

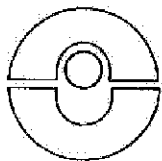
UIC Code

550-1
OR

1st edition, 11.1990

**Electrical switch cabinets
on passenger stock**

**NUMERISATION DANS
L'ETAT DU DOCUMENT**



International Union of Railways

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3.0 - 870

550-1

-2-

OR

Leaflet to be classified in Volumes :

- V - Transport stock
- VI - Traction

Amendments

Obligatory provisions are preceded by an asterisk : *

Note

This leaflet is part of a set which also includes :

- Leaflet 533 : Protection by the earthing of metal parts of vehicles.
- Leaflet 550 : Power supply installations for passenger stock.
- Leaflet 552 : Electric power supply for trains taken from the train cable.
- Leaflet 553 : Ventilation, heating and air-conditioning in coaches.
- Leaflet 555 : Electric lighting in passenger rolling stock.

Contents

- 0 - General
- 1 - Electrical switch cabinets
- 2 - Control panel for train crew
- 3 - Operating and monitoring equipment for maintenance staff
- 4 - Inscriptions and marking
- 5 - Definition of the role allotted to operating and monitoring equipment

0 - General

0.1 - This leaflet applies to all passenger stock in common use in international traffic. Its provisions shall apply by analogy to couchette coaches, sleeping-cars, dining cars and other special-purpose coaches in so far as this is possible in view of the more important electrical equipment which they carry.

0.2 - This leaflet comprises :

- general provisions with which all switch cabinets and electric switch control panels must comply, and
- special provisions applicable to devices up for standardisation.

0.3 - The term "air-conditioning equipment" encompasses the three functions of ventilation, heating and cooling. It is also used when the cooling function is not present.

0.4 - The carriage inspection staff also form part of the maintenance staff.

1 - Electrical switch cabinets

* **1.1** - All control panels, distribution boards and instrument panels for electrical and electronic coach equipment must be housed, as far as possible, in a switch cabinet which must be situated in one of the entrance vestibules so as to be easily accessible.

* **1.2** - The switch cabinet must be provided with one or several doors so as not to be accessible to passengers.

* **1.3** - It must be possible to open the outer doors by means of the square socket key shown in Appendix B of T.U.

* **1.4** - Doors of switch cabinets must be so designed that when open, during use of equipment and control panels, they do not interfere with the operation of the automatic doors situated in this area nor hamper passenger movement more than a minimum.

1.5 - It is recommended that the switch cabinet doors be easily removable.

* **1.6** - Switch cabinet components must be arranged in two sections : one section for the train crew and one for maintenance staff. When designing equipment, the regulations in force should be respected in order to avoid accidents. Assembly units which are subject to a voltage higher than the permissible contact voltage (UIC Leaflet 533, point 6.2) must receive special protection against accidental contacts.

1.7 - In the section for maintenance staff, it is recommended that particularly important components or those which must under no circumstances be touched should be consequently protected ; similarly, it is advisable to protect against theft.

* **1.8** - In order to allow easy observation of operating and monitoring equipment described more fully in plates 1 and 2, the switch cabinet door must include a glass panel positioned in the field of vision of a person standing upright. To this end, the centre of the panel must be situated at a height between 1.45 and 1.65 m above the floor.

* **1.9** - The incident record (log) and the operating instructions must be accessible by opening the outer doors of the switch cabinet.

1.10 - All low-voltage fuses protecting the various power-intake circuits must be housed in the switch cabinet if possible. If such an arrangement is impossible or inconvenient, the fuses must be placed in the vicinity of the power-intake circuits which they are designed to protect.

2 - Control panel for train crew

* **2.1** - The instruments to be operated or monitored by the train crew shall be accessible through the opening, by means of the square socket key shown in Plate 8 of the RIC, of that part of the switch

cabinet door provided with a glass panel. The door should close without the need to use the key by means of a locking mechanism whose retractable latch should automatically click into place as a result of pressure exerted upon the door.

* 2.2 - The section accessible to the train crew comprises :

- operating equipment (for turning power-intake equipment on and off) and
- monitoring equipment (pilot lamps and indicators) indicating :
 - normal operation,
 - malfunction.

* 2.3 - The basic layout of the control panel is shown in Plate 3. Function groups must be laid out according to Plates 4 to 6.

* 2.4 - The operating and monitoring equipment which, in so far as it exists, is to be grouped in that part of the panel accessible to the train crew, is shown in Plates 1 and 2.

