



CYLINDERS

## FRONT MOUNT

Dettagli Tecnici • Technical Data • Détail Techniques • Technischedatum • Detalles Tècnico

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[hspenta.it](http://hspenta.it)



DIFFERENT BY DESIGN

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## FRONT MOUNT



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 CERTIFICATE ♦ CERTIFICATO ♦ CERTIFICAT ♦ CERTIFIKAT ♦ 認證證書 ♦



# CERTIFICATO

Nr 50 100 2740 - Rev. 06

Si attesta che / This is to certify that

IL SISTEMA QUALITÀ DI  
THE QUALITY SYSTEM OF

**H.S. PENTA S.p.A.**

SEDE LEGALE E OPERATIVA:

VIA PROVENTA 31

I-48018 FAENZA (RA)

È CONFORME AI REQUISITI DELLA NORMA  
HAS BEEN FOUND TO COMPLY WITH THE REQUIREMENTS OF

**UNI EN ISO 9001:2008**

Questo certificato è valido per il seguente campo di applicazione  
This certificate is valid for the following product or service range

**Progettazione, fabbricazione ed assistenza di cilindri oleodinamici in particolare telescopici per ribaltabili; progettazione e costruzione dispositivi idraulici per cilindri oleodinamici, in particolare anticaduta e fine corsa (IAF 18)**

**Design, manufacture and after-sale service of telescopic hydraulic cylinders for tipping gears; design and construction of hydraulic devices for hydraulic cylinders, hose burst valves and end-of-stroke devices (IAF 18)**



SGQ N° 049A SSI N° 005G PRD N° 081B  
SGAN N° 018D ITX N° 001L ISP N° 057E  
SCR N° 009F PRS N° 077C LAB N° 0076

Membro degli Accordi di Mutuo Riconoscimento  
EA, IAF e ILAC  
Signatory of EA, IAF and ILAC Mutual Recognition  
Agreements

Per l'Organismo di Certificazione  
For the Certification Body

**TÜV Italia S.r.l.**

*Paolo Merenda*  
Direttore Certificazione

Data di emissione / Issue date

**2012-05-15**

Data di scadenza / Expiry date

**2015-04-30**

**Organizzazione certificata per la prima volta in data 2003-05-20**

"La validità del presente certificato è subordinata a sorveglianza periodica a 12 mesi e al riesame completo del sistema di gestione aziendale con periodicità triennale"

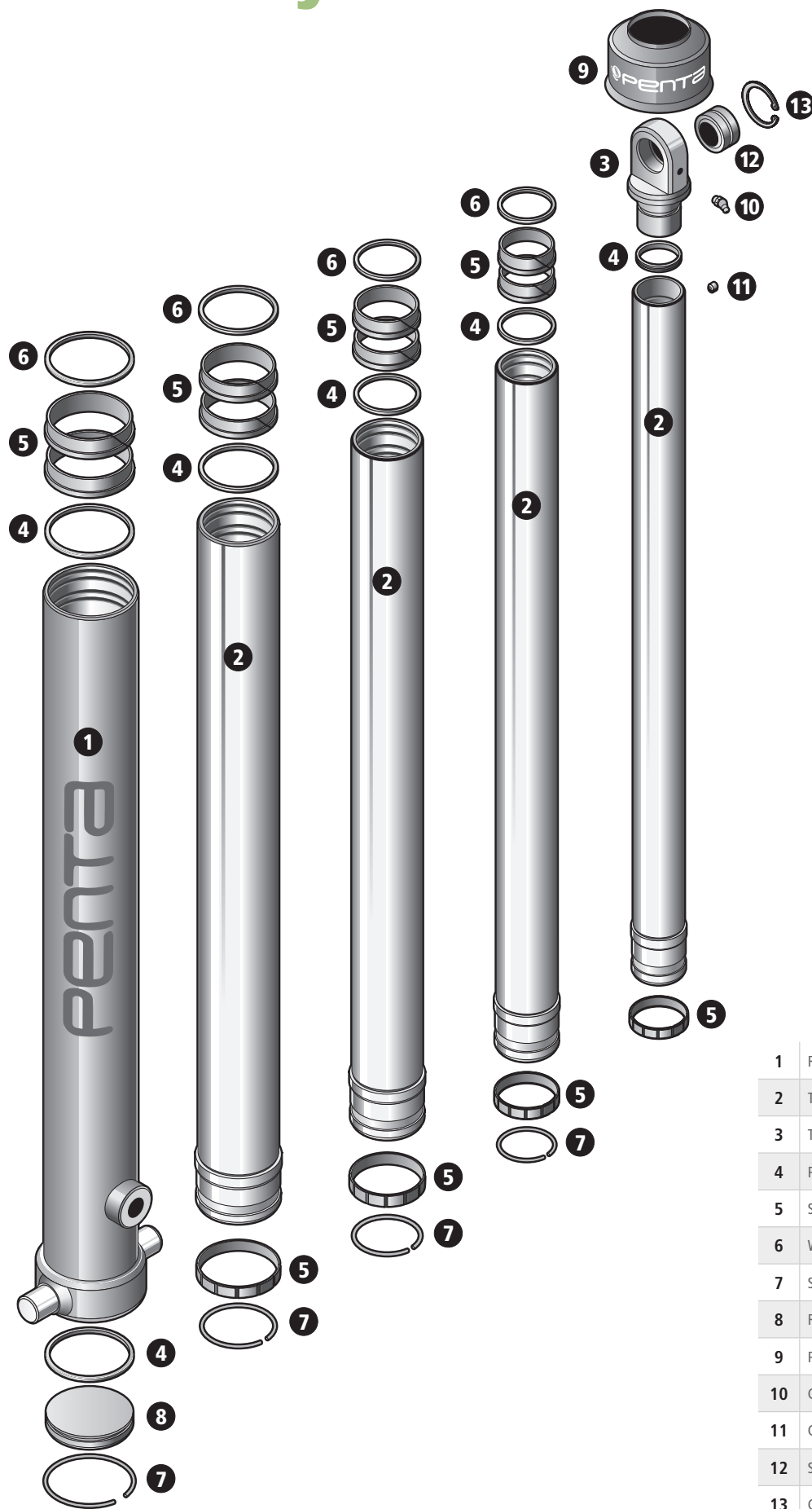
"The validity of the present certificate depends on the annual surveillance every 12 months and on the complete review of company's management system after three-years"

TÜV Italia S.r.l. • Gruppo TÜV SÜD • Via Carducci 125, Pal. 23 • 20099 Sesto San Giovanni (MI) • Italia • [www.tuv.it](http://www.tuv.it) **TÜV®**

PINS TO EYE

**HF**  
SERIES

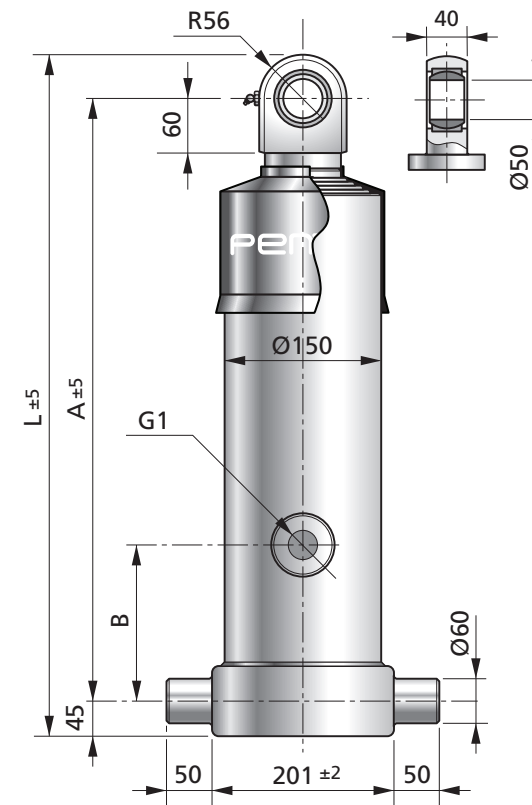
# HF Assembly



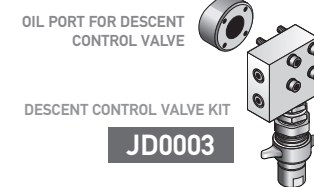
1	Ram tube
2	Tube stages
3	Top head
4	Polyurethan seal
5	Slider (Delrin)
6	Wiper seal
7	Steel circlip
8	Ram base
9	Plastic cap
10	Grease nipple
11	Grub screw
12	Spherical bearing
13	Circlip

