SYDNEY TRAMWAY MUSEUM

MUNICH TRAMWAYS
M5.65 TYPE TRAMCARS

Instruction Manual for Cars 2656 and 2666

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SYDNEY TRAMWAY MUSEUM

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AUTHOR'S NOTE:

The German language words reproduced in this Instruction Book (usually in *italics*) were copied from the two tramcars and have been translated and then transcribed into technical "tramway-English" for the purpose of instructing prospective drivers in the correct operation of the trams.

My thanks are due to Bill Parkinson, Howard Clark, Joe Kirchberger and Josephine Somers for their help in the production of this manual.

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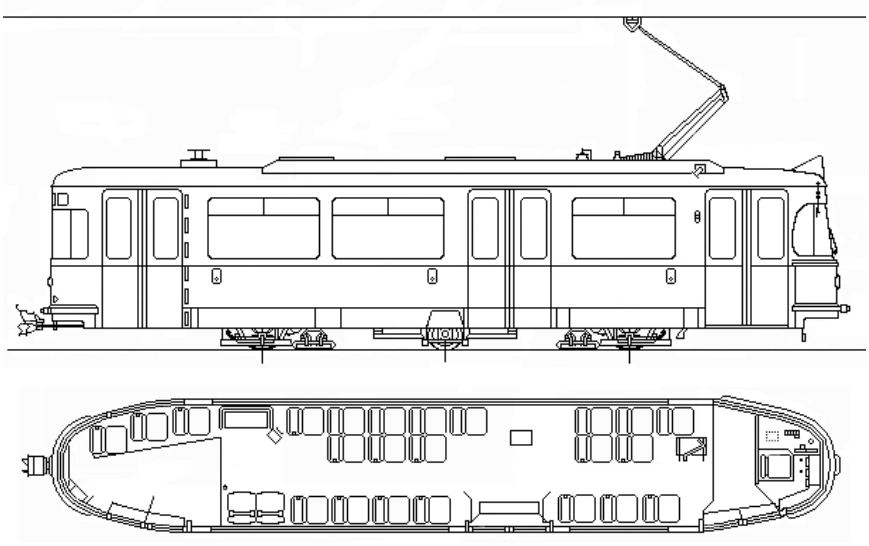
SYDNEY TRAMWAY MUSEUM

MÜNCHEN VERKEHRSBETRIEBE VEREIN
(Munich Tramway Network)
M5.65 TYPE TRAMCARS

INSTRUCTION MANUAL FOR
Cars 2656 and 2666



01 GENERALLY

The Munich (MVV) cars Nos.2656 and 2666 are six wheel vehicles. They have direct power control as well as dynamic, air, track and hand brakes. They are also equipped with a number of auxiliary devices and controls that are sufficiently non-standard to warrant special consideration when compared with most other Museum fleet cars.

Therefore, to avoid damage to the trams, members are directed not to attempt to drive them until they have undergone essential tuition. The instructions given apply generally to either tramcar.

02 THE TRAMS

They are single ended but have backup driving controls in the normally non-driving end. Egress doors are fitted to the right hand side only, in the European configuration. Until the body is modified, each car will be used only in special service on the museum tramway.

03 PANTOGRAPH CURRENT COLLECTOR

The trams are fitted with one single arm, manual/air operated pantograph on the roof over the forward axle.

In normal service this can be raised or lowered with air pressure controlled by a lever in the driver's compartment.

When stowed, the pantograph is latched flat on the roof. To allow it to rise it is necessary to open the rear one of two ceiling hatches between the front and centre doors and turn the handle. It may also be necessary to hold this handle for a few seconds until the pantograph begins to rise.

With no air pressure in the system the pantograph will rise rapidly and strike the overhead wire with considerable force. To control this movement a rope is fitted. This is accessible through the forward ceiling hatch and should be held while the pantograph rises. The rope also allows the pantograph to be lowered when no air pressure is available.

04 DRIVER'S EQUIPMENT

The driver requires a reverser key to unlock the power controller. In addition, a triangular key is required to unlock/lock egress door locks and some equipment panels and auxiliary panels internally and externally on the car. Attached to this is a controller lock key and a key to unlock secondary access panels.

