



**KONGSBERG**  
AUTOMOTIVE

# Product Catalogue

Raufoss Couplings



Enhancing the driving experience

Valid from 02.2016

**Raufoss**<sup>TM</sup>  
COUPLINGS

Kongsberg Automotive has operations in  
twenty countries on four continents.  
Our customer portfolio comprises more than  
fifty vehicle manufactures.



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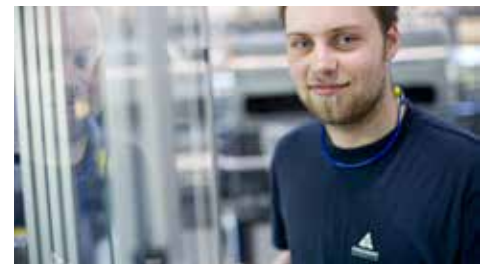
## A lifetime of service and support

The world's commercial vehicle manufacturers require innovative solutions that offer functionality, comfort and safety. Kongsberg Automotive's customers include a broad range of leading manufacturers worldwide.

To meet individual specifications on concept, design and technical

issues, vehicle manufacturers prefer a close cooperation with Kongsberg Automotive.

By focusing on easy installation, cost effectiveness, and environment friendly solutions, Kongsberg Automotive provides added value to customers all over the world.



[www.kongsbergautomotive.com](http://www.kongsbergautomotive.com)

## Aligned with customers' demands

Close follow-up of deliveries is important to customers' success. Potential deviations are therefore resolved at an early phase or eliminated through product modifications. Kongsberg Automotive follows up after-market sales through close contact with vehicle manufacturers and dealers, as well as end users.

Our manufacturing facilities and sales offices have a global reach, enabling us to optimize production and to be close to our customers.

We provide professional service to our customers within:

- ▶ Sales and logistics
- ▶ Product function training
- ▶ Product installation training
- ▶ Product repair training
- ▶ Warranty handling

Kongsberg Automotive has a global network of distributors to ensure rapid delivery to all corners of the world. See our webpages to find the distributor covering your country.





## Our vision

### “Enhancing the driving experience”

Every day we try to make things better than we did yesterday.

No matter what vehicle you drive or operate, it's our vision to enhance your driving experience.

Whatever position, role or work assignment we hold in the Kongsberg Automotive team, we all contribute to making your vehicle safer, more comfortable and sustainable. To us this is a never-ending goal, pushing us to look for the better way every day.

# Raufoss ABC™ System

A new generation of couplings, based on composite materials in combination with leading coupling technology.

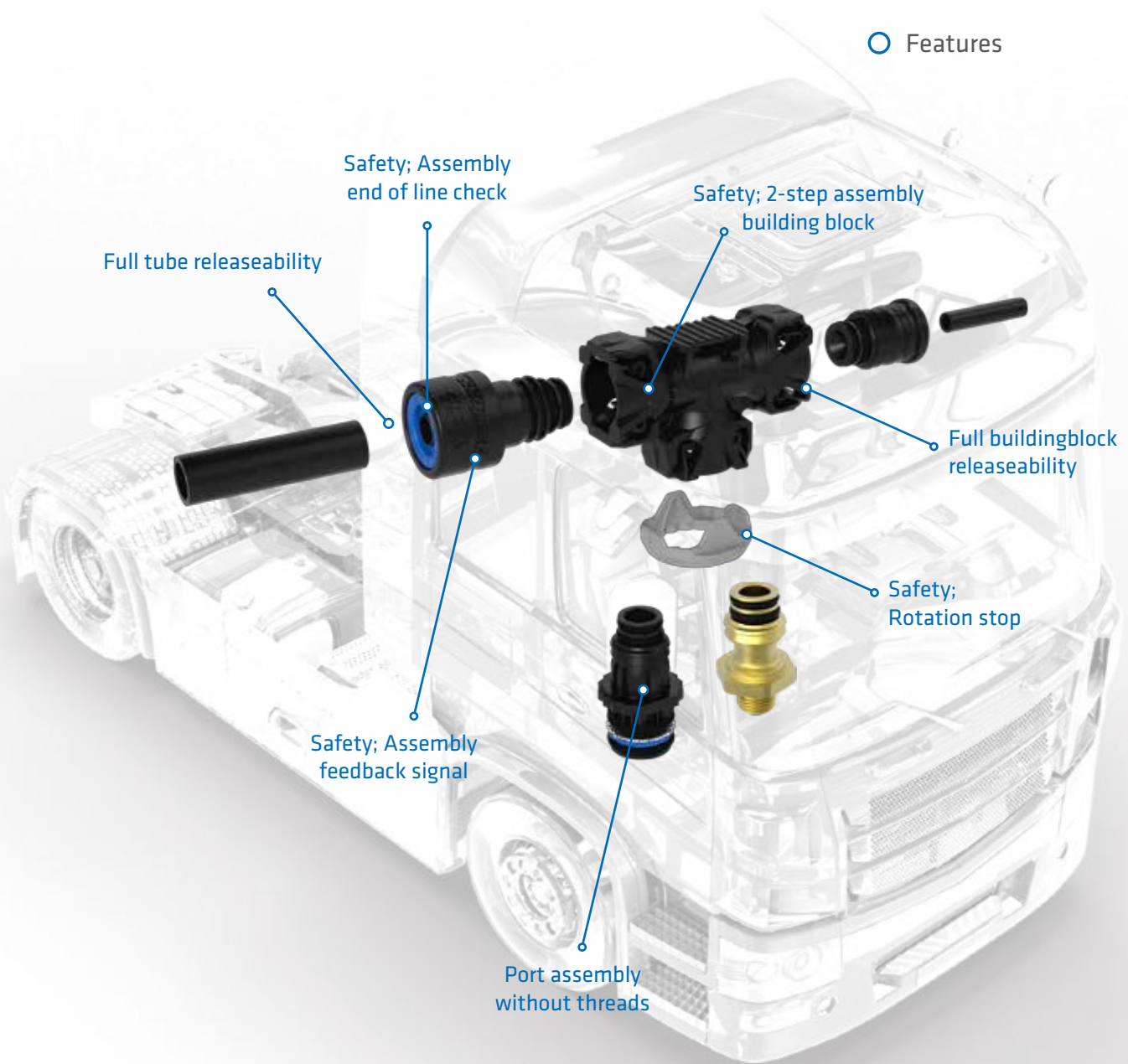
The system will provide significant improvement in key coupling areas, and enable Raufoss to take a broader responsibility in pneumatic system building on commercial vehicles.

New composite materials reduce system cost, weight, article numbers and increases design flexibility.

Brass components secure structural integrity in highly stressed areas.

One global system, fulfilling different engineering philosophies within truck, bus, trailer, off-road applications.

## ○ Features



## Raufoss ABC Push-in family



ABC New line



ABC KArtridge

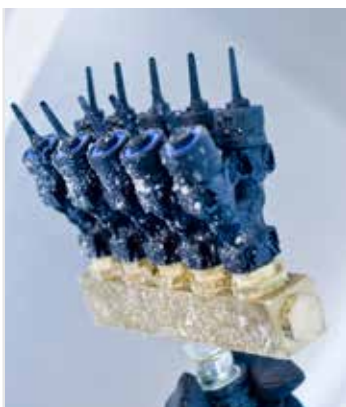


ABC Threadless



ABC Integral

## ABC Building Block – Program overview



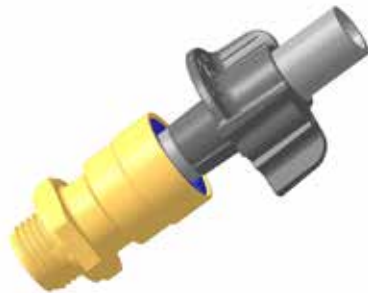


## Release Tool

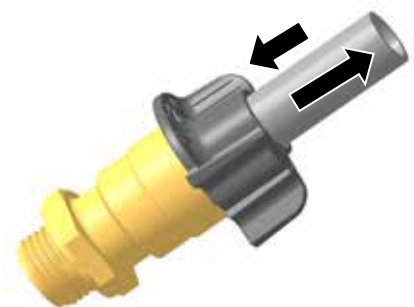
1. Remove the pressure totally from the system
2. Push the tube to the bottom of the coupling to move the grip ring out of locking position.
3. Apply Release Tool on to the tube.
4. Push the Release Tool to stop with the flange at the top of the tube without using extensive force.
5. While pushing the Release Tool towards the coupling; pull the tube out.
6. Kongsberg Automotive recommends that each single push-in coupling experience a total of maximum five (5) tube assemblies and releases in a lifetime perspective



1



2



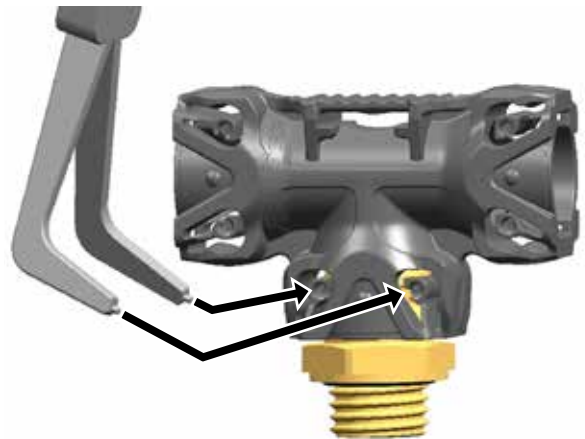
3/4

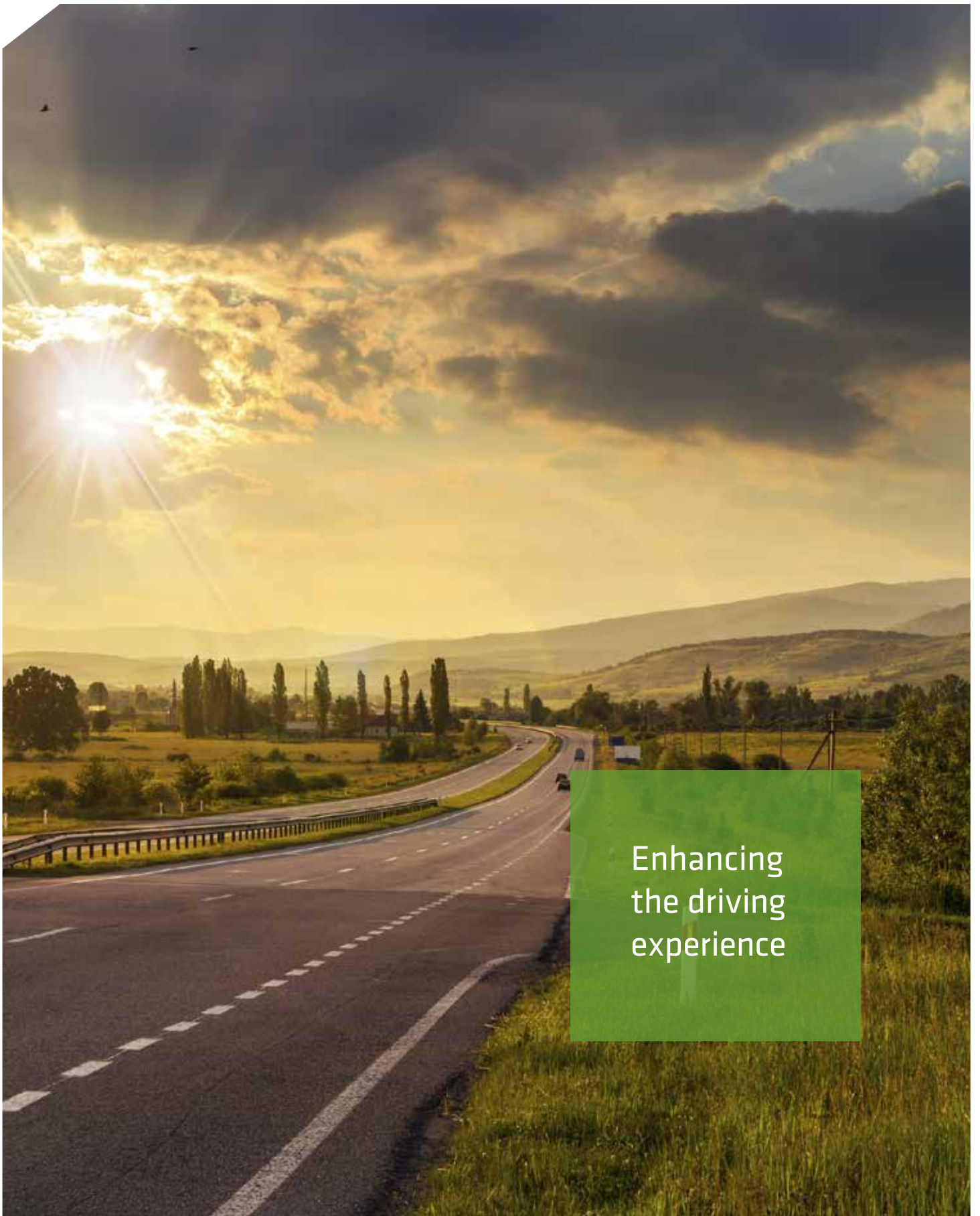
## ABC Building Block release



Standard circlip plier - 90° elbow

Standard circlip plier - Straight





Enhancing  
the driving  
experience

GB / FR / DE / IT

**SYMBOLS - SYMBOLES - SYMBOLE - LEGENDA**



Hexagon width/Clé de/Schlüsselweite/Chiave [mm]



Packing unit/Unité emballage/Verpackungseinheit/Unità d'imballo



Weight/Poids/Gewicht/Peso [g]

BRK/P5 products on page 59.

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19	ABC Swivel Bulkhead	ABC Embase fileté passe-cloison	ABC Anschlußschottstutzen	ABC Innesto girevole con passaparete
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36	Socket joint	Manchon	Gewindemuffe	Manicotto filettato
36	Plug	Bouchon	Stopfen	Tappo
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37	Test point	Prise de pression	Prüfanschluss	Raccordo presa pressione
38	Drain plug	Purge de bouteille	Entwässerungsanschluss	Raccordo spurgo condensa
38	Hose nipple	Raccord queue lisse/cannelée	Schlauchstutzen	Bocchettone
40	Accessories/Spare parts	Accessoires/pièces de rechange	Zubehör/Ersatzteile	Accessori/Ricambi
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## General System Information

Kongsberg Automotive has, in co-operation with various commercial vehicle manufacturers, developed a new air coupling system based on composite material and brass for use with plastic tubing for the compressed air circuits used on commercial vehicles.

The carefully developed, matured and thought out ABC™ couplings system consists of the following elements:

- Push-in couplings
- ABC™ Swivels
- ABC™ Building Blocks
- Bulkhead couplings
- Test Points
- Hose nipples
- Accessories

Raufoss ABC™ couplings can be used with polyamide (PA 6.10, PA 10.10, PA 10.12, PA 11, PA 12) or Hytrel tubing to one of the following standards:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844

Operating temperature for ABC™ Couplings is between -40°C to +100°C, with peak-temperature up to + 130°C (pressure less, for a period of approximately 2 hours.)

The operating pressure is max 12,5 bar for the couplings. Please take into consideration the max allowed tube operation pressure.

## Informations générales sur le système

Kongsberg Automotive, en coopération avec des constructeurs de véhicules industriels, a développé un programme de raccords de freinage en matière composite et laiton pour tubes polyamide destiné aux circuits d'air comprimé des véhicules industriels.

Le système de raccords de freinage ABC™ repose sur un concept réfléchi comprenant les éléments suivants :

- des unions mâles
- des embases orientables ABC™
- des pièces de forme (coudes, tés, croix etc.)
- des passe-cloisons
- des prises de pression
- des Raccords queue lisses et cannelées
- des accessoires

Les raccords Raufoss ABC™ peuvent être utilisés avec des tubes polyamide (PA 6.10, PA 10.10, PA 10.12, PA 11, PA 12) ou Hytrel conformes aux normes suivantes:

- SO 7628
- DIN 74324
- DIN 73378
- SAE J844

La température de service des raccords ABC™ peut varier entre -40°C et + 100°C, avec une température de pointe à + 130°C (sans pression, pendant environ 2 heures).

La pression de service des raccords est de 12,5 bar ; veillez à la résistance maximale des tubes.

Product Produit	Material Designation <sup>1)</sup> Spécification Matière <sup>1)</sup>	Comments Commentaires
Brass components	EN 12164 CW617N (CuZn39Pb2)	
Composants laiton	EN 12164 CW614N (CuZn39Pb3)	
ABC™ composite bodies	PA12 GF50	
ABC™ boîtiers composites	PA12GF50	
O-rings	EPDM	
Joints toriques	EPDM	
Steel components <sup>2)</sup>	EN 10087 9SMnPb28	Yellow Chromated acc. ISO4042/A3C
Composants Acier <sup>2)</sup>	EN 10087 9SMnPb28	Bichromates jaune ISO4042/A3C

The use of our couplings with other media than air is not permitted without prior approval.

Raufoss ABC™ couplings from Kongsberg Automotive is approved and certified by: TÜV Nord

Kongsberg Automotive quality system is approved according to the following international standards:

- ISO/TS 16 949
- ISO 14001

For any further specific requirements, applications of our product or support for technical solutions, please ask for individual consultation from Kongsberg Automotive, our subsidiary Kongsberg Raufoss Distribution SAS.

<sup>1)</sup>Unless otherwise specified

<sup>2)</sup>Steel components are marked with # in the product list

L'utilisation de nos raccords avec des fluides autre que l'air n'est pas autorisée sauf accord express de nos services techniques.

Les raccords Raufoss ABC™ de Kongsberg Automotive sont certifiés et approuvés par : TÜV Nord

Le système qualité de Kongsberg Automotive est certifié selon les normes suivantes :

- ISO/TS 16 949
- ISO 14001

Pour tous renseignements complémentaires sur les applications de nos produits ou pour obtenir une aide technique, veuillez contacter votre revendeur ou Kongsberg Raufoss Distribution SAS.

<sup>1)</sup>Des déviations sont marquées

<sup>2)</sup>Composants en acier sont marqués avec #

## Allgemeine System Information

Kongsberg Automotive als kompetenter Systemlieferant der weltweiten Nutzfahrzeugindustrie hat, in Kooperation mit führenden Nutzfahrzeugherstellern, ein Steckverbindungs-System für Kunststoffrohre in der Druckluftbremsanlage von Nutzfahrzeugen entwickelt.

Das sorgfältig, entwickelte, ausgereifte und durchdachte ABC™ Couplings - Verschraubungssystem besteht aus den folgenden Komponenten:

- Gerade Steckverbindungen
- ABC™ Schnellanschlußstutzen
- ABC™ Baukastenteile
- Schottverschraubungen
- Prüfanschluß
- Schlauchstutzen
- Zubehörteile

Raufoss ABC™ Couplings können für Polyamid-Rohre (PA 6.10, PA 10.10, PA 10.12, PA 11, PA 12) sowie Hytrel-Rohre der folgenden Normen verwendet werden:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844

Die Betriebstemperatur für das ABC Couplings™ ist -40°C bis +100°C ausgelegt, mit einer Spitzentemperatur von bis +130°C (drucklos, für die Dauer von ca. 2 Stunden).

Der zulässige Betriebsdruck ist 12,5 bar. Bitte beachten Sie den max. erlaubten Betriebsdruck der Rohre.

## Informazioni sul sistema

Kongsberg Automotive, in collaborazione con i principali costruttori di veicoli industriali, ha sviluppato un tecnologico sistema di raccordi ad innesto rapido in materiale composito ed ottone idoneo al collegamento delle tubazioni termoplastiche degli impianti pneumatici.

La produzione del sistema di raccordi ABC™ Couplings è stata avviata dopo un'attenta fase di ricerca, sviluppo e collaudi, e consiste dei seguenti componenti:

- Raccordi ad innesto rapido New Line
- Raccordi girevoli ABC™
- Raccordi ABC™ multipli
- Raccordi passaparete
- Raccordi presa pressione
- Bocchettoni
- Accessori

Il sistema Raufoss ABC™ Couplings può essere impiegato con tubazioni in poliamide (PA 6.10, PA 10.10, PA 10.12, PA 11, PA 12) od in Hytrel conformi ai seguenti standard:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844

La temperatura di lavoro prescritta è compresa tra i -40°C ed i +100°C, con una temperatura di picco di +130°C (senza pressione per un periodo max di 2 ore).

La pressione di lavoro massima è di 12,5 bar, tenendo in considerazione la pressione massima prescritta per i tubi.

	Produkt Prodotto	Material Spezifikation <sup>1)</sup> Descrizione del materiale <sup>1)</sup>	Anmerkungen Commenti
TABELLE 1	Messing System-Komponenten	EN 12164 CW617N (CuZn39Pb2)	
	Parti in ottone	EN 12164 CW614N (CuZn39Pb3)	
	Gehäuse des ABC™	PA12 GF50	
	Corpi dei raccordi ABC™	PA12GF50	
	O-Ringe	EPDM	
	O-rings	EPDM	
	Stahlteile <sup>2)</sup>	EN 10087 9SMnPb28	Gelbverzinkt nach ISO4042/A3C
	Parti in acciaio <sup>2)</sup>	EN 10087 9SMnPb28	Zincatura gialla ISO4042/A3C

Andere Medien als Druckluft dürfen nur mit besonderer Freigabe verwendet werden.

Die Raufoss ABC™ - Verschraubungen vom Kongsberg Automotive ist geprüft und zertifiziert von: TÜV Nord

Das Qualitätssicherungssystem von Kongsberg Automotive ist nach den folgenden international anerkannten Normen zertifiziert:

- ISO/TS 16 949
- ISO 14001

Für Rückfragen stehen Ihnen die Anwendungsberater von Kongsberg Automotive oder von Kongsberg Raufoss Distribution SAS gerne zur Verfügung, sowie unsere Händler.

<sup>1)</sup>Abweichungen sind gekennzeichnet

<sup>2)</sup>Die Stahl-Komponenten sind mit # gekennzeichnet

Non è consentito l'uso del sistema Raufoss ABC™ Couplings con fluidi diversi dall'aria, salvo specifica approvazione.

Il sistema Raufoss ABC™ Couplings prodotto dalla Kongsberg Automotive è approvato e certificato dal: TÜV Nord

Il sistema Qualità della Kongsberg è conforme ai seguenti standard:

- ISO/TS 16 949
- ISO 14001

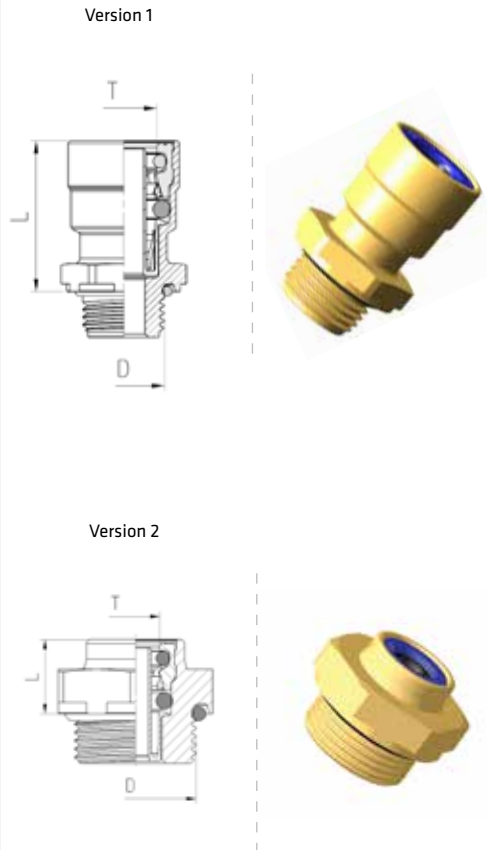
Per applicazioni diverse o per ricevere supporto tecnico sul sistema di raccordi Raufoss ABC™ Couplings, vogliate consultare Kongsberg Raufoss Distribution SAS.




<sup>1)</sup>Salvo diversa specifica

<sup>2)</sup>I componenti in acciaio sono contrassegnati da # sul catalogo

GB: ABC New Line Push-in Coupling  
DE: ABC New Line Steckverbinder

FR: ABC New Line Union Mâle  
IT: ABC New Line Raccordo ad innesto rapido

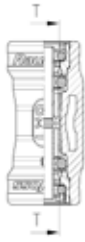


Article no.	T	D	L	Version	Support sleeve			
901 06 010	6x1	M10x1	24	1	black	16	200	20
901 06 012	6x1	M12x1,5	23	1	black	18	170	25
901 06 014	6x1	M14x1,5	16	2	black	20	150	26
901 06 016	6x1	M16x1,5	12	2	black	22	175	29
901 06 022	6x1	M22x1,5	12	2	black	28	100	55
901 06 004	6x1	M12x1,5K	22	2	black	16	150	35
901 06 049	6x1	1/8" - 27 NPTF	23	1	black	16	100	21
901 08 010	8x1	M10x1	26	1	black	18	150	24
901 08 012	8x1	M12x1,5	25	1	black	18	150	28
901 08 014	8x1	M14x1,5	25	1	black	20	150	33
901 08 016	8x1	M16x1,5	17	1	black	22	150	30
901 08 022	8x1	M22x1,5	13	2	black	28	100	52
901 08 059	8x1	G1/8"		1	black	17	200	22
901 08 060	8x1	G1/4"	25	1	black	20	100	32
901 08 070	8x1	R1/4"	24	1	black	18	100	28
901 10 012	10x1	M12x1,5	29	1	light grey	20	100	34
901 10 014	10x1	M14x1,5	29	1	light grey	20	100	38
901 10 016	10x1	M16x1,5	28	1	light grey	22	90	41
901 10 022	10x1	M22x1,5	20	2	light grey	28	70	56
901 10 112	10x1,25	M12x1,5	29	1	black	20	100	34
901 10 116	10x1,25	M14x1,5	28	1	black	22	90	41
901 10 122	10x1,25	M22x1,5	20	2	black	28	80	56
901 10 212	10x1,5	M12x1,5	29	1	dark grey	20	100	34
901 10 216	10x1,5	M16x1,5	28	1	dark grey	22	90	41
901 10 222	10x1,5	M22x1,5	20	2	dark grey	28	80	56
901 12 012	12x1,5	M12x1,5	30	1	black	22	80	39
901 12 016	12x1,5	M16x1,5	30	1	black	22	75	43
901 12 022	12x1,5	M22x1,5	19	2	black	28	75	50
901 12 061	12x1,5	G3/8"	30	1	black	22	75	44
90114022	14x2	M22x1,5	23	1	black	28	50	47
901 15 016	15x1,5	M16x1,5	33	1	black	28	50	64
901 15 022	15x1,5	M22x1,5	23	2	black	28	60	54
901 16 016	16x2	M16x1,5	33	1	black	28	50	62
901 16 022	16x2	M22x1,5	30	1	black	28	50	66

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

GB: Tube connector  
DE: Rohr Verbinder

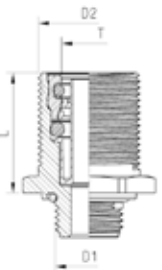
FR: Union double  
IT: Giunzione



Article no.	T						
905 06 006	6x1					250	10
905 08 008	8x1					200	23
905 12 012	12x1,5					120	23

GB: Bulkhead with ABC-NewLine  
DE: Schottstutzen mit ABC-NewLine

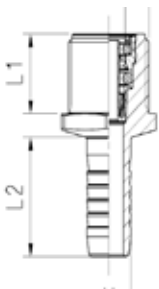
FR: Passe cloison avec ABC new line  
IT: Passaparete con ABC New Line



Article no.	T	D1	D2	L			
909 12 016	12x1,5	16x1,5	M24x1,5	30	28	50	75
909 12 022	12x1,5	22x1,5	M24x1,5	26	28	50	71

GB: New Line Push-In with hose nipple  
DE: New Line Schlauchstutzen

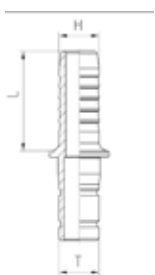
FR: Raccord queue cannelée  
IT: Bocchettone con raccordo rapido



Article no.	T	H	D	L1	L2			
910 08011	8x1	Ø 11	M22x1,5	20	30	26	50	80

GB: Hose Adapter  
DE: Schlauch Adapter

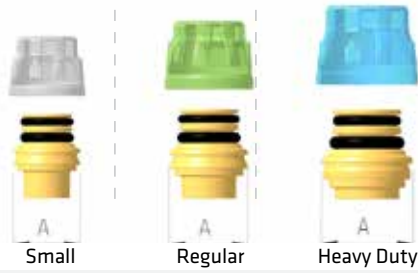
FR: Adaptateur  
IT: Bocchettone per



Article no.	T	H	L				
943 11 012	12x1,5	11	30			150	30

Only to be used in combination Newline 901120XX.

## ABC Port Sizes



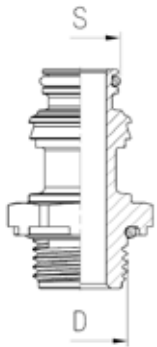
Swivel / Building Block Size	TubeA	A	Cap Color
Small	6x1 / 8x1	15	White
Regular	6x1 - 12x1,5	17	Green
Heavy Duty	12x1,5 / 15x1,5 / 16x2	20	Blue

GB: ABC Swivel

DE: ABC Anschlußstutzen

FR: ABC Embase fileté

IT: ABC Innesto girevole



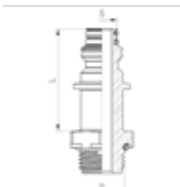
Article no.	S	D	Cap	Rotolock			
931 40 010	Small	M10x1	White	964 42 018	18	175	25
931 40 012	Small	M12x1,5	White	964 42 018	18	175	25
931 40 014	Small	M14x1,5	White	./.	20	150	32
931 40 016	Small	M16x1,5	White	964 42 022	22	125	37
931 40 049	Small	1/8"-27 NPTF	White	964 42 016	16	200	22
931 40 050	Small	1/4"-18 NPTF	White	964 42 016	16	150	27
931 40 051	Small	3/8"-18 NPTF	White	964 42 018	18	125	38
931 40 069	Small	R 1/8"	White	964 42 016	16	175	20
931 50 010	Regular	M10x1	Green	964 52 018	18	125	28
931 50 012	Regular	M12x1,5	Green	964 52 018	18	125	29
931 50 014	Regular	M14x1,5	Green	964 50 020	20	100	34
931 50 016	Regular	M16x1,5	Green	964 50 022	22	100	39
931 50 022	Regular	M22x1,5	Green	964 52 028	28	70	51
931 50 049	Regular	1/8"-27 NPTF	Green	964 52 018	18	120	28
931 50 050	Regular	1/4"-18 NPTF	Green	964 52 018	18	100	31
931 50 051	Regular	3/8"-18 NPTF	Green	964 52 018	18	100	40
931 50 052	Regular	1/2"-14 NPTF	Green	964 50 022	22	65	50
931 50 060	Regular	G 1/4"	Green	964 50 022	20	30	34
931 50 061	Regular	R 3/8"	Green	964 50 020	22	100	41
931 60 016	Heavy Duty	G 3/8"	Blue	964 50 022	22	75	45
931 60 022	Heavy Duty	M22x1,5	Blue	964 60 028	28	50	60
931 60 026	Heavy Duty	M26x1,5	Blue	./.	32	30	81
931 60 051	Heavy Duty	3/8"-18 NPTF	Blue	964 60 022	22	70	50
931 60 052	Heavy Duty	1/2"-14 NPTF	Blue	964 60 022	22	65	59

GB: ABC Extended Swivel

DE: ABC Anschlussstutzen, verlängert

FR: Extension d'embase ABC

IT: Girevole ABC con prolunga



Article no.	S	D	L	Cap			
931 41 016	Small	M16X1,5	37	White	22	50	66
931 51 014	Regular	M14x1,5	42	Green	20	50	56
931 59 014	Regular	M14x1,5	55	Green	20	50	63

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

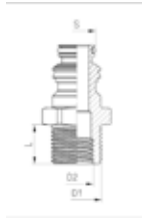


## GB: ABC Swivel Bulkhead

DE: ABC Anschlusschottstutzen

## FR: ABC Embase fileté passe-cloison

IT: ABC Innesto girevole con passaparete



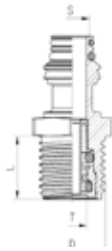
Article no.	S	D1	D2	L	Cap	Rotolock			
933 51 218	Regular	M18x1,5	M12x1,5	14	Green	964 50 022	22	50	58
933 51 622	Regular	M22x1,5	M16x1,5	23	Green	964 52 028	28	40	84
933 62 228	Heavy Duty	M28x1,5	M22x1,5	24	Green	NA	34	30	137

## GB: ABC Swivel bulkhead with Push-In

DE: ABC-Schottstutzen mit Push-In

## FR: Embase fileté passe-cloison avec union mâle ABC

IT: ABC Innesto giervole con passaparete



Article no.	S	T	D	L	Cap	Rotolock			
934 50 080	Regular	8x1	M20x1,5	18	Green	NA	24	80	57
934 50 101	Regular	10x1,25	M22x1,5	23	Green	NA	26	50	70
934 50 120	Regular	12x1,5	M24x1,5	23	Green	964 52 028	28	50	72

## GB: ABC Swivel Bulkhead

DE: ABC Anschlusschottstutzen

## FR: ABC Embase fileté passe-cloison

IT: ABC Innesto girevole con passaparete



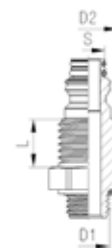
Article no.	S	D	L	K	Cap	Rotolock			
933 52 416	Regular	M16x1,5	35	24°-10	Green	964 50 022	22	50	79
933 53 418	Regular	M18x1,5	22	24°-10	Green	964 500 22	22	50	55
933 52 418	Regular	M18x1,5	42	24°-12	Green	NA	24	50	98
933 62 418	Heavy Duty	M18x1,5	42	24°-12	Blue	NA	24	30	111

## GB: ABC Swivel Bulkhead

DE: ABC Anschlusschottstutzen

## FR: ABC Embase fileté passe-cloison

IT: ABC Innesto girevole con passaparete



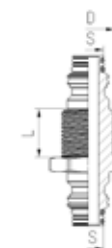
Article no.	S	D1	D2	L	Cap	Rotolock			
933 52 216	Regular	M16x1,5	M22x1,5	18	Green	964 52 028	28	25	115
933 52 222	Regular	M22x1,5	M22x1,5	18	Green	964 52 028	28	40	102

## GB: ABC Double Swivel Bulkhead

DE: ABC Doppel Anschlusschottstutzen

## FR: ABC Embase fileté double/ passe-cloison

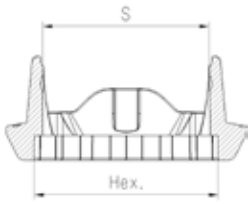
IT: ABC Innesto girevole x2 con passaparete



Article no.	S	D	L	Cap	Rotolock			
933 52 205	Regular	M22x1,5	23	Green	964 52 028	28	30	120
933 62 206	Heavy Duty	M22x1,5	27	Blue	964 60 028	28	30	187

GB: Rotolock  
DE: Rotolock

FR: Rotolock  
IT: Rotolock



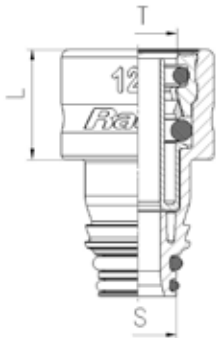
Article no.	S	Hex	Color Code		
964 42 016	Small	16	Dark Grey	500	2
964 42 018	Small	18	Light Grey	500	2
964 42 022	Small	22	Light Grey	500	2
964 52 018	Regular	18	Light Grey	400	3
964 50 020	Regular	20	Dark Grey	400	3
964 50 022	Regular	22	Light Grey	400	3
964 52 028	Regular	28	Dark Grey	300	3
964 60 022	Heavy Duty	22	Light Grey	250	5
964 62 028	Heavy Duty	28	Dark Grey	250	4

GB: ABC Threadless Push-in Coupling

DE: ABC Threadless Gewindeloses Steckverbindung

FR: ABC Threadless Raccord pour tube à clipser

IT: ABC Threadless Raccordo ad innesto rapido senza filetto



Article no.	T	S	L	Support sleeve	Cap		
902 04 004	4x1	small (brass)	19	NA	White	150	33
902 06 004	6x1	small	4	black	White	500	4
902 08 004	8x1	small	10	black	White	400	6
902 04 005	4x1	regular (brass)	19		Green	100	40
902 06 005	6x1	regular	4	black	Green	450	6
902 08 005	8x1	regular	8	black	Green	375	7
902 10 005	10x1	regular	11	light grey	Green	275	9
902 10 105	10x1,25	regular	11	black	Green	275	9
902 10 205	10x1,5	regular	11	dark grey	Green	275	9
902 12 005	12x1,5	regular	18	black	Green	200	12
902 12 006	12x1,5	heavy duty	18	black	Blue	200	11
902 14 006	14x2	heavy duty	21	black	blue	120	18
902 15 006	15x1,5	heavy duty	21	black	Blue	125	22
902 16 006	16x2	heavy duty	21	black	Blue	120	22

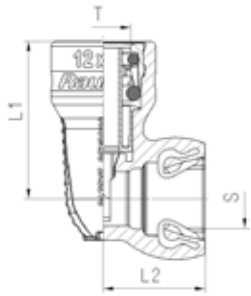
If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

GB: ABC Integral Push-in

DE: 90° ABC Push-In Steckverbinder

FR: Coude intégré ABC à clipser

IT: Raccordo ABC 90° integrato



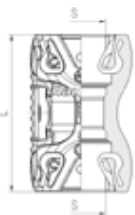
Article no.	T	S	L1	L2	Support sleeve		
903 06 004	6x1	small	32	18	black	150	11
903 08 004	8x1	small	34	18	black	150	13
903 06 005	6x1	regular	31	21	black	150	13
903 08 005	8x1	regular	33	21	black	150	15
903 10 005	10x1	regular	35	24	light grey	125	18
903 10 105	10x1,25	regular	35	24	black	125	18
903 10 205	10x1,5	regular	35	24	dark grey	125	18
903 12 205	12x1,5	regular	37	24	black	120	20
903 15 006	15x1,5	heavy duty	46	31	black	60	36
903 16 006	16x2	heavy duty	46	31	black	70	35

GB: ABC Union Female

DE: Gerader ABC Verbinder

FR: Union double ABC

IT: Giunzione ABC femmina x2



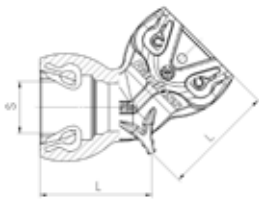
Article no.	S (2x)	L		
961 40 004	Small	39	70	8
961 50 205	Regular	45	80	13

GB: 45° Elbow

DE: 45° Winkel

FR: Coude 45°

IT: Gomito 45°



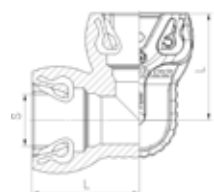
Article no.	S (2x)	L		
920 40 045	Small	22	150	9
920 50 045	Regular	25	120	14
920 60 045	Heavy Duty	30	75	20

GB: 90° Elbow

DE: 90° Winkel

FR: Coude 90°

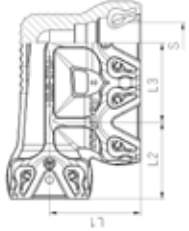
IT: Gomito 90°



Article no.	S (2x)	L		
920 50 090	Regular	29	100	15
920 60 090	Heavy Duty	34	60	25

**GB: Union F**  
**DE: F - Stück**

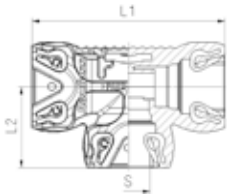
**FR: Coude F**  
**IT: Raccordo a F**



Article no.	S (3x)	L1	L2	L3		
920 40 015	Small	26.6	22.4	23	100	15
920 50 015	Regular	31	26.1	27	50	25
920 60 015	Heavy Duty	36.3	30.6	32	35	29

**GB: Union T&L**  
**DE: T&L - Stück**

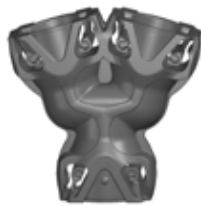
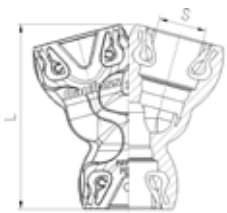
**FR: Union T&L**  
**IT: Raccordo a T&L**



Article no.	S (3x)	L1	L2		
920 40 010	Small	53	22	90	14
920 50 010	Regular	62	26	70	22
920 60 010	Heavy Duty	73	31	40	34

**GB: Union Y**  
**DE: Y - Stück**

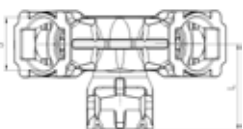
**FR: Union Y**  
**IT: Raccordo a Y**



Article no.	S (3x)	L		
920 40 030	Small	46.9	100	13
920 50 030	Regular	54.8	70	21

**GB: 3 - Way Block**  
**DE: 3 - Wege Block**

**FR: Té ABC à clipser**  
**IT: Raccordo a 3 vie**



Article no.	S (3x)	L		
920 40 060	Small	24	75	16
920 52 060	Regular	28	50	25
920 60 060	Heavy Duty	33	35	38

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: 4 - Way Cross**  
**DE: Kreuzstück**

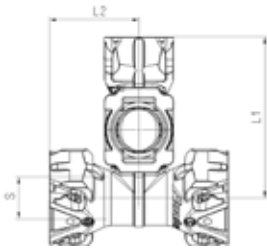
**FR: Croix**  
**IT: Raccordo a croce**



Article no.	S (4x)	L		
920 50 070	Regular	29	75	25
920 60 070	Heavy Duty	34	50	40

**GB: 4 - Way Block**  
**DE: 4 - Wege Block**

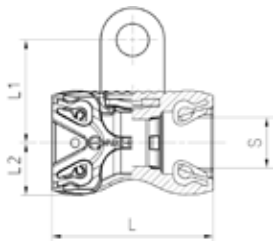
**FR: Croix renversée**  
**IT: Raccordo a 4 vie**



Article no.	S (4x)	L1	L2		
920 50 061	Regular	50	28	50	28
920 60 061	Heavy Duty	59	33	30	44

**GB: T&L Union Female with straight bracket clip**  
**DE: Gerade ABC Verbinder mit Lasche**

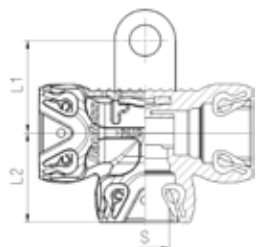
**FR: Union double à clipser avec fixation**  
**IT: Giunzione con staffa**



Article no.	S (2x)	L	L1		
961 40 024	small	39	27	100	21
961 50 225	regular	45	29	75	25

**GB: Union T&L w/ Bracket clip 90°**  
**DE: T-Stück mit Lasche**

**FR: Té ABC à clipser avec fixation**  
**IT: Raccordo a T&L con staffa**



Article no.	S (3x)	L1	L2		
920 50 025	Regular	27	26	50	34
920 60 025	Heavy Duty	28	31	30	46

GB: ABC Swivel with 24° cone connection  
DE: ABC Anschlußstutzen mit 24° Konus

FR: ABC Embase fileté avec cône 24°  
IT: Raccordo girevole ABC con cono 24°



Article no.	S	D	K	Rotolock			
931 52 412	Regular	M12x1,5	24°	964 52 018	18	100	38

GB: ABC Swivel with Internal Threads  
DE: ABC Anschluss mit Innengewinde

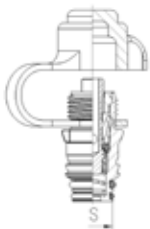
FR: Adaptateur ABC à filetage femelle  
IT: Adattatore ABC con innesto senza filetto



Article no.	S	D	Cap	Rotolock			
931 50 110	Regular	M10x1	Green	964 52 018	18	125	29
931 50 112	Regular	M12x1,5	Green	964 52 018	18	150	29
931 50 114	Regular	M14x1,5	Green	964 52 018	18	100	31
931 50 116	Regular	M16x1,5	Green	964 50 022	22	80	50
931 50 122	Regular	M22x1,5	Green	964 52 028	28	40	72
931 50 149	Regular	1/8"NPTF	Green	964 52 018	18	100	33
931 50 150	Regular	1/4"NPTF	Green	964 52 018	18	150	34
931 50 160	Regular	G1/4"	Green	964 52 018	18	150	23

GB: ABC Threadless Test point ISO 3583  
DE: ABC Prüfanschluss ISO 3583

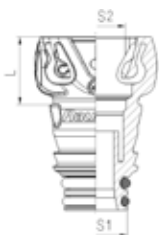
FR: ABC Prise de pression à clipser ISO 3583  
IT: ABC Presa pressione senza filetto ISO 3583



Article no.	S	Cap		
960 50 000	Regular	Green	200	12

GB: ABC Reducer  
DE: ABC Reduzierstück

FR: Réducteur ABC  
IT: Riduzione ABC



Article no.	S1	S2	L		
961 50 106	Heavy Duty	Regular	15.1	175	11

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

GB: ABC Union Male

DE: Gewindeloser ABC Verbinder

FR: Jonction ABC

IT: Giunzione ABC maschio x2



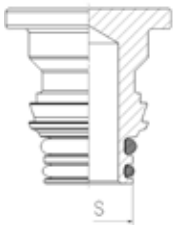
Article no.	S1	S2	Rotolock		
965 40 004	Small	Small	96442018	120	6
965 40 005	Small	Regular	96442018	240	7
965 50 005	Regular	Regular	96452018	200	8
965 50 006	Regular	Heavy Duty	96452018	150	10
965 60 006	Heavy Duty	Heavy Duty	96460022	140	13

GB: ABC Threadless Swivel Plug

DE: Gewindeloser ABC Stopfen

FR: Obturateur ABC à clipser

IT: Tappo ABC senza filetto



Article no.	S	Cap		
962 40 000	Small	White	170	23
962 50 000	Regular	Green	150	33
962 60 000	Heavy Duty	Blue	100	48

GB: Push - In Plug

DE: Stopfen für Steckverbindung

FR: Bouchon

IT: Tappo per innesto rapido



Article no.	T		
962 10 004	4x1,0	1000	1
962 10 006	6x1,0	1000	1
962 10 008	8x1,0	700	1
962 10 010	10x1 / 10x1,25 / 10x1,5	250	2
962 10 012	12x1,5	250	2
962 10 015	15x1,5	150	3
962 10 016	16x2,0	150	4

GB: Transportation plug

DE: Transport Stopfen

FR: Bouchon pour transport

IT: Tappo di protezione



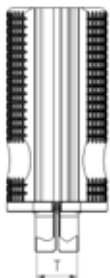
Article no.	T	Colour		
967 06 000	6x1	red	1000	1
967 06 010	6x1	yellow	1000	1
967 08 000	8x1	red	1000	1
967 10 000	10&3/8"	red	1000	1
967 12 000	12x1,5	red	500	1
967 15 000	15x1,5	red	250	1
967 16 000	16x2	red	250	2

## GB: Release Tool Professional

## DE: Demontage Werkzeug Professional

## FR: Outil de deconnexion métallique

## IT: Attrezzo in metallo smontaggio tubi



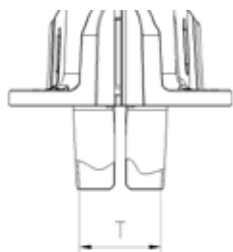
Article no.	T	T	T	T(SAE)		
966 06 020	6x1			1/4"	36	58
966 08 020	8x1				36	57
966 10 020	10x1	10x1,25	10x1,5	3/8"	36	57
966 12 020	12x1,5			1/2"	36	56
966 15 020	15x1,5				16	114
966 16 020	16x2			5/8"	16	112

## GB: Release Tool Standard

## DE: Demontage Werkzeug Standard

## FR: Outil de déconnexion

## IT: Attrezzo smontaggio tubi



Article no.	T	T	T	T(SAE)		
966 06 010	6x1,0			1/4"	150	4
966 08 010	8x1,0				125	5
966 10 010	10x1,0	10x1,25	10x1,5	3/8"	100	5
966 12 710	12x1,5			1/2"	100	5
966 14 010	14x2				100	7
966 15 010	15x1,5				75	7
966 16 010	16x2,0			5/8"	75	6

## Release Tool

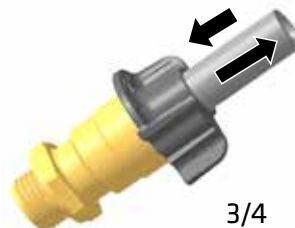
1. Remove the pressure totally from the system
2. Push the tube to the bottom of the coupling to move the grip ring out of locking position.
3. Apply Release Tool on to the tube.
4. Push the Release Tool to stop with the flange at the top of the tube without using extensive force.
5. While pushing the Release Tool towards the coupling; pull the tube out.
6. Kongsberg Automotive recommends that each single push-in coupling experience a total of maximum five (5) tube assemblies and releases in a lifetime perspective.



1



2



3/4

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.



# RAUFOSS ABC™ KARTRIDGE

“Designed For Manufacturing”

Development of the KARtridge program has changed the way air coupling systems were designed. Saves manufacturing cost in a combination of unmachined molded port and straight push into port assembly.

## Features & Benefits:

- In use with ABC Push-in technology
- In use with both ABC swivel and buildingblock features
- Various port sizes to optimize system response time and available space
- Extensive use of advanced materials
- Exceeds present air brake safety requirements
- Port design easy to mold and process
- Outstanding grip in port, by using stainless “Starwasher”
- Validated for use in various composite and aluminum port materials



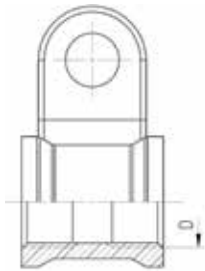
Contact us for details and more information about the KARtridge products

**GB: Union, 2 x thread with bracket.** See assembly sketch.

**DE: Gerade Befestigung, 2 x Gewinde.** Siehe Montageskizze

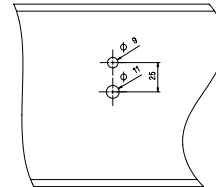
**FR: Union, avec fixation 2 x taraudages.** Voir dessin.