# HF 129

EFFECTIVE DIAMETER [mm] 129 - 111 - 95 - 80

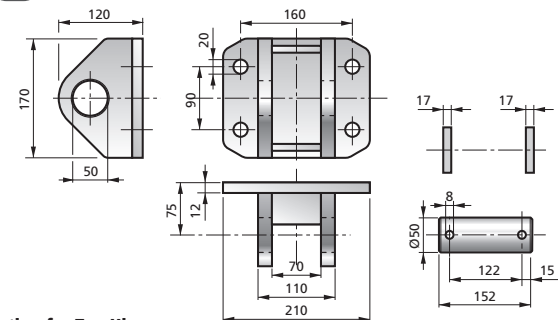


## OPTIONAL



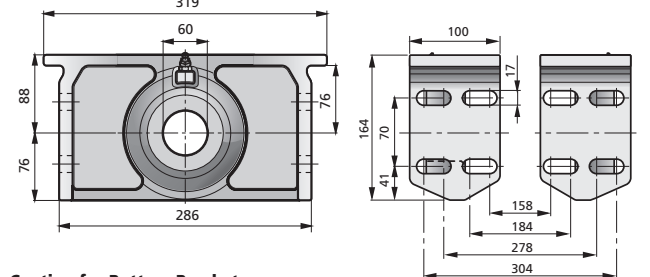
## ACCESSORIES

### TOP HINGE A40050013



**Caution for Top Hinge**  
It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.

### BOTTOM BRACKET • PAIR A90060002



**Caution for Bottom Brackets**  
Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.

### ! Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.

### + Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

## HF 129 TECHNICAL DATA

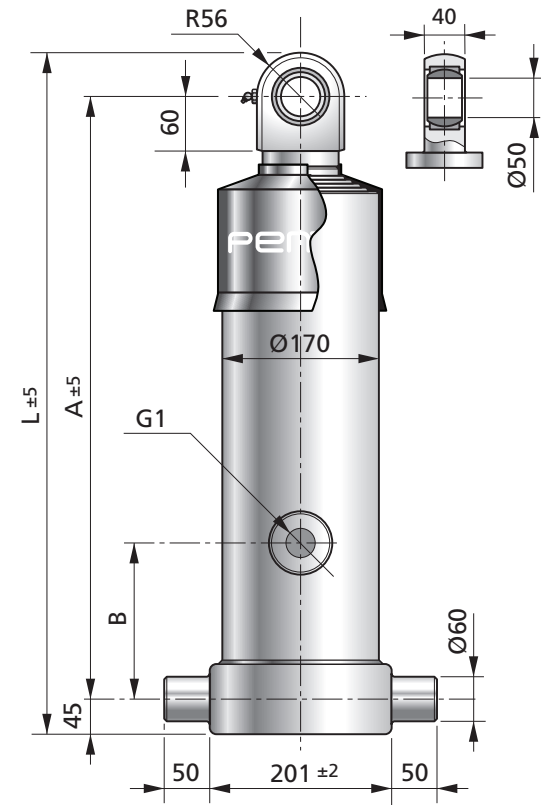
MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm <sup>3</sup> ]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HF 3500 129 3	4113601293010	3	3500	123	34,7	200	29-55	1528	1427	190
HF 3840 129 3	4114701293010	3	3840	132	38,1	200	29-55	1683	1582	190
HF 4190 129 4	4112351294010	4	4190	128	36,4	200	25-47	1419	1318	190
HF 4370 129 4	4112801294010	4	4370	132	38	200	25-47	1464	1363	190



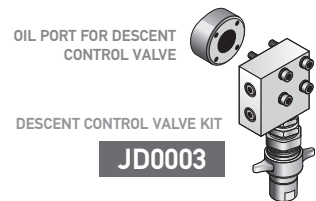
PINS TO EYE

# HF 149

EFFECTIVE DIAMETER [mm] 149 - 129 - 111 - 95 - 80

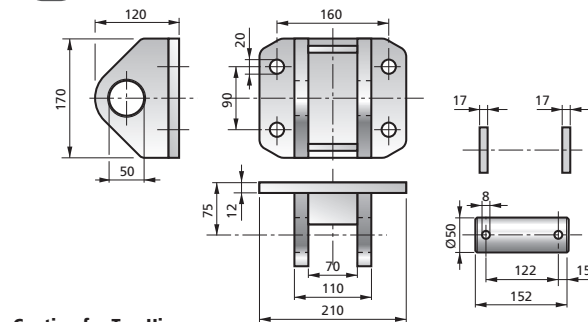


## OPTIONAL



## ACCESSORIES

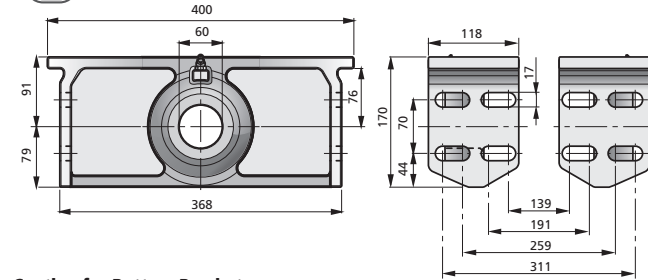
### TOP HINGE A40050013



#### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.

### BOTTOM BRACKET • PAIR A90060003



#### Caution for Bottom Brackets

Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.



#### Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



#### Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

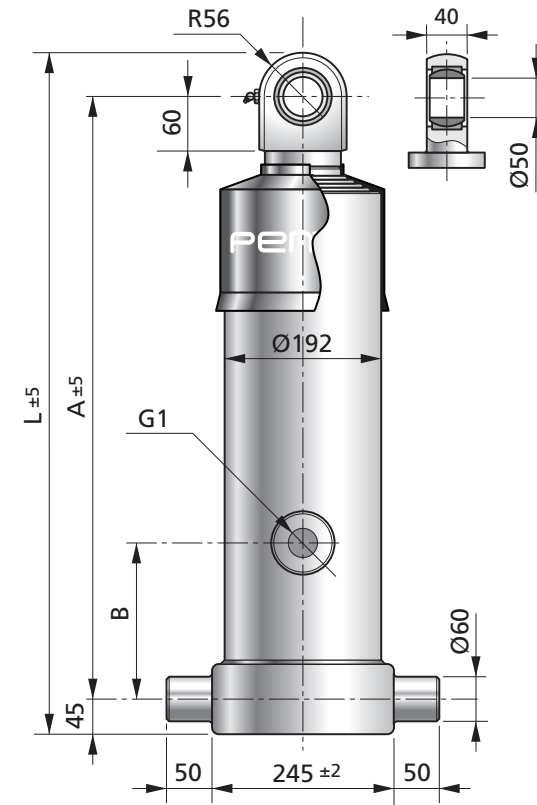
## HF 149 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HF 4350 149 4	4112801494010	4	4350	154	51,3	200	34-64	1459	1358	190
HF 4650 149 4	4113601494010	4	4650	164	54,8	200	34-64	1534	1433	190
HF 4950 149 4	4114301494010	4	4950	172	58,4	200	34-64	1609	1508	190
HF 4620 149 5	411151495010	5	4620	150	48,2	200	29-54	1305	1204	190

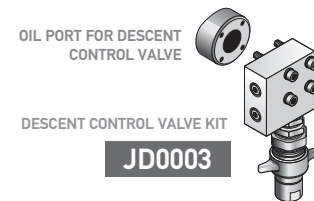
PINS TO EYE

# HF 169

EFFECTIVE DIAMETER [mm] 169 - 149 - 129 - 111 - 95

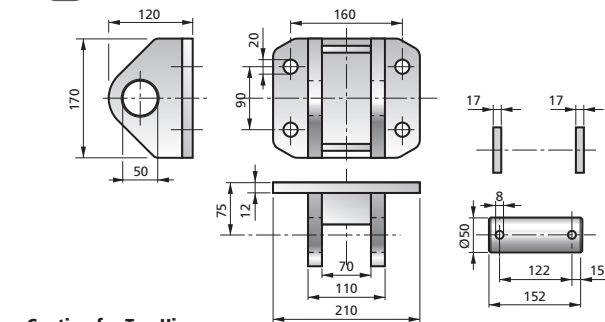


## OPTIONAL



## ACCESSORIES

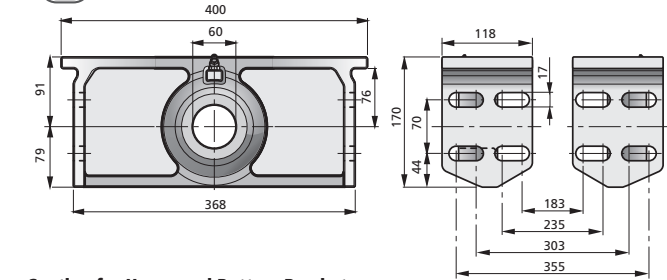
### TOP HINGE A40050013



#### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.

### BOTTOM BRACKET • PAIR A90060003



#### Caution for Upper and Bottom Brackets

Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.



#### Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



#### Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

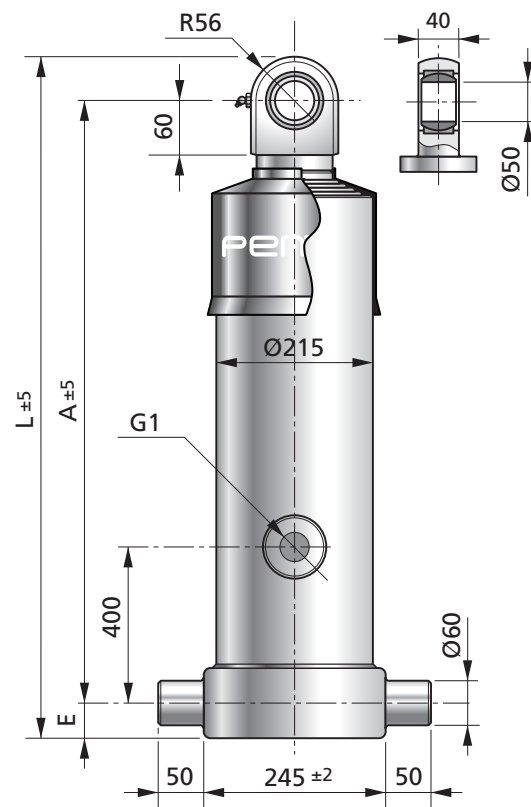
## HF 169 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HF 4330 169 4	4112801694010	4	4330	193	67,6	200	46-85	1459	1358	190
HF 4630 169 4	4113601694010	4	4630	205	72,3	200	46-85	1534	1433	190
HF 4930 169 4	4114301694010	4	4930	214	77	200	46-85	1609	1508	190
HF 5090 169 4	4114701694010	4	5090	217	79,5	200	46-85	1649	1548	400
HF 5690 169 4	4116801694010	4	5690	246	88,9	200	46-85	1859	1758	400
HF 5420 169 5	4112801695010	5	5420	204	75,4	200	39-73	1470	1369	400
HF 5800 169 5	4113601695010	5	5800	215	80,6	200	39-73	1545	1444	400
HF 6170 169 5	4114301695010	5	6170	226	85,8	200	39-73	1620	1519	400
HF 6720 169 5	4116001695010	5	6720	250	93,5	175	39-64	1790	1689	400
HF 7120 169 5	4116801695010	5	7120	265	99,1	150	39-55	1870	1769	400
HF 7720 169 5	4118001695010	5	7720	280	107,4	130	34-48	1990	1889	400

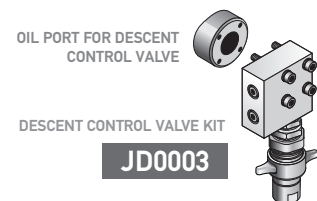
PINS TO EYE

# HF 191

EFFECTIVE DIAMETER [mm] **191-169-149-129-111-95**



## OPTIONAL

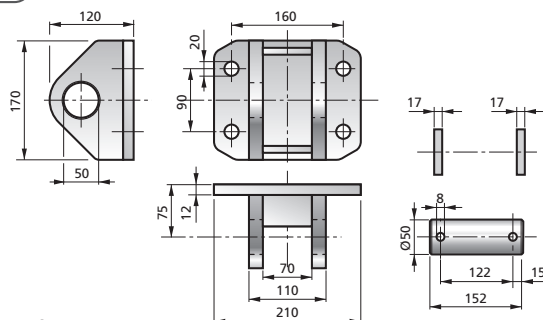


## ACCESSORIES



**TOP HINGE**

**A40050013**



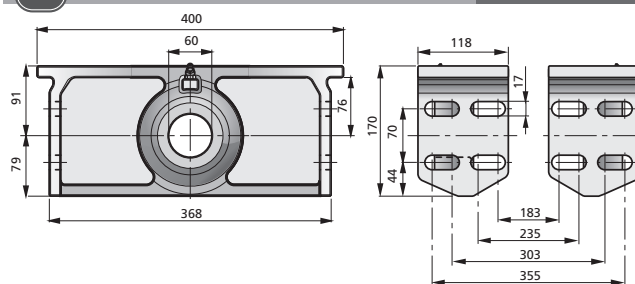
### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.



**BOTTOM BRACKET • PAIR**

**A90060003**



### Caution for Bottom Brackets

Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.



**Pull-out**

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



**Chromium Plate**

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

## HF 191 TECHNICAL DATA

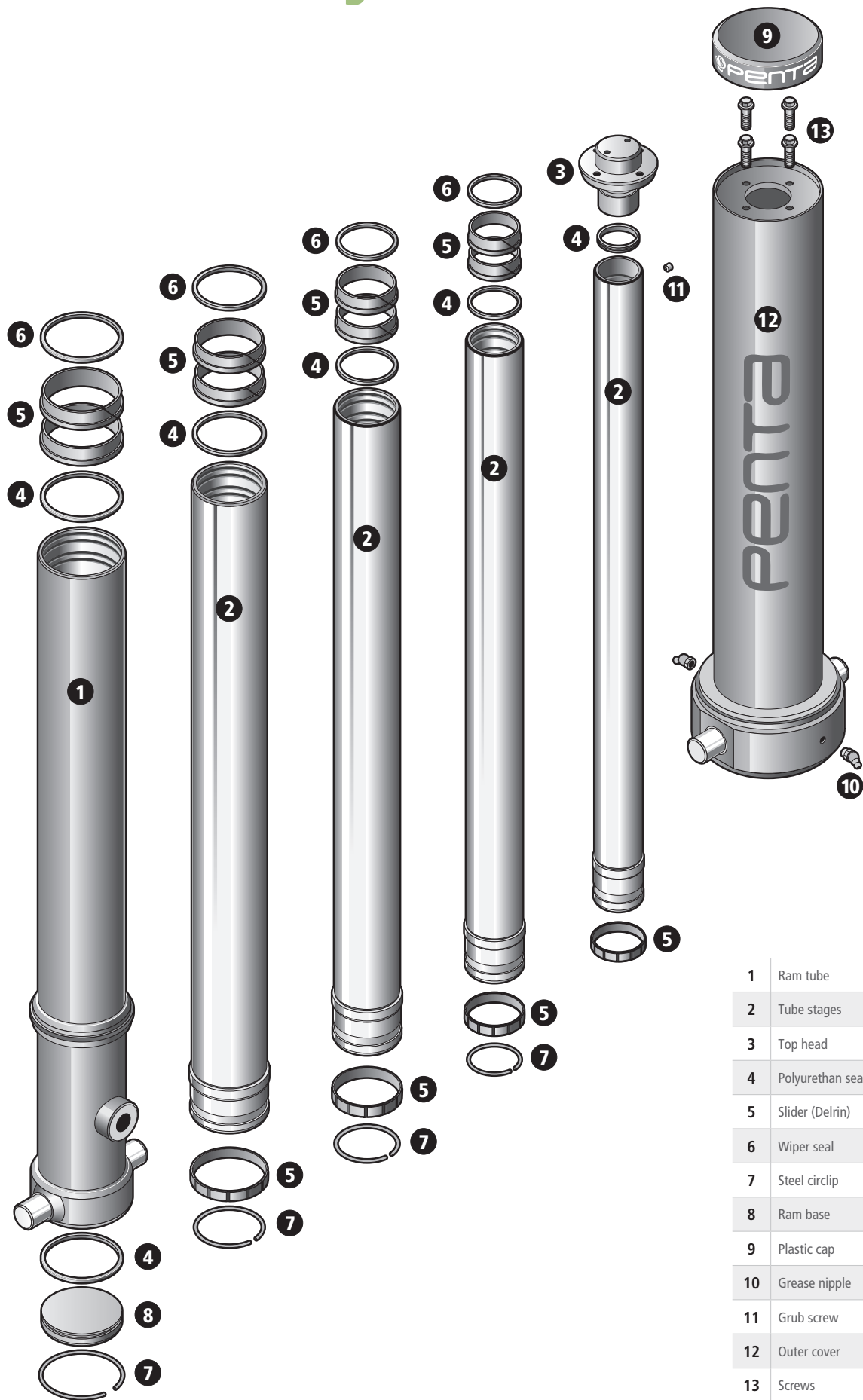
MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm <sup>3</sup> ]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	E
HF 5170 191 5	4112351915010	5	5170	243	94,1	200	52-97	1431	1330	45
HF 5400 191 5	4112801915010	5	5400	251	98,2	200	52-97	1476	1375	45
HF 6150 191 5	4114301915010	5	6150	280	111,9	200	52-97	1626	1500	70
HF 7100 191 5	4116801915010	5	7100	323	129,3	200	52-97	1876	1775	45
HF 8050 191 5	4118801915010	5	8050	355	146,6	150	52-73	2066	1965	45
HF 6670 191 6	4113101916010	6	6670	270	108,9	200	45-84	1517	1416	45
HF 7390 191 6	4114301916010	6	7390	293	120,7	175	45-73	1637	1511	70

