SKAT

HTN

Swiss Centre for
Development Cooperation in Technology and Management

Afridev Handpump Specification

Revision 2-1994

AFRIDEV DEEPWELL HANDPUMP SPECIFICATION

REVISION 2-1994

This SKAT Specification contains a full product definition for the AFRIDEV Deepwell Handpump including:

- manufacturing processes and inspection
- requirements for compliance with international standards
- part and assembly drawings
- parts list

The Specification results from work carried out by the UNDP-World Bank Water and Sanitation Program in partnership with handpump field workers and development organisations in many countries. The experience gained in recent years in UNICEF, and many other country programmes, has been incorporated into Revision 2 - 1994.

Since the issue of the first AFRIDEV Specification in 1989, the AFRIDEV has become the deepwell VLOM handpump of choice in an increasing number of countries in Africa and Asia. It is recommended that large-format drawings are used for manufacturing purposes. Information on obtaining these can be supplied by SKAT.

This Specification is intended to assist all users of the AFRIDEV pump, but is primarily aimed at purchasers, manufacturers and inspectors of the AFRIDEV. Suggestions for improvements and requests for further information are welcome, and should be sent to SKAT at the address given below.

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Authors: Erich Baumann and John Keen

Drawings: TREFF, Degersheim, Switzerland

Print: Niedermann Druck AG, St.Gallen

Distribution: SKAT - BOOKSHOP
Vadianstrasse 42
9000 St.Gallen
Switzerland

Tel: +41 71 23 74 75
Fax: +41 71 23 75 45

SKAT
HTN

Vadianstr. 42, CH-9000 St.Gallen, Switzerland
Phone: +41 (0)71 237475 Fax: +41 (0)71 237545
e-mail 100270.2647@COMPUSERVE
Swiss Centre for Development Cooperation in Technology and Management

To all Promoters,
Manufacturers and Purchasers
of Afridev Handpumps

our ref: F9350-EB
your ref:

23. January 1995

Subject: Afridev Specification Rev. 2-1994

Dear Colleague,

the work on the second revision of the Afridev Specification is now finished. Therefore we are pleased to enclose a copy of the "Afridev Handpump Specification Revision 2-1994"

If you need further copies of the specification, we suggest you make photocopies as required

The present document will remain valid for 3 years. In order to enable us to up-date the specification after this period we would appreciate receiving your comments and a feedback of the experiences you had with this handpump.

Yours sincerely

Erich Baumann
Handpump Technology Network
Secretariat - SKAT

Enclosure: mentioned

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Revision 2 - 1994

SPECIFICATION FOR AFRIDEV DEEP-WELL HANDPUMP

1. Scope

- The Afridev deepwell handpump is suitable for lifting water from depths of 10 m to 45 m.

- The Afridev is suitable for boreholes with casing sizes of nominal 100 mm, 115 mm, 127 mm, 150 mm or 200 mm internal diameter.

Note - If the pump is to be used in dug wells, suitable provision must be made for locating the rising main and modifying the suction pipe, as necessary.

2. Nomenclature

- A brief description of the major pump components is given below:

  (a) Pumpstand - The assembly above ground level, including the pump handle;

  (b) Cylinder Assembly - This contains the plunger, valves, etc and delivers water to the Pumpstand via the Rising Main;

  (c) Pumprod Assembly - This provides a linkage between the handle and the plunger;

  (d) Rising Main - This delivers water from the cylinder to the Pumpstand.

3. Drawing Summary and Design Options

Pump Assembly (schematic) - See Fig. Z-00

3.1 Pumphead Assembly including Options a and b - See Fig. A-00, A-00a, A-00b

3.1.1 Pumphead Parts including Options a and b - See Fig. A-01, A-02, A-03, A-03a, A-03b, A-04, A-04a

3.2 Cover Assembly - See Fig. B-00

3.2.1 Cover Parts - See Fig. B-01

3.3 Bearing Set and Fulcrum/Hanger Pin Assemblies - See Fig. C-00, C-01

3.4 Handle Assembly Front - See Fig. D-00

3.4.1 Handle Parts - See Fig. D-01, D-02

3.5 Handle Assembly - See Fig. E-00, E-01

3.5.1 Handle Parts - See Fig. E-02

3.6 Rodhanger Assembly and Parts - See Fig. F-00

3.7 Stand Assemblies including Options a and b - See Fig. G-00, G-00a, G-00b

3.7.1 Stand Parts including Options a and b - See Fig. G-01, G-01a, G-01b, G-02b

3.8 Steel Cone Assembly - See Fig. H-00

3.9 Pumprod Assemblies including Option a and Footvalve Fitting See - Fig. J-00, J-00a

3.10 Rising Main Parts - see Fig. K-00, K-01, K-02

Cylinder Assembly - See Fig. L-00

3.11 Cylinder Sub-assembly - See Fig. L-01

3.11.1 Cylinder Parts - See Fig. L-02, L-03, L-04

3.12 Fishing Tool - See Fig. M-00

3.13 Spanners including Option a - See Fig. N-00, N-00a

3.14 Concrete Pump Pedestal - See Fig. P-00

Design Options

Optional designs are included in the Afridev Specification for the pumpstand, pump rods and connectors, rising main centralisers and spanner. The design options to be used would normally be agreed between the pump purchaser and supplier and specified in the pump order.

3.16 Pumpstand

Three designs are available. One is the 'concrete' version (Fig. G-00) and is suitable for casting integral with the pump apron. The second is the all-steel version (Fig. G-00a) designed for setting into the pump apron. The third design (Fig. G-00 b) is also in steel and is suitable for mounting directly onto pump aprons with cast-in foundation bolts. The pumphead design is common to all pumpstand options, there is a choice of spout lengths, either 512 or 232 mm. The spout's direction can also be specified - either facing away from the handle, or facing to the left or right. (Fig. A-00, A-00a, A-00b)

3.17 Rods and Connectors

Two designs are available, and one of these can be made in three different materials (mild steel and two types of stainless steel) giving four possible versions in all. The first design (Fig. J-00) using mild steel rods and mild steel fabricated connectors, is intended for non-corrosive groundwaters. (As a guide, this includes water with a Ph value greater than 6.5, but other parameters are also important in determining corrosivity). The complete assembly is hot-dip galvanised to increase corrosion resistance. The second design (Fig. J-00a) uses rods and forged connectors. This design can be made in hot-dip galvanised mild steel or either AISI 304 or AISI 316 stainless steel. (As a guide, the stainless versions are suitable for waters in which the Ph value is less than 6.5. AISI 316 would be used in preference to 304 in situations where corrosion conditions are particularly severe).

3.18 Rising Main Centralisers

These are all of the same basic design (Fig. K-01, K-02) but five different diameters are available to suit the diameter of the borehole casing in use. If the pump is to be used in dug wells, suitable provision must be made for locating the rising main and modifying the suction pipe, as necessary.

3.19 Spanners

Two designs are available. One (Fig. N-00) features a hinged extension to the handle which provides increased leverage in the anticlockwise direction for unfastening. In the clockwise direction the extension folds back into the handle so that only the normal leverage is available for fastening to prevent overtightening. The second design (Fig. N-00a) features a fixed length handle which is simpler and cheaper to manufacture, but does not provide additional leverage for unfastening.

4. General Requirements

4.1 The material, tolerances, etc, shall be as given in the respective figures.

4.2 The bolts and nuts used for Afridev handpump assembly shall conform to the relevant parts of ISO 4017 / DIN 933 for bolts and ISO 4032 / DIN 934 for nuts. For pumpstand option G-00b the brass nuts shall conform to ISO 4033.

4.3 The washers shall conform to Type A of ISO 7089 or DIN 125.

4.4 The rising main pipe shall be DN50 PN16 conforming to DIN 19532 'Pipelines of Unplasticised Polyvinylchloride (Rigid PVC, UPVC) for Drinking Water Supply'.

4.5 The welding shall be done in accordance with DIN 8551, Part I 'Code of procedure for manual metal arc welding of mild steel'.

Stainless steel components shall be welded using the TIG process in accordance with DIN 8551, Part 3 'Code of procedures for MIG and TIG welding'.

4.6 The steel plates, sheets, angle iron legs and square bars for fabrication of the Afridev pump shall conform to designation ISO 630 / DIN 17100, ST37-2 'Steels for general structural purposes: quality standard'.

Chemical properties of test pieces:
C=0.21% max; P=0.065% max; S=0.065% max; N=0.010%
Tensile strength: 340-470 N/mm2
Yield strength: 235 N/mm2

4.7 The steel pipes for fabrication of Afridev pump parts shall conform to designation DIN 1615, ST37-2 'Welded circular non-alloyed steel tubes not subject to special requirements: technical delivery conditions'.

Tensile strength: 250-540 N/mm2
Yield strength: 175 N/mm2

Dimensions conforming to ISO 4200 / DIN 2458 'Plain End welded Steel Tubes'.

4.8 The Square Tube shall conform to ISO 4019 / DIN 59411 'Hollow Sections for Structural Engineering'.

4.9 The Plastic components shall be made of one of the following materials:

(a) PA 6.6 NC

(b) POM NC

(c) UPVC conforming to DIN 7748 Part One, 'Plastic Moulding Materials, unplasticised Polyvinyl Chloride (UPVC) moulding Materials'.

4.10 The Rubber components shall be made of Acrylonitrile-Butadiene Rubber (NBR) conforming to British Standard BS 2751 and BS 3222: 1982 'Acrylonitrile-butadiene Rubber compounds: compound numbers BA70 and BA80'. The plunger seal (Pos. 556) listed in the Specification is a proprietary item, although this component can be locally produced provided it complies with the relevant British Standards.

4.11 The Brass cylinder liner shall be made of seamless tubing of CuZn37 conforming to DIN 17660. For increased resistance to de-zincification in corrosive waters (with high chloride content for example), CuZn20Al2 or CuZn28Sn1 may be specified.

Mechanical properties and technical delivery conditions shall conform to DIN 17671, Parts 1 and 2, DIN 1785 and DIN 17679.

4.12 Stainless Steel components shall be made of AISI Type 304 or 316 as specified.

Chemical properties of test pieces for AISI Type 304 to DIN 17400 - 1.4301:

C=0.08% max; Cr=18.0-20.0%; Ni=8.0-12.0%;
Si=1.0% max; Mn=2.0% max; P=0.045% max; S=0.03% max
Tensile Strength (annealed): 590 N/mm2
Yield Strength (annealed): 240 N/mm2

Chemical properties of test pieces for AISI Type 316 to DIN 17440 - 1.4401:

C=0.08% max; Cr=16.0-18.5%; Ni=10.5-14.0%; Mo=2.0-2.5%;
Si=1.0% max; Mn=2.0% max; P=0.045% max; S=0.03% max
Tensile Strength: 700 N/mm2
Yield Strength (0.2%): 450 N/mm2

Dimensions conforming to DIN 2463.

Compliance is required with the technical delivery conditions for stainless steel materials and semi-finished products given in DIN 17440. This includes information on the heat treatment of forged components.

4.13 Stainless steel and mild steel pumprods are to be manufactured from cold drawn bright bar conforming to designation DIN 668: 'Bright round steel, dimensions and tolerances to ISO tolerance zone h11'.

4.14 The Cementing Compound shall be made on the basis of Tetra-Hydrofuran (Thf) conforming to ISO 7387, Part 1. It must also conform to toxicity requirements for drinking water.

The cleaning agent for preparation of the joints shall be made on the basis of Methylene Chloride.

5. Anti-Corrosion Treatment

- The handpumps shall be given anti-corrosion treatment as specified below:

5.1 Galvanizing - The following assemblies shall be galvanized according to DIN 50976, 'Protection against corrosion: hot dip galvanized coatings on fabricated ferrous products: requirements and tests'

(a) Pumphead Assembly;

(b) Cover Assembly;

(c) Handle Assemblies, (front and rear);

(d) Stand Assembly;

(e) Pumprod Assemblies (unless Stainless Steel is used);

(f) Rodhanger Assembly;

(g) Steel Cone Assembly;

(h) Fishing tool.

5.2 The following shall be electro-galvanized and passivated to DIN 50961-Fe/Zn12C 'Electroplated coatings: coatings of zinc and cadmium coatings on iron and steel'.

(a) Fulcrum Pin and Rodhanger Pin;

(b) All Bolts, Nuts and Washers (except Stainless Steel/Brass Fasteners);

(c) Spanner.

5.3 The electro-galvanized assemblies shall be given chromate conversion coating Type C to DIN 50941 'Protection against corrosion: chromating of electroplated zinc and cadmium coatings'.

6. Testing

6.1 Sampling - Unless otherwise specified in the contract or order, the procedure given in IS:2500 (Part I) - 1973 'Sampling Inspection Tables: Part I - Inspection by attributes and by count of defects' shall be followed for sampling inspection. For the characteristics given under 6.3, the single sampling plan with inspection level III and Average Quality Level of one percent as given in Table 1 and 2 of IS:2500 (Part I) - 1973 shall be used.

6.2 Visual and Dimensional Tests

The following are the additional characteristics to be checked:

6.2.1 One hundred percent interchangeability of sub-assemblies and components is an essential requirement;

6.2.2 All pumps shall be examined for welding, surface coating, finish, workmanship and visual defects and nameplate markings;

6.2.3 All dimensions of the assemblies and sub-assemblies shall be checked for conformance with the drawings;

6.2.4 The handle shall have good surface contact with the stopper plates at upper and lower stroke positions;

6.2.5 The flanges shall be reasonably flat to provide proper matching. Use of force for insertion of flange bolts is not permissible;

6.2.6 Alignment check; A 10 mm measuring rod shall pass freely through a 12 mm slot in a measuring gauge placed in the 87.0 diameter hole of the pumphead assembly. The slot must be orientated parallel to the axis of the pump handle.

6.2.7 The following dimensions shall be specially checked:

(a) Stroke length (225 +/-3);

(b) Internal diameter and surface finish of fulcrum housing and rod hanger housing (47 +0.1/-0);

(c) Length of rod hanger housing (58 +0.2/-0) and fulcrum housing 109.5 +0.2/-0;

(d) Outside diameter of rod hanger pin and fulcrum pin (38 +0/-0.2);

(e) Length of rod hanger pin (68.5 +0.2/-0) and fulcrum pin (119.5 +0/-0.2);

(f) Distance between the bracket plates where fulcrum pin is fixed (120.2 +0.5/-0);

(g) The inside diameter of UPVC riser pipe bell ends.

6.2.8 Stainless steel sleeves shall not protrude beyond the end faces of fulcrum and rod hanger housings and pins.

6.2.9 Bearing assembly fit - the bush shall be an easy sliding fit in the housing. The pin shall be easy sliding fit when bushes are in position. Locating lugs shall engage fully without excessive clearance.

6.2.10 The rod hanger should fit in between the forks easily and the retainer bush shall be in line with the two slots provided at the top of the pumphead body.

6.2.11 The pump rod and the plunger rod shall be examined for diameter, fitment of hook and centralizers. The quick coupling devices shall be checked for in-line attachment to the rods.

6.2.12 The following checks shall be carried out on the cylinder assembly in addition to dimensional checks:

(a) Outside diameter of the unlined cylinder length;

(b) Leakage test of 1.0 bar and 10.0 bar hydraulic pressure;

(c) Correct engagement of footvalve with fishing tool;

(d) Tensile test on one plunger/footvalve valve body.

6.3 Routine Test - Unless otherwise specified in the contract or order, a minimum of two complete pumps from the selected sample shall be subjected to the following tests, in addition to the tests in 6.2 above:

6.3.1 The pumps and cylinders selected shall be dismantled and the components checked in detail for dimensional conformity to the drawings, general requirements and additional requirements.

6.3.2 The cylinder shall be placed in a barrel of 200 litres water capacity. The cylinder shall be primed and testing shall start only after continuous flow of water through the spout has been obtained. The water shall then be collected in a container for 40 continuous full strokes of the plunger. This test shall be completed in one minute and the discharge thus measured shall not be less than 16.5 litres.

6.4 Criteria for Conformity - The lot shall be considered conforming to the requirements of this specification if the pumps selected according to 6.1 and 6.3 satisfy the following requirements:

(a) The number of pumps not meeting the requirements of a characteristic inspected under 6.2 does not exceed the corresponding acceptance number, and

(b) The pumps inspected according to 6.3 meet the requirements given in 6.3.1 and 6.3.2.

6.5 **National Standards** - Wherever equivalent national standards are available the materials and processes shall conform to such national standards.

6.5.1 Further information on the ISO/DIN/BS Standards used in this Specification is available from SKAT.

7. Guarantee

Unless otherwise specified in the contract or order, the pump and accessories shall be guaranteed for 12 months from the date of installation, or 18 months from the date of supply, whichever is earlier, against faulty workmanship and/or materials.

8. Marking

The nameplate shall be permanently attached to the pump body. If pop-riveting is used the height of the nameplate shall be such that the lowest rivet is above the drainage holes.

