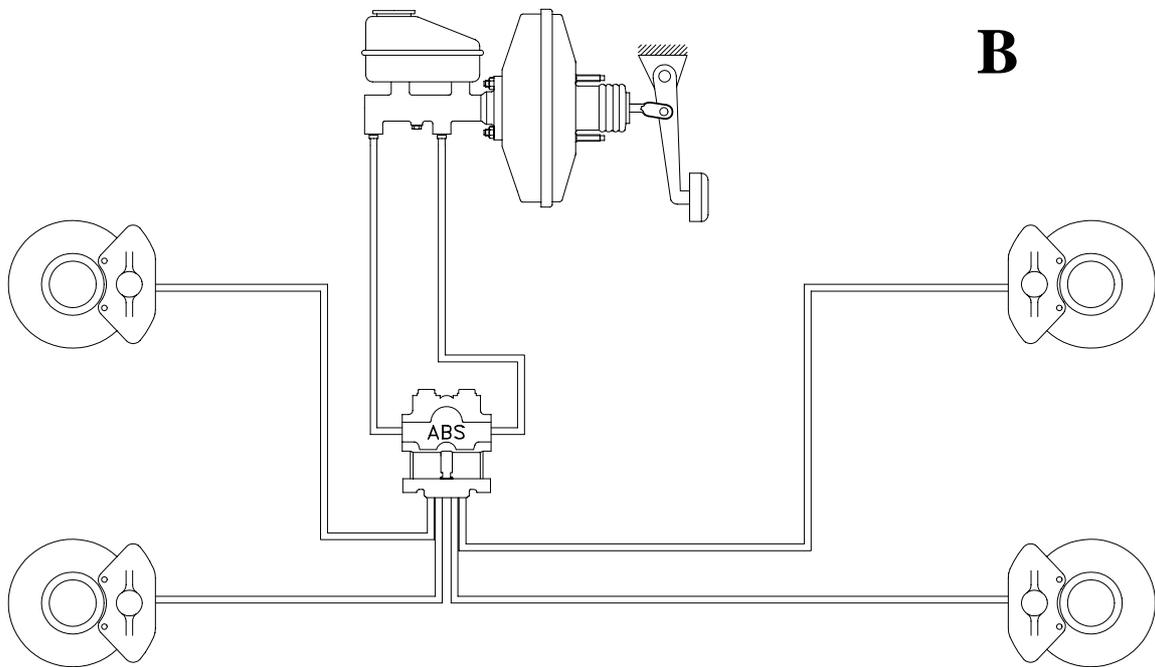
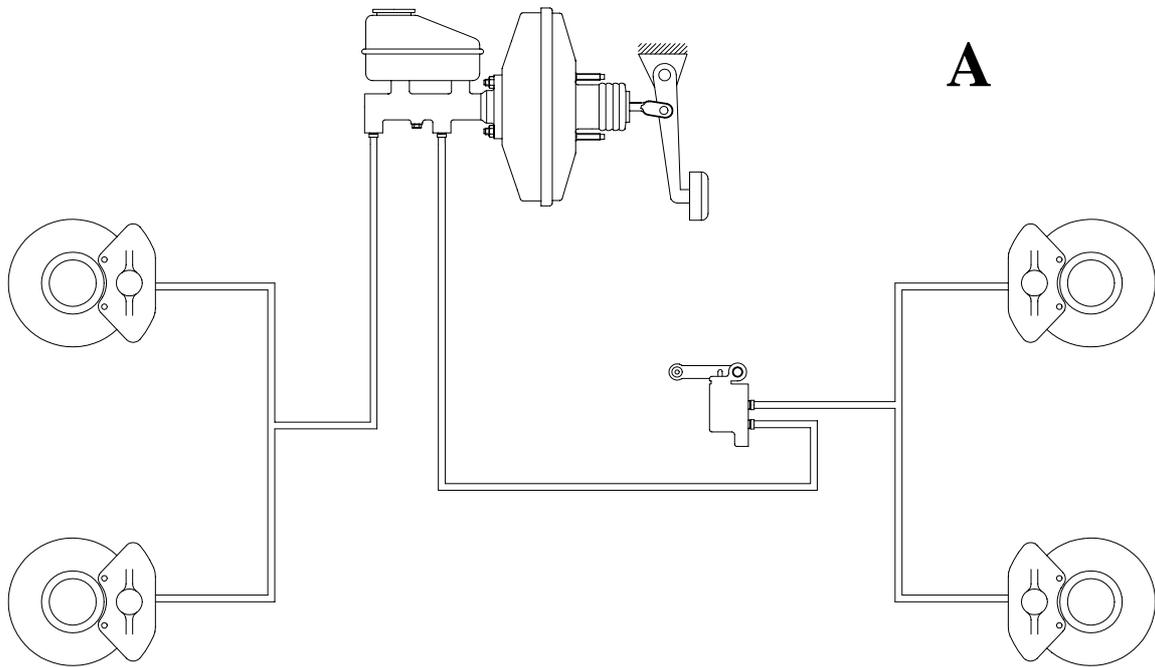


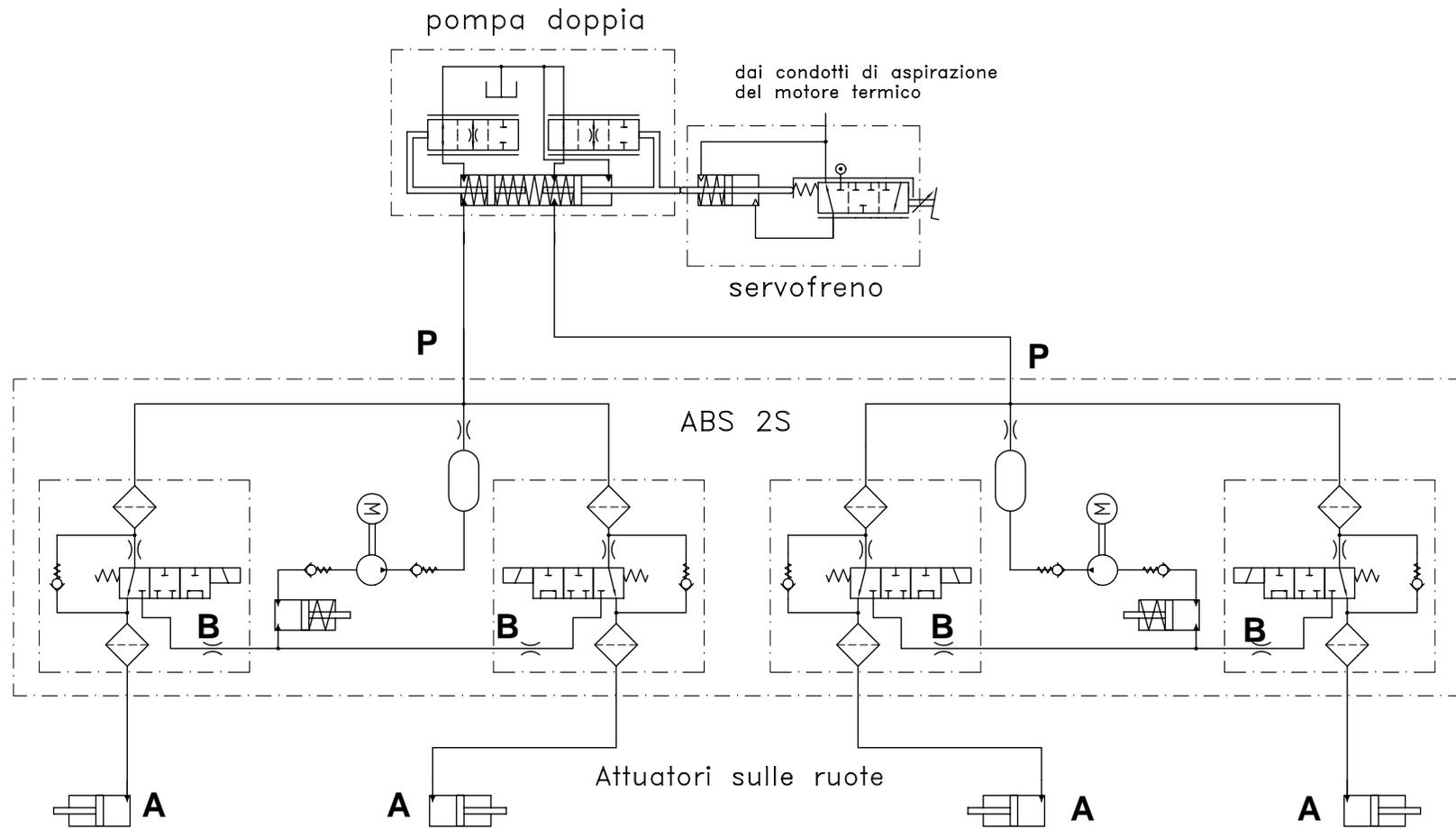
# IMPIANTI DI FRENATURA ELETTROIDRAULICI



