



Brzdové systémy

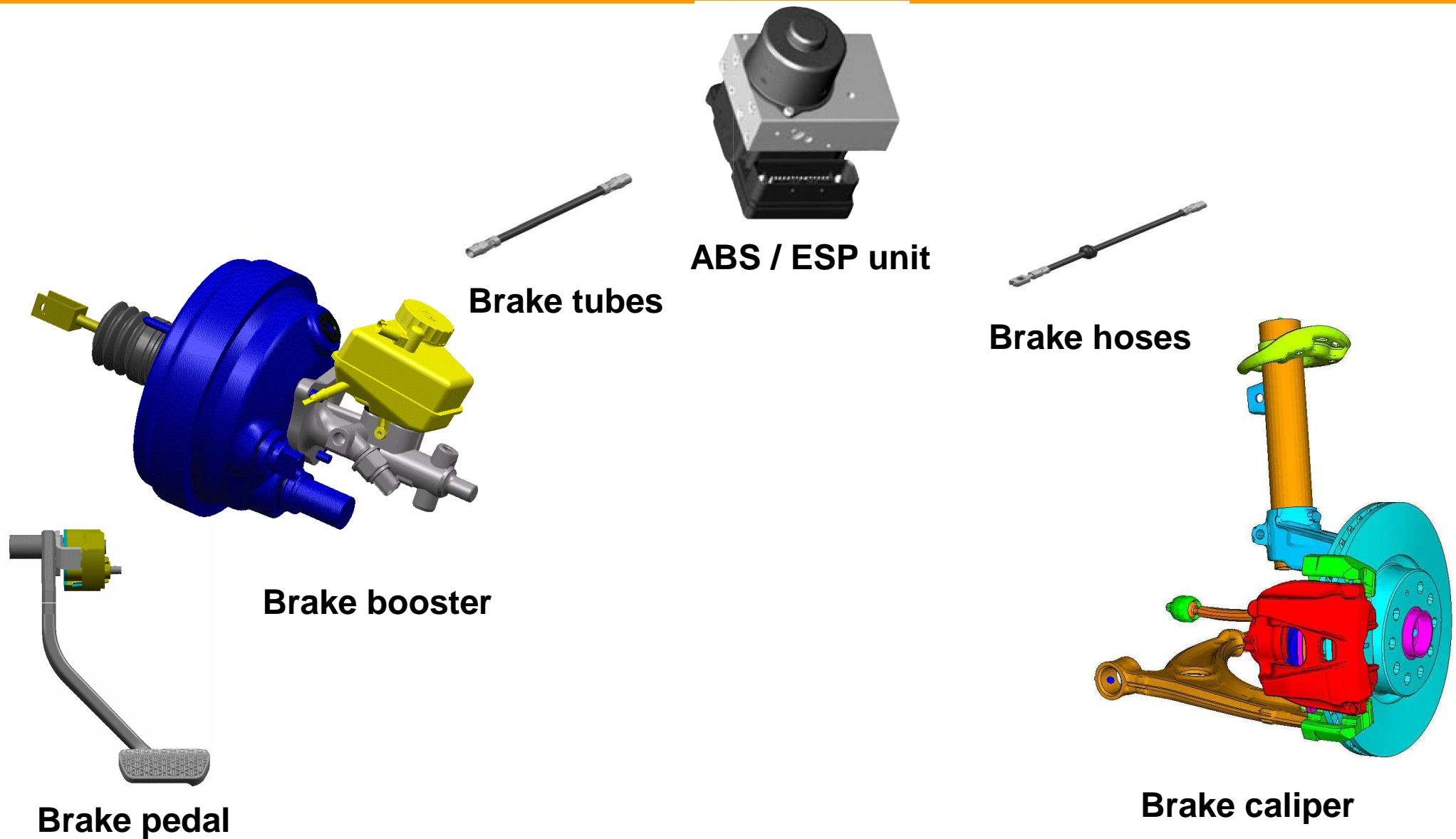
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Brzdový posilovač silničních vozidel

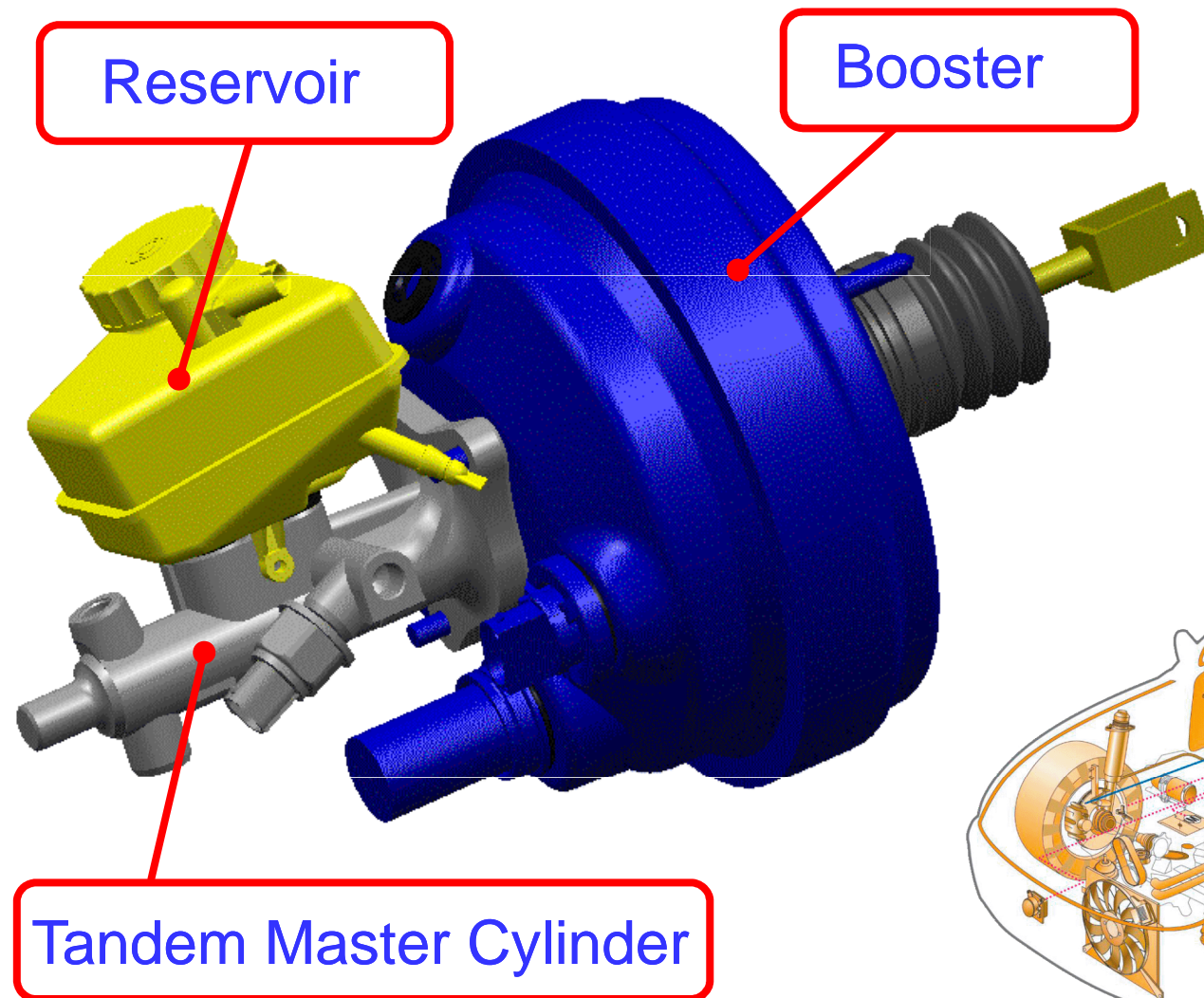
Ing. Petr Kašpar, DiS.

# Brake system – general overview

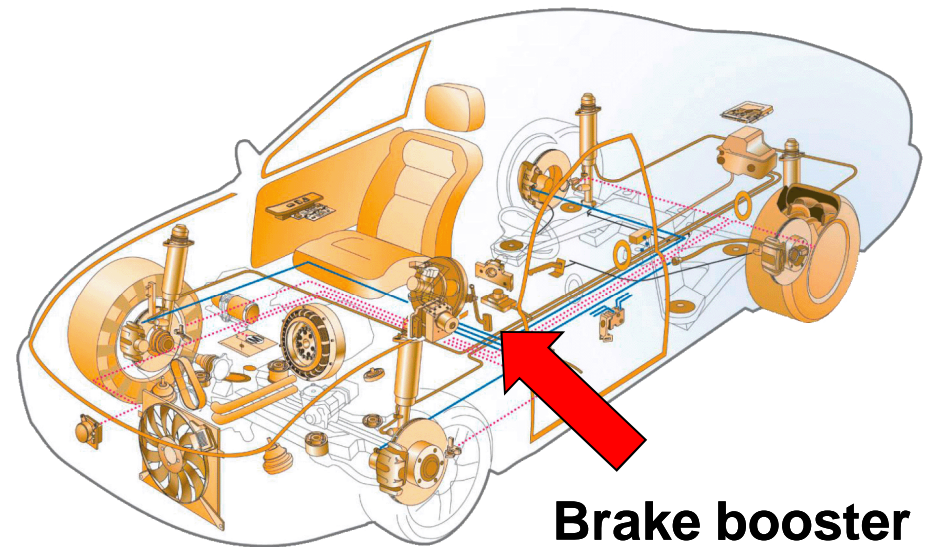
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# VACUUM BRAKE BOOSTER