**IT: Manicotto filettato, con staffa di fissaggio.** Vedi istruzioni.



Article no.	D								
623 7847	M 12 x 1,5								60 92
612 6933	M 16 x 1,5								60 77

GB: Assembly sketch  
FR: Dessin d'assemblage  
DE: Montageskizze  
IT: Istruzioni di installazione

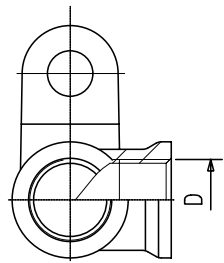


**GB: Union, 2 x thread with bracket.** See assembly sketch

**DE: Gerade Befestigung, 2 x Gewinde.** Siehe Montageskizze

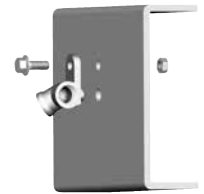
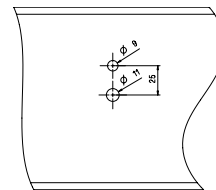
**FR: Union, avec fixation 2 x taraudages.** Voir dessin

**IT: Gomito a 90° filettato, con staffa di fissaggio.** Vedi istruzioni



Article no.	D								
612 6934	M 16 x 1,5								40 95

GB: Assembly sketch  
FR: Dessin d'assemblage  
DE: Montageskizze  
IT: Istruzioni di installazione

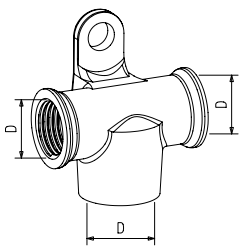


**GB: Union T, 3 x thread with bracket**

**DE: T-Befestigung, 3 x Gewinde**

**FR: Té taraudé, avec fixation**

**IT: Raccordo a T, con 3 filettature e staffa di fissaggio.**



Article no.	D								
623 7863	M 16 x 1,5								40 95

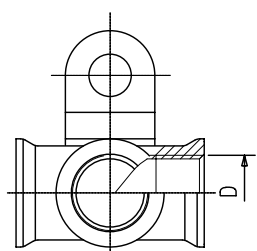
GB: Assembly sketch  
FR: Dessin d'assemblage  
DE: Montageskizze  
IT: Istruzioni di installazione

**GB: 90° Union T, 3 x thread with bracket.** See assembly sketch

**DE: 90° T-Befestigung, 3 x Gewinde.** Siehe Montageskizze.

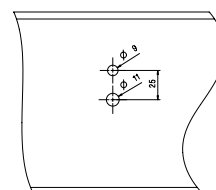
**FR: 90° Té taraudé, avec fixation 3 x taraudages.** Voir dessin

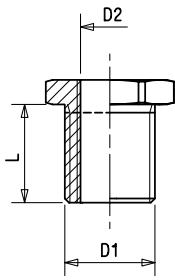
**IT: Raccordo a T 90°, con 3 filettature e staffa di fissaggio a 90°.** Vedi istruzioni.



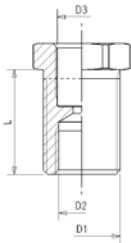
Article no.	D								
612 6935	M 16 x 1,5								30 112

GB: Assembly sketch  
FR: Dessin d'assemblage  
DE: Montageskizze  
IT: Istruzioni di installazione

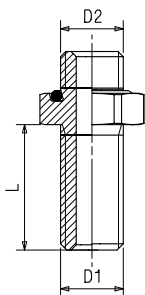


**GB: Bulkhead coupling**  
**DE: Schottstutzen**
**FR: Passe-cloison**  
**IT: Passaparete**


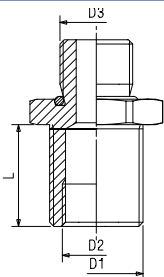
Article no.	D1	D2	L			
623 7722	M 16 x 1,5	M 10 x 1,0	20	22	150	35
616 1182	M 16 x 1,5	M 10 x 1,0	28	22	100	47
623 7723	M 16 x 1,5	M 10 x 1,0	35	22	75	47
623 7726	M 22 x 1,5	M 16 x 1,5	24	28	80	57
623 7727	M 26 x 1,5	M 16 x 1,5	24	32	50	97

**GB: Adapter for pressur gauge**  
**DE: Anschluß für manometer**
**FR: Passe-cloison**  
**IT: Passaparete**


Article no.	D1	D2	D3	L			
623 7625	M18x1,5	M 12x1,5	G1/4" -ISO837-1	20	22	120	38

**GB: Bulkhead coupling**  
**DE: Schottstutzen**
**FR: Passe-cloison**  
**IT: Passaparete**


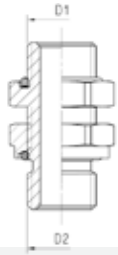
Article no.	D1	D2	L				
623 7622	M 12 x 1,5	M 12 x 1,5	24	18	200	29	
623 7624	M 12 x 1,5	M 14 x 1,5	24	20	200	34	
623 7693	M 16 x 1,5	M 16 x 1,5	24	22	110	41	
623 7697	M 16 x 1,5	M 16 x 1,5	35	22	75	50	
623 9116	M 16 x 1,5	R 1/4"	#	24	22	100	45
623 7735	M 22 x 1,5	M 16 x 1,5	24	28	50	73	

**GB: Bulkhead coupling**  
**DE: Schottstutzen**
**FR: Passe-cloison**  
**IT: Passaparete**


Article no.	D1	D2	D3	L			
623 7728	M 22 x 1,5	M 16 x 1,5	3/8 - 18 NPTF	24	28	60	83
623 7729	M 22 x 1,5	M 16 x 1,5	1/2 - 14 NPTF	24	28	50	88
623 7731	M 22 x 1,5	M 16 x 1,5	M 16 x 1,5	24	28	50	72
623 7733	M 22 x 1,5	M 16 x 1,5	M 16 x 1,5	40	28	50	94
623 7730	M 22 x 1,5	M 16 x 1,5	M 22 x 1,5	24	28	50	70
623 7721	M 22 x 1,5	M 16 x 1,5	M 22 x 1,5	40	28	40	94

**GB: Bulkhead coupling**, pre-assembled with o-ring and nut  
**DE: Schottstutzen**, mit vormontierter Kontermutter incl. O-Ring

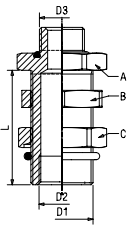
**FR: Passe-cloison**, avec contre-ecrou et joints  
**IT: Passaparete**, completo di dado e o-ring



Article no.	D1	D2							
623 7834	M 16 x 1,5	M 16 x 1,5							70 58
623 7835	M 22 x 1,5	M 16 x 1,5							50 120
623 7887	M 22 x 1,5	M 22 x 1,5							35 115
623 7887	M22x1,5	M22x1,5							50 83

**GB: Bulkhead coupling**  
**DE: Schottstutzen**

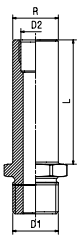
**FR: Passe-cloison**  
**IT: Passaparete**



Article no.	D1	D2	D3	A	B	C	L				
623 7999	M22 x 1,5	M16 x 1,5	M16 x 1,5	623 7733	623 7749	623 7747	40	28	40	127	

**GB: Bulkhead coupling**, for fixing air reservoir  
**DE: Schottstutzen**, für Luftbehälter-Lagerung

**FR: Passe-cloison**, pour fixation de réservoir d'air  
**IT: Passaparete**, di supporto serbatoio aria



Article no.	D1	D2	R		L				
623 9736	M 22 x 1,5	M 16 x 1,5	Ø22	#	60	27	30	170	

GB: The producer of the air reservoir must approve fixing it with the ports.

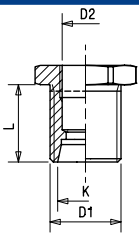
FR: Nécessité de l'approbation du producteur de réservoir.

DE: Bitte beachten Sie, daß der Luftbehälterproduzent die Lagerung über die Anschlüsse freigeben muß.

IT: Salvo approvazione del produttore del serbatoio aria.

**GB: Bulkhead coupling**, with 24° cone  
**DE: Schottstutzen**, mit 24°-Konus

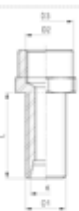
**FR: Passe-cloison**, avec cône 24°  
**IT: Passaparete**, con cono 24°



Article no.	D1	K	D2		L				
623 7694	M 22 x 1,5	K 24° - 15	M 16 x 1,5	#	24	28	80	60	

**GB: Bulkhead coupling**, with 24° cone  
**DE: Schottstutzen**, mit 24°-Konus

**FR: Passe-cloison**, avec cône 24°  
**IT: Passaparete**, con cono 24°

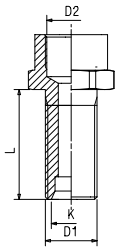


Article no.	D1	K	D2	D3		L			
623 7696	M16 x 1,5	K24° - 10	M16 x 1,5	M 22 x 1,5		34	24	50	70

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: Bulkhead coupling, with 24° cone**  
**DE: Schottstutzen, mit 24°-Konus**

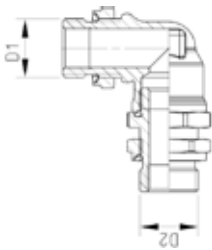
**FR: Passe-cloison, avec cône 24°**  
**IT: Passaparete, con cono 24°**



Article no.	D1	K	D2	L			
623 9113	M 12 x 1,5	K 24° - 6	M 12 x 1,5	34	20	100	45
623 7695	M 16 x 1,5	K 24° - 10	M 16 x 1,5	#	34	24	50
623 7732	M 18 x 1,5	K 24° - 12	M 16 x 1,5	34	24	50	60
623 9111	M 18 x 1,5	K 24° - 12	M 16 x 1,5	#	34	22	60
623 7799	M 22 x 1,5	K 24° - 15	M 22 x 1,5	34	28	40	105

**GB: 90° Elbow, for bulkhead**  
**DE: 90° Winkel, mit Schottstutzen**

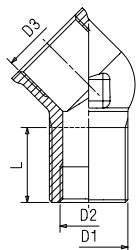
**FR: Coude 90°, passe-cloison**  
**IT: Gomito a 90°, con passaparete**



Article no.	D1	D2			
623 8883	M 22 x 1,5	M 22 x 1,5	28	25	210

**GB: 45° Elbow, for bulkhead**  
**DE: 45° Winkel, mit Schottstutzen**

**FR: Coude 45°, passe-cloison**  
**IT: Gomito a 45°, con passaparete**



Article no.	D1	D2	D3	L		
623 7881	M 22 x 1,5	M 16 x 1,5	M 22 x 1,5	Min 21	40	86

**GB: Bulkhead coupling, with 24° cone**  
**DE: Schottstutzen, mit 24°-Konus**

**FR: Passe-cloison, avec cône 24°**  
**IT: Passaparete, con cono 24°**



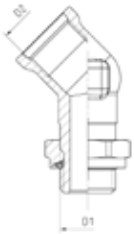
Article no.	D1	D2	L		
623 8873	M 16 x 1,5	M 16 x 1,5	Min 22	50	86

# Material: Steel/Matière: Acier/Material: Stahl/Materiale: Acciaio

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: 45° Elbow**, for bulkhead pre-assembled with o-ring and nut  
**DE: 45° Winkel**, mit Schottstutzen mit vormontierter Kontermutter incl. O-Ring

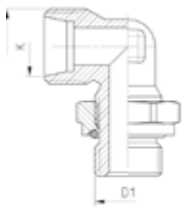
**FR: Coude 45°**, passe-cloison avec contre-écrou et joint  
**IT: Gomito a 45°**, con passaparete completo di dado e o-ring



Article no.	D1	D2	A	B			
623 7831	M 16 x 1,5	M 16 x 1,5	623 8873	623 7746	22	40	59

**GB: 90° Elbow**, with 24° cone for bulkhead  
**DE: 90° Winkel**, mit Schottstutzen und 24°-Konus

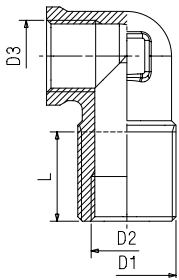
**FR: Coude 90°**, passe-cloison avec cône 24°  
**IT: Gomito a 90°**, con cono 24° e passaparete



Article no.	D1	D2	K			
623 7962	M16 x 1,5	M18x1,5	K24°-12	22	50	58
623 7960	M22x 1,5	M18x1,5	K24°-23	28	25	83

**GB: 90° Elbow**, for bulkhead  
**DE: 90° Winkel**, mit Schottstutzen

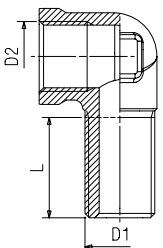
**FR: Coude 90°**, passe-cloison  
**IT: Gomito a 90°**, con passaparete



Article no.	D1	D2	D3	L		
623 7809	M 22 x 1,5	M 16 x 1,5	M 16 x 1,5	20	50	75
623 7880	M 22 x 1,5	M 16 x 1,5	M 22 x 1,5	22	25	190

**GB: 90° Elbow**, for bulkhead  
**DE: 90° Winkel**, mit Schottstutzen

**FR: Coude 90°**, passe-cloison  
**IT: Gomito a 90°**, con passaparete



Article no.	D1	D2	L		
623 7807	M 12 x 1,5	M 12 x 1,5	17	80	45
623 7813**	M 14 x 1,5	M 12 x 1,5	18	100	48
623 7808	M 16 x 1,5	M 16 x 1,5	22	50	62

\*\* GB: No standard article; please ask for availability.

\*\* DE: Kein Standardartikel, bitte Verfügbarkeit nachfragen.

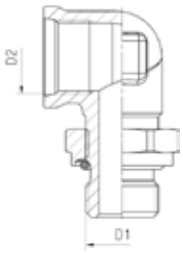
\*\* FR: Article sur demande, merci de vérifier la disponibilité.

\*\* IT: Articolo a richiesta

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: 90° Elbow**, for bulkhead pre-assembled with o-ring and nut  
**DE: 90° Winkel**, mit Schottstutzen mit vormontierter Kontermutter incl. O-Ring

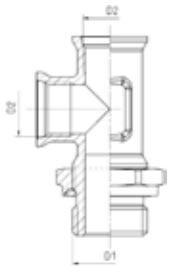
**FR: Coude 90°**, passe-cloison avec contre-écrou et joint  
**IT: Gomito a 90°**, con passaparete completo di dado e o-ring



Article no.	D1	D2					
623 7928	M 10 x 1,0	M 12 x 1,5			16	80	45
623 7830	M 16 x 1,5	M 16 x 1,5			22	70	100
623 7891	M22x1,5	M22x1,5			28	35	129
623 9970	M 26 x 1,5	M 22 x 1,5			32	15	258

**GB: L-coupling**, for bulkhead  
**DE: L-Schottstutzen**

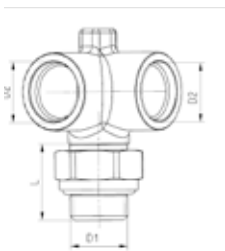
**FR: Raccord L passe-cloison**  
**IT: Raccordo a L**, con orientabile



Article no.	D1	D2	L				
623 7980	M 16 x 1,5	M 16 x 1,5	20		22	40	81
623 7982	M 22 x 1,5	M 16 x 1,5	20		28	40	102

**GB: 3-way coupling**, for bulkhead  
**DE: 3-Wege Schottstutzen**

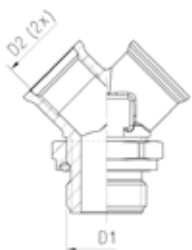
**FR: Té forme "L"**, passe-cloison taraudé 2 X  
**IT: Raccordo a 3 vie orientabile**



Article no.	D1	D2	L				
623 7829	M 16 x 1,5	M 16 x 1,5	21		40	109	

**GB: Y bulkhead**  
**DE: Y Schottstutzen**

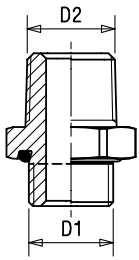
**FR: Y Passe-cloison**  
**IT: Y orientabile**



Article no.	D1	D2					
623 7981	M 22 x 1,5	M 16 x 1,5				40	100

GB: Transfer adapter  
DE: Adapter

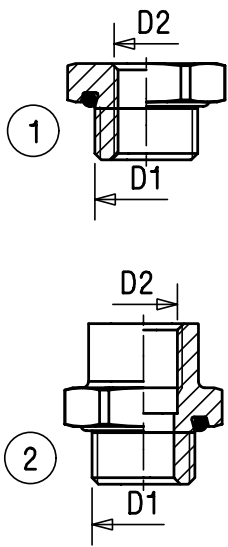
FR: Adaptateur  
IT: Adattatore filettato



Article no.	D1	D2				
623 7714 **	M 16 x 1,5	3/8" - 18 NPTF		22	150	41
623 7900	M 16 x 1,5	M 22 x 1,5		24	125	50

GB: Transfer adapter  
DE: Adapter

FR: Adaptateur  
IT: Adattatore filettato



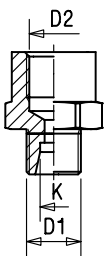
Article no.	D1	D2	Form				
623 7626	1/4" - 18 NPTF*	M 12 x 1,5	2		18	200	31
623 7628	1/4" - 18 NPTF*	M 16 x 1,5	2		22	125	48
623 7633	3/8" - 18 NPTF*	M 16 x 1,5	2		22	130	46
623 7655	M 16 x 1,5	1/8" - 27 NPTF	1		22	200	25
623 7656	M 16 x 1,5	1/4" - 18 NPTF	1		22	150	33
623 7657	M 16 x 1,5	3/8" - 18 NPTF	1		22	100	40
623 7904	M 16 x 1,5	3/8" - 32 UNEF	1		22	250	25
623 7614	M 16 x 1,5	M 12 x 1,5	1		22	150	20
623 7615	M 22 x 1,5	M 12 x 1,5	1		28	150	45
623 7616	M 22 x 1,5	M 16 x 1,5	1		28	150	34
623 7618	M 26 x 1,5	M 16 x 1,5	1		32	100	73
623 9131	R 1/4" *	M 10 x 1,0	2	#	17	200	23
623 9130	R 3/8" *	M 12 x 1,5	2	#	19	200	32
623 9132	R 1/2" *	M 16 x 1,5	2	#	27	80	75

GB: Transfer adapter, with 24° cone (Adapter: Steel tube to Raufoss couplings™)

DE: Adapter, mit 24°-Konus (Adapter: Stahlrohr auf Raufoss couplings™ System)

FR: Adaptateur, M/F à cône 24° (connexion entre tube acier et système Raufoss couplings™)

IT: Adattatore, con cono 24° (intermedio tubo in acciaio e sistema Raufoss couplings™)



Article no.	D1	D2	K				
623 9102	M 12 x 1,5	M 12 x 1,5	K 24° - 6	#	19	120	32
623 9104	M 16 x 1,5	M 16 x 1,5	K 24° - 10	#	22	100	38

\* Without o-ring sealing against port/Sans joint torique/Ohne O-Ring Dichtung am Gewinde/Senza o-ring su filetto

# Material: Steel / Matière: Acier / Material: Stahl / Materiale: Acciaio

\*\* GB: No standard article; please ask for availability

\*\* FR: Article sur demande, merci de demander la disponibilité

\*\* DE: Kein Standardartikel, bitte Verfügbarkeit nachfragen

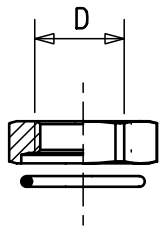
\*\* IT: Articolo a richiesta

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.



**GB: Locking nut, with o-ring**  
**DE: Kontermutter, mit O-Ring**

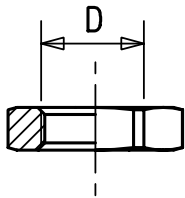
**FR: Contre écrou, avec joint torique**  
**IT: Controdado, con o-ring**



Article no.	D					
623 7745	M 12 x 1,5			18	200	9
623 7742	M 14 x 1,5			20	200	11
623 7746	M 16 x 1,5			22	200	12
623 7778	M 18 x 1,5			24	100	15
623 7747	M 22 x 1,5			28	100	17

**GB: Locking nut**  
**DE: Kontermutter**

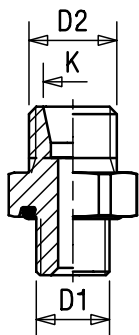
**FR: Contre écrou**  
**IT: Controdado**



Article no.	D					
623 9134	M 12 x 1,5	#		17	200	7
623 9135	M 14 x 1,5	#		19	200	8
623 7748	M 16 x 1,5			22	500	12
623 9136	M 16 x 1,5	#		22	200	11
623 7775	M 18 x 1,5			24	300	14
623 9137	M 18 x 1,5	#		24	200	12
623 7751	M 20 x 1,5			27	400	11
623 7749	M 22 x 1,5			28	300	16
623 9138	M 22 x 1,5	#		28	200	23
623 7753	M24 x1,5			28	300	13
623 9749	M 26 x 1,5	#		32	100	30
623 7798	M28 x 1,5			36	100	36

**GB: Transfer adapter, with o-ring and 24° cone**  
**DE: Adapter, mit O-Ring und 24°-Konus**

**FR: Adaptateur, avec joint torique et cône 24°**  
**IT: Adattatore filettato, con o-ring e cono 24°**



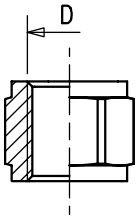
Article no.	D1	D2	K				
623 7781	M 10 x 1,0	M 12 x 1,5	K 24° - 6		16	400	20
623 7782	M 16 x 1,5	M 12 x 1,5	K 24° - 6		22	200	32
623 7783	M 12 x 1,5	M 16 x 1,5	K 24° - 10		18	200	25
623 7784	M 16 x 1,5	M 16 x 1,5	K 24° - 10		22	150	39
623 9109	M 16 x 1,5	M 16 x 1,5	K 24° - 10	#	22	100	31
623 7785	M 16 x 1,5	M 18 x 1,5	K 24° - 12		22	150	36
623 9110	M 16 x 1,5	M 18 x 1,5	K 24° - 12	#	22	100	31
623 7786	M 22 x 1,5	M 16 x 1,5	K 24° - 10		28	100	51
612 6278	M 22 x 1,5	M 22 x 1,5	K 24° - 15		28	75	69

# Material: Steel / Matière: Acier / Material: Stahl / Materiale: Acciaio

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

GB: Socket joint  
DE: Gewindemuffe

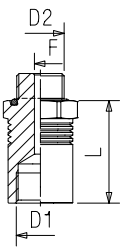
FR: Manchon  
IT: Manicotto filettato



Article no.	D						
623 7741	M 12 x 1,5				18	250	24
623 7743	M 16 x 1,5				22	175	35
623 7744	M 22 x 1,5				28	100	48

GB: Transfer adapter, with air flow reducer  
DE: Reduzieradapter

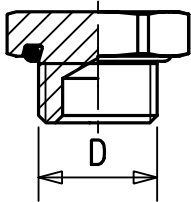
FR: Adaptateur, réducteur de débit  
IT: Adattatore filettato, con riduttore per l'aria



Article no.	D1	D2	F	L			
623 7692	M 16 x 1,5	M 16 x 1,5	10	36	22	100	57

GB: Plug  
DE: Stopfen

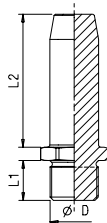
FR: Bouchon  
IT: Tappo



Article no.	D						
623 7604	M 10 x 1,5				16	350	12
623 7605	M 12 x 1,5				18	350	19
623 7606	M 14 x 1,5				20	250	25
623 7607	M 16 x 1,5				22	220	29
623 7608	M 22 x 1,5				28	120	53

GB: Plug, for fixing air reservoir <sup>1)</sup>  
DE: Stopfen, für Luftbehälterlagerung <sup>1)</sup>

FR: Bouchon, pour fixation de réservoir d'air <sup>1)</sup>  
IT: Tappo, di supporto serbatoio aria <sup>1)</sup>



Article no.	D	L1	L2				
623 9738	M 22 x 1,5	18	60	#	27	30	248

<sup>1)</sup> GB: The producer of the air reservoir must approve fixing it with the ports.

FR: Nécessité de l'approbation du producteur de réservoir.

DE: Bitte beachten Sie, daß der Luftbehälterproduzent die Lagerung über die Anschlüsse freigeben muß.

IT: Salvo approvazione del produttore del serbatoio aria.