05 ELECTRICAL SAFETY

The tram has an all-steel body. Should it run onto non-conducting rails or be badly derailed, all metal parts on the tram should be considered "live" until the pantograph is removed from the overhead wire.

The trolley wire above the tram should be de-energised before any person climbs onto the roof.

06 ROOF ACCESS

The tram is fitted with fold down steps that have been placed out of commission. Until these are restored any person who requires access to the tram roof must use a ladder suitable for electrical work.

07 COUPLINGS

An automatic Van Dorn type coupler is fitted at the rear of the tram for towing a trailer. The coupler provides for mechanical and electric coupling and air connections in a coupled set.

The two trams are not fitted for coupled electric operation but may be altered to allow them to couple back-to-back for special operations.

When not in use the coupling is supported from a bracket under the car and may be released by pulling a red lever towards the coupler mounting.

To couple the cars, centre the couplings on facing tramcars, then drive one car up to the other until the couplings engage and lock. The pivoted electric connector box on each coupling should move upright in contact with that on the adjoining car.

To uncouple the cars, pull out one of the side levers on the coupler heads to its full extent, thereby releasing the mechanical coupling. With the hand brake applied on one car, try to drive the other car away a short distance. The mechanical couplings should part. The electric couplings should also part and swing back and the protective cover close over the contacts. ENSURE BOTH TRAMS ARE SECURED BEFORE RELEASING THE COUPLING.

An emergency towing coupler is located under the front apron, retracted to one side. The two curved panels below the bumper are unlatched from behind and lifted off after which the coupler may be released and swung out for use. A removable pin secures the coupling when not in use and must be replaced after the coupling is retracted.

08 LIFEGUARD/EMERGENCY BRAKE

The tram is fitted with a front lifeguard operating gate. When this strikes any object emergency operations are performed. The traction power auto switch opens, the track brakes lock down onto the rails and the doors are released. It must be understood that this can cause serious damage to the tram and track and must only be allowed to occur in cases of real emergency. Once the tram has come to a stand under this procedure it must only be released and driven, at slow speed, back to the depot for changeover and inspection and not be further used until approved by the maintenance staff.

While-ever auxiliary power is available the track brake slippers will remain in contact with the rails. To enable the tram to be moved, if appropriate, the shoes may be released by pressing the yellow button (*Schienenbremse*) in the bottom centre of the driver's console.

09 TRUCKS

The tramcar is fitted with a three-axle truck mounted to the underside of the body shell. This includes two motored axles, in sub-frames, one at each end of the tram, free to rotate to take up a position on curves radial to the curve. Each is connected to a centrally mounted non-motored axle that is free to swing from side to side under the tram body and restrict the movement of the driving axles.

When travelling around curves the centre axle moves some distance sideways at which time a flap on the body side on the outside of the curve may open.

The trucks are not designed to traverse sharp reverse curves and special care is required when a Munich tram is to be moved through this track configuration.

Each powered axle carries a 100 kw (134 hp) motor and a pair of electric track brakes.

10 MOTOR GENERATOR SET/BATTERIES

Control power at 24 volts DC is provided by a motor/generator set under the tramcar floor. The M/G set is in circuit with a 24-volt battery located under a seat in the passenger saloon. Apart from ensuring the panel in the front of the battery box is properly secured there is no reason for traffic staff to interfere with this box or the wet cells within.

Failure of the M/G set to operate will require the tram to be returned to the tram shed immediately for changeover. Failure of the battery supply will prevent the tram from operating at the start of a shift. Battery power is required to get the tram operational.

11 AUXILIARY POWER/BATTERY/MOTOR GENERATOR MASTER SWITCH

An auxiliary power master switch is fitted and must be switched ON for the tram to operate and OFF after stabling the tram to prevent the batteries being drained.

The master switch for the car is located under the driver's console approximately below the speedometer.

12 AUTO CIRCUIT BREAKER

An automatic circuit breaker is located in the ceiling above the driver's seat. It may be manually opened or closed/reset, by turning the handle projecting below the ceiling fully to the OPEN (*Aus*) or CLOSED (*Ein*) position.

When the battery is charged and the battery control switch is ON this auto switch is opened and closed by operating a remote switch on the driver's console.