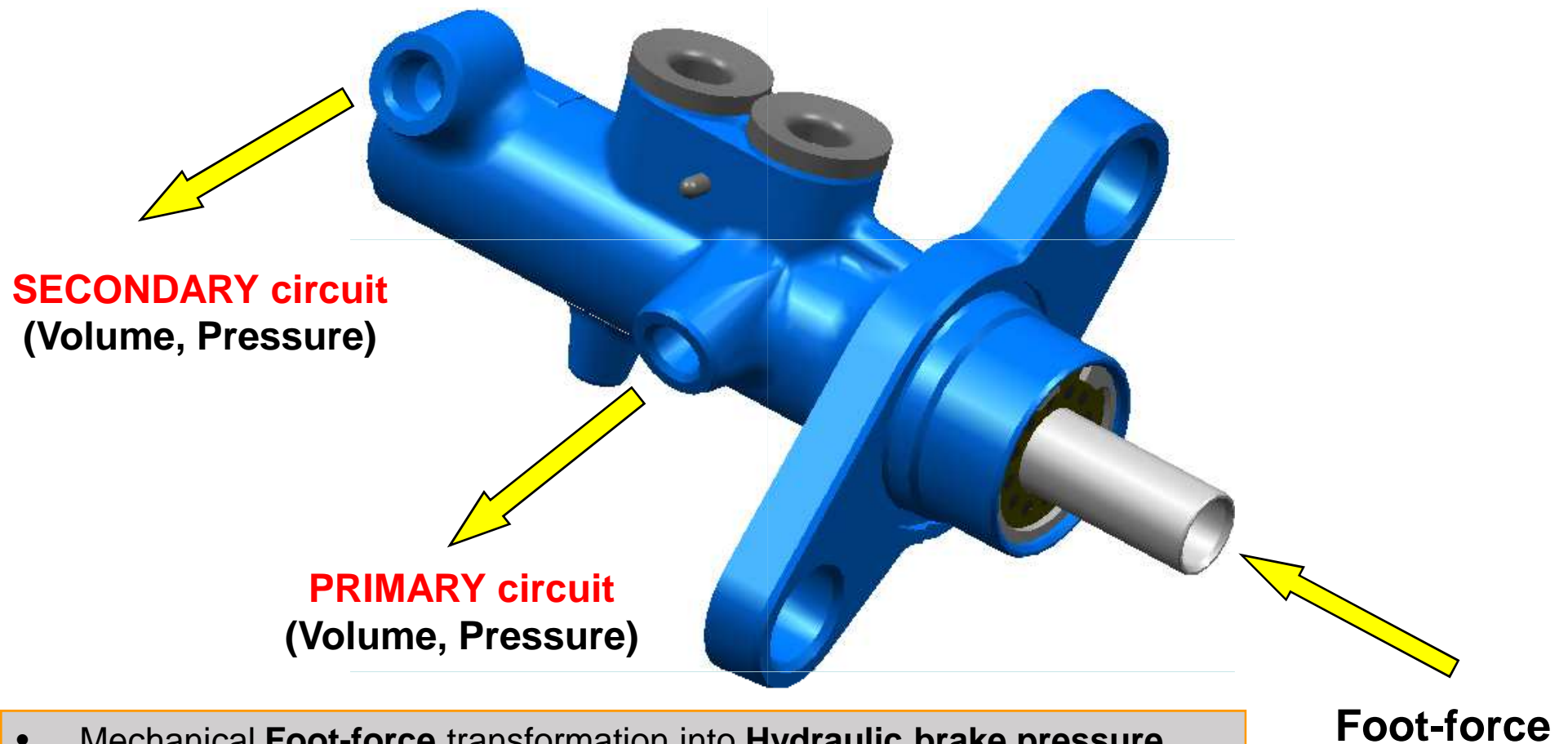


**TMC  
section**



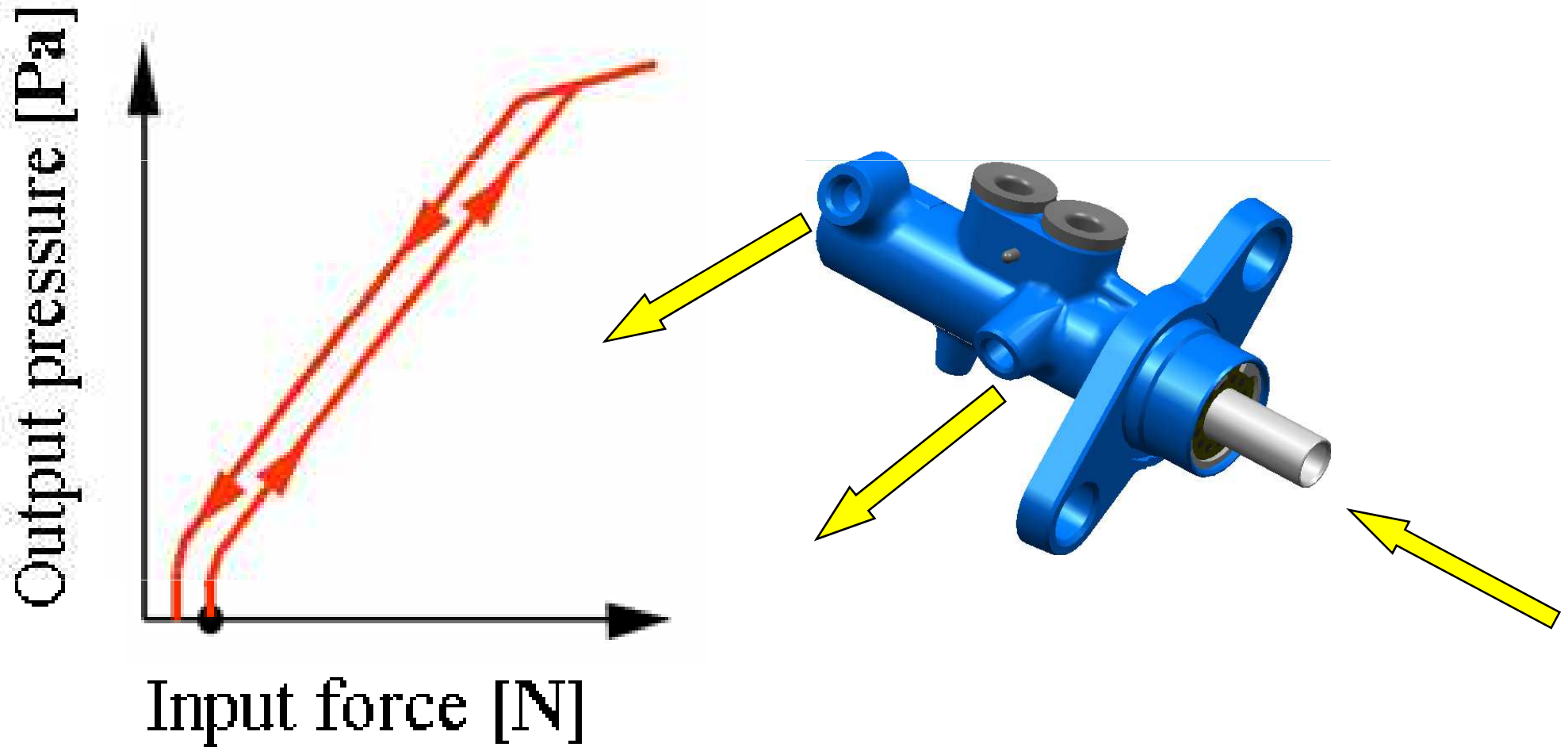
**Brake booster  
position**

# Tandem Master Cylinder



- Mechanical **Foot-force** transformation into **Hydraulic brake pressure**
- distribute uniformly hydraulic brake pressure on all four wheel brakes
- distribute uniformly hydraulic brake fluid volume to control wheel brakes

# Tandem Master Cylinder – Output characteristic

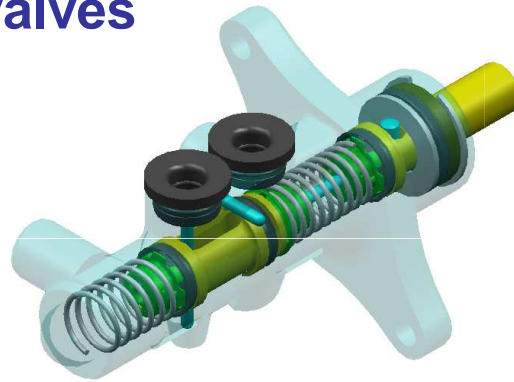




# Stages in TMC development

## TMC with 2 center valves

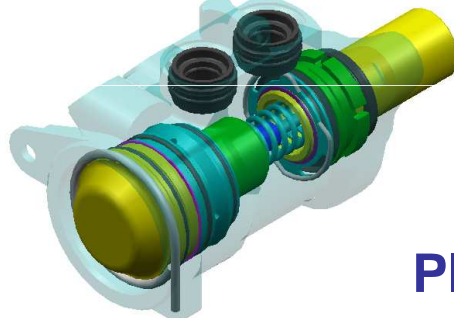
(Series since 1993)



### Additional requirements

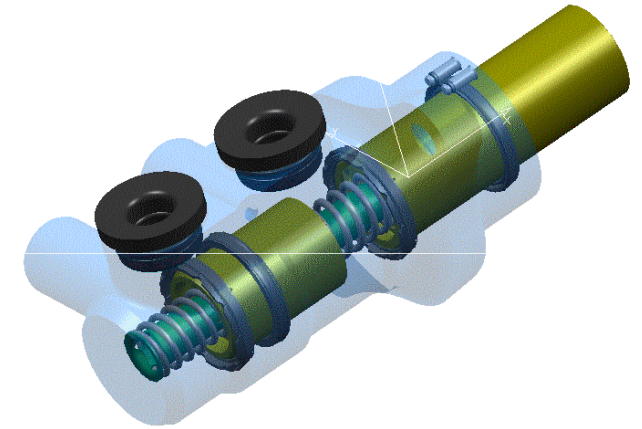
- crash optimization
- suitable for active Boosters

(Brake assistent + ICC)



## Plunger – TMC – Generation 1

(since 1998)



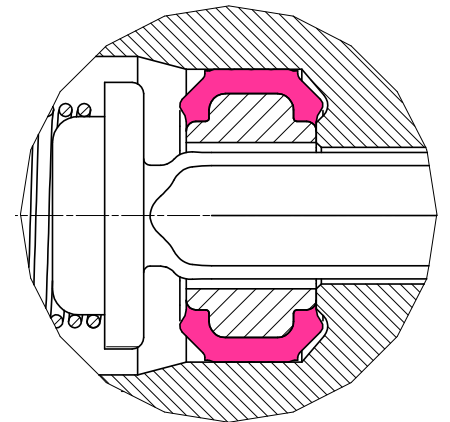
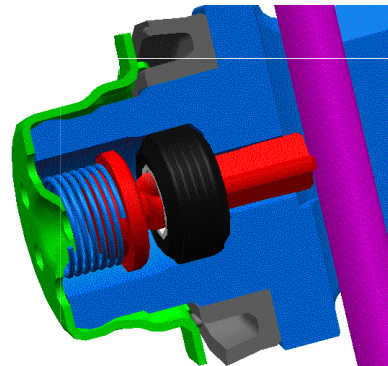
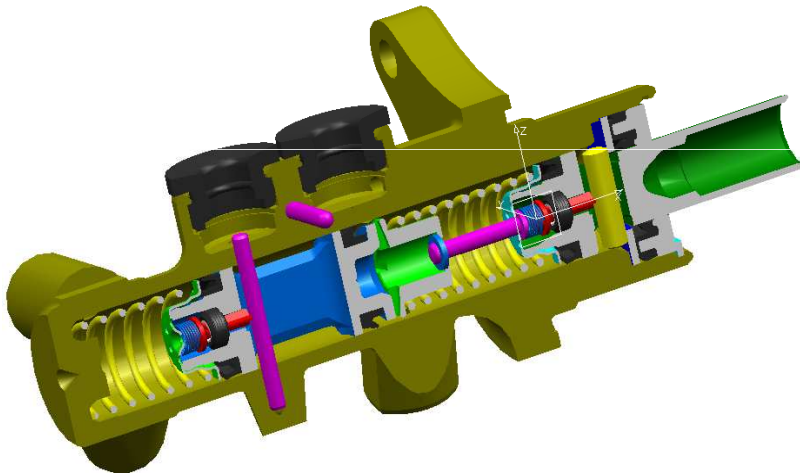
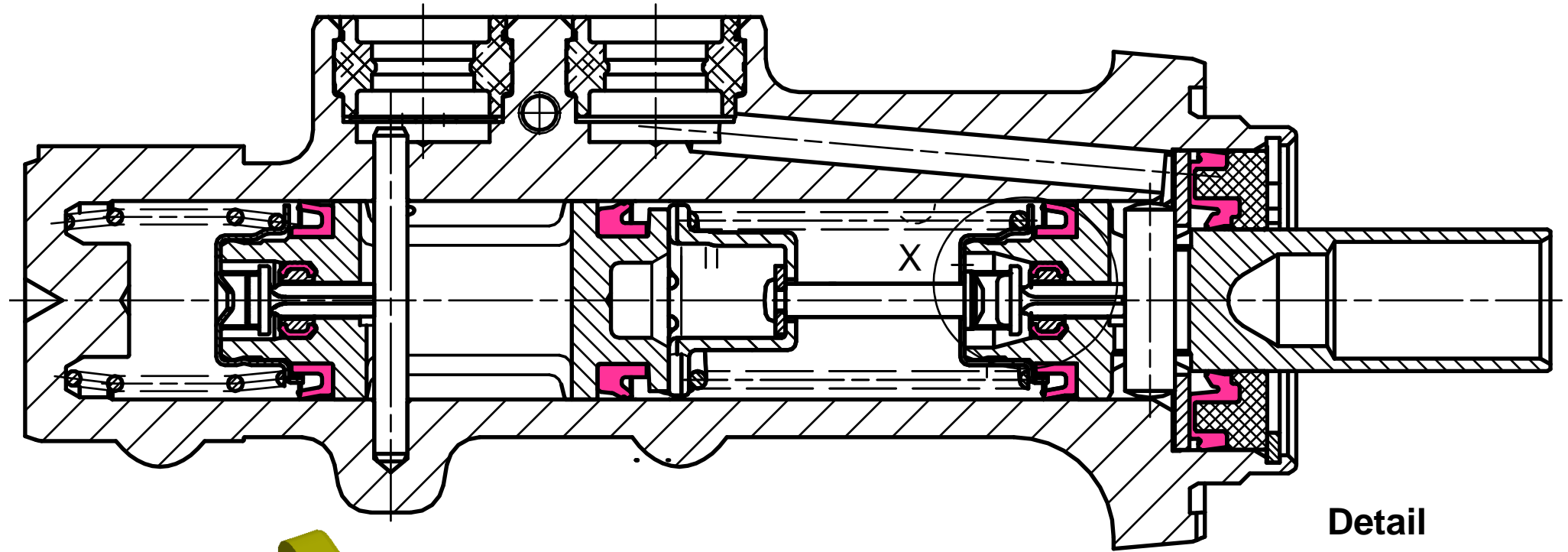
## Plunger - TMC - Generation 2

(since 2004)

### Additional requirements

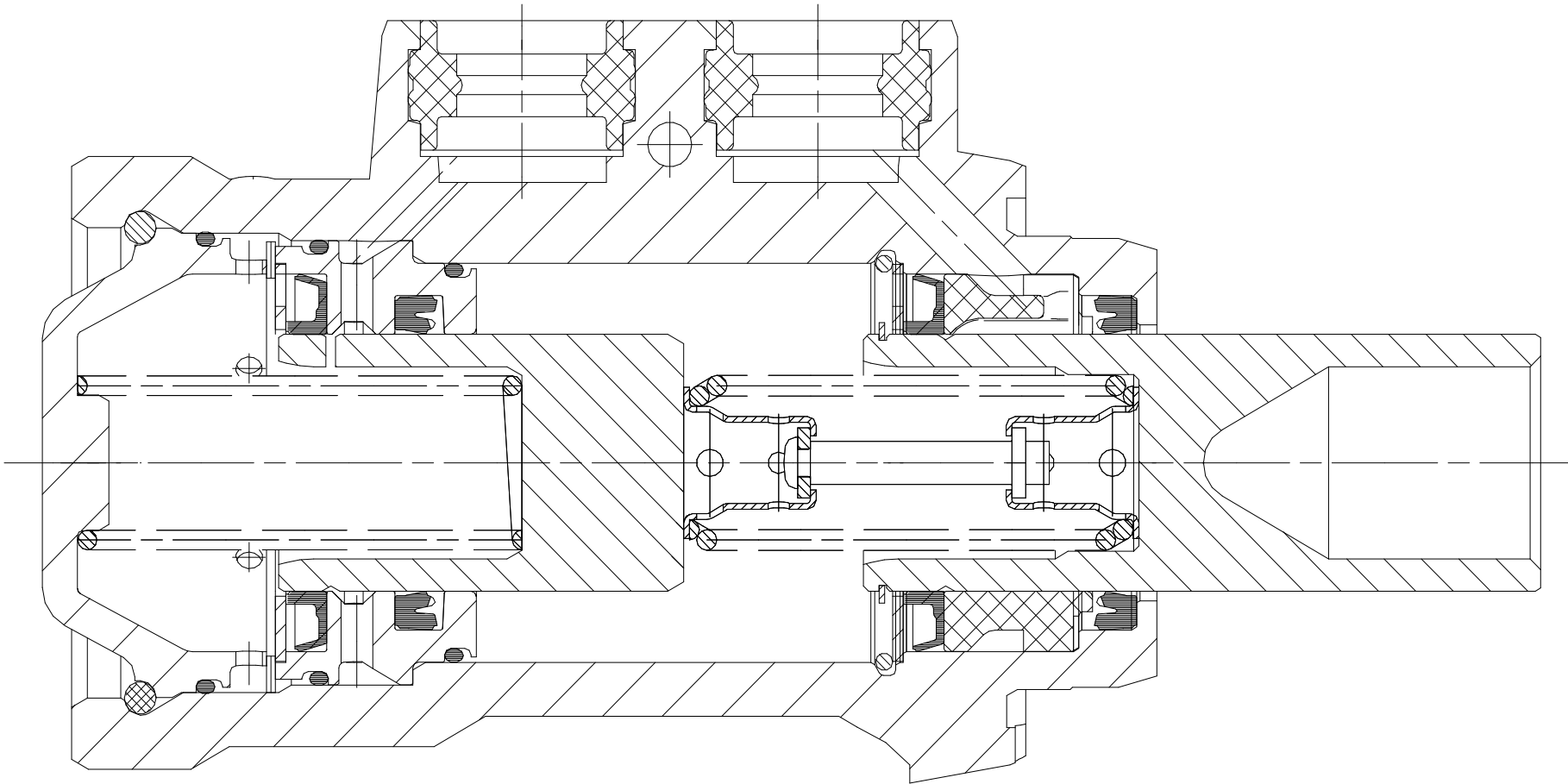
- further packaging improvement
- weight reduction
- standardisation