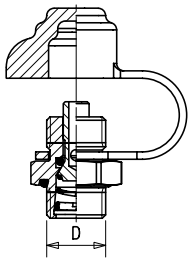
\* Without o-ring sealing against port/Sans joint torique/Ohne O-Ring Dichtung am Gewinde/Senza o-ring su filetto

**GB: Test point, ISO 3583**

**DE:Prüfanschluß, ISO 3583**

**FR: Prise de pression, ISO 3583**

**IT: Raccordo presa pressione, ISO 3583**



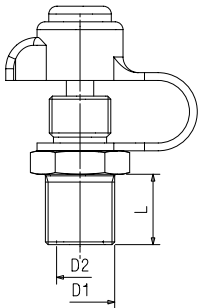
Article no.	D					
623 7776	M 16 x 1,5			22	75	40
623 7777	M 22 x 1,5			28	60	68

**GB: Test point, for bulkhead ISO 3583**

**DE:Prüfanschluß, mit Schottstutzen ISO 3583**

**FR: Prise de pression, passe-cloison ISO 3583**

**IT: Raccordo presa pressione, con passaparete ISO 3583**



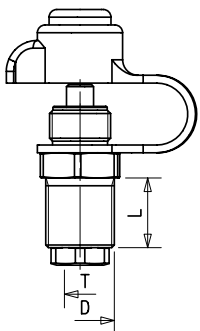
Article no.	D1	D2	L			
623 9144	M 18 x 1,5	M 12 x 1,5	18	22	50	60

**GB: Test point, with integrated push-in for bulkhead ISO 3583**

**DE:Prüfanschluß, mit Steckverbinder ISO 3583**

**FR: Prise de pression, passe-cloison avec Union mâle ISO 3583**

**IT: Raccordo presa pressione, con passaparete e raccordo rapido ISO 3583**



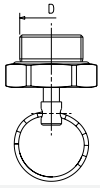
Article no.	D	T	L			
623 7207	M 18 x 1,5	6 x 1	18	22	60	68
623 7227	M 18 x 1,5	8 x 1	18	22	60	61

GB: Drain plug, DIN 74292

DE: Entwässerungsanschluss, DIN 74292

FR: Purge de bouteille, DIN 74292

IT: Raccordo spurgo condensa, DIN 74292



Article no.	D						
623 7787	M 22 x 1,5				28	75	42

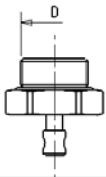
with key ring

GB: Drain plug, DIN 74292

DE: Entwässerungsanschluss, DIN 74292

FR: Purge de bouteille, DIN 74292

IT: Raccordo spurgo condensa, DIN 74292



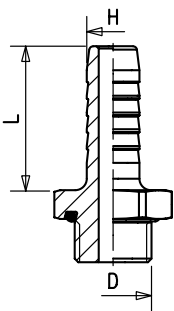
Article no.	D						
623 7788	M 22 x 1,5				28	75	40

without key ring

GB: Hose nipple, with o-ring Raufoss couplings™ standard  
 DE: Schlauchstutzen, nach Raufoss couplings™ System Norm

FR: Raccord queue cannelée, avec joint torique incorporé norme Raufoss couplings™

IT: Bocchettone, con O-ring a norma Raufoss couplings™



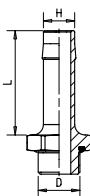
Article no.	H (Ø Hose size)	D	L			
623 7926	9,5 (3/8")	M 16 x 1,5	30	22	100	45
623 7927	9,5 (3/8")	M22x1,5	30	28	75	73
623 7905	10	M 16 x 1,5	30	22	100	43
623 7912	10	M 22 x 1,5	30	28	75	71
623 7906	11	M 12 x 1,5	30	18	150	44
623 7907	11	M 16 x 1,5	30	22	130	38
623 7915	11	M 22 x 1,5	30	28	75	53
623 7908	13	M 16 x 1,5	30	22	120	37
623 7914	13	M 22 x 1,5	30	28	60	61
623 7911	14,5 (1/2")	M 16 x 1,5	30	22	11	110
623 7913	14,5 (1/2")	M 22 x 1,5	30	28	75	73

GB: Hose nipple, with o-ring DIN std.

DE: Schlauchstutzen, nach DIN

FR: Raccord queue lisse, avec joint torique incorporé norme DIN

IT: Bocchettone, con o-ring a norma DIN



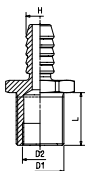
Article no.	H (Ø Hose size)	D1	L			
623 7994	11	M 16 x 1,5	40	22	100	44
623 7997	11	M 22 x 1,5	40	28	50	69
623 7995	13	M 16 x 1,5	40	22	90	60
623 7996	13	M 22 x 1,5	40	28	50	70

GB: Hose nipple.

DE: Schlauchstutzen

FR: Raccord queue cannelée

IT: Bocchettone

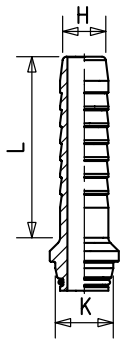


Article no.	H (Ø Hose size)	D1	D2	L			
623 7752	3/8"	M 22 x 1,5	M 16 x 1,5	24	28	50	77

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: Hose nipple, with cone and o-ring**  
**DE: Schlauchstutzen, mit Konus und O-Ring**

**FR: Raccord queue cannelée, avec cône et joint torique**  
**IT: Bocchettone, con cono e oring**



Article no.	H (Ø Hose size)	K	Nut/Ecrou/Mutter/Dado	L		
623 8992 **	9	K 24° - 10	6161146	40	200	23
623 8993	11	K 24° - 12	6161147	40	100	18

Remarks: a) Kindly purchase the nut separately.  
 b) Connection to bulkhead or adapter with cone (24').

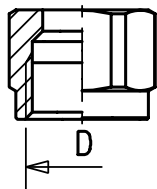
Remarques: a) Ecrou vendu séparément.  
 b) Raccordement à un passe-cloison ou un adaptateur avec cône (24').

Hinweis: a) Bitte Überwurfmuttern extra bestellen.  
 b) Anschluß an Schottstutzen oder Ü - Stücke mit Konus (24').

Note: a) Dado da ordinare separatamente.  
 b) Collegamento a passaparte o adattatore con attacco conico da 24'.

**GB: Nut, for hose nipple**  
**DE: Überwurfmutter, für Schlauchstutzen**

**FR: Ecrou, pour Raccord queue cannelée**  
**IT: Dado, per bocchettone**



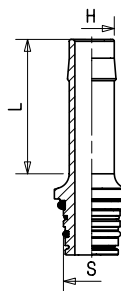
Article no.	D1				
616 1146	M 16 x 1,5	6238992	19	300	18
616 1147	M 18 x 1,5	6238993	22	200	25

**GB: Hose nipple, with plug-in P5s. Cannot be rotated, therefore permitted between frame and axle.**

**DE: Schlauchstutzen, mit P5s Stutzen. Nicht drehbar, geeignet für die Verbindung Rahmen & Achse**

**FR: Raccord queue lisse, à embase P5 non orientable convient pour la connexion entre châssis et essieux**

**IT: Bocchettone, con innesto P5s. Non è girevole, pertanto utilizzabile per collegamenti con moto relativo (es. telaioassale)**

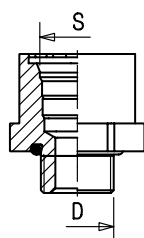


Article no.	H (Ø Hose size)	S	L		
623 7046	11	P 5s	40	100	32
623 7047	13	P 5s	40	100	44

Remarks: Kindly use the counterparts 623 7044 or 623 7045.  
 Remarques: Ne s'utilise qu'avec les adapteurs 623 7044, 623 7045.  
 Hinweis: Bitte nur die Gegenstücke 623 7044, 623 7045 benutzen.  
 Nota: Da utilizzare con i particolari 623 7044, 623 7045.

**GB: Connector, for hose nipple P5s**  
**DE: Anschluß für Schlauch stutzen, mit P5s Anschluß**

**FR: Adaptateur, Pour Raccord queue lisse à embase P5s**  
**IT: Raccordo di passaggio P5s**



Article no.	D	S			
623 7044	M 16 x 1,5	P 5s	26	80	55
623 7045	M 22 x 1,5	P 5s	28	75	62

\*\* GB: No standard article; please ask for availability

\*\* DE: Kein Standardartikel, bitte Verfügbarkeit nachfragen

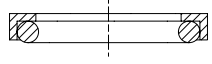
\*\* FR: Article sur demande, merci de demander la disponibilité

\*\* IT: Articolo a richiesta

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB:** Pressure ring, with o-ring  
**DE:** Druckring, mit O-Ring

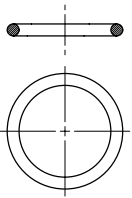
**FR:** Cuvette, avec joint torique  
**IT:** Guarnizione per raccordi in acciaio, con o-ring



Article no.	D								
623 9139	M 10 x 1,0								100
623 9140	M 12 x 1,5								100
623 9141	M 14 x 1,5								100
623 9142	M 16 x 1,5								100
623 9143	M 22 x 1,5								100
623 9149	M 26 x 1,5								100

**GB:** O-ring, for push-in for plug-in P5  
**DE:** O-Ring, für GE-Steckverbinder, für P5 Abschlußstutzen

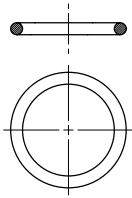
**FR:** Joint torique, pour raccords rapides pour embases P5  
**IT:** O-Ring, per raccordo rapido raccordo girevole



Article no.	D								
357 9081	M 10 x 1,0								
357 9089	M 12 x 1,5								
357 9093	M 14 x 1,5								
357 9088	M 16 x 1,5								
357 9086	M 22 x 1,5								
357 9186	M 28 x 1,5								

**GB:** O-ring, for locking nut  
**DE:** O-Ring, für Kontermutter

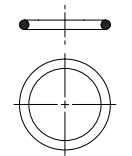
**FR:** Joint torique, pour contre-écrous  
**IT:** O-Ring, per - controddado



Article no.	D								
357 9119	M 12 x 1,5								
357 9094	M 14 x 1,5								
357 9092	M 16 x 1,5								
357 9219	M 18 x 1,5								
357 9086	M 22 x 1,5								

**GB:** O-ring, for hose nipple  
**DE:** O-Ring, für Schlauchstutzen

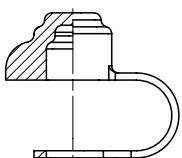
**FR:** Joint torique, pour nipples  
**IT:** O-Ring, per - bocchettone



Article no.	K	House nipple							
357 9121	Ø10	623 8992							
357 9122	Ø12	623 8993							

**GB:** Safety cap, for test point  
**DE:** Schutzkappe, für Prüfventil

**FR:** Capuchon, pour prise de pression  
**IT:** Tappo di protezione, per Raccordo presa pressione



Article no.									
357 9076									50

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

# RAUFOSS ABC™ SYSTEM

A new generation of couplings, based on composite materials in combination with leading couplings technology

The system will provide significant improvement in key coupling areas, and enable Raufoss to take a broader responsibility in pneumatic system building on commercial vehicles. New composite materials reduce system cost, weight, number of articles and increases design flexibility.

Brass components secure structural integrity in highly stressed areas. One global system, fulfilling different engineering philosophies within truck, bus, trailer and off-road applications.

## Features & Benefits:

- Design flexibility
- Full releasability
- Integrated safety
- System cost reduction
- One global system
- Up to 83% weight reduction



## Raufoss ABC™ System - Assembly proposals

### L-coupling with test point



### Integral-coupling with rotolock



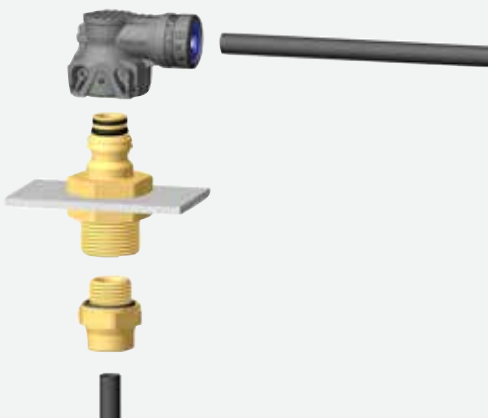
### T-coupling



### L-coupling



### Bulkhead with integral coupling



### F-coupling



If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.



# Raufoss ABC™ System - Assembly proposals

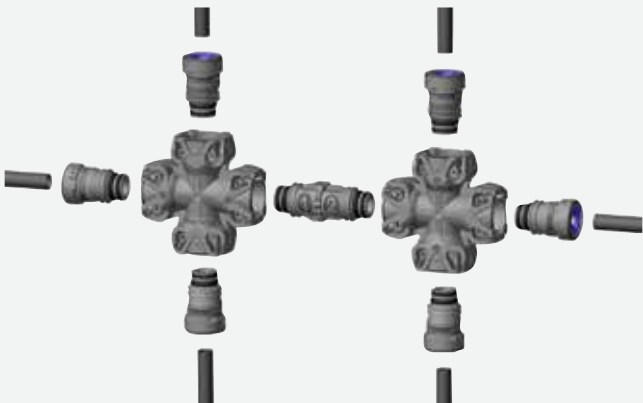
**Reducer**



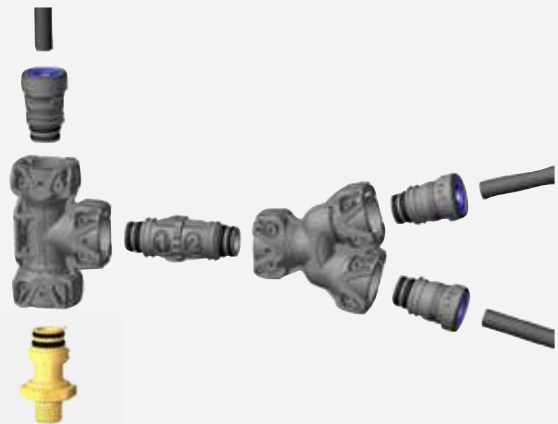
**4-Way Cross with Reducer**



**4 - way Union couplings**



**Combined couplings**



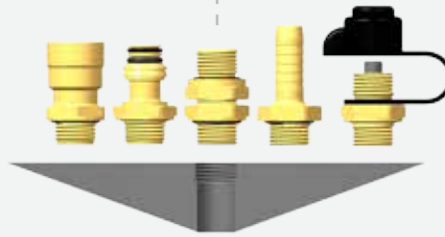
If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

## Parallel thread

### Assembly instructions

## Rapides Métriques

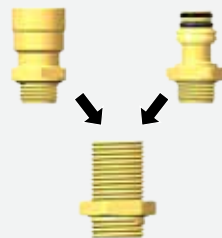
### Instructions de montage



The installation of the metric Push-In couplings, ABC™ swivels, locking nuts etc. shall be directly tightened into the thread (acc. DIN 3852, ISO 6149, ISO 4039-1, ISO 4039-2, Voss port geometry) without any further preparation. The necessary torque values according to Table 2a:

Les raccords rapides métriques, embases et contre écrous etc, sont vissés sans préparation, directement dans le taraudage récepteur. (DIN 3852, ISO 6149, ISO 4039-1, ISO 4039-2, Voss) Les couples de serrage sont indiqués dans le tableau 2a ci-dessous :

Thread Filetage	Recommended torque 1) 2) Couple de serrage recommandé 1) 2)	Max. torque 2) Couple de serrage max 2)
G 1/8"	15 Nm	18 Nm
G 1/4"	24 Nm	28 Nm
M 10 x 1.0	15 Nm	18 Nm
M 12 x 1.5	20 Nm	24 Nm
M 14 x 1.5	24 Nm	28 Nm
M 16 x 1.5	30 Nm	35 Nm
M 18 x 1,5	TBD	TBD
M 20 x 1,5	TBD	TBD
M 22 x 1.5	34 Nm	40 Nm
M 24 x 1,5	TBD	TBD
M 26 x 1.5	43 Nm	50 Nm
M28 x 1,5	TBD	TBD



When using Push-In couplings or swivels together with Raufoss couplings™ bulkheads, the following reduced torque values (Table 2b) are applicable:

Pour le montage de raccords rapides et d'embases orientables dans les passe-cloisons Raufoss Couplings™, appliquer les couples de serrage réduits selon le tableau 2b:

Thread Filetage	Recommended torque 1) 2) Couple de serrage recommandé 1) 2)	Max. torque 2) Couple de serrage max 2)
M 10 x 1.0	10 Nm	12 Nm
M 12 x 1.5	14 Nm	16 Nm
M 16 x 1.5	20 Nm	24 Nm

1) The recommended torques are based on the threads without lubrication. The recommended torques applies to ports of aluminum, brass or steel. A "torque wrench" should be used.

2) Please refer to the max. torque of the valve, air reservoir etc

1) Les couples de serrage recommandés sont basés sur des filetages non lubrifiés. Les couples de serrage recommandés s'appliquent aux taraudages en aluminium, en laiton ou en acier. Une clé à cliquet dynamométrique doit être utilisée.

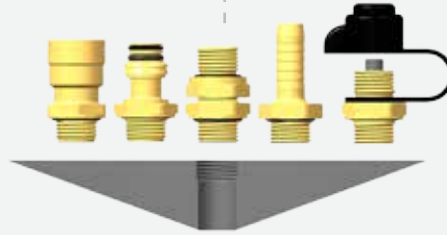
2) Veuillez également ne pas dépasser le couple de serrage maximum pour les valves, bouteilles d'air etc.

## Parallel Gewinde

### Montagehinweise

## Filettatura metrica

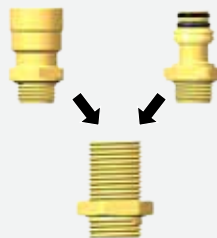
### Istruzioni di montaggio



Die geraden Steckverbinder, ABC Anschlussstutzen, Kontermuttern etc. werden ohne weitere Vorbereitung in die Aufnahmegehwinde. (DIN 3852, ISO 6149, ISO 4039-1, ISO 4039-2, Voss Geometrie) geschraubt. Die Anzugsdrehmomente sind der Tabelle 2a zu entnehmen:

Le filettature dei raccordi ABC (New Line, girevoli, dadi, ecc) sono idonee per le sedi secondo gli standard. (DIN 3852, ISO 6149, ISO 4039-1, ISO 4039-2, Voss) Le coppie di serraggio prescritte sono illustrate nella tabella 2a:

	Gewinde Filetto	Empfohlenes Anzugsdrehmoment 1) 2) Coppia di serraggio prescritta 1) 2)	Max. Anzugsdrehmoment 2) Coppia di serraggio max. 2)	
TABELLE 2A	G 1/8"	15 Nm	18 Nm	TABELLA 2A
	G 1/4"	24 Nm	28 Nm	
	M 10 x 1.0	15 Nm	18 Nm	
	M 12 x 1.5	20 Nm	24 Nm	
	M 14 x 1.5	24 Nm	28 Nm	
	M 16 x 1.5	30 Nm	35 Nm	
	M 18 x 1,5	TBD	TBD	
	M 20 x 1,5	TBD	TBD	
	M 22 x 1.5	34 Nm	40 Nm	
	M 24 x 1,5	TBD	TBD	
	M 26 x 1.5	43 Nm	50 Nm	
M28 x 1,5	TBD	TBD		



Bei Verwendung von Steckverbinder, ABC Anschlussstutzen in Raufoss Couplings™ - Schottstutzen gelten die nachfolgenden, reduzierten Drehmomente gemäß Tabelle 2b:

Quando i raccordi rapidi New Line o girevoli vengono montati su raccordi passaparte, la coppia di serraggio si riduce come prescritto nella tabella 2b:

	Gewinde Filetto	Empfohlenes Anzugsdrehmoment 1) 2) Coppia di serraggio prescritta 1) 2)	Max. Anzugsdrehmoment 2) Coppia di serraggio max. 2)	
TABELLE 2B	M 10 x 1.0	10 Nm	12 Nm	TABLEAU 2B
	M 12 x 1.5	14 Nm	16 Nm	
	M 16 x 1.5	20 Nm	24 Nm	

1) Die empfohlenen Anzugsdrehmomente gelten für nicht vorbehandelte Gewinde. Die empfohlenen Anzugsdrehmomente gelten für Gewinde in Aluminium, Messing, oder Stahl. Die Verwendung eines Drehmomentschlüssels wird empfohlen.

2) Bitte beachten Sie das max. zulässige Anzugsdrehmoment des Ventils, Luftbehälter, etc.

1) Le coppie di serraggio si riferiscono a montaggi su sedi in ottone, alluminio od acciaio e senza l'impiego di lubrificanti. Utilizzare chiavi dinamometriche.

2) Considerare le coppie Max prescritte per le sedi dei componenti quali valvole, serbatoi aria, etc.

## Conical thread

### Assembly instructions

## Filetage Conique

### Instructions de montage



For the installation of Push-In couplings and ABC™ swivels with “NPTF” - “R” thread, a sealing fluid should be used for tightening. The following Table 2c shows the recommended torque values

Pour le montage de raccords rapides et d'embases orientables ABC avec le filetage “NPTF” - “R”, il est nécessaire d'utiliser une pâte d'étanchéité avant de visser. Les couples de serrage sont indiqués dans le tableau 2c ci-dessous.

Thread Filetage	Recommended torque 1) 2) Couple de serrage recommandé 1) 2)	Max. torque 2) Couple de serrage max 2)
1/8 - 27 NPTF	15 Nm	18 Nm
1/4 - 18 NPTF	24 Nm	28 Nm
3/8 - 18 NPTF	32 Nm	38 Nm
1/2 - 18 NPTF	36 Nm	42 Nm
R 1/4"	24 Nm	28 Nm
R 3/8"	32 Nm	38 Nm
R 1/2"	36 Nm	42 Nm
R 5/8"	43 Nm	50 Nm

1) The recommended torques are based on the threads without lubrication. The recommended torques applies to ports of aluminum, brass or steel. A “torque wrench” should be used.

2) Please refer to the max. torque of the valve, air reservoir etc.

3) No O-ring seal on conical tread

1) Les couples de serrage recommandés sont basés sur des filetages non lubrifiés. Les couples de serrage recommandés s'appliquent aux taraudages en aluminium, en laiton ou en acier. Une clé à cliquet dynamométrique doit être utilisée.

2) Veuillez également ne pas dépasser le couple de serrage maximum pour les valves, bouteilles d'air etc.

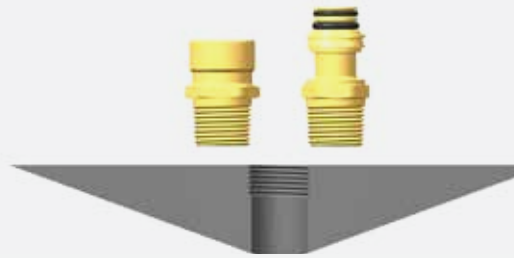
3) Ne pas utiliser de joint d'étanchéité sur filetage conique.

## Konisches Gewinde

### Montagehinweise

## Sedi coniche

### Istruzioni di montaggio



Für gerade Steckverbindungen und ABC Anschlussstutzen mit "NPTF"; "R" Gewinde soll ein Dichtmittel verwendet werden. Die Anzugsdrehmomente sind der Tabelle 2c zu entnehmen.

Per il montaggio dei raccordi New Line ed ABC girevoli con filettature "NPTF"; "R", deve essere utilizzato un liquido sigillante. Le coppie di serraggio prescritte sono illustrate nella tabella 2c:

	Gewinde Filetto	Empfohlenes Anzugsdrehmoment 1) 2) Coppia di serraggio prescritta 1) 2)	Max. Anzugsdrehmoment 2) Coppia di serraggio max. 2)
TABELLE 2C	1/8 - 27 NPTF	15 Nm	18 Nm
	1/4 - 18 NPTF	24 Nm	28 Nm
	3/8 - 18 NPTF	32 Nm	38 Nm
	1/2 - 18 NPTF	36 Nm	42 Nm
	R 1/4"	24 Nm	28 Nm
	R 3/8"	32 Nm	38 Nm
	R 1/2"	36 Nm	42 Nm
	R 5/8"	43 Nm	50 Nm

1) Die empfohlenen Anzugsdrehmomente gelten für nicht vorbehandelte Gewinde. Die empfohlen Anzugsdrehmomente gelten für Gewinde in Aluminium, Messing, oder Stahl. Die Verwendung eines Drehmomentschlüssels wird empfohlen.

2) Bitte beachten Sie das max. zulässige Anzugsdrehmoment des Ventils, Luftbehälter, etc.

3) Keine O-Ring Dichtung bei konischem Gewinde

1) Le coppie di serraggio si riferiscono a montaggi su sedi in ottone, alluminio od acciaio e senza l'impiego di lubrificanti. Utilizzare chiavi dinamometriche.

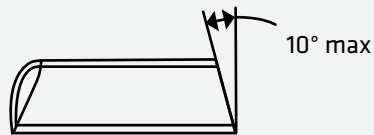
2) Considerare le coppie Max prescritte per le sedi dei componenti quali valvole, serbatoi aria, etc.

3) Sulle filettature coniche non ci sono o-ring.

## Tube assembly

### Assembly instructions

The tube has to be cut with a tube cutter by 90°. A maximum deviation of 10° is allowed. The tube end must be free of marks, stickers etc.

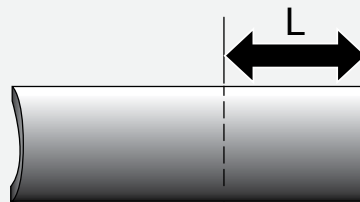


The tube can be assembled in the push-in coupling by hand without using any tool. Tube assembly is simplified by pushing and turning the tube at the same time. Positioning is accomplished according to the Grip-then-seal principle:

1. Grip: Passing the grip ring.
2. Seal: Passing the O-ring main seal. When the tube has passed the grip ring, no slip out of tube is possible. Before reaching the mechanical stop at the fullpush-in length, a small mechanical clip will be released, giving a distinct assembly feeling and securing correct assembly.

The maximum required tube push-in forces are shown in table approx 3. 2/3 of the given values is serial standard.

3. Pull back the tube by hand to secure the assembly  
Customer decision depending of the criticality level of the application.