* 2.5 - The operating and monitoring equipment for the train crew must be limited to what is strictly necessary.

* 2.6 - When a central fault-diagnosis mechanism exists, one single fault-indicator lamp shall be provided, the other fault indicators not being required.

2.7 - It is recommended that the loudspeaker microphone be placed on the control panel or in the immediate vicinity. The microphone must be easily accessible when the glass door is open but should not be visible from outside.

* 2.8 - Control devices and pilot lamps should be sufficiently large in size for non-technical staff.

3 - Operating and monitoring equipment for maintenance staff

3.1 - Operating and monitoring equipment for the train crew shall also be used by maintenance staff ; equipment provided specifically for the maintenance staff will play a complementary role.

3.2 - Equipment accessible solely to maintenance staff must only be accessible by opening all doors of the switch cabinet or by activating other devices if they exist.

3.3 - The layout of monitoring equipment for maintenance staff is a matter for each individual railway.

4 - Inscriptions and marking

* 4.1 - The operating and control switches grouped on the control panel must carry clear inscriptions. These inscriptions must be written in all the languages stipulated by the RIC or else be represented by pictograms. Preference is given to use of the pictograms represented in Appendix 1, which replace an inscription in several languages.

* 4.1.1 - The pictograms must be placed directly on the control mechanism or in the immediate vicinity.

* 4.2 - The fault-indicator lamps should light up in red when members of the train crew have to take action according to the directives or instructions of their own railway.

4.2.1 - It is recommended that pilot lamps should flash when indicating a malfunction and that the train crew should take action accordingly.

* 4.2.2 - Pilot lamps in other colours indicate to the train crew member that equipment is working correctly or that there is a malfunction which has yet to be examined by the maintenance staff. Members of the train crew do not need to take action in such a case.

4.2.3 - If a numerical marking is used, a key to the numbers must be given on the inside of the control panel door.

* 4.3 - The "on" and "off" positions of switches must, with the exception of light switches, be clearly recognisable.

* 4.3.1 - The "off" position must be shown by "0".

* 4.3.2 - The "on" position must be shown by "1" or "1/1".

* 4.3.3 - An intermediate position must be shown by "1/2".

4.3.4 - It is recommended that green push-buttons be provided for switching on and red push-buttons for switching off.

* 4.3.5 - In the case of rotary switches which can only be turned in one direction, the direction of rotation must be indicated by an arrow.

* 4.4 - All electrical and electronic equipment in switch cabinets must have a marking.

The marking may be numerical or alphanumeric provided that it conforms to the wiring diagram, and should allow the function of the equipment, together with the fault location instructions, to be easily understood and the maintenance staff to be informed of the malfunction as precisely as possible.

* 4.5 - All locations of fuses must bear an inscription indicating the nominal current intensity, their references in the wiring diagram, and also the power-intake circuit protected. This inscription must be provided even if the fuse concerned is not in place.

4.5.1 - If there is not enough space for the above-mentioned inscription, fuses protecting the circuits must be numbered. In this event, a table or similar notice showing the connection of the fuses to the circuits or mechanisms concerned must be placed inside the cabinet.

5 - Definition of the role allotted to operating and monitoring equipment

5.1 - The HT (high voltage) pilot lamp must indicate as directly as possible the presence of voltage in the train line.

5.2 - Fault-indicator lamps must have a high information value.

5.3 - During insulation tests relating to earth, only the low-voltage electricity supply of the coach shall be taken into account.

Planches — Tafeln — Plates

PLATE 1

Control mechanisms placed on that part of the control panel accessible to the train crew, according to point 2.4

Functions (in so far as they are present)	Obligatory	Recommended	Visible
1 - Train lighting 0/1	x		x
2 - Coach lighting 0, 1/2, 1	x		x
3 - Air conditioning 0/1	x		x
4 - Coach temperature selector Coach only		x	x
5 - High voltage energy supply 0/1		x	x
6 - Converter or transformer 0/1		x	x
7 - Water heater 0/1	x		x
8 - Direction indicator switch (restaurant)	x		x
9 - Panel push-button for incandescent lamp test (lamp test)	x		x
10 - Low-voltage fuse check device		x	
11 - Loudspeaker system (microphones)		x	
12 - Fuses, circuit-breakers		x	
13 - Insulation test +/-		x	
14 - Normal operation / Heat conservation		x	
15 - Fault-diagnosis mechanisms		x	x

Monitoring devices or pilot lamps on the visible section of the control panel (point 2.4).