WITH OUTER COVER

# HFC

SERIES

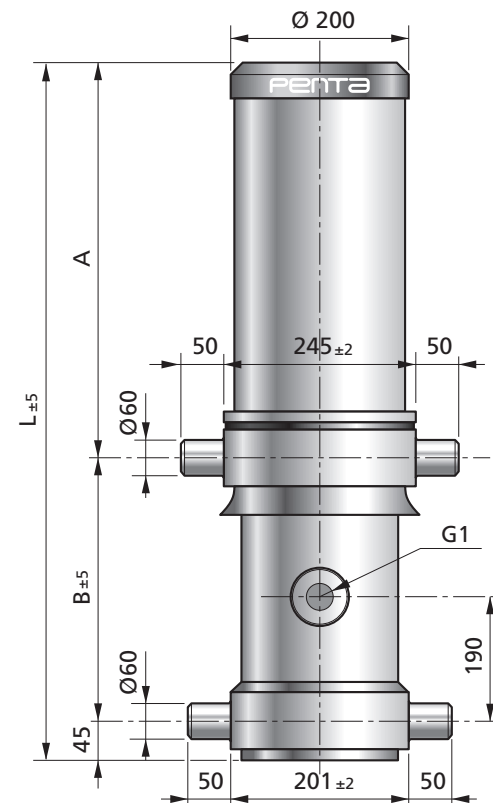
WITH OUTER COVER  
**HFC Assembly**



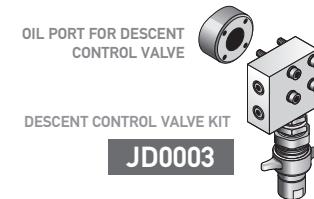
1	Ram tube
2	Tube stages
3	Top head
4	Polyurethan seal
5	Slider (Delrin)
6	Wiper seal
7	Steel circlip
8	Ram base
9	Plastic cap
10	Grease nipple
11	Grub screw
12	Outer cover
13	Screws

WITH OUTER COVER  
**HFC 129**

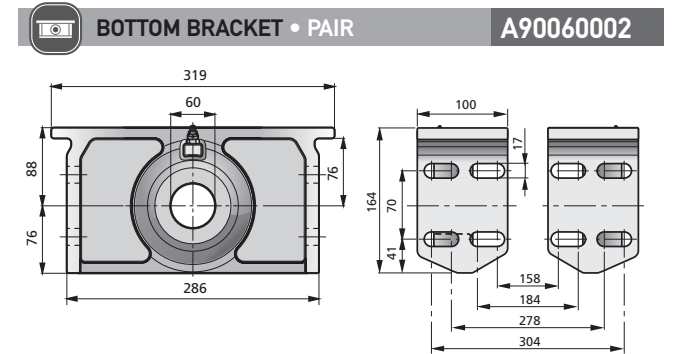
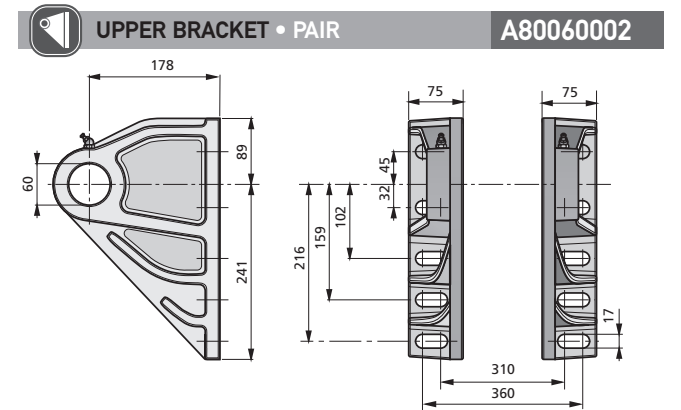
EFFECTIVE DIAMETER [mm] 129 - 111 - 95 - 80



OPTIONAL



ACCESSORIES



**Caution for Upper and Bottom Brackets**  
Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.

**! Pull-out**

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.

**+ Chromium Plate**

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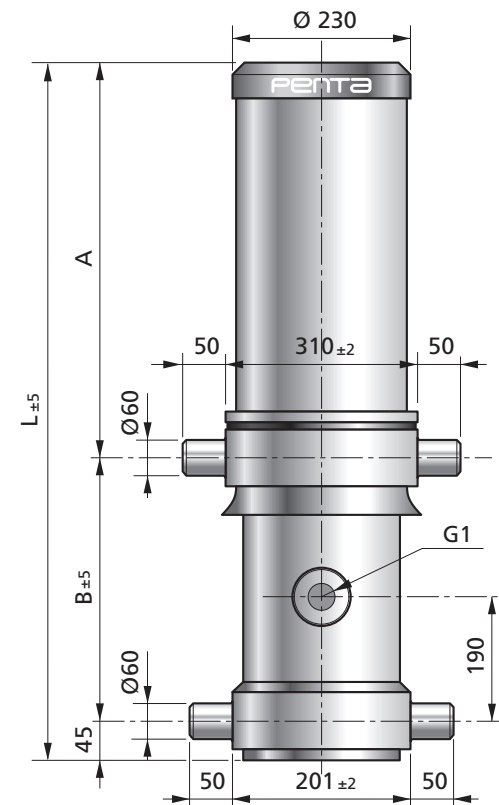
**HFC 129 TECHNICAL DATA**

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFC 3500 129 3	4213601293010	3	3500	167	34,7	200	29-55	1464	1101	311
HFC 3840 129 3	4214701293010	3	3840	178	38,1	200	29-55	1581	1211	320
HFC 4290 129 3	4216801293010	3	4290	195	42,6	200	29-55	1789	1424	320
HFC 4190 129 4	4212351294010	4	4190	168	36,4	200	25-47	1355	979	331
HFC 4370 129 4	4212801294010	4	4370	173	38	200	25-47	1400	1026	326
HFC 4670 129 4	4213601294010	4	4670	181	40,6	200	25-47	1475	1101	322

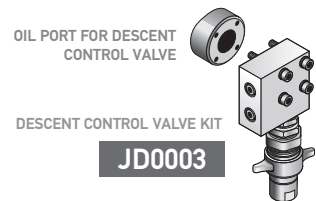
WITH OUTER COVER

# HFC 149

EFFECTIVE DIAMETER [mm] 149 - 129 - 111 - 95 - 80

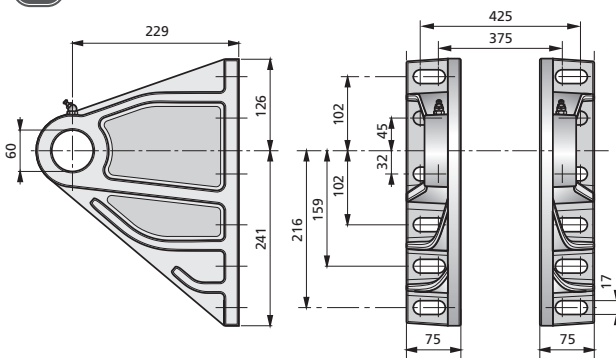


## OPTIONAL

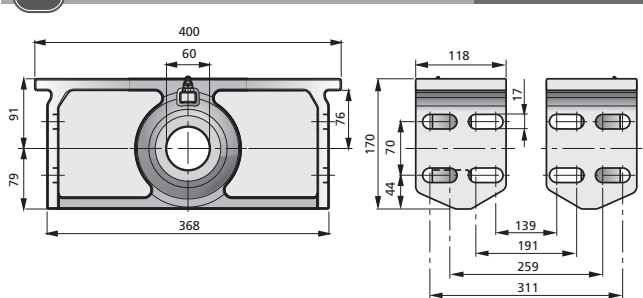


## ACCESSORIES

### UPPER BRACKET • PAIR A80060001



### BOTTOM BRACKET • PAIR A90060003



**Caution for Upper and Bottom Brackets**  
Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.



### Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



### Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

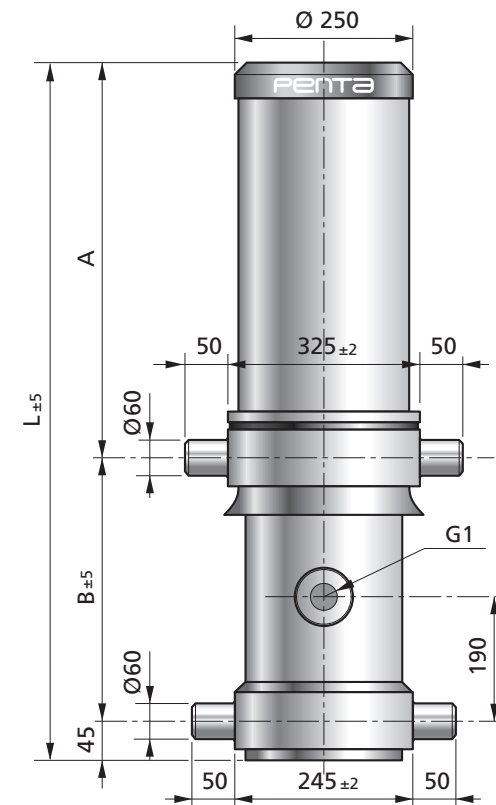
## HFC 149 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFC 4280 149 3	4216801493010	3	4280	258	57,2	200	40-74	1786	1423	318
HFC 4350 149 4	4212801494010	4	4350	225	51,3	200	34-64	1397	1023	329
HFC 4650 149 4	4213601494010	4	4650	235	54,8	200	34-64	1472	1107	320
HFC 4950 149 4	4214301494010	4	4950	254	58,4	200	34-64	1547	1173	329
HFC 4620 149 5	4211151495010	5	4620	213	48,2	200	29-54	1243	861	337