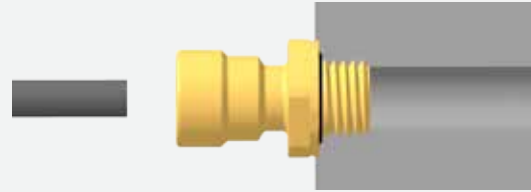
A marking for visual control of the push-in length is optional; the Push-In length is mentioned in Table 3, In cases the tube is not pushed in correctly, only passing the grip ring (see above) a measurable controlled leakage will occur, and an audible whistle can be heard. Depending on the tube dimension it can be re-pushed under pressure and is then 100% sealed.

For connections between chassis and axle it is recommend using the tube size  $\leq 12 \times 1,5$ .

## Montage des tubes

### Instructions de montage

Couper le tube à angle droit, 90°. Un écart angulaire de 10° maximum est admissible. L'extrémité du tube doit être exempte de toute trace de détérioration, d'adhésifs, etc.



L'emmanchement du tube dans le raccord se fait manuellement sans avoir besoin d'un quelconque outil. Il est facilité si l'on pousse et tourne le tube en même temps. L'introduction se décompose en 2 phases distinctes :

- 1ère phase: Le passage de l'anneau de retenue du tube.
- 2ème phase: Le passage du dispositif d'étanchéité (joint) jusqu'en butée au fond du raccord qui déclenchera le signal sonore et tactile de parfait emmanchement. Quand le tube a passé l'anneau de retenue il ne peut pas être ressorti.

Les forces d'emmanchement maximum sont indiquées sur le tableau ci-dessous. En pratique l'effort nécessaire équivaut aux 2/3 de ces valeurs.

- 1ère phase: Tirez manuellement sur le tube pour s'assurer du bon emmanchement. La décision du client dépendra du niveau de criticité de l'application.

Pour un contrôle visuel de la longueur d'emmanchement, mentionnée sur le tableau 3, une marque peut être apposée sur le tube. Si le tube n'est pas emmanché correctement, cela provoquera une fuite qui sera détectable par un sifflement sonore. Selon la taille et l'accessibilité du tube celui-ci peut être repoussé jusqu'en butée pour une parfaite étanchéité.

Il est recommandé d'utiliser un tube de 12x1.5 pour une connexion entre essieu et châssis.

	Ø External tube Filetage Ø Extérieur du tube	Push- in length Longueur d'emmanchement	Max. push-in force 1) Force d'emmanchement (Moyenne)1)
TABLE 3	4 mm	17,2 mm	70 N
	6 mm	19,5 mm	80 N
	8 mm	20,5 mm	90 N
	10 mm	24,0 mm	100 N
	12 mm	25,0 mm	110 N
	15 mm	27,0 mm	125 N
	16 mm	27,0 mm	130 N

TABLEAU 3

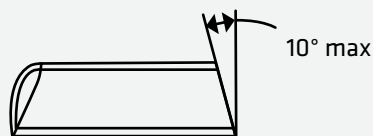
1) Tube diameter, tolerances, ovality and cutting quality may affect the Push-In force.

1) Diamètre du tube, tolérances, rondeur et qualité de coupe peuvent influencer la force d'emmanchement.

## Montage des ABC™ Baukastensystems

### Montagehinweise

Die Rohre werden rechtwinklig mit einem Rohrschneider abgeschnitten. Eine max. Abweichung von 10° ist zulässig. Das Rohrende muss frei sein von Beschädigungen, Aufklebern usw.



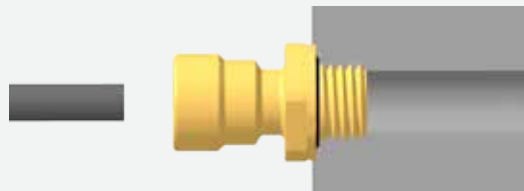
Die Rohre werden einfach von Hand, bis zum Anschlag in die Steckverbindung eingeschoben. Gleichzeitiges drücken und drehen erleichtern das Einstecken. Deutlich spürbar ist der Einschub in zwei Stufen:

- 1: Passieren des Klemmrings.
- 2: Passieren des O-Rings und Erreichen des Steckendpunktes, Eindeutiges Montagegefühl beim Passieren des Klemmrings und durch Auslösen des "Feed Back Signals".
- 3: Ziehen sie per Hand Sie an dem Rohr, um die Montage zusätzlich zu kontrollieren. Kundenentscheidung in Abhängigkeit des Sicherheitslevels der Anwendung.

## Montaggio del tubo

### Istruzioni di montaggio

Il tubo deve essere tagliato con una taglierina effettuando un taglio netto. E' tollerato uno scostamento max di 10°. L'estremità del tubo deve essere libera da marcatore, adesivi, ecc.



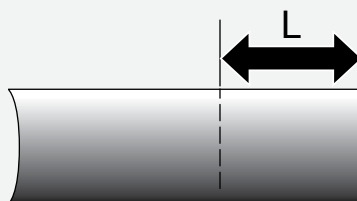
Il tubo può essere innestato a mano e senza l'ausilio di attrezzature. L'operazione di montaggio è più lineare se durante l'innesto si effettua con la mano anche una rotazione del tubo. Il fissaggio del tubo è garantito in quanto si esegue la tenuta meccanica prima di quella pneumatica:

1. Meccanica: il tubo supera il segmento di graffaggio in ottone.
2. Pneumatica: il tubo supera anche l'oring di tenuta

Quando il tubo ha superato il segmento di graffaggio in ottone, viene da questo trattenuto e non può più sfilarsi. Quindi superando l'oring si raggiunge anche la tenuta pneumatica. Quando il tubo ha superato i sistemi di tenuta prima meccanica, poi pneumatica, esso fa scattare un terzo meccanismo che genera un "clic!", segnale questo che è stata raggiunta la battuta al fondo della sede di innesto.

Le forze di innesto Max dei tubi sono illustrate nella tabella I valori standard corrispondono ai 2/3 dei valori Max.

3. Per verificare l'avvenuto aggancio, tirare SEMPRE il tubo prima di rilasciarlo. Operazione a discrezione del Cliente secondo il livello di sicurezza richiesto.



Für eine visuelle Kontrolle kann die Einstecklänge gemäß Tabelle 3 auf den Rohren gekennzeichnet werden. Wenn das Rohr nicht korrekt gesteckt ist, tritt eine messbare, kontrollierte Leckage auf, ein Pfeifton zur Lokalisierung. In Abhängigkeit von Rohrabmessung kann es unter Druck nachgesteckt werden.

Für Verbindungen Rahmen – Achse ist die Verwendung von Rohrabmessungen  $\leq 12 \times 1,5$  empfohlen.

Per un controllo visivo dell'avvenuto montaggio del tubo, è possibile effettuare una marcatura come indicato sulla tabella 3. Qualora il tubo abbia passato solamente il segmento di tenuta meccanica (vedere Montaggio del tubo) non appena l'impianto viene messo in pressione, il raccordo ha una piccola perdita controllata udibile per un sibilo. Talvolta è possibile completare l'operazione di montaggio del tubo anche con l'impianto in pressione.

Per collegamenti tra telaio e ponte è consigliabile l'impiego di tubazioni  $\leq 12 \times 1,5$ .

	Ø Rohr-Außen Ø esterno del tubo	Einstecklänge Lunghezza di innesto	Niveau des Einsteckkraft Forza d'innesto
TABELLE 3	4 mm	17,2 mm	70 N
	6 mm	19,5 mm	80 N
	8 mm	20,5 mm	90 N
	10 mm	24,0 mm	100 N
	12 mm	25,0 mm	110 N
	15 mm	27,0 mm	125 N
	16 mm	27,0 mm	130 N

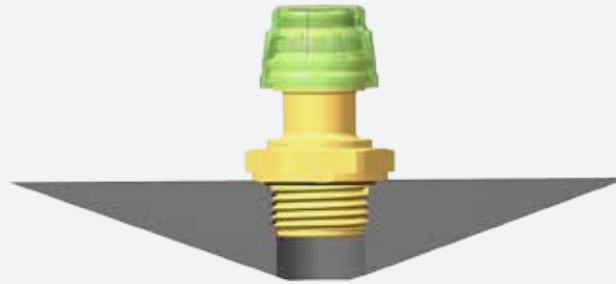
1) Rohrdurchmesser, Toleranzen, Qualität und Schnittqualität können die Einsteckkräfte beeinflussen.

1) Il diametro, le tolleranze, l'ovalizzazione del tubo e la qualità del taglio possono influire sulla forza d'innesto.

## Assembly of the ABC™ Building Block system

### Assembly instructions

It is not allowed to mix the ABC™ Building Block system with similar systems produced by other manufacturers.



The swivel shall be mounted with the recommended torque (equal as for Push-In). Remove the protection cap after mounting, directly before assembling the Building Block.

## Assemblage des pièces de forme du système ABC™

### Instructions de montage

Il n'est pas permis de mélanger les pièces de forme ABC avec des composants d'une autre marque.

Les embases filetées seront vissées selon les couples préconisés, les mêmes que pour les unions mâles. Le capuchon de protection ne doit pas être enlevé avant utilisation.



The ABC Building Block system is a 2 step connection. The parts are pressed together by hand. The connection swivel and Building Block can be turned for positioning.

When reaching the 1st (safety) position only, a controlled leakage will be discharged, this is slightly audible. Depending on the dimension and accessibility the connection can be re-pressed under pressure and is then sealed.

La connexion des pièces de forme ABC et des composants à «clipser» (embases et raccords pour tube) peut être décomposée en 2 temps : 1er temps : position de sécurité (1er clic). Il est encore possible de donner aux pièces l'orientation désirée mais l'étanchéité de l'assemblage n'est pas encore assurée (fuite volontairement audible).

2ème temps : poursuite de l'emmanchement (2ème clic) les joints toriques sont comprimés, l'étanchéité est assurée. Aucune de ces opérations ne nécessite l'usage d'un quelconque outil.

#### IMPORTANT RECOMMENDATIONS

In these cases:

- Connection between truck and trailer (e.g. brake hose/Air coils)
- Between axle and chassis (e.g. brake hose)
- The tube orientation has to be fixed use the RotoLock in combination with ABC Building Block

#### RECOMMANDATIONS IMPORTANTES

En cas de connexion:

- Entre tracteur et remorque
- Entre châssis et essieux
- L'orientation du tube doit être figée au moyen de RotoLock bloquant les embases en rotation.



## Montage des ABC™ Baukastensystems

### Montagehinweise

Das ABC-Baukastensystem darf nicht mit ähnlichen Systemen anderer Hersteller gemischt werden.

Das Einschrauben des Stutzens erfolgt mit dem erforderlichen Drehmoment (siehe Steckverbindungen). Die Schutzkappe wird unmittelbar vor der Montage des Gegenstücks entfernt.

Das ABC Baukastensystem hat eine zweistufige Verbindung. Die Teile werden von Hand zusammengefügt. Die Verbindung Anschlußstutzen und Baukastenteil ist drehbar zur Positionierung.

Wenn lediglich die erste Verriegelungsstufe (Sicherungsstufe) erreicht wird, tritt eine kontrollierte, leicht hörbare Leckage auf, die durch nachdrücken der Verbindung problemlos behoben werden kann.

#### WICHTIGE HINWEISE

In den Fällen:

- Verbindung zwischen Motorwagen und Anhängerfahrzeug (z.B. Bremsschlauch / IWendelflex)
- Zwischen Achse und Fahrgestellrahmen (z.B. Bremsschlauch)
- Das Rohr eine feste Ausrichtung haben muß Nutzen Sie den RotoLock In Verbindung mit dem ABC Baukastensystem

## Montaggio del sistema di raccordi ABC™

### Istruzioni di montaggio

Non è consentito il montaggio dei raccordi del sistema ABC su raccordi di sistemi simili di altri produttori.

I raccordi girevoli devono essere montati rispettando le coppie di serraggio prescritte (medesime dei raccordi New Line). Montato il raccordo girevole, rimuovere il cappuccio subito prima del montaggio del raccordo multiplo.

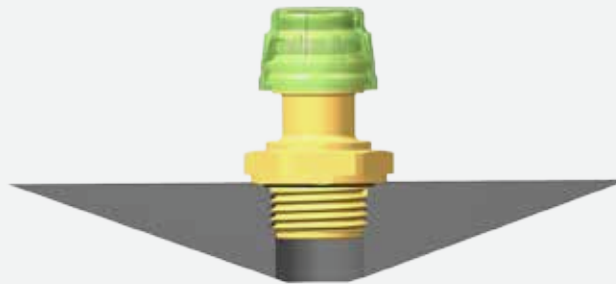
Il sistema di innesto dei raccordi multipli ABC si esegue a mano e prevede 2 scatti: posizione di sicurezza e posizione di aggancio. Quando si ode il primo scatto, posizione di sicurezza, il montaggio del raccordo multiplo è incompleto in quanto è trattenuto solo meccanicamente e non pneumaticamente. Esso rilascerà una limitata e controllabile perdita d'aria non appena l'impianto verrà messo in pressione. Talvolta è possibile completare il montaggio raggiungendo il secondo scatto anche con l'impianto in pressione.

Premendo ulteriormente, si raggiunge il secondo scatto, posizione di aggancio, che segnala il completamento del montaggio. In questa posizione, il raccordo multiplo può essere orientato.

#### IMPORTANTE

Per i seguenti collegamenti è obbligatorio applicare il rotolock al raccordo multiplo:

- Tra motrice e rimorchio
- Tra telaio e ponte
- Quando l'orientamento del tubo deve essere fisso



# Assembly of Rotolock

## Assembly instructions

# Montage des bagues de blocage Rotolock

## Instructions de montage

It is not allowed to mix the ABC™ Building Block system with similar systems produced by other manufacturers.

Il n'est pas permis de mélanger les pièces de forme ABC avec des composants d'une autre marque.

1. Press Rotolock + ABC Building Block together.



2. Plug this assembly on top of the swivel (1st/safety position).



3. Define the orientation.



4. Click the ABC Building Block into the 2nd/locked position.



1. Clipser la bague Rotolock sur le corps ABC.

2. Clipser l'embase partiellement (1ère position de sécurité).

3. Choisir l'orientation désirée.

4. Emmancher l'embase complètement (2ème position d'étanchéité).

## Montage des Rotolock

### Montagehinweise

Das ABC-Baukastensystem darf nicht mit ähnlichen Systemen anderer Hersteller gemischt werden.

1. Zusammenstecken von Rotolock + ABC Baukastenteil.

2. Stecken dieser Kombination auf den Anschlußstutzen (erste Sicherheits- Position).

3. Ausrichtung.

4. Drücken das ABC Baukastenteil in die zweite Dichtposition.

## Montaggio del Rotolock

### Istruzioni di montaggio

Non è consentito il montaggio dei raccordi del sistema ABC su raccordi di sistemi simili di altri produttori.

1. Montare il Rotolock sul raccordo multiplo.

2. Montare l'insieme sul raccordo girevole premendo fino al primo scatto - posizione di sicurezza.

3. Orientare il raccordo multiplo.

4. Premere il raccordo multiplo fino a raggiungere il secondo scatto - posizione di aggancio.



## Repair instructions

When using the Raufoss ABC™ system, the exchange of valves, air reservoirs, air bellows etc. can be performed without any problem.

Before starting to work on the couplings:

- Remove air pressure completely out of the pneumatic system, to be able to release the tubing / couplings.
- Remove cable ties close to coupling. Tube must be accessible (as straight as possible)
- Clean the push-in area around the tube / the locking area of the Building Block. Make sure that no dirt or contamination will be pushed into the tube or coupling
- Kongsberg Automotive recommends that each single push-in coupling experience a total of maximum five (5) tube assemblies and releases in a lifetime perspective

## Conseils pour la réparation

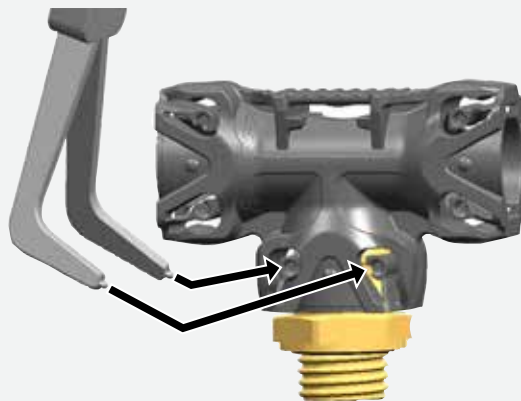
Avec le système Raufoss ABC l'échange de valves, réservoirs, coussin d'air peut se faire sans problème.

Instruction pour la déconnexion des tubes :

- Dépressuriser complètement le circuit
- Enlever les colliers de serrage à proximité du raccord pour rendre le tube accessible (aussi droit que possible).
- Nettoyer la zone autour du tube. S'assurer qu'aucune impureté ne puisse s'introduire dans le tube ou le raccord.
- Kongsberg Automotive recommande de ne pas excéder 5 connexions tube-union mâle avec le même raccord.

## Instruction for Building Block Release

## Instruction pour le démontage des composants ABC



The ABC Building Block system can be disconnected with a standard circlip plier<sup>1)</sup>. The parts are reusable.

<sup>1)</sup>Pliers with thin tips are to prefer; i.ex. Knipex 46 21 A2 or 46 11 A2.

Les raccords composés à partir des éléments du système ABC peuvent être aisément désassemblés avec une pince à circlips ordinaire<sup>1)</sup>. Les composants démontés peuvent être réutilisés.

<sup>1)</sup>De préférence des pinces avec des pointes fines p.ex Knipex 46 21 A2 or 46 11 A2.

## Reparatur Hinweise

Bei Verwendung des Raufoss ABC Systems, ist der Austausch von Ventilen, Luftbehältern, Luftfederbälge problemlos möglich.

Gehen Sie wie folgt vor:

- Entlüften Sie Druckluftanlage vollständig, um das Rohr aus der Verschraubung lösen zu können.
- Entfernen Sie der Kabelbinder nahe der Verschraubung, Rohr muß frei zugänglich (so gerade wie möglich) sein.
- Säubern Sie den Push-In Bereich um das Rohr/ den Verschlußbereich des Baukastenteils. Das Rohr soll Schmutz- und Staubfrei sein.
- Kongsberg Automotive empfiehlt für die Nutzungsdauer der Steckverbindungen max. 5 Montagen und Demontagen durchzuführen.

## Istruzioni per la sostituzione

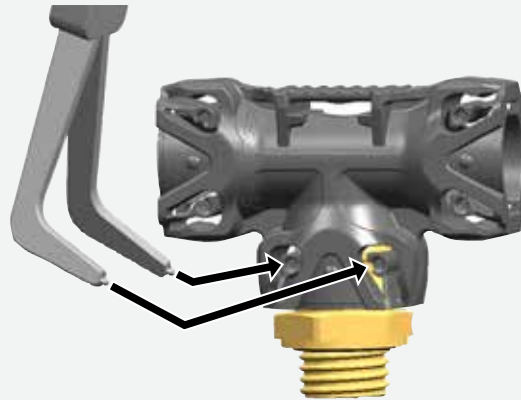
Con l'impiego del sistema Raufoss ABC, è possibile sostituire valvole, serbatoi, ecc, semplicemente smontando il tubo dal raccordo.

Prima di effettuare questa operazione

- Scaricare completamente l'impianto pneumatico
- Garantire il miglior accesso possibile al tubo rimuovendo eventuali fascette o altro.
- Ripulire l'area intorno al collegamento tubo-raccordo.
- Kongsberg Automotive ha previsto un massimo di 5 operazioni di sostituzione del tubo su ciascun raccordo.

## Hinweise für die Baukasten demontage

## Istruzioni per lo smontaggio del raccordo multiplo



Die ABC Baukastenteile können mit einer Standard Seegeringzange<sup>1)</sup> demontiert werden. Die Teile sind wiederverwendbar.

<sup>1)</sup>Seegeringzange z.B Knipex 46 21 A2 oder 46 11 A2.

I raccordi multipli del sistema ABC possono essere smontati utilizzando una pinza standard per seeger<sup>1)</sup>.

<sup>1)</sup>Consigliamo le pinze Knipex 4621 A2 oppure 4611 A2

# Handling of ABC Release Tool

## Assembly instructions

# Manipulation de l'outil de déconnexion ABC

## Instructions de montage

### INSTRUCTION FOR TUBE RELEASE

1. Push the tube to the bottom of the coupling to move the grip ring out of locking position.
2. Check that the Release Tool is not damaged or blunt. If so, then replace it.
3. Apply Release Tool on to tube.
4. Ensure tight contact between Release Tool and tube.
5. Push the Release Tool to stop with the flange at the top of the coupling without using extensive force.
6. Silicone spray can be used to ease the injection of the Release Tool.
7. While pushing the Release Tool towards the coupling; pull the tube out. Rotating the tube may ease the release.
8. Remove the Release Tool.
9. Assure that tube end is clean and undamaged. If not cut the tube end.
10. Clean the inside of the push-in coupling (tube section), by sample with compressed air, to remove eventual contamination, secure that no dirt is going inside the port.
11. Push-in the clean tube.
12. Kongsberg Automotive recommends that each single push-in coupling experience a total number of maximum five (5) tube assemblies and releases in a lifetime perspective.

In cases where ABC Release Tool is not available, the connection can be released together with the tube.

The Push-In coupling is turning on the tube



### INSTRUCTION POUR LE DÉMONTAGE DU TUBE

1. Pousser le tube au fond du raccord pour décoller l'anneau de retenue de tube.
2. Vérifier que l'outil de déconnexion n'est pas endommagé. Dans ce cas il faut le remplacer.
3. Le disposer sur le tube en l'enveloppant étroitement.
4. Assurer un bon contact entre l'outil de déconnexion et le tube.
5. Pousser l'outil jusqu'à ce que la collerette touche le haut du raccord, sans force excessive.
6. Pour faciliter l'introduction de l'outil on peut pulvériser un peu de silicone.
7. Tenir l'outil de déconnexion et retirer le tube en le tournant légèrement.
8. Enlever l'outil de déconnexion.
9. Vérifier que le tube est propre et pas endommagé, sinon il faut couper le bout du tube.
10. Nettoyer l'intérieur du raccord (partie tube) avec par exemple de l'air comprimé afin d'enlever d'éventuelles saletés et s'assurer qu'elles ne pourront pas s'introduire dans la valve.
11. Emmancher le tube propre.
12. Kongsberg Automotive recommande de ne pas excéder 5 connexions tube-union mâle avec le même raccord.

Sans outil de déconnexion il reste possible d'ôter, sans enlever le tube, de dévisser le raccord de la valve, celui-ci étant libre en rotation sur le tube.

Les unions mâles sont en libre rotation sur les tubes.

# Handhabung des ABC Demontage Werkzeug Montagehinweise

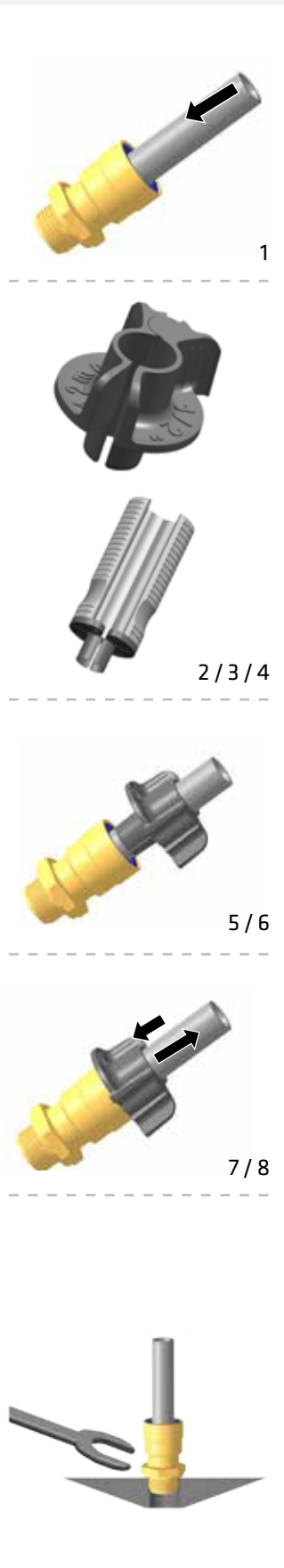
# Uso dell'utensile di sgancio del tubo Istruzioni di montaggio

## HINWEISE FÜR DIE ROHR-DEMONTAGE

1. Drücken Sie das Rohr bis zum Anschlag in die Verschraubung zu lösen Klemmring.
2. Prüfen, ob das Lösewerkzeug unbeschädigt ist, gegebenenfalls ersetzen.
3. Überstülpen des Lösewerkzeuges um das Rohr.
4. Schlissen sie das Werkzeug zwischen Lösewerkzeug und Rohr.
5. Drücken des Lösewerkzeugs in die Verschraubung bis auf dem Rand der Verschraubung, wenden keine große Kraft auf.
6. Silikonspray kann zum leichteren Einführen des. Lösewerkzeuges verwendet werden.
7. Halten das Lösewerkzeug fest in der Verschraubung und ziehen das Rohr bei gleichzeitigen leicht drehen aus der Verschraubung.
8. Entfernen das Lösewerkzeug.
9. Prüfen, ob das Rohr sauber und unbeschädigt ist, wenn nicht Rohrende abschneiden.
10. Reinigen der Verschraubung (Rohrbereich), zum Beispiel mit Druckluft, um eventuelle Verschmutzungen zu entfernen, stellen sicher, dass keine Verunreinigungen in das Ventil geraten.
11. Stecken des sauberen Rohrs.
12. Kongsberg Automotive empfiehlt für die Nutzungsdauer der Steckverbindungen max. 5 Montagen und Demontagen durchzuführen.