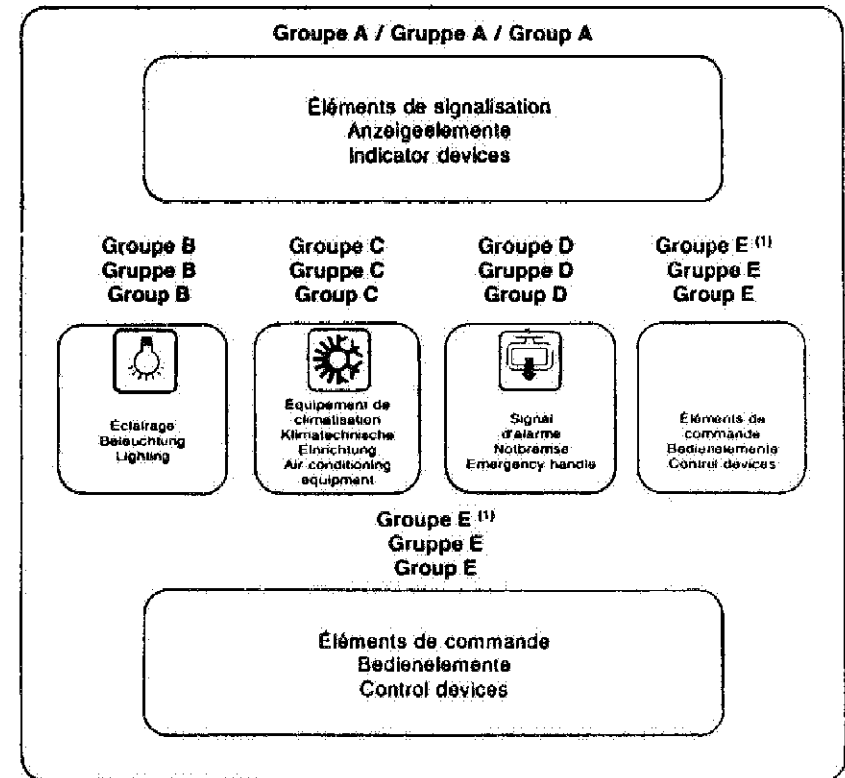
Functions (in so far as they exist)	Obligatory		Recommended	
	A Normal operation	B Malfunction	A Normal operation	B Malfunction
1 - High voltage present	x			
2 - Single fault-indicator lamp for location of faults after fault-diagnosis		x ⁽¹⁾		
3 - Energy supply				
3.1 - Battery charging		x	x ⁽²⁾	
3.2 - Converter, transformer		x	x	
4 - Air-conditioning equipment		x	x ⁽³⁾	
5 - Door locking		x		
6 - Wheel slip prevention device		x		

A = Normal operation is indicated by the colours white, green or yellow ; blue solely for cooling.

B = Malfunction is indicated by the colour red or orange.

- (1) When a single fault indicator exists, other fault indicators are not required (point 2.6).
- (2) Recommended if there is no measuring instrument.
- (3) This pilot lamp may be replaced by the three pilot lamps for ventilation, heating and cooling.

Principe de composition du tableau de commande Grundsätzliche Aufteilung des Bedienfeldes Basic layout of the control panel



- (1) Disposition possible selon les conditions d'encombrement
 Anordnung je nach Platzverhältnissen möglich
 Possible layout depending on available space

**Signification des désignations
Bedeutung der Bezeichnungen
Key to symbols**

Éléments de commande En cas de réalisation sous forme de bouton-poussoir
Bedienelemente Bei Ausführung als Taster
Control devices If in pushbutton form

