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## APTU Uniform Rules (Appendix F to COTIF 1999)

### Uniform Technical Prescriptions (UTP) applicable to Rolling Stock, subsystem

### FREIGHT WAGONS - (UTP WAG) - ANNEX FF

#### BRAKING

### LIST OF APPROVED BRAKE COMPONENTS

#### Explanatory note:

The texts of this UTP which appear without columns are identical with corresponding texts of the European Union regulations. Texts which appear in two columns differ; left-hand column contains the UTP regulations, right-hand column shows the text in the corresponding EU regulations. The text in the right hand column is for information only and not part of the OTIF regulations.

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### FF.1 WHEEL SLIDE PROTECTION DEVICES


#### FF.1.1 WHEEL SLIDE PROTECTION DEVICES FOR NEW, EXISTING, UP-GRADED AND RENEWED VEHICLES

Manufacturer	Type	Observations
FAIVELEY	AEF 82 C	Tested on disc brakes
OERLIKON	GSE 201	Tested on disc brakes
OERLIKON	GSE 202	Tested on disc brakes
FAIVELEY	AEF 83 P.1	Tested on disc brakes
FAIVELEY	AEF 83 P.2	Tested on shoe brakes
OERLIKON	OMG 202	Tested on disc brakes
PARIZZI	WUPAR 83	Tested on disc brakes
WABCO-WESTINGHOUSE	WGMC 19/1	Tested on disc brakes
FAIVELEY	AEF 91 P1 AEF 91 P2 <sup>(1)</sup>	Tested on disc brakes
MANNESMANN REXROTH PNEUMATIK GmbH	MRP-GMC 29	Tested on disc brakes
SAB WABCO KP GmbH	SWKP AS 20R	Tested on disc brakes
SAB WABCO KP GmbH	SWKP AS 20C	Confirm in January 1998: Type features identical to AS 20R
Knorr-Bremse	MGS 2	
DAKO	PE 94 MSV	

<sup>(1)</sup> Combined disc/shoe braked coaches

<sup>1</sup> TSI Freight Wagons – The Annex to Commission Decision 2006/861/EC published in the EU Official Journal L344 on 08.12.2006 as amended by Commission Decision 2009/107/EC published in EU Official Journal L45 on 14.02.2009.

<sup>2</sup> If no EU reference is indicated, it means that the chapter/section number is the same as in the OTIF text.

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## FF.1.2 WHEEL SLIDE PROTECTION DEVICES FOR USE ON EXISTING VEHICLES

The following list of WSP equipment is accepted for use on existing wagons, unless the brake system is upgraded or renewed. Other upgrades or renewals of the wagon will not require a change to the WSP system.

Manufacturer	Type	Observations	
Mechanical Types for speeds up to 160 km/h			
OERLIKON	inertia 4 GS1 & GSA	Tested on shoe brake	preferably only for trailing stock without its own electrical supply
KNORR	MW	(1)	
KNORR	MWX	(1)	

Manufacturer	Type	Observations
<b>Electrical Types</b>		
WESTINGHOUSE	D1	(1)
WESTINGHOUSE	WG	Tested on disc brakes
WESTINGHOUSE	WGK	Tested on shoe brakes
GIRLING	SP	Tested on disc brakes
OERLIKON	GSE 100	(1)
PARIZZI	289	Tested on shoe brakes
PARIZZI	447	Tested on disc brakes
KNORR	GR	(1)
KOVLIS	DAKO	(1)
KRAUSS-MAFFEI	K Micro	(1)
OERLIKON	GSE 200	(1)
KNORR	MGS 1	Tested on disc brakes
WABCO-WESTING- HOUSE	WGMC 19	Tested on disc brakes

(1) Combined disc/shoe braked coaches

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## FF.2 COMPRESSED-AIR BRAKES FOR ‘FREIGHT TRAINS’ AND ‘PASSENGER TRAINS’