The nameplate shall have the following stamped on it:

(a) Manufacturer's name and address;

(b) Serial number;

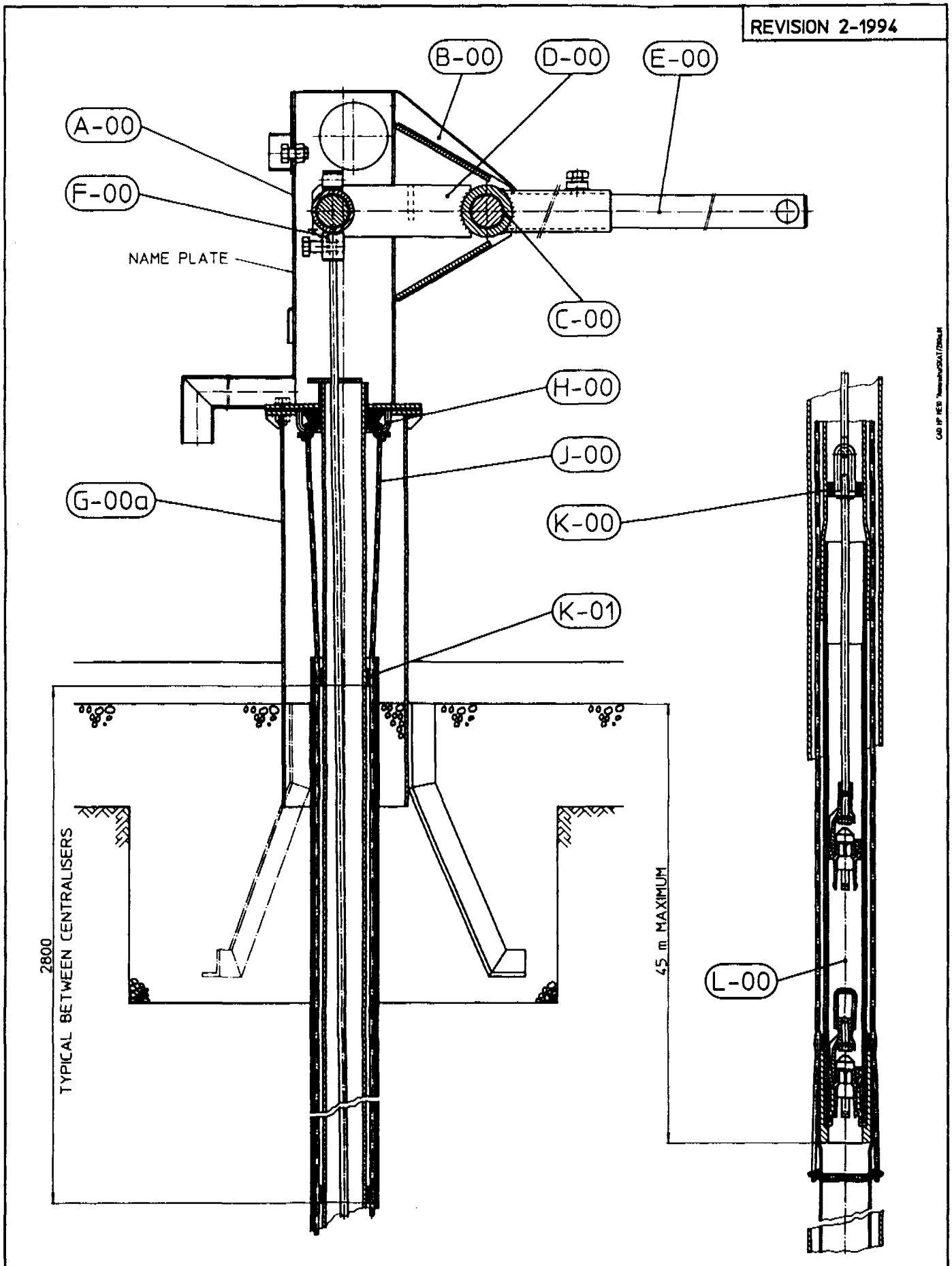
(c) Year and month of manufacture.

The pumphead flanges and stand flanges shall be marked permanently with the manufacturer's name/identification mark and year of production.

The cylinder body, shall have the manufacturer's name/identification mark and year of production marked in permanent ink.

9. Packaging

A study of the packaging requirements for transportation of the Afridev pump has been undertaken by the Institute of Packaging in India. The resulting report is available as a separate publication from SKAT and is entitled 'Guidelines for Packaging of Afridev Deepwell Handpump Sub-Assemblies and Components'.



Rev. No.	drawn by	Date	Z00a.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:2,5	PUMP ASSEMBLY SCHEMATIC	Z-00
			JULY 1991			

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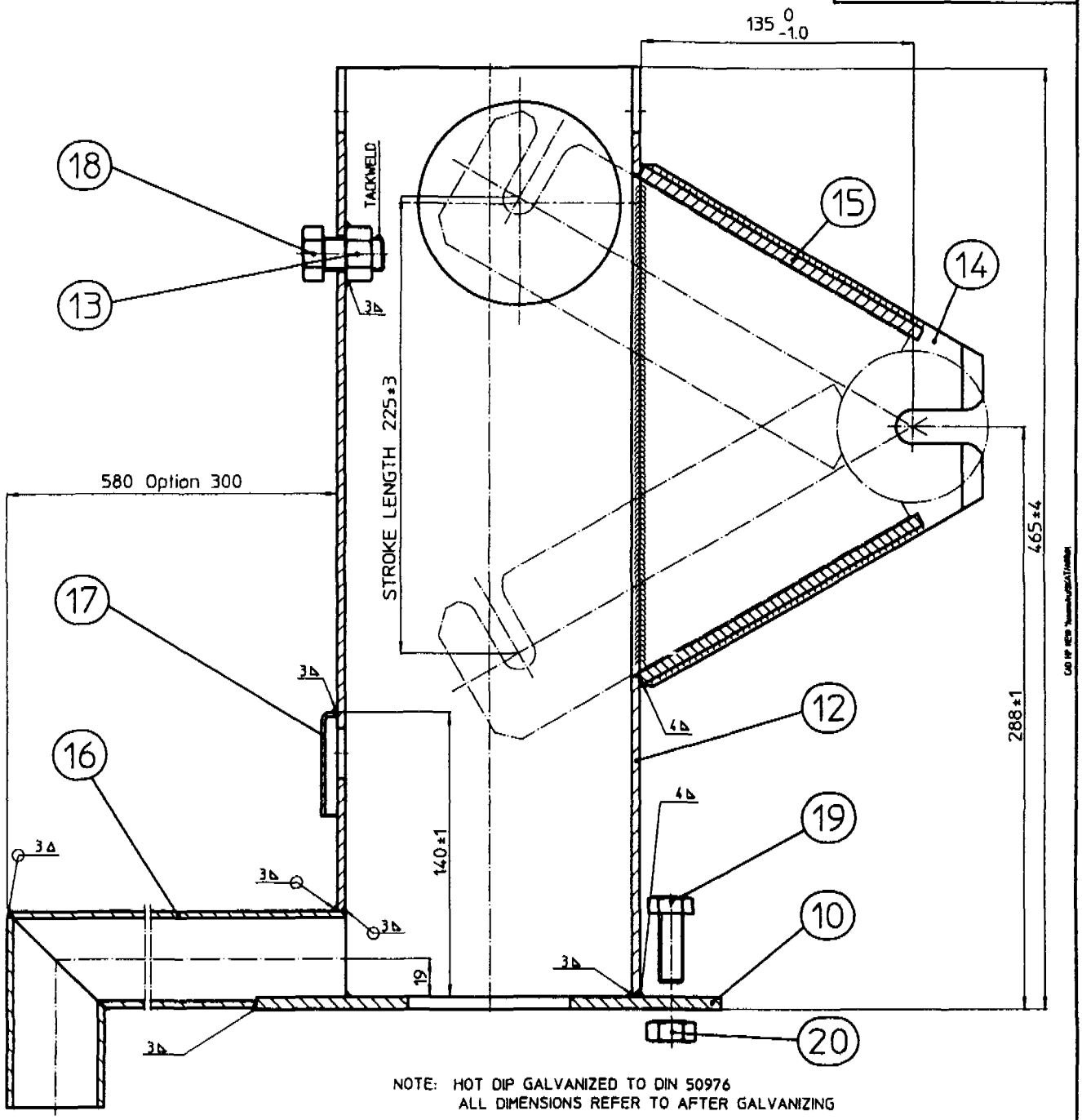

NOTE: HOT DIP GALVANIZED TO DIN 50976
ALL DIMENSIONS REFER TO AFTER GALVANIZING

GENERAL TOLERANCES , +/-2 UNLESS OTHERWISE STATED

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
20	4	HEX. NUT	DIN 934 M12	CLASS 4	
19	4	HEX. BOLT	DIN 933 M12x35	CLASS 4.6	
18	1	HEX. BOLT	DIN 933 M16x25	CLASS 4.6	
17	1	OVER FLOW COVER			
16	1	SPOUT			
15	2	STOPPER PLATE			
14	2	FULCRUM BRACKET			
13	1	HEX. NUT	DIN 934 M16	CLASS 4	
12	1	RHS - BODY			
10	1	BASE FLANGE			

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2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: ASSEMBLY	A-00
			JULY 1991			

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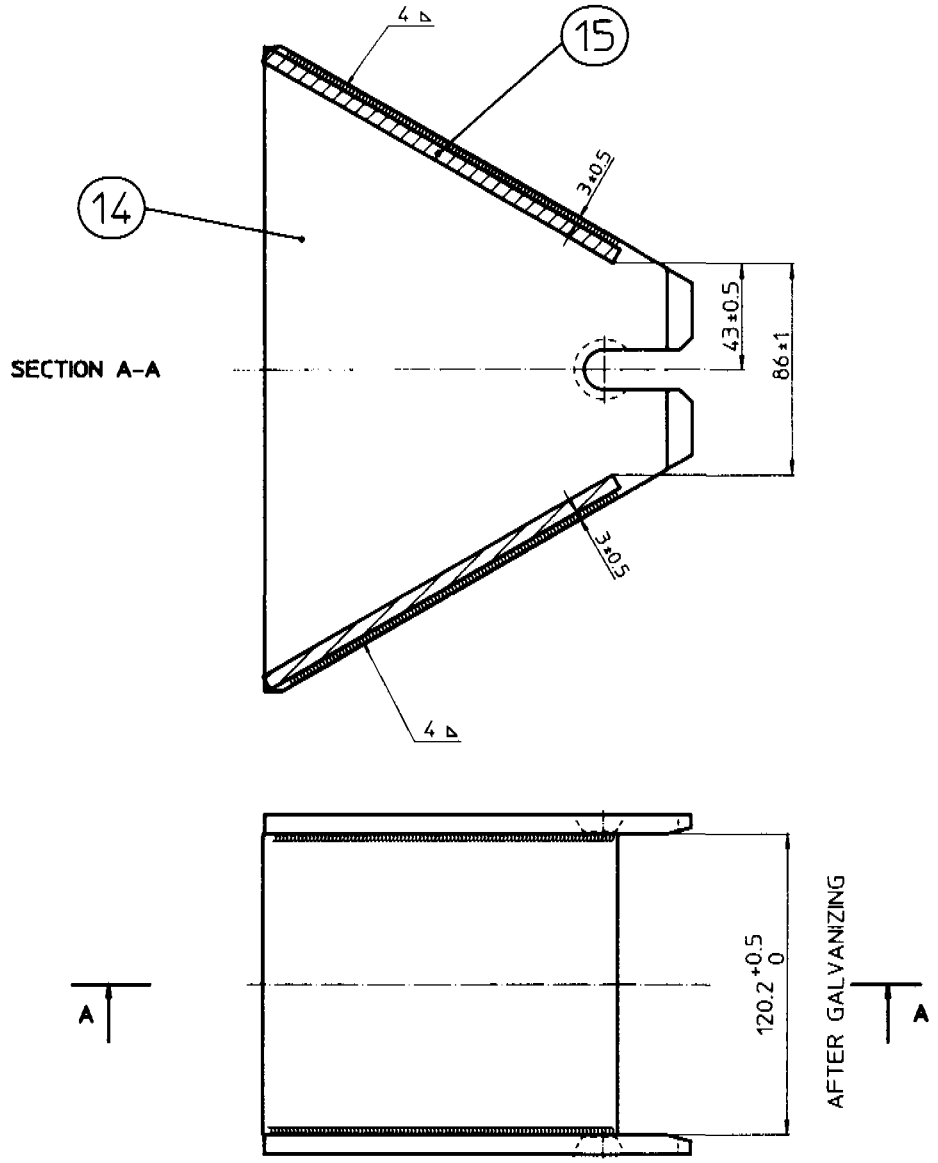

NOTE: ALL DIMENSIONS REFER TO AFTER HOT DIP GALVANIZING

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
15	2	STOPPER PLATE			
14	2	FULCRUM BRACKET			

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2	RU	JULY 1994	TREFF AG	M. 1:1
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AFRIDEV HANDPUMP

PUMPHEAD: FULCRUM BRACKET SUBASSY.

SKAT

A-01

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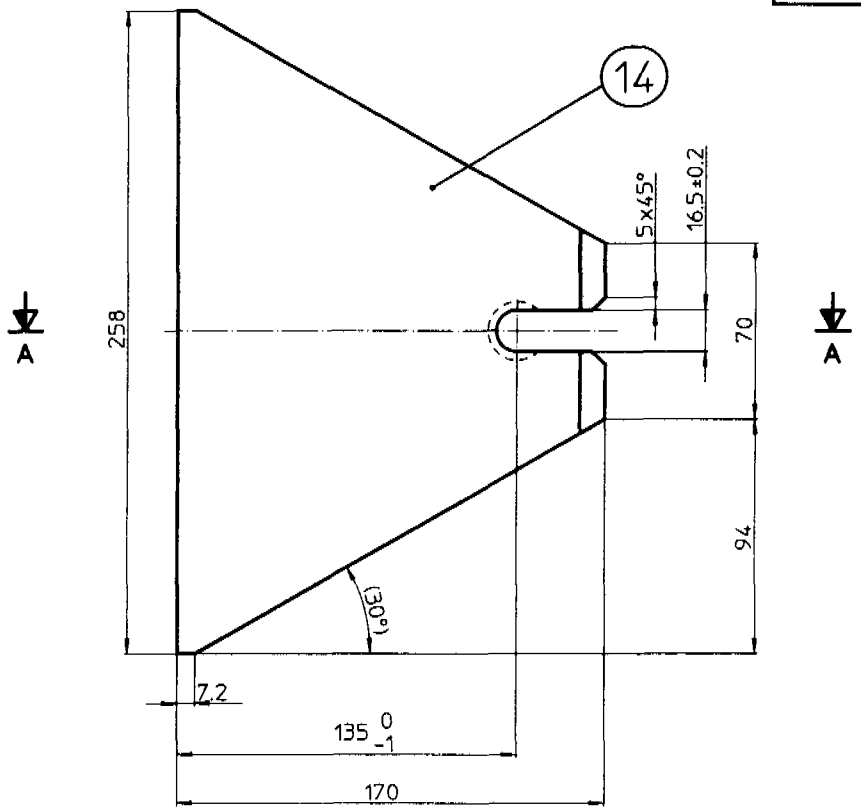
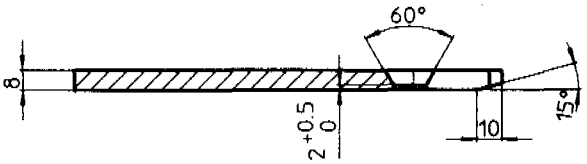
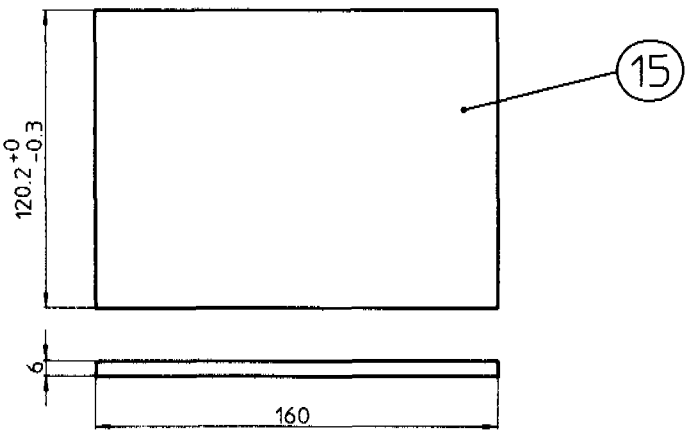


SECTION A-A



GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1



GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
15	2	STOPPER PLATE		St 37	
14	2	FULCRUM BRACKET		St 37	

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2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: PARTS	A-02
			JULY 1991			

