



Escola Tècnica Superior d'Enginyeries  
Industrial i Aeronàutica de Terrassa



# General Assembly

Meeting PROHIPP (period 37-48 month)

26-27 May 2008  
Vic (Catalonia-Spain)



## Studied cases:

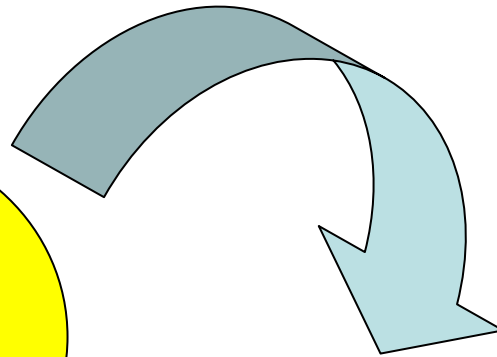
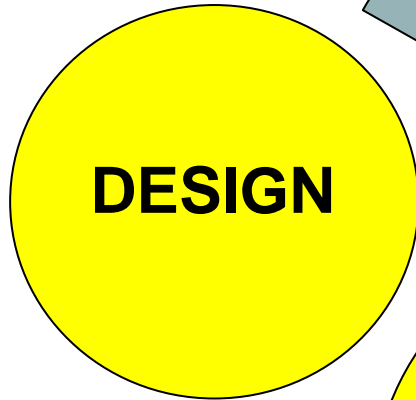
- Dumper truck (SEMPERE)
- Backhoe LEON (HIDRAR)
- Backhoe BMH (HIDRAR)

Partners involved:

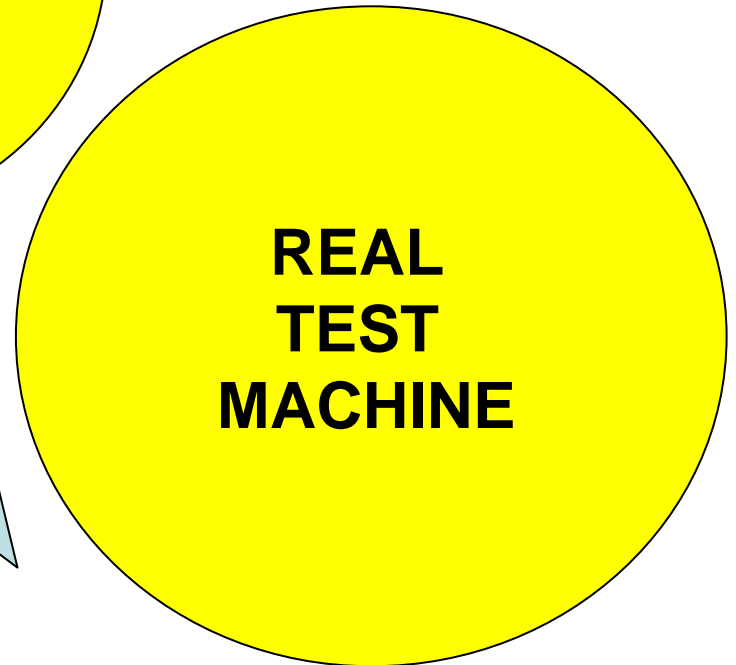
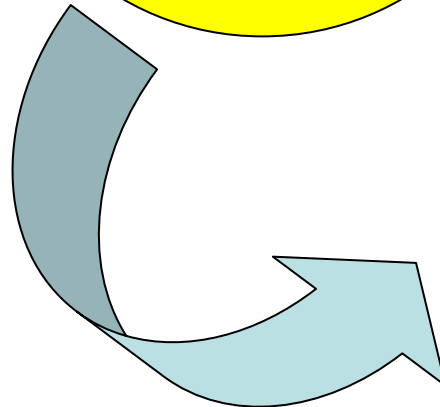
IMAMOTER, Pedro ROQUET SA, HIDRAR, SEMPERE, UPC-LABSON

OBJECTIVE:

New  
idea



Check it

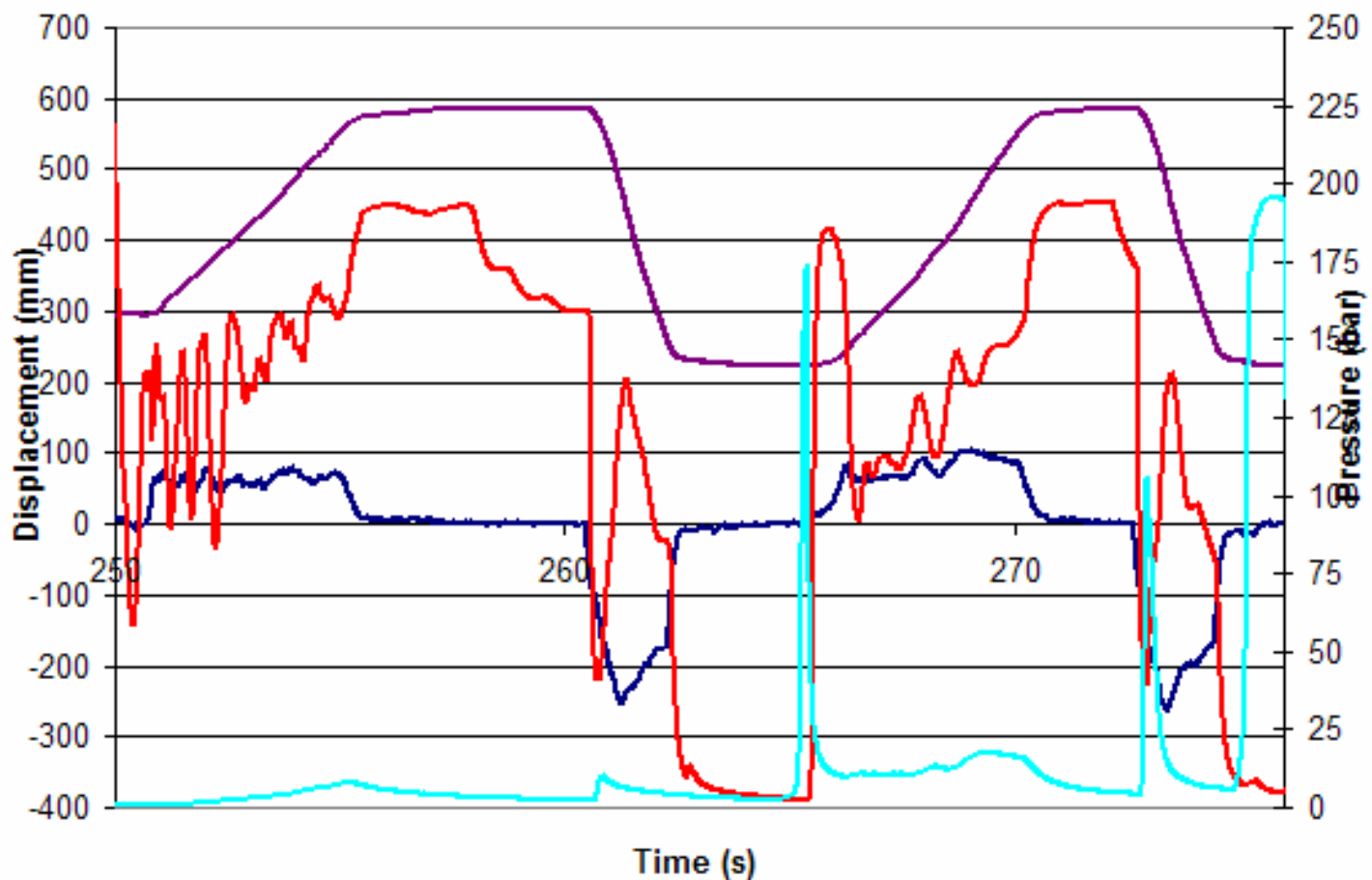


## BMH Backhoe

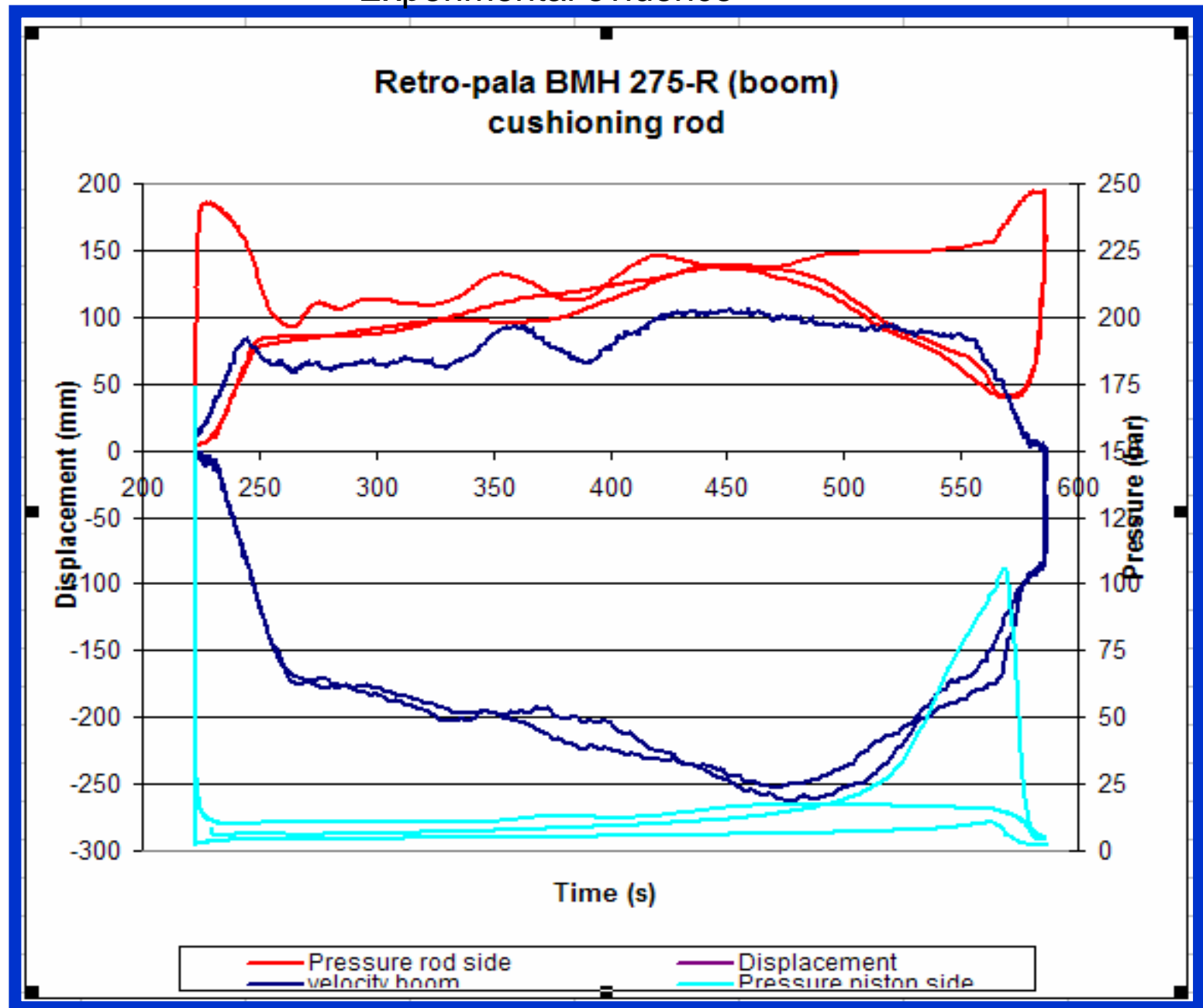