# Two center valves TMC



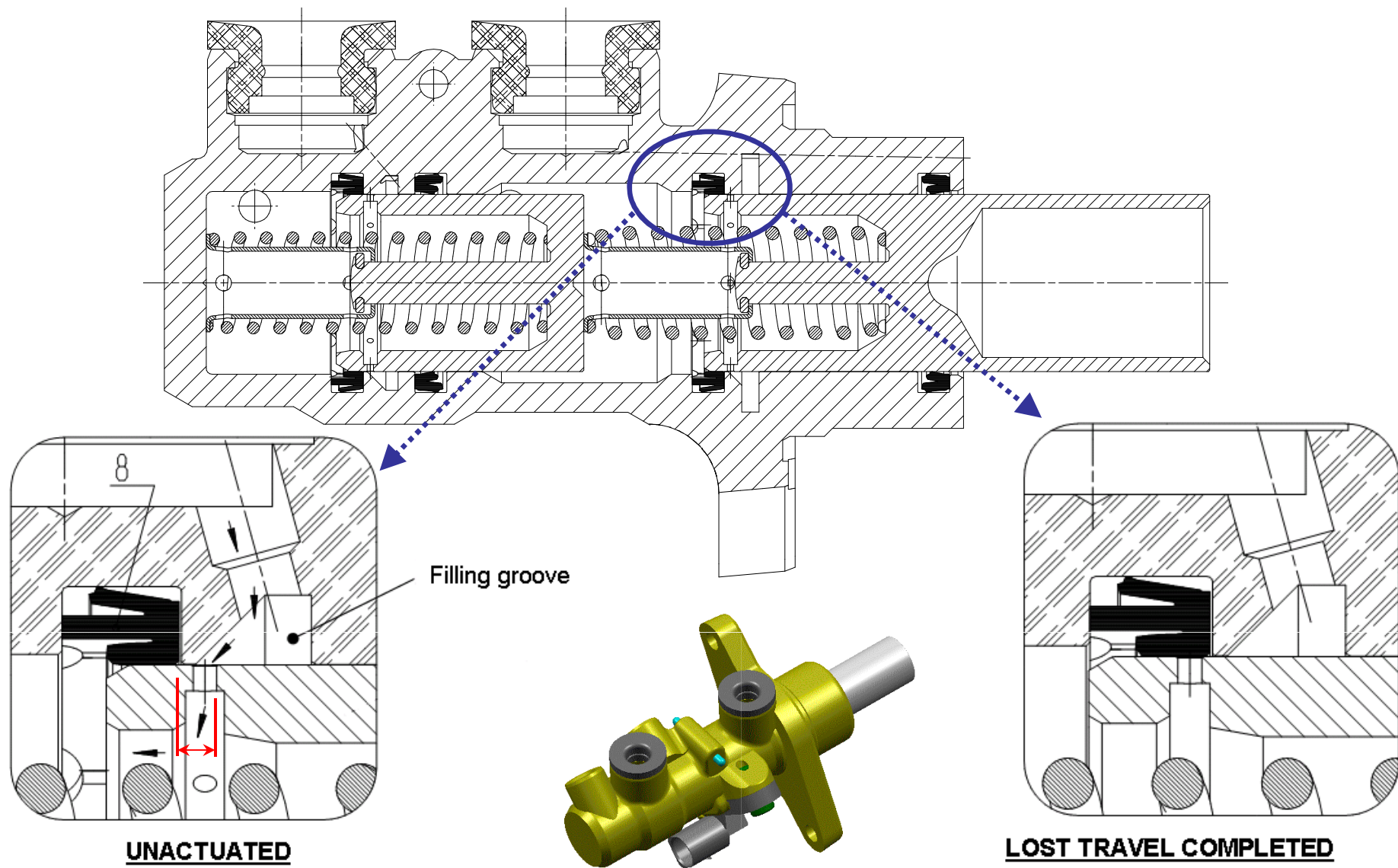
# Plunger – 1 generation

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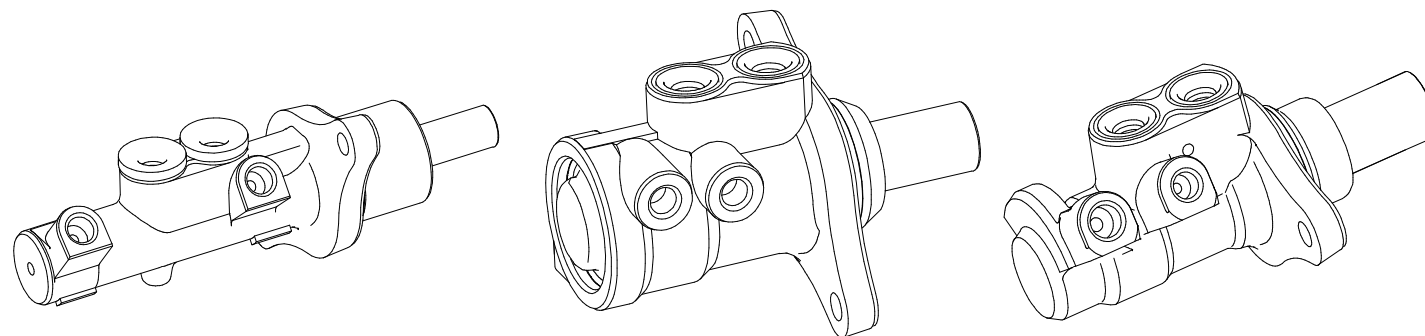




# Plunger – 2 generation

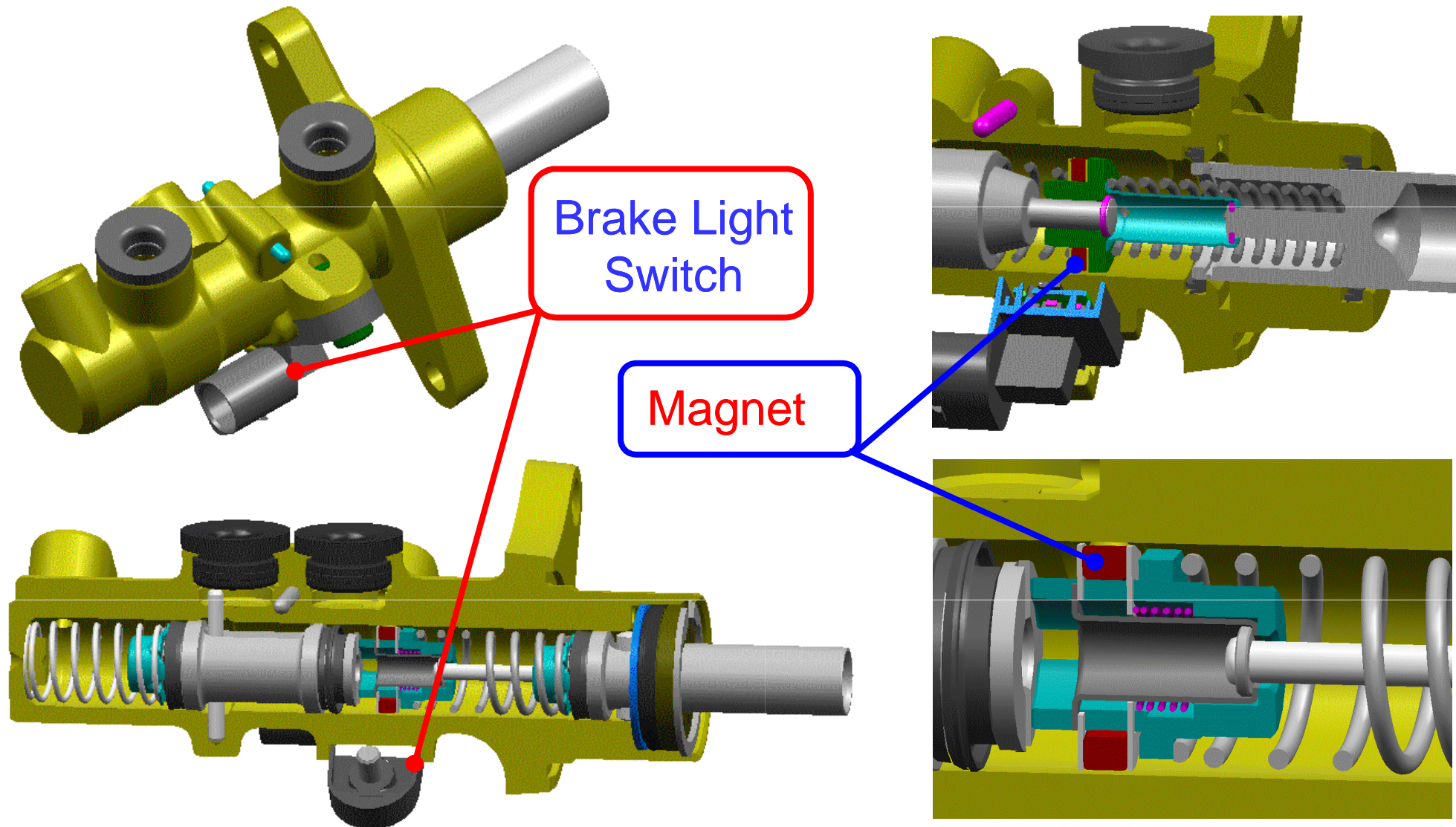


# Technical data for TMC types



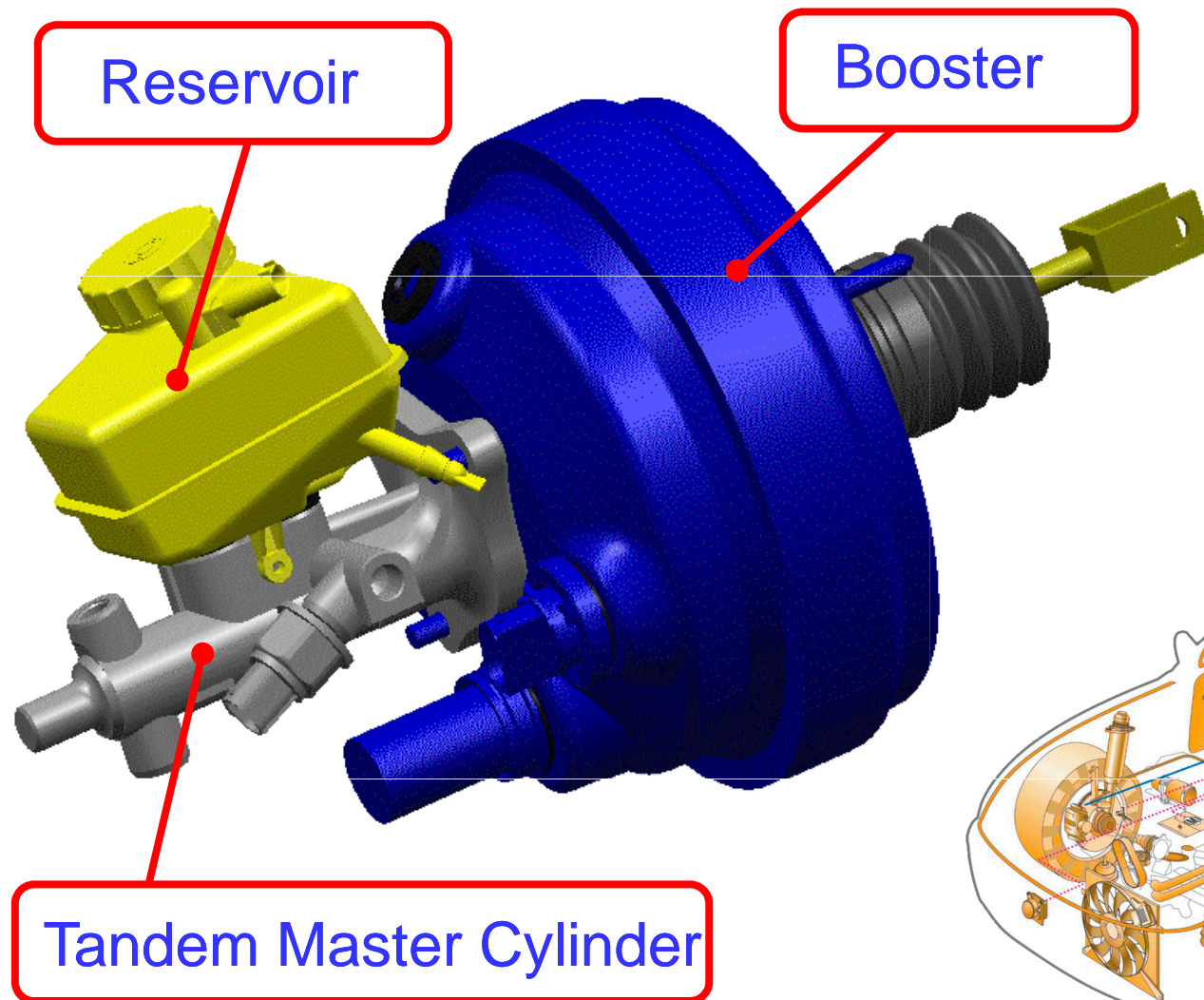
TMC	2 center valves	Plunger Generation 1	Plunger Generation 2
Number of parts (pcs.)	27	27	15
Weight (g)	540	620	500
Diameter of valves (mm)	Ø20.64 - Ø26.99	Ø22.2 - Ø25.4	Ø20.64 - Ø26.99

# TMC with Brake Light Switch (BLS)

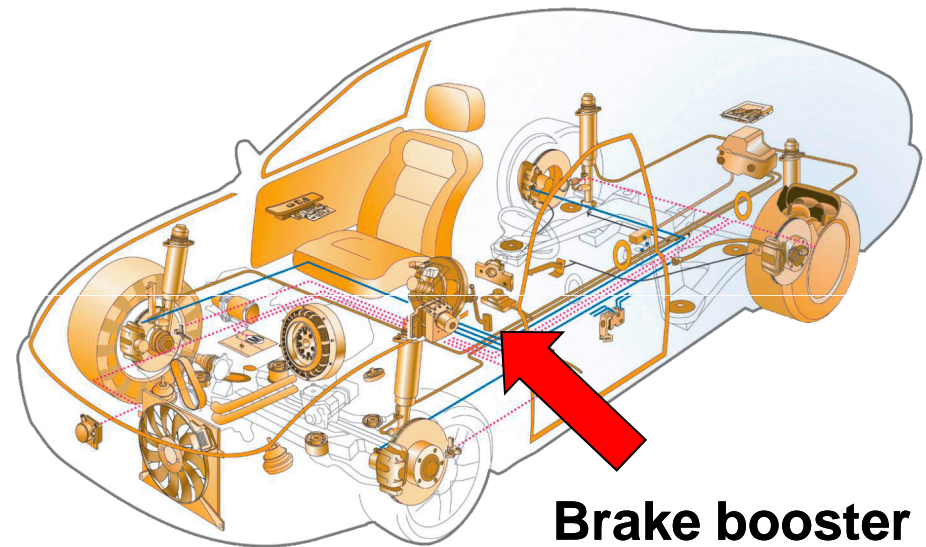




# VACUUM BRAKE BOOSTER



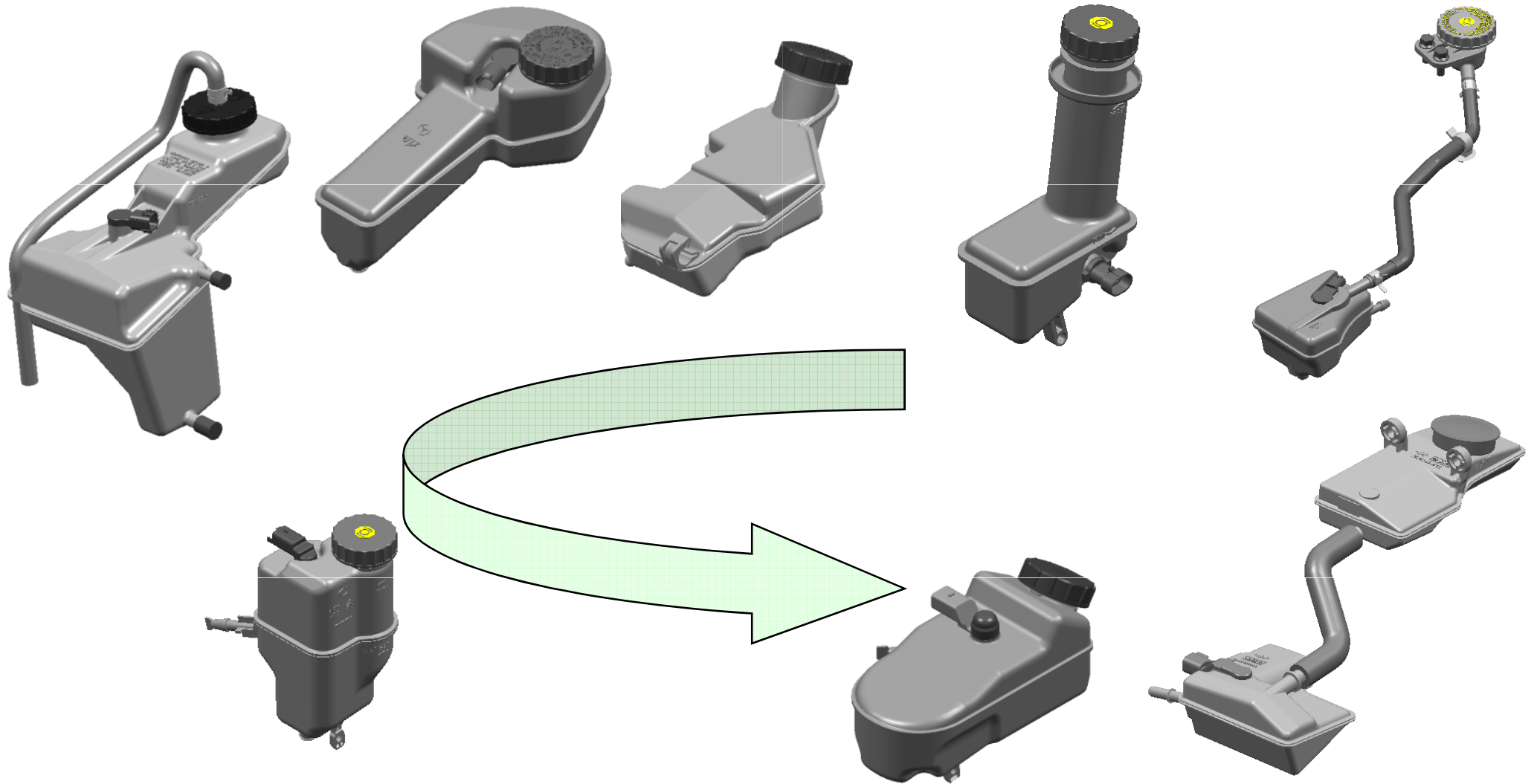
**Reservoir  
section**



**Brake booster  
position**

# Reservoir types

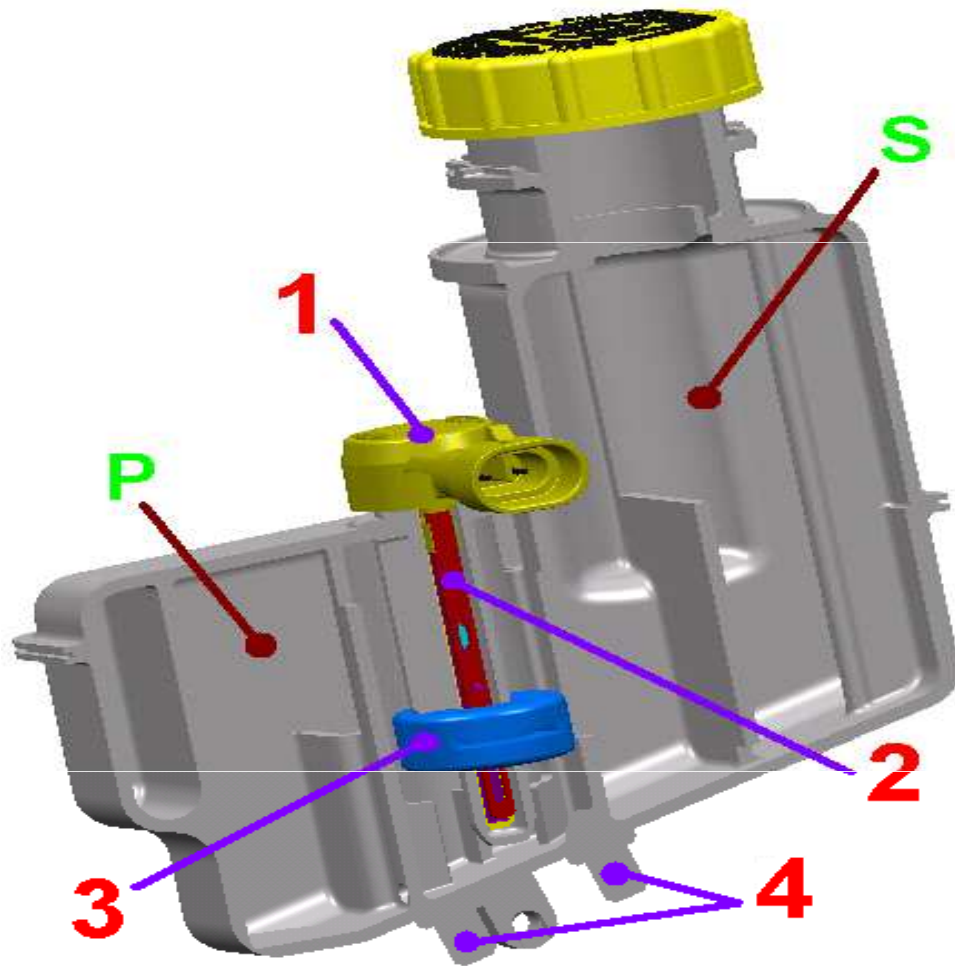
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# Brake booster reservoir