13 POWER CONTROLLER

The tramcar is fitted to run on 600 volts DC, direct control. It is operated through a lever actuated direct-type controller. The lever has two functions. Moved from the centre OFF position forward it will accelerate the tram through normal resistance notches to Full Series. Moved further it will allow the car to accelerate to Full Parallel.

There are 17 power notches. Only 1 and 10 (Series) and 11 and 16 (Parallel) and 17 are marked. Notch 17 is for high speed (weak field) and must not be used.

Moved from the centre OFF position backward the dynamic brake will be applied.

There are 13 braking notches. Only 1 and 13 are marked but any notch can be used to create increasing retardation rates.

A reverser key is required to unlock the controller. This is inserted on the reverser drum in the normal manner with the key pointing away from the driver. There are eight positions of the reverser barrel:-

- NEUTRAL: where the key may be inserted or removed;
- CLOCKWISE: (from Neutral): **FORWARD,**
  (first step - to **I+II**) both motors in circuit;
  (second step - to **I** †) motor No.2 cut out;
  (third step - to **II**) motor No.1 cut out.
- ANTI-CLOCKWISE: (from Neutral): **REVERSE,**
  (first step - to **I+II**) both motors in circuit;
  (second step - to "*Ra"*) control transferred to back-up controller - see below - and reverser handle may be removed from controller;
  (third step -to **I** †) motor No.2 is cut out;
  (fourth step - to **II**) motor No.1 is cut out.

When the reverser key is moved to either the FORWARD or REVERSE position it will encounter a mechanical stop. To move it further (†), to the motor cut-out positions, it will be necessary to lift the handle as far as it will go then push it to the other steps as required. Then, to return the reverser to OFF, the key must be returned to the FORWARD or REVERSE position and then allowed to drop fully onto the reverser shaft after which it may be turned to OFF and, if necessary, removed.

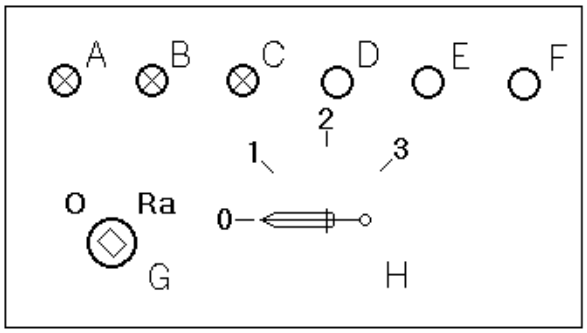
When the reverser is set to either of the single motor positions, the controller cannot be operated into the Parallel notches, forward or backward.

If the air brake pedal is depressed while the controller handle is in any power or braking notch, the handle will be returned to OFF under air pressure with considerable force. Do not attempt to hold this handle as serious injury could result.

If the controller handle is moved to the first power or brake notch when a door is open or the door release switch has been moved to RELEASE or the air-operated brake is in operation a warning buzzer will sound until the situation is corrected.

Some latitude is available between the first power notch and the first brake notch, but the controller handle must be in the OFF position before the reverser handle can be removed.

14 BACK-UP CONTROLS



A cabinet is provided in the rear end of the tram with controls to enable the vehicle to be driven in reverse, usually only for a short distance such as may be necessary when shunting.

Fig 3: Back-up Controller

A: *Türe 3* - Open door 3.
B: *Signal* - Reversing signal pushbutton.
C: *Rasselglocke* - Warning Arattle@ gong.
D: *Türen* - Door indicator.
E: *Schienenbremse - Ein* - track brake
F: *Schienenbremse - Losen* - track brake
G: Reverser. O - Off, Ra - Drive (backwards)
H: Controller handle:
  1: *Gebremst* - track brake applied.
  2: *Bremse frei* - brake released.
  3: *Farst. 1* - first speed (slow).
  4: *Farst. 2* - second speed (moderate).

To switch control of the tram to this position it is necessary to operate the main controller reverser key to the "*Ra*" (backwards) position and lift the key off the controller. This is then positioned on the back-up controller and turned to *Ra* - ON ie to drive backwards. The tram may then

be driven in reverse from this position. A spring loaded control handle is provided. The handle must be held while the tram is moving. Other controls operate the nearby doors and a rattle gong fitted at that end.

When the reversing movement is completed the reverser key must be removed and returned to the main controller before the tram continues or is stabled.

