASPECT