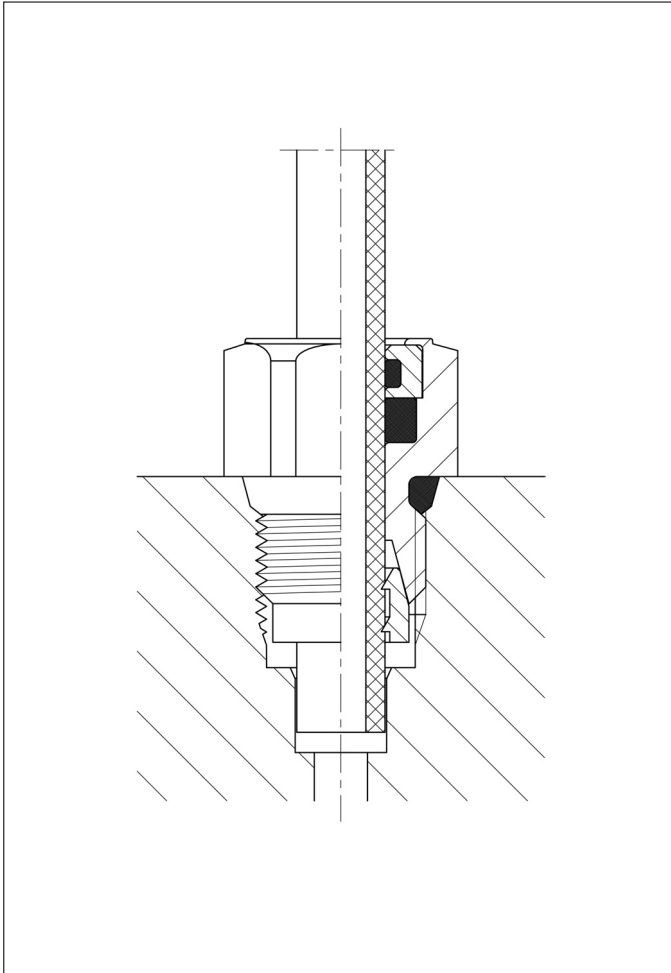


## B 203 Assembly instructions



These assembly instructions are intended for qualified fitters for auxiliary pneumatic systems, fuel systems, central lubrication systems and air suspensions (motor cars) in vehicles.

### 1. Introduction

Nylon tube lines are in general use today in compressed air systems, fuel systems, central lubrication systems and air suspension systems.

Nylon tubes are insensitive to corrosion, vibration and torsional stress in vehicle bodywork.

The following factors are essential for their functional reliability:

- Correct material and proper handling
- Appropriate connection fittings
- Correct assembly

As a connecting element between nylon tubing and components, the VOSS quick connect system 203 permits rapid and safe connection.

### 2. Nylon tubing

The properties of nylon tubing and details of its use in commercial vehicles are defined in the following standards:

DIN 73 378

Polyamide tubing for motor vehicles

DIN 74 324, Part 1

Air braking systems - thermoplastic tubing; part 1: requirements and tests

DIN 74 324, Part 2

Air braking systems - thermoplastic tubing; part 2: guide for assembling

Only nylon tubing which conforms to DIN 73378 or DIN 74324 part 1 and made of polyamide 11 or polyamide 12 may be used.

### 3. VOSS quick connect system 203

Tube	Nominal size	Thread sizes of assemblies
4 x 1	4	M 8 x 1
6 x 1	6	M 10 x 1
System components for other tube dimensions e.g. 8x1, 10x1, 12x1.5 etc. on request		

Table 1

The VOSS quick connect system 203 permits rapid assembling of nylon tubing to aggregates made of various materials, without the need of any tube reinforcement.

The only tool required for disconnection is a wrench (opening width see table 3 in Section 4.2).

The system components are mainly made of brass and are available for the following tube dimensions (see table 1).