A: impianto tradizionale

B: impianto con ABS

## IMPIANTO CON ABS: schema simbolico equivalente



anteriore destra

anteriore sinistra

Collegamento a II

posteriore destra

posteriore sinistra

anteriore destra

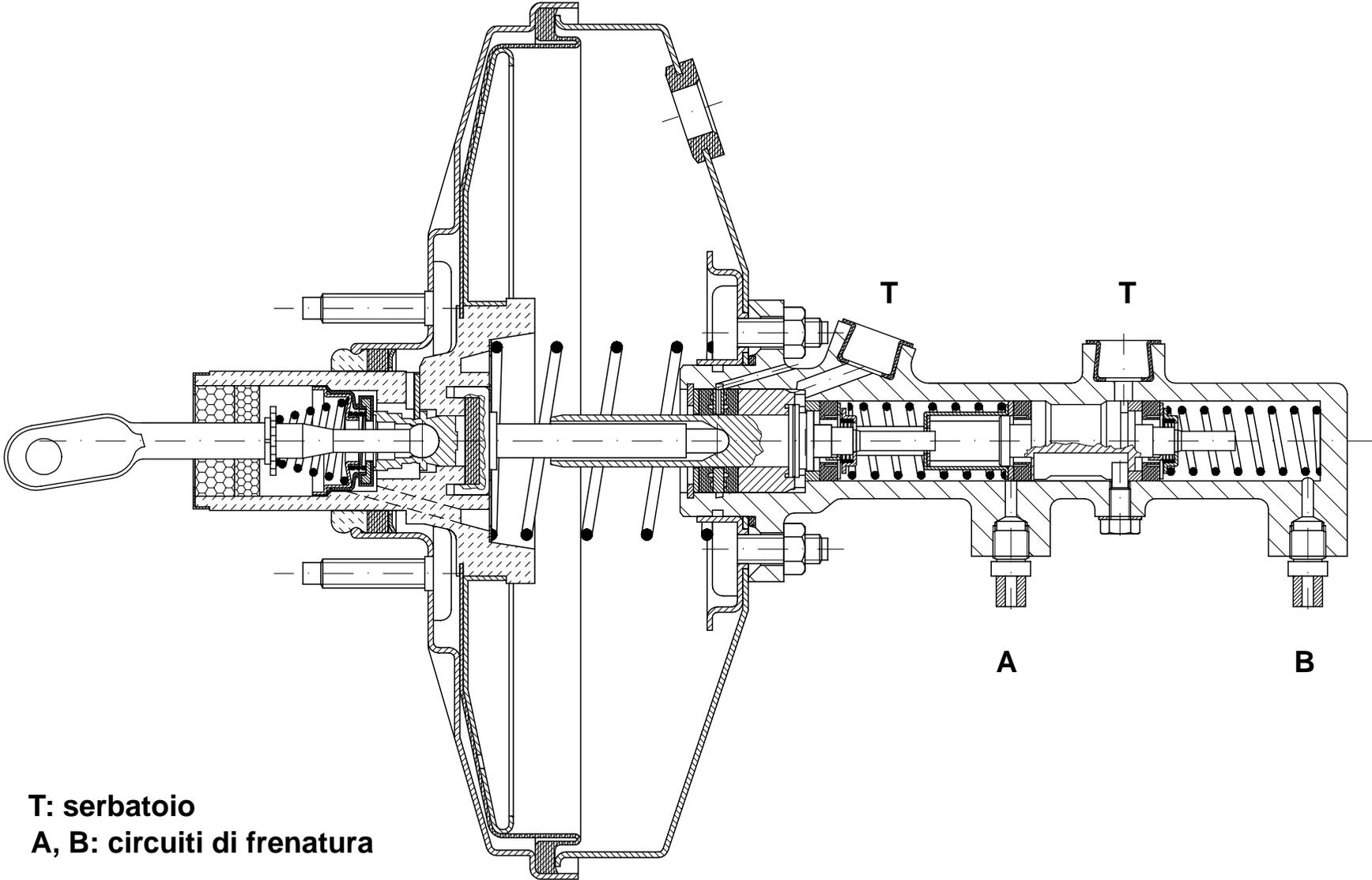
posteriore sinistra

Collegamento a X

anteriore sinistra

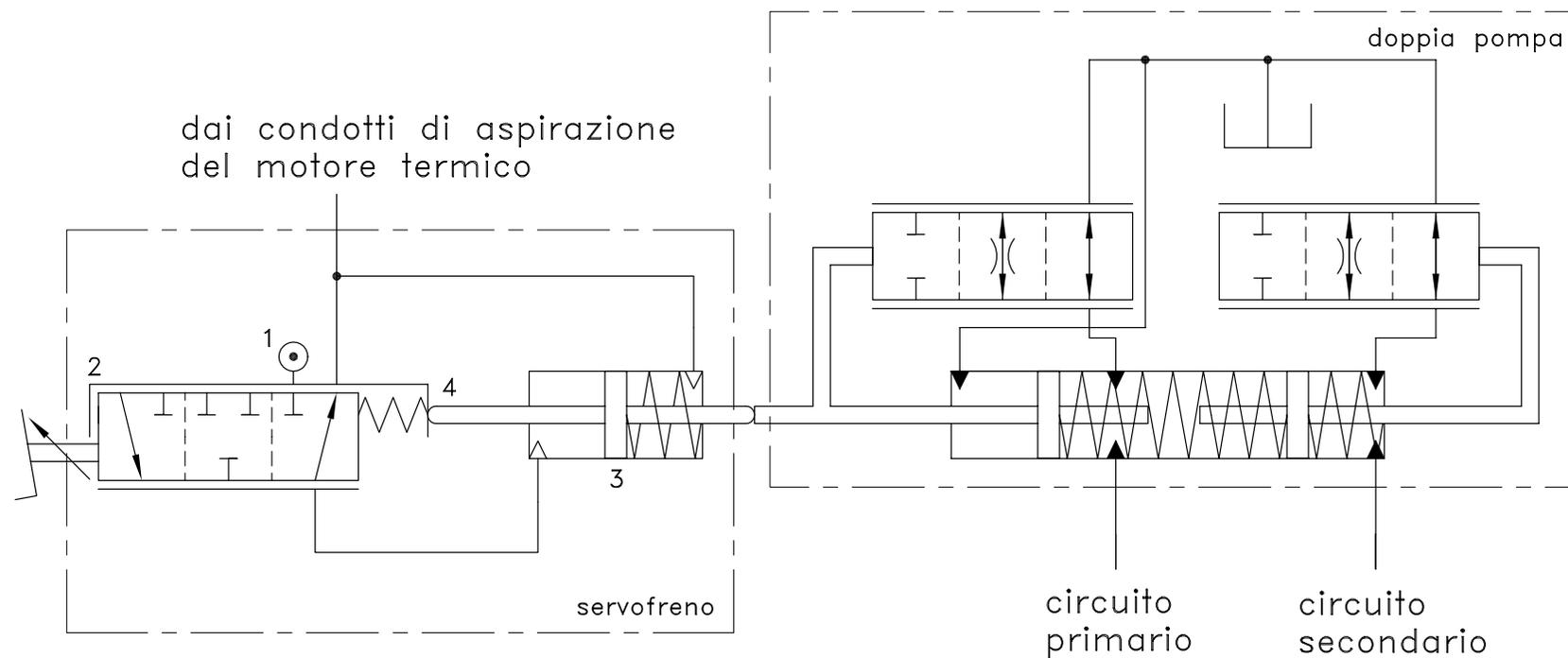
posteriore destra

**GRUPPO DI ALIMENTAZIONE: sezione**



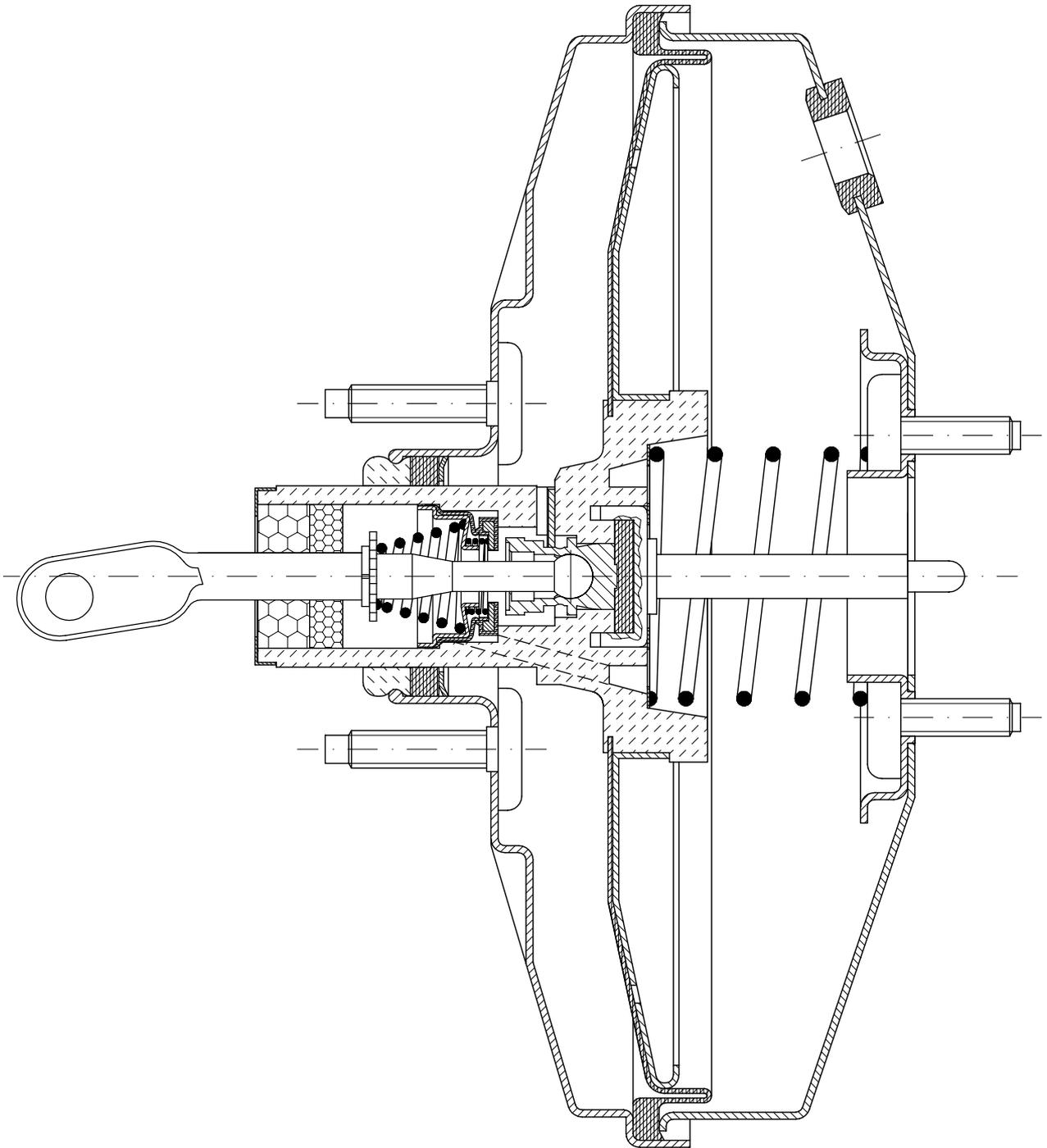
**T: serbatoio**  
**A, B: circuiti di frenatura**

## GRUPPO DI ALIMENTAZIONE: schema simbolico equivalente

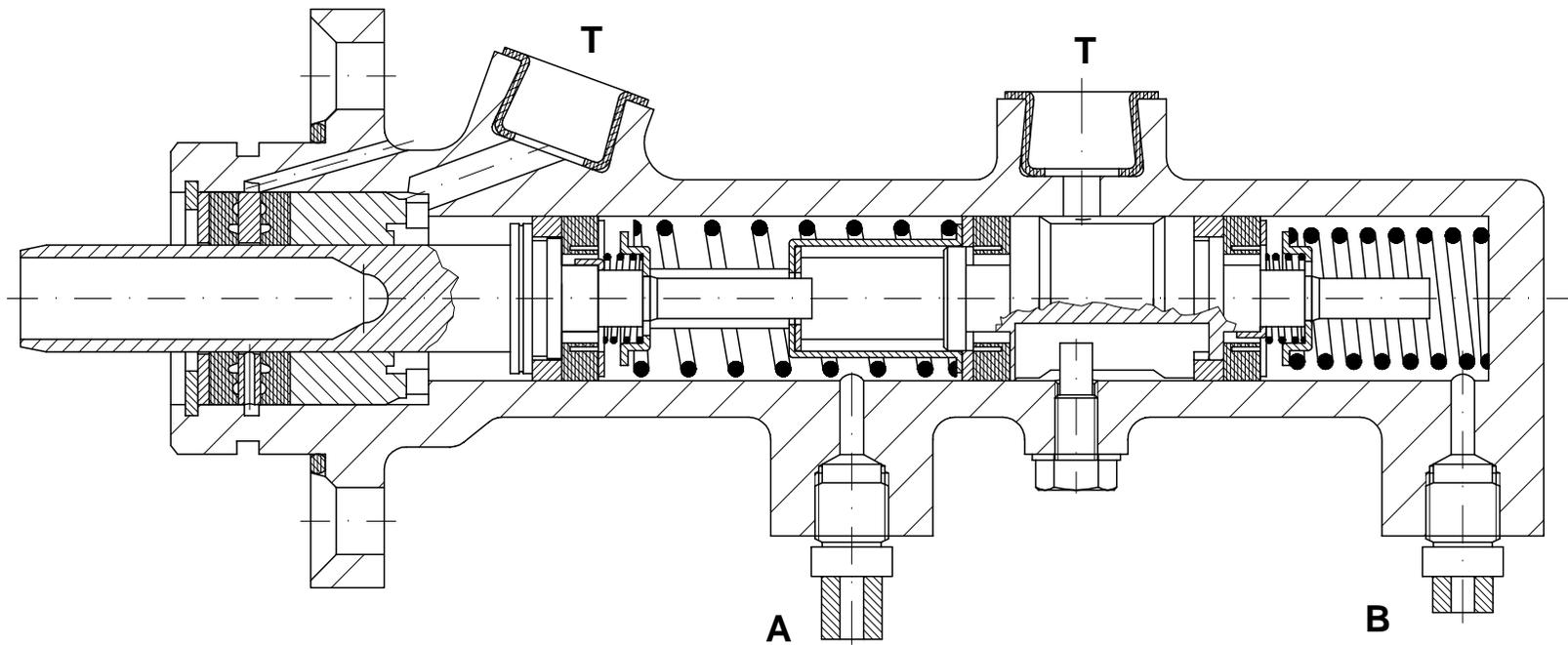


1. Sorgente a pressione costante
2. Distributore a posizionamento continuo
3. Attuatore lineare
4. Retroazione di posizione

**SERVOFRENO: sezione del componente in posizione di saturazione**



## POMPA DOPPIA: sezione del componente in posizione di lavoro

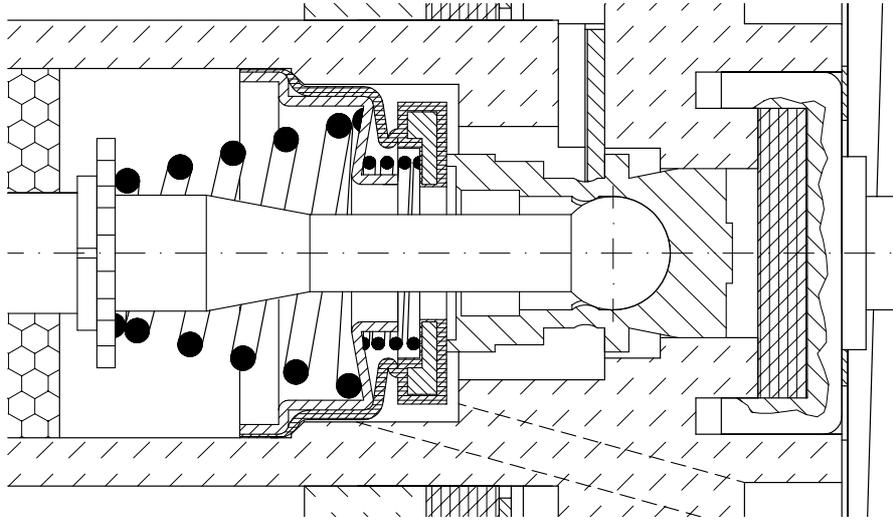


**T: serbatoio**

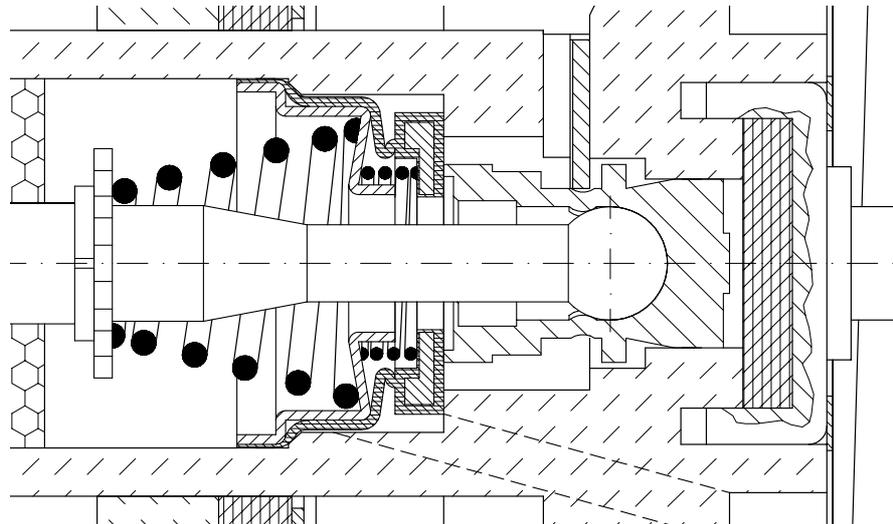
**A, B: ai cilindretti attuatori**

# SERVOFRENO: posizioni del distributore

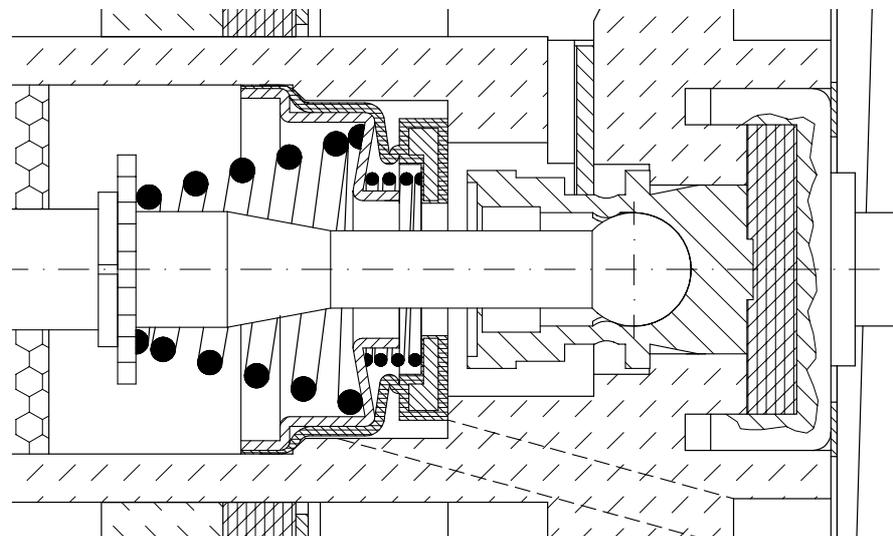
posizione di riposo



posizione di centro chiuso

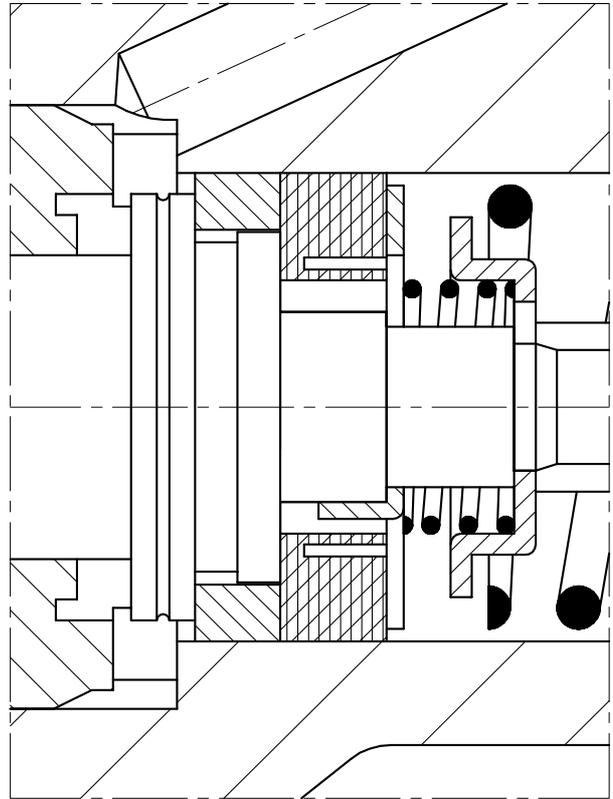
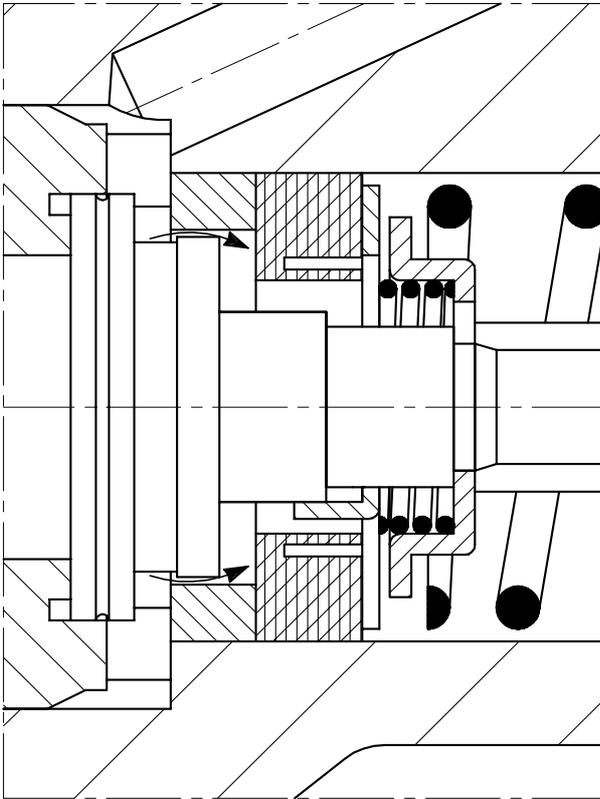