Sollte das ABC Release Tool nicht zur Verfügung stehen, kann die Verschraubung mit dem Rohr zusammen aus dem Anschluß geschraubt werden.

Die Steckverbindung dreht sich um dem Rohr.



## ISTRUZIONI PER LO SGANCIO DEL TUBO

1. Ruotandolo, premere il tubo verso il raccordo.
2. Verificare l'integrità dell'utensile. Sostituire se danneggiato.
3. Dilatare l'utensile premendo sulle apposite alette.
4. Calzare l'utensile sul tubo (lato sottile verso il raccordo) assicurandosi che esso sia aderente al tubo.
5. Spingere l'utensile all'interno del raccordo. Non sforzare durante l'inserimento.
6. Può essere usato spray al silicone per facilitare l'operazione.
7. Mantenendo premuto l'utensile all'interno del raccordo, estrarre il tubo.
8. Estrarre l'utensile.
9. Prima di reinserire il tubo nel raccordo, verificare che esso sia pulito e non danneggiato. Eventualmente tagliare l'estremità danneggiata.
10. Verificare che l'interno del raccordo sia pulito.
11. Inserire il tubo applicando una leggera rotazione.
12. Kongsberg Automotive ha previsto un massimo di 5 operazioni di sostituzione del tubo su ciascun raccordo.

Qualora non sia disponibile l'utensile specifico per lo sgancio del tubo, è possibile svitare il raccordo con il tubo montato.

Il raccordo ruoterà sul tubo.



BRK – 1985



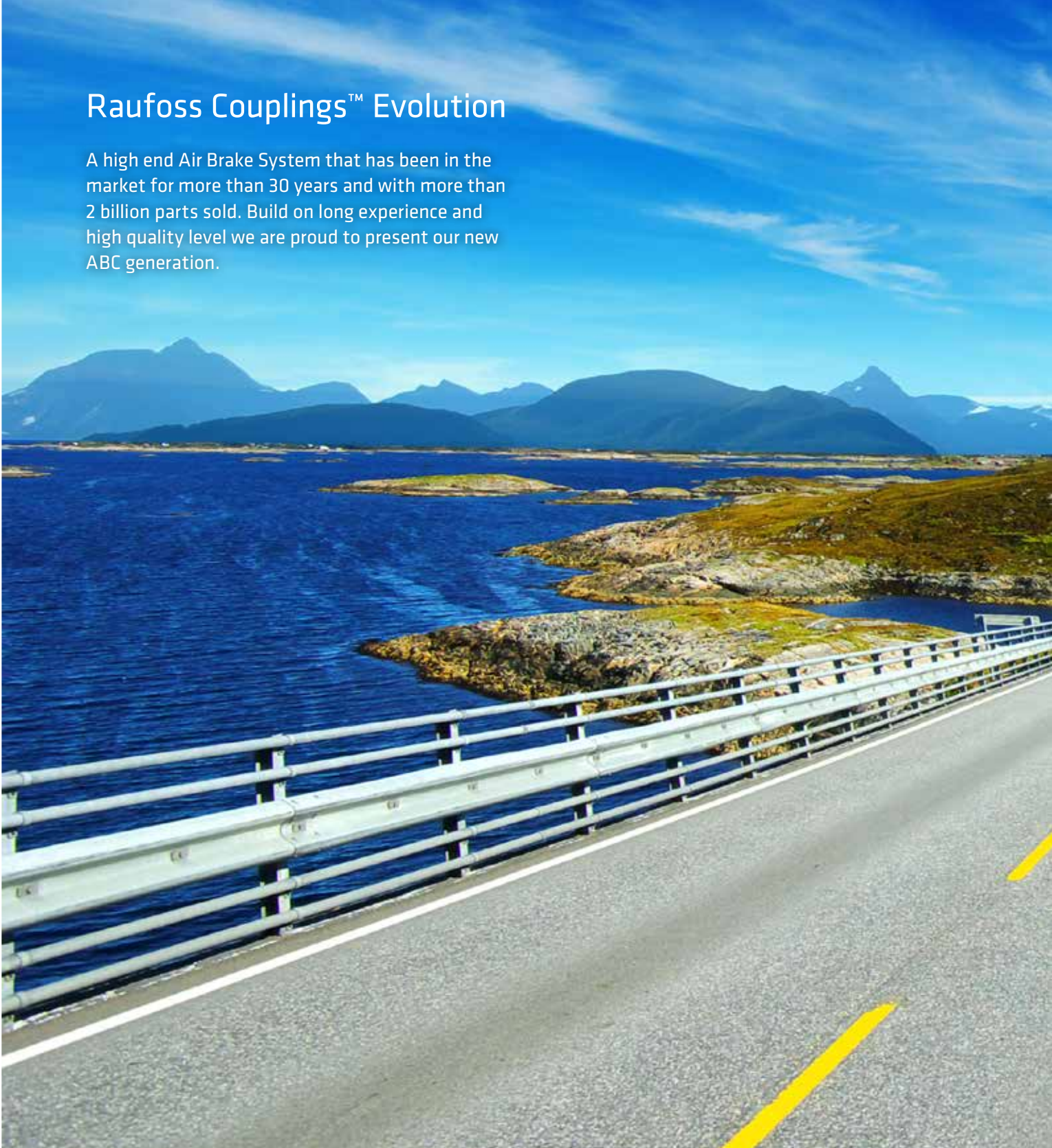
Newline – 2006



Threadless – 2008

## Raufoss Couplings™ Evolution

A high end Air Brake System that has been in the market for more than 30 years and with more than 2 billion parts sold. Build on long experience and high quality level we are proud to present our new ABC generation.



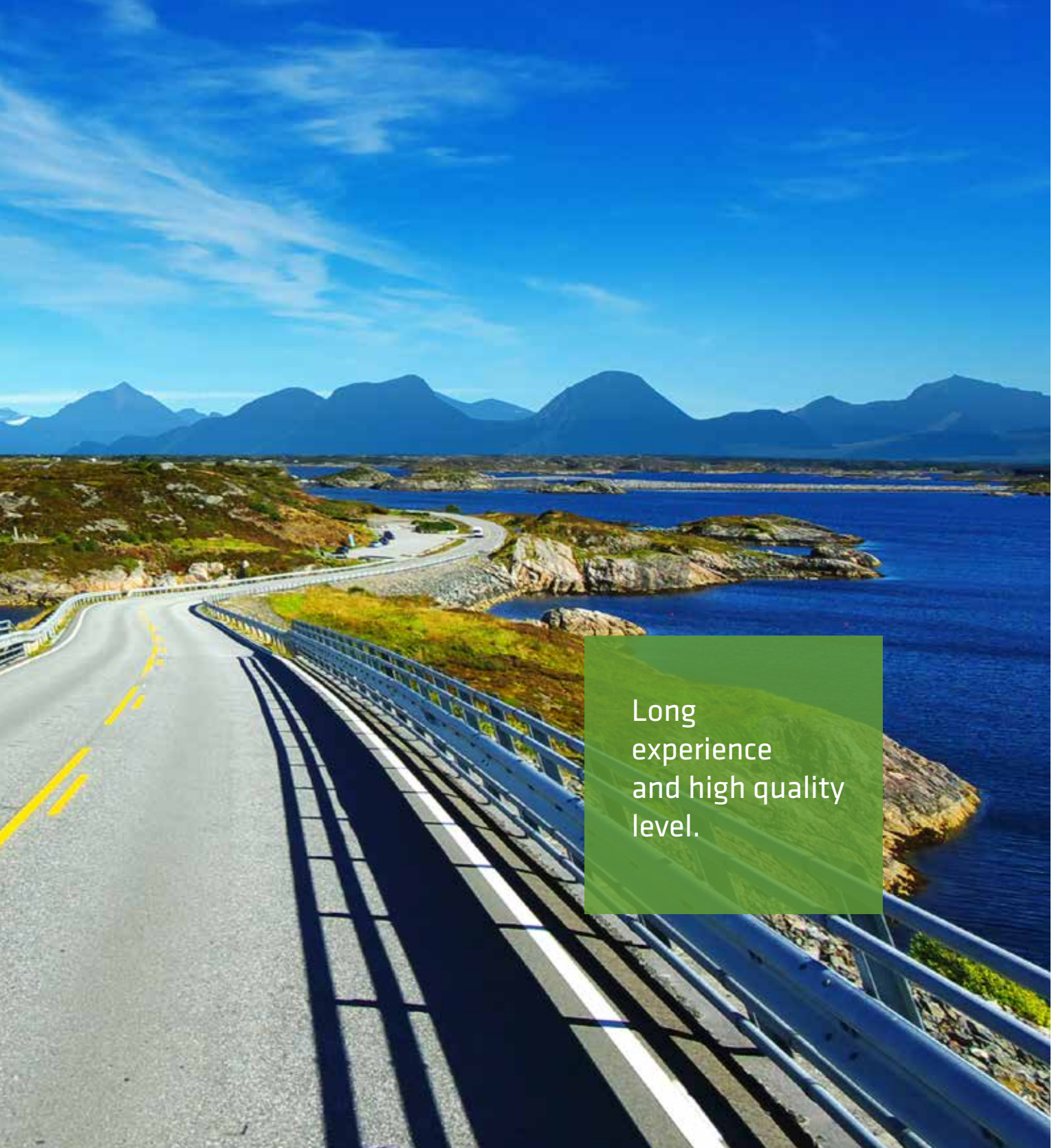




KArtridge – 2008



Weight optimization – 2015



Long  
experience  
and high quality  
level.



## Our values

Passionate  
Accountable  
Prepared

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GB / FR / DE / IT

**SYMBOLS - SYMBOLES - SYMBOLE - LEGENDA**

Hexagon width/Clé de/Schlüsselweite/Chiave [mm]



Packing unit/Unité emballage/Verpackungseinheit/Unità d'imballo



Weight/Poids/Gewicht/Peso [g]

## General system information

**Kongsberg Automotive** has, in co-operation with various commercial vehicle manufacturers, developed an advanced air-coupling system based on composite material and brass for use with plastic tubing for the compressed air circuits used on commercial vehicles.

The carefully developed, matured and thought out **Raufoss couplings™** consists of the following elements:

- Plug-ins
- Building Blocks

**Raufoss couplings™** system can be used with polyamide or hytrel tubing to one of the following standards:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844
- NFR 12-632

The couplings' operating temperature is between -40°C to +100°C, with peak-temperature up to +130°C (for a period of approximately 2 hours.)

The operating pressure for the couplings meet with the requirements for non metallic tubes.

All brass components are manufactured from (CuZn40Pb2/CuZn39Pb3) in compliance with DIN 17600, unless otherwise specified.

All steel components are manufactured from 9SMnPb28 in compliance with DIN 1651 and yellow chromated acc. ISO 4042/A3C. See separate notes in the catalogue.

All o-rings are manufactured from EPDM.

The use of our couplings with other media than air is not permitted without prior approval.

Kongsberg Automotive has been approved and certified by the following organisations:

**TÜV  
UTAC**

Kongsberg Automotive's quality system is approved according to the following international standards:

**ISO/TS 16 949  
ISO 14001**

For any further specific requirements, applications of our product or support for technical solutions, please ask for individual consultation from Kongsberg Automotive, our subsidiary **Kongsberg Raufoss Distribution SAS** or our distributors.

**Please note:**

Some items within this catalogue are only available from Kongsberg Raufoss Distribution SAS.

## Informations générales sur le système

**Kongsberg Automotive**, partenaire reconnu des plus grands constructeurs européens de véhicules industriels, s'est imposé comme un fournisseur privilégié, en développant un programme de raccords de freinage pour tubes polyamide destiné aux circuits d'air comprimé des véhicules industriels.

Le système de raccords de freinage **Raufoss couplings™** repose sur une conception modulaire avec:

- des embases orientables P5
- des pièces de forme (coudes, tés, croix, etc.)

Les raccords **Raufoss couplings™** doivent être utilisés avec des tubes polyamide ou hytrel conformes aux normes suivantes:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844
- NFR 12-632

La température de service des raccords peut varier entre -40° et +100°C (avec une possibilité de pointe à 130°C pendant 2 heures).

La pression de service des raccords n'est limitée que par la possibilité de résistance des tubes.

Sauf indication contraire, les composants sont en laiton CuZn40Pb2/ CuZn39Pb3 selon la norme DIN 17600.

Les composants en acier 9SMnPb28 selon la norme DIN 1651 et bichromatés jaune selon ISO 4042/A3C sont repérés par le symbole # dans le catalogue.

Les joints toriques sont en EPDM.

L'utilisation de nos raccords avec des fluides autres que l'air n'est pas autorisée sauf accord express de nos services techniques.

Kongsberg Automotive a été certifiée et approuvée par les organismes suivants :

**TÜV  
UTAC**

La démarche de qualité Kongsberg Automotive est certifiée par les normes internationales suivantes :

**ISO/TS 16 949  
ISO 14001**

Pour tous renseignements complémentaires sur les applications de nos produits ou pour obtenir une aide technique, veuillez contacter votre distributeur ou revendeur **Kongsberg Raufoss Distribution SAS**.

**Attention :**

Certains produits ne sont disponibles que chez Kongsberg Raufoss Distribution SAS.

## Allgemeine System Information

**Kongsberg Automotive** als kompetenter Systemlieferant der weltweiten Nutzfahrzeugindustrie hat, in Kooperation mit führenden Nutzfahrzeugherstellern, ein Steckverbindingssystem für Kunststoffrohre für die Druckluftbremsanlage in Nutzfahrzeugen entwickelt.

Das ausgereifte, durchdachte **Raufoss couplings™** System besteht aus den folgenden System-Komponenten:

- P5 Schnellanschlussstutzen
- Formstücke für P5 Schnellanschlüsse

Das **Raufoss couplings™** System kann für Polyamid-Rohre (PA11/ PA12) sowie HYTREL-Rohre der folgenden Normen verwendet werden:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844
- NFR 12-632

Das Steckverbinder-System ist für einen Dauertemperatur Einsatz von -40°C bis +100°C ausgelegt, im drucklosen Zustand bis +130°C (für die Dauer von ca. 2 Stunden).

Der Betriebsdruck des Steckverbinder-Systems entspricht dem der jeweils verwendeten Kunststoffrohre.

Alle System-Komponenten sind aus Messing (CuZn40Pb2/CuZn39Pb3) nach DIN 17600 gefertigt; Abweichungen sind gekennzeichnet.

Die Stahl-Komponenten werden aus 9SMnPb28 nach DIN 1651 gefertigt und gelbverzinkt nach ISO 4042/A3C. Die Artikel sind mit # gekennzeichnet.

Die O-Ringe sind aus EPDM hergestellt.

Andere Medien als Druckluft dürfen nur mit besonderer Freigabe verwendet werden.

Kongsberg Automotive ist von den folgenden Organisationen geprüft und zertifiziert:

**TÜV**  
**UTAC**

Kongsberg Automotives Qualitätssicherungssystem ist nach den folgenden international anerkannten Normen zertifiziert:

**ISO/TS 16 949**  
**ISO 14001**

Für Rückfragen und Problemlösungen stehen Ihnen unsere erfahrenen Anwendungsberater gerne zur Verfügung.

### Bitte beachten:

Einige der System-Komponenten sind nur über Kongsberg Raufoss Distribution SAS verfügbar.

## Informazioni sul sistema

**Kongsberg Automotive**, fornitore di provata competenza a livello mondiale nell'industria dei veicoli industriali, ha sviluppato l'ormai affermato sistema di raccordi ad innesto rapido idoneo per tubi termoplastici per i circuiti pneumatici per veicoli industriali.

Il sistema di raccordi **Raufoss couplings™** sviluppato con la massima accuratezza, consta dei seguenti particolari:

- Raccordi girevoli
- Raccordi multipli

Il sistema di raccordi rapidi **Raufoss couplings™** è applicabile a tubi in poliamide od hytel rispondenti ad una delle seguenti normative:

- ISO 7628
- DIN 74324
- DIN 73378
- SAE J844
- NFR 12-632

La temperatura d'esercizio dell'intero sistema di raccordi è compresa tra -40°C e +100°C con picchi fino a +130°C (per la durata massima di ca. 2 ore).

La pressione d'esercizio corrisponde a quella dei tubi termoplastici impiegati.

I componenti in ottone (CuZn40Pb2/CuZn39Pb3) rispettano la norma DIN 17600, se non diversamente specificato.

I componenti in acciaio (9SMnPb28) rispettano la norma DIN 1651 e sono zincati gialli secondo la norma ISO 4042/A3C. Vedere note nel catalogo.

Gli o-ring sono EPDM.

Non sono raccomandate applicazioni con fluidi diversi dall'aria, salvo specifica approvazione del costruttore.

Il sistema di raccordi Kongsberg Automotive è stato approvato e certificato dalle seguenti organizzazioni:

**TÜV**  
**UTAC**

La qualità dei prodotti Kongsberg Automotive risponde ai parametri richiesti dalle seguenti normative internazionali:

**ISO/TS 16 949**  
**ISO 14001**

Per ogni ulteriore informazione in merito all'applicazione dei nostri prodotti o per consulenze tecniche, rivolgersi alle agenzie o distributori del sistema di raccordi Kongsberg Raufoss Distribution SAS più vicini a Voi.

### Nota:

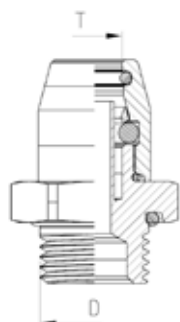
Alcuni componenti presenti in questo catalogo, sono solo disponibili presso la Kongsberg Raufoss Distribution SAS in Francia.




GB: BRK Push-in Coupling

DE: BRK Gerader Steckverbindung

FR: BRK Union mâle

IT: BRK Raccordo ad innesto rapido



Article no.	T	D	ABC Alternative			
623 7190	4x1	M10x1		16	275	19
623 7192	4x1	M12x1,5		18	275	22
623 7201	6x1	1/8NPTF*	90106049	14	200	28
623 7203	6x1	1/4NPTF*		16	200	26
623 7210	6x1	M10x1	90106010	16	275	24
623 7212	6x1	M12x1,5	90106012	18	225	28
623 7214	6x1	M14x1,5	90106014	20	150	33
623 7216	6x1	M16x1,5	90106016	22	150	38
623 7217	6x1	M22x1,5	90106022	28	100	57
623 7223	8x1	1/4NPTF*		18	100	42
623 7233	8x1	3/8NPTF*		18	125	49
623 7230	8x1	M10x1	90108010	18	200	33
623 7232	8x1	M12x1,5	90108012	18	200	34
623 7234	8x1	M14x1,5	90108014	20	150	40
623 7236	8x1	M16x1,5	90108016	22	125	46
623 7237	8x1	M22x1,5	90108022	28	90	67
623 7262	9x1,5	M12x1,5		20	130	45
623 7300	10x1	M10x1		20	130	47
623 7302	10x1	M12x1,5	90110012	20	130	47
623 7304	10x1	M14x1,5	90110014	20	100	46
623 7306	10x1	M16x1,5	90110016	22	100	51
623 7307	10x1	M22x1,5	90110022	28	80	72
6237318	10x1,25	G1/4		20	100	49
6237322**	10x1,25	R3/8**		20	100	60
623 7312	10x1,25	M12x1,5	90110112	20	130	47
623 7314	10x1,25	M14x1,5		20	100	50
623 7316	10x1,25	M16x1,5	90110116	22	100	53
623 7317	10x1,25	M22x1,5	90110122	28	80	71
623 7323	10x1,5	1/4NPTF*		20	100	52
623 7330	10x1,5	M10x1		20	100	47
623 7332	10x1,5	M12x1,5	90110212	20	125	48
623 7334	10x1,5	M14x1,5		20	125	45
623 7336	10x1,5	M16x1,5	90110216	22	100	51
623 7337	10x1,5	M22x1,5	90110222	28	80	73
623 7356	11x1,5	M16x1,5		22	100	59
623 7363	12x1,5	1/4NPTF*		22	100	63
623 7370	12x1,5	M10x1		22	100	58
623 7372	12x1,5	M12x1,5	90112012	22	100	59
623 7374	12x1,5	M14x1,5		22	100	57
623 7376	12x1,5	M16x1,5	90112016	22	100	61
623 7377	12x1,5	M22x1,5	90112022	28	70	81
623 7412	15x1,5	R1/2**		26	45	101
623 7444	15x1,5	M14x1,5		26	50	81
623 7446	15x1,5	M16x1,5	90115016	26	50	54

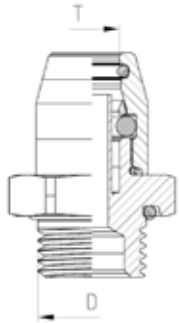
If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

GB: BRK Push-in Coupling

FR: BRK Union mâle

DE: BRK Gerader Steckverbindung

IT: BRK Raccordo ad innesto rapido



Article no.	T	D	ABC Alternative			
623 7447	15x1,5	M22x1,5	90115022	28	50	57
623 7451	15x1,5	M26x1,5		32	40	121
623 7448	15x2	M16x1,5		26	50	98
623 7449	15x2	M22x1,5		28	50	102
623 7452	16x2	M12x1,5		26	65	84
623 7454	16x2	M14x1,5		26	65	84
623 7456	16x2	M16x1,5	90116016	26	65	86
623 7457	16x2	M22x1,5	90116022	28	60	89
623 7468	16x2	M26x1,5		32	40	119
623 7476	18x2	M16x1,5		28	50	98
623 7477	18x2	M22x1,5		28	50	99
623 7478	18x2	M26x1,5		32	40	131

GB: BRK Push-in Coupling

FR: BRK Union mâle

DE: BRK Gerader Steckverbindung

IT: BRK Raccordo ad innesto rapido



Article no.	T	D						
623 7101**	1/4"	1/8NPTF				14	250	25
623 7102**	1/4"	1/4NPTF*				16	200	34
623 7110**	1/4"	M10x1				16	275	22
623 7112	1/4"	M12x1,5				18	225	26
623 7116	1/4"	M16x1,5				22	150	41
623 7122	3/8"	1/4NPTF*				18	150	44
623 7124	3/8"	3/8NPTF*				18	100	56
623 7125**	3/8"	1/2NPTF*				22	100	100
623 7130**	3/8"	M10x1,0				18	150	39
623 7132	3/8"	M12x1,5				18	150	44
623 7136	3/8"	M16x1,5				22	125	47
623 7142**	1/2"	1/4NPTF*				22	100	69
623 7144	1/2"	3/8NPTF*				22	90	75
623 7145	1/2"	1/2NPTF*				22	80	96
623 7156	1/2"	M16x1,5				22	100	62
623 7164**	5/8"	3/8NPTF*				26	45	78
623 7165**	5/8"	1/2NPTF*				26	40	97
623 7176	5/8"	M16x1,5				26	65	65
623 7177	5/8"	M22x1,5				28	50	95

\* GB: Without o-ring sealing against port

\* FR: Sans joint torique

\* DE: Ohne O-Ring Dichtung am Gewinde

\* IT: Senza o-ring su filletto

\*\*GB: Article availability may vary please contact us for information

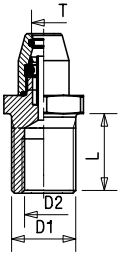
If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

GB: BRK push-in coupling, for bulkhead

DE: BRK Gerade Steckverbindung, mit Schottstutzen

FR: BRK Union mâle, passe-cloison

IT: Raccordo ad innesto rapido, con passaparete



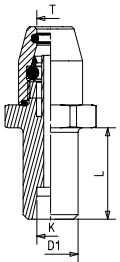
Article no.	T	D1	D2	L			
623 7208	6x1	M18x1,5	M12x1,5	22	22	100	57
623 7246	8x1	M16x1,5	M10x1	20	20	110	48

GB: BRK Push-in coupling, with 24° cone for bulkhead

DE: BRK Gerade Steckverbindung, mit Schottstutzen und 24°-Konus

FR: BRK Union mâle, passe-cloison avec cône 24°

IT: Raccordo ad innesto rapido, con passaparete e cono 24°



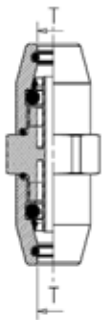
Article no.	T	D1	K	L			
623 7202	6x1	M12x1,5	K24°-6	20	18	175	37
623 7224	8x1	M14x1,5	K24°-8	20	18	130	47
623 7385	12x1,5	M18x1,5	K24°-12	34	22	40	106

GB: BRK Tube connector

DE: BRK Rohr Verbinder

FR: BRK Union double

IT: Giunzione



Article no.	T	ABC Alternative		
623 7195	4x1		200	25
623 7205*	6x1	90506006	200	40
623 7225*	8x1	90508008	125	53
623 7265	9x1,5		80	80
623 7305	10x1		80	81
623 7315	10x1,25		80	80
623 7325	10x1,5		80	81
623 7355	11x1,5		60	75
6237365*	12x1,5	90512012	60	95
623 7445	15x1,5		40	131
623 7465	16x2		40	136
623 7475	18x2		40	151
623 7115	1/4"		180	40
623 7135	3/8"		100	68
623 7155	1/2"		60	100
623 7175	5/8"		40	140

\* GB: Please note that we now have an ABC alternative, with the new ABC Tube connector. See page 15



If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

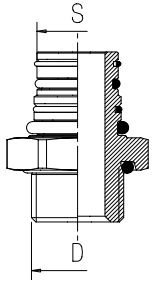


GB: Plug-in P5

DE: P5 Anschluß-Stutzen

FR: Embase P5

IT: Innesto girevole P5



Article no.	S	D					
623 7031	P 5	1/8 NPTF			20	150	28
623 7032	P 5	1/4" NPTF			20	100	34
623 7033	P 5	3/8" NPTF			20	100	38
623 7034	P 5	1/2" NPTF			22	100	57
623 7021	P 5	G1/4"			20	125	33
623 7026	P 5	R3/8"			20	100	39
623 7027	P 5	R1/2"			22	100	63
623 7010	P 5	M10x1,0			17	175	25
623 7012	P 5	M12x1,5			17	150	29
623 7014	P 5	M14x1,5			20	150	30
623 7016	P 5	M16x1,5			22	125	33
623 7017	P 5	M22x1,5			28	75	48
623 7019	P 5	M26x1,5			32	59	77

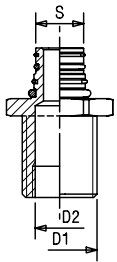
\* Without o-ring sealing against port/Sans joint torique/  
Ohne O-Ring Dichtung am Gewinde/Senza o-ring su filetto

GB: Plug-in P5, for bulkhead

DE: P5 Anschluß-Stutzen, mit Schottstutzen

FR: Embase P5, passe-cloison

IT: Innesto girevole P5, con passaparete



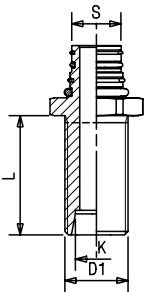
Article no.	S	D1	D2	L			
623 7043	P 5	M22x1,5	3/8NPTF	20	28	50	57
623 7036	P 5	M22x1,5	M16x1,5	24	28	50	75

GB: Plug-in P5, with 24° cone for bulkhead

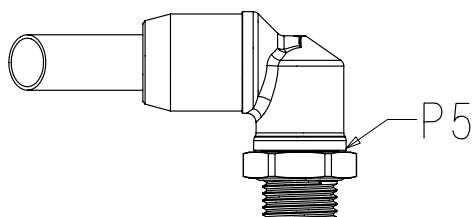
DE: P5 Anschluß-Stutzen, mit Schottstutzen und 24°-Konus

FR: Embase P5, passe-cloison avec cône 24°

IT: Innesto girevole P5, con passaparete e cono 24°



Article no.	S	D1	K	L			
623 7037	P 5	M18x1,5	K24°-12	24	28	60	75

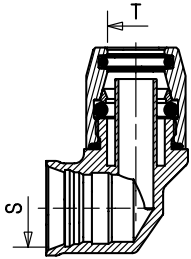


GB: Please refer to assembly instructions on page 70/71 for limitations of use.  
FR: Veuillez faire attention aux instructions de montage sur les pages 70/71.  
DE: Bitte beachten Sie die Montagehinweise auf Seite 70/71.  
IT: Leggere attentamente i consigli per il montaggio a pagg. 70/71.

