Appendix to

UIC CODE 541-05

3rd edition, March 2016

Last update 18/5/2017

Translation or original

Brakes

Specifications for the construction of various brake parts - Wheel Slide Protection device (WSP)

Appendix F

WSPs approved for international traffic

Appendix F (points F1 to F4) replaces the previous appendices K, L, M and N of the 2nd edition of the Leaflet

The tables given in this appendix:

- are updated regularly,
- correspond to the above date of update.

INTERNATIONAL UNION
OF RAILWAYS

Appendix F1 - WSPs accepted in international traffic for vehicles built between 01.01.1974 and 31.12.1986

Manufacturer	Type	Period of approvals testing	
		Block brakes	Disc brakes
I – Mechanical types			
OERLIKON	Inertia 4 GS1 et GSA	November 1968	
KNORR	MW	October 1975	October 1975
KNORR	MWX	October 1975	October 1975
II - Elektronic types			
WESTINGHOUSE	D1	June1970	November 1969
WESTINGHOUSE	WG		October 1973
WESTINGHOUSE	WGK	Autumn 1973	
GIRLING	SP		June 1970
OERLIKON	GSE 100	October 1972	October 1972
PARIZZI	289	November 1967	
PARIZZI	447	-	May 1973
KNORR	GR	-	June 1970
KNORR	GR	October 1973	
KOVOLIS	DAKO	October 1977	
	DAKO	-	November 1977
KRAUSS-MAFFEI	K Micro	June 1979	June 1979
OERLIKON	GSE 200 with pulse sensors	March 1980	March 1980
KNORR	MGS 1	-	April 1981
WABCO-WESTINGHOUSE	WGMC 19	-	March 1982
FAIVELEY	AEF 83 C	-	September 1983
OERLIKON	GSE 201	-	April 1984
OERLIKON	GSE 202	-	April 1984
FAIVELEY	AEF 83 P.1	-	October 1984
FAIVELEY	AEF 83 P.2	October 1984	-

Appendix F2 (page 1/2): WSPs accepted in international traffic for vehicles built after 01.01.1987 (a)

Manufacturer	Type	Period of approvals testing		Remarks
		Block brakes	Disc brakes	
I – Mechanical types for speeds up to 160 km/h				
OERLIKON	Inertia 4 GS1 and GSA	November 1968		Preferably only for use on wagons without their own power supply
KNORR	MWX	October 1975	October 1975	
II – Electronic types				
WESTINGHOUSE	D1	June 1970	November 1969	b)
WESTINGHOUSE	WG	-	October 1973	b)
WESTINGHOUSE	WGK	Autumn 1973	-	b)
GIRLING	SP	-	June 1970	b)
OERLIKON	GSE 100	October 1972	October 1972	b)
PARIZZI	447	-	May 1973	b)
KNORR	GR	-	June 1970	b)
KNORR	GR	October 1973	-	b)
KOVOLIS	DAKO	October 1977	-	b)
	DAKO	-	November 1977	b)
KRAUSS-MAFFEI	K-Micro	June 1979	June 1979	
OERLIKON	GSE 200	March 1980	March 1980	
KNORR	MGS 1	-	April 1981	g), h)
WABCO-WESTINGHOUSE	WGMC 19	-	March 1982	g), h)

a) Also approved for vehicles built previously
b) These types are no longer to be used for newly-built vehicles
c) From 01.01.1997, approval is valid also when using the SKF LS 1639 speed sensor
d) Approvals testing was conducted on a passenger coach without adhesion-independent brakes (e.g. magnetic brakes)
e) From 01.07.2002, approval is valid also when using the IMG3xx pulse sensors
f) Passenger coaches with combined block/disc braking
g) From 01.02.2005, certification is valid also when using the FSxx pulse sensors
h) From 01.04.2011, certification is valid also when using the pulse sensors Lenord & Bauer GEL 247x

Appendix F2 (2/2): WSPs accepted in international traffic for vehicles built after 01.01.1987 (a)

Manufacturer	Type	Period of approvals testing		Remarks
		Block brakes	Disc brakes	
FAIVELEY	AEF 83 C	-	September 1983	
OERLIKON	GSE 201	-	April 1984	
OERLIKON	GSE 202	-	April 1984	
FAIVELEY	AEF 83 p. 1	-	October 1984	
FAIVELEY	AEF 83 p. 2	October 1984	-	
OERLIKON	OMG 202	-	March 1986	e)
PARIZZI	WUPAR 83	-	October 1986	c)
WABCO-WESTINGHOUSE	WGMC 19/I	-	October 1987	c), g)
FAIVELEY	AEF 91 P1 AEF 91 P2	- September 1992 (f)	September 1992	
MANNESMANN REXROTH PNEUMATIK GmbH	MRP-GMC 29	-	October 1993	g), h)
KES Keschwari Electronic Systems GmbH & Co.KG (previously SAB WABCO KP GmbH)	KES AS 20R	-	October 1997	Change of designation of Manufacturer in January 2013
KES Keschwari Electronic Systems GmbH & Co.KG (previously SAB WABCO KP GmbH)	KES AS 20C	-	None	Confirmed in January 1998: General properties identical with those of AS 20R Changes of Manufacturer's name of the SWKP AS 20 R/C
Knorr-Bremse	MGS 2	-	April 1997	g), h)
DAKO	PE 94 MSV	-	September 1998 (d)	