posizione di saturazione

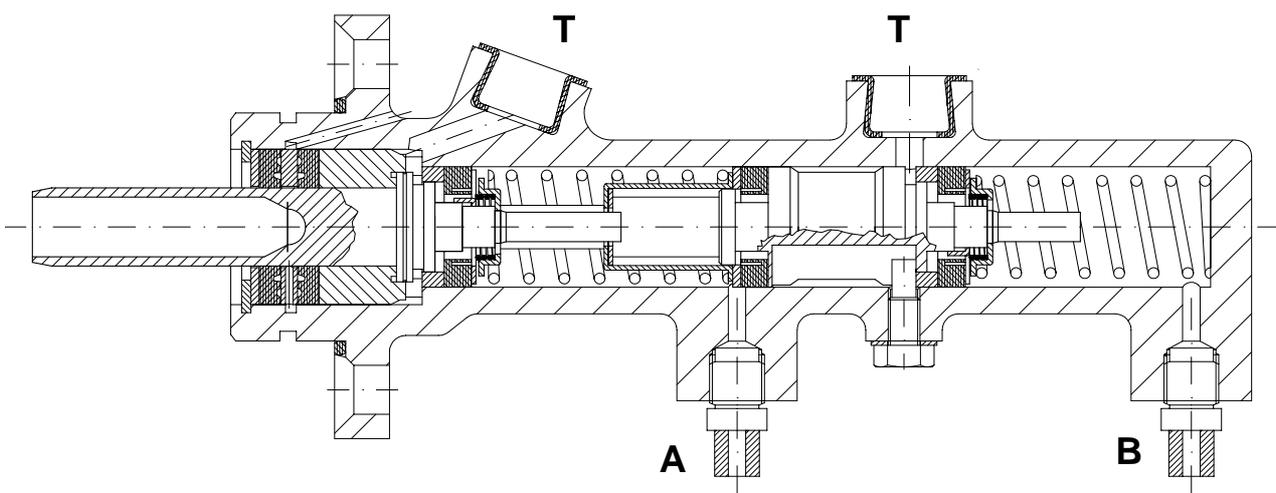


## POMPA DOPPIA:

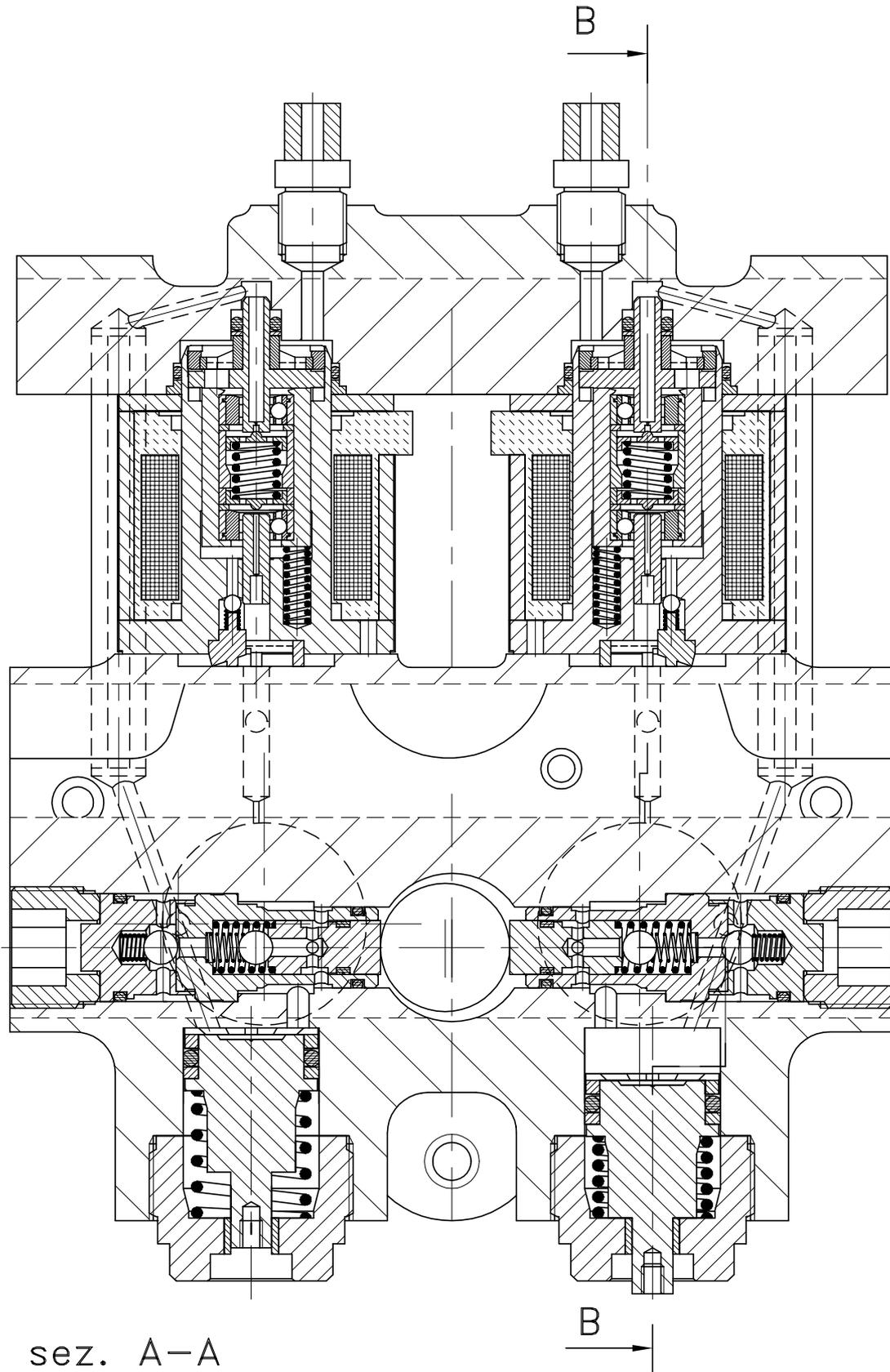
### ingrandimento degli organi di tenuta