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**S** – secondary chamber

**P** – primary chamber

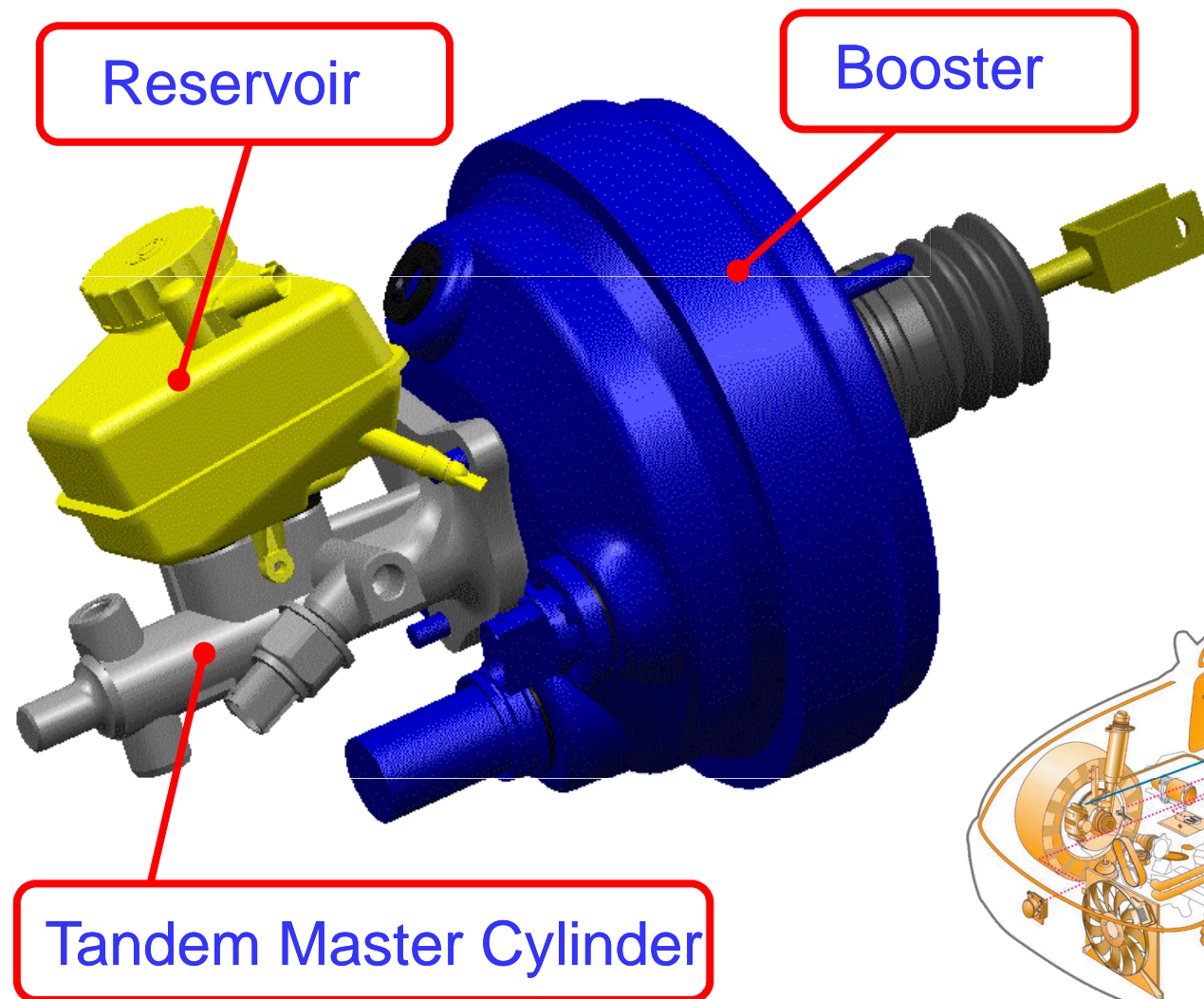
**1** – connector

**2** – reed contact

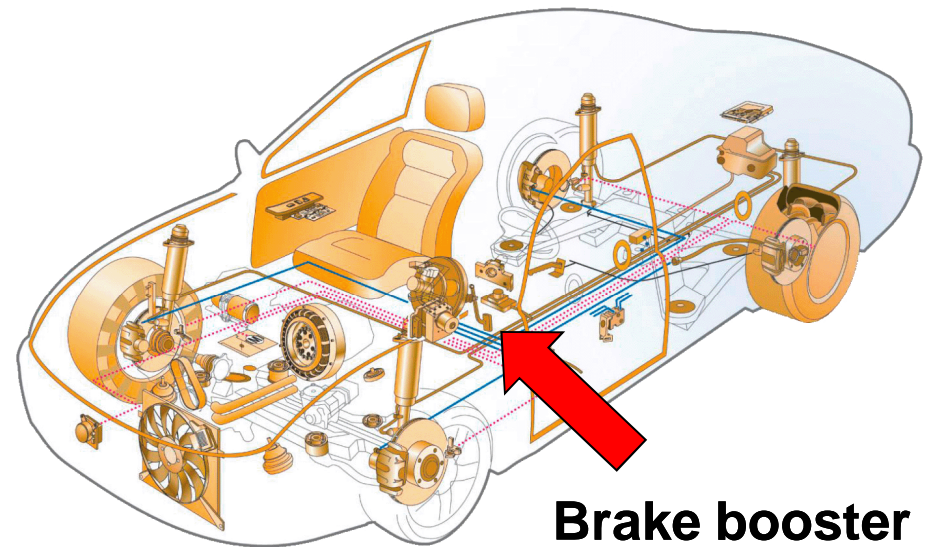
**3** – floater

**4** – input / output ports

# VACUUM BRAKE BOOSTER



**Booster  
section**

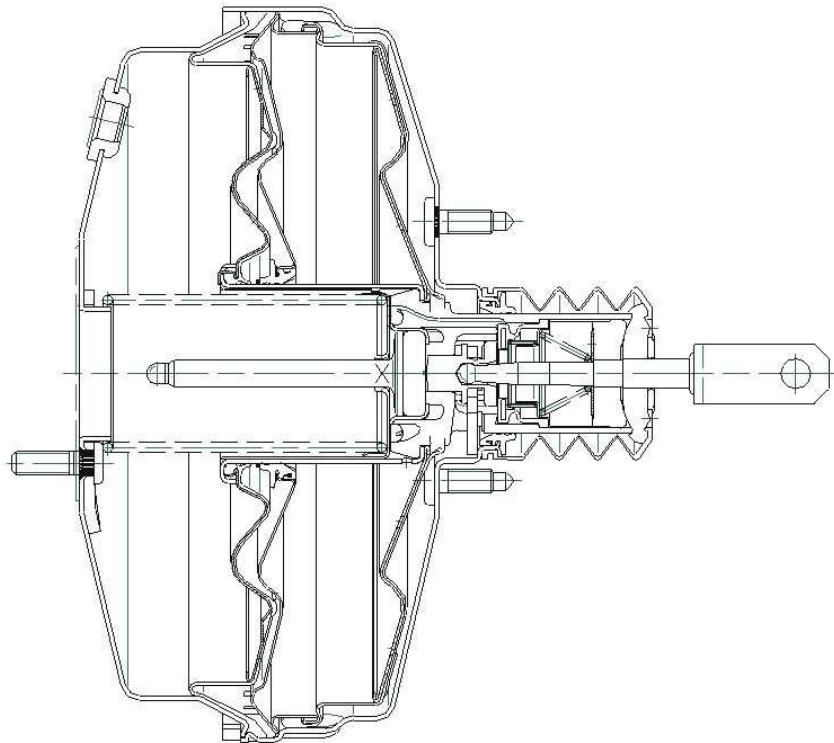


**Brake booster  
position**

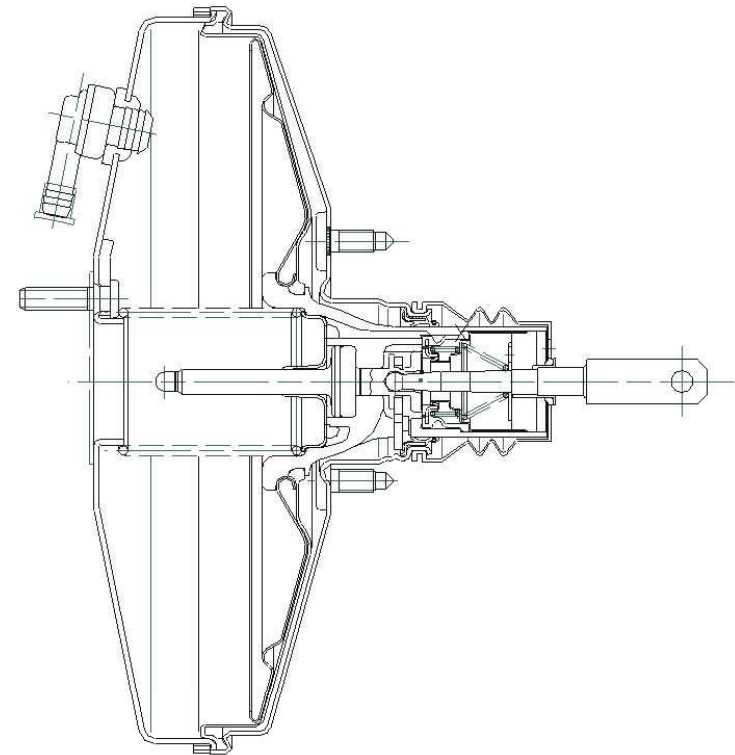
# Type of booster size

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## Tandem booster



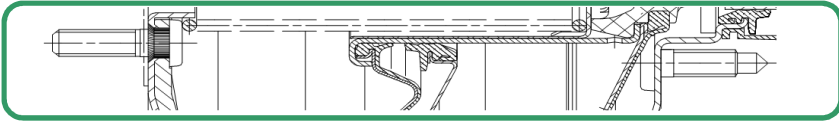
## Single booster



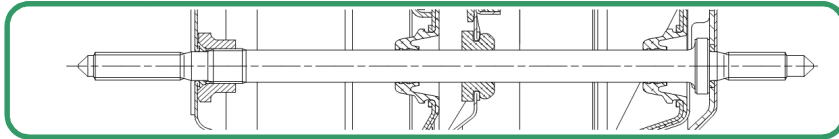
- ▶ SINGLE BOOSTERS: 8", 9", 10", 11"
- ▶ TANDEM BOOSTERS: 8/9", 9/10", 10/11", 11"

# Type of booster design

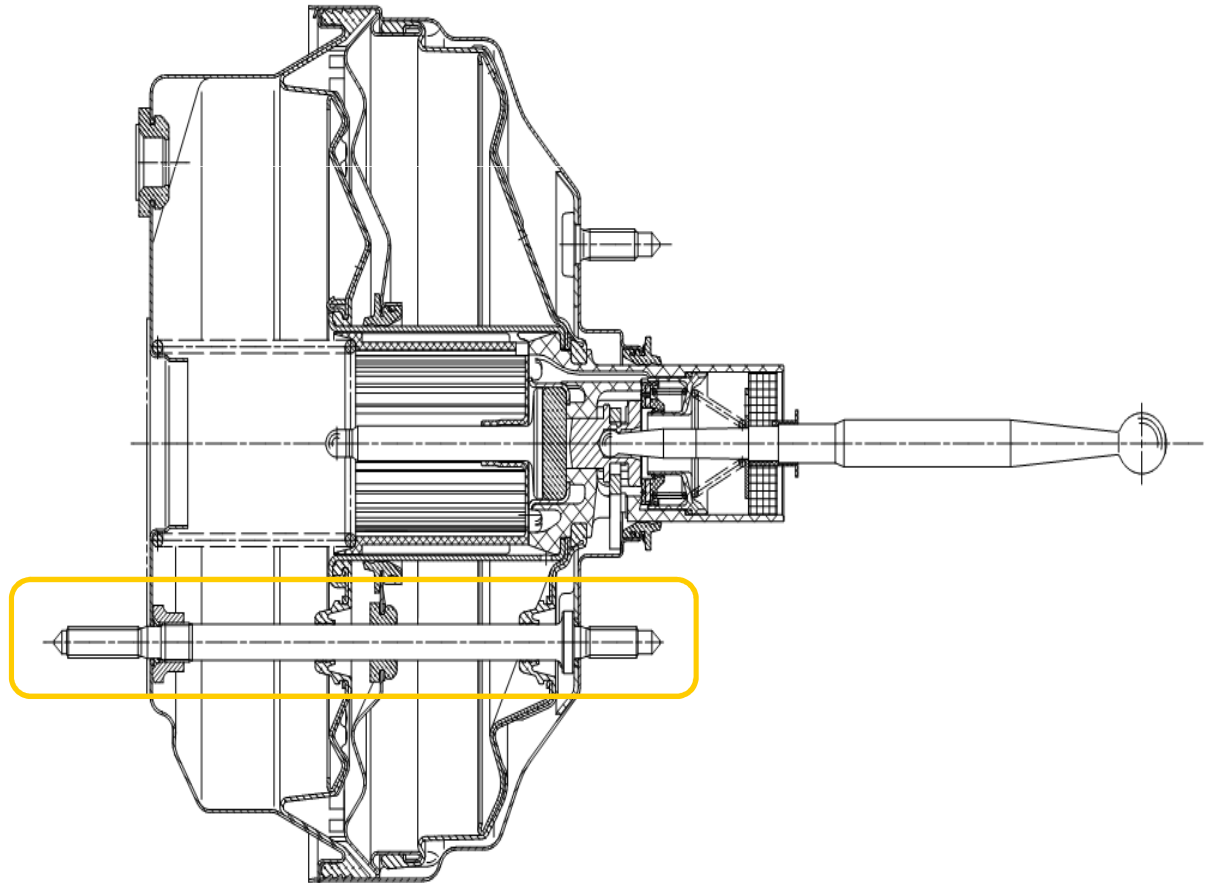
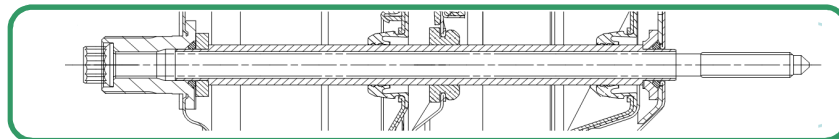
## ▶ CONVENTIONAL