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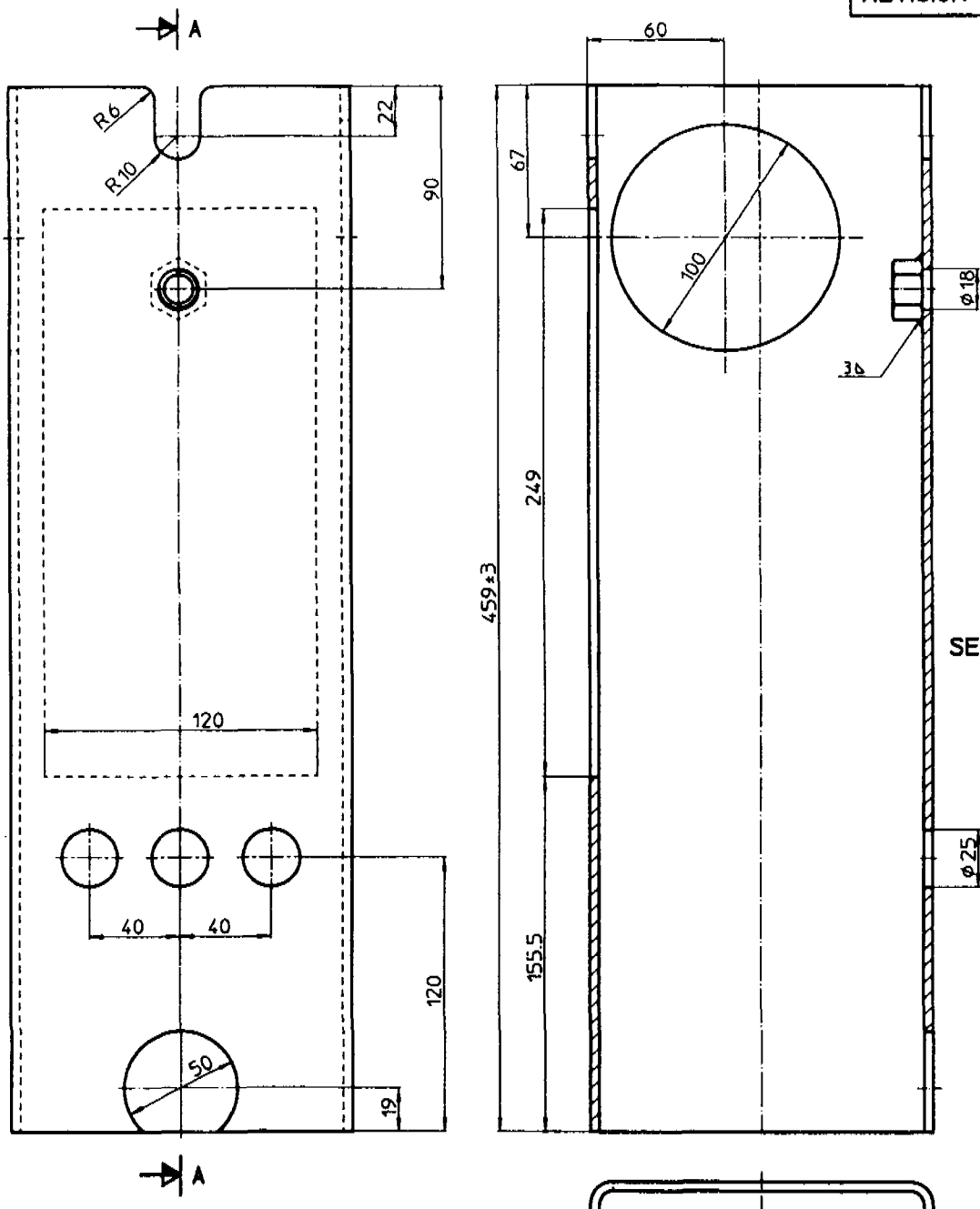

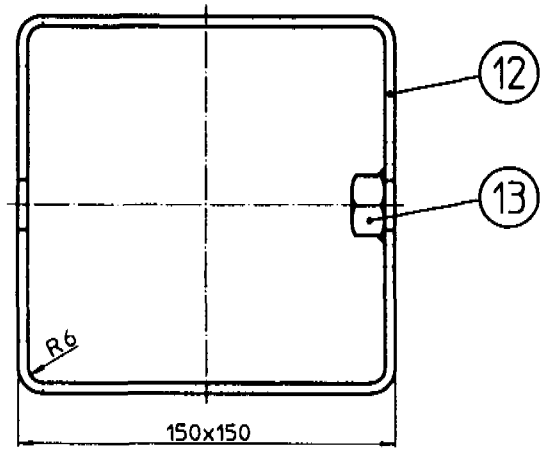

NOTE: RHS 150x150 CAN BE FABRICATED
FROM 4MM SHEET.

THE WELDS SHALL BE PLACED SUCH
THAT THEY DO NOT IMPEDE THE FUNCTION
OF THE PUMPHEAD.
THE WELDS TO BE CONTINUOUS ON INSIDE AND OUTSIDE.
NOT TO BE GROUND.

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
13	1	HEX. NUT	DIN 934 M16	CLASS 4	
12	1	RHS-BODY	150x150x4	St 37-2	DIN 59411

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AFRIDEV HANDPUMP
PUMPHEAD: PARTS

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A-03

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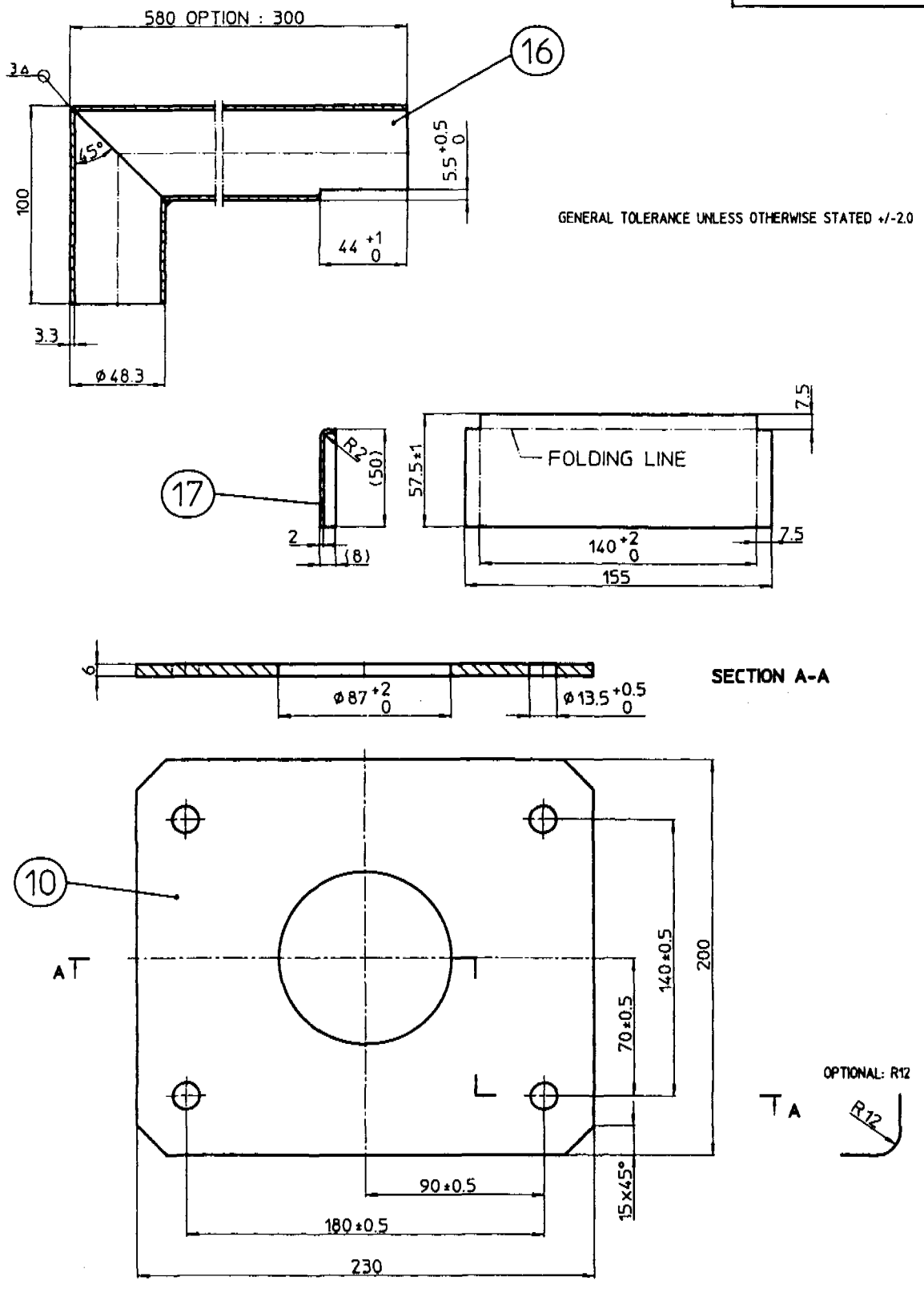

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
17	1	OVER FLOW COVER		St 37	
16	1	SPOUT	ø48,3x3,3	St 37-2	DIN 2458
10	1	BASE FLANGE		St 37	

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2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: PARTS	A-04
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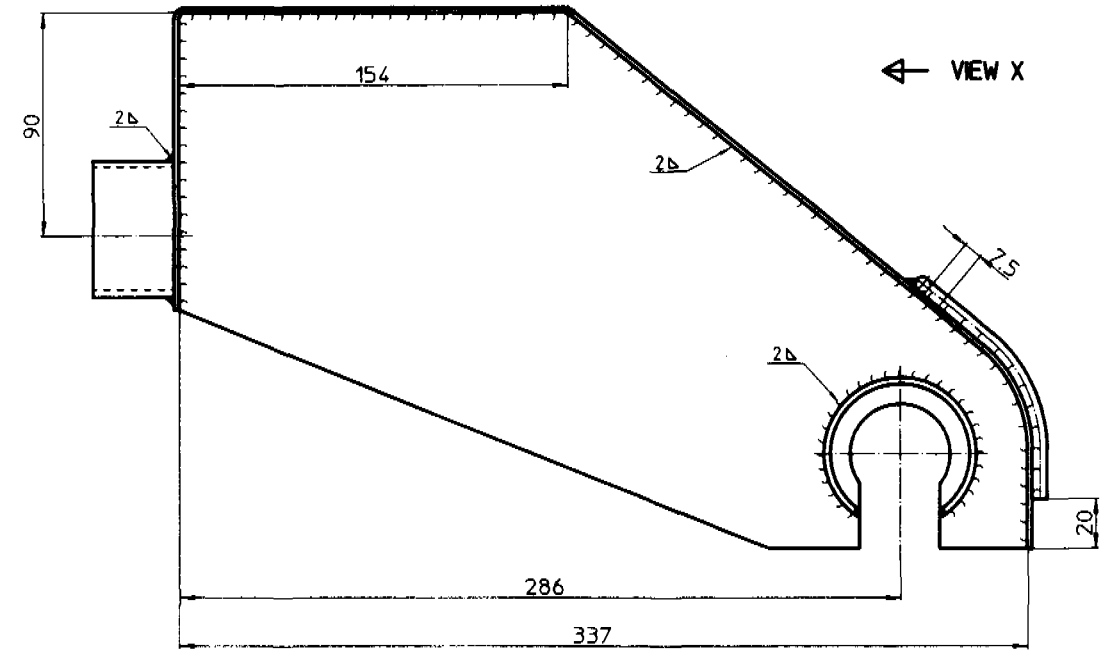

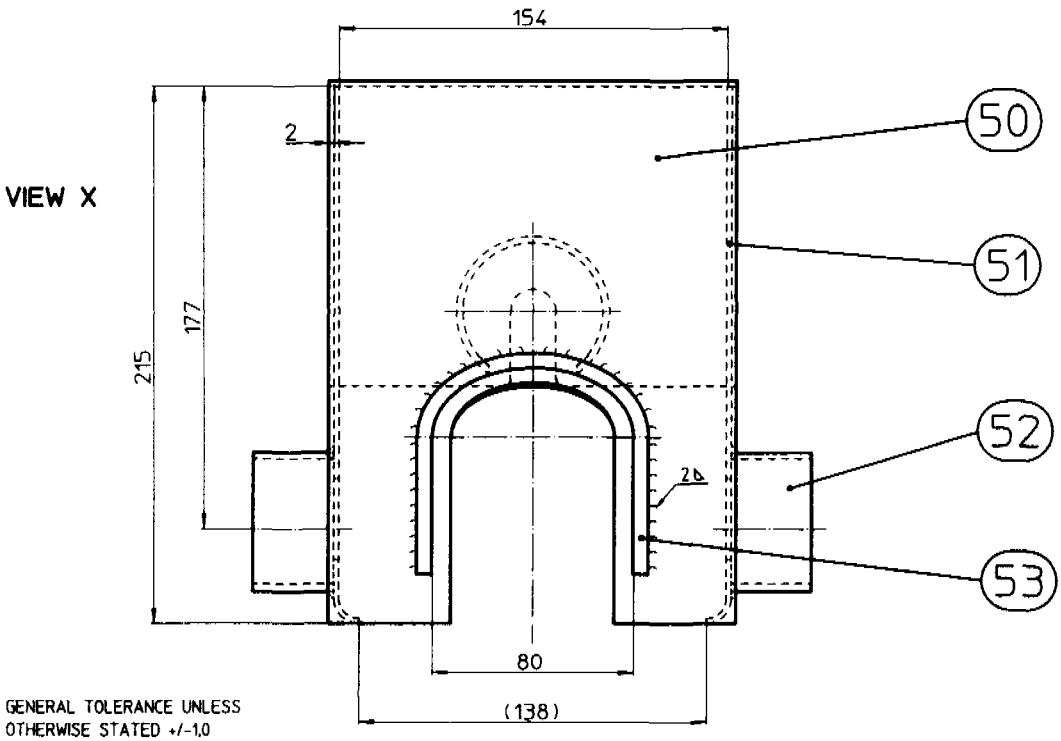

GENERAL TOLERANCE UNLESS
OTHERWISE STATED +/-1.0

NOTE: HOT DIP GALVANIZED TO DIN 50976
ALL DIMENSIONS REFER TO AFTER GALVANIZING

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
53	1	DEFLECTOR			
52	3	SHROUD			
51	2	SIDE PLATE			
50	1	COVER PLATE			

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2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: COVER ASSEMBLY	B-00
			JULY 1991			

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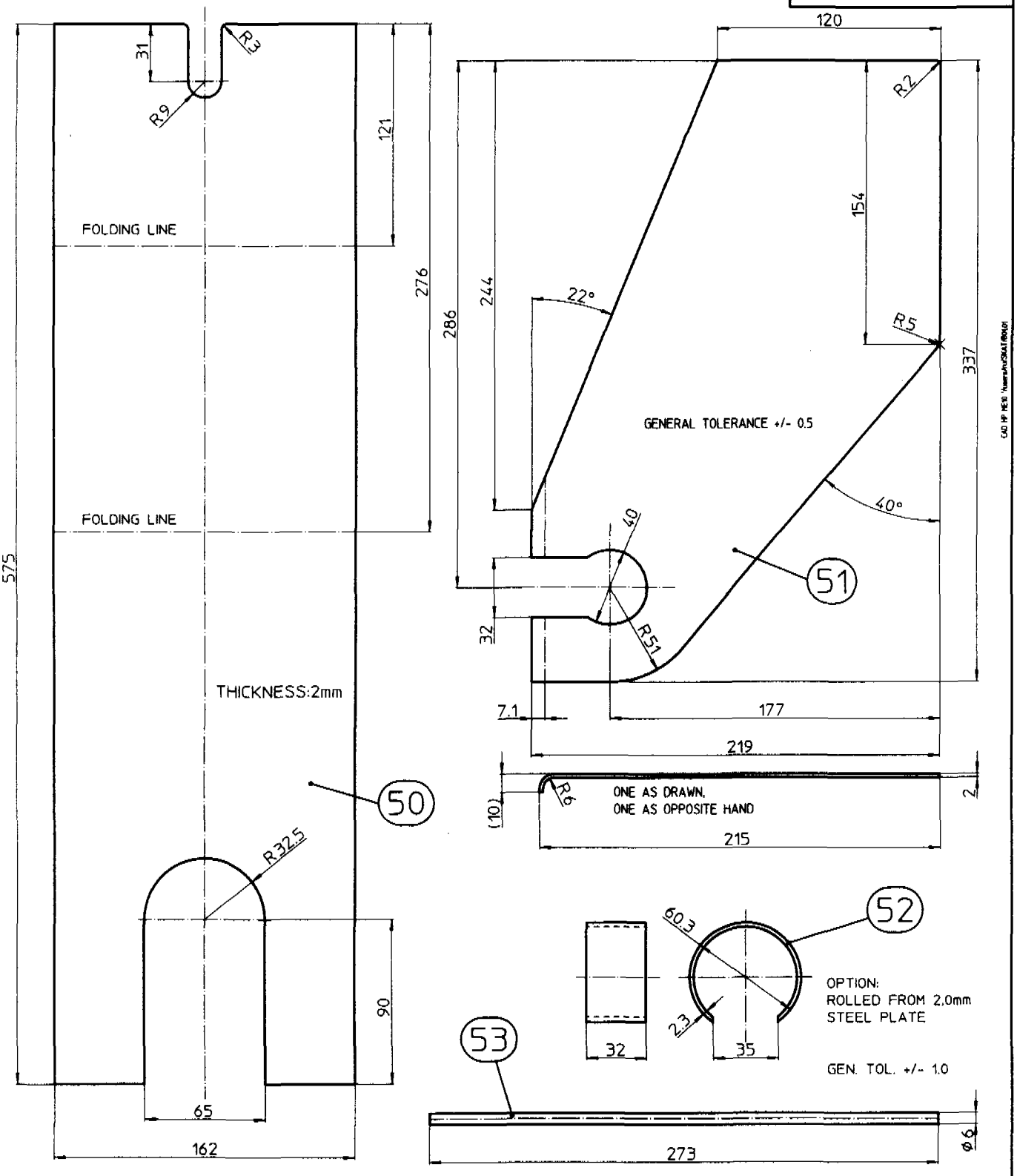

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
53	1	DEFLECTOR		St 37	
52	3	SHROUD	Ø60,3x2,3	St 37-2	DIN 2458
51	2	SIDE PLATE		St 37	
50	1	COVER PLATE		St 37	