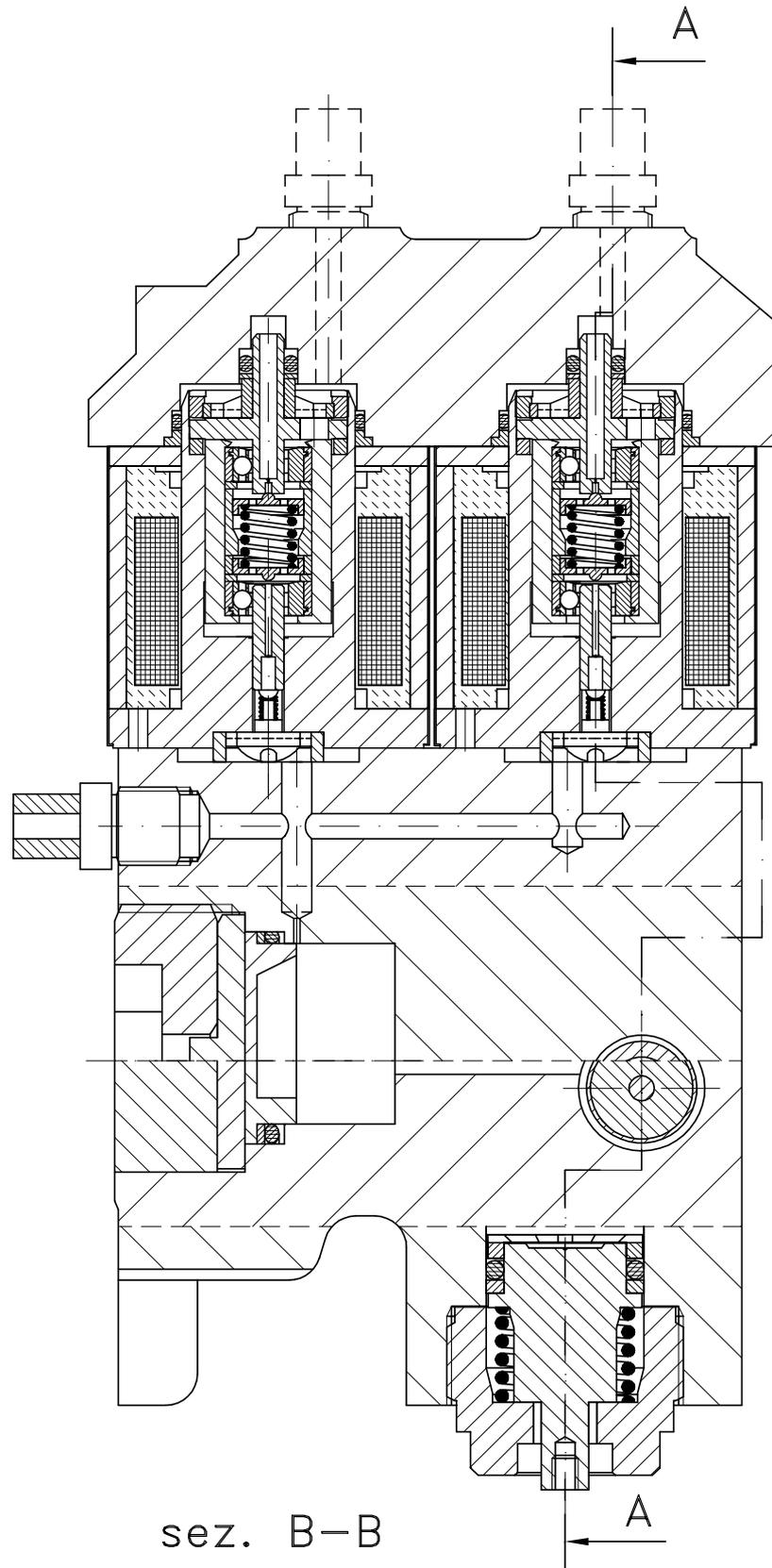
### pistoni di lavoro



ABS 2S BOSCH: sezione

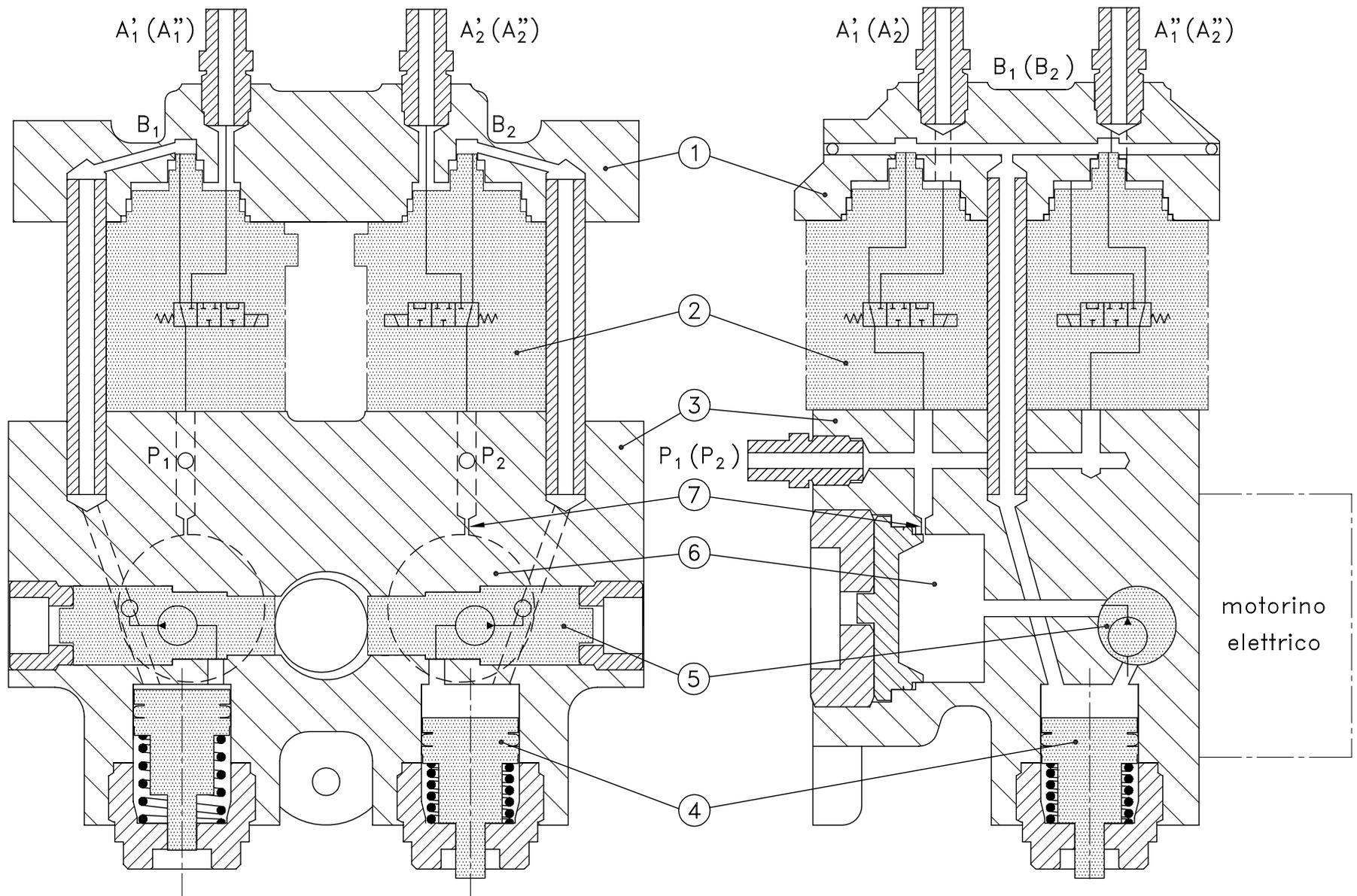


**ABS 2S BOSCH: sezione**

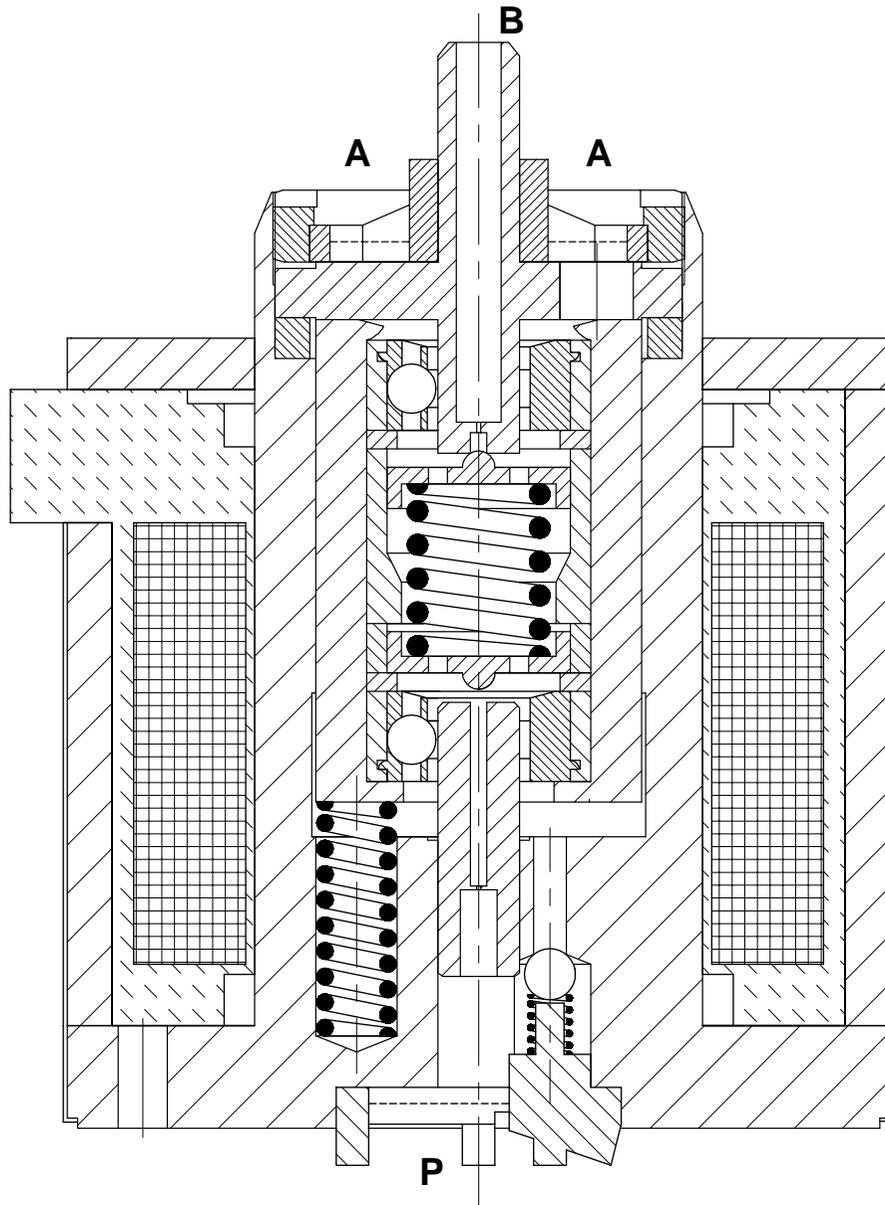


sez. B-B

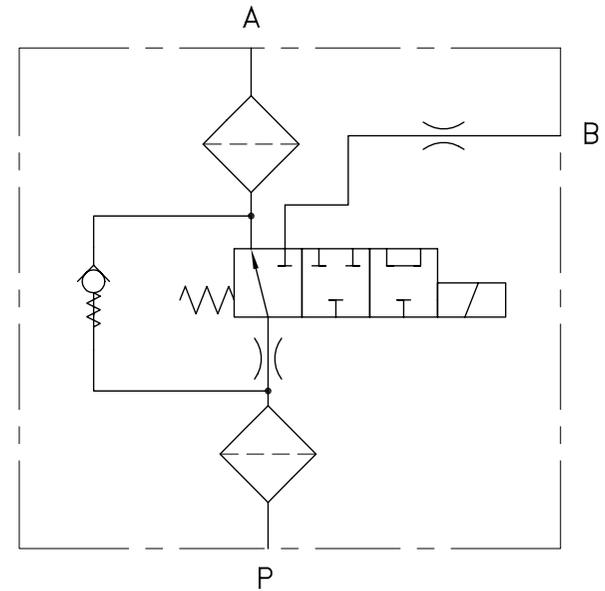
# ABS 2S BOSCH: schema semplificato



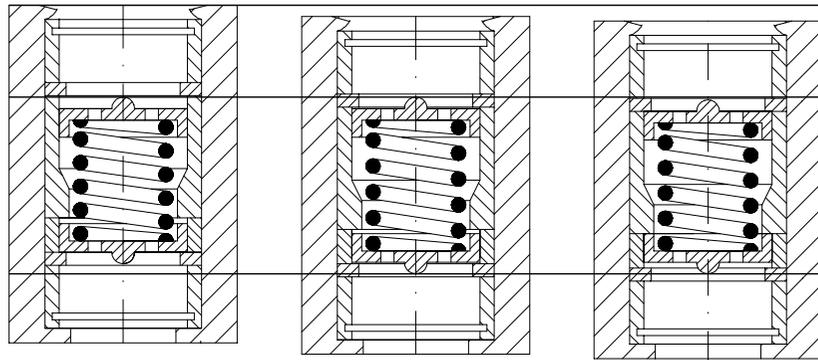
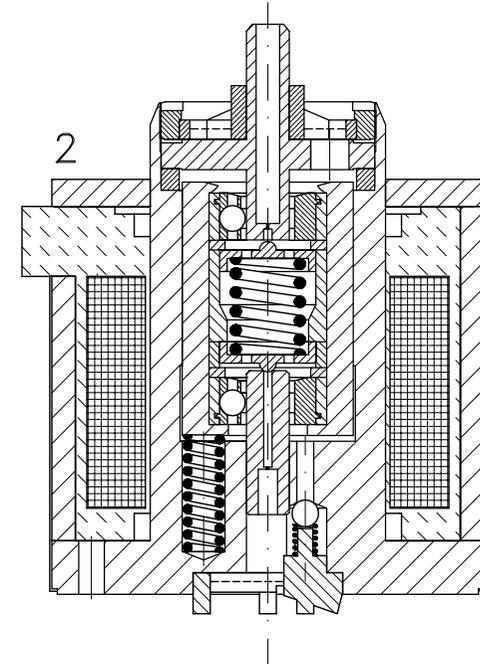
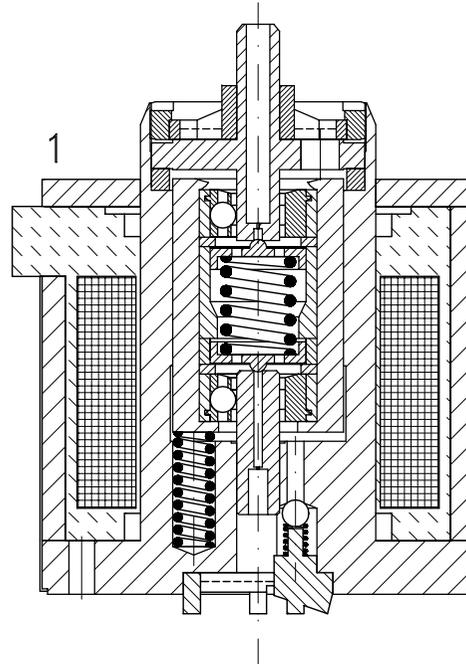
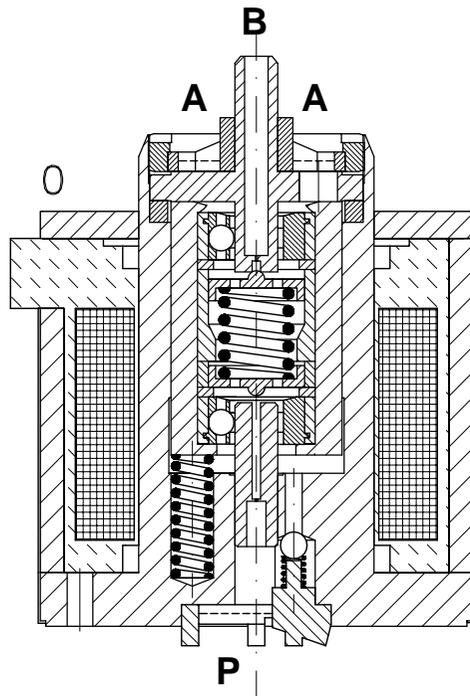
# ABS 2S BOSCH: ingrandimento della valvola a solenoide