### FF.2.1 DISTRIBUTOR VALVES FOR NEW VEHICLES, UPGRADED AND RENEWED VEHICLES

Brake type	Abbreviated description	Abbreviated name	Compressed-air brake
			Freight train (G) Passenger train (P)
Knorr brake	KE 1d <sup>(a)</sup> KE 2d, KE Rd <sup>(c)</sup>	KE	G/P brake
Oerlikon brake	ESG 121 <sup>(d)</sup> <sup>(e)</sup>	0	G/P brake
Oerlikon brake	ESG 121-1 <sup>(d)</sup> <sup>(e)</sup>	0	G/P brake
Knorr brake	KE 1 a/3,8 <sup>(a)</sup> <sup>(f)</sup>	KE	G/P brake
Oerlikon brake	ESH 100 <sup>(g)</sup>	0	G/P brake
Oerlikon brake	ESH 200 <sup>(h)</sup>	0	G/P brake
Knorr brake	KE 1ad <sup>(a)</sup> KE 2ad	KE	G/P brake
SAB-WABCO	SW 4 <sup>(i)</sup>	SW	G/P brake
SAB-WABCO	SW 4C <sup>(j)</sup>	SW	G/P brake
SAB-WABCO	SW 4/3 <sup>(k)</sup>	SW	G/P brake
DAKO brake	CV1 nD <sup>(l)</sup>	OK	G/P brake
SAB-WABCO brake	C3WR <sup>(d)</sup> <sup>(e)</sup>	Ch	G/P brake
SAB-WABCO brake	C3W with AC3D	Ch	G/P brake
SAB-WABCO brake	WU-C <sup>(d)</sup> <sup>(e)</sup>	WU	G/P brake
Oerlikon brake	Est3f 1 HBG 300 <sup>(d)</sup> <sup>(m)</sup>	0	G/P brake
MZT HEPOS brake	MH3f/HBG310/100 <sup>(d)</sup> MH3f/HBG310/200 <sup>(d)</sup> MH3f/HBG310/3xx <sup>(c)</sup> <sup>(d)</sup>	MH	G/P brake
Knorr-Bremse	KE1dv KE2dv KERdv <sup>(c)</sup>	KE	G/P brake
Oerlikon brake	Est3f 1 HBG 300 <sup>(d)</sup> <sup>(m)</sup>	0	G/P brake

(a) Subsequent fitting of other relay valves not permitted.

(b) Void – (not relevant any more)

(c) Brake assembly linked to a load-proportional braking system approved under section FF3.

(d) Separate pressure reducing valve necessary if backfeed via main air supply pipe.

(e) Brake assembly made up of distributor, relay and supports.

(f) Additional maintenance measures on MAV (Hungary) to ensure that the maximum brake cylinder pressure of 3,8 bar is always achieved.


(g) Standard functions up to a maximum of 14 l brake cylinder volume and control volume (dummy volume).

(h) Standard function.

(i) SW 4 — controlled filling of auxiliary reservoir.

(j) SW 4C — controlled filling of control reservoir with protection against overcharge when brake is released.

(k) SW 4/3 — with the C3W cut-off valve, filling of control and auxiliary reservoirs has to take almost identical times.

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<sup>(l)</sup> Distributor choke should be adapted in stages to the vehicle's auxiliary reservoir volumes.

<sup>(m)</sup> Only to be used with added relay.

## FF.2.2 VALVES FOR VEHICLES EXISTING BEFORE 2005 WHICH ARE UPGRADED OR RENEWED


Brake type	Abbreviated description	Abbreviated name	Compressed-air brake
			Freight train (G) Passenger train (P)
Knorr	KEs KE2cAL	KE	G/P brake
Dako	CV CV1	DK	G/P brake
Westinghouse	U	WU	G/P brake
Charmilles brake	C 3 A	Ch	G/P brake
Oerlikon brake	Est 3f with HBG 300	0	G/P brake
Charmilles brake	C 3 W	Ch	G/P brake
Knorr brake	KE Od KE 1d KE 2d	KE	G/P brake
Westinghouse brake	C3 W2	WE	G/P brake
Oerlikon brake	ESG 101	0	P brake
Oerlikon brake	ESG 121	0	G/P brake
Oerlikon brake	ESG 131	0	P brake
Oerlikon brake	ESG 141	0	G/P brake
Oerlikon brake	ESG 101-1	0	P brake
Oerlikon brake	ESG 121-1	0	G/P brake
Oerlikon brake	ESG 131-1	0	P brake
Oerlikon brake	ESG 141-1	0	G/P brake
Knorr brake	KE 1 a/3,8	KE	G/P brake
Knorr brake	KE Oa/3,8	KE	G/P brake
Oerlikon	ESH 100	O	G/P brake with non-universal action where the connected brake cylinder or pre-adjusted volumes are up to 14 l
Oerlikon	ESH 200	O	G/P brake with universal action
Knorr brake	KE 1 ad	KE	G/P brake
Knorr brake	KE 0 ad	KE	G/P brake
Knorr brake	KE 2 ad	KE	G/P brake
SAB-WABCO	SW 4 <sup>(a)</sup>	SW	G/P brake
SAB-WABCO	SW 4C <sup>(b)</sup>	SW	G/P brake
SAB-WABCO	SW 4/3 <sup>(c)</sup>	SW	G/P brake
DAKO brake	CV1 nD <sup>(d)</sup>	DK	G/P brake

<sup>(a)</sup> SW 4 — controlled filling of Auxiliary Reservoir.