Photos by HIDRAR/ROQUET/LABSON

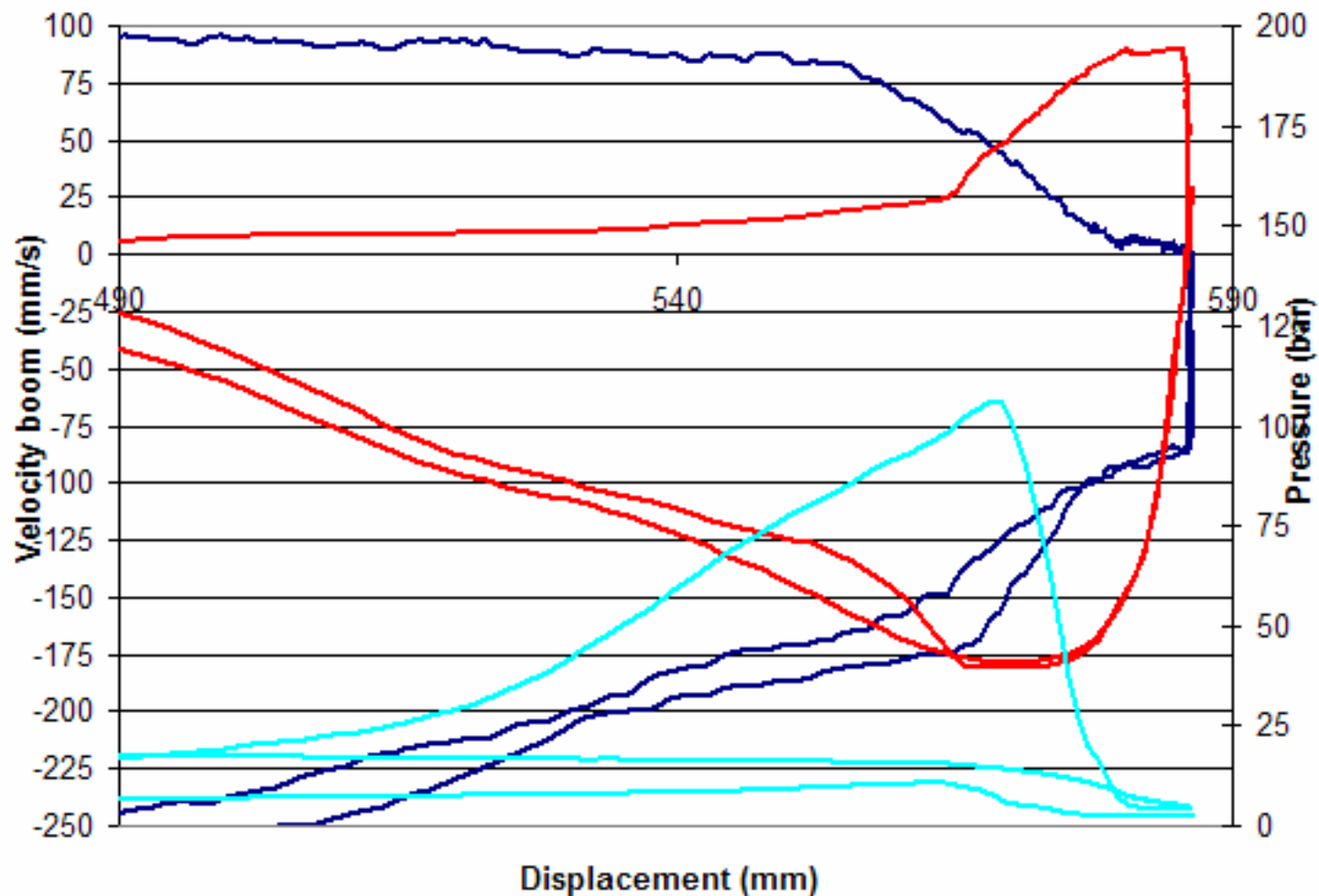
### Retro-pala BMH 275-R (boom) cushioning