## schema simbolico equivalente



## ABS 2S BOSCH: ingrandimento della valvola a solenoide nelle tre posizioni



fine corsa superiore  
del cassetto

fine corsa dell'otturatore  
della valvola di ritorno

fine corsa dell'otturatore  
della valvola di alimentazione

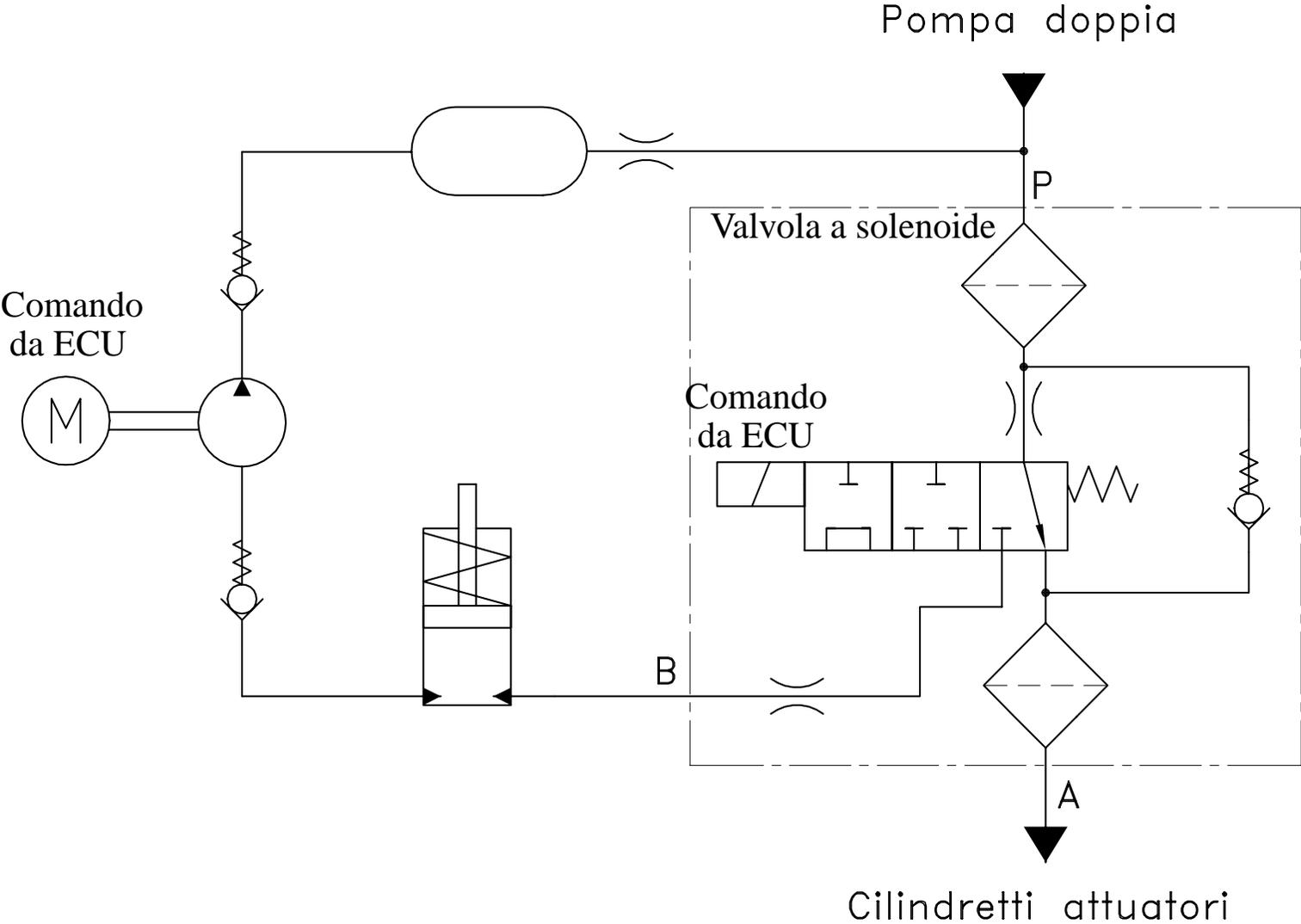
fine corsa inferiore  
del cassetto

0: posizione di riposo

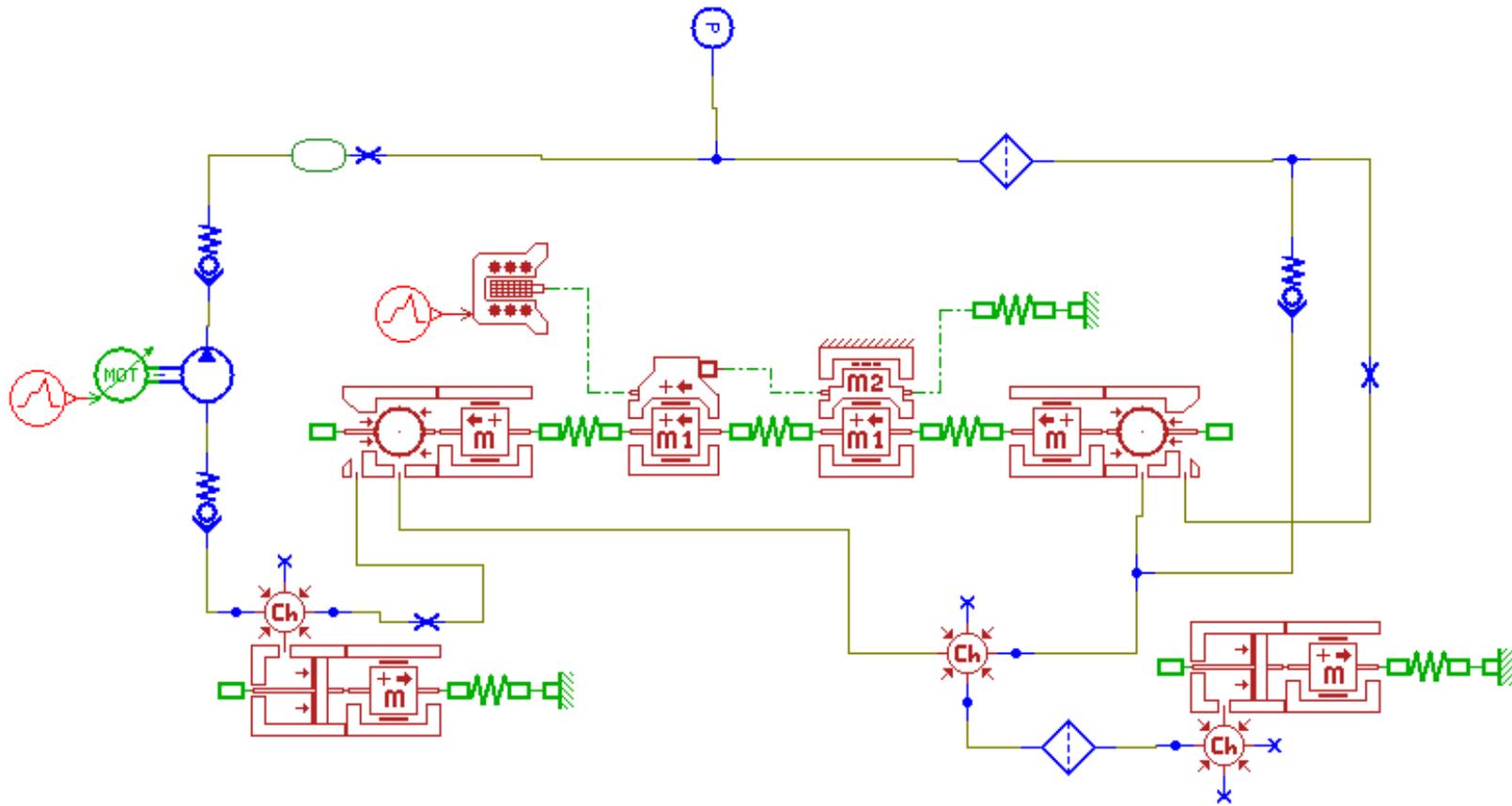
1: posizione intermedia

2: posizione di scarico

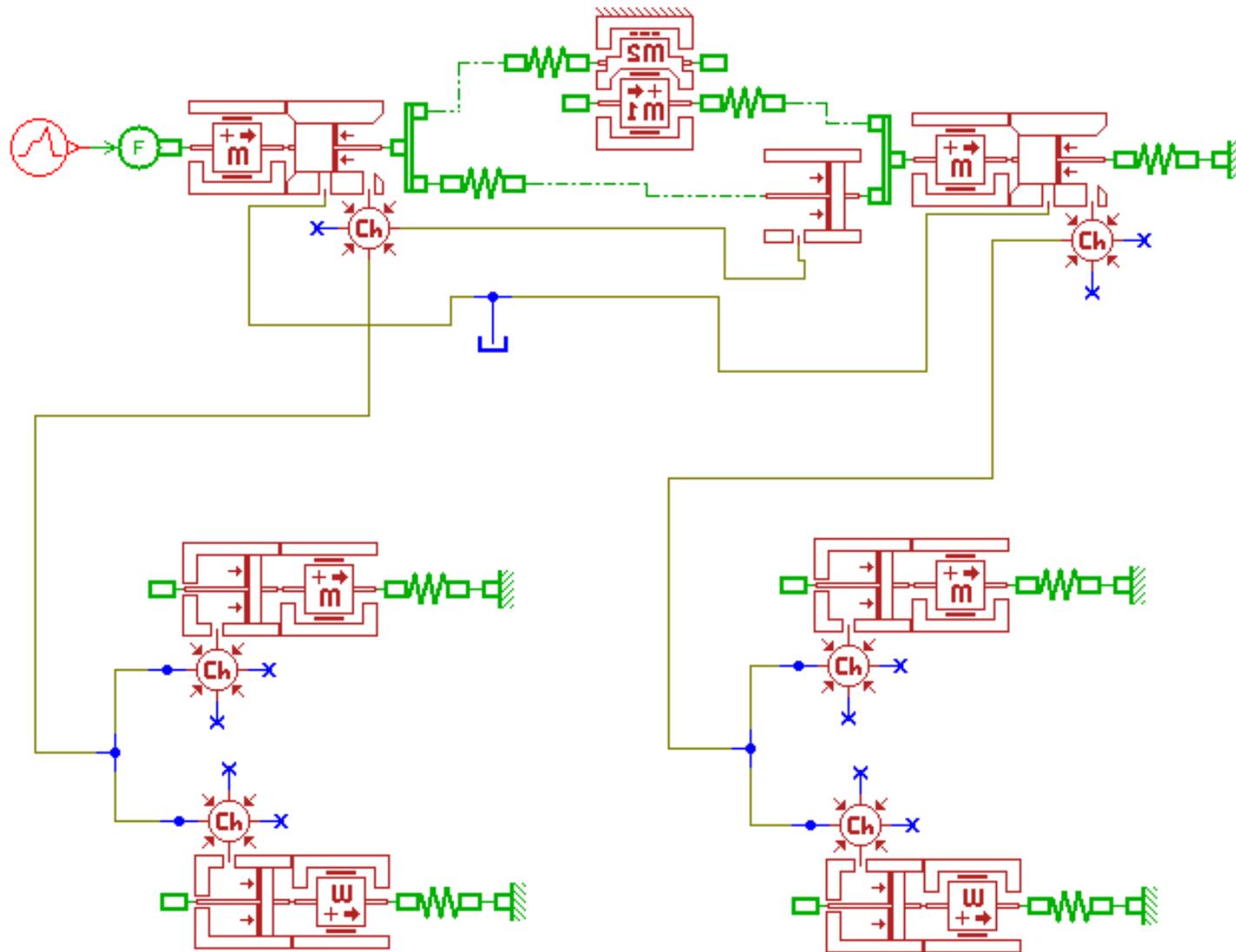
**ABS 2S BOSCH: schema simbolico equivalente delle parti simulate**



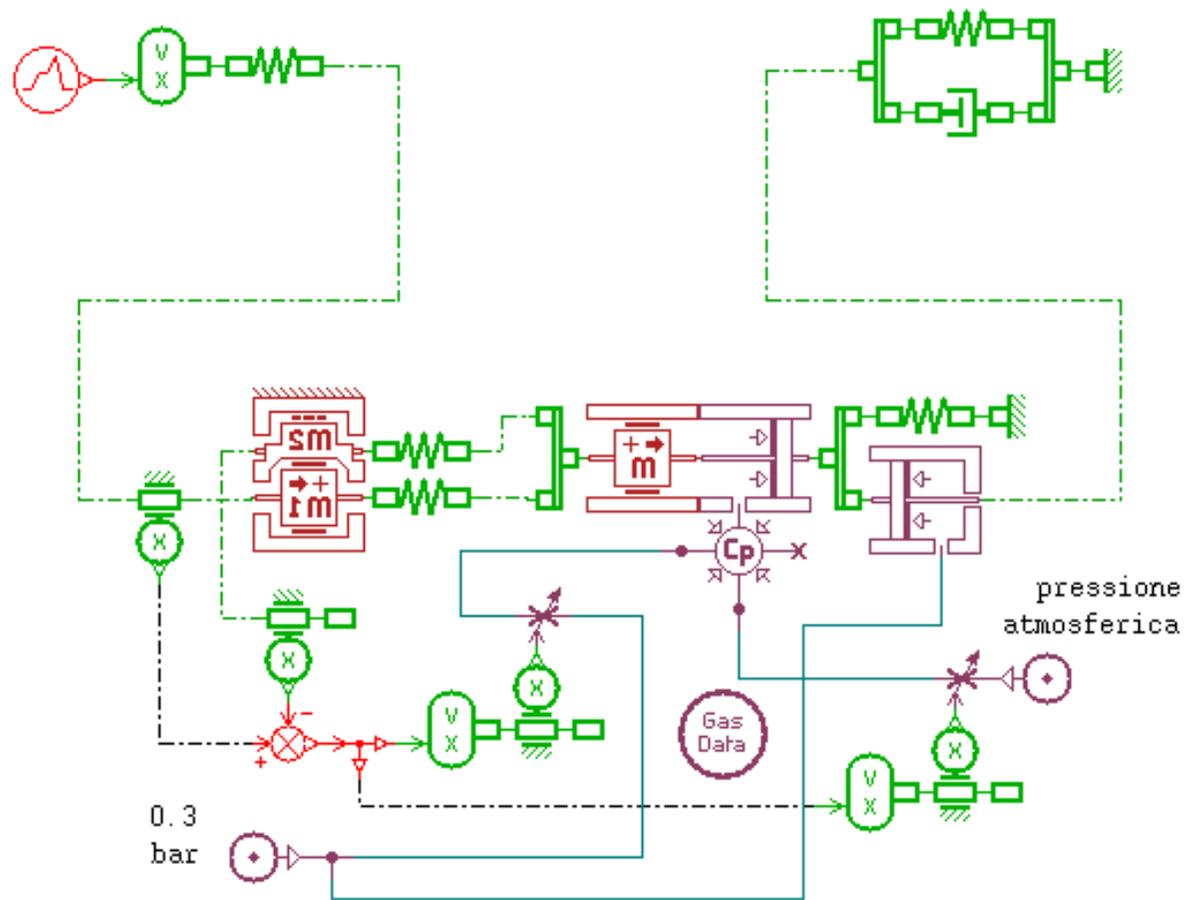
# ABS 2S BOSCH: circuito di simulazione



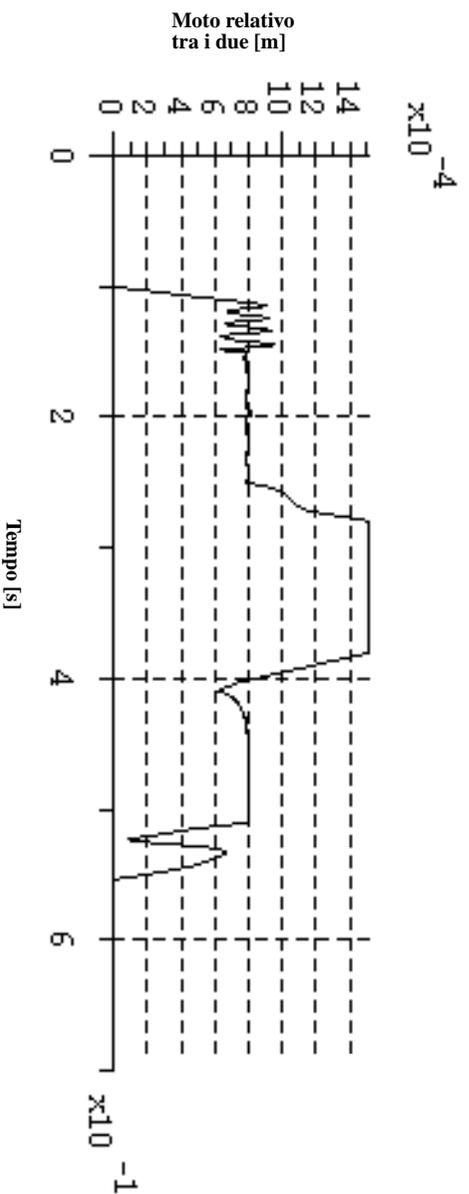
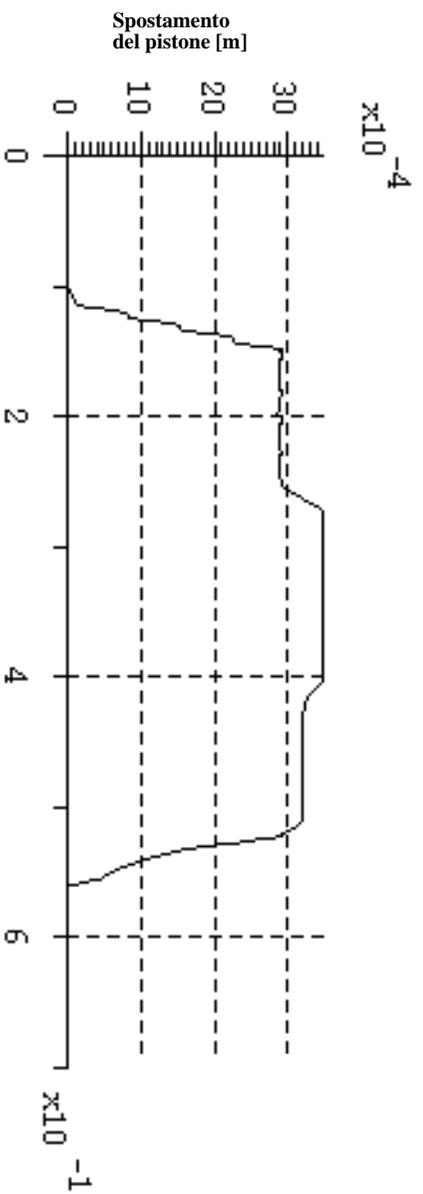
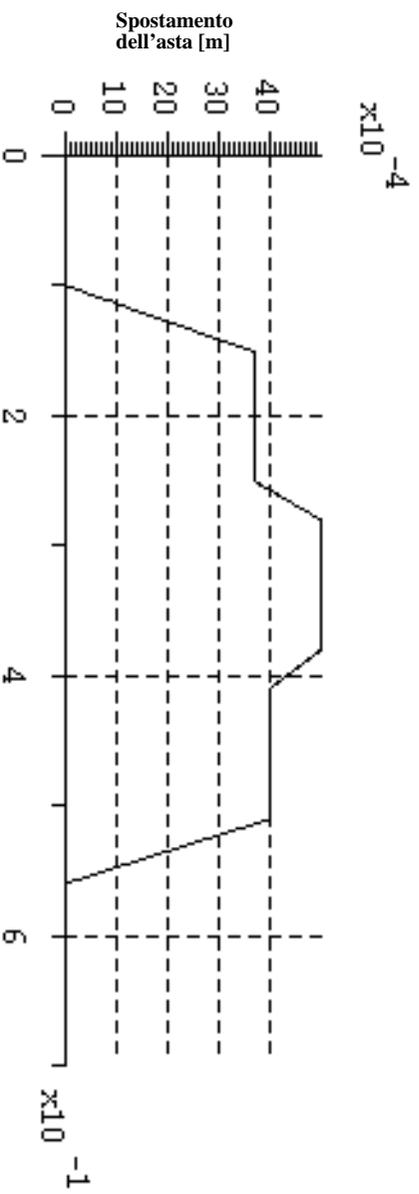
## POMPA DOPPIA E ATTUATORI DI FRENATURA: circuito di simulazione



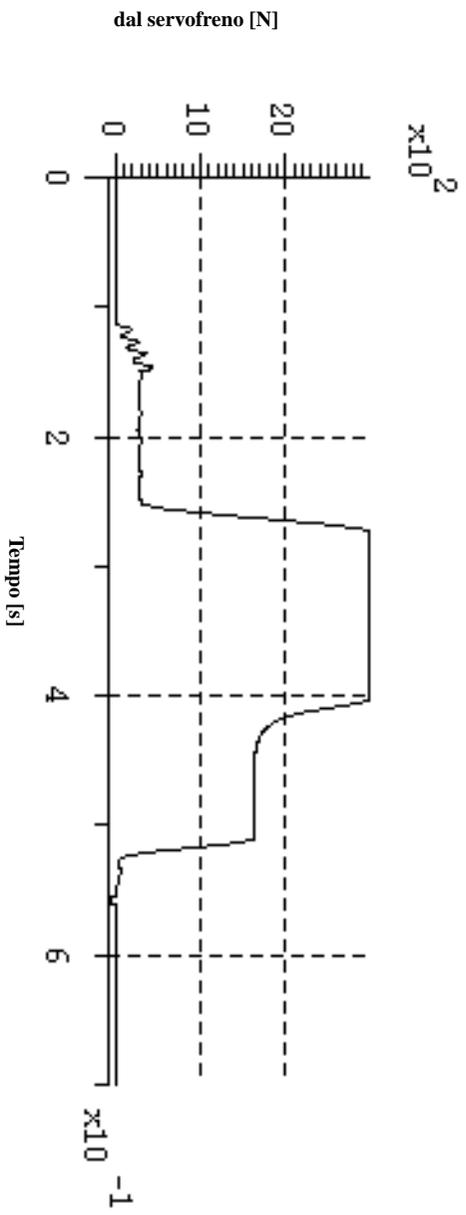
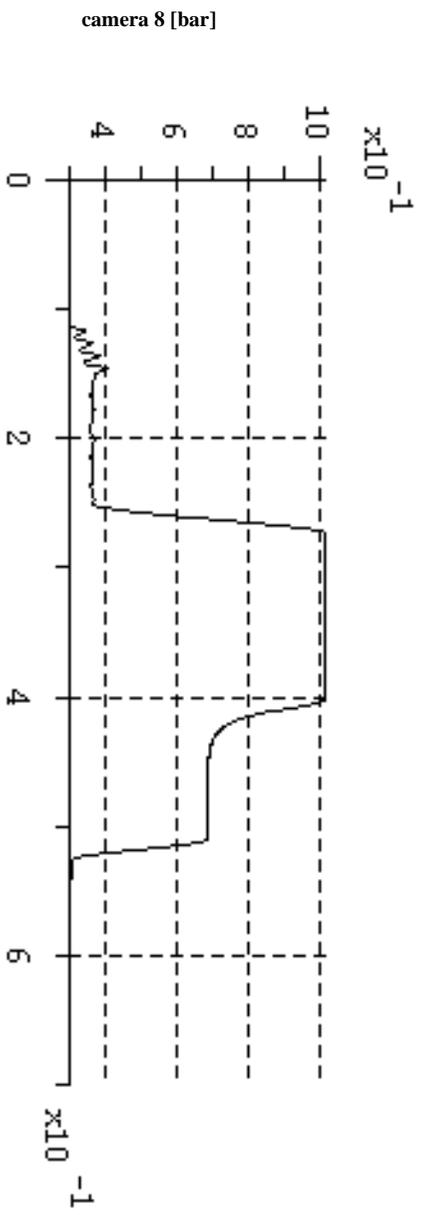
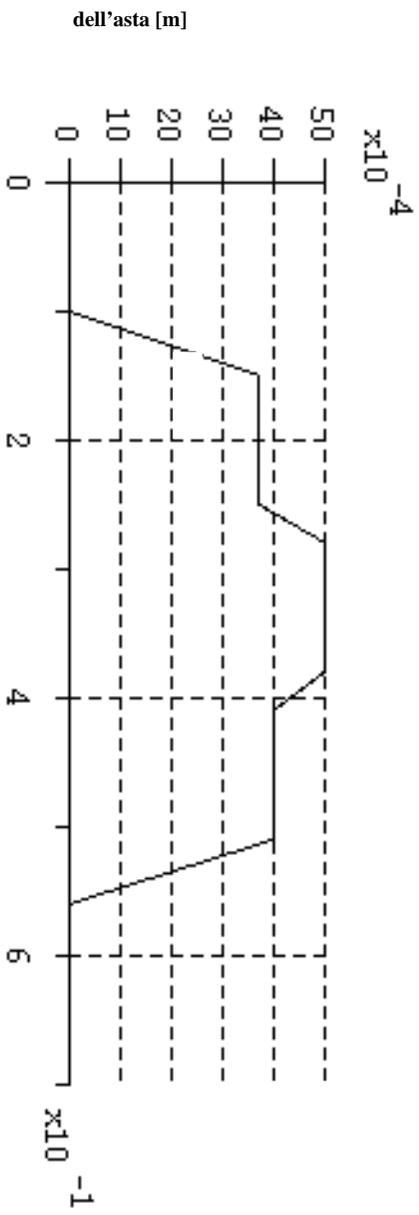
## SERVOFRENO: circuito di simulazione