a) Also approved for vehicles built previously
b) These types are no longer to be used for newly-built vehicles
c) From 01.01.1997, approval is valid also when using the SKF LS 1639 speed sensor
d) Approvals testing was conducted on a passenger coach without adhesion-independent brakes (e.g. magnetic brakes)
e) From 01.07.2002, approval is valid also when using the IMG3xx pulse sensors
f) Passenger coaches with combined block/disc braking
g) From 01.02.2005, certification is valid also when using the FSxx pulse sensors
h) From 01.04.2011, certification is valid also when using the pulse sensors Lenord & Bauer GEL 247x

Appendix F3 (1/3): WSPs accepted in international traffic for vehicles built after 01.01.2004

Manu-facturer	Type design-ation	Type			Application			Date of testing for approval	Approved from:
		Control unit	Speed sensor	WSP valve	Vehicle category 1)	Types of brakes 2)	Maximum speed		
Alstom	µWUPAR	µWUPAR 4A4C-2H; 4A2C-2H; 4A4C-HS;	ALSTOM GF-1PSV oder SKF LS 1639	ALSTOM µEV-SR or Alstom OSR-SR	High speed trains, passenger coaches, multiple units	Disc brakes, magnetic brakes,,	200 km/h (4A4C-2H; 4A2C-2H); 250 km/h (4A4C-HS)	April 2004	01.07.2004
KES	SWKP	ASM20R/C	MFIG 20 IG 20 FSG 20	MV 20	Passenger coaches Locom-otives, multiple units, high speed trains	Disc brakes, magnetic brakes, Friction brakes, dynamic brakes	200 km/h 364 km/h		01.07.2007 01.01.2012
KNORR-Bremse SfS GmbH	MGS2	ESRA	GI5 GID5 GI6 FS01x SKFxx-KB	GV 12 GV 21 GV 221 ASV1	Passenger coaches, Locomotives, multiple units, high speed trains	Friction brakes, Dynamic brakes, Magnetic brakes	405 km/h	---	22.01.2009 01.07.2011 01.03.2017

1) - Passenger coaches,
   - Freight wagons,
   - Locomotives / multiple units,
   - High speed trains

2) - Disc brakes,
   - Block brakes,
   - Combined disc/block brakes,
   - Dynamic brakes,
   - Adhesion-independent brakes,
   - Magnetic brakes,
   - Friction brakes

Appendix F3 (2/3): WSPs accepted in international traffic for vehicles built after 01.01.2004

Manu-facturer	Type designation	Type			Application			Date of testing for approval	Approved from:
		Control unit	Speed sensor	WSP valve	Vehicle category 1)	Types of brakes 2)	Maximum speed		
Faiveley Transport	AEF G2	1/8011xx (Motorola 375) or 1/8012xx (Motorola CF)	Faiveley FYGEN, inductive power sensor (axle bearing cover or gearbox casing) or: Faiveley S-Vel or SVEL 2 (active power or current sensor) or: active current sensor integrated in bearing, produced by SKF or FAG	EVPM2, EVPM5, EVPM6, DV1, DV12 or MV20DVW SP 0001-01	Passenger coaches, Locomotives, multiple units, high speed trains	Friction brakes, dynamic brakes, magnetic brakes	400 km/h	---	01.02 2010 01.02.2015
KNORR-Bremse SfS GmbH	MGS EP Compact	ESRA: GU + CU0xy or GCU0xy	FSxx SKF-KB	GVxx ASV1	Passenger coaches, Locomotives, multiple units, high speed trains	Friction brakes, Dynamic brakes, Magnetic brakes	405 km/h	---	01.02.2010 01.03.2017
Poli-Wabtec	ATHENA	UCF xxxx-yy	SSHE xxxx-yy SKF speed sensor FS715B FS725A	DVWSP xxxx-yy Parizzi dump valve Typ 46251	Passenger coaches, Locomotives, multiple units	Friction brakes, dynamic brakes, magnetic brakes	200 km/h	---	01.02.2010 01.02.2011

1) - Passenger coaches,
   - Freight wagons,
   - Locomotives / multiple units,
   - High speed trains

2) - Disc brakes,
   - Block brakes,
   - Combined disc/block brakes,
   - Dynamic brakes,
   - Adhesion-independent brakes,
   - Magnetic brakes,
   - Friction brakes

Appendix F3 (3/3): WSPs accepted in international traffic for vehicles built after 01.01.2004