# Experimental evidence

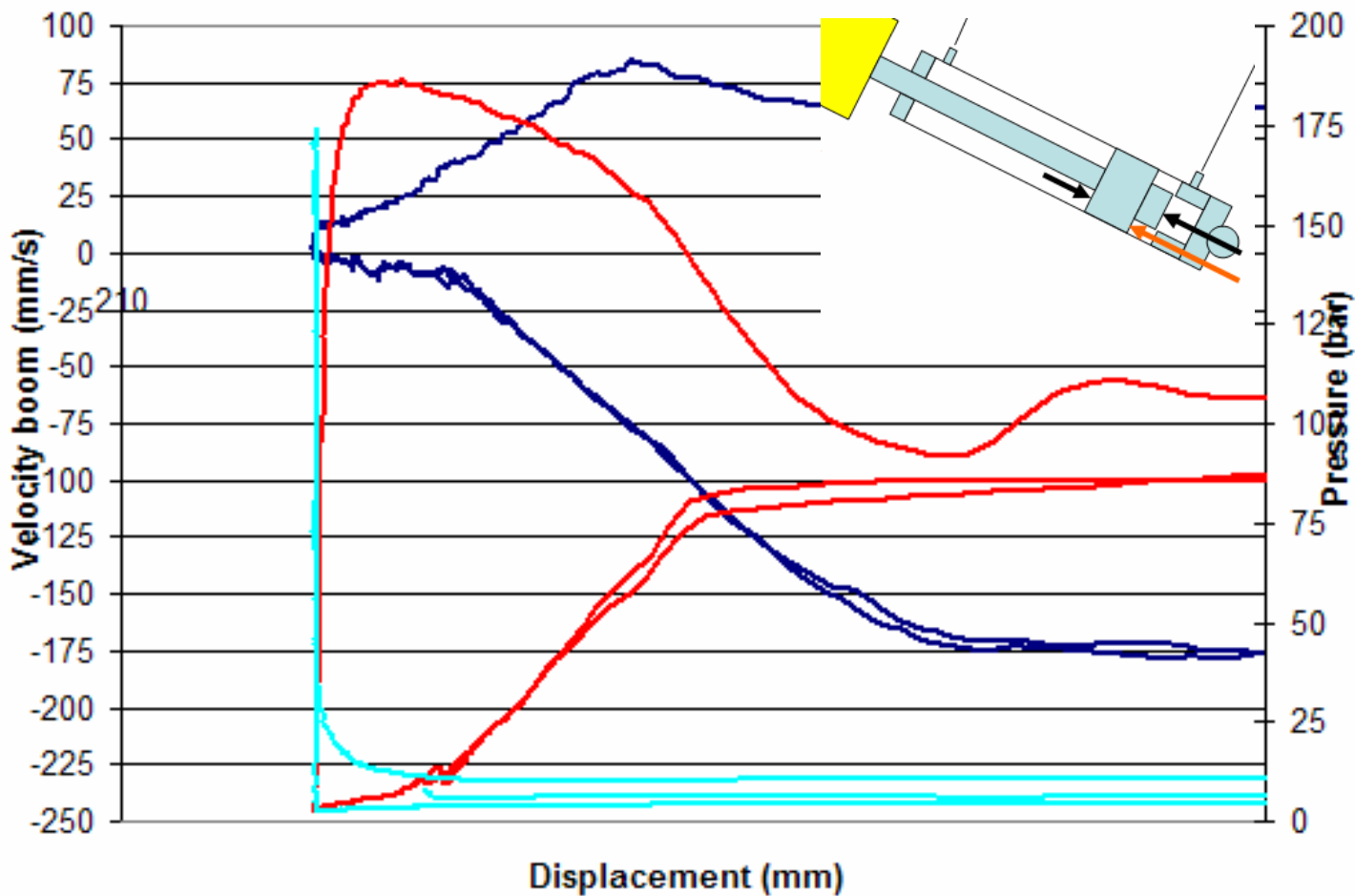


### Retro-pala BMH 275-R (boom) cushioning rod out



— Displacement  
— Pressure rod side  
— velocity boom  
— Pressure piston side

### Retro-pala BMH 275-R (boom) cushioning rod in



- Displacement
- velocity boom
- Pressure rod side
- Pressure piston side



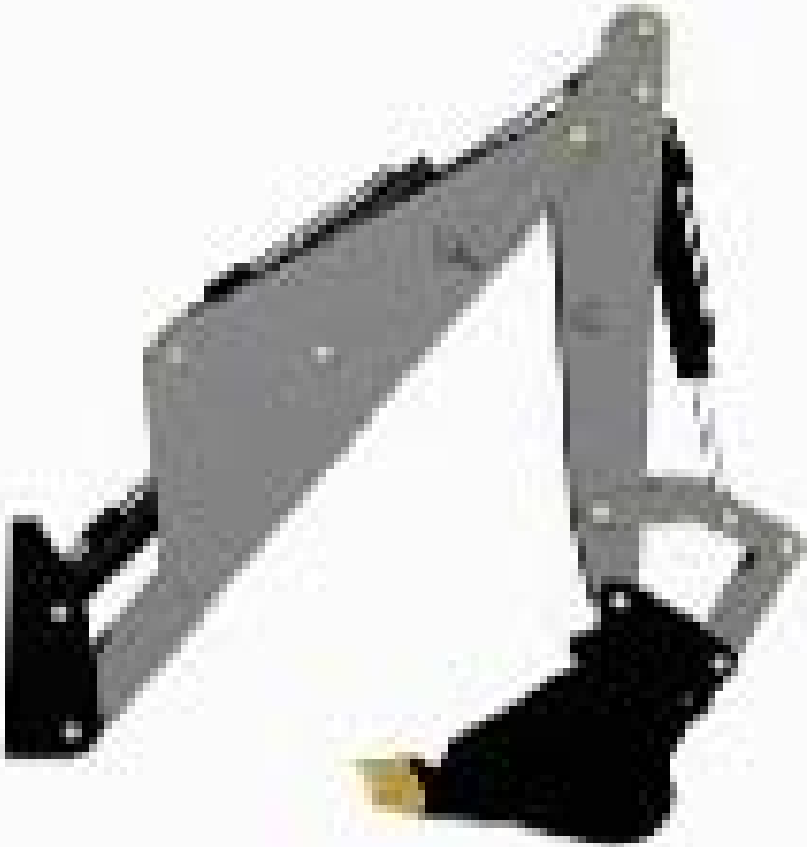
# BACKHOE LEON



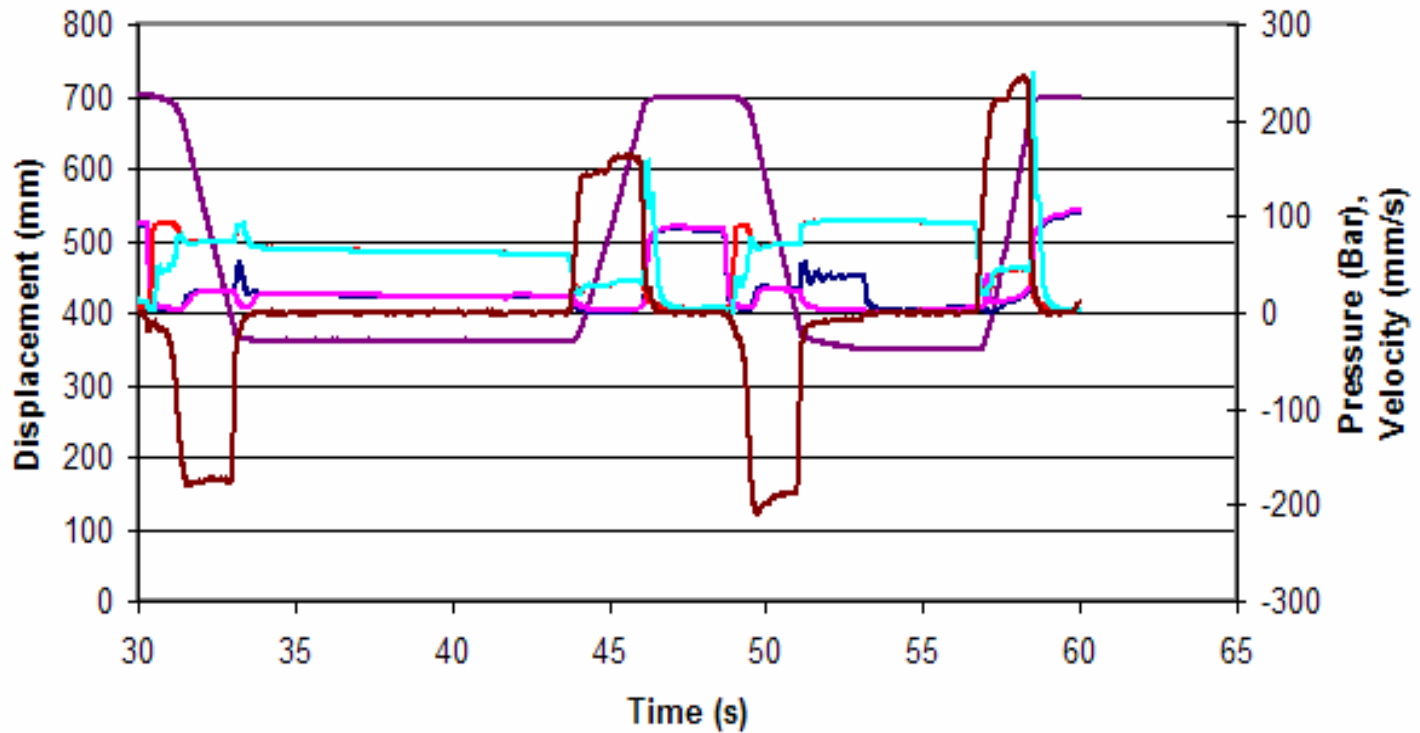
Pictures by HIDRAR/ROQUET/LABSON

OBJECTIVE:

Cushioning end strokes of hydraulic cylinder  
(movement of stick arm)