<sup>(b)</sup> SW 4C — controlled filling of Auxiliary Reservoir with protection against over control reservoir overcharge when brake is released.

<sup>(c)</sup> SW 4/3 — with the C3W cut-off valve (filling of A and R takes place in practically the same time).

<sup>(d)</sup> Distributor choke should be adapted in stages to the vehicle's R reservoir volumes.

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### FF.3 SELF-ADJUSTING LOAD-PROPORTIONAL BRAKING DEVICES APPROVED FOR INTERNATIONAL TRAFFIC

Manufacturer	Type	Abbreviated description
SAB	<b>I — Mechanical features</b> Load-proportional valve and automatic load-proportional distributor <b>II — Pneumatic features</b>	AC 3 D
WESTINGHOUSE	Load-proportional valve and differential brake cylinder	WDC 14 and WDC 16
KNORR	Load-proportional valve and dual brake cylinder	RLV 12/10 DGB 10"/12"
OERLIKON	Load-proportional valve and dual brake cylinder	ALM-ALT
OERLIKON	Mechanical drive system and dual brake cylinder	ALS-ALT
WESTINGHOUSE	16" brake cylinder	WDR
OERLIKON	Relay valve for self-adjusting load-proportional brakes with single brake cylinder	ALM/ALR 150
KNORR	Relay valve for self-adjusting load-proportional brakes with single brake cylinder	RLV 11d
METALSKI ZAVOD-TITO	Relay valve for self-adjusting load-proportional brakes with single brake cylinder for high-speed intercity traffic.	AKR SS/10
METALSKI ZAVOD-TITO	Relay valve for self-adjusting load-proportional brakes with single brake cylinder for high-speed intercity traffic.	AKR S/01
KNORR	Relay valve for self-adjusting load-proportional brakes with single brake cylinder	RLV 11d
DAKO	Relay valve for self-adjusting load-proportional brakes DSS with load-proportional valve SL1 for high-speed intercity traffic.	DAKO-DSS
DAKO	Relay valve for self-adjusting load-proportional brakes DS with load-proportional valve SL1 for high-speed intercity traffic.	DAKO-DS
DAKO	Load-proportional valve	SL1 or SL2 DAKO-DSS
DAKO	Load-proportional valve	SL1 or SL2 DAKO-DS
SAB-WABCO	Load-proportional valve and dual brake cylinder	SWDR-2
SAB-WABCO	Relay valve for self-adjusting VCAV with distributor SW4, SW4-C or SW4/3 and load-proportional valve DP1 or F87	GF4 SS1 GF4 SS2 GF6 SS1 GF6 SS2
SAB WABCO	Relay valve for self-adjusting integrated VCAV with distributor SW4, SW4-C or SW4/3 and load-proportional valve DP1 or F87	GFSW4-D-AV GFSW4-S-AV

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## FF.4 BRAKE PIPE EMPTYING ACCELERATORS ACCEPTED IN INTERNATIONAL SERVICES

Manufacturer	Type	Remarks
Dako-Kovalis	Dako-Z	Accepted for use in conjunction with the CV1-R type brake
Knorr-Bremse	EB3	Accepted for use in conjunction with the KEs type brake
	EB3-S	Fit for use with the NBŮ (~ SAFI)
	EB3-S/L	Fit for use with the NBŮ (~ SAFI)
Oerlikon-Buhrle	SB 3	Accepted for use in conjunction with the Est 3e type brake
	SBS 100	
Davies and Metcalfe	BPA 1	Fit for use with the NBŮ (~ SAFI)
MZT HEPOS	VBK 100	Fit for use with the NBŮ (~ SAFI)

## FF.5 QUICK-RELEASE VALVES ACCEPTED IN INTERNATIONAL SERVICES

Table 1


Quick-release valves for modern brakes (a)

Manufacturer	Type
<b><i>Installed in the distributor</i></b>	
OERLIKON	LV3:LV3F
OERLIKON	LV7
CHARMILLES	C3P1
CHARMILLES	C3P2
KNORR	ALV3a, ALV7, ALV9, ALV9a
WESTINGHOUSE (Italy)	SA1
WESTINGHOUSE (Italy)	SA1V
KNORR	AL V11
WESTINGHOUSE (Great Britain)	A1 and A2
<b><i>Applicable to existing distributors, when their circuits provide for the emptying of the control reservoir only</i></b>	
OERLIKON	LV3
OERLIKON	LV4F
WESTINGHOUSE (France)	W 104, W 204
WESTINGHOUSE (Italy)	SA1
WESTINGHOUSE (Italy)	SA1V