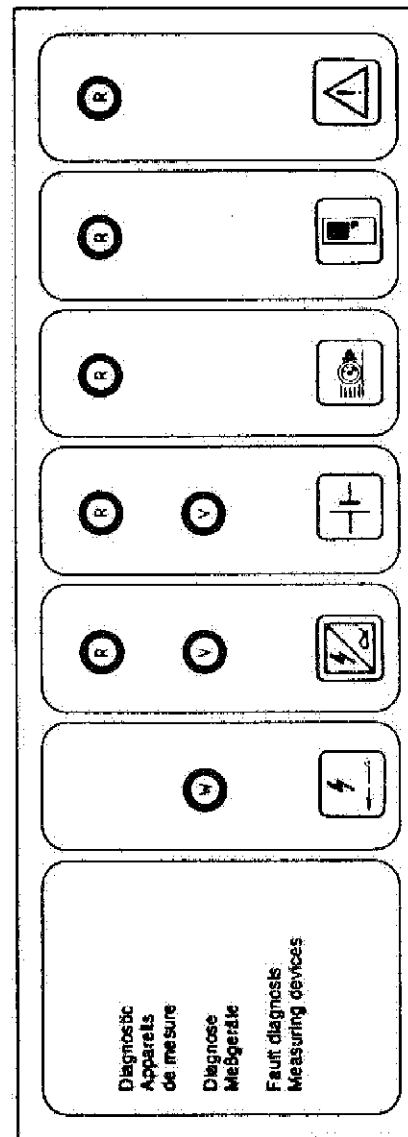
1	=	Marche - Ein - On	vert - grün - green
1/2 et 1/4	=	Fonctionnement partiel - Teilbetrieb Part working	jaune - gelb - yellow
0	=	Arrêt - Aus - Off	rouge - rot - red
T	=	Bouton-poussoir - Taster - Pushbutton	blanc - weiß - white

Lampe-témoin - Leuchtmelder - Pilot lamp

R	=	rouge - rot - red
V	=	vert - grün - green
J	=	jaune - gelb - yellow
B	=	bleu - blau - blue
W	=	blanc - weiß - white

**Éléments de signalisation
Anzeigeelemente
Indicator devices**

Gruppe A
Gruppe A
Group A

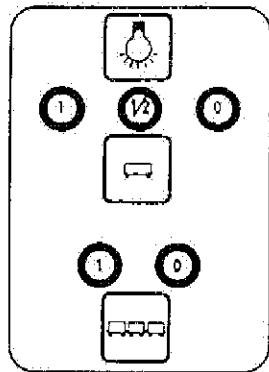


Les éléments de signalisation de ce panneau doivent respecter la planche 2.
Die Anzeigeelemente dieser Darstellung müssen Tafel 2 entsprechen.
The indications on these panel should be in accordance with Plate 2.

Éléments de commande et de signalisation
Bedien- und Anzeigeelemente
Control and Indicator devices

Groupe B
Gruppe B
Group B

Éclairage
Beleuchtung
Lighting

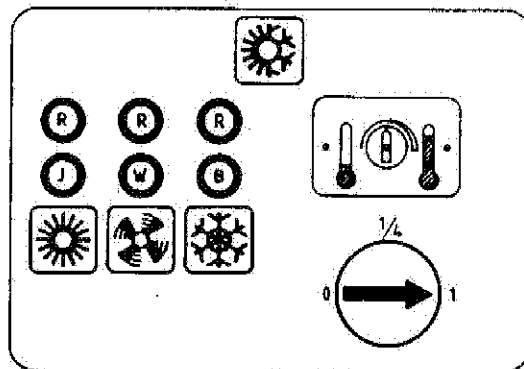
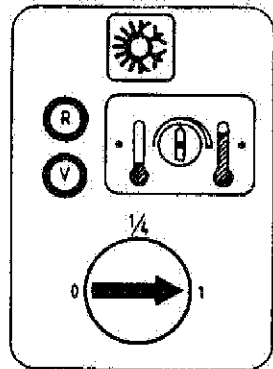


Groupe C
Gruppe C
Group C

Équipement de climatisation - Klimatechnische Einrichtung - Air conditioning equipment

Modèle a - Ausführung a
Layout a

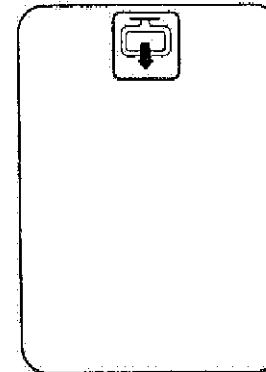
Modèle b - Ausführung b
Layout b



Les fonctions 0, 1/4, 1 peuvent être réalisées, soit par boutons poussoir, soit par interrupteurs rotatifs.
Die Funktionen 0, 1/4, 1 können entweder mit Drucktastern oder Drehschaltern realisiert werden.
Functions 0, 1/4, 1 may be performed using either pushbuttons or rotary switches.