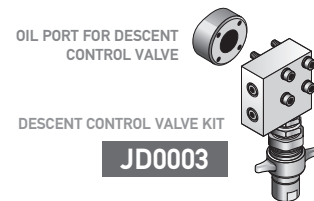
WITH OUTER COVER

# HFC 169

EFFECTIVE DIAMETER [mm] 169 - 149 - 129 - 111 - 95

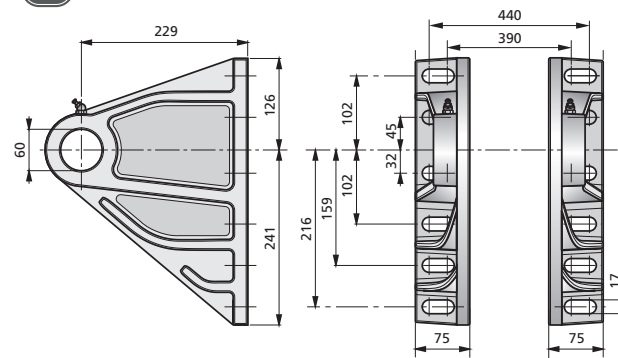


## OPTIONAL

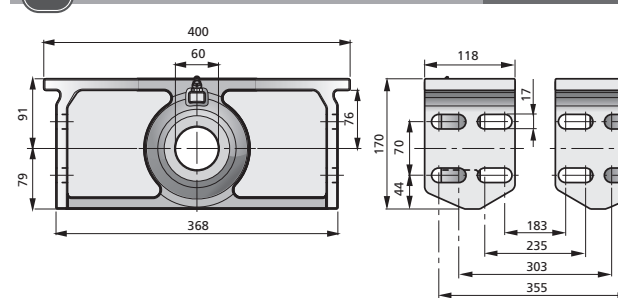


## ACCESSORIES

### UPPER BRACKET • PAIR A80060001



### BOTTOM BRACKET • PAIR A90060003



**Caution for Upper and Bottom Brackets**  
Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.



### Pull-out

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### Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

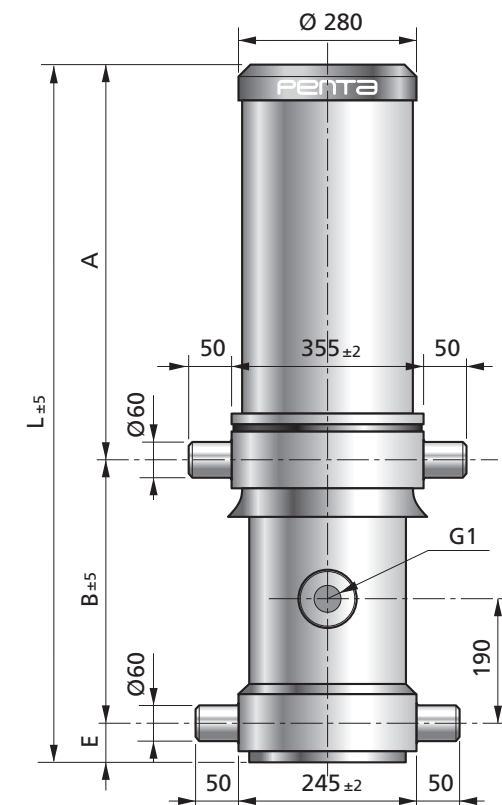
## HFC 169 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFC 4630 169 4	4213601694010	4	4630	290	72,3	200	46-85	1476	1104	327
HFC 4930 169 4	4214301694010	4	4930	308	77	200	46-85	1551	1188	318
HFC 5090 169 4	4214701694010	4	5090	310	79,5	200	46-85	1591	1217	329
HFC 5690 169 4	4216801694010	4	5690	343	88,9	200	46-85	1801	1423	333
HFC 5420 169 5	4212801695010	5	5420	294	75,4	200	39-73	1412	1034	333
HFC 5800 169 5	4213601695010	5	5800	308	80,6	200	39-73	1492	1104	343
HFC 6170 169 5	4214301695010	5	6170	320	85,8	200	39-73	1562	1188	329
HFC 6720 169 5	4216001695010	5	6720	345	93,5	200	39-73	1737	1349	343
HFC 7120 169 5	4216801695010	5	7120	360	99,1	200	39-73	1812	1438	329
HFC 8070 169 5	4218801695010	5	8070	389	112,3	200	39-73	2002	1619	338
HFC 9020 169 5	4220601695010	5	9020	421	125,6	155	39-57	2192	1674	473
HFC 9520 169 5	4221601695010	5	9520	439	132,5	140	37-51	2292	1781	466

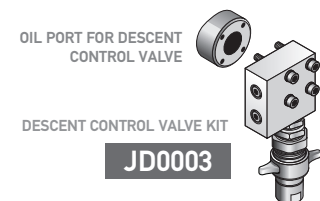
WITH OUTER COVER

# HFC 191

EFFECTIVE DIAMETER [mm] **191-169-149-129-111-95**

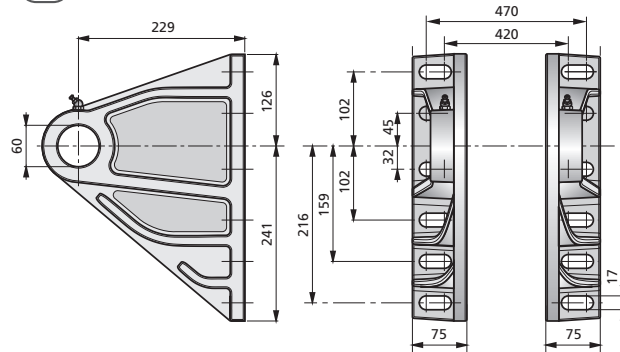


## OPTIONAL

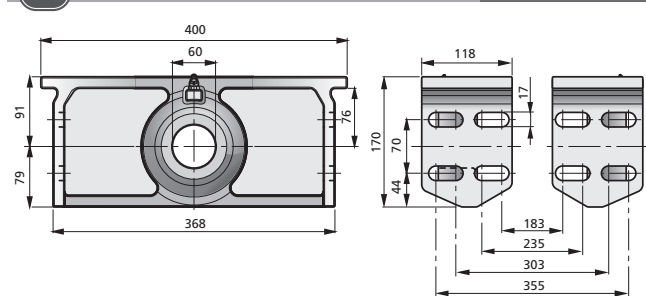


## ACCESSORIES

### UPPER BRACKET • PAIR **A80060001**



### BOTTOM BRACKET • PAIR **A90060003**



**Caution for Upper and Bottom Brackets**  
Recommended backlash between pin over-bosses and brackets / supports = 3 mm total (1.5 mm each side). It is recommended to fit M16 bolts/nuts, type 8.8 or better.



### Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



### Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

## HFC 191 TECHNICAL DATA

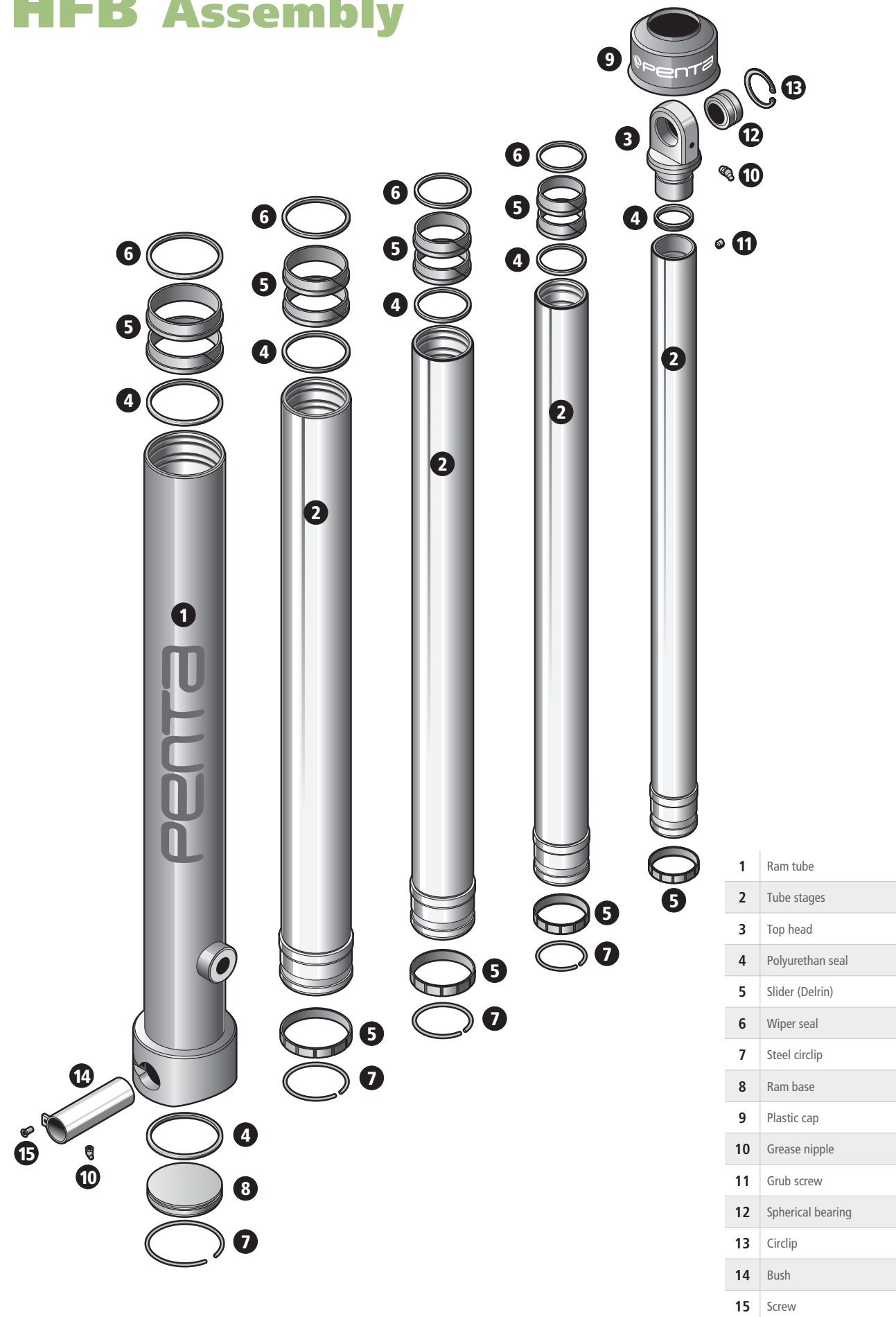
MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm <sup>3</sup> ]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	E
HFC 6150 191 5	4214301915010	5	6150	381	111,9	200	52-97	1577	1177	330	70
HFC 7100 191 5	4216801915010	5	7100	433	129,3	200	52-97	1827	1450	332	45
HFC 8050 191 5	4218801915010	5	8050	473	146,6	200	52-97	2017	1636	336	45
HFC 9000 191 5	4220601915010	5	9000	507	164	200	52-97	2207	1686	476	45
HFC 9500 191 5	4221601915010	5	9500	528	173,1	175	52-85	2307	1796	466	45
HFC 6670 191 6	4213101916010	6	6670	369	108,9	200	45-84	1468	1082	341	45
HFC 7390 196 6	4214301916010	6	7390	395	120,7	200	45-84	1588	1177	341	70

EYE TO EYE  
**HFB**  
SERIES



EYE TO EYE

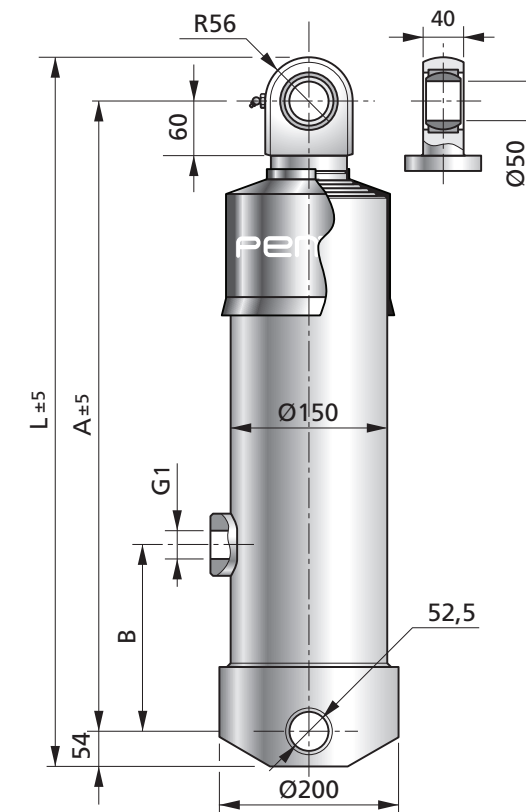
# HFB Assembly



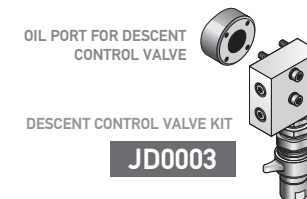
EYE TO EYE

# HFB 129

EFFECTIVE DIAMETER [mm] 129 - 111 - 95



OPTIONAL

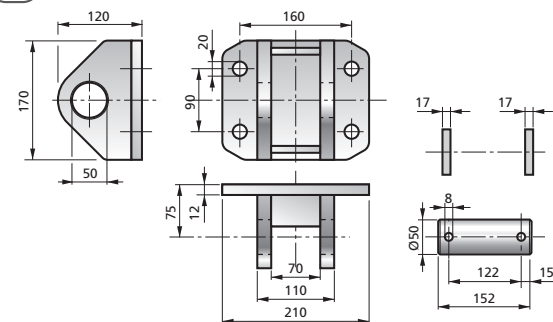


## ACCESSORIES



TOP HINGE

A40050013



### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.



Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

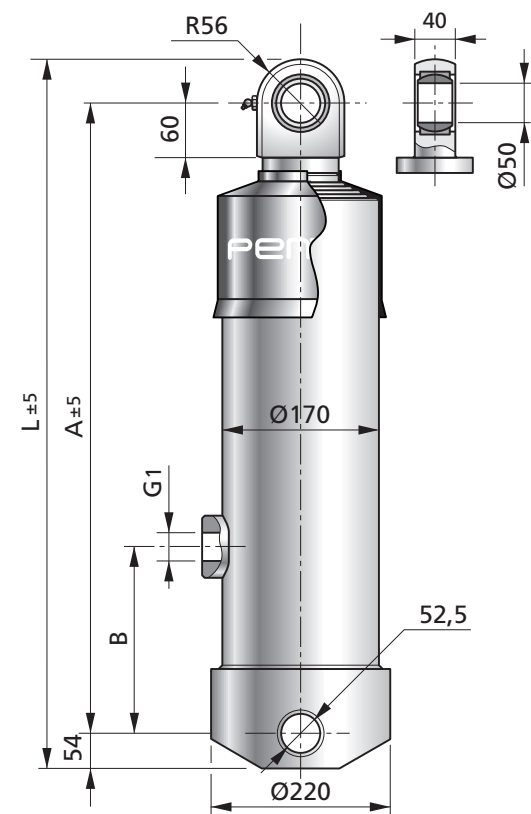
## HFB 169 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFB 3270 129 3	4312801293010	3	3270	124	32,5	200	29-55	1542	1432	300
HFB 3840 129 3	4314701293010	3	3840	142	38,1	200	29-55	1732	1622	300

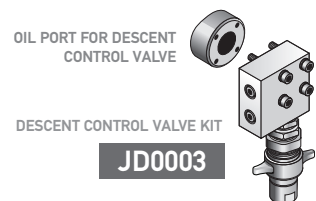
EYE TO EYE

# HFB 149

EFFECTIVE DIAMETER [mm] 149 - 129 - 111 - 95 - 80



## OPTIONAL

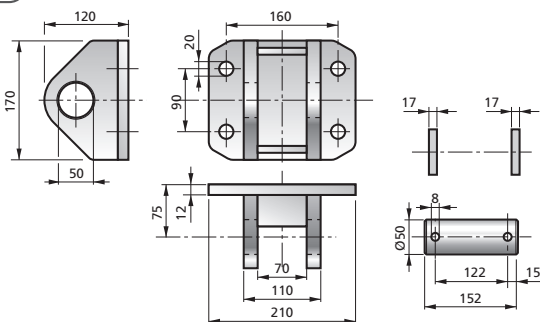


## ACCESSORIES



TOP HINGE

A40050013



### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.



Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



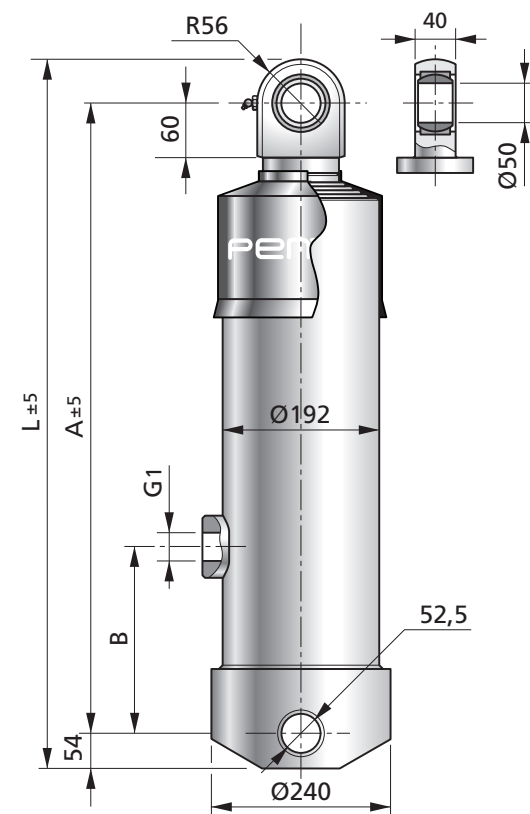
Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

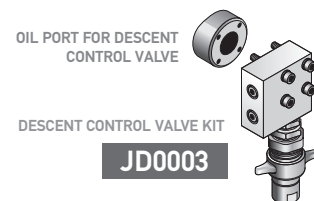
EYE TO EYE

# HFB 169

EFFECTIVE DIAMETER [mm] 169 - 149 - 129 - 111 - 95



## OPTIONAL

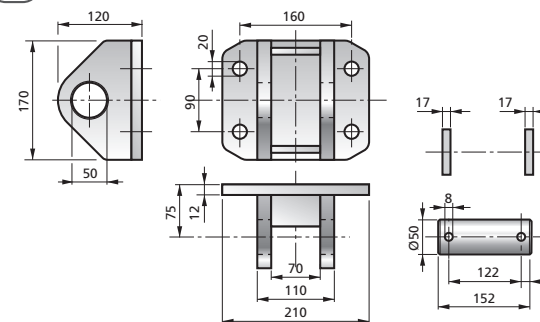


## ACCESSORIES



TOP HINGE

A40050013



### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly (+/-7°). These spacers are included.



Pull-out

Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



Chromium Plate

All front mount Penta cylinders have the piston rod hard chrome plated, to ensure better resistance to corrosion and longer lifetime to the seals (the seal set of the piston rod is the most critical, as when the truck is in motion the tipping body can vibrate). Penta do not guarantee standard cylinders against corrosion.

## HFB 149 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFB 3240 149 3	4312801493010	3	3240	156	43,3	200	40-74	1537	1427	300
HFB 3710 149 3	4314301493010	3	3710	172	49,5	200	40-74	1687	1577	300
HFB 3690 149 4	4311151494010	4	3690	150	43,5	200	34-64	1383	1273	300
HFB 3850 149 4	4311551494010	4	3850	155	45,4	200	34-64	1423	1313	300
HFB 4350 149 4	4312801494010	4	4350	168	51,3	200	34-64	1548	1438	300
HFB 4650 149 4	4313601494010	4	4650	177	54,8	200	34-64	1623	1513	300

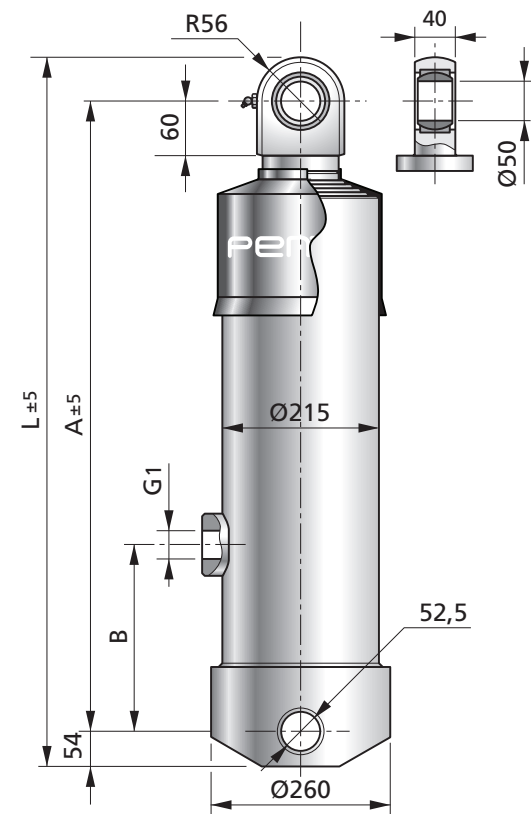
## HFB 169 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFB 4330 169 4	4312801694010	4	4330	203	67,6	200	46-85	1548	1438	300
HFB 5090 169 4	4314701694010	4	5090	229	79,5	200	46-85	1738	1628	300
HFB 4800 169 5	4311551695010	5	4800	197	66,7	200	46-85	1434	1324	300

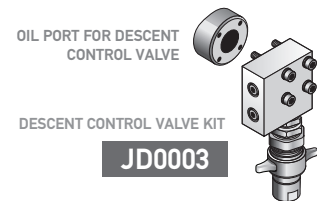
## EYE TO EYE

# HFB 191

EFFECTIVE DIAMETER [mm]	191 - 169 - 149 - 129 - 111
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## OPTIONAL

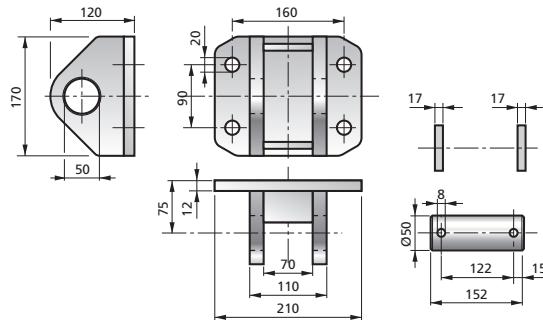


## ACCESSORIES



**TOP HINGE**

A40050013



### Caution for Top Hinge

It is recommended the fitment of two spacers ensuring the top bearing to be centered on the support and to swivel properly ( $\pm 7^\circ$ ). These spacers are included.



Dimension marked as **A** (closed centre dimension) refers to cylinder completely closed. It is recommended to fit the cylinder with 20-25 mm pull-out more than the specified **A** dimension, in order to avoid unwanted loads on internal steel stop rings when tipper body is fully loaded.



## Chromium Plate

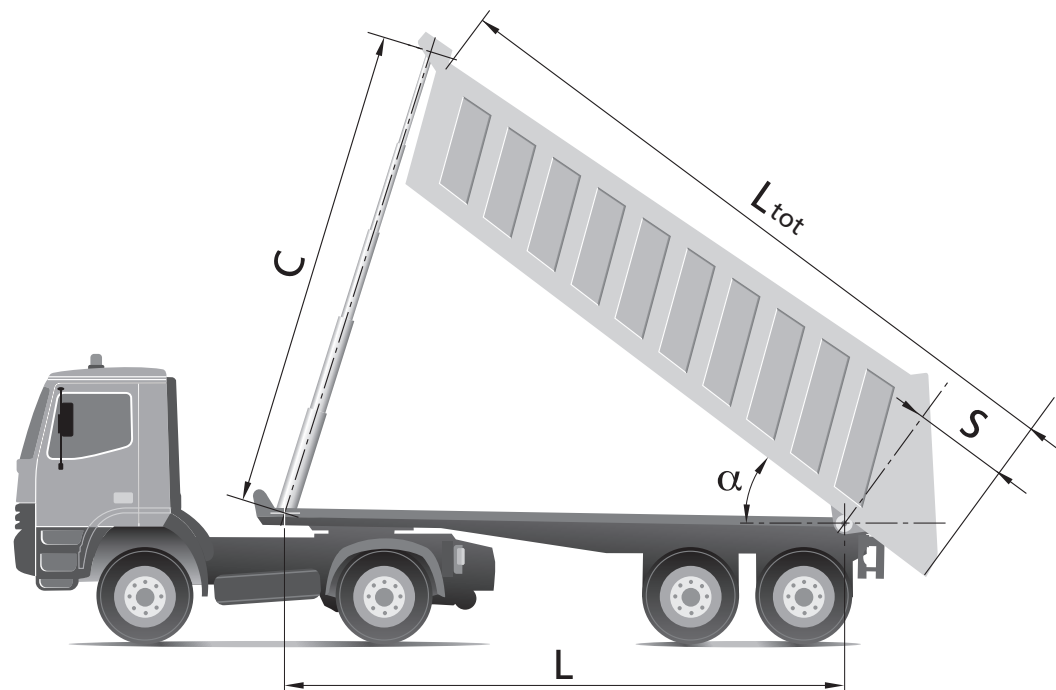
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## HFB 191 TECHNICAL DATA

MODEL	CODE	EXTENSIONS N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A [mm]	B
HFB 5400 191 5	4312801915010	5	5400	261	98,2	200	52-97	1565	1455	300
HFB 5770 191 5	4313601915010	5	5770	275	105,1	200	52-97	1640	1530	300
HFB 6150 191 5	4314301915010	5	6150	288	111,9	200	52-97	1715	1605	300
HFB 7100 191 5	4316801915010	5	7100	332	129,3	200	52-97	1965	1855	300

## Notes

# Selection Charts



Stroke						
L [mm]	BODY TILTING α [°]					
	40	45	48	50	55	60
4000	2736	3061	3254	3381	3694	4000
4500	3078	3444	3661	3804	4156	4500
5000	3420	3827	4067	4226	4617	5000
5300	3625	4056	4311	4480	4895	5300
5600	3831	4286	4555	4733	5172	5600
6000	4104	4592	4881	5071	5541	6000
6300	4309	4822	5125	5325	5818	6300
6600	4515	5051	5369	5579	6095	6600
7000	4788	5358	5694	5917	6464	7000
7300	4993	5587	5938	6170	6742	7300
7600	5199	5817	6182	6424	7019	7600
8000	5472	6123	6508	6762	7388	8000
8300	5678	6353	6752	7015	7665	8300
8600	5883	6582	6996	7269	7942	8600
9000	6156	6888	7321	7607	8311	9000
9300	6362	7118	7565	7861	8589	9300
9600	6567	7348	7809	8114	8866	9600
10000	6840	7654	8135	8452	9235	10000
10500	7182	8036	8541	8875	9697	10500
11000	7524	8419	8948	9298	10158	11000

POWER STROKE

C [mm]

$$C_{[mm]} = 2L_{[mm]} \sin\left(\frac{\alpha_{[rad]}}{2}\right) \Rightarrow$$

$$\Rightarrow C_{[mm]} \approx \frac{3,1416}{180} \cdot \alpha_{[°]} \cdot L_{[mm]} \cdot \left(1 - \frac{9,8696}{777600} \alpha_{[°]}^2\right)$$

• The stroke is identified by crossing the pivot length (L) with the requested tipping angle (°).