Table 2

Quick-release valves for old-type brakes

Manufacturer	Type
KNORR	AL V 4 <sup>(a)</sup>
OERLIKON	LV3
OERLIKON	LV4F
WESTINGHOUSE (France)	W 104, W 204

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WESTINGHOUSE (Italy)	SA/CG, SA/RA	
WESTINGHOUSE (Italy)	SA1	
KNORR	L2 <sup>(b)</sup>	
WESTINGHOUSE (Italy)	SARAV	
HARDY	L3 <sup>(b)</sup>	

<sup>(a)</sup> The KNORR ALV4 quick-release valve is applicable to the modern KNORR KE distributor since the latter's release valve only empties the control reservoir (the auxiliary reservoir is emptied by another means: isolating cock).

<sup>(b)</sup> Applicable only to the HIK distributor.


Table 3

**Quick-release valves for modern <sup>(a)</sup> or old-type brakes**

<b>Manufacturer</b>	<b>Type</b>
WESTINGHOUSE (France)	W3,W4
DAKO	OS1
KNORR	ALV4b
BDZ	BRV <sup>(b)</sup>

<sup>(a)</sup> Modern brakes are understood as being those approved for international services after 1.1.1948.

<sup>(b)</sup> Applicable only to the HIK distributor.

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## FF.6 BRAKE PADS FOR VEHICLES EQUIPPED WITH DISC BRAKES, ACCEPTED FOR INTERNATIONAL TRAFFIC

Manufacturer/ Product name	Type	Remarks	Railway request
1	2	4	5
Jurid	Jurid 869	up to 200 km/h	SNCF
Becorit	Becorit 918 <sup>(1)</sup>	up to 200 km/h	DB
Ferodo	ID 425 L <sup>(2)</sup>	up to 200 km/h	FS
Bremskerl	5818 <sup>(2)</sup>	up to 200 km/h	FS
Bremskerl	6792 <sup>(1)</sup>	up to 200 km/h	DB
Jurid	877 <sup>(1)</sup>	up to 200 km/h	DB
Bremskerl	7240 <sup>(1)</sup>	up to 200 km/h	DB
Frendo	2126 <sup>(2)</sup>	up to 200 km/h	FS
Faist Licence Textar	T 543 <sup>(2)</sup>	up to 200 km/h	FS
ICER	ICER 918 <sup>(2)</sup>	up to 200 km/h	RENFE
Flertex	Flertex 664 HD <sup>(3)</sup>	up to 200 km/h	SNCF
Rona (Hungary) Licence Becorit	Rona 918 <sup>(2)</sup>	up to 200 km/h	MAV
Textar	T 550 <sup>(2)</sup>	up to 200 km/h	DB
Frenoplast x.	FR20H.2 <sup>(2)</sup>	up to 200 km/h	PKP
Textar	T550 <sup>(2)</sup>	up to 200 km/h	DB
Becorit	V30 <sup>(2)</sup>	up to 200 km/h	DB
Bremskerl	Bremskerl 2000 <sup>(2)</sup>	up to 200 km/h	DB
Bremskerl	7 699	up to 200 km/h	FS
Italian Brakes	FS 5M1 <sup>(1)</sup>	up to 200 km/h	FS

<sup>(1)</sup> tested on cast-iron and cast-steel disc brakes

<sup>(2)</sup> tested on cast-iron disc brakes

<sup>(3)</sup> tested on cast-steel disc brakes

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## FF.7 AUTOMATIC ‘EMPTY-LOADED’ CONTROL MECHANISMS ACCEPTED IN INTERNATIONAL TRAFFIC

Manufacturer	Type
<b>a) multi-purpose usage</b>	
Westinghouse	WAD
SAB	VA2
SAB	DP2
KNORR	Du-111 WM
OERLIKON	ALM/ALR 140
<b>b) use only on loaded or empty wagons</b>	
Westinghouse	WAN
SAB	VTa

## FF.8 TEST BENCHES ASSESSED UP TO JUNE 2004 AS CAPABLE OF CARRYING OUT ACCEPTANCE TESTS ON BRAKE PADS

Company	Location
DB	Minden
FS	Florence
SNCF	Vitry MF1 Vitry MF3
CFR	Bucharest
ČD	Prague
PKP	Warsaw
ŽSR	Zilina