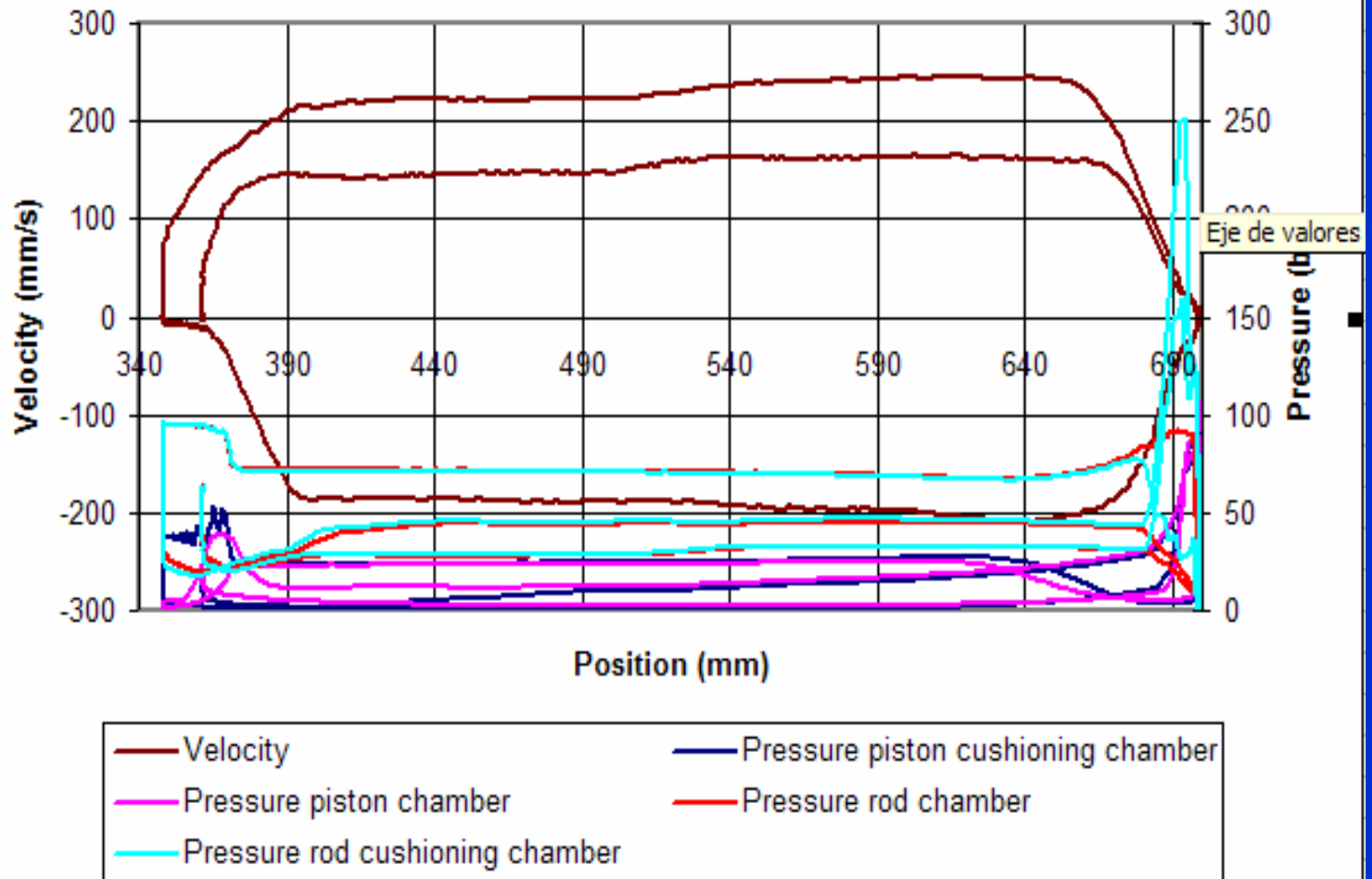
**Backhoe -LABSON**  
**Stick hydraulic cylinder with cushioning**  
**ref 2652/25 with grooves**



- Displacement (mm)
- Pressure piston cushioning chamber
- Pressure piston chamber
- Pressure rod cushioning chamber
- Pressure rod chamber
- Velocity