Manu-facturer	Type designation	Type			Application			Date of testing for approval	Approved from:
		Control unit	Speed sensor	WSP valve	Vehicle category 1)	Types of brakes 2)	Maximum speed		
Selectron	WSP 800	Selectron MAS Traffic	Baumer 58L1624K/ 10600689 Lenord & Bauer GEL247x UIC Zertifikat Nr. B-004/2011-04	Knorr GV12 (max. 1A, 24/36V)	passenger train cars, locomotives, multiple unit trains,	friction brake, dynamic brake, magnetic track brake	200 km/h	-	01.07.2013
Siemens	SIBAS®GS	BSG 2	GEL2475 Lenord & Bauer	DAKO N8	Coach, Locomotiven, Tractive units, HS train sets	Wheel brakes, Magnetic track brakes, Friction brakes, dynamic brakes	454 km/h	---	01.09.2013
Siemens	SIBAS®GS kompakt	BSG 3	Lenord & Bauer: GEL247x, GEL348x SKF AV BT2	DAKO N8 DAKO N8.1 Poli DVWSP	Coaches, Locomotives, Tractive units, HS train sets	Wheel brakes, Magnetic track brakes, Friction brakes, dynamic brakes	454 km/h	---	10.06.2014

1) - Passenger coaches,
   - Freight wagons,
   - Locomotives / multiple units,
   - High speed trains

2) - Disc brakes,
   - Block brakes,
   - Combined disc/block brakes,
   - Dynamic brakes,
   - Adhesion-independent brakes,
   - Magnetic brakes,
   - Friction brakes

Appendix F4: WSPs accepted in international traffic for vehicles built after 01.04.2016

Manu-facturer	Type designation	Type			Application			Date of testing for approval	Approved from:
		Control unit	Speed sensor	WSP valve	Vehicle cathegory 1)	Types of brakes 2)	Maximum speed		
Currently no certified WSP									

Details of updates:

Date of update:	Body:	Decision:
07.04.2004	CTR Steering Committee	Creation of a UIC website listing components with UIC approval; Deletion of the corresponding appendices in UIC Leaflets
01.10.2004	SC Braking and Running Gear; July 2004 meeting	Publication of Leaflet 541-05 1st edition, Appendices K, L and M on the website, including updates of the tables extracted from the leaflet; Appendix L: • New entry, the IMG3xx pulse sensor, approved as of 1.7.2002 Appendix M • 1st publication of the new Appendix M • New entry of the µWuparWSP
01.03.2005	SC Braking and Running Gear; Tagung Januar 2005	Appendix L: • New entry of the Knorr Type FSxx pulse sensor, certified as of 1.2.2005 • Modification of footnote concerning FAIVELY build type, from “2” to “f” • Replacement of digits with letters in footnotes Appendix M • Addition of the word “.... also....” in the table title
01.07.2007	SG 5 „Braking and Running Gear“ June 2007 meeting	Appendix M • New entry of the SWKP - ASM20R/C WSP
01.04.2009	SET 7 „Braking“ January 2009 meeting	Appendix M • New entry of the KB SfS – MGS2 WSP
10.02.2010	SET 7 „Braking“ January 2010 meeting	Appendix M • New entry of the WSP Faiveley Transport – AEF G2 • New entry of the WSP Knorr Bremse SfS – MGS EP Compact • New entry of the WSP Poli Wabtec –Athena
12.03.2010	SET 7 „Braking“ January 2010 meeting	Appendix M • Changes at the WSP Poli Wabtec –Athena
21.01.2011	SET 7 „Braking“ January 2011 meeting	Appendix M • Extension of the WSP Poli Wabtec –Athena
01.07.2011	SET 7 „Braking“ June 2011 meeting	Appendix M • Extension of the KB SfS – MGS2 WSP, intropduction of GV 221 dump valve
06.04.2011	SET 7 „Braking“ Email survey 2011-03	Appendix M • New entry of GEL 247x pulse sensor, approved as of 2011-04-01
05.02.2012	SET 7 „Braking“ January 2012 meeting	Appendix M • Changes at the WSP KES ASM 20 R/C
05.07.2013	SET 7 „Braking“ June 2013 meeting	Appendix M • New entry of the Selectron WSP 800
01.09.2013	SET 7 „Braking“ June 2013 meeting	Appendix M • New entry of the WSP Siemens SIBAS ® (BSG2)

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10.06.2014	SET 7 „Braking“ January 2014 meeting	Appendix M • New entry of the WSP Siemens SIBAS ® kompakt (BSG3)
22.01.2015	SET 7 „Braking“ January 2015 meeting	Appendix M • Extension of the WSP FT AEF G2 with the speed sensor SVEL2
22.05.2017	SET 7 „Braking“ January 2017 meeting	Appendix F • Extension of the WSP KB MGS 2 with the speed sensor ASV1 • Extension of the WSP KB MGS EP Compact with the speed sensor ASV1