#### 3.1 Range of application

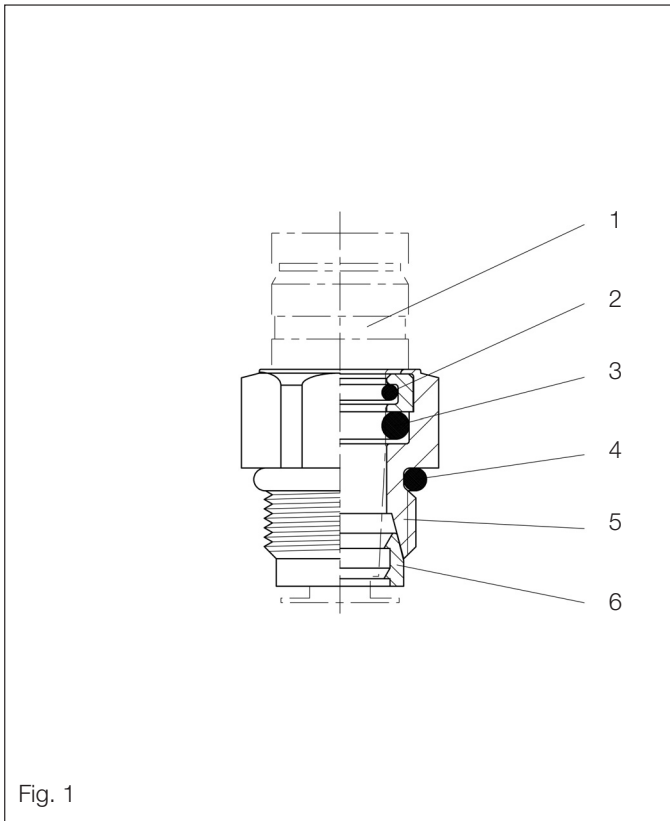
The range of application depends to a great extent on the operating pressure, the thermal range of application and the working medium.

This determines the type of sealing, adjusted to match the operating conditions. (see table 2)

Table 2

Nominal Size NS	Thermal Application		Medium				Sealing material						Colour Identification assy
							Thread seal → G		Tube seal → R				
	-40°C to 125°C	-40°C to 100°C	Com-pressed air	Fuel acc. to EN228 EN590 EN14214	Hydr. oil	70NBR		60FPM		70EPDM			
					G	R	G	R	G	R			
4 and 6		•	•			•	•					None	
		•		•				•	•			Brown	
	•		•							•	•	Red	
		•	•			•					•	Violet	
		•			•	•	•					Green	

Applications for other tube qualities, media, temperatures and pressures on request.



## 3.2 System elements

### 3.2.1 The integral variant of the VOSS quick connection 203

With the integral variant a so-called assy is preassembled into a system specific profiled bore.

- a.) The assy mainly consists of the components male tube fitting (Pos. 5) and grip ring (Pos. 6). Together with the PE assembly plug (Pos. 1) these two parts form an assy that can then be directly screwed into an aggregate. Upon completion of the installation the assembly plug is removed before inserting the tube.
- b.) As a prerequisite for the use of the assy the connecting bore in the aggregate must be designed as a profiled bore (see section 3.2.2).

The integral version features a low construction height and is particularly suitable for direct connection of tubes to valves, distributors and aggregates.