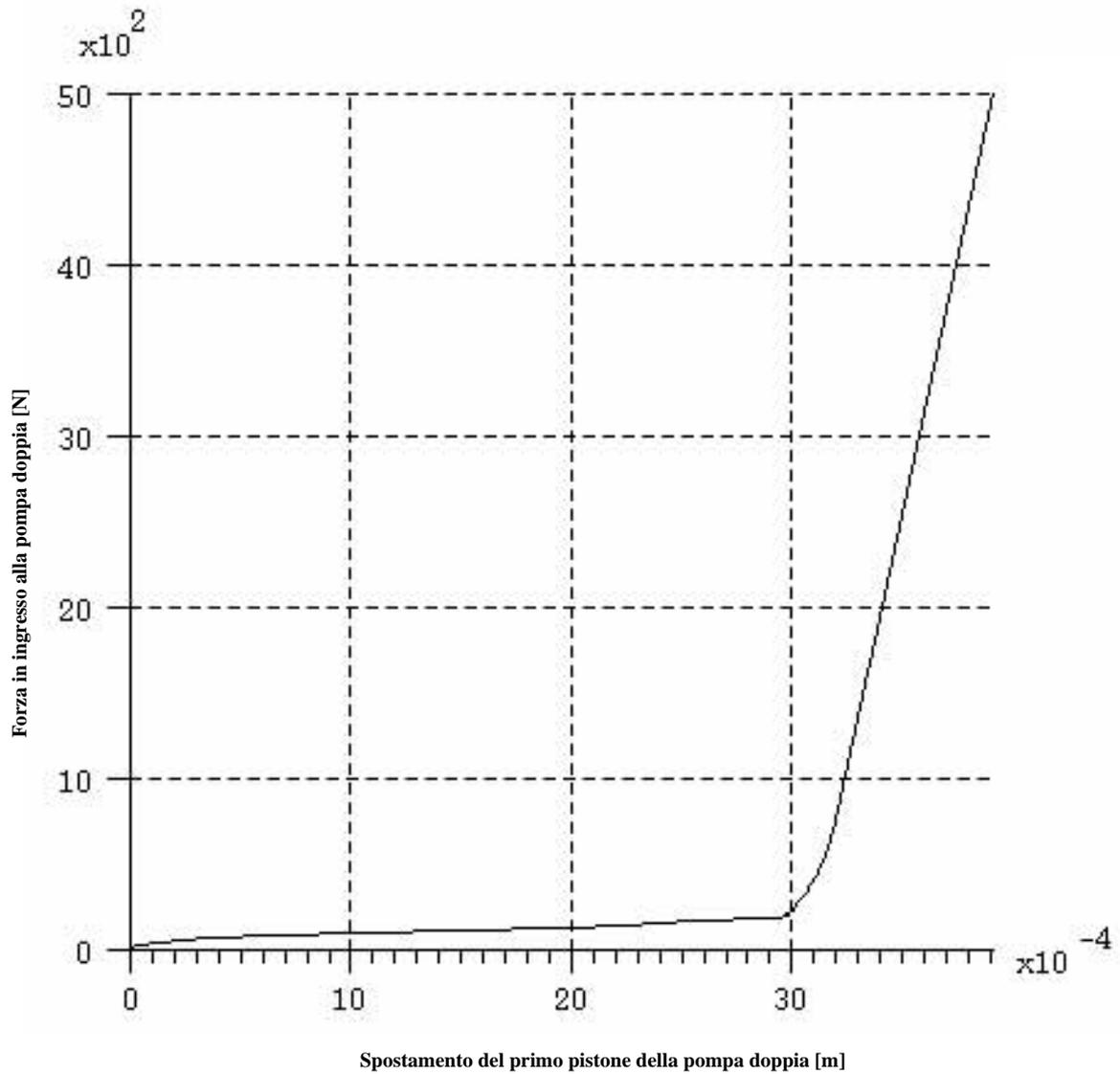
## SERVOFRENO: confronto tra gli spostamenti di asta e pistone



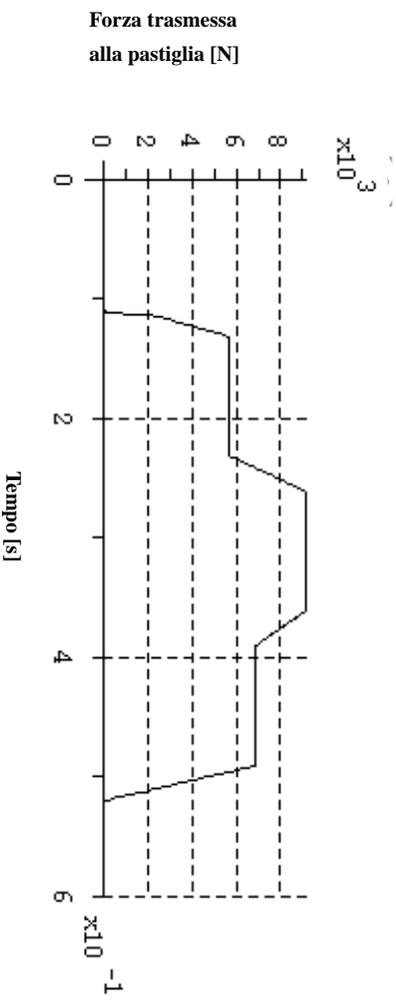
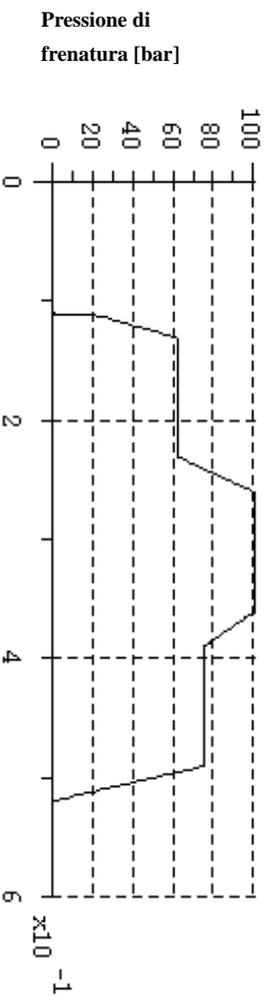
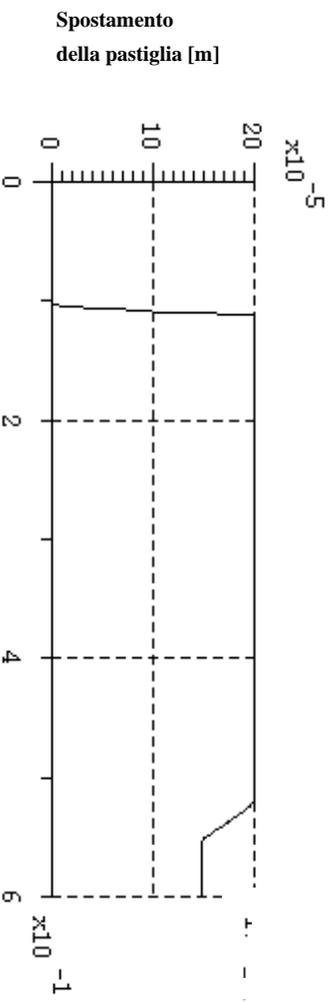
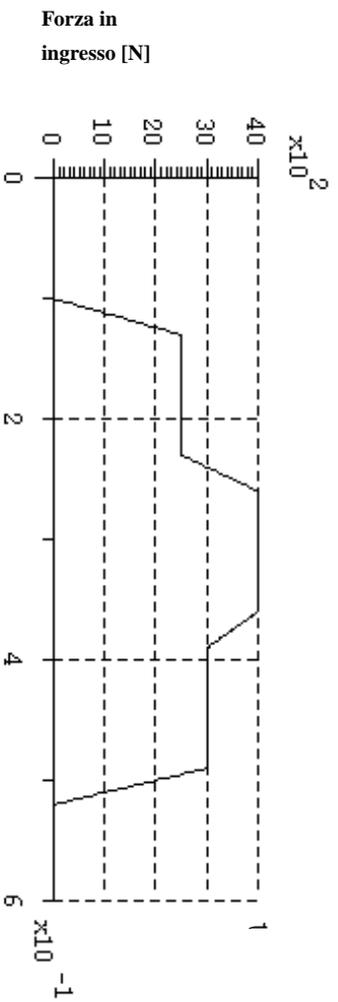
# SERVOFRENO: forza in uscita



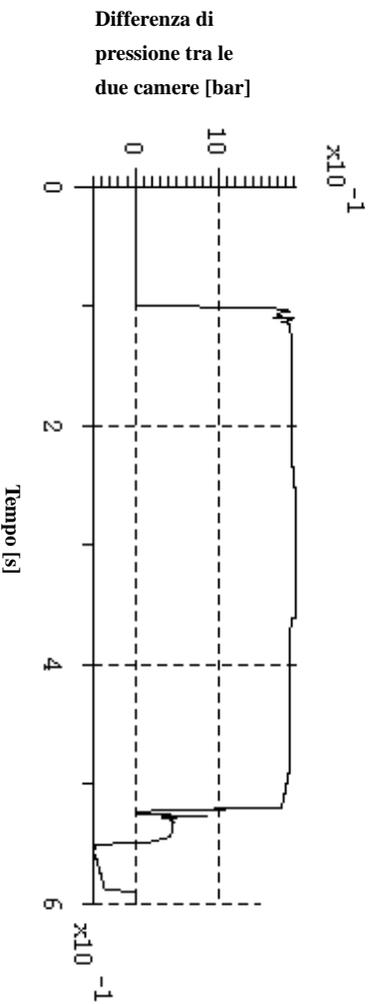
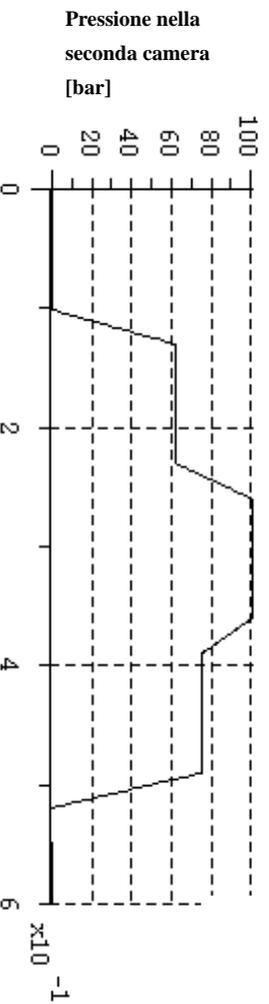
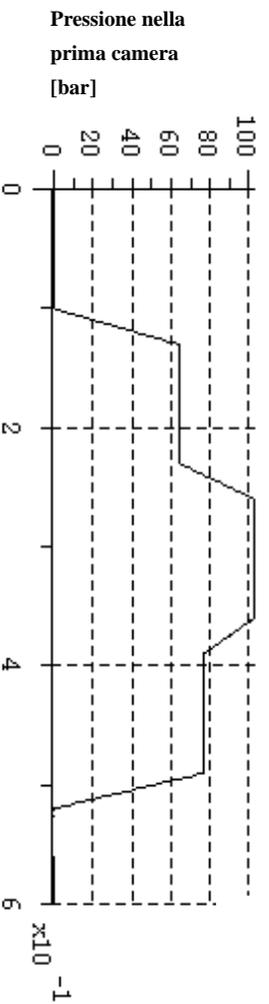
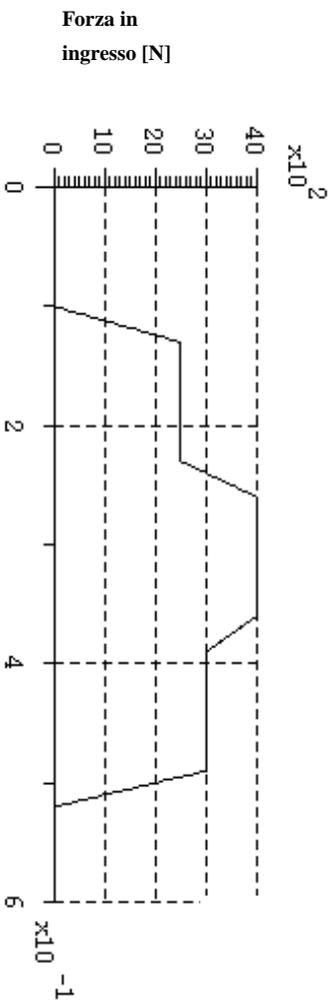
## Caratteristica di rigidezza della pompa doppia