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2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: COVER-PARTS DETAILS	B-01
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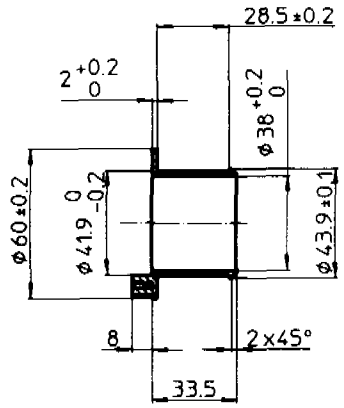
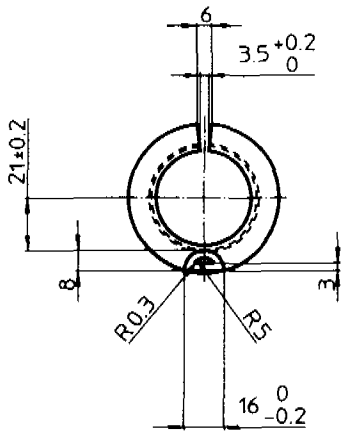
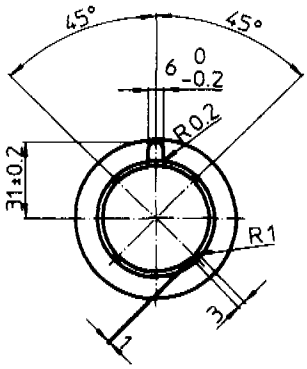
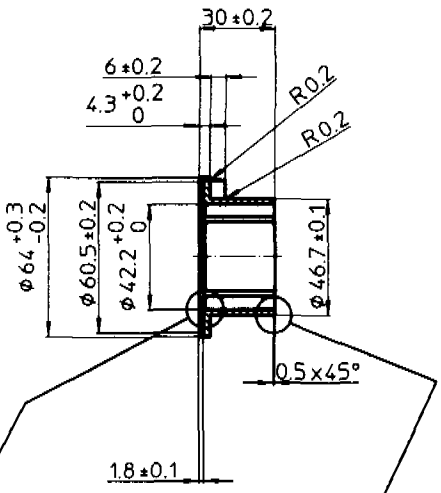


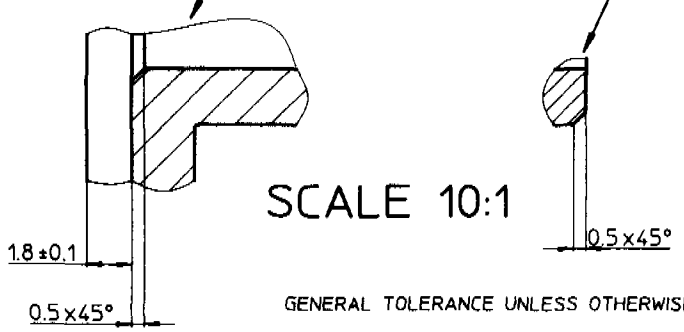


100





101



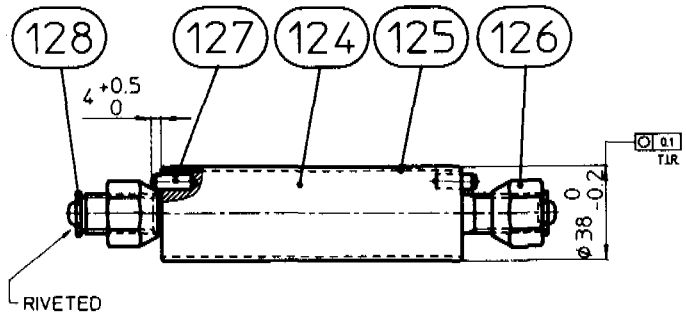
SCALE 10:1

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.2

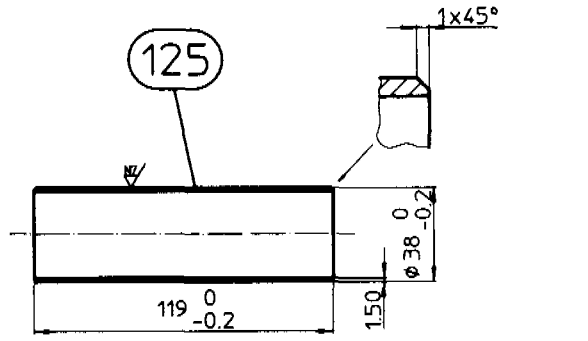
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
101	4	BEARINGBUSH OUTER		POM NC	
100	4	BEARINGBUSH INNER		PA 6.6 NC	

Rev. No.	drawn by	Date	C00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: BEARING SET	C-00
			JULY 1991			

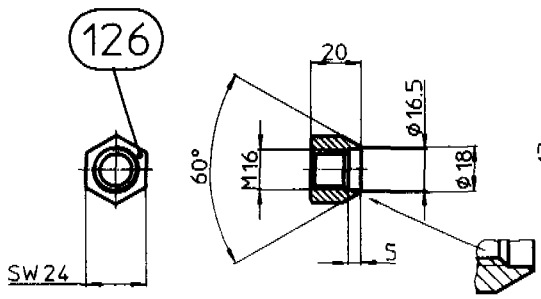
REVISION 2-1994



SLEEVE TO BE FIXED WITH EPOXY ADHESIVE
EG ARALDITE "STANDARD"

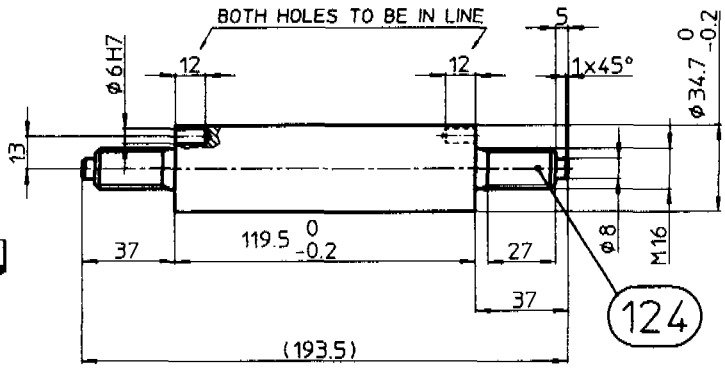


GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.3



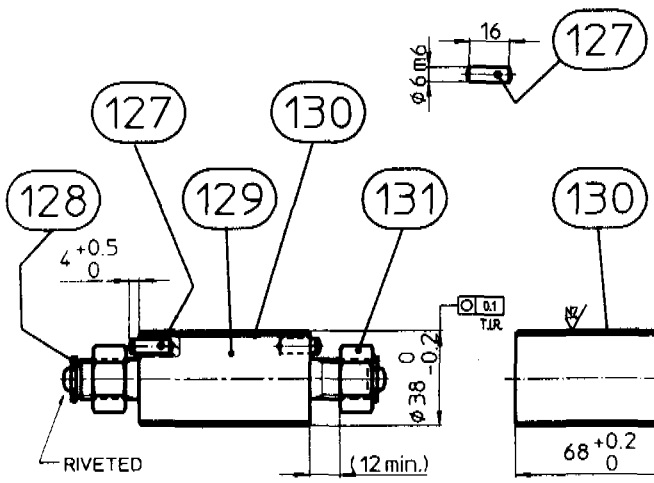
ELECTROGALVANIZED TO DIN 50961

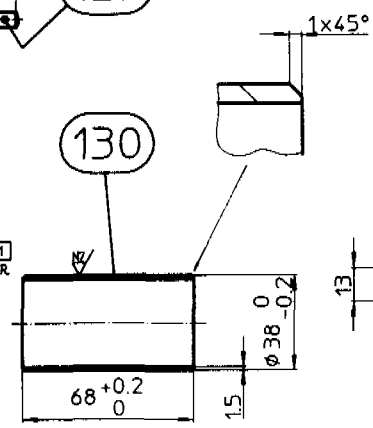
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.3



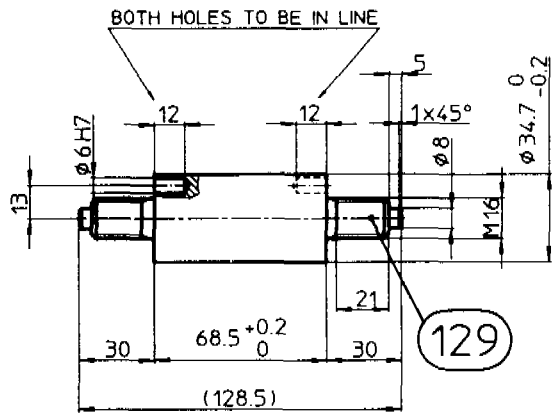
ELECTROGALVANIZED TO DIN 50961

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.3





SLEEVE TO BE FIXED WITH EPOXY ADHESIVE
EG ARALDITE "STANDARD"



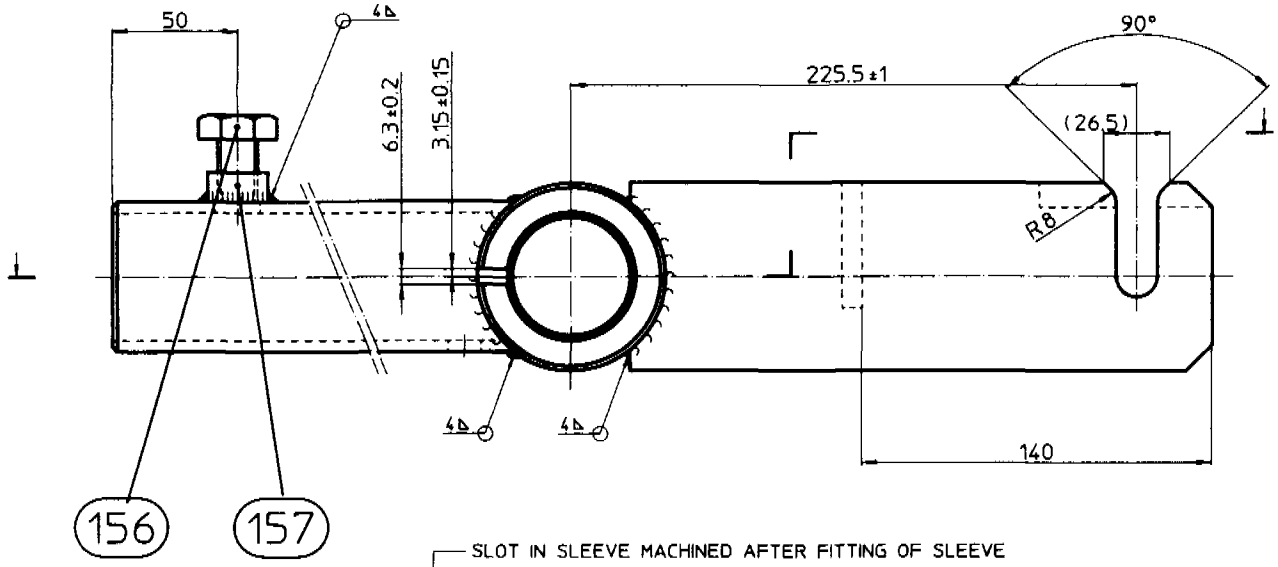
ELECTROGALVANIZED TO DIN 50961

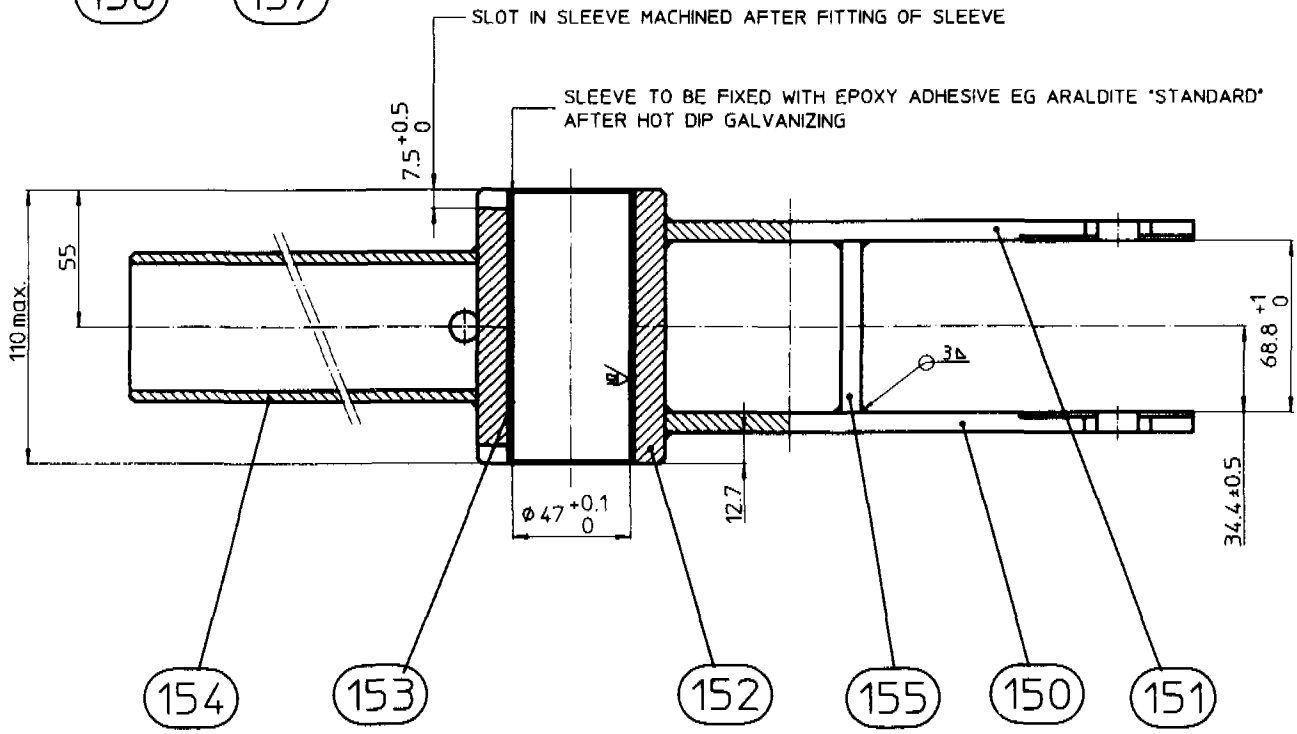
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.3

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
131	2	HEX. NUT	DIN 934 M16	CLASS 4	EL. GALV.
130	1	SLEEVE		AISI-304	
129	1	RODHANGER PIN		St 37	
128	4	WASHER	DIN 125 8,4	St 37	EL. GALV.
127	4	LOCK PIN	DIN 7 6x16	St 37	EL. GALV.
126	2	HEX. NUT SPECIAL M16		St 42	EL. GALV.
125	1	SLEEVE		AISI-304	
124	1	FULCRUM PIN		St 37	

Rev. No.	drawn by	Date	C01.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: FULCRUM- & HANGER-PINS	C-01
			JULY 1991			

REVISION 2-1994





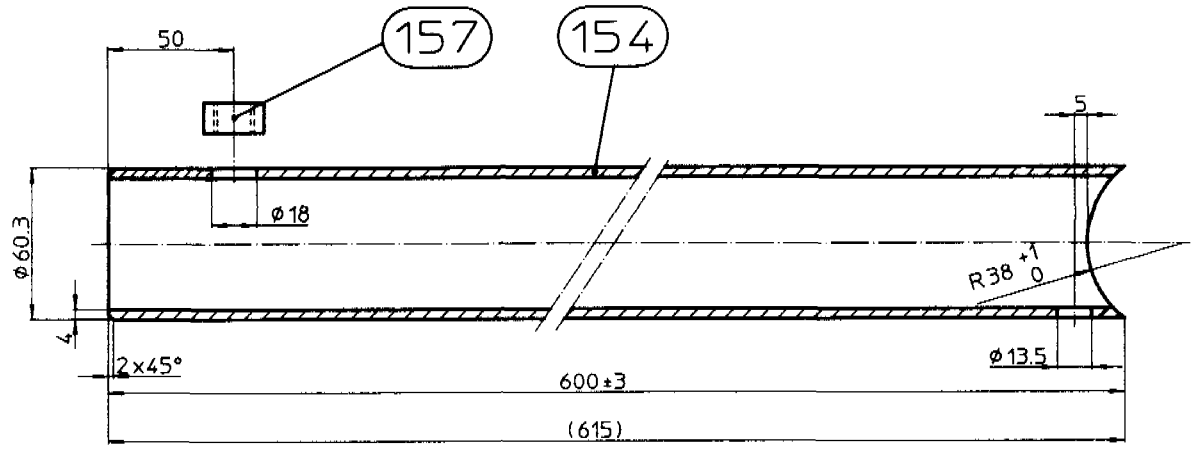
HOT DIP GALVANIZED TO DIN 50976
ALL DIMENSIONS REFER TO AFTER GALVANIZING

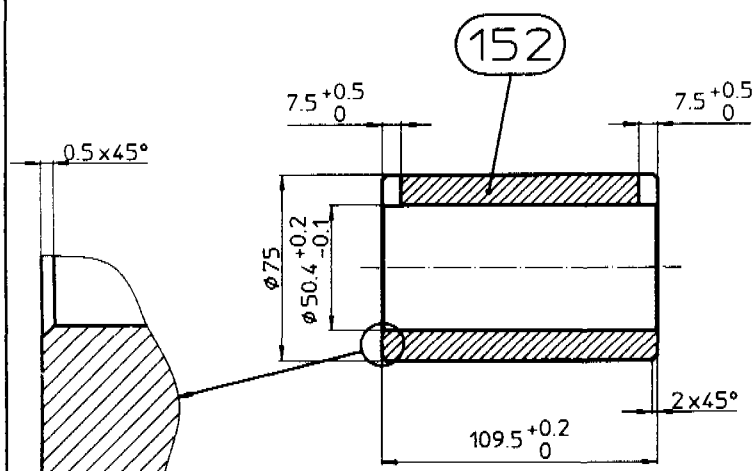
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