15 CONTROLLER LOCK

For security reasons in Munich, it was found necessary to fit a key lock to the controller to prevent unauthorised use of the tram. This is located between the controller lever and the reverser. It can only be operated with the controller lever at OFF. This lock key is attached to the triangular key that is required for access to various locations in the tram.

16 FOOT-GONG

Two foot-gong controls are fitted.

The punch to the left of the brake pedal is a mechanical operator and is struck in the same manner as those fitted to Sydney trams.

The punch under the heel of the driver's shoe resting on the air brake pedal is air operated and provides a "rattle" warning while the gong button is depressed. If this fails to reset, a lever is provided (Rattle gong isolator - *Rasselglocke zu/auf*) on the lower bulkhead beside the driver to cut the gong out of use.

17 SERVICE BRAKE

High-pressure air brakes are provided on the tram, operated by pressing a foot pedal. This may be locked down to secure the tram. The pedal operates a Westinghouse type triple valve and in operation RELEASES air from the train pipe to apply the brakes in the same manner as on major railway systems.

There is one valve for each driving axle. If the brakes do not release in normal operation a pressure bleed handle for each valve is accessible behind a hinged external panel in the skirting marked "*Steuerventil"*.

A dual needle gauge is provided on the driver's console to indicate the pressure in the reservoir (White needle) and the pressure in the train line (Red needle).

When the brake pedal is fully depressed a small spring loaded latch will engage to lock the pedal in the ON position. This must be moved sideways to release the brake.

The tram may also be controlled through the dynamic braking notches on the power controller.

18 AIR COMPRESSOR

This will come into operation only with the reverser handle in a drive position. It is also necessary for the 24-volt auxiliary supply to be operating. Check that the battery switch is turned ON.

19 DYNAMIC SERVICE BRAKING

The tram is fitted with a regulated dynamic brake that is brought into operation by working the power/brake controller lever backwards from OFF through the 13 braking notches. This is done in stages, notch-by-notch, until sufficient braking effect is obtained.

The reverser should remain set for the direction the tram is moving during operation of this brake. Initially the dynamic brake function takes a significant time to build up so when the tram is coasting towards a known stopping place the controller should be placed in the first braking notch.

This will allow the dynamic function to generate but will usually not create a noticeable braking effect. When necessary, the controller may then be moved to the second and subsequent braking notches when the effect will then be virtually instantaneous.

The dynamic brake may be eased as required (i.e. "back-notched") without detriment to the equipment.

Second and Third Emergency braking procedures are also available if required.

It should be noted, however, that the effect of the dynamic brake and the Third (Electrical) Emergency brake is lost when the tram speed reduces to about 7 km/h (walking pace). If the tram begins to roll away backwards, the reverser handle should be left in the FORWARD position, the dynamic brake will function regardless of the direction setting of the reverser. Reduced dynamic braking is available with either motor cut out.

20 EMERGENCY BRAKE LEVER

To the right of the driver is a combination sander/emergency brake lever. Pulling this back will cause sand to be dropped onto the rails in front of the leading wheels. Depressing the red button on the lever knob will perform an emergency application of the track brake slippers as detailed under "Life-guard/Emergency Brake".

21 PARKING BRAKES

The tram is fitted with two parking brakes; a mechanical brake operated by a fold down handle in the driver's cabin and an air operated brake controlled by a switch on the right hand side console.

The mechanical brake handle must be released and turned to apply or release the brake. Because it is a screw type hand brake no ratchet is required for applying the brake nor is there a ratchet and pawl unit to be worked to release the brake.

The air operated parking brake must only be used when the tram is stationary. The brake pedal must be operated to bring the tram to a stop when the control switch may be thrown to ON to retain sufficient air in the braking system to hold the tram stationary. The pedal may then be released.

When restarting the tram the driver will strike first notch then throw the control switch to OFF. Normal control will then be regained using the brake pedal. The air operated parking brake will not function unless there is air pressure in the main system.

Except when parked on level track, the tram MUST be chocked when not under the immediate control of the Driver regardless of the use of either of the parking brake types.

22 SANDING GEAR

The tramcar is fitted with sanding gear that delivers sand under the front wheels. Sand boxes are located under the front corner seats in the passenger saloon and must be checked at regular intervals to ensure a sufficient supply of sand is carried.