Thrust							
EXTENSION DIAMETER [mm]	PRESSURE [bar]						
	50	75	100	125	150	175	200
80	25	38	50	63	75	88	101
95	35	53	71	89	106	124	142
111	48	73	97	121	145	169	194
129	65	98	131	163	196	229	261
149	87	131	174	218	262	305	349
169	112	168	224	280	336	393	449
191	143	215	287	358	430	501	573

THRUST  
[kN]

$$S_{[kN]} = \frac{\pi}{4} d_{[mm]}^2 \frac{p_{[bar]}}{10000} \Rightarrow$$

$$\Rightarrow S_{[kN]} \approx \frac{0,785}{10000} d_{[mm]}^2 p_{[bar]}$$

• The thrust is a force generated by oil under pressure, which lifts the stage of the cylinder. "d" is the diameter of the stage.

Quick reference selection chart						
TYPE	TOTAL MASS [ton]					
	97÷52	85÷45	74÷39	64÷34	55÷29	47÷25
191	5	6				
169		4	5			
149			3	4	5	
129					3	4

EXTENSION N.

• Depending on the total tipping weight, the chart identifies the most suitable model and number of stages available.

# Warnings

This catalogue lists the whole range of H.S. PENTA under-body hoists for tippers, standard type. Telescopic cylinders are commonly installed on dumping vehicles and are devices which are intended to provide only a lifting force. The machinery into which the cylinders are incorporated must comply with the requirements of the in force directives and norms. The cylinders are not a structural member, and is not designed, nor intended to provide stability to the dumping vehicle.

Fitment suggestions and operating conditions. The normal application of multi-stage cylinder is to lift up tipping bodies, loaded with different materials, and consequently discharge this material whilst the cylinder is extended all along its stroke. The body weight plus the payload are the total lifting weight that must be raised by the cylinder. This value, calculated at the working pressure, is a rough indication of the tipping power of the cylinder. The cylinders have been sized for loads along the longitudinal axis (e.g. no side load is admitted).

A few hints for correct fitment of the cylinder:

- 1) Protect the top of the cylinder from welding spatter, or other foreign particles;
- 2) Always fit a relief valve in the hydraulic pressure line. The relief valve must be set at a pressure lower than the max admitted for the cylinder (see specification for each cylinder);
- 3) Fit a filter in the hydraulic line, flush the oil tank and pipes, use good quality hydraulic oil;
- 4) The tipper body should not rest on the cylinder. The cylinder should be extended at least 20 mm (when the tipper body is fully loaded).

Further information please see "Hydraulic cylinder for tipping equipment user & maintenance manual – General safety regulations".

# Guarantee

## 1. Guarantee conditions

- 1.1 H.S.PENTA S.P.A. (hereinafter referred to as the "Company") guarantees the satisfactory operation of its hydraulic components, hydraulic cylinders, and respective accessories (hereinafter jointly referred to as the "Products") and the absence of flaws and defects in the same within the limits specified in these General Guarantee Conditions.
- 1.2 This guarantee of satisfactory operation has a validity of two (2) years from the date of sale of the Products.
- 1.3 The Company guarantees the conformity of the Products exclusively to Italian and European Community standards.

## 2. Guarantee coverage

- 2.1 Without prejudice to the content of the following Article 2.2 regarding hidden defects, the Products will be considered as having been accepted by the purchaser whenever within 5 days from delivery such latter has not provided the Company with written notice of the presence of flaws and/or defects.
- 2.2 Upon pain of relinquishing rights to coverage under the guarantee, the purchaser must provide the Company with written notice of the defect in conformity and/or flaw in the Product or part of the same, specifying the nature of the same in detail within 8 days of the date in which the purchaser has observed such defect in conformity and/or flaw.
- 2.3 The defective Products reported in such notice as per the sense and effect of Article 2.2 above must be conserved by the purchaser for the purpose of examination by the Company.  
Following written request from the Company, the purchaser must send the defective Product(s) carriage paid to the latter or the party indicated by the same; whenever after the Company's examination, the Product is declared defective and as such is covered by these General Guarantee Conditions, the Company will reimburse the purchaser for the costs of shipping, while remaining expressly specified that such shipping costs must be within the average reference costs.  
The purchaser relinquishes the right to coverage under guarantee whenever he does not permit every reasonable inspection of the Product requested by the Company or whenever after receiving written request from the Company for the return of the Product he fails to do so within 30 days of receiving such request.
- 2.4 Following transmission of due notice by the purchaser performed as per the sense and effect of previous Article 2.2, after ascertaining the existence of the defect or flaw, the Company can take any of the following courses of action at its own discretion:
  - (a) provide the purchaser with Products in replacement of those defective free-of-charge;
  - (b) repair the Products directly or through third parties at its own expense; or
  - (c) reimburse the price paid by the purchaser for the Products ascertained defective.

It is hereby agreed that any Products supplied in replacement of those proven defective must be shipped "ex-works" and that the defective Products returned to the Company will remain the property of such latter.

- 2.5 With the exception of those mentioned in Article 2.4 above, the costs and expenses incurred by the replacement or repair of the defective Products must be borne by the purchaser.  
For mere purposes of example without excluding others, the purchaser must bear the costs for:
  - (a) consumptions caused by the removal of the defective Products from the machinery in which they were installed and the subsequent re-installation of the same;

- (b) the transport of materials and/or equipment;
- (c) lubricants and/or expendable materials necessary for the replacement or repair of the defective Products;

- (d) the re-painting of the Products;
- (e) the transfer expenses of the Company's personnel during checking for flaws and defects reported by the purchaser.

- 2.6 Nothing will be due to the purchaser by way of compensation for the time that the machinery in which the defective Products are installed remain out of operation for the repair or replacement of the same, and the Company must be considered expressly released from liability for any direct or indirect damage, cost or expense derived by such machinery inactivity.

- 2.7 For the parts of the Product replaced or repaired, the guarantee will be automatically extended for a new 2-year period from the date of such replacement or repair.

- 2.8 Except in case of fraudulent intention or serious neglect, the Company will not be liable in any way for any direct or indirect damage, cost, loss, or expense to persons and/or property derived from the operation and use of the Products and/or the interruption of activity of the machinery in which the Products are installed, given that the guarantee specified in Article 2 is the only remedy in the purchaser's favour.

## 3. Guarantee exclusions

- 3.1 The Company will not provide guarantee coverage for defects in conformity and/or flaws in the Product or any of its parts for any of the following cases:
  - (a) reasons due or linked to normal wear;
  - (b) the failure of the purchaser to correctly perform the procedures for the installation, use (or equivalent), and maintenance of the Products specified in the Use and Maintenance manual provided by the Company together with the Products;
  - (c) the incorrect use and/or operation of the Products or accident caused by the negligence, inexperience, or imprudence of the purchaser;
  - (d) the inadequate maintenance of the Products by the purchaser or modifications, repair and/or replacement made by the same without the Company's written consent;
  - (e) shock or impact against the vehicle or machinery in which the Products are installed; and
  - (f) causes other than defects in fabrication and/or engineering, working, and/or materials.
- 3.2 Guarantee coverage will also be excluded whenever:
  - (a) the Company is not placed in the conditions to promptly perform the necessary repair or replacement of defective Products;
  - (b) the Products are modified by the purchaser;
  - (c) the Products are used after the discovery of a flaw or defect;
  - (d) Repairs that are not authorized by the Company are made;
  - (e) the flaw or defect regards paint coatings and/or is represented by the corrosion of parts of the Product coated or not coated.

## 4. Applicable Law - Controversy

- 4.1 These General Guarantee Conditions are regulated by Italian Law with the express exclusion of the application of the United Nations Convention on international movable property sales contracts.
- 4.2 Any controversy derived from these General Guarantee Conditions, including those regarding their validity, interpretation, execution and resolution that cannot be settled out of court will be subjected to the exclusive decision of the Court of Ravenna, Italy.

"General guarantee conditions" 19/11/2008