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: 90° Push-in coupling**, for plug-in P5  
**DE: 90° Steckverbinder**, mit P5 Anschluß

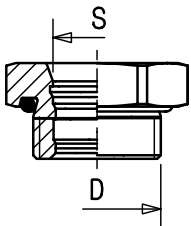
**FR: Coude prémonté 90°**, pour embase orientable P5  
**IT: Raccordo rapido a 90°**, per innesto girevole P5



Article no.	T	S					
623 6816	6x1	P 5				125	41
623 6826	8x1	P 5				100	53
623 6991	10x1	P 5				80	62
623 6814	10x1,25	P 5				70	62
623 6824	10x1,5	P 5				80	63
623 6836	12x1,5	P 5				75	68
623 6992	15x1,5	P 5				40	94
623 6993	15x2	P 5				40	89
623 6840	16x2	P 5				40	92

**GB: Connector**, for plug-in P5  
**DE: Verbinder**, für P5 Anschluß

**FR: Adaptateur**, pour embase P5  
**IT: Adattatore**, per innesto girevole P5



Article no.	S	D						
623 7057	P 5	M22x1,5				28	130	41

**GB: 45° Elbow**, for plug-in P5  
**DE: 45°-Bogen**, für P5 Anschluß

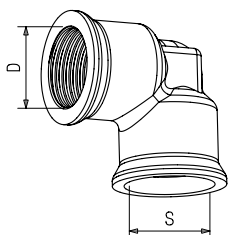
**FR: Coude 45°**, pour embase P5  
**IT: Gomito a 45°**, per innesto girevole P5



Article no.	S	D					
623 6832	P 5	M16x1,5				80	43

**GB: 90° Elbow**, for plug-in P5  
**DE: 90°-Bogen**, für P5 Anschluß

**FR: Coude 90°**, pour embase P5  
**IT: Gomito a 90°e**, per innesto girevole P5

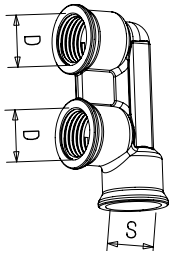


Article no.	S	D					
623 6803	P 5	M12x1,5				80	58
623 6833	P 5	M16x1,5				90	45

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: Union F**, for plug-in P5 2 x thread  
**DE: F-Stück**, mit P5 Anschluß

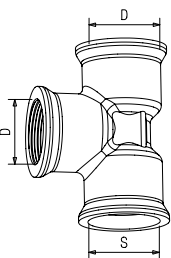
**FR: Coude F**, pour embase P5 avec 2 sorties taraudées  
**IT: Raccordo a F**, per innesto girevole P5 con 2 filettature



Article no.	S	D						
623 6845	P 5	M16x1,5						40 68

**GB: Union T**, for plug-in P5 2 x thread  
**DE: L-Stück**, mit P5 Anschluß

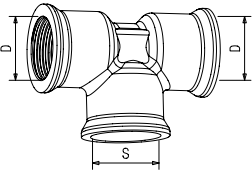
**FR: Raccod L**, pour embase orientable P5  
**IT: Raccordo a L**, per innesto girevole P5 con 2 filettature



Article no.	S	D						
623 6804	P 5	M12x1,5						50 86
623 6834	P 5	M16x1,5						50 61

**GB: Union T**, for plug-in P5 2 x thread  
**DE: T-Stück**, mit P5 Anschluß

**FR: Té**, pour embase orientable P5  
**IT: Raccordo a T**, per innesto girevole P5 con 2 filettature



Article no.	S	D						
623 6805	P 5	M12x1,5						50 86
623 6835	P 5	M16x1,5						50 62

**GB: 3-way block**, for plug-in P5 2 x thread  
**DE: 3-Wege Winkelblock**, mit P5 Anschluß

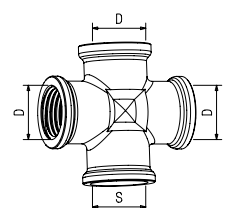
**FR: Raccord 3 voies**, pour embase orientable P5  
**IT: Raccordo a 3 vie**, per innesto girevole P5 con 2 filettature



Article no.	S	D						
623 6846	P 5	M16x1,5						50 66

**GB: 4-way cross block**, for plug-in P5 3 x thread  
**DE: Kreuzstück**, mit P5 Anschluß

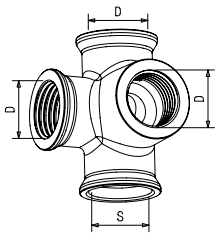
**FR: Croix**, pour embase orientable P5  
**IT: Raccordo a croce a 4 vie**, per innesto girevole P5 con 3 filettature



Article no.	S	D						
623 6838	P 5	M16x1,5						40 78

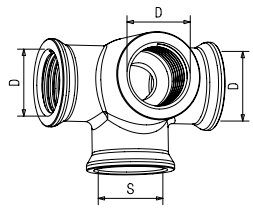
If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

**GB: 4-way block L**, for plug-in P5 3 x thread  
**DE: 4-Wege Block L-Form**, mit P5 Anschluß



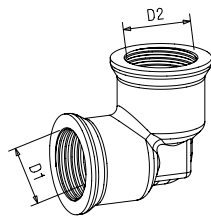
Article no.	S	D						
623 6839	P 5	M16x1,5						35 80

**GB: 4-way block T**, for plug-in P5 3 x thread  
**DE: 4-Wege Block T-Form**, mit P5 Anschluß



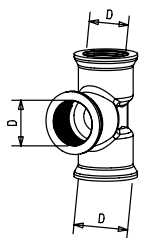
Article no.	S	D						
623 6837	P 5	M16x1,5						35 80

**GB: 90° Elbow**, 2 x thread  
**DE: 90°-Bogen**, 2 x Gewinde



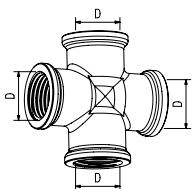
Article no.	D1	D2						
623 7823	M12x1,5	M12x1,5						100 47
623 7862	M16x1,5	M16x1,5						80 52
623 7865	M16x1,5	M18x1,5						70 58
623 7867	M22x1,5	M22x1,5						40 80

**GB: Union T**, 3 x thread  
**DE: T-Stück**, 3 x Gewinde



Article no.	D							
623 7825	M12x1,5							80 64
623 7864	M16x1,5							50 68
623 7868	M22x1,5							30 95

**GB: 4-way cross block**, 4 x thread  
**DE: Kreuzblock**, 4 x Gewinde



Article no.	D							
623 7828	M16x1,5							40 81

If the product you are looking for is not in this catalogue, please contact us for information on alternative solutions.

# RAUFOSS ABC™ MANIFOLD & MULTICONNECTORS

“Customer tailor made solutions”

Raufoss ABC™ system has opened a new way of thinking and building air couplings systems. Innovative initial products, advanced molding and assembly technology has opened several new and cost saving solutions. Standard ABC™ components in combination with customer cooperation have resulted in optimal total design.

## Features & Benefits:

- Fully ABC™ compatibility
- Poka-yoke based connection
- Customer specific marking of ports and Manifold fixation
- Different housing materials approved
- Flexible design
- Total cost saving
- Integrated sealing on demand
- Automation gives cost competitive solutions.
- Suited for fast assembly in assembly line

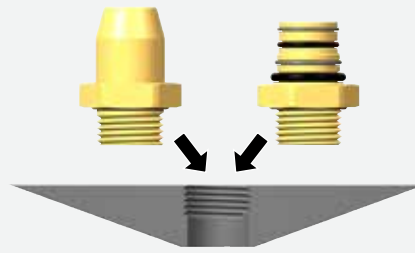


## Parallel thread

### Assembly information

## Rapides Métriques

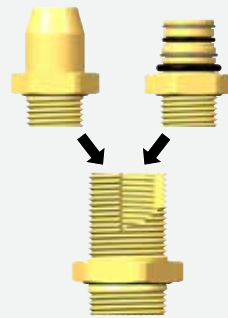
### Instructions de montage



The installation of the metric push-in couplings, plug-ins, locking nuts etc. shall be directly tightened into the thread (acc. DIN 3852, ISO 6149, ISO 4039-2, Voss) without any further preparation. The necessary torque values according to table 1a:

Les raccords rapides métriques, embases et contre écrous etc., sont vissés sans préparation, directement dans le taraudage récepteur (selon DIN 3852, ISO 6149, ISO 4039-2, Voss). Les couples de serrage sont indiqués dans le tableau ci-dessous :

	Thread Filetage	Recommended torque <sup>*)</sup> Couple de serrage recommandé <sup>*)</sup>	Max. torque <sup>**)</sup> Couple de serrage max <sup>**)</sup>
TABLE 1A	G 1/8"	15 Nm	18 Nm
	G 1/4"	24 Nm	28 Nm
	M10x1.0	15 Nm	18 Nm
	M12x1.5	20 Nm	24 Nm
	M14 x1.5	24 Nm	28 Nm
	M16x1.5	30 Nm	35 Nm
	M22x1.5	34 Nm	40 Nm
	M26x1.5	43 Nm	50 Nm



When using push-in couplings or plug-ins together with **Raufoss couplings™** bulkheads, the following reduced torque values (table 1b) are applicable:

Pour le montage de raccords rapides et d'embases orientables dans les passe-cloisons **Raufoss couplings™**, appliquer les couples de serrage réduits :

	Thread Filetage	Recommended torque <sup>*)</sup> Couple de serrage recommandé <sup>*)</sup>	Max. torque Couple de serrage max
TABLE 1B	M10x1.0	10 Nm	12 Nm
	M12x1.5	14 Nm	16 Nm
	M16x1.5	20 Nm	24 Nm

\* The recommended torques are based on threads without lubrication. The recommended torques apply to ports of aluminum, brass or steel. A "click type" torque spanner should be used.

\*\* Please refer to the max. torque of the valve, air reservoir etc.

\* Les couples de serrage recommandés sont basés sur des filetages non lubrifiés. Les couples de serrage recommandés s'appliquent aux taraudages en aluminium, en laiton ou en acier. Une clé à cliquet dynamométrique doit être utilisée.

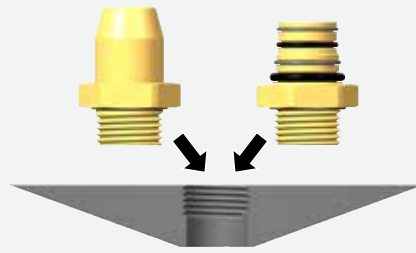
\*\* Veuillez également ne pas dépasser le couple de serrage maximum pour les valves, bouteilles d'air etc.

## Parallel Gewinde

### Montagehinweise

## Sistema Metrico

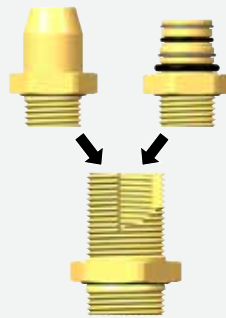
### Istruzioni di installazione



Die metrischen Steckverbinder P5 Anschlußstutzen, Kontermuttern etc. werden ohne weitere Vorbereitung direkt in die Aufnahmegehwinde (nach DIN 3852, ISO 6149, ISO 4039-2, Voss) geschraubt. Die Anzugsdrehmomente sind der Tabelle 1a zu entnehmen.

I raccordi metrici (ad innesto rapido, girevoli, controdadi etc.) vengono avvitati direttamente nelle filettature (a norma DIN 3852, ISO 6149, ISO 4039-2, Voss) e non richiedono operazioni preliminari. Le coppie di serraggio sono indicate nella tabella 1a:

	Gewinde Filettatura	Empfohlener Anzugsmoment <sup>*)</sup> Coppia di serraggio consigliata <sup>*)</sup>	Max. Anzugsdrehmoment <sup>**)</sup> Coppia di serraggio max <sup>**)</sup>	
TABELLE 1A	G 1/8"	15 Nm	18 Nm	TABELLA 1A
	G 1/4"	24 Nm	28 Nm	
	M10x1.0	15 Nm	18 Nm	
	M12x1.5	20 Nm	24 Nm	
	M14 x1.5	24 Nm	28 Nm	
	M16x1.5	30 Nm	35 Nm	
	M22x1.5	34 Nm	40 Nm	
	M26x1.5	43 Nm	50 Nm	



Bei Verwendung von Steckverbindern und P5 Schnellan schlußstutzen in **Raufoss couplings™** - Schottstutzen gelten die nachfolgend aufgeführten, reduzierten Drehmomente gemäß Tabelle 1b:

Per il montaggio di raccordi ad innesto rapido o girevoli su passaparete **Raufoss couplings™**, osservare le seguenti coppie di serraggio ridotte indicate in tabella 1b:

	Gewinde Filettatura	Empfohlener Anzugsmoment <sup>*)</sup> Coppia di serraggio consigliata <sup>*)</sup>	Max. Anzugsdrehmoment Coppia di serraggio max	
TABELLE 1B	M10x1.0	10 Nm	12 Nm	TABELLA 1B
	M12x1.5	14 Nm	16 Nm	
	M16x1.5	20 Nm	24 Nm	

\* Die empfohlenen Anzugsdrehmomente gelten für nicht vorbehandelte Gewinde. Die empfohlenen Anzugsdrehmomente gelten für Anschlüsse in Aluminium, Messing oder Stahl. Die Verwendung eines einstellbaren Drehmomentschlüssels wird empfohlen.

\*\* Bitte achten Sie auf das max. Anzugsdrehmoment des Ventils, Luftbehälters etc.

\* Le coppie consigliate si riferiscono a filettature senza lubrificazione. Le coppie consigliate si riferiscono a sedi in alluminio, ottone o acciaio. Raccomandiamo l'uso di una chiave dinamometrica.

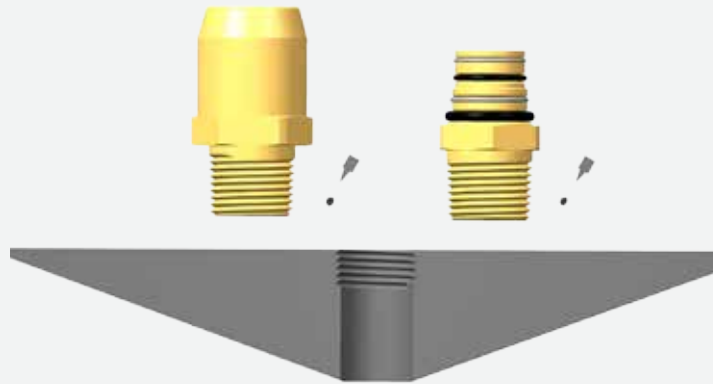
\*\* Considerare anche la coppia di serraggio massima prevista per il componente, serbatoio aria, valvola, etc.

## Conical thread

Assembly information

## Filetage Conique

Instructions de montage



For the installation of push-in couplings and plug-ins with “NPTF”- “R” thread, a dry seal has to be used before tightening. The following table 1c shows the recommended torque values:

Pour le montage de raccords rapides et d’embases orientables avec le filetage “NPTF”- “R”, il est nécessaire d’utiliser une pâte d’étanchéité avant de visser. Les couples de serrage sont indiqués dans le tableau ci-dessous :

Thread Filetage	Recommended torque *) Couple de serrage recommandé *)	Max. torque **) Couple de serrage max **)
1/8-27 NPTF	15 Nm	18 Nm
1/4-18 NPTF	24 Nm	28 Nm
3/8-18 NPTF	32 Nm	38 Nm
1/2-18 NPTF	36 Nm	42 Nm
R1/4"	24 Nm	28 Nm
R3/8"	32 Nm	38 Nm
R1/2"	36 Nm	42 Nm
R5/8"	43 Nm	50 Nm

\* The recommended torques are based on threads without lubrication. The recommended torques apply to ports of aluminum, brass or steel. A “click type” torque spanner should be used.

\*\* Please refer to the max. torque of the valve, air reservoir etc.

\* Les couples de serrage recommandés sont basés sur des filetages non lubrifiés. Les couples de serrage recommandés s’appliquent aux taraudages en aluminium, en laiton ou en acier. Une clé à cliquet dynamométrique doit être utilisée.

\*\* Veuillez également ne pas dépasser le couple de serrage maximum pour les valves, bouteilles d’air etc.

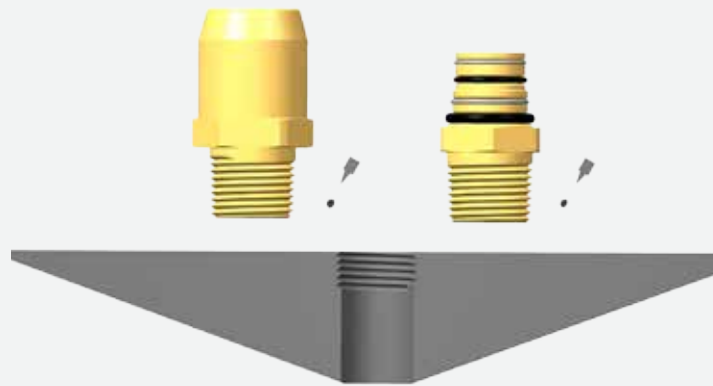


## Konisches Gewinde

Montagehinweise

## Filettature Coniche

Istruzioni di installazione



Die Steckverbinder und P5 Schnellanschlußstutzen mit "NPTF"- "R" Gewinde werden mit einem Dichtmittel versehen und in die Aufnahmegewinde geschraubt. Die Anzugsdrehmomente sind der Tabelle 1c zu entnehmen.

Per il montaggio di raccordi ad innesto rapido e girevoli in filettature del tipo "NPTF"- "R" apporre prima dell'avvitamento un sigillante a secco. I valori di coppia di serraggio da osservare sono riportati nella tabella 1c:

	Gewinde Filettatura	Empfohlener Anzugsmoment <sup>*)</sup> Coppia di serraggio consigliata <sup>*)</sup>	Max. Anzugsdrehmoment <sup>**)</sup> Coppia di serraggio max <sup>**)</sup>	
TABELLE 1C	1/8-27 NPTF	15 Nm	18 Nm	TABELLA 1C
	1/4-18 NPTF	24 Nm	28 Nm	
	3/8-18 NPTF	32 Nm	38 Nm	
	1/2-18 NPTF	36 Nm	42 Nm	
	R1/4"	24 Nm	28 Nm	
	R3/8"	32 Nm	38 Nm	
	R1/2"	36 Nm	42 Nm	
	R5/8"	43 Nm	50 Nm	

\* Die empfohlenen Anzugsdrehmomente gelten für nicht vorbehandelte Gewinde. Die empfohlenen Anzugsdrehmomente gelten für Anschlüsse in Aluminium, Messing oder Stahl. Die Verwendung eines einstellbaren Drehmomentschlüssels wird empfohlen.

\*\* Bitte achten Sie auf das max. Anzugsdrehmoment des Ventils, Luftbehälters etc.

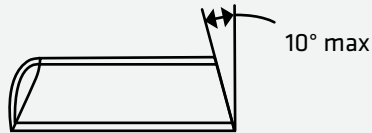
\* Le coppie consigliate si riferiscono a filettature senza lubrificazione. Le coppie consigliate si riferiscono a sedi in alluminio, ottone o acciaio. Raccomandiamo l'uso di una chiave dinamometrica.

\*\* Considerare anche la coppia di serraggio massima prevista per il componente, serbatoio aria, valvola, etc.

## Tube assembly

### Assembly information

The tube has to be cut with a tube cutter by 90°. A maximum deviation of 10° is allowed. The tube end must be free of marks, stickers etc.



The tube can be assembled in the push-in coupling by hand without using any tool. Tube assembly is simplified by pushing and turning the tube at the same time. Positioning is accomplished according to the Grip-then-seal principle:

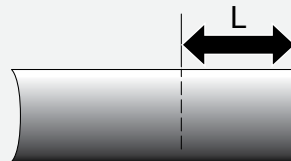
1. Grip: Passing the grip ring.
2. Seal: Passing the O-ring main seal. When the tube has passed the grip ring, no slip out of tube is possible. Before reaching the mechanical stop at the full push-in length, a small mechanical clip will be released, giving a distinct assembly feeling and securing correct assembly.

The maximum required tube push-in forces are shown in table approx 3. 2/3 of the given values is serial standard.

3. Pull back the tube by hand to secure the assembly  
Customer decision depending of the criticality level of the application.

A marking for visual control of the push-in length is optional; the Push-In length is mentioned in Table 3, In cases the tube is not pushed in correctly, only passing the grip ring (see above) a measurable controlled leakage will occur, and an audible whistle can be heard. Depending on the tube dimension it can be re-pushed under pressure and is then 100% sealed.

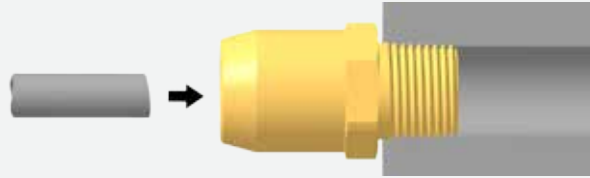
For connections between chassis and axle it is recommend using the tube size  $\leq 12 \times 1,5$ .



## Montage des tubes

### Instructions de montage

Couper le tube à angle droit, 90°. Un écart angulaire de 10° maximum est admissible. L'extrémité du tube doit être exempte de toute trace de détérioration, d'adhésifs, etc.



L'emmanchement du tube dans le raccord se fait manuellement sans avoir besoin d'un quelconque outil. Il est facilité si l'on pousse et tourne le tube en même temps. L'introduction se décompose en 2 phases distinctes :

- 1ère phase: Le passage de l'anneau de retenue du tube.
- 2ème phase: Le passage du dispositif d'étanchéité (joint) jusqu'en butée au fond du raccord qui déclenchera le signal sonore et tactile de parfait emmanchement. Quand le tube a passé l'anneau de retenue il ne peut pas être ressorti.

Les forces d'emmanchement maximum sont indiquées sur le tableau ci-dessous. En pratique l'effort nécessaire équivaut aux 2/3 de ces valeurs.