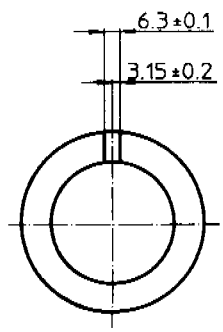
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
157	1	SOCKET			
156	1	SET SCREW	DIN.933 M16x25	CLASS 4.6	
155	1	SPACER			
154	1	HANDLE PIPE			
153	1	SLEEVE			
152	1	FULCRUM HOUSING			
151	1	HANDLE FORK RIGHT			
150	1	HANDLE FORK LEFT			

Rev. No.	drawn by	Date	D00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: HANDLE ASSEMBLY FRONT	D-00
			JULY 1991			

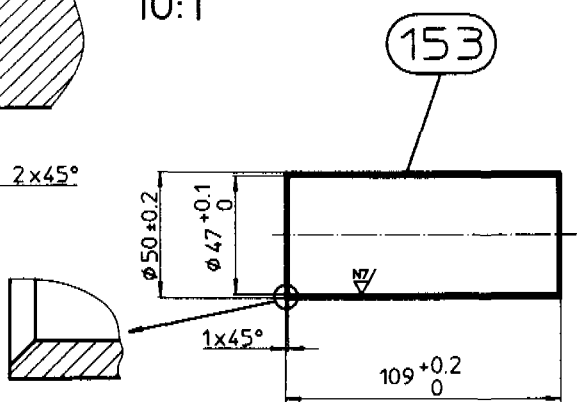
REVISION 2-1994

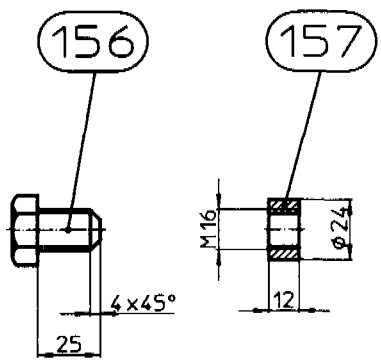






10:1





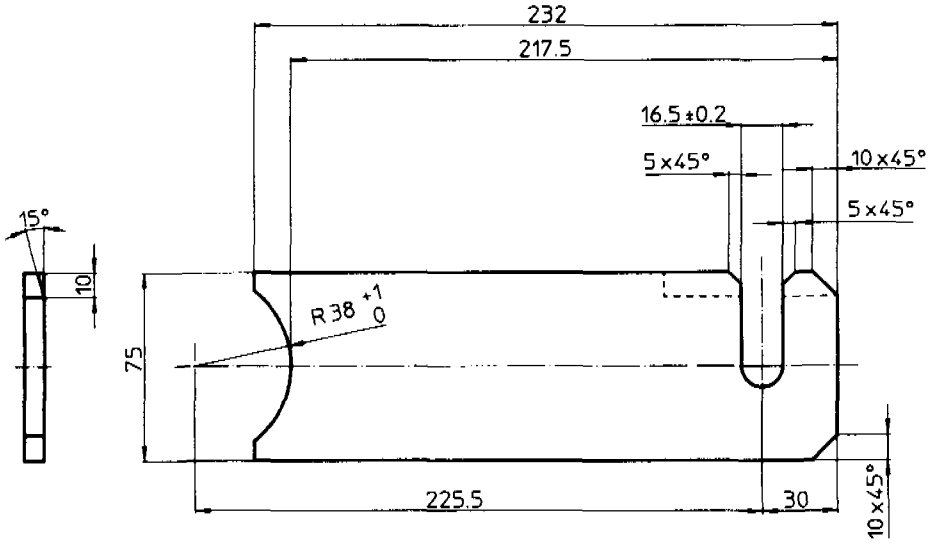
10:1

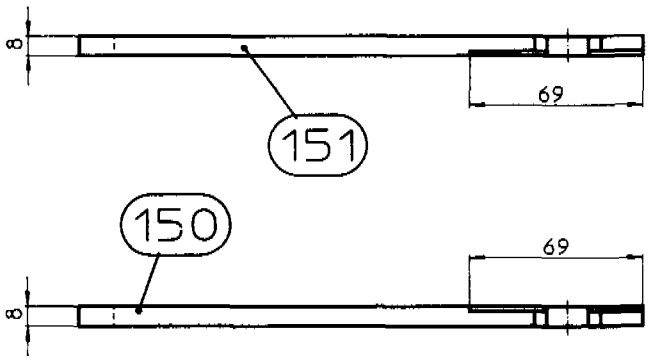
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

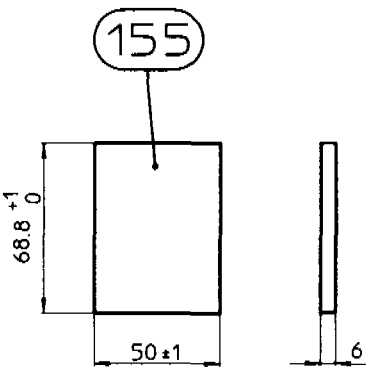
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
157	1	SOCKET		St 37	
156	1	SET SCREW	DIN 933 M16x25	CLASS 4.6	
154	1	HANDLE PIPE	ø60,3x4	St 37-2	DIN 2458
153	1	SLEEVE		AISI 304	
152	1	FULCRUM HOUSING		St 37	

Rev. No.	drawn by	Date	D01.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: HANDLE PARTS	D-01
			JULY 1991			

REVISION 2-1994







GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-1.0

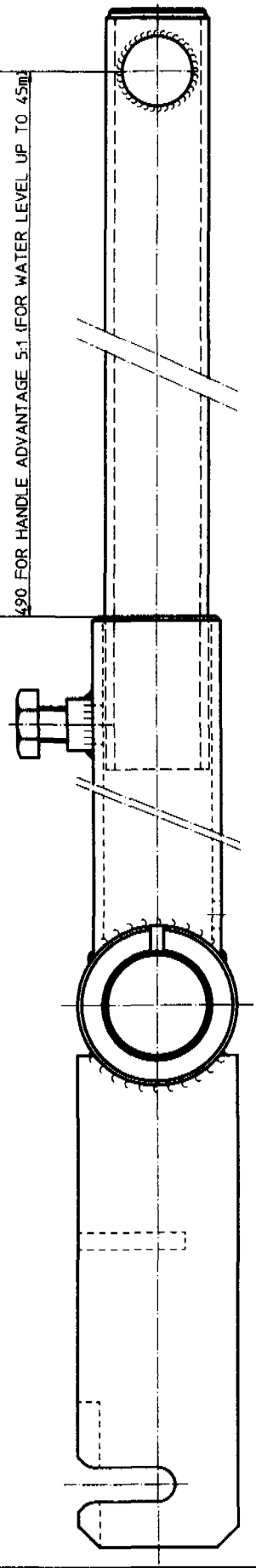
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
155	1	SPACER		St 37	
151	1	HANDLE FORK RIGHT		St 37	
150	1	HANDLE FORK LEFT		St 37	

Rev. No.	drawn by	Date	D02.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: HANDLE PARTS	D-02
			JULY 1991			

REVISION 2-1994

GUIDELINES FOR HANDLE SETTINGS

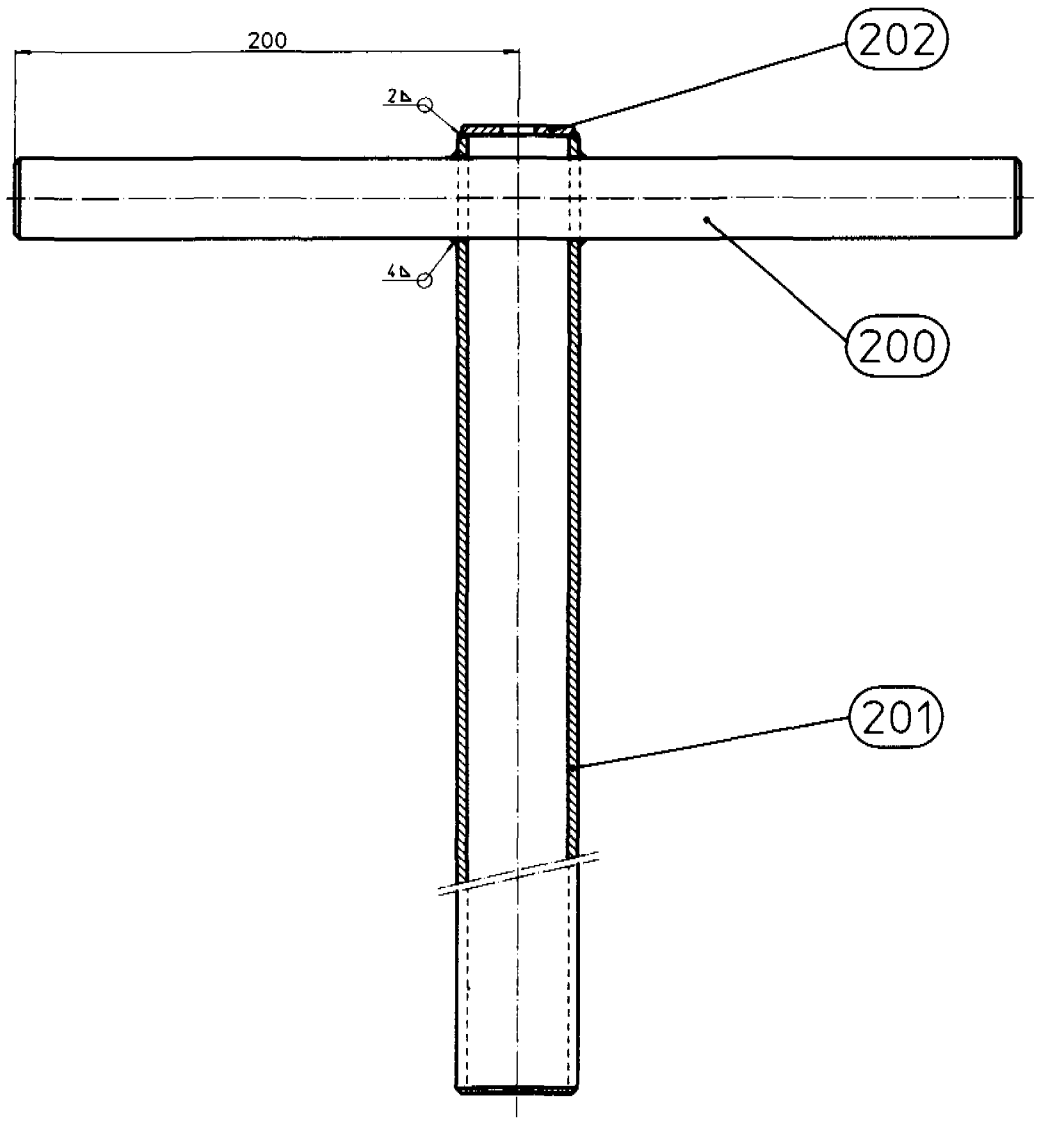
40 FOR HANDLE ADVANTAGE 3:1 (FOR WATER LEVEL UP TO 25m)
265 FOR HANDLE ADVANTAGE 4:1 (FOR WATER LEVEL UP TO 35m)
490 FOR HANDLE ADVANTAGE 5:1 (FOR WATER LEVEL UP TO 45m)



NOTE: HANDLE ASSEMBLY SHOULD BE CLAMPED TO OPTIMUM MECHANICAL ADVANTAGE AND OPERATIONAL COMFORT DEPENDING ON WATER LEVEL IN THE WELL

Rev. No.	drawn by	Date	E00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1		
			JULY 1991		HANDLE ASSEMBLY	E-00

REVISION 2-1994



HOT DIP GALVANIZED TO DIN 50976

GENERAL TOLERANCE +/- 5,0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
202	1	ENDPLATE			
201	1	HANDLE EXTENSION PIPE			
200	1	T-BAR			