Groupe D
Gruppe D
Group D

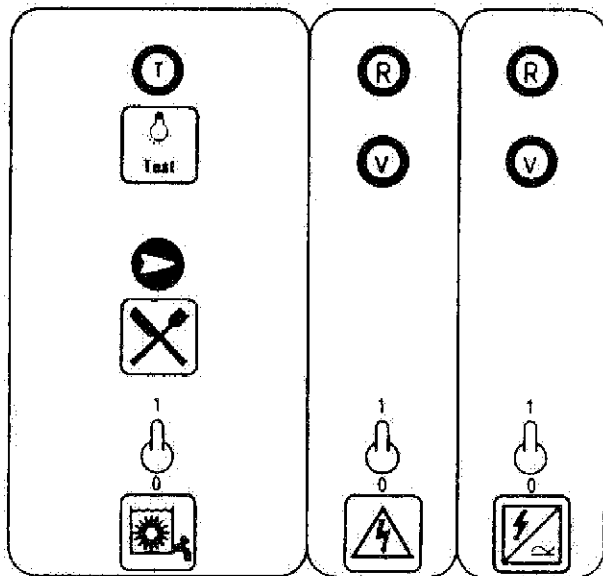
Signal d'alarme
Notbremse
Emergency handle



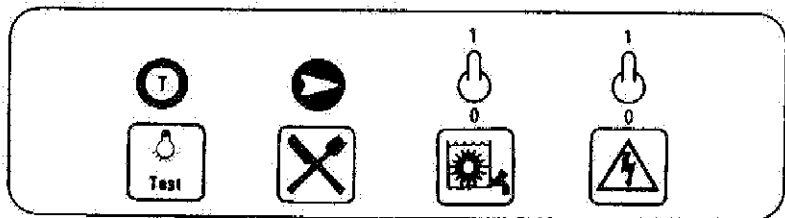
Éléments de commande
Bedienelemente
Control devices

Gruppe E
Gruppe E
Group E

Modèle a
Ausführung a
Layout a

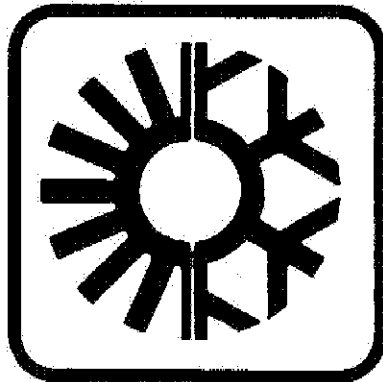


Modèle b
Ausführung b
Layout b

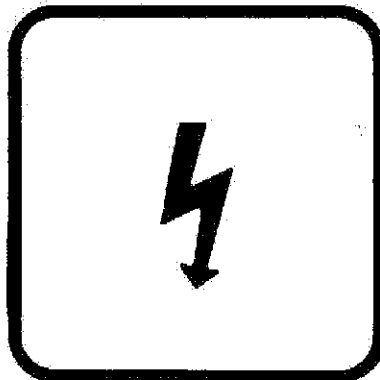


Pictogrammes - Piktogramme - Pictograms

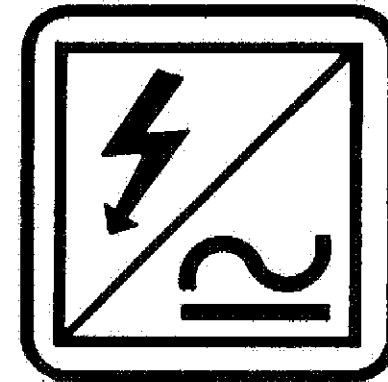
Conditionnement d'air
Klimatechnische Einrichtung
Air Conditioning



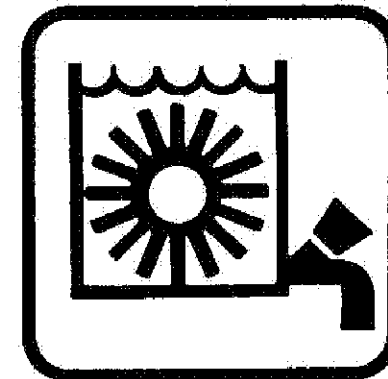
Fourniture d'énergie
Energieversorgung
Energy supply



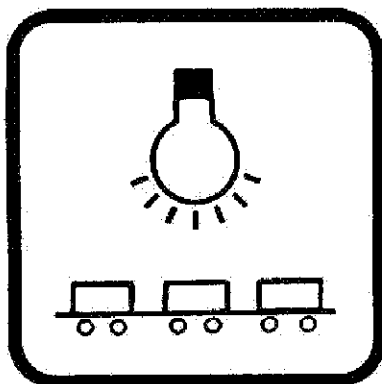
Convertisseur ou transformateur
Umrichter oder Transformator
Converter or Transformer



