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.

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 (hereinafter referred to as “Product(s)”) and the absence of flaws and defects in the same within the limits specified in these General Guarantee Conditions. The notice must be submitted no later than 8 days from the date of delivery of the Product(s) by the Company to the latter or the party indicated by the Company for the purpose of examination by the Company.

2.3 The defective Products reported in such notice are the same 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.

2.4 For purposes of the guarantee, the purchaser must send the defective Product(s) carriage paid to the latter or the party indicated by the Company for the purpose of examination by the Company.

2.5 A qualified employee of the Company must perform the examination of the Products at the residence of the Company or at the residence of the Company's representative at the place of delivery of the Products.

3. Guarantee exclusion

3.1 The Company will not provide guarantee coverage for defects in conformity and/or flaws in the Product(s) of 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, inexpertoise, 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/or flaws 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 condition 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. Liability

The Company will not be liable in any way for any direct or indirect damage, cost, loss, or expense derived by the machinery inactivity, cause of a defect in conformity and/or flaw in the Product(s) 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, inexpertoise, 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/or flaws in fabrication and/or engineering, working, and/or materials.

5. Applicable law and controversy

4.1 These General Guarantee Conditions are regulated by Italian Law with the qualification of “Italian Law Guarantee Condition”.

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

H.S. PENTA reserves the right to make any improving changes without notice.

All right reserved.

Certificato Quality System

H.S. PENTA S.p.A.
Via Provenza 31
48018 Faenza (RA)

This certificato is valid for the following product or service range

1. 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

2. WARRANTY OF THE SAME;

(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.

3. Fit a filter in the hydraulic line, flush the oil tank and pipes, use good quality hydraulic oil.

4. Free 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).

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

6. The normal application of filters in the hydraulic line is not designed, nor intended to provide stability to the dumping vehicle.

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”.

7. 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”.

8. The normal application of filters in the hydraulic line is not designed, nor intended to provide stability to the dumping vehicle.
Index

LIGHT DUTY

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9   Notes

10-11  Selection charts

12  Assembly

Endpaper  Warnings - Warranty
**L 174**

**EFFECTIVE DIAMETER (mm)** 174 - 154 - 135 - 120 - 105 - 90 - 75 - 60

---

**ACCESSORIES**

- **CYLINDER SUPPORT PAIR**
  - A70050001

- **CRADLE SUPPORT PAIR**
  - A60050001

- **CRADLE**
  - A50200001

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**ACCESSORIES**

- CYLINDER SUPPORT PAIR: A70050001
- CRADLE SUPPORT PAIR: A60050001
- CRADLE: A50300001

**OPTIONS**

- Sleeve complete of Burst Valve
- Option with Rod Eye - Pins
- Option with Rod Eye - Lower Pins
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**ACCESSORIES**

- **CYLINDER SUPPORT PAIR** A70045001
- **CRADLE SUPPORT PAIR** A60045001
- **CRADLE** A5L080001

**OPTIONS**
- Sleeve complete of Burst Valve
- OPTION with ROD EYE - PINS
- OPTION with ROD EYE - LOWER PINS

---

**Dimensions**

- Ø45 mm
- CRADLE SUPPORT PAIR [mm] 11,5
- MAX CAPACITY (ton) 11
**L 105**

**EFFECTIVE DIAMETER (mm)**  
105 • 90 • 75 • 60 • 45 • 30

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**ACCESSORIES**

1. **CYLINDER SUPPORT PAIR**  
   - Code: A70040001

2. **CRADLE SUPPORT PAIR**  
   - Code: A60040001

3. **CRADLE**  
   - Code: A5L060001

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**OPTIONS**

- Sleeve complete of Burst Valve
- Option with Rod Eye - Pins
- Option with Rod Eye - Lower Pins

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**NOTES**

- Max. = 30°
L 90

**TECHNICAL DATA**

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### ACCESSORIES

- **CYLINDER SUPPORT PAIR**: A70035001
- **CRADLE SUPPORT PAIR**: A60035001
- **CRADLE**: A5L020001

---

**OPTIONS**
- Sleeve complete of Burst Valve

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**NOTE**
- L ±5
- A ±5
- B ±2
- max = 30°
# Selection charts

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

\[ C_{\text{min}} = \frac{2L_{\text{min}} \sin \left( \frac{\alpha_{\text{req}}}{2} \right)}{1 + \frac{9.6696}{777600}} \]

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

\[
S_{KN} = \frac{A}{\pi} d_m^2 \frac{P_{[bar]}}{10000} \Rightarrow S_{KN} \equiv 0.785 \frac{d_m^2}{10000} P_{[bar]}
\]

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

This catalogue into 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 is not a structural member, and is not designed, nor intended to provide stability to the dumping vehicle.

Maintenance suggestions and operating conditions. The normal application of multi-stage cylinder is to lift or support bodies, loaded with different materials, and consequently discharge this material whilst the cylinder is extended all along its travel. The load applied to the cylinder is the total tipping 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).

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 pair of negating 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 on which the purchaser has observed such defect in conformity and/or flaw.
2.3 The defective Products reported in such notice as the part and effect of Article 2.2 are due to be conserved by the purchaser for the purpose of examination by the Company.
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 will reimburse the purchaser for the costs of shipping, while remaining expressly specified that such shipping costs must be within the average reference costs.
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.
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 remains 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.

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) unusu 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;
(f) cause 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 following exceptions:
(a) For the purpose of the General Guarantee Conditions, 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.

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

Progettazione, fabbricazione ed assistenza di cilindri oleodinamici in particolare teleseoplici per ribaltabili, progettazione e costruzione dispositivi idraulici per cilindri oleodinamici, in particolare anticaduta e fine corsa (AF 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 (AF 18)

Organization certificata per la prima volta in data 2002-08-20

“La validità del presente certificato è sottoposta a sorveglianza periodica e, a tutto rinvio al termine compreso del sistema di gestione accreditabile per periodicità vendite”

The validity of the present certificate depends on the annual surveillance every 10 months on the complete renewal of the company’s management system after three years.

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).

H.S. PENTAG S.P.A.
SEDE LEGALE E OPERATIVA:
VIA PROVENTA 31
I-48018 FAENZA (RA)

This certificate is valid for the following product or service range

5) Fit a filter in the hydraulic line, flush the oil tank and pipes, use good quality hydraulic oil;
6) 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”.

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“General guarantee conditions” 19/11/2008