Manual working of the sanding gear for testing purposes or if it ices up in winter conditions may be carried out by inserting the track tool in the sockets adjacent to the front seat frame legs and pulling the lever forward briefly.

23 DOORS

The tram is fitted with three pairs of two leaf "plug" type doors. Access to the tram is through any doorway.

The doors fit flush within the body of the car but move out and then swing along the side of the tram. The doors operate with air pressure supplied from the general air braking/control supply. A door air release lever is situated under the car immediately forward of the rear doors. This may be

operated to allow the doors to be opened by hand. Ensure that this lever is in the closed (vertical) position before the tram is placed in traffic.

The driver operates the front doors.

The centre and rear doors are passenger operated. They are fitted with electric latching devices that are unlocked by the passenger pushing a button on an illuminated panel (“*Türautomatik”)* either inside or outside the tram to gain access. When this button is pressed the doors will open and remain open for a short period before automatically closing.

There is no proximity switch to reverse the closing cycle but a step switch is provided. If a passenger is still standing on the bottom step the doors may begin to close. If the step remains obstructed the opening cycle will repeat until the doorway is cleared. To prevent passengers attempting to enter or leave the tram at inappropriate times the driver may operate a switch that overrides the door unlatching function.

NOTE: The doors are not interlocked with the power controller or the brakes in any way to prevent the tram operating with a door open. However, a warning buzzer will sound if the controller is moved from OFF towards power ON or braking while a door is open.

On reaching a stop the centre and rear doors may be unlatched, but do not open, and must be opened as required. Because passengers may not be familiar with this procedure, Traffic Staff are to be on the alert and direct passengers to perform this manual opening task when necessary.

Special conditions apply to the operation of the doors when preparing a tram for traffic and when stabling after service.

Doors are fitted with a mechanical lock that may be worked from outside the car with the triangle key provided. All doors should be closed and latched when the trams are left stabled out of the tram shed outside of traffic hours. Except the front door, as directed, no other door is to be locked from the outside unless the normal latching mechanism is defective.

24 SWITCHES

Generally any of four types of electric switch may be found on the Munich cars.

TRACTION POWER AUTO SWITCH: above the driver’s seat and set (or reset) by turning the large black handle to ON (*Ein*) or OFF (*Aus*). It is also fitted with a solenoid for remote operation when the battery is switched on.

THUMB SWITCH: (may be spring loaded to return to centre position) *centre* - neutral; *right/up* or *left/down* - as indicated. Some switches have only one direction of operation.

PUSH BUTTON: Press briefly (2 seconds) and release. If pressed and a click is noted, then usually it will be necessary to press the button once more to reset the function.

PULL SWITCH: Pull up to operate, push down to reset.

25 DRIVER'S CABIN

The driver's cabin is provided with a narrow entry way fitted with a detachable draught deflector. This will usually be latched out of use. Inward opening side vent windows are fitted each side of the main windscreen. A small two speed fan is located above the left hand side window for the driver's use.

Each driver's window is provided with fine heating elements to clear condensation from the interior surface of the glass.

Several tools for track maintenance, ice and snow removal in winter, etc are carried in and behind the cabin secured on hooks and cleats. Crews are to ensure that passengers do not move or otherwise interfere with this equipment.

26 DRIVER'S SEAT

The driver's seat is adjustable. A latch on the right hand side frame at the front must be released to allow the seat to move fore and aft and must be properly inserted to hold the seat secure. The seat back is also adjustable.

Because of the short route distances involved it is recommended that the seat adjustment, as found, not be altered unless absolutely necessary, especially if several drivers will be operating the tramcar during any day shift.