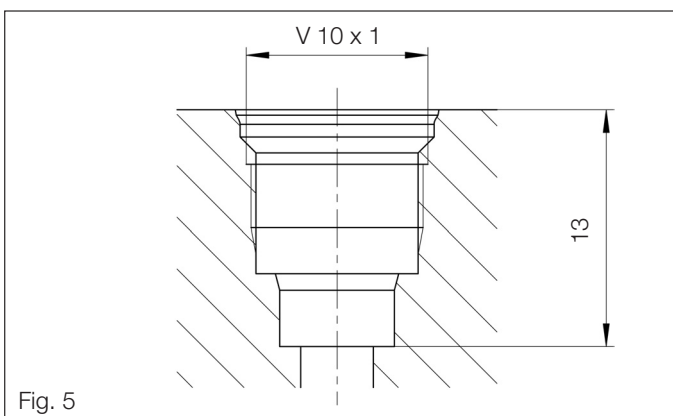
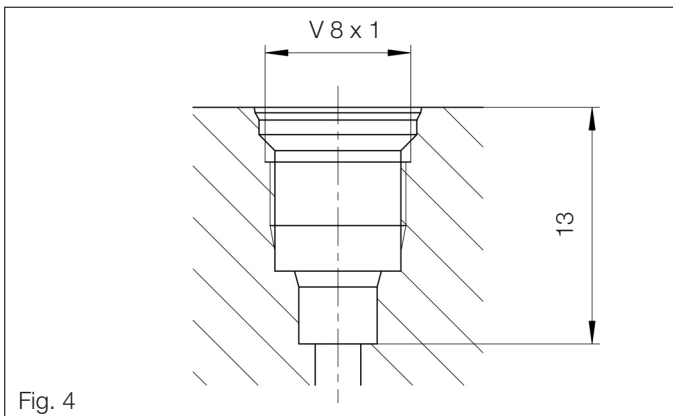
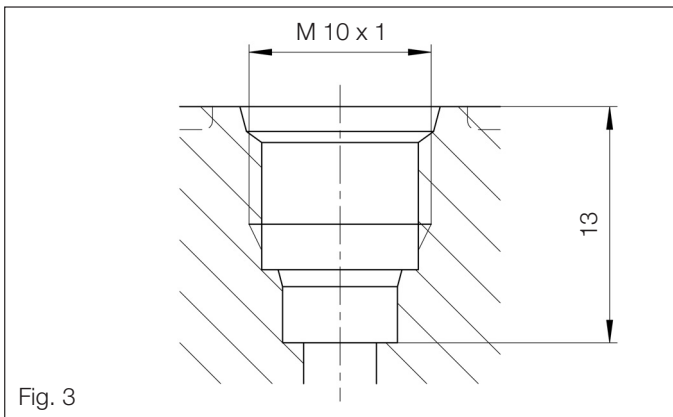
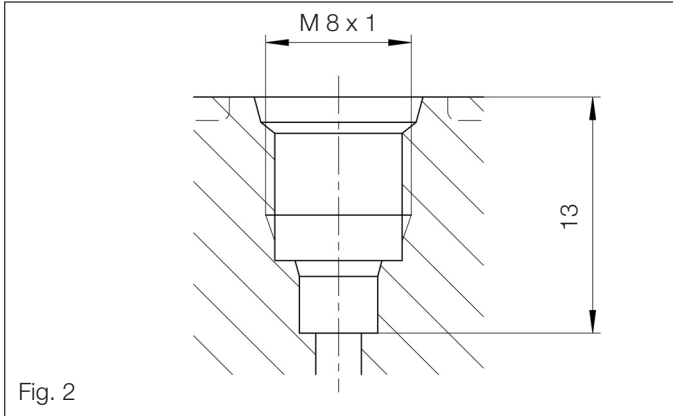
The assy (Fig. 1) consists of the following individual parts.

1. Assembly plug
2. Dirt-protection O-ring\*
3. Sealing O-ring\*
4. Thread-sealing O-ring\*
5. Male tube fitting, brass
6. Grip ring, brass

\* Material is dependent on temperature and medium.

### 3.2.1.1 Functional description

The grip ring (Pos.6) in the assy has two circumferential retaining edges inside, which engage in the nylon tube after it has been plugged in. The tube is sealed by the well established 2 O-ring principle of VOSS. The O-ring (Pos.3) seals against the medium, the O-ring (Pos.2) prevents dirt and contaminants from entering.



### 3.2.2 Profiled bore VOSS quick con- nection 203

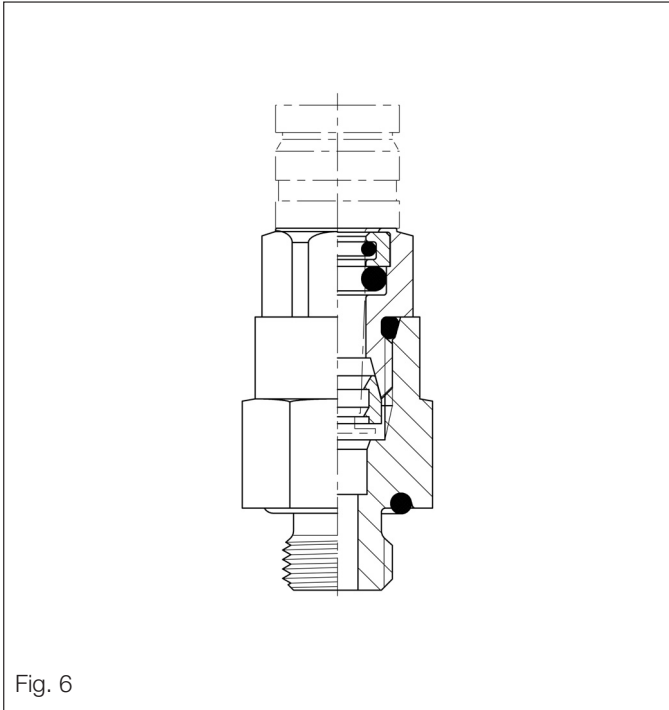
Today the system specific profiled bore is standard in automobile engineering and with its overall contour covers the following functions of the VOSS quick connection 203 :

- optimal sealing of thread
- reliable space for the grip ring
- stop for the nylon tube

The profiled bore is available in two different designs, especially adapted to the conditions of the manufacturing process and the functional requirement.