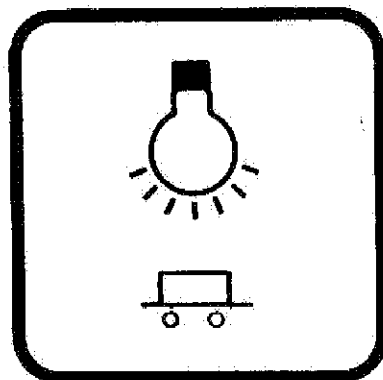
Réchauffeur d'eau
Brauchwasserheizung
Water heater



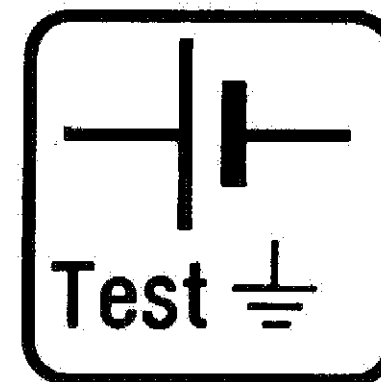
Éclairage "Train"
Beleuchtung "Zug"
"Train" Lighting



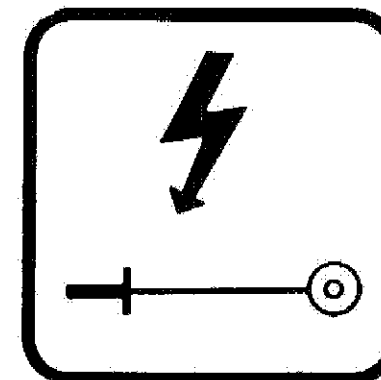
Éclairage "Voiture"
Beleuchtung "Wagen"
"Coach" Lighting



Essai d'isolation circuit Batterie
Isolationsprüfung Batterienetz
Insulation test Battery



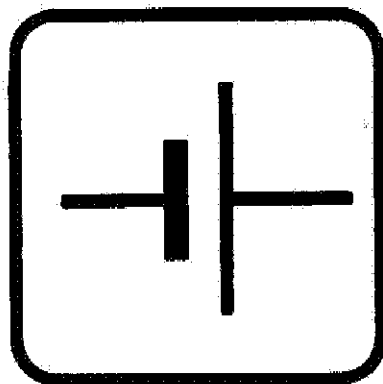
Présence HT
Hochspannung vorhanden (ZS)
High voltage present



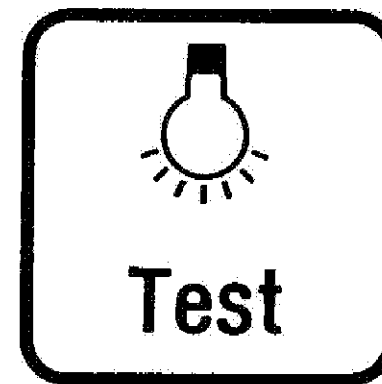
Présence défauts
Fehler vorhanden
Faulty equipment



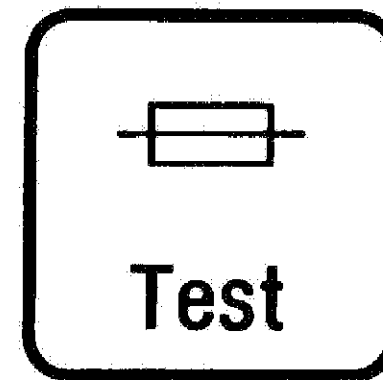
Charge batterie
Batterieladung
Battery charging



Essai des lampes
Lampenprüfung
Lamp test



Dispositif essai "fusibles"
Prüfeinrichtung für "Sicherungen"
"Fusing" test device