## Forza trasmessa ad una pastiglia di una ruota posteriore

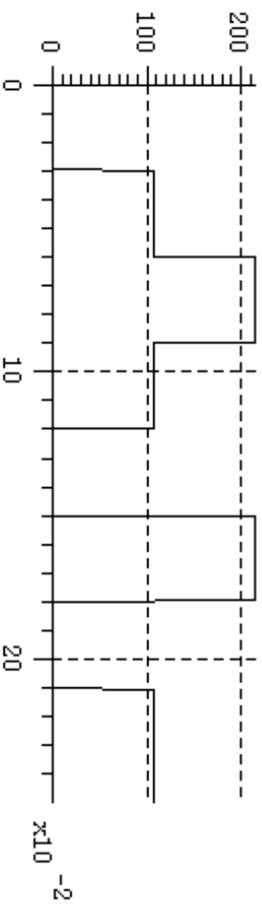


# POMPA DOPPIA: pressione nelle due camere a volume variabile

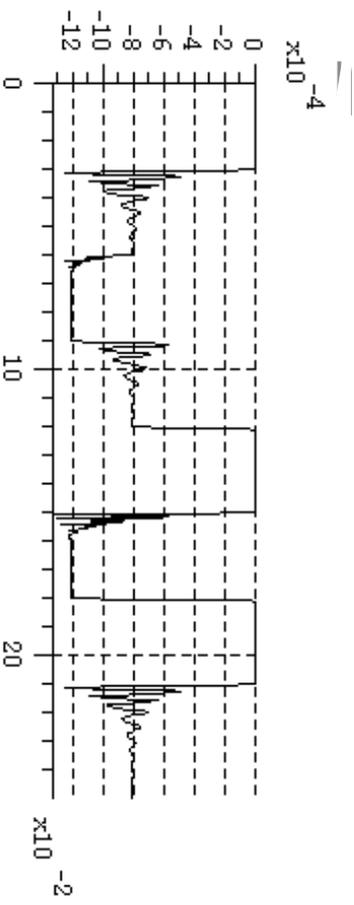


# ABS 2S BOSCH: spostamento di camicia e otturatori

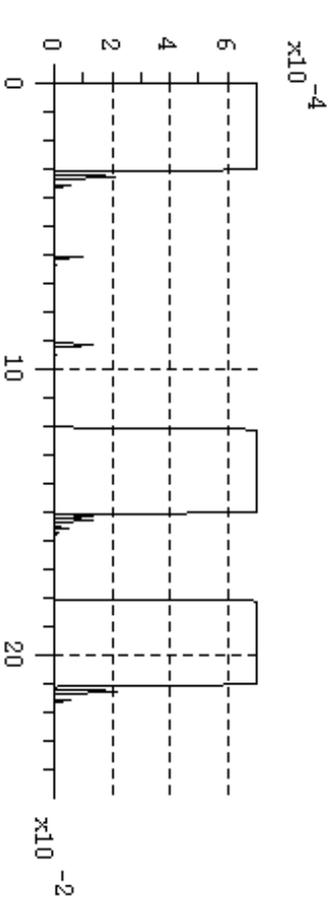
Forza del solenoide [N]



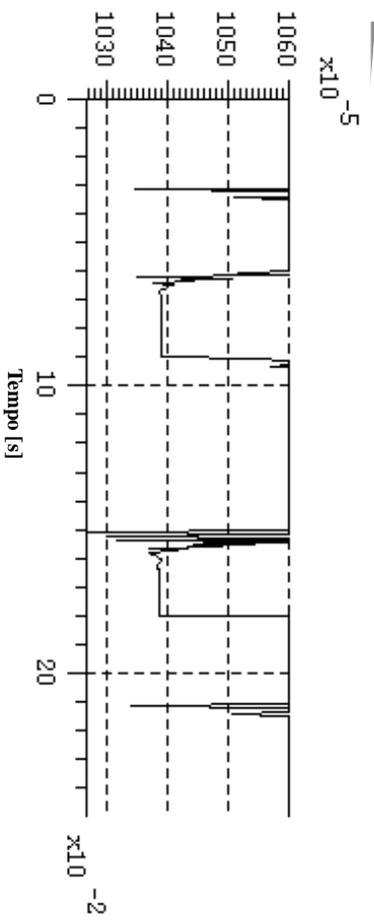
Spostamento della camicia [m]



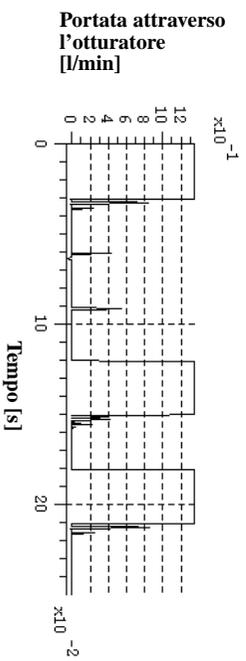
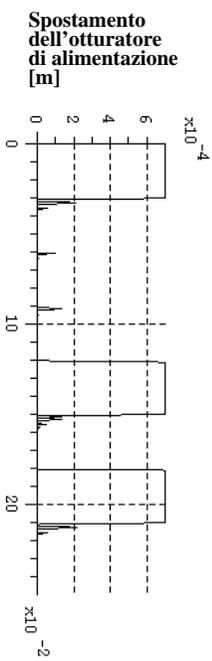
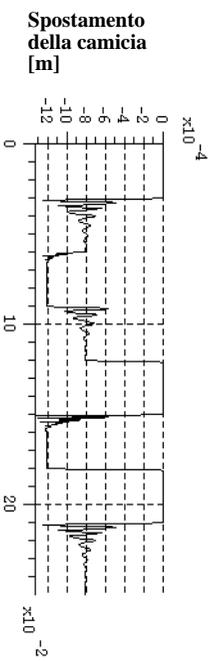
Spostamento dell'otturatore di alimentazione [m]



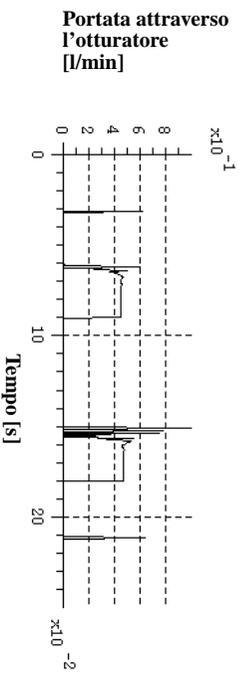
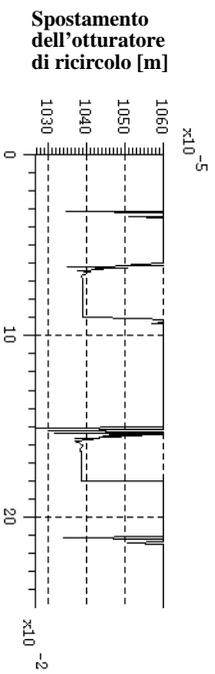
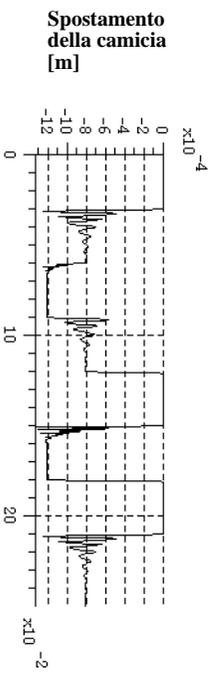
Spostamento dell'otturatore di ricircolo [m]



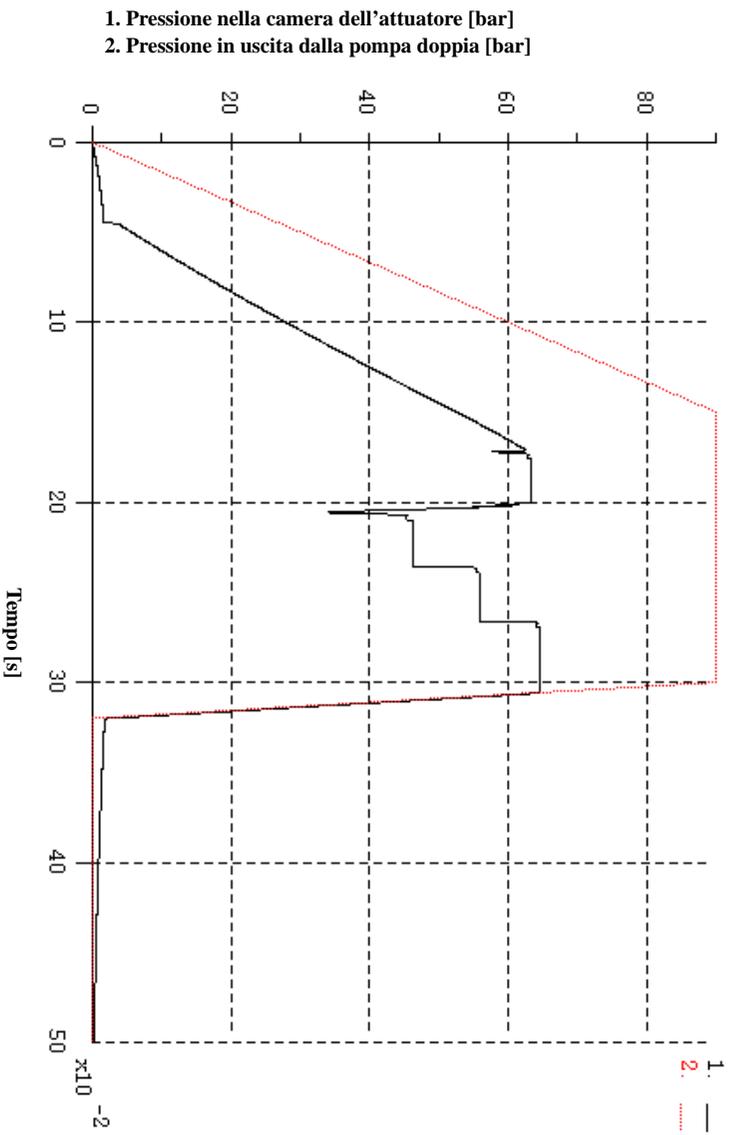
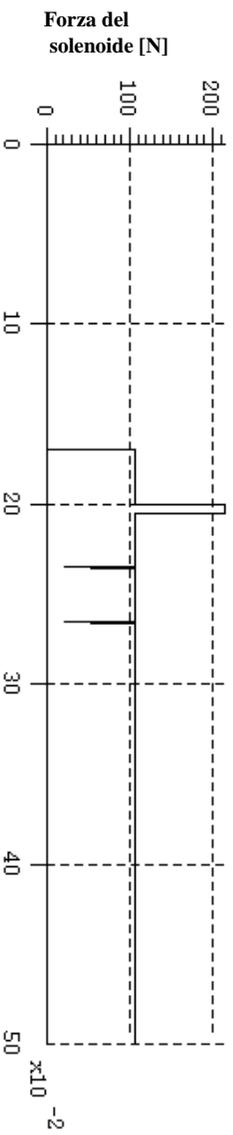
# ABS 2S BOSCH: portata attraverso gli otturatori di alimentazione