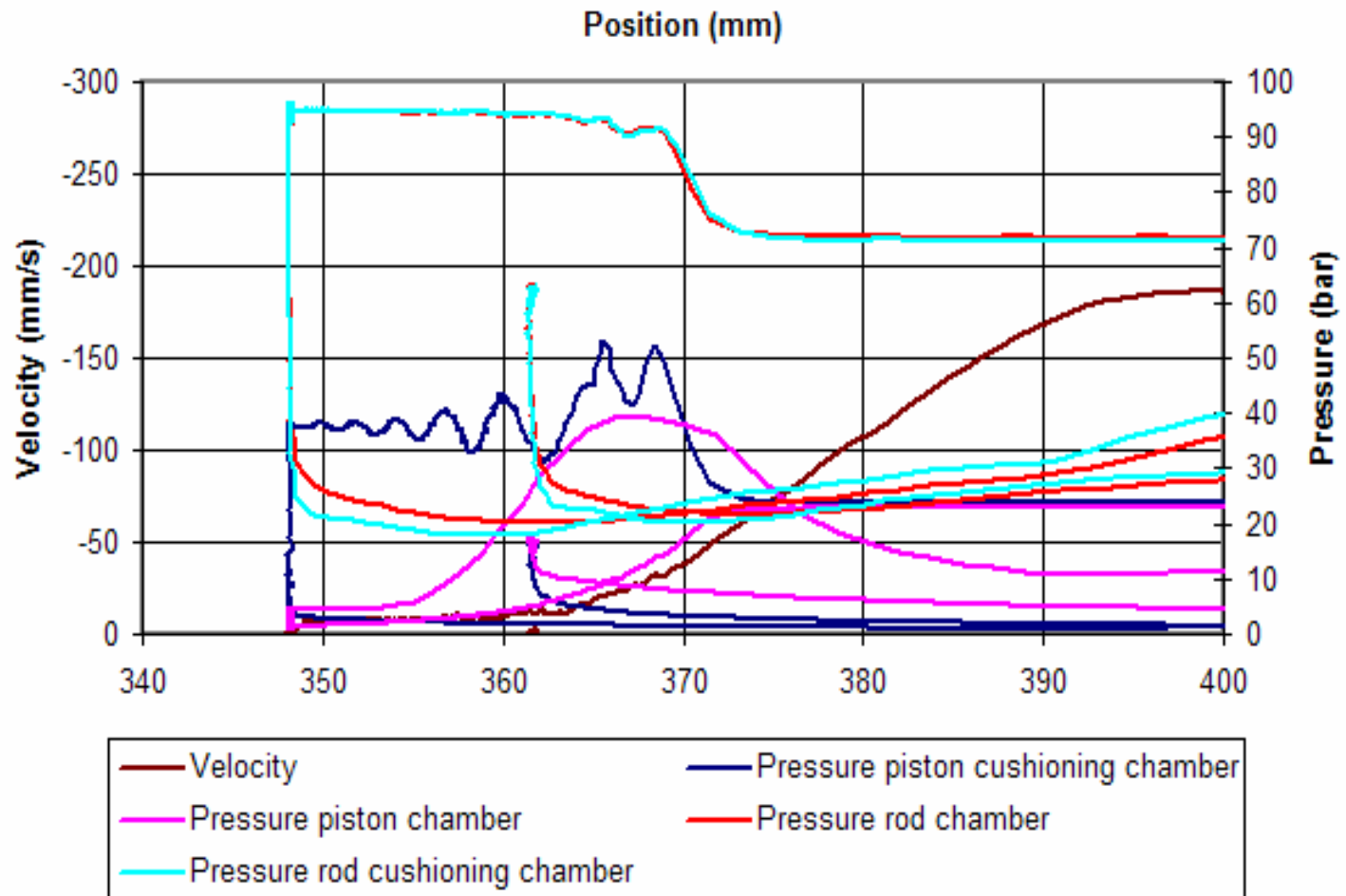
# Backhoe -LABSON

## Stick hydraulic cylinder with cushioning ref 2652/25 with grooves

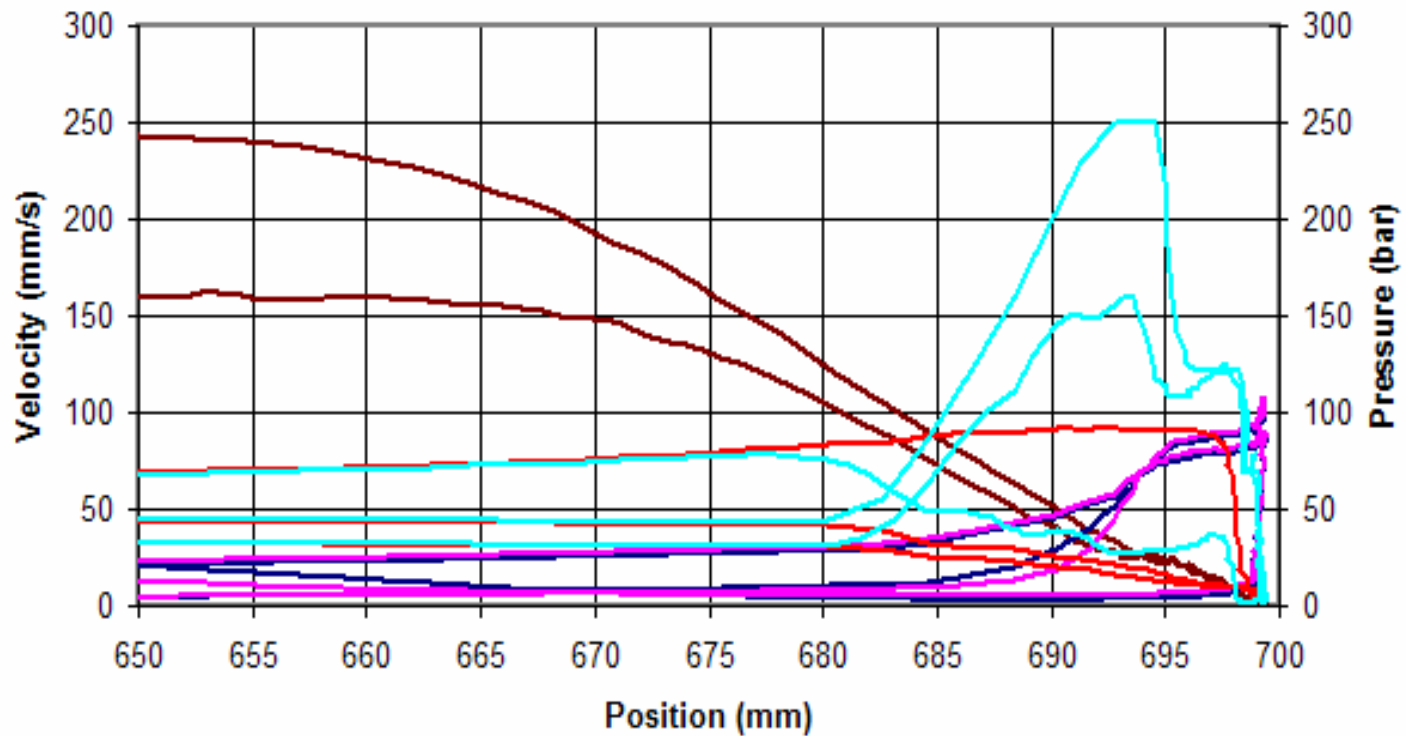


# Backhoe -LABSON

## Stick hydraulic cylinder with cushioning ref 2652/25 with grooves (in-stroke)



**Backhoe -LABSON**  
**Stick hydraulic cylinder with cushioning**  
**ref 2652/25 with grooves (out-stroke)**



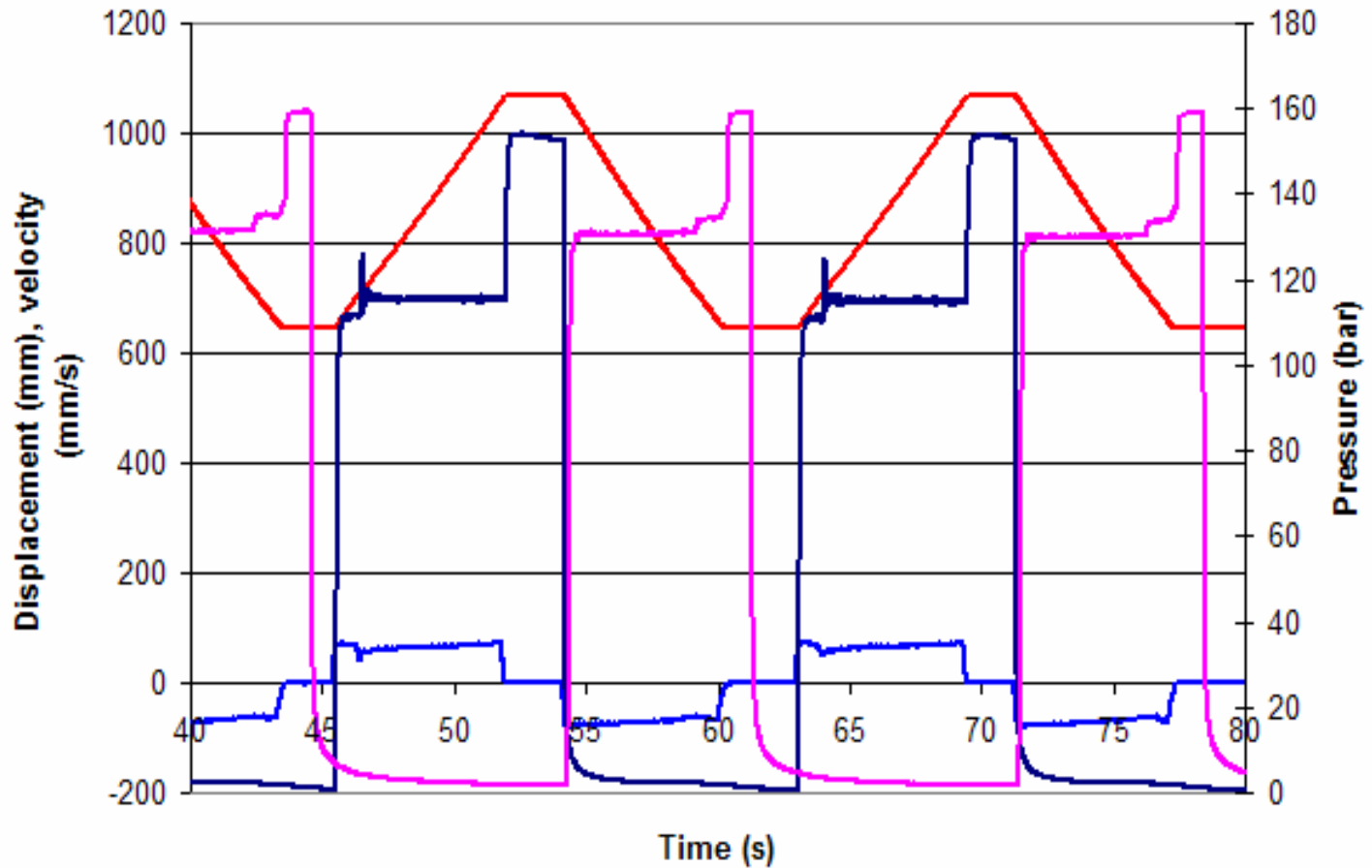
- Velocity
- Pressure piston cushioning chamber
- Pressure piston chamber
- Pressure rod chamber
- Pressure rod cushioning chamber