27 DRIVER'S CABIN LAYOUT

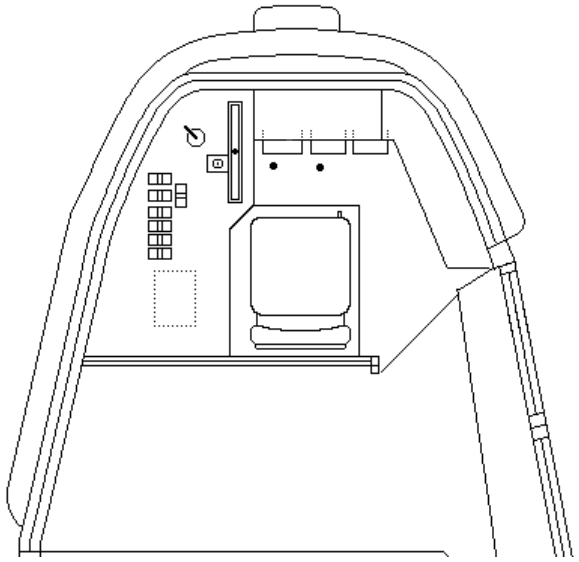
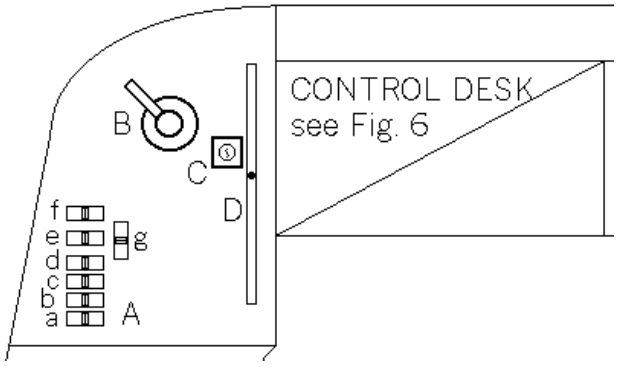


Fig. 4: General Layout of Driver's Cabin



A:a Switch* (*Türe 2*) : door control [---]*zu*[*auf*]; doors latched/unlatched
A:b Switch* (*Notlicht*) : emergency lights [---]*aus*[*ein*]; OFF/ON
A:c Switch* (*Notblinkenlage*): emergency flashers [---]*aus*[*ein*]; OFF/ON
A:d Switch* (*Kabinenleuchte*) : driver's cabin light [---]*aus*[*ein*]; OFF/ON
A:e Switch* (*Beleuchtg.*) : saloon and headlight [---]*aus*[*ein*]; ---/OFF/ON
A:f Switch* (*Automat*): auto remote [*aus*]---[*ein*]; OFF/---/ON

Fig. 5: Layout of Left Side of Driver's Desk

A:g Switch* (*Türen*) : door override [---]*Entriegelt*[*Verrigelt*]; ---/unlatched/latched. Must be in centre position to release doors.

B: Reverser
C: Controller lock
D: Controller handle

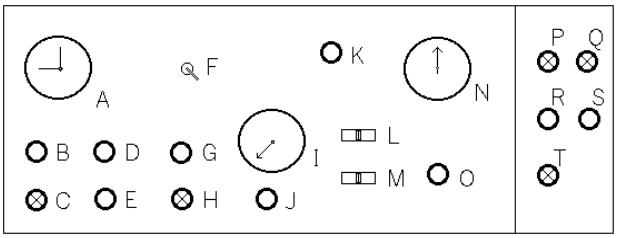
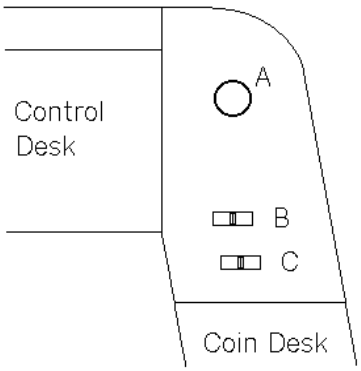