Rev. No.	drawn by	Date	E01.01	Scale
2	RU	JULY 1994	TREFF AG	M. 1:1
			JULY 1991	

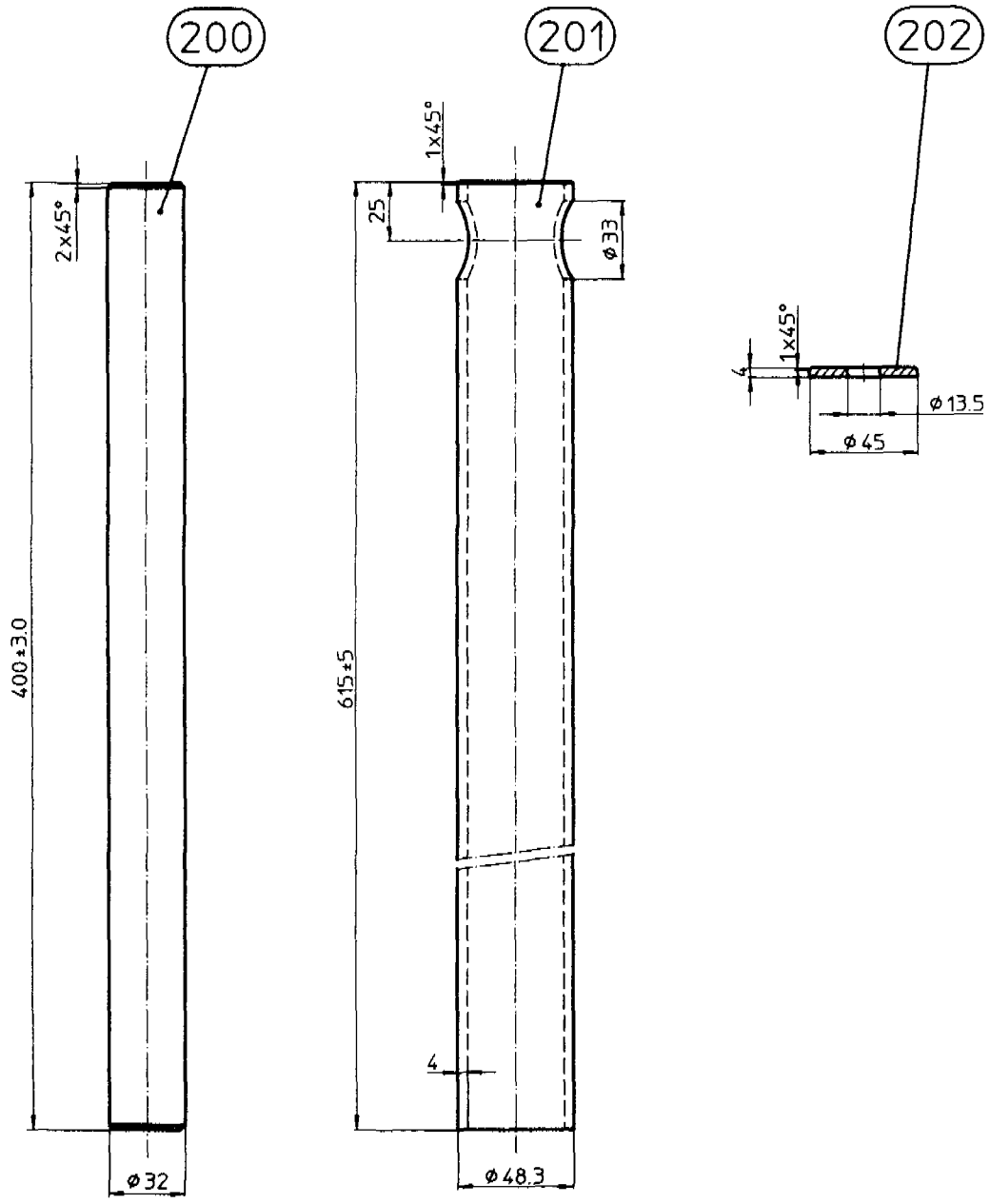
AFRIDEV HANDPUMP

HANDLE ASSEMBLY REAR

SKAT

E-01

REVISION 2-1994

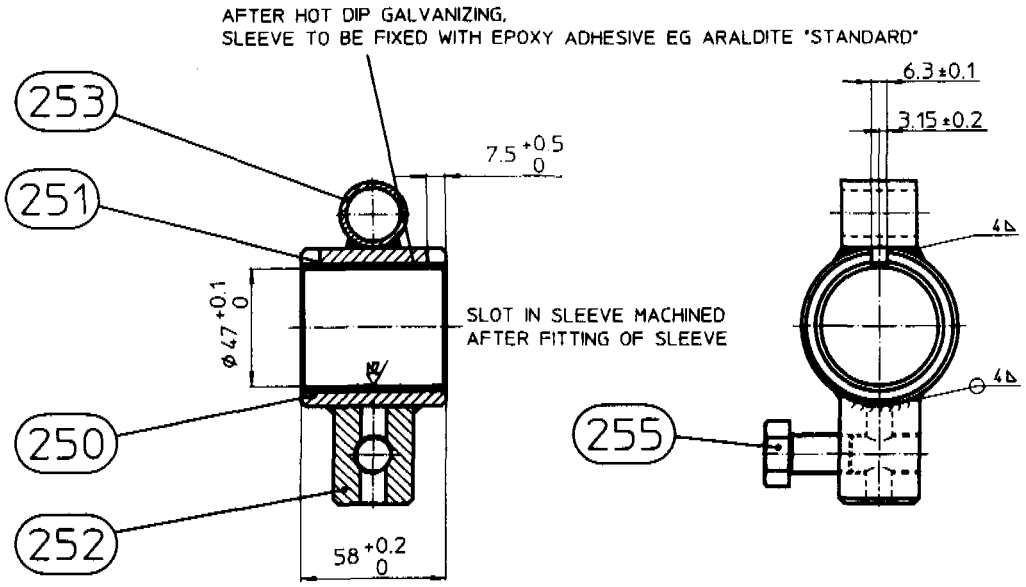


GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1.0

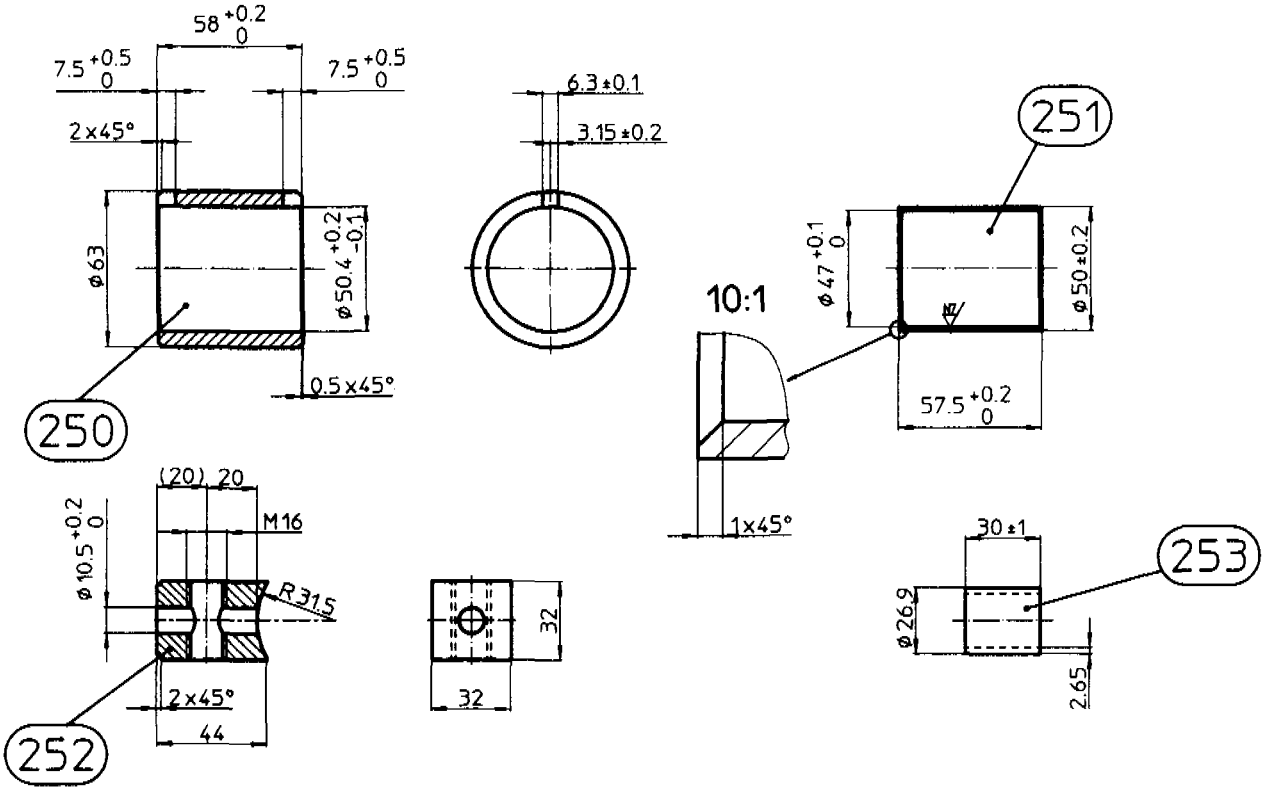
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
202	1	ENDPLATE		St 37	
201	1	HANDLE EXTENSION PIPE	ø48.3x4	St 37-2	DIN 2458
200	1	T-BAR		St 37	

Rev. No.	drawn by	Date	E02.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1		
			JULY 1991		HANDLE PARTS	E-02

REVISION 2-1994



NOTE: HOT DIP GALVANIZED TO DIN 50976
ALL DIMENSIONS REFER TO AFTER GALVANIZING



GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 0.3

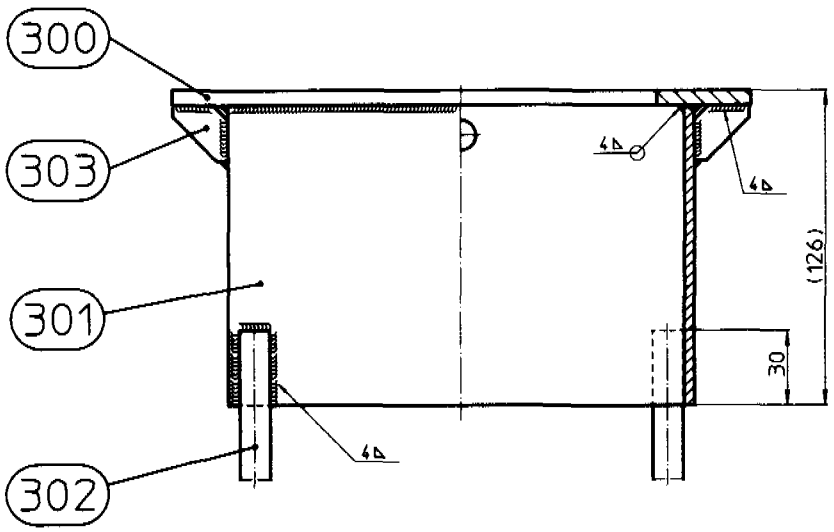
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
255	1	HEX. BOLT	DIN 933 M16x25	CLASS 4.6	
253	1	RETAINER BUSH	ø26,9x2.65	St 37-2	DIN 2458
252	1	RODHANGER CONNECTOR		St 37	
251	1	SLEEVE		AISI 304	
250	1	HANGER BUSH		St 37	

Rev. No.	drawn by	Date	F00.01	Scale
2	RU	JULY 1994	TREFF AG	M. 1:1
			JULY 1991	

AFRIDEV HANDPUMP
PUMPHEAD: RODHANGER ASSY. & PARTS

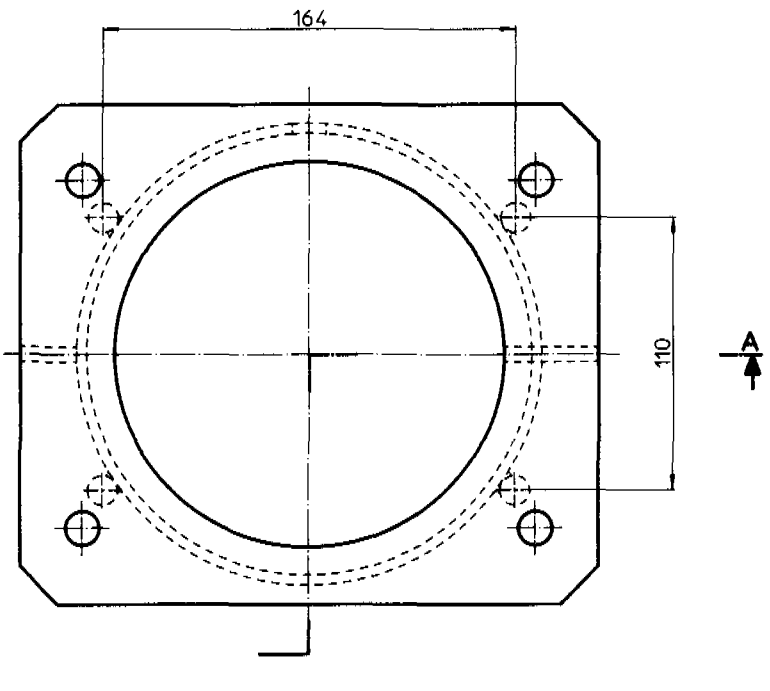
SKAT F-00

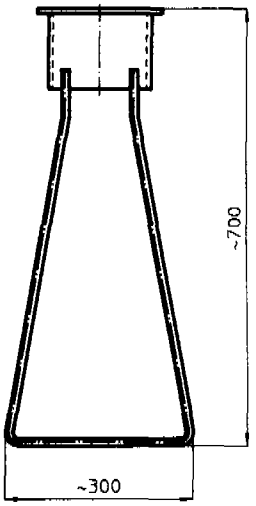
REVISION 2-1994



SECTION A-A

NOTE: IF STAND PIPE 6" (NB 150 mm)
IS USED DIMENSION 164
SHOULD BE 140





M. 1:4

NOTE: HOT DIP GALVANIZED TO DIN 50976

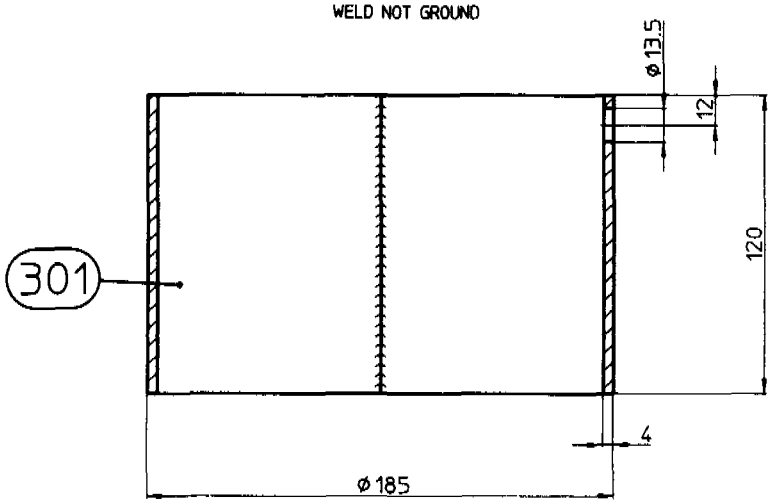
GENERAL TOLERANCE UNLESS OTHERWISE STATED ±5

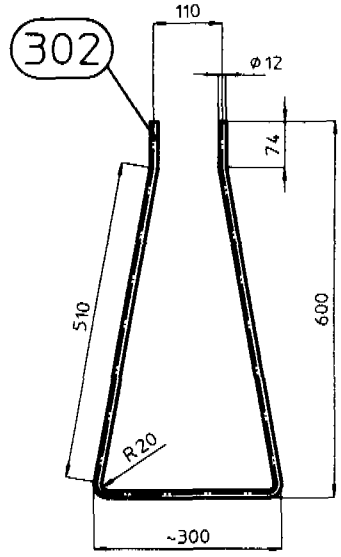
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
303	2	GUSSET			
302	2	LEG			
301	1	STAND PIPE			
300	1	STAND FLANGE			

Rev. No.	drawn by	Date	G00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	STAND: ASSEMBLY	G-00
			JULY 1991			

REVISION 2-1994

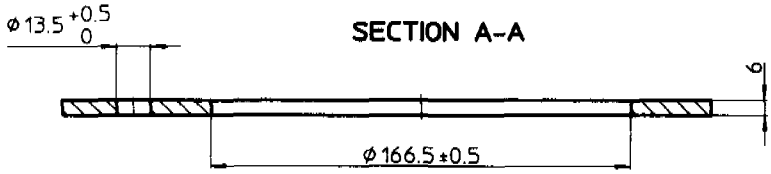
NOTE: ROLLED FROM 4mm SHEET
WELD NOT GROUND



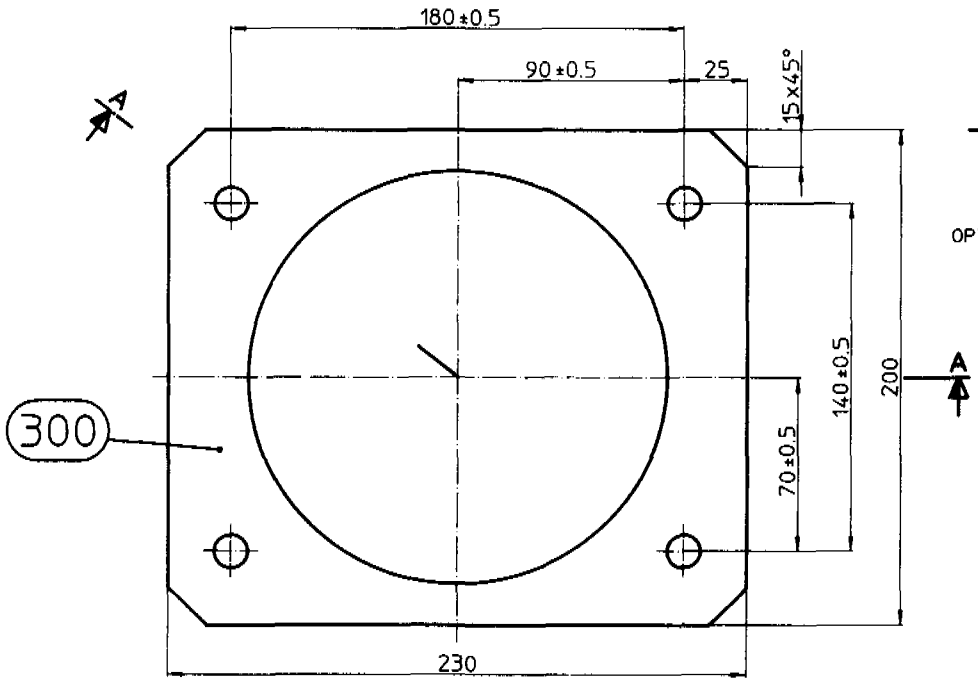


M. 1:4

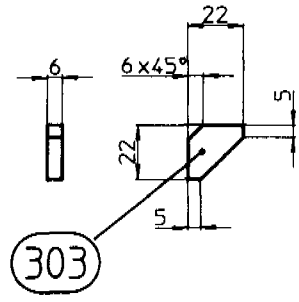
IF WELL CASING PIPE UP TO 5" (125mm) IS USED,
USE OF 6" (150mm) MEDIUM PIPE 126 LONG IS PERMISSIBLE



GENERAL TOLERANCE UNLESS OTHERWISE
STATED +/-5.0



OPTIONAL: R12



GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1,0

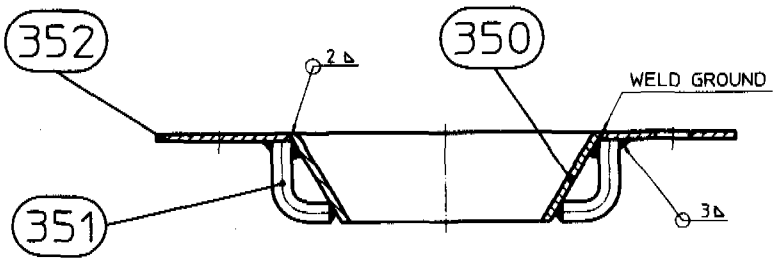
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
303	2	GUSSET		St 37	
302	2	LEG		St 37	
301	1	STAND PIPE		St 37	
300	1	STAND FLANGE		St 37	