## Back door movement of dumper truck



Pictures by SEMPERE/ROQUET/LABSON

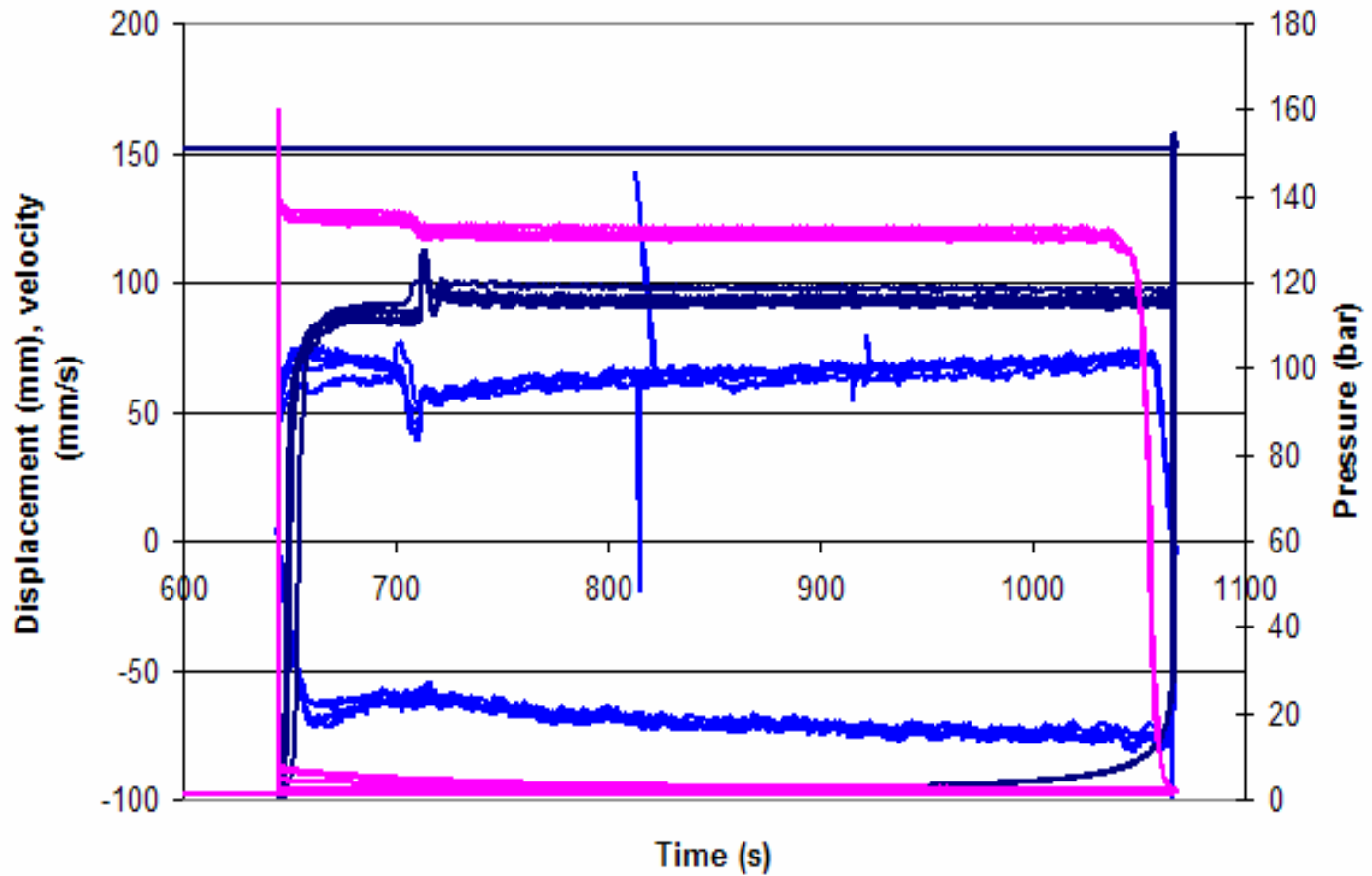
### Cushioning Back Door Hydraulic Cylinder SEMPERE (dumper truck)