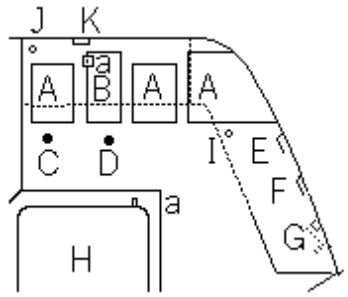
Fig. 6 Layout of Main Control Desk

A: Dual air gauge (*Druckluft*) kP/cm²
B: Lamp [H] glows when windscreen heaters are ON
C: Switch (*Heizscheibe*); windscreen heater
D: Lamp (*Batterie*)
E: Lamp (*2.TW Automat aus*); main switch indicator on trailing motor car
F: Switch (*Scheibenwischer*); windscreen wiper
G: Lamp
H: Switch (*Scheinwerfer*); headlight (high beam)
I: Speedometer (*Geschwindigkeit*)
J: Switch (*Schienenbremse*); track brake release switch
K: Light (*Richtungsanzeige*); flashes when emergency flashers or turn indicator operated
L: Switch* (*Fahrtrichtung*); trafficator (?)
M: Switch* (*Weiche*); points selector (out of use)
N: Voltmeter (*Niederspannung*); for 24 volt auxiliaries
O: Light (*Türen*); glows when all doors are closed
P: Pushbutton TW (*Türen*); front doors, open/close, on motor car
Q: Pushbutton BW (*Türen*); doors, open/close, on trail car (out of use)
R: Pushbutton; (out of use), lamp glows when centre doors are open
S: Lamp (Halt); (*Hahrgast halt)* "Open Door" button has been pressed
T: Pushbutton; (out of use), lamp glows when rear doors are open



A: Microphone (out of use)
B: Switch* (*Lautsprecher*) : loud speakers [*außen*]---[*innen*]; outside/inside car
C: Switch* (*Einbremsg.*) : [---]---[*ein*] air operated parking brake applied

Fig. 7: Doors/Brake Switch Panel



On Floor

A: Foot rests
B: Brake pedal
B:a Brake lock
C: Bell punch - single stroke
D: Bell punch - "Rattle" gong
H: Driver's seat
H:a Driver's seat latch
I: Push button
J: Push button

Fig. 8 FLOOR / LOWER WALLS CONTROLS

On Wall

E: Lever (*Rasselglocke*) : "Rattle" gong isolator - *zu/auf* : ON/OFF
F: Lever (*Stromabnehmer*) : Pantograph operator - *hoch/tief* : UP/DOWN
G: Hand brake lever (folds down to operate)
K: Battery isolation switch

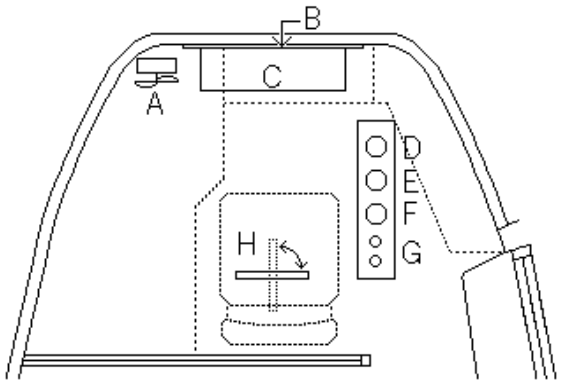


Fig. 9: Ceiling Controls

Above Left Windscreen

A: Fan (switch on back).

On Ceiling

B: Destination board access panel.
C: Route number board access panel.
D: Switch (*Beiwagen*) : trailer heating - (out of use)
E: Switch (*Heizung fahrgastraum*) : car saloon heating
F: Switch (*Heizung fahrerstand*) : driver's cabin heating.
G: Indicator lights.
H: Main auto switch.

28 LIGHTS

Saloon Lights, Headlight and Red Tail Light: Controlled together from switch on driver=s control desk. Switched to rear of car when back-up controller in use.

Saloon Emergency Lights: Switch on driver's control desk. Lamps over doorways.

Driver's Cabin Lights: Switch on driver's control desk.

Turn Indicators/Emergency Flashers: Turn indicators will flash on side of tramcar when switch on driver's control desk is operated. Emergency flashers will operate on both sides of tramcar when push button is released on driver's control desk. (NOTE: not all electrical functions will operate through to a trailing motor car.)

Destination Box Lights: Will glow when car lights are turned on.

29 HEATERS AND VENTILATION

Since the tramcar was designed for use in a relatively cold climate it is rather poorly equipped with fresh air ventilation. On the other hand, electric heating elements are provided under some of the saloon seats and in the driver's cabin.

Because of the milder climate in Sydney it is unlikely that the heaters will require more than occasional use. Should the tram become exceptionally hot inside, the crews should examine the heating controls to see that they have not been turned on. Bottom hung quarter light windows are provided along each saloon that may be unlatched and allowed to open into the car. The side panels of the driver's cabin window can be unlatched to fold inwards as can similar windows at the rear of the passenger saloon.