## ▶ TIE - ROD

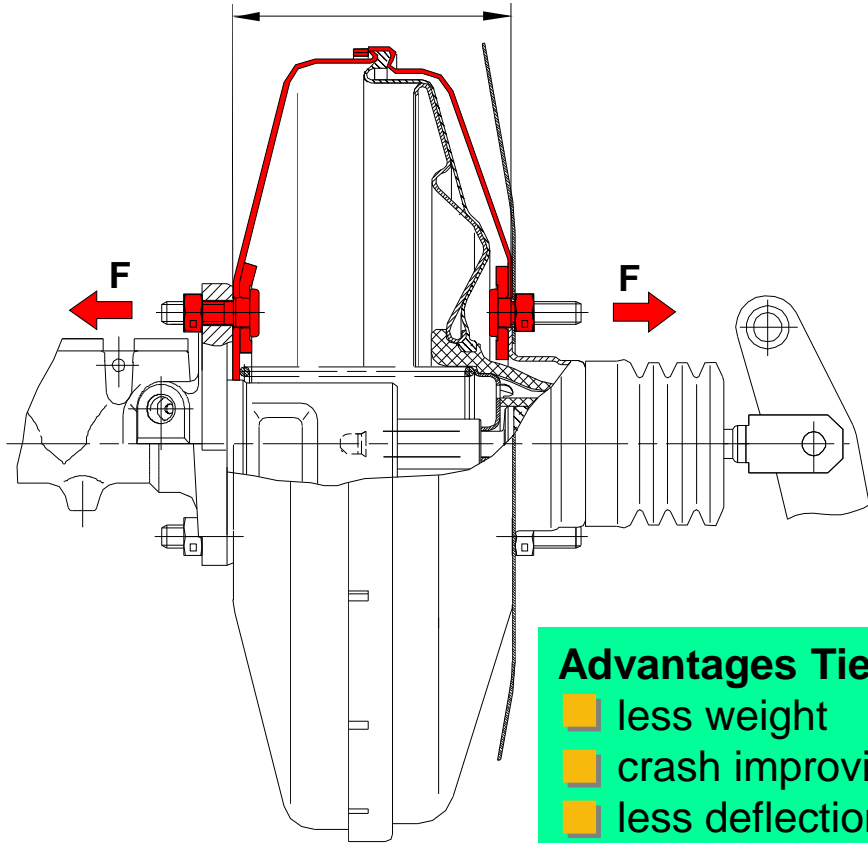


## ▶ FRONT - BOLT

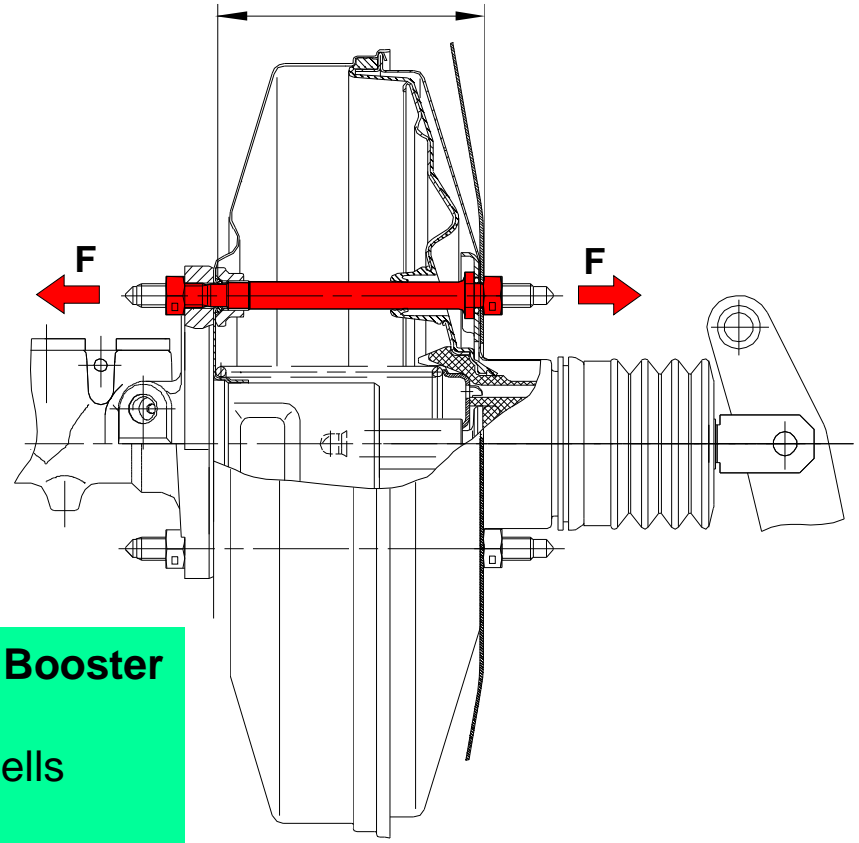


# Advantages of Tie-Rod booster

Conventional Booster 10"



Tie Rod Booster 10"



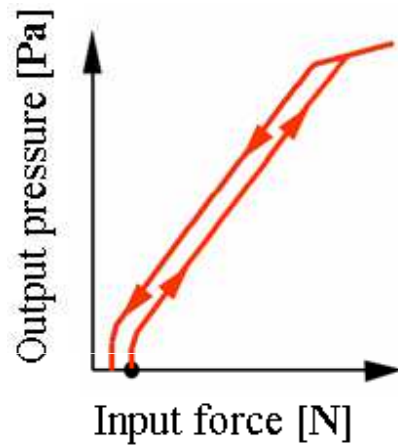
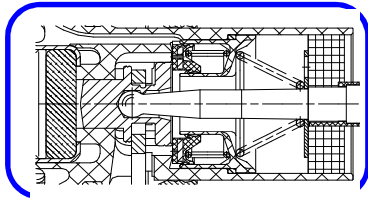
## Advantages Tie Rod Booster

- less weight
- crash improving shells
- less deflection
- => shorter pedal stroke
- => better pedal feel



# Type of booster function

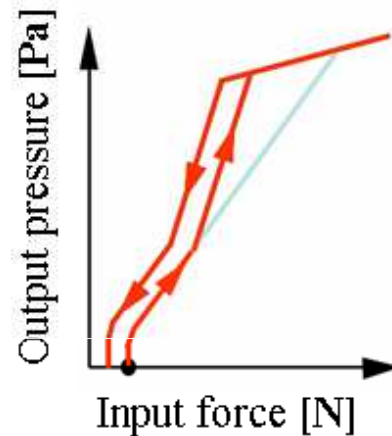
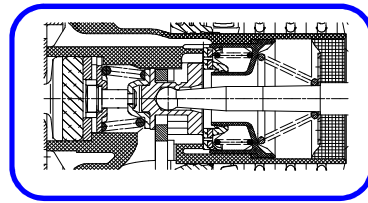
## CONVENTIONAL



**FUNCTION:**

CONVENTIONEL

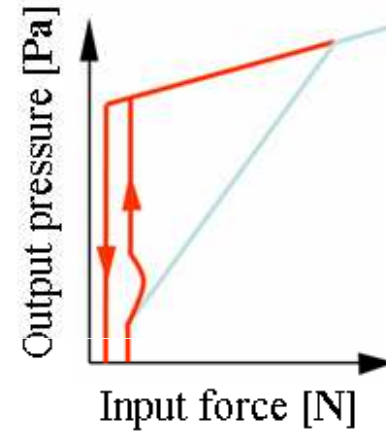
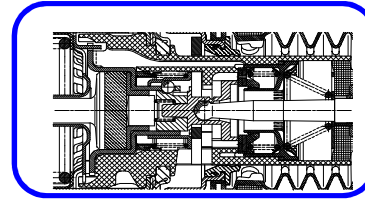
## DUAL RATIO



**FUNCTION:**

DUAL RATIO FUNCTION  
(PERMANENT)

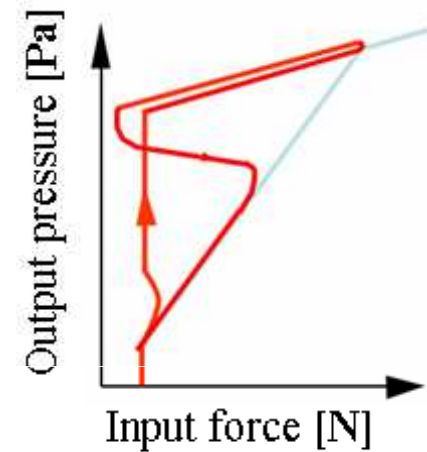
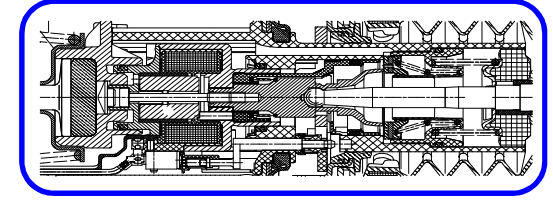
## ADAM