- 1ère phase: Tirez manuellement sur le tube pour s'assurer du bon emmanchement. La décision du client dépendra du niveau de criticité de l'application.

Pour un contrôle visuel de la longueur d'emmanchement, mentionnée sur le tableau 3, une marque peut être apposée sur le tube. Si le tube n'est pas emmanché correctement, cela provoquera une fuite qui sera détectable par un sifflement sonore. Selon la taille et l'accessibilité du tube celui-ci peut être repoussé jusqu'en butée pour une parfaite étanchéité.

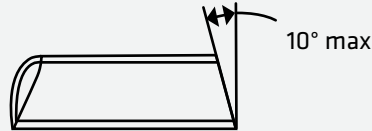
Il est recommandé d'utiliser un tube de 12x1.5 pour une connexion entre essieu et châssis.

	Ø External tube Ø Ext. du tube	Push- in length Longueur d'emmanchement	Max. push-in force Force Maximale	
TABLE 2	4 mm	17,2 mm	70 N	TABLEAU 2
	6 mm	19,5 mm	80 N	
	8 mm	20,5 mm	90 N	
	9 mm	22,1 mm	95 N	
	10 mm	24,0 mm	100 N	
	11 mm	23,0 mm	105 N	
	12 mm	25,0 mm	110 N	
	15 mm	27,0 mm	125 N	
	16 mm	27,0 mm	130 N	
	18 mm	27,0 mm	130 N	
	25 mm	29,0 mm	150 N	
	1/8"	19,5 mm	80 N	
	3/8"	23,5 mm	100 N	
	1/2"	25,5 mm	110 N	
5/8"	27,5 mm	130 N		

## Montage des Rohres

### Montagehinweise

Die Rohre werden rechtwinklig mit einem Rohrschneider abgeschnitten. Eine max. Abweichung von 10° ist zulässig. Das Rohrende muss frei sein von Beschädigungen, Aufklebern usw.



Die Rohre werden einfach von Hand, bis zum Anschlag in die Steckverbindung eingeschoben. Gleichzeitiges drücken und drehen erleichtern das Einstecken. Deutlich spürbar ist der Einschub in zwei Stufen:

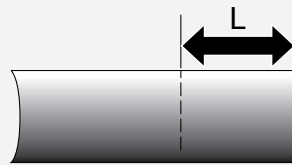
Stufe 1: Passieren des Klemmrings.

Stufe 2: Passieren des O-Rings und Erreichen des Steckendpunktes, Eindeutiges Montagegefühl beim Passieren des Klemmrings und durch Auslösen des "Feed Back Signals".

Stufe 3: Die maximale Einsteckkraft entnehmen sie bitte der Tabelle 3, der übliche Serienwert beträgt 2/3 dieser Kräfte.

Für eine visuelle Kontrolle kann die Einstecklänge gemäß Tabelle 3 auf den Rohren gekennzeichnet werden. Wenn das Rohr nicht korrekt gesteckt ist, tritt eine messbare, kontrollierte Leckage auf, ein Pfeifton zur Lokalisierung. In Abhängigkeit von Rohrabmessung kann es unter Druck nachgesteckt werden.

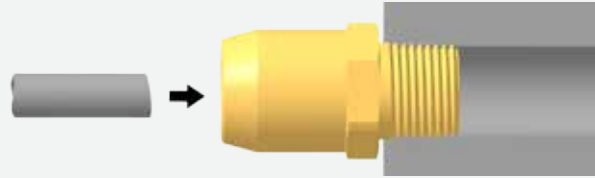
Für Verbindungen Rahmen – Achse ist die Verwendung von Rohrabmessungen  $\leq 12 \times 1,5$  empfohlen.



## Inserimento del tubo

### Istruzioni di installazione

Il tubo deve essere tagliato con una taglierina effettuando un taglio netto. E' tollerato uno scostamento max di 10°. L'estremità del tubo deve essere libera da marcatore, adesivi, ecc.



Il tubo può essere innestato a mano e senza l'ausilio di attrezzature. L'operazione di montaggio è più lineare se durante l'innesto si effettua con la mano anche una rotazione del tubo. Il fissaggio del tubo è garantito in quanto si esegue la tenuta meccanica prima di quella pneumatica:

1. Meccanica: il tubo supera il segmento di graffaggio in ottone.
2. Pneumatica: il tubo supera anche l'oring di tenuta

Quando il tubo ha superato il segmento di graffaggio in ottone, viene da questo trattenuto e non può più sfilarsi. Quindi superando l'oring si raggiunge anche la tenuta pneumatica. Quando il tubo ha superato i sistemi di tenuta prima meccanica, poi pneumatica, esso fa scattare un terzo meccanismo che genera un "clic!", segnale questo che è stata raggiunta la battuta al fondo della sede di innesto.

Le forze di innesto Max dei tubi sono illustrate nella tabella I valori standard corrispondono ai 2/3 dei valori Max.

3. Per verificare l'avvenuto aggancio, tirare SEMPRE il tubo prima di rilasciarlo. Operazione a discrezione del Cliente secondo il livello di sicurezza richiesto.

Per un controllo visivo dell'avvenuto montaggio del tubo, è possibile effettuare una marcatura come indicato sulla tabella 3. Qualora il tubo abbia passato solamente il segmento di tenuta meccanica (vedere Montaggio del tubo) non appena l'impianto viene messo in pressione, il raccordo ha una piccola perdita controllata udibile per un sibilo. Talvolta è possibile completare l'operazione di montaggio del tubo anche con l'impianto in pressione.

Per collegamenti tra telaio e ponte è consigliabile l'impiego di tubazioni  $\leq 12 \times 1,5$ .

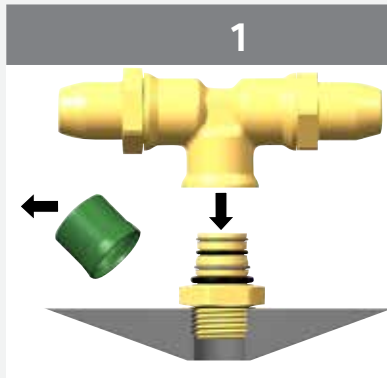
	Ø Rohr-Außen Ø Esterno tubo	Einstecklänge Lunghezza d'inserimento	Max. Einsteckkraft Forza massima d'inserimento
TABELLE 2	4 mm	17,2 mm	70 N
	6 mm	19,5 mm	80 N
	8 mm	20,5 mm	90 N
	9 mm	22,1 mm	95 N
	10 mm	24,0 mm	100 N
	11 mm	23,0 mm	105 N
	12 mm	25,0 mm	110 N
	15 mm	27,0 mm	125 N
	16 mm	27,0 mm	130 N
	18 mm	27,0 mm	130 N
	25 mm	29,0 mm	150 N
	1/8"	19,5 mm	80 N
	3/8"	23,5 mm	100 N
	1/2"	25,5 mm	110 N
	5/8"	27,5 mm	130 N

TABELLA 2

## Plug-in system P5 assembly

### Assembly information

The P5 system cannot, and must not be used with similar systems produced by other manufacturers.



The connection plug-in and building-block form a perfect junction, which can be turned for positioning.

The installation of both parts is performed manually.

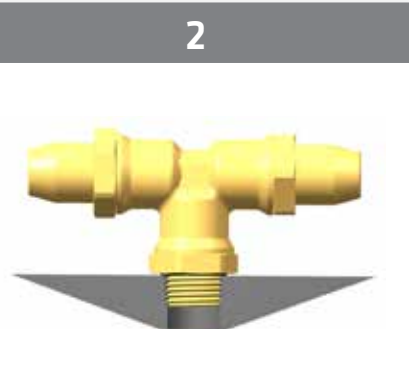
The thread of the plug-in shall be tightened with the necessary torque. The protective cap should be left in place, and only removed when installing the mating part.

When reaching the first position only, a controlled leakage will be discharged, which is slightly audible. By completing the assembly the connection is 100% tight and secure.

## Montage des embases filetées P5

### Instructions de montage

Le système P5 permettant l'accouplement de pièces de forme avec des embases filetées fait appel à une technologie élaborée différente de celles qu'on peut trouver dans d'autres gammes ayant pu s'en inspirer.



Le groupe Kongsberg Automotive décline donc toute responsabilité dans le cas où il serait fait usage d'un composant P5 (corps ou embase) avec des pièces en provenance d'autres marques.

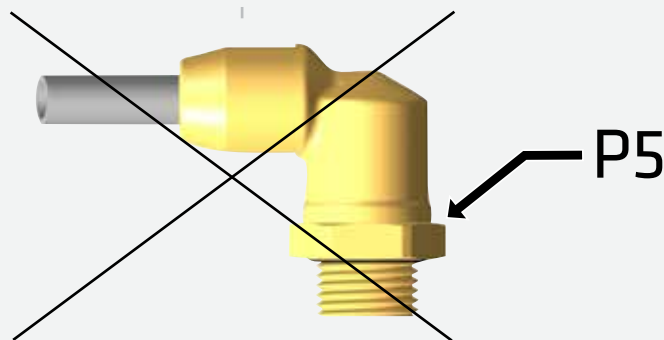
Par ailleurs l'attention de l'utilisateur est attirée sur le fait que si le système d'embases a pour but :

- de permettre le montage et le démontage aisé des raccords (coudes - tés - croix , etc.)

- ainsi qu'un parfait positionnement lors de leur installation, il ne s'agit pas pour autant de raccords tournants, mais uniquement orientables.

## Between frame and axle

### Assembly information



### WARNING

The P5 connection may not be used for the following applications

- Part of connection between the prime mover and the trailer (e.g brake hose/air brake coils)
- Between axle and chassis (e.g brake hose)

## Entre châssis et essieux

### Instructions de montage

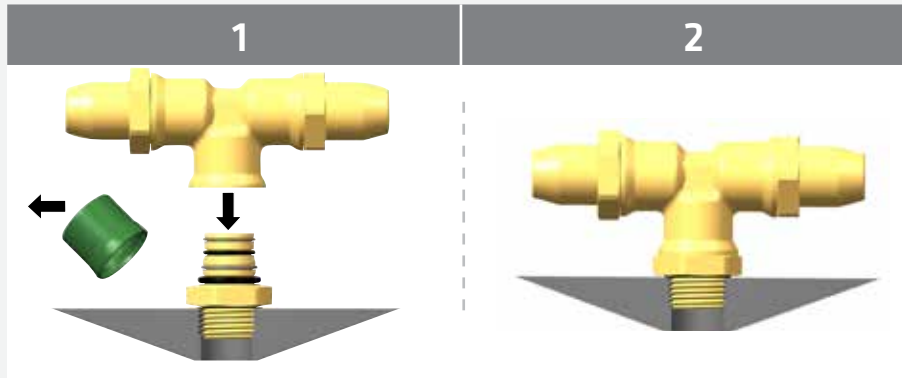
### ATTENTION

- Le système d'embases P5 ne devra donc jamais être utilisé notamment sur des tubes reliant des organes suspendus (châssis) à des organes non suspendus (essieux) ou entre tracteurs et remorques
- En cas de service exposant le raccord à des sollicitations par oscillation ou rotation, l'utilisation d'un raccord ayant un filetage faisant partie intégrante du corps s'avère indispensable

## Montage des P5-Systems

### Montagehinweise

Das P5-System darf nicht mit ähnlichen Systemen anderer Hersteller gemischt werden.



Die Verbindung Anschlußstutzen und Formteil bildet eine unlösbare Einheit, die nach der Montage zur Positionierung gedreht werden kann.

Beide Teile werden von Hand zusammengefügt.

Das Einschrauben des Stutzens erfolgt mit dem erforderlichen Drehmoment. Die Schutzkappe wird unmittelbar vor dem Aufsetzen des Gegenstücks entfernt.

Wenn lediglich die erste Verriegelungsstufe erreicht wird, tritt eine kontrollierte, leicht hörbare Leckage auf, die durch Nachdrücken der Verbindung problemlos behoben werden kann.

## Inserimento raccordo girevole P5

### Istruzioni di installazione

Non è possibile utilizzare il raccordo girevole P5 unitamente ad altri sistemi simili di marche e produttori diversi da Raufoss couplings.

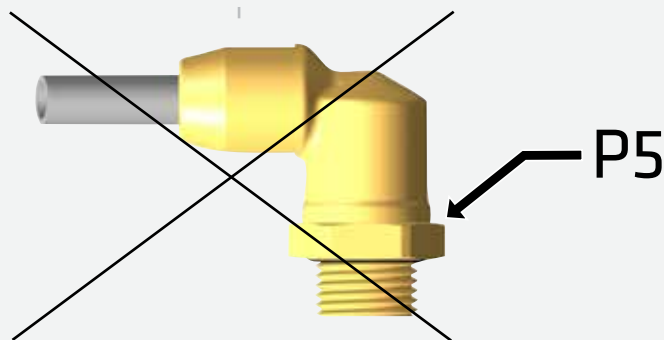
Il raccordo femmina ed il raccordo maschio formano un'unica unità girevole onde facilitarne il posizionamento. I due particolari vengono uniti manualmente.

Avvitare il raccordo filettato P5 rispettando la coppia prescritta. Rimuovere il tappo di protezione appena prima di inserire il raccordo femmina.

Con il primo scatto il raccordo è inserito in posizione di sicurezza, ma non completamente montato. In questa posizione, si verifica una leggera fuoriuscita di aria udibile dall'operatore. Con il secondo scatto si completa l'inserimento del raccordo che, in questa posizione garantisce la perfetta tenuta pneumatica.

## Zwischen Rahmen und Achse

### Montagehinweise



### ACHTUNG

Die P5 Verbindung darf nicht verwendet werden als

- Teil der Verbindung zwischen Motorwagen und Anhängerfahrzeug (z.B. Bremsschlauch/Wendelflex)
- Zwischen Achse und Fahrgestellrahmen

## Tra telaio e ponte

### Istruzioni di installazione

### ATTENZIONE

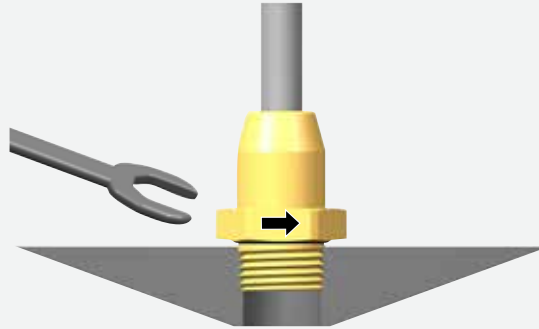
Il raccordo P5 non è idoneo per le seguenti applicazioni

- collegamento tra motrice (trattore) e rimorchio (ad esempio tubo flessibile freni e rotocamera)
- collegamento tra asse e telaio (esempio: tubi flessibili freni)
- collegamento di componenti con moto relativo tra loro

## Repair instructions

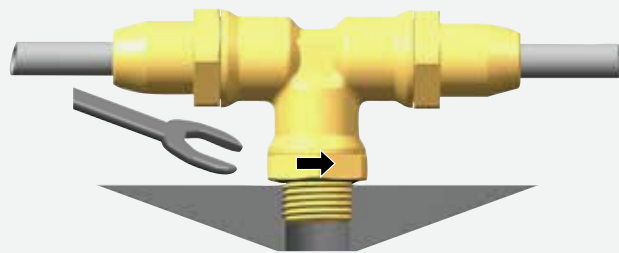
### Assembly information

When using the Raufoss couplings™, the exchange of valves, air reservoirs, air bellows etc. can be performed without any problem. The connection is disconnected together with the tubes.



- The push-in coupling is turning on the tube.

Before re-assembly, the o-ring on the thread sealing should be inspected and if necessary, replaced.



- The P5-plug-in turns on the building-block.

Before re-assembly, the o-ring on the thread sealing should be inspected and if necessary, replaced.

If you are forced to re-use push-in coupling, e.g. emergency repair, kindly proceed as follows:

- Cut the PA-tube approx. 1 cm ahead of the push-in coupling.
- Dismantle the coupling, using a pipe-wrench and a spanner.
- Carefully push the tube through the nut.
- Re-assemble.
- Push the new PA-tube into the coupling.

## Instructions de réparation

### Instructions de montage

Avec le système Raufoss couplings™, le remplacement de valves, de réservoirs ou de tout autre composant peut être effectué très facilement. Le raccord peut être dévissé et revissé sans en extraire le tube.

- Le raccord rapide est en libre rotation sur le tube.

Avant le remontage, il est nécessaire de contrôler et éventuellement de remplacer le joint torique se situant sur la partie filetée du raccord.

- L'embase P5 pivote sur le plan de montage.

Avant le remontage, il est nécessaire de contrôler et éventuellement de remplacer le joint torique se situant sur la partie filetée du raccord.

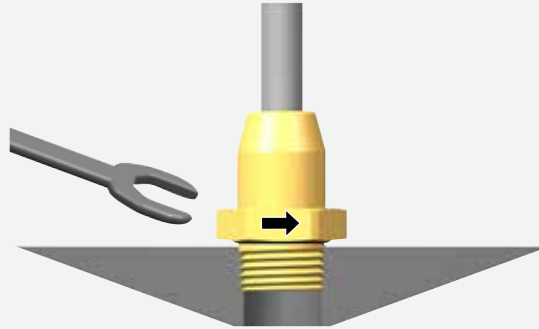
En cas de réutilisation forcée, ex. réparation d'urgence, veuillez respecter scrupuleusement la procédure suivante :

- Couper le tube PA à environ 1 cm du raccord. Démontez le raccord à l'aide d'une clé à griffes et d'une clé plate.
- Retirez prudemment le tube de l'écrou.
- Remontez le raccord en veillant à respecter le bon couple de serrage.
- Insérez de nouveau le tube dans le raccord.

## Reparaturhinweise

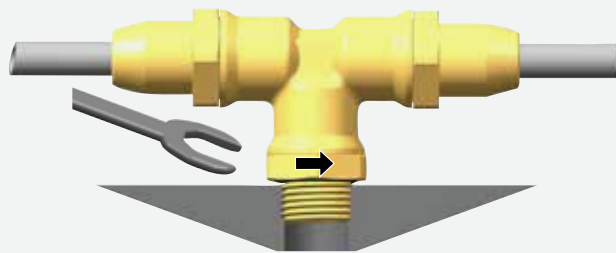
### Montagehinweise

Bei Verwendung des Raufoss couplings™ System, ist der Austausch von Ventilen, Luftbehältern, Luftfederbälgen problemlos möglich. Im Gegensatz zu den Schneidring - Verschraubung werden bei dem Raufoss couplings die Verschraubungen mit dem Rohr zusammen aus dem Anschluß geschraubt.



- Der Steckverbinder dreht sich auf den Rohr.

Bitte überprüfen Sie vor der Montage den Sitz des o-Ringes an der Gewindedichtung und tauschen Sie ihn gegebenenfalls aus.



- Der P5 Stutzen dreht sich in dem Formteil.

Bitte überprüfen Sie vor der Montage den Sitz des O-Ringes an der Gewindedichtung und tauschen Sie ihn gegebenenfalls aus.

Sind Sie z.B. bei einer Notreparatur gezwungen, den Steckverbinder wiederzuverwenden, so gehen Sie wie folgt vor:

- Schneiden Sie das PA-Rohr 1 cm vor dem Steckverbinder ab.
- Schrauben Sie mit Rohrzanze und Maulschlüssel den Steckverbinder auseinander.
- Schieben Sie das Rohr vorsichtig nach vorne durch die Mutter.
- Schrauben Sie beide Teile wieder mit dem gleichen Drehmoment zusammen.
- Schieben Sie ein neues PA-Rohr ein.

## Istruzioni per l'assistenza

### Istruzioni di installazione

Utilizzando il sistema di raccordi Raufoss couplings™, la sostituzione di valvole, serbatoi per l'aria, sospensioni ad aria e similari, risulta essere molto semplice. Il raccordo si può svitare unitamente al tubo che ruota all'interno del raccordo stesso.

- Raccordo ad innesto rapido e tubo.

Prima di riavvitare nuovamente il raccordo, controllare che l'o-ring sia posizionato bene, garantendone così la tenuta. In caso contrario sostituirlo.

- L'innesto P5 ruota nel raccordo multiplo.

Prima di riavvitare nuovamente il raccordo, controllare che l'o-ring sia posizionato bene, garantendone così la tenuta. In caso contrario sostituirlo.

Qualora si rendesse necessario il riutilizzo del raccordo, per esempio in caso di un intervento d'emergenza, procedere come segue:

- Tagliare il tubo plastico ad una distanza dal raccordo di ca. 1 cm.
- Svitare il corpo del raccordo dall'esagono con l'ausilio di una pinza ed una chiave inglese.
- Estrarre il tubo spingendo l'estremità che fuoriesce dal raccordo.
- Riavvitare il corpo del raccordo sull'esagono con la corretta coppia di serraggio.
- Inserire nel raccordo il tubo plastico.





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623 7695	29	623 7904	32	901 08 060	14	920 60 015	20	962 10 006	23
623 7696	28	623 7905	36	901 08 070	14	920 60 025	21	962 10 008	23
623 7697	27	623 7906	36	901 10 012	14	920 60 045	19	962 10 010	23
623 7714	32	623 7907	36	901 10 014	14	920 60 060	20	962 10 012	23
623 7721	27	623 7908	36	901 10 016	14	920 60 061	21	962 10 015	23
623 7722	27	623 7911	36	901 10 022	14	920 60 070	21	962 10 016	23
623 7723	27	623 7912	36	901 10 112	14	920 60 090	19	962 40 000	23
623 7726	27	623 7913	36	901 10 116	14	931 40 010	16	962 50 000	23
623 7727	27	623 7914	36	901 10 122	14	931 40 012	16	962 60 000	23
623 7728	27	623 7915	36	901 10 212	14	931 40 014	16	964 42 016	18
623 7729	27	623 7926	36	901 10 216	14	931 40 016	16	964 42 018	18
623 7730	27	623 7927	36	901 10 222	14	931 40 049	16	964 42 022	18
623 7731	27	623 7928	31	901 12 012	14	931 40 050	16	964 50 020	18
623 7732	29	623 7960	30	901 12 016	14	931 40 051	16	964 50 022	18
623 7733	27	623 7962	30	901 12 022	14	931 40 069	16	964 52 018	18
623 7735	27	623 7980	31	901 12 061	14	931 41 016	16	964 52 028	18
623 7741	34	623 7981	31	901 14 022	14	931 50 010	16	964 60 022	18
623 7742	33	623 7982	31	901 15 016	14	931 50 012	16	964 60 028	18
623 7743	34	623 7994	36	901 15 022	14	931 50 014	16	964 60 028	18
623 7744	34	623 7995	36	901 16 016	14	931 50 016	16	965 40 004	23
623 7745	33	623 7996	36	901 16 022	14	931 50 022	16	965 40 005	23
623 7746	33	623 7997	36	902 04 004	18	931 50 049	16	965 50 005	23
623 7747	33	623 7999	28	902 04 005	18	931 50 050	16	965 50 006	23
623 7748	33	623 8873	29	902 06 004	18	931 50 051	16	966 00 006	23
623 7749	33	623 8883	29	902 06 005	18	931 50 052	16	966 06 010	24
623 7751	33	623 8992	37	902 08 004	18	931 50 060	16	966 06 020	24
623 7752	36	623 8993	37	902 08 005	18	931 50 061	16	966 08 010	24
623 7753	33	623 9102	32	902 10 005	18	931 50 110	22	966 08 020	24
623 7775	33	623 9104	32	902 10 105	18	931 50 112	22	966 10 010	24
623 7776	35	623 9109	33	902 10 205	18	931 50 114	22	966 10 020	24
623 7777	35	623 9110	33	902 12 005	18	931 50 116	22	966 12 020	24
623 7778	33	623 9111	29	902 12 006	18	931 50 122	22	966 12 710	24
623 7781	33	623 9113	29	902 14 006	18	931 50 149	22	966 14 010	24
623 7782	33	623 9116	27	902 15 006	18	931 50 150	22	966 15 010	24
623 7783	33	623 9130	32	902 16 006	18	931 50 160	22	966 15 020	24
623 7784	33	623 9131	32	903 06 004	19	931 51 014	16	966 16 010	24
623 7785	33	623 9132	32	903 06 005	19	931 52 412	22	967 06 000	23
623 7786	33	623 9134	33	903 08 004	19	931 59 014	16	967 08 000	23
623 7787	36	623 9135	33	903 08 005	19	931 60 016	16	967 10 000	23
623 7788	36	623 9136	33	903 10 005	19	931 60 022	16	967 12 000	23
623 7798	33	623 9137	33	903 10 105	19	931 60 026	16	967 15 000	23
623 7799	29	623 9138	33	903 10 205	19	931 60 051	16	967 16 000	23
623 7807	30	623 9139	38	903 12 205	19	931 60 052	16		
623 7808	30	623 9140	38	903 15 006	19	933 51 218	17		
623 7809	30	623 9141	38	903 16 006	19	933 51 622	17		
623 7813	30	623 9142	38	905 06 006	15	933 52 205	17		
623 7823	68	623 9143	38	905 08 008	15	933 52 216	17		
623 7825	68	623 9144	35	905 12 012	15	933 52 217	17		
623 7828	68	623 9149	38	909 12 016	15	933 52 222	17		
623 7829	31	623 9736	28	909 12 022	15	933 52 416	17		



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