30 WARNING BELL/CONDUCTOR'S SIGNAL

The tram was not provided with conductor and/or passenger communication devices when delivered. Until such a system is fitted for local service the conductor must use hand signals or a whistle to signal the driver to proceed or stop.

A signal button is provided in the back-up control box and may be used for a Conductor's signal in the interim.

31 DESTINATION AND ROUTE INDICATORS

A destination box is located above the driver's front window accessible from a drop down panel. Printed boards are fitted into slots in the box and illuminated by lamps in the front of the box. A similar box, also accessible from the driver's cab, is provided for a route number board.

An auxiliary frame is provided against a quarter light window near the rear doors for an additional destination display board, while route number boxes are provided on the rear corners of the car.

32 PUBLIC ADDRESS SYSTEM

Although portions of this are still installed in the tram, the system is inoperative. A switch is provided to allow the driver to make announcements either within the car or to speakers on the outside. This facility may be made operable in due course.

33 PREPARING TRAM FOR SERVICE

If the tram has been correctly stabled in accordance with instructions, unlock the right hand front door and swing it open. Enter the tram and after ensuring it is chocked or the hand brake is applied place the reverser key on the controller reverser post.

Close the battery switch and check that the voltmeter is indicating about 24 volts. Open the ceiling hatches and retrieve the pantograph rope. Swing the pantograph release handle, holding some tension on the rope. When certain that the pantograph is unlatched release the rope slowly until the collector pans contact the trolley wire.

Select a direction with the reverser key and if traction power is available then the compressor should be heard to operate. Ensure the door reservoir drain cock is closed (vertical/down) and the front door operating button is illuminated. The brake pedal should be down and latched. When the air system is fully charged, release the hand brake and/or remove the chock.

Once the compressor has shut off check that the air gauge is showing the correct indications; full pressure on the white needle, zero on the red needle. Close the front doors and release the spring-loaded latch on the leading front door. Unlatch the brake pedal and release the brakes, checking that the red needle on the gauge moves up behind the white needle. The brakes should be applied once more for correct operation. If everything is satisfactory then the tram is ready for service.

34 EMERGENCY ACCESS

If the tram has not been properly stabled and all door latches are engaged then the driver must move to the rear of the tram and disengage a curved rod latched behind the rear bumper bar at a point indicated by two red arrows. This rod is designed to be inserted between the rubber buffers on the door meeting edges and to hook onto a door catch. The catch must then be retracted and the door swung open. The rod must then be securely stowed in the catches provided behind the bumper before the car is prepared for service.

35 STABLING TRAM AT END OF SERVICE

When the tram is correctly positioned for stabling the driver will ensure that the air brake pedal is latched down, the door release switch is in the latched position and the centre and rear doors are closed, and then remove the reverser key, thereby switching off the compressor.

Lower the pantograph, ensuring it is secured under the roof hook. Wind on the hand brake if directed. Open the battery switch and door reservoir drain tap (horizontal). Close the left hand front door against the latch.

Partially close the right hand door and pull down and lock the door latch in the down position. After leaving the tram the driver must manually close this door and lock this door only using the triangular key provided.

36 PASSENGER OPERATION PROCEDURES

In Munich service the tram was used exclusively in single operator ("one-man") service and stopped at all nominated stopping places. It was delivered to Loftus without conductor or passenger signalling devices.

If the driver leaves the doors latched while the tram is running until approaching a defined stopping place where passengers may require to leave or board the car, then the tram may be restarted from other locations without a special conductor's proceed signal.

37 NOTES:

CAR DETAILS

Classification: M5.65
Built by Waggonfabrik Joseph Rathgeber AG of Munich.
Entered service 4th October and 18th November 1965, respectively.
Originally numbered 1035 and 1045.
Renumbered 1970/71 as 2656 and 2666.
Motors: 2 x 135 hp. (100 kW) Type ABM 100, each car.
Length 13.250 m (over car).
Length 13.640 m (overall).
Width 2.20 m.
Weight: 17.86 tonne.
Officially withdrawn from service in 1998.
Handed over 11th December 1998 in Munich. To Hamburg, sailed on *Contship Nobility,* offloaded at La Spezia, Italy before being reloaded on *P&O Nedlloyd Jakata*, arrived Port Botany on 5th March 1999.
Delivered to Loftus 11th March 1999.