Version for metal housing for mechanical manufacturing by lathe turning or form drilling (Fig. 2+3). Version for nylon housing made of material PA66GF35 or PBT GF30 with a specially developed V-thread (optimized to maintain the initial tensile force over a long time) for injection moulding (Fig. 4+5).

On request we would gladly provide you with comprehensive design regulations for the profiled bore and assist you in selecting the required tools.



### 3.2.3 The stud variant quick connection 203

The stud variant of quick connection 203 consists of a threaded socket with screw-in journal for connection to all aggregates with tapped bores acc. to DIN 3852 (see Fig. 6).

The stud variant is delivered completely assembled with the assy and consists of the following individual parts:

1. Assy acc. to section 3.2.1
2. Stud
3. O-ring for sealing of socket thread

Fig. 7 shows an example for a direction adjustable stud variant, which can be delivered completely with hexagon nut and O-ring on request. Other stud forms, manifolds, etc. can be found in our catalogue or are available on request.

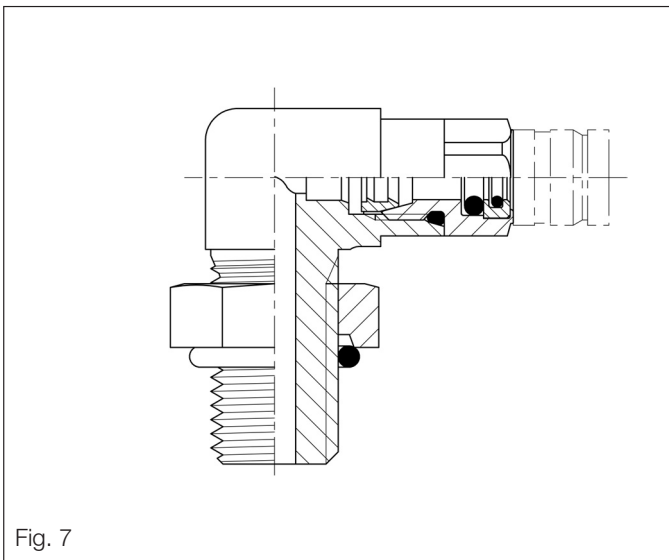




Fig. 8

## 4. Installation instructions

### 4.1 Cutting nylon tubing to length

The nylon tube must be cut off square. A saw may not be used for this purpose as the possible formation of burrs will jeopardise the sealing capability of connection. For cutting nylon tubing to the correct length, we recommend the use of the VOSS cutting pliers (Fig. 8), which ensure that the tubing is cut squarely and cleanly. Subsequent treatment of the cut surface such as deburring is no longer necessary then.

The surface of the nylon tube must be free of damage and clean over the entire plugin length.

### 4.2 Assembly of the assy

To ensure functional reliability the connecting bore must be thoroughly cleaned before assembly. Sticking paint residues in the areas of sealing chamfer and front face must be removed in particular. Apart from this the right angle of the thread to the contact face for the assy must also be assured.

The assy is then screwed into the corresponding profiled bore and tightened by means of a torque wrench. The assembly plug must not be removed from the assy before the specified torque has been reached. Tightening torques for the corresponding sizes and material combinations can be taken from the following table.

Table 3

Tightening torques in metal materials with a minimum tensile strength of 220 N/mm <sup>2</sup>			
Thread sizes	Nominal size NS	Across flats SW	Tightening torque Nm
M8x1	4	10	5+1Nm
M10x1	6	12	5+1Nm
Tightening torques in nylon materials PA66GF35 and PBT GF30 with V-thread			
Thread sizes	Nominal size NS	Across flats SW	Tightening torque Nm
V8x1	4	10	2+0.5Nm
V10x1	6	12	3+1Nm