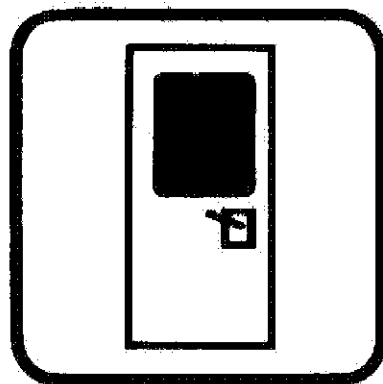


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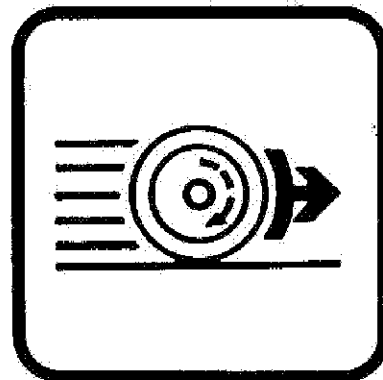
ANNEXE 1
ANLAGE 1
APPENDIX 1

- 28 -

Verrouillage des portes de la voiture
Türblockierung der Reisezugwagen
Locking of coach doors



Anti-enrayeur
Gleitschutz
Wheel slip prevention (WSP) device

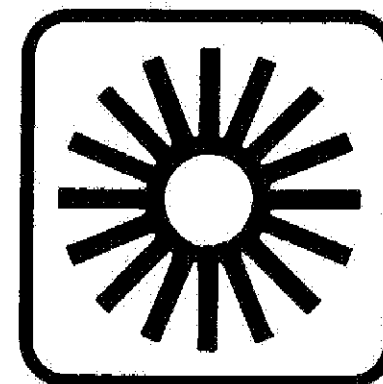


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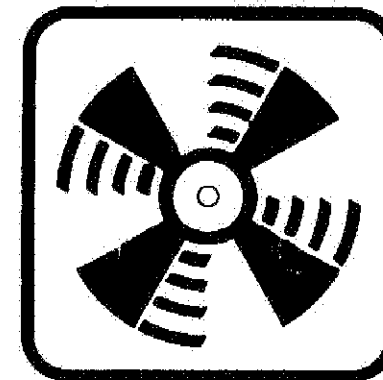
ANNEXE 1
ANLAGE 1
APPENDIX 1

- 29 -

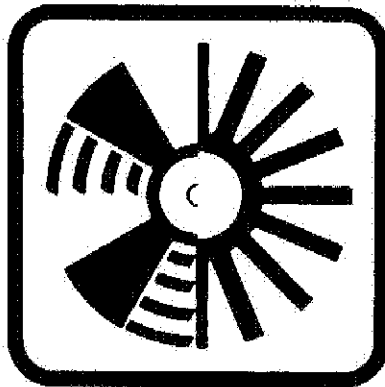
Chauffage
Heizung
Heating



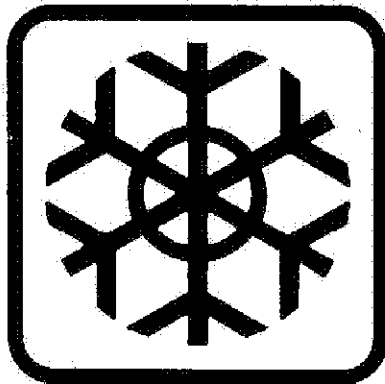
Ventilation
Lüftung
Ventilation



Chauffage à air
Luftheizung
Air heating



Réfrigération
Kühlung
Cooling



D'autres pictogrammes figurent dans la fiche N° 413, par exemple pour l'indicateur de direction du restaurant, N° 34, pour le sélecteur de température, N° 72, et pour la sonorisation, N° 75.

Le disjoncteur principal haute tension doit être repéré suivant la fiche N° 552, planche I.

Weitere Piktogramme sind in dem UIC-Merkblatt 413 vorhanden, z.B. für das Speisewagenhinweisschild die Nr. 34, für die Temperatursteleinrichtung die Nr. 72 und für die Lautsprecheranlage die Nr. 75.

Der Hochspannungshauptschalter ist nach dem UIC-Merkblatt 552, Tafel I, zu kennzeichnen.

Other pictograms are listed in UIC Leaflet 413, such as for the restaurant car, No. 34, for temperature control, No. 72, and for the loudspeaker volume control, No. 75.

The main high-voltage circuit breaker should be identified in accordance with plate I of UIC Leaflet 552.

550-1

OR

Application

As of 1 January 1990.

All UIC railways.

Record references

Heading under which this question has been dealt with :

– *Question 5/R/FIC* - Revision of leaflets.

– *Item 3.1* - Approval of new Leaflet 550-1 : "Electrical switch cabinets on passenger stock".

(Traction and Rolling Stock Committee : Helsinki, June 1989).