— Displacement (mm) — Velocity (mm/s) — Pressure P1 — Pressure P2

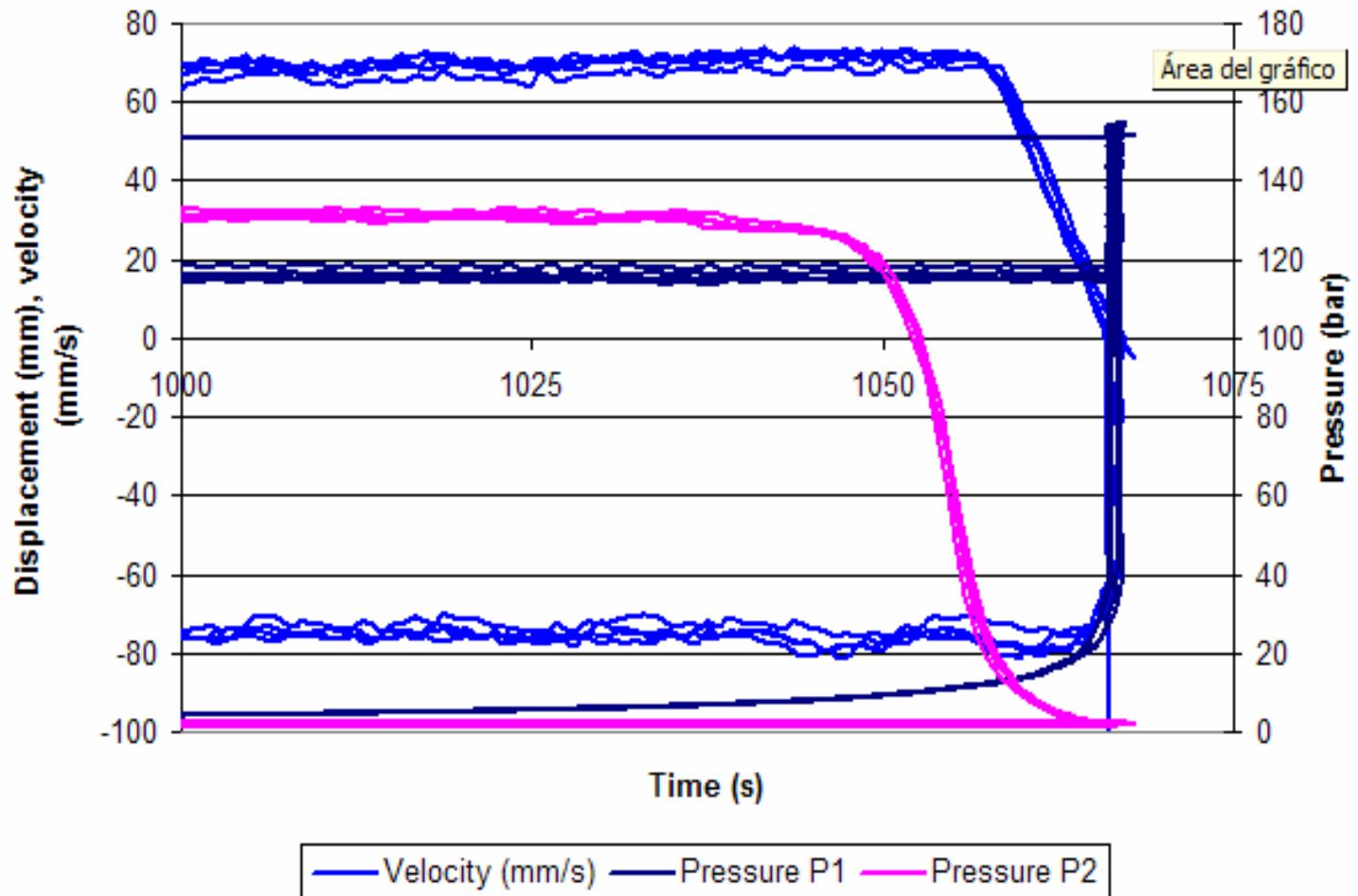


### Cushioning Back Door Hydraulic Cylinder SEMPERE (dumper truck)

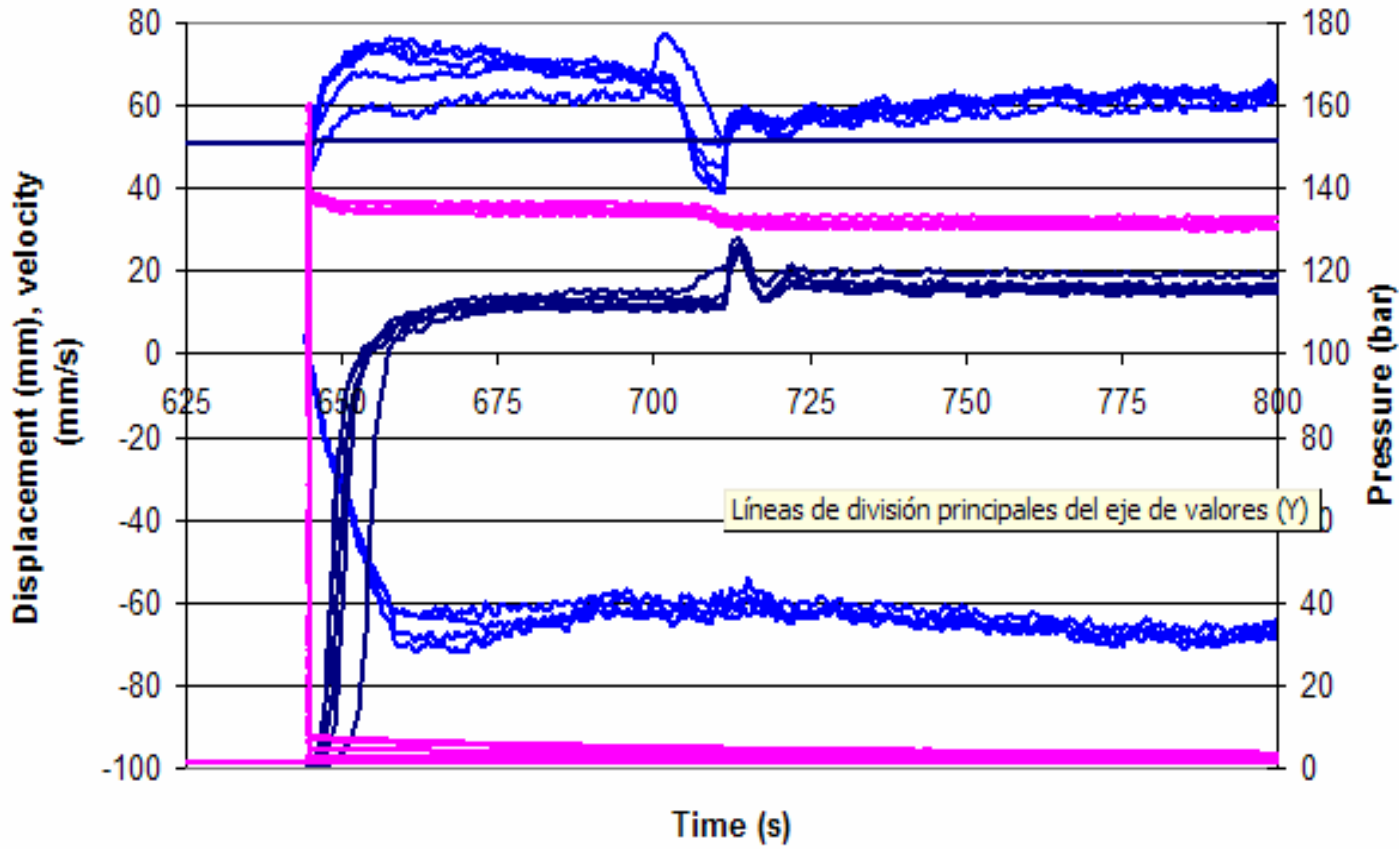


— Velocity (mm/s) — Pressure P1 — Pressure P2

Cushioning Back Door Hydraulic Cylinder  
SEMPERE (dumper truck)  
door going up (instroke rod)



### Cushioning Back Door Hydraulic Cylinder SEMPERE (dumper truck) door going down (outstroke rod)



— Velocity (mm/s) — Pressure P1 — Pressure P2

**Cushioning Back Door Hydraulic Cylinder  
SEMPERE (dumper truck)  
door going down (outstroke rod)**