Conventional sockets do not fit over the assembly plug

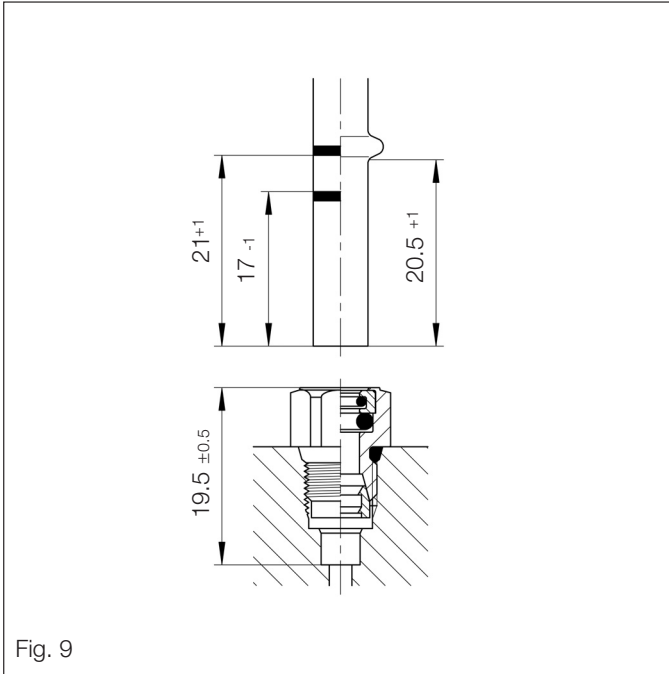


Fig. 9

When screwing in make sure that the grip rings are not sitting on the threads and that the first two thread pitches are screwed centrally into the bores without applying pressure.

→ Turn in at least 2 revolutions by hand!

### 4.3 Removing the assembly plug

The assembly plug must be pulled straight out of the bore.

### 4.4 Fitting of nylon tube into the assy

Mind the plug-in depth when plugging the nylon tube into the assy.

For plug-in depth, marking and bead on tube see Fig. 9. The engagement of the retaining edges of the grip ring in the PA tube must be assured. Pull the tube back to test.

### 4.5 Disconnecting and reassembly

#### 4.5.1 Replacing an aggregate or a connection

Before loosening the connection the connected tube must be depressurized. The assy is unscrewed from the aggregate or the connection. Male tube fitting and grip ring remain on the nylon tube. Before re-assembly the individual parts should be cleaned, as required, (see section 4.2).

For reassembly the assy with tube is screwed into the connecting element or the aggregate and tightened with the specified tightening torque (see section 4.2).

#### 4.5.2 Replacing a defective system line

The assy with tube is unscrewed from the aggregate or connection. The defective system tube is completely replaced with male tube fitting and grip ring. A new assy is screwed into the aggregate or connection as specified in 4.2 and the new system line is plugged in as described in 4.4.

When replacing unplugged assies it must be assured that the loose grip ring is removed from the profiled bore.

### 4.6 Leak test

The necessary leak or function test for the aggregate must be carried out by using a male gauge as specified in the schematic diagram (Fig. 10). On request we will gladly supply you with a implementing regulations for male gauges.

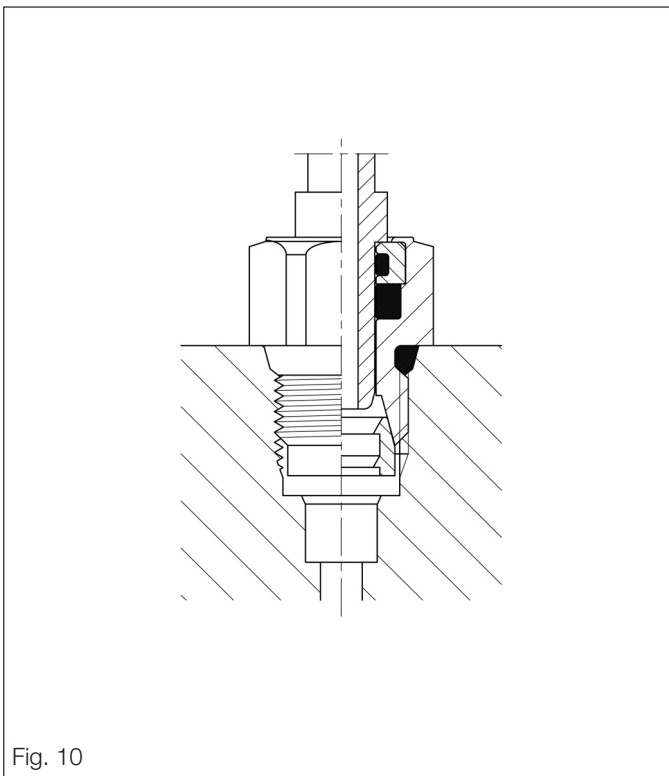


Fig. 10

# VOSS

VOSS Automotive GmbH  
P.O.Box 15 40  
D-51679 Wipperfürth

Leiersmühle 2-6  
D-51688 Wipperfürth

Phone: +49 2267 63-0  
Fax: +49 2267 63-5982

E-Mail: [automotive@voss.de](mailto:automotive@voss.de)  
Internet: [www.voss.de](http://www.voss.de)