**FUNCTION:**

BRAKE ASSIST

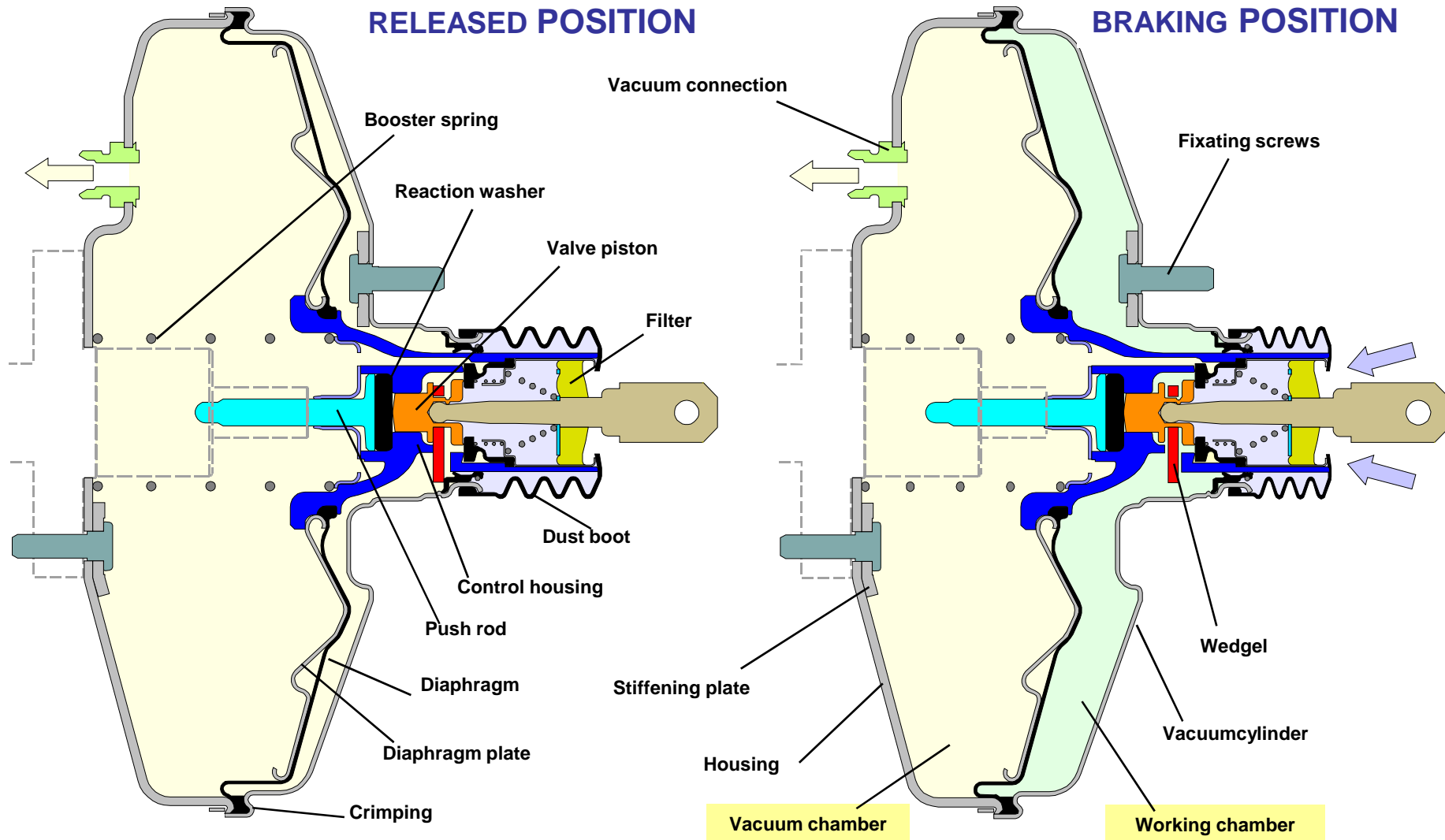
## ACTIVE



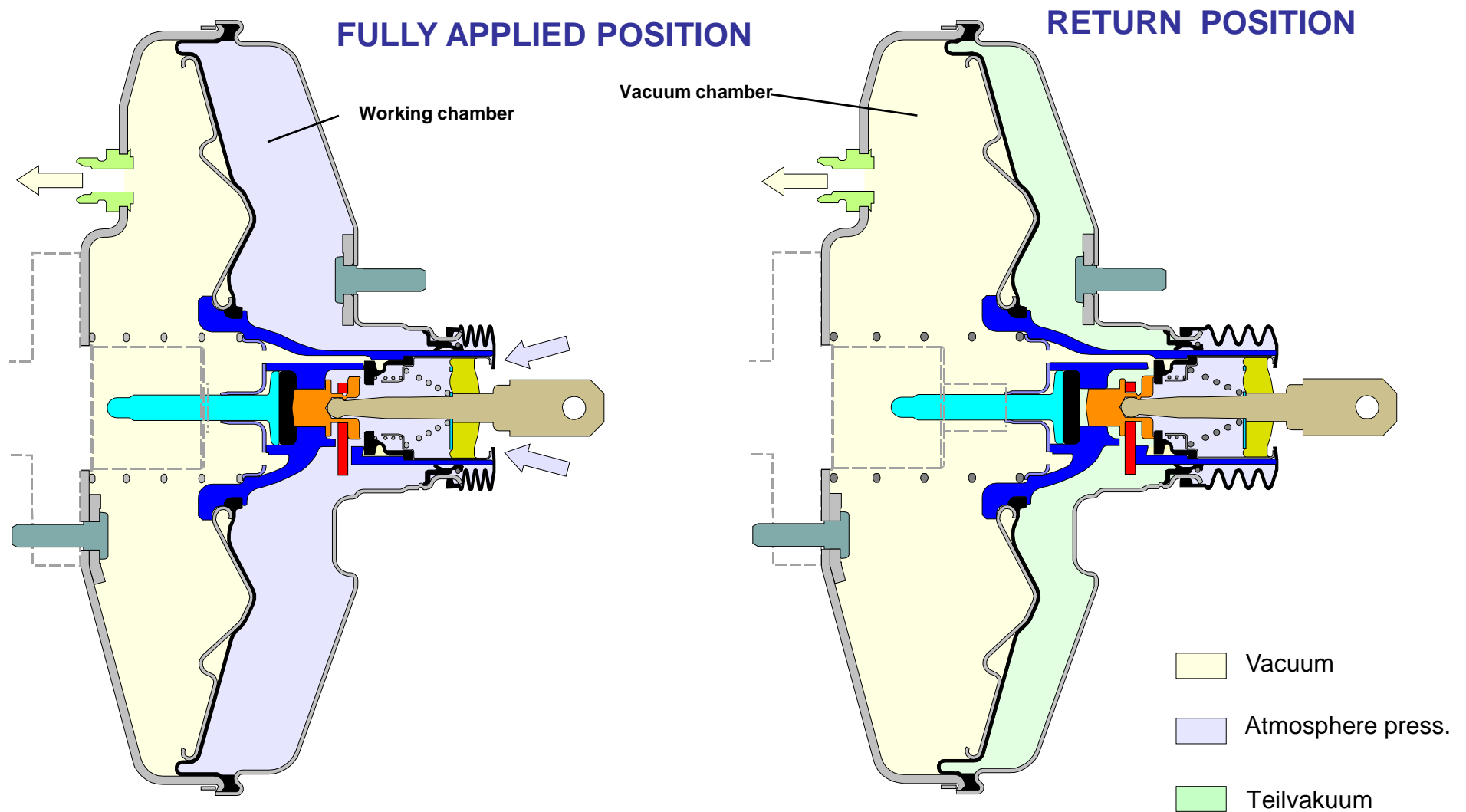
**FUNCTION:**

BRAKE ASSIST  
INCLUDING TRAVEL SIGNAL

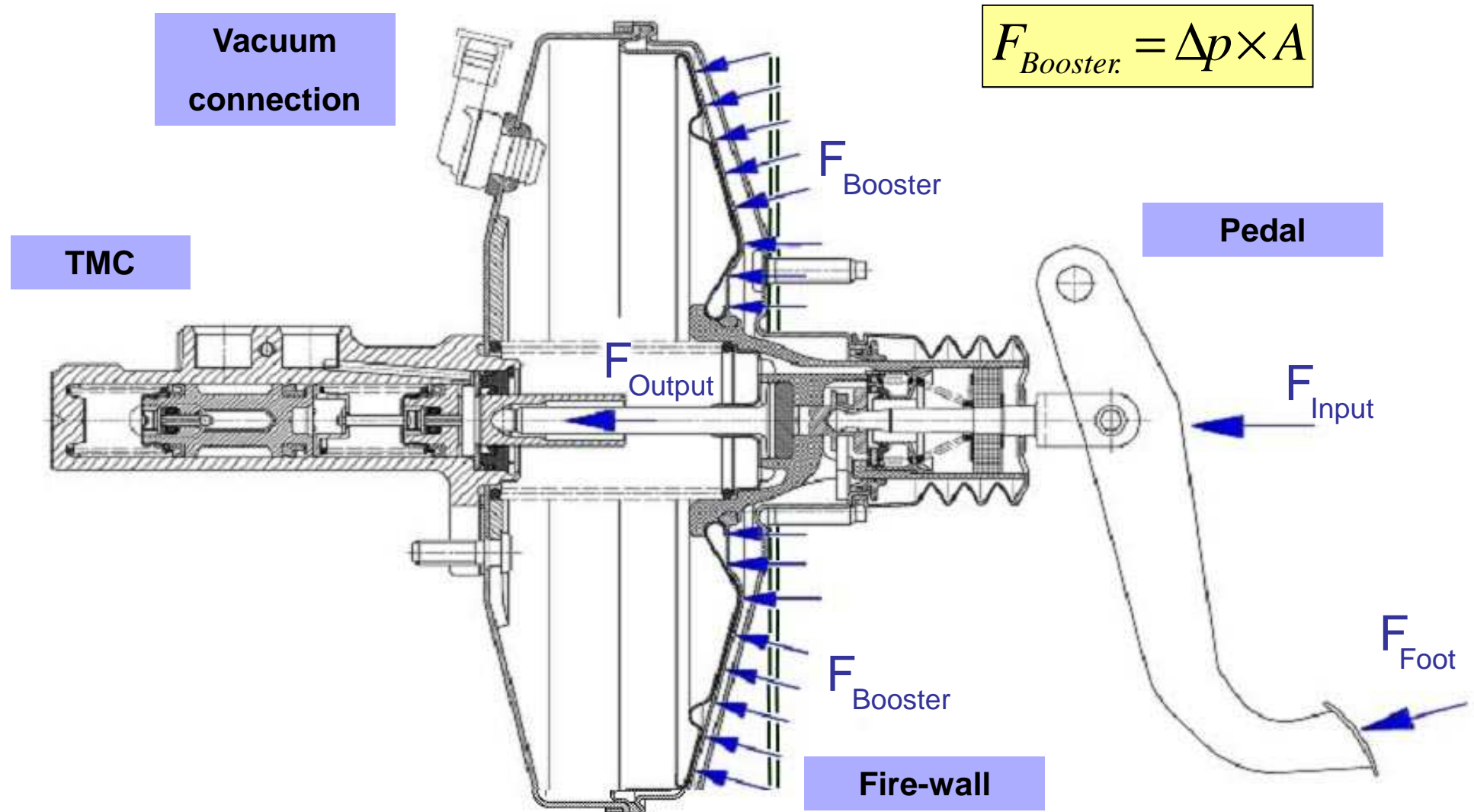
# Brake booster function



# Brake booster function



# Brake booster function



# Brake booster characteristic