e di mandata



# ABS 2S BOSCH: pressione di frenatura sulla ruota controllata



## GRAFICI DI CONFRONTO

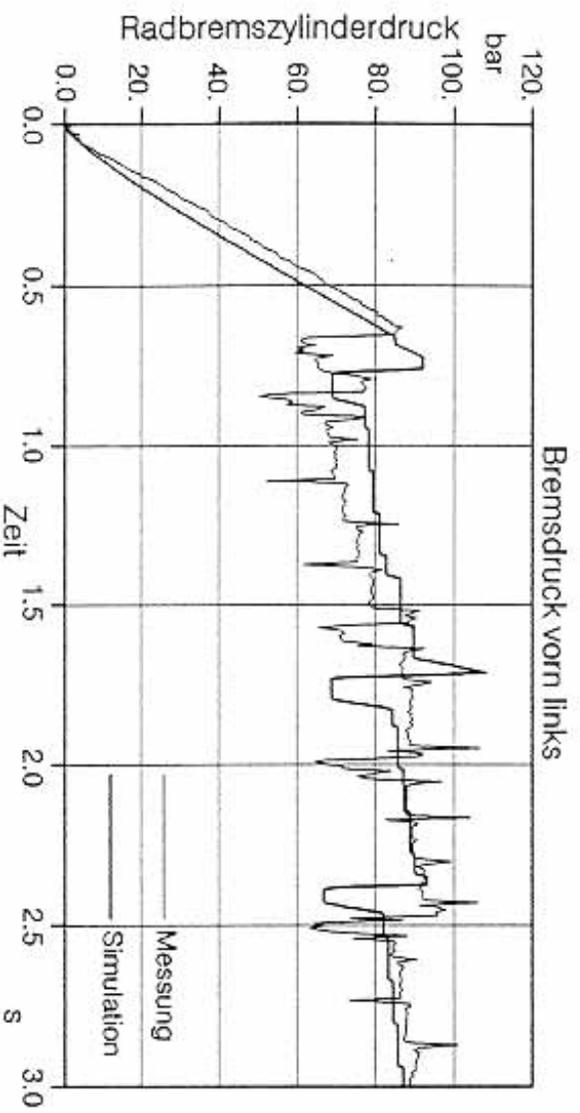
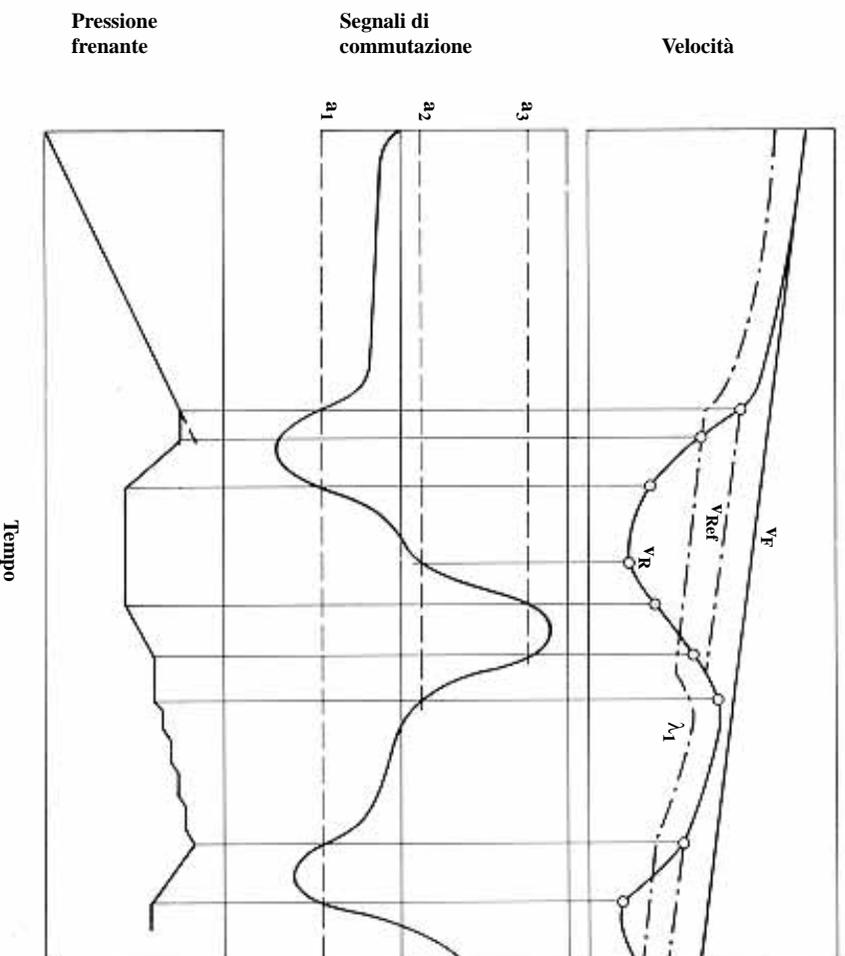
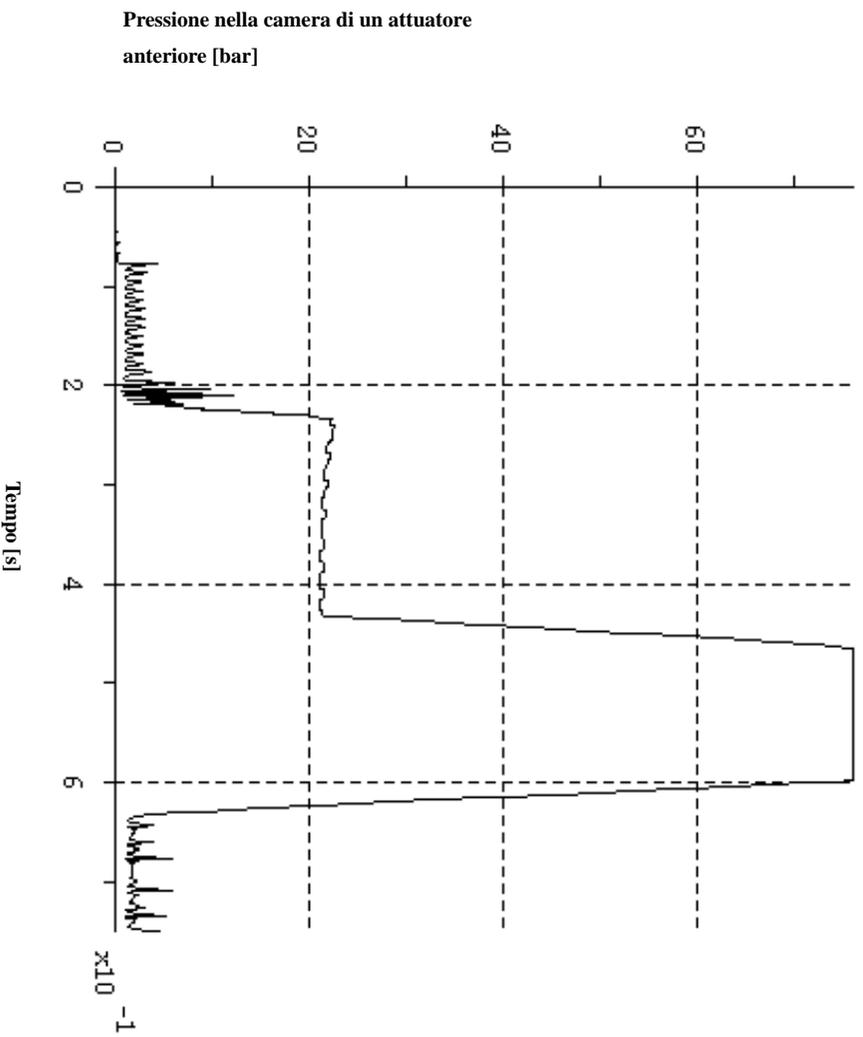
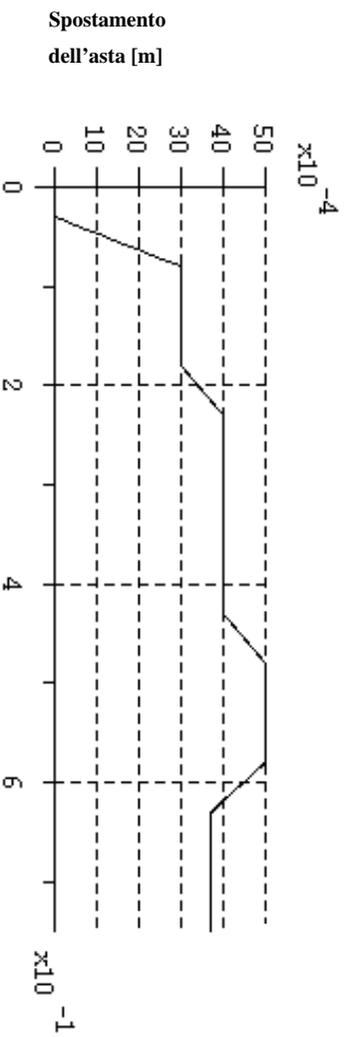
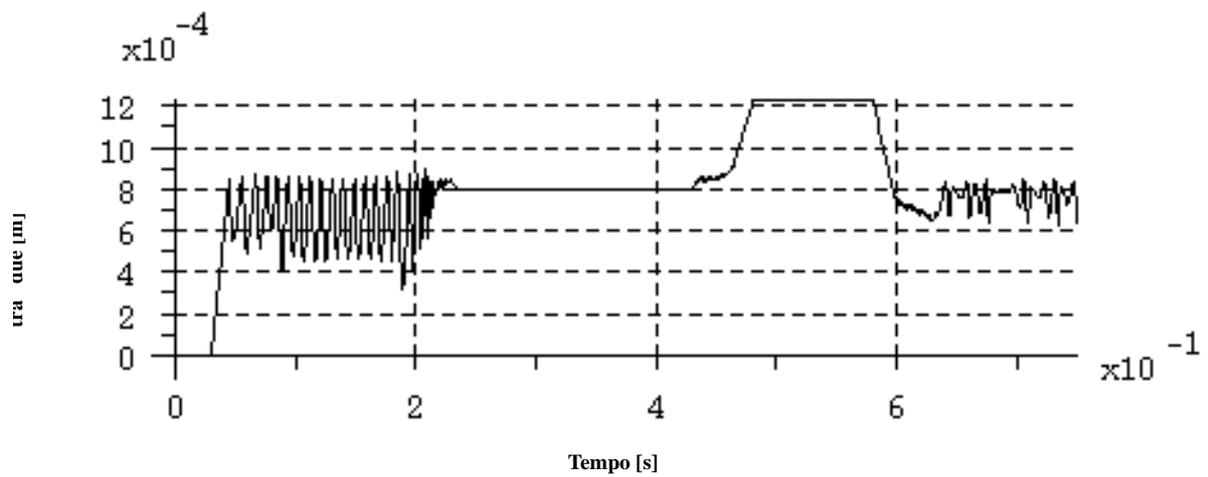
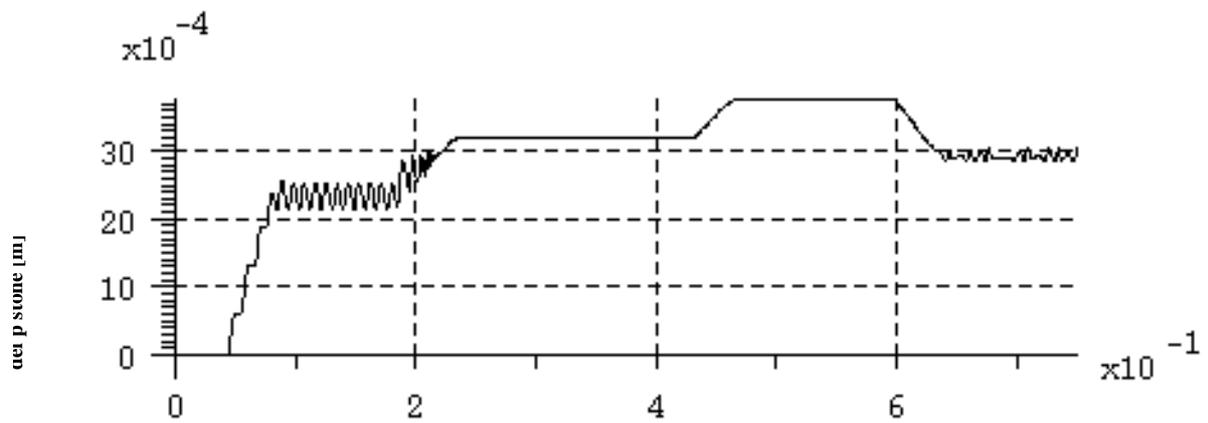
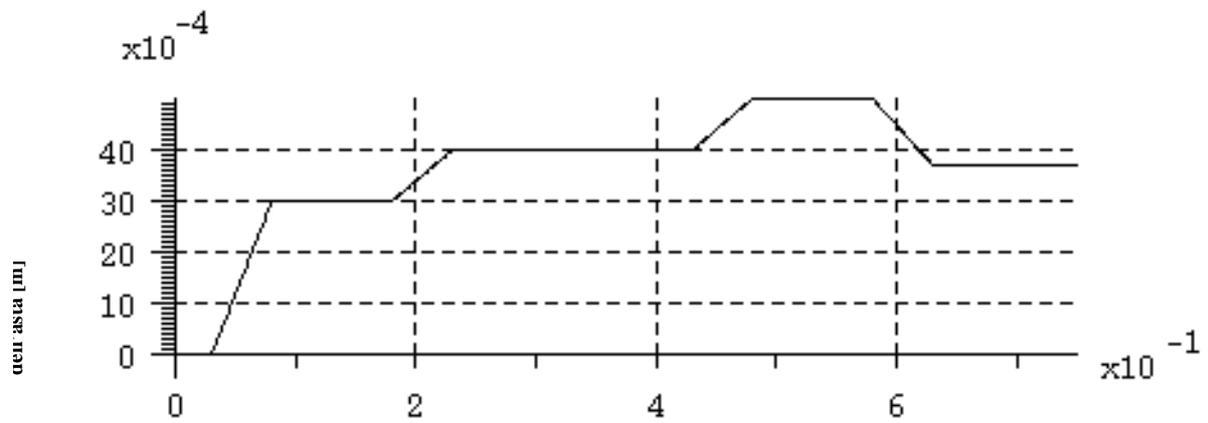


Abb. 5.4: Bremsdruckverlauf am linken Vorderrad bei einer geregelten Bremsung aus ca. 100 km/h auf griffiger, schwach unebener Fahrbahn; Vergleich zwischen Messung und Simulation.

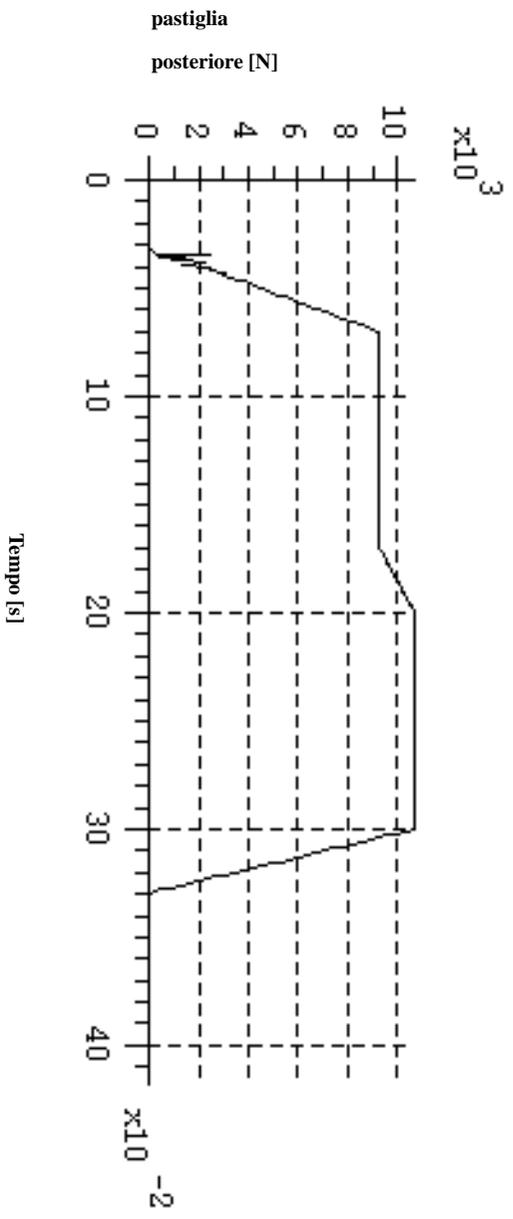
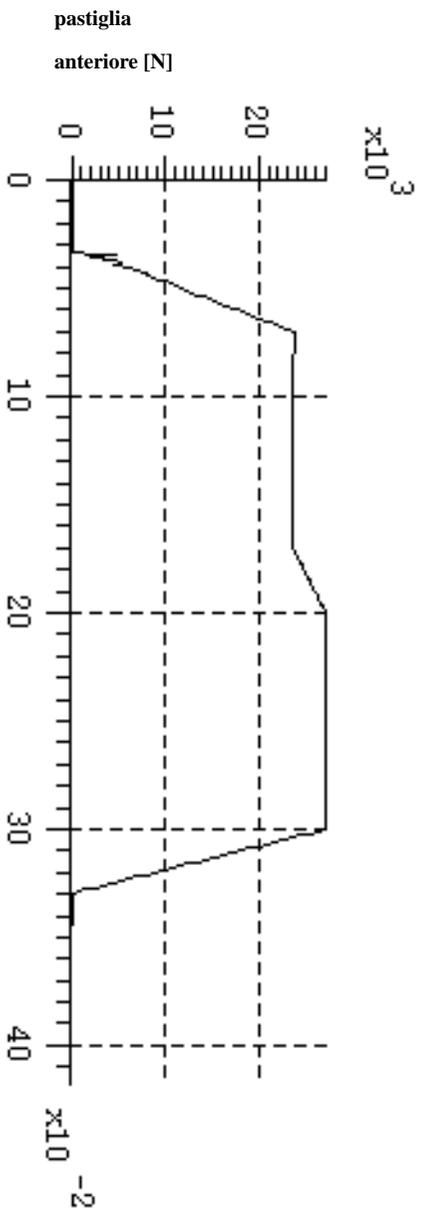
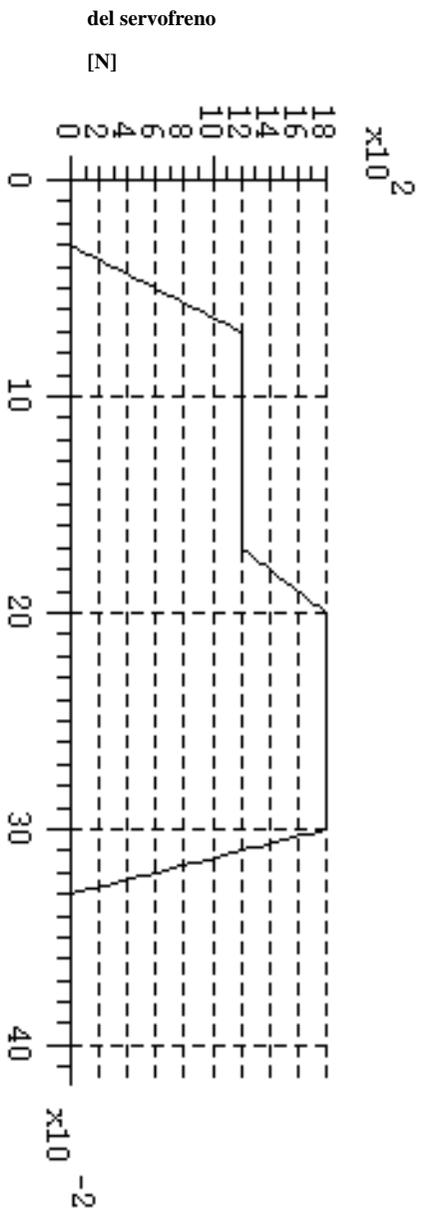
# POMPA DOPPIA: pressione nella camera di un attuatore anteriore



# SERVOFRENO: confronto tra gli spostamenti delle parti mobili



# FORZE TRASMESSE AI DISCHI: valori massimi



# **AMESim**

## **Adaptive Modelling Environment for Simulation**

### **SKETCH:**

disposizione delle icone sul piano di lavoro

### **SUBMODELS:**

assegnazione a ciascuna icona del sottomodello più adatto

### **PARAMETERS:**

assegnazione ai sottomodelli dei parametri ricavati

### **SIMULATION:**

integrazione delle equazioni differenziali ordinarie