Rev. No.	drawn by	Date	G01.01	Scale
2	RU	JULY 1994	TREFF AG	M. 1:1
			JULY 1991	

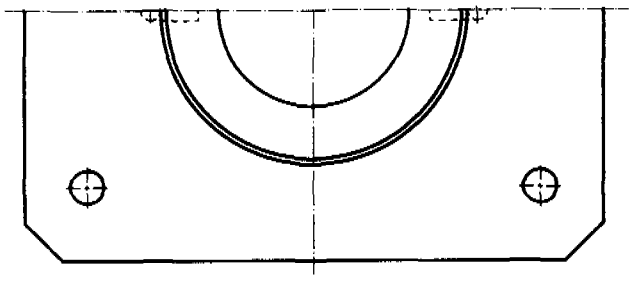
AFRIDEV HANDPUMP
STAND: PARTS

SKAT
G-01

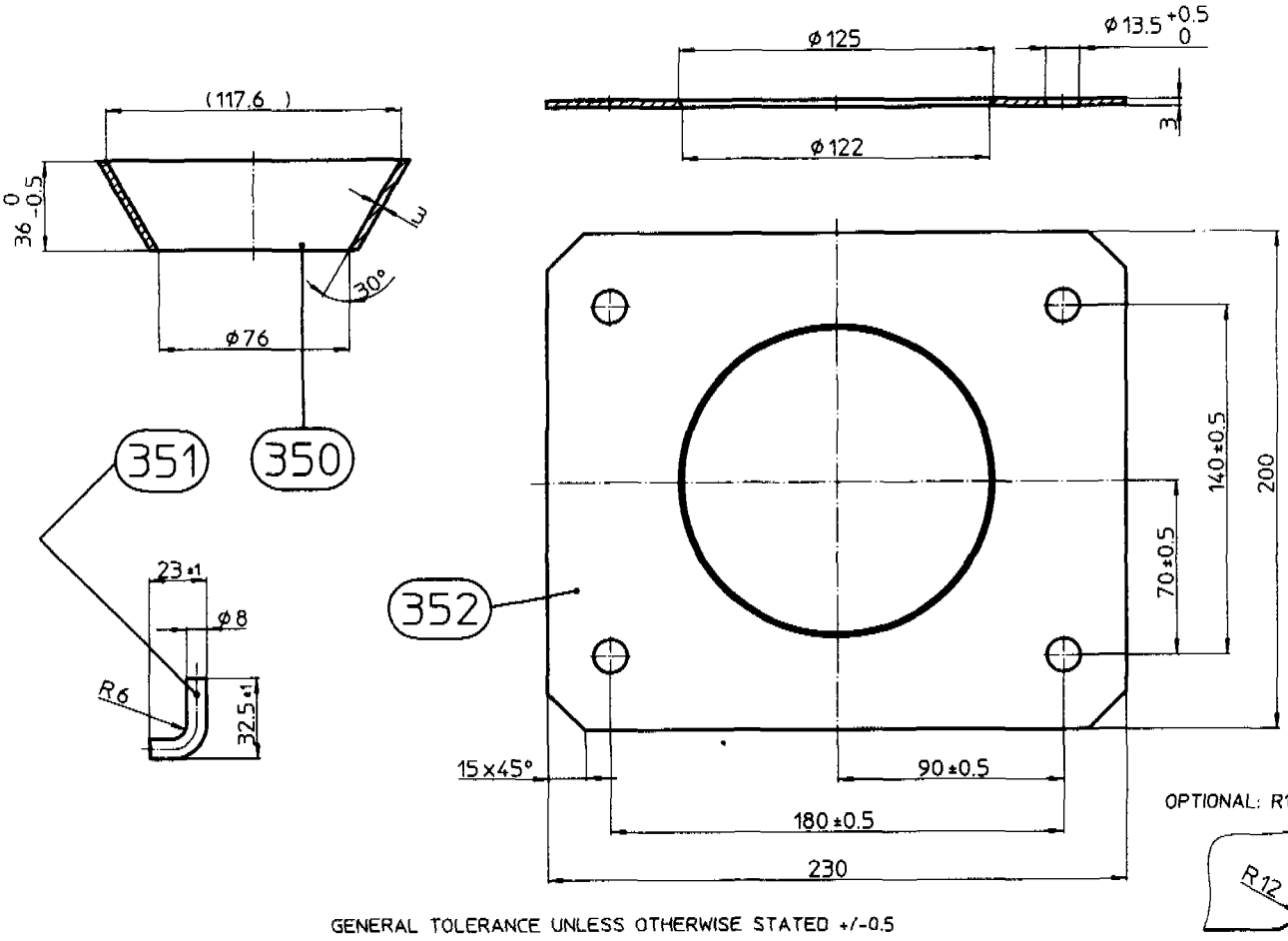
REVISION 2-1994



NOTE: STEEL CONE MAY BE MADE
BY DEEP DRAWING IN ONE PIECE
INSTEAD OF TWO WELDED COMPONENTS



HOT DIP GALVANIZED TO DIN 50976



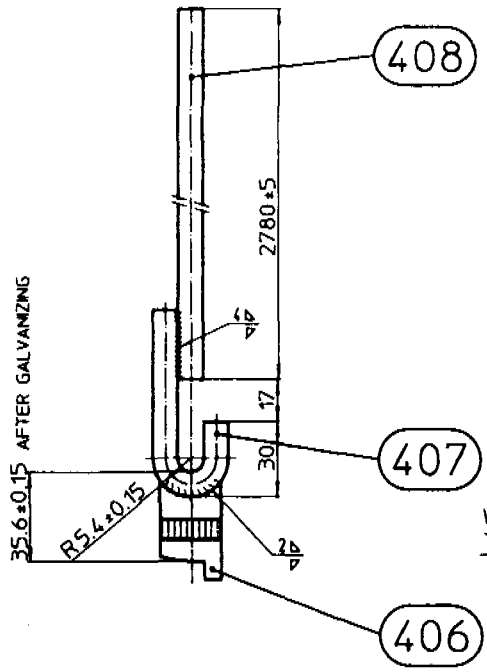
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
352	1	FLANGE PLATE		St 37	
351	2	EYE		St 37	
350	1	STEEL CONE		Q St 52-3	DEEP DRAW

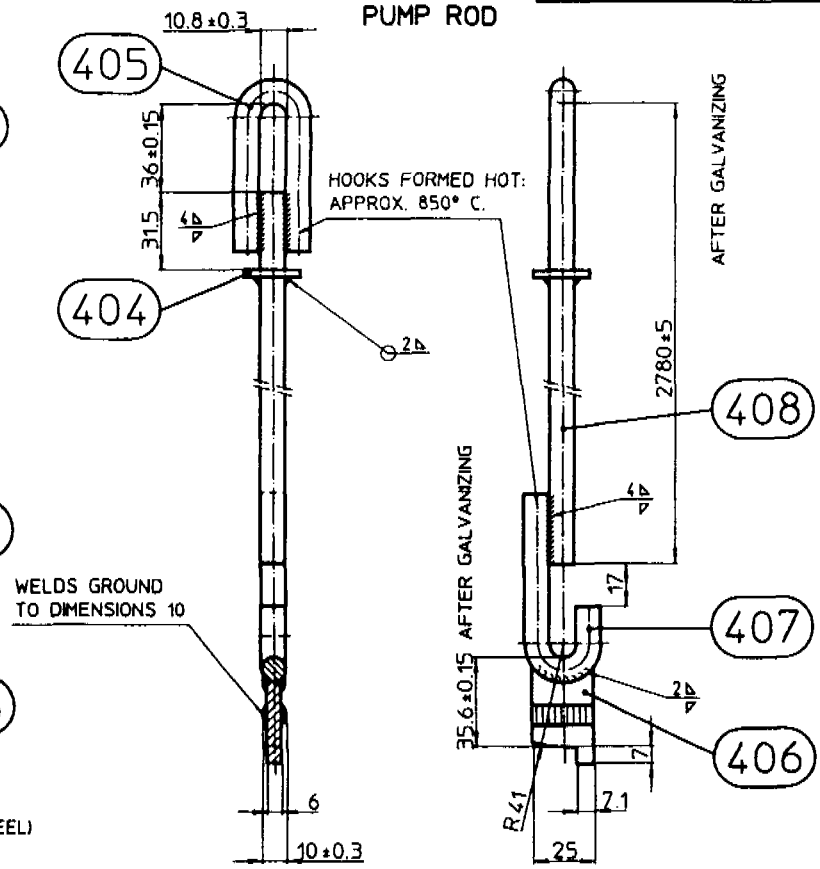
Rev. No.	drawn by	Date	H00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	STEEL CONE: ASSEMBLY	H-00
			JULY 1991			

REVISION 2-1994

PUMP ROD FITTING: TOP

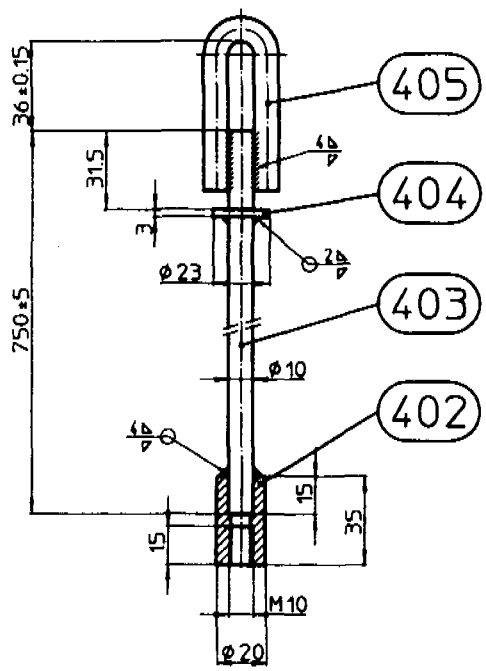


PUMP ROD

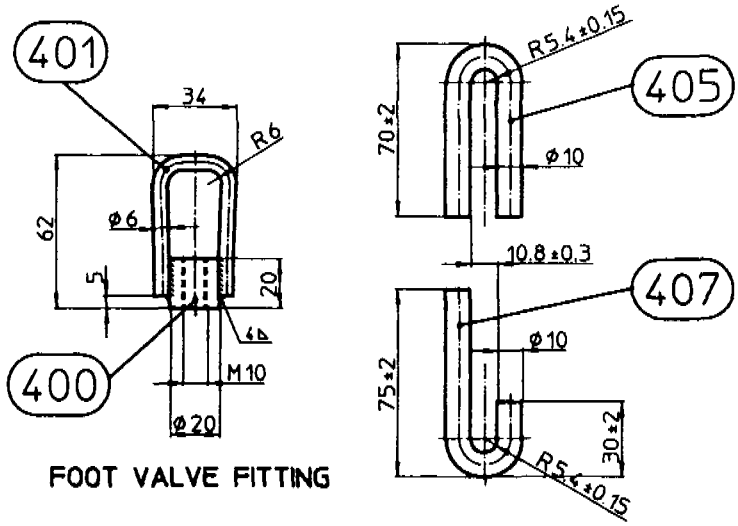


PLUNGER FITTING: BOTTOM

(NOTE: POS.405 AISI 304/316 STAINLESS STEEL)



NOTE:
- MATERIAL MILDSTEEL HOT DIP GALVANIZED TO DIN 50976
- GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.3

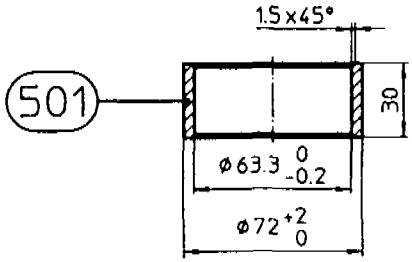


FOOT VALVE FITTING

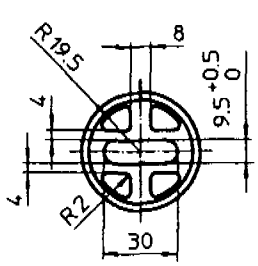
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
408	X	ROD		St 37	DIN 668
407	X	HOOK (BAR LENGTH 105±2 PRIOR TO BENDING)		St 37	DIN 668
406	X	SPACER		St 37	
405	X	EYE-HOOK (BAR LENGTH 180±2 PRIOR TO BENDING)		St 37	DIN 668
404	X	WASHER		St.37/AISI/304/316	
403	1	PLUNGER ROD		AISI 304/316	
402	1	PLUNGER CONNECTOR		AISI 304/316	
401	1	U-HOOK		AISI 304/316	
400	1	FOOTVALVE CONNECTOR		AISI 304/316	

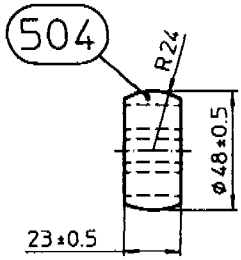
Rev. No.	drawn by	Date	J00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPROD ASSY. AND FOOT VALVE FITTING	J-00
			JULY 1991			

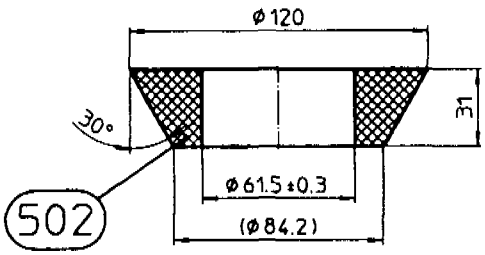
REVISION 2-1994

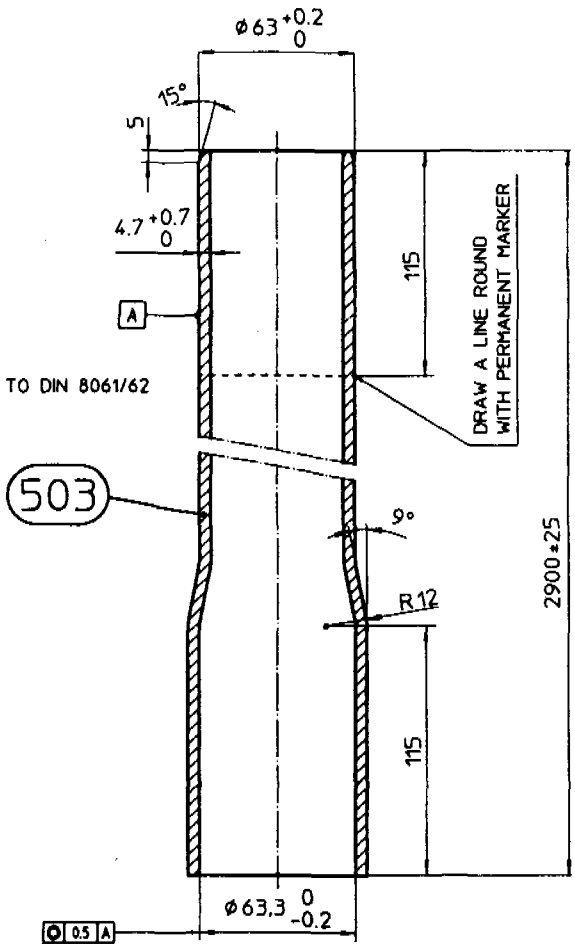


HEAT FORMED FROM STANDARD PIPE

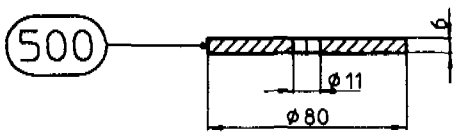








PIPE STRAIGHTNESS TO DIN 8061/62



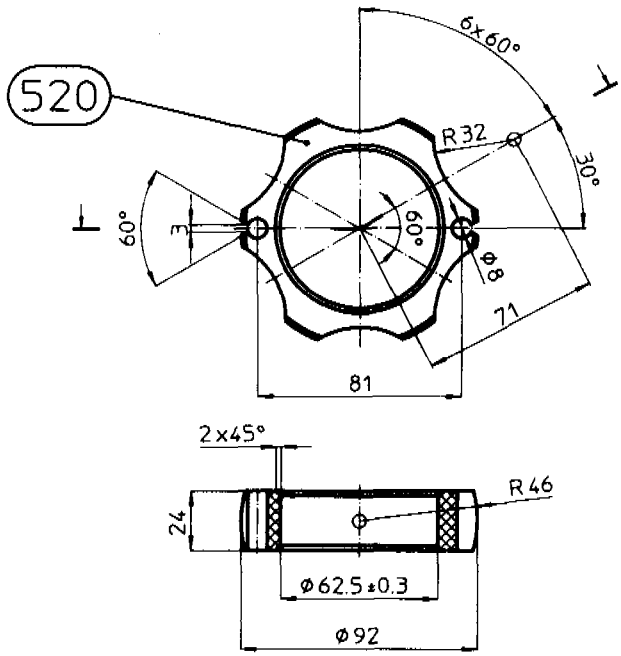
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
504	X	ROD CENTRALISER	BS 2751/3222	NBR BA 80	SH 80°
503	X	RISING MAIN PIPE	DIN 19532 DN50 PN 16	uPVC	
502	1	COMPRESSION CONE	BS 2751/3222	NBR BA 70	SH 70°
501	1	TOP SLEEVE	DIN 19532 DN50 PN 16	uPVC	
500	1	FLAPPER		RUBBER/PE	

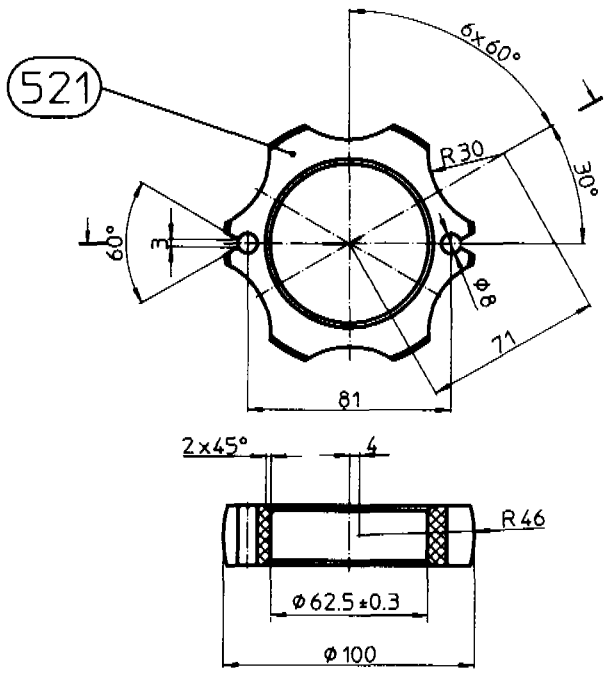
Rev. No.	drawn by	Date	K00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1		
			JULY 1991		RISING MAIN: PARTS	K-00

REVISION 2-1994

FOR 4" CASING



FOR 4.5" CASING



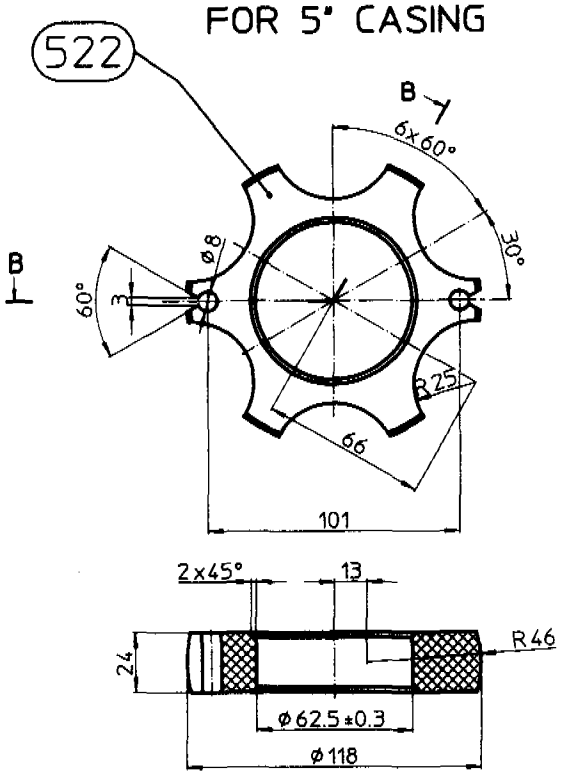
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-2

521	X	PIPE CENTRALISER 4.5"	ø 100 BS 2751/3222	NBR BA 80	SH 80°
520	X	PIPE CENTRALISER 4"	ø 92 BS 2751/3222	NBR BA 80	SH 80°
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS

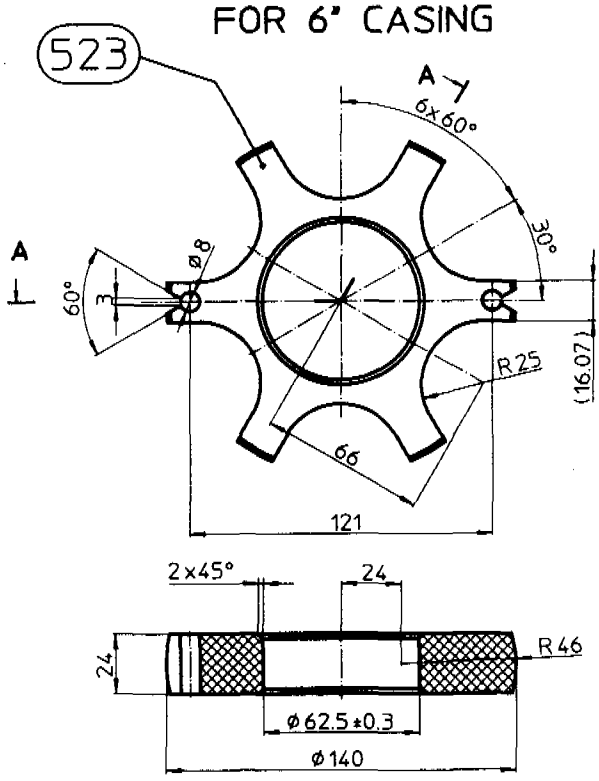
Rev. No.	drawn by	Date	K01.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	RISING MAIN: PIPE CENTRALISER	K-01
			JULY 1991			

REVISION 2-1994

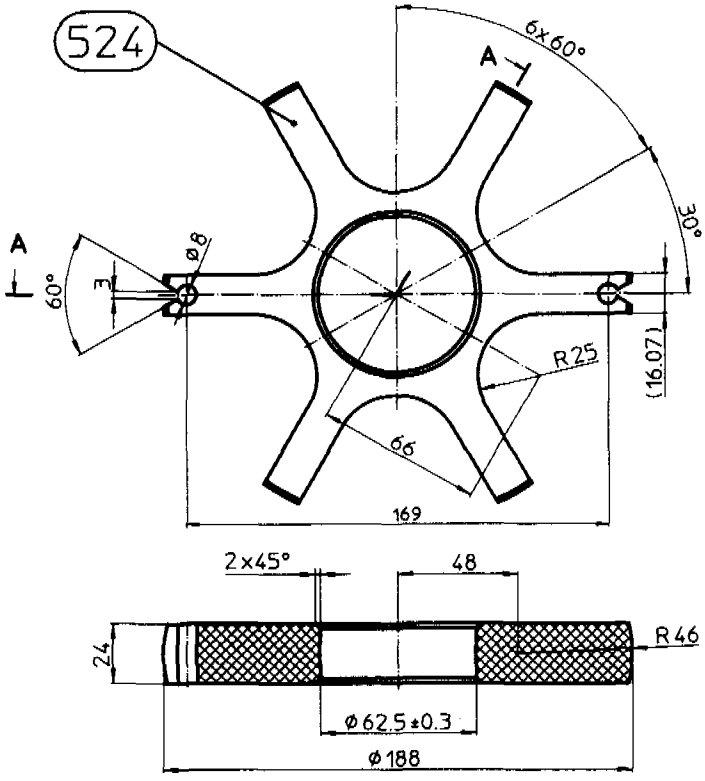
FOR 5" CASING



FOR 6" CASING



FOR 8" CASING

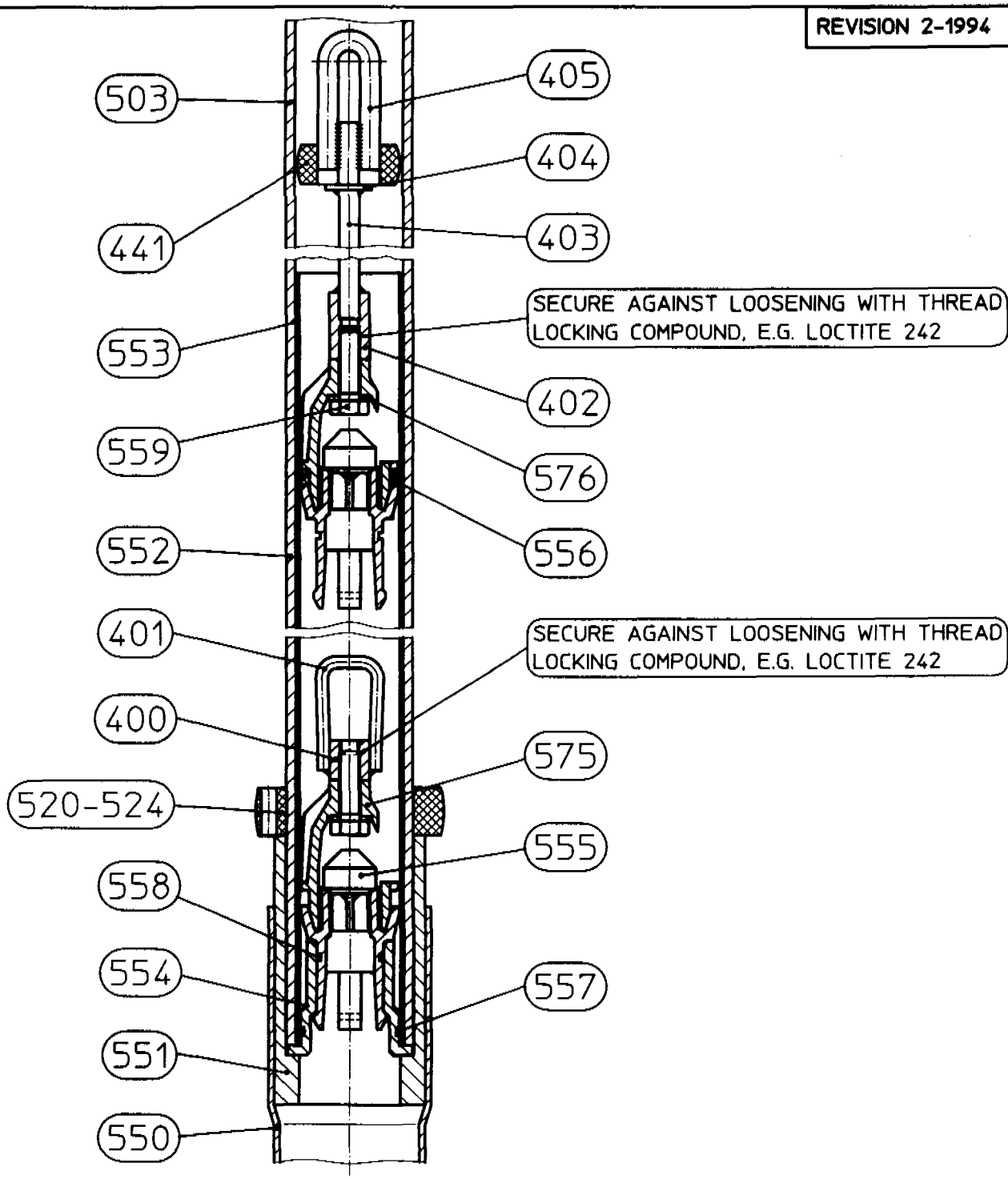


GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-2

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
524	X	PIPE CENTRALISER 8"	ø 188 BS 2751/3222	NBR BA 80	SH 80°
523	X	PIPE CENTRALISER 6"	ø 140 BS 2751/3222	NBR BA 80	SH 80°
522	X	PIPE CENTRALISER 5"	ø 118 BS 2751/3222	NBR BA 80	SH 80°

Rev. No.	drawn by	Date	K02.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	RISING MAIN: PIPE CENTRALISER	K-02
			JULY 1991			

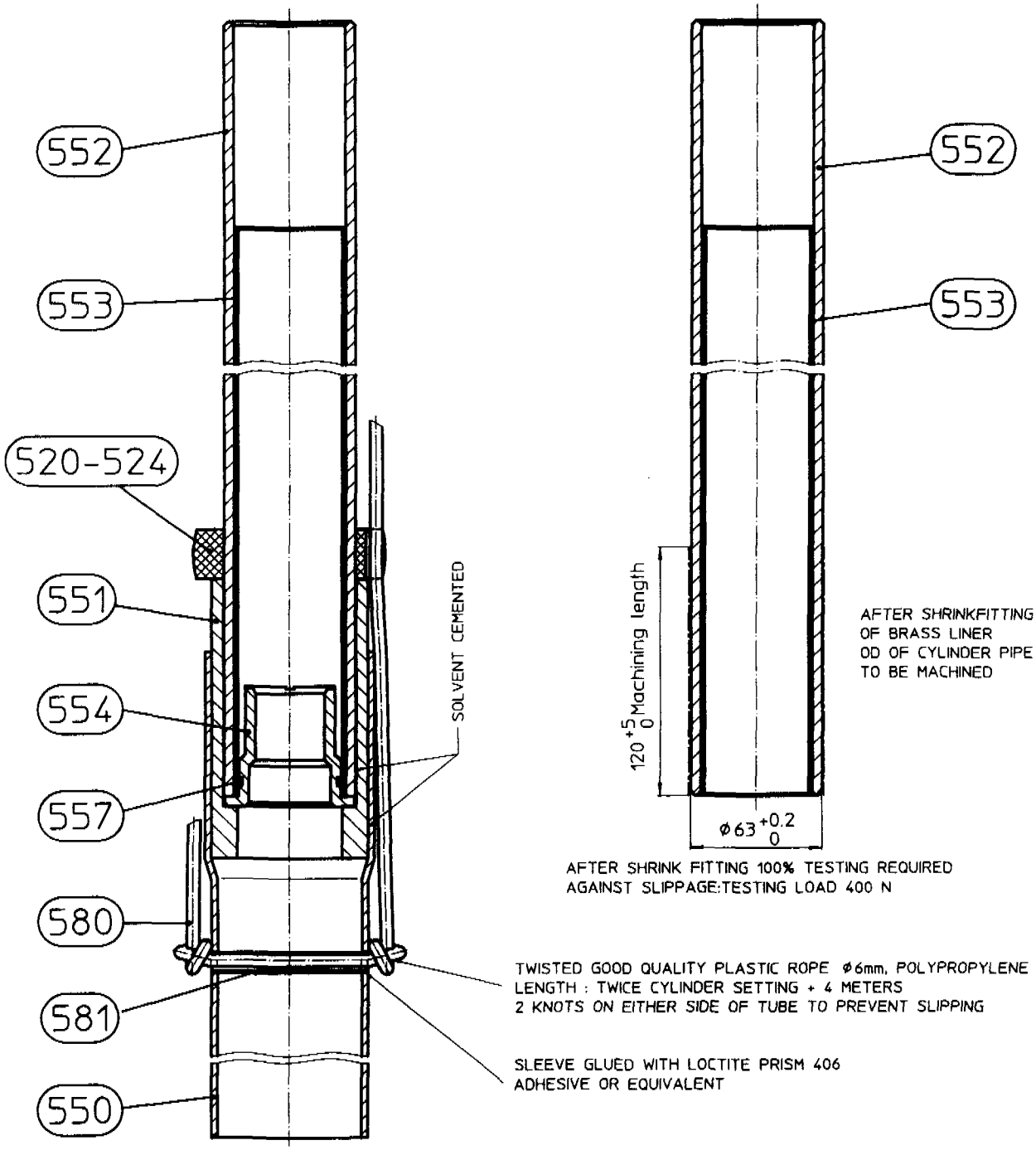
REVISION 2-1994



POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
576	2	WASHER	DIN 125 ø 10.5	A4	
575	2	PLUNGER FOOTVALVE			
559	2	HEX. BOLT	DIN 933 M10x35	A4	
558	1	O-RING (FOOTVALVE)			
557	1	O-RING (RECEIVER)			
556	1	U-SEAL (PLUNGER)			
555	2	VALVE BOBBIN			
554	1	FOOTVALVE RECEIVER			
553	1	LINER			
552	1	CYLINDER PIPE			
551	1	REDUCER			
550	1	SUCTION PIPE			

Rev. No.	drawn by	Date	L00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	CYLINDER ASSEMBLY	L-00
			JULY 1991			

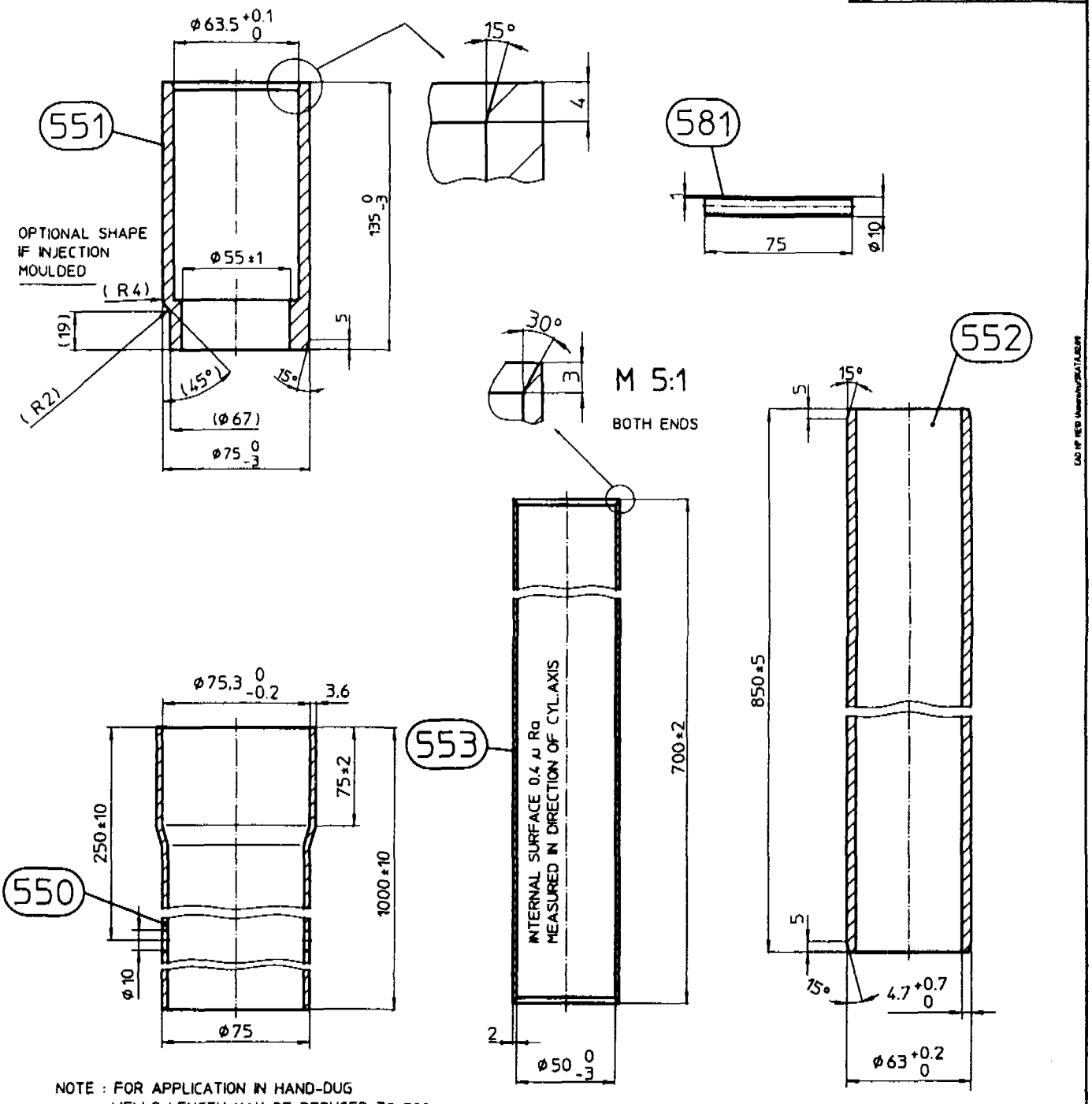
REVISION 2-1994



POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
581	1	SLEEVE			
580	1	ROPE			
557	1	O-RING			
554	1	FOOTVALVE RECEIVER			
553	1	LINER			
552	1	CYL. PIPE			
551	1	REDUCER			
550	1	SUCTION PIPE			
520	X	PIPE CENTRALIZER			

Rev. No.	drawn by	Date	L01.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	CYLINDER SUB ASSEMBLY	L-01
			JULY 1991			

REVISION 2-1994



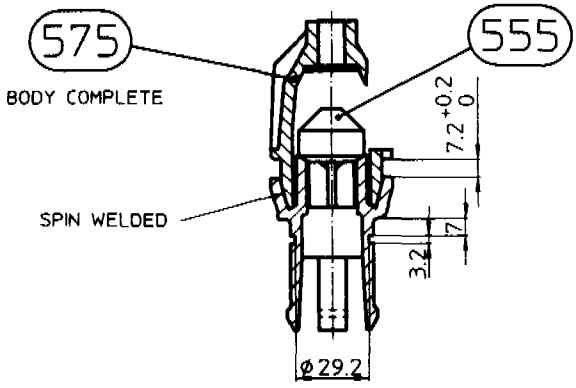
NOTE : FOR APPLICATION IN HAND-DUG WELLS LENGTH MAY BE REDUCED TO 300 mm

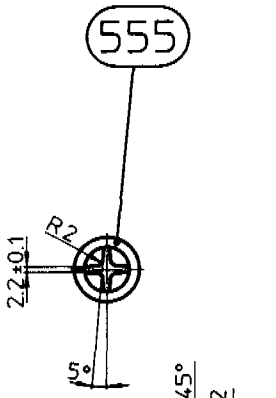
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
581	1	SLEEVE		NYLON	
553	1	LINER (CuZn20Al2 OR CuZn28Sn1)	DIN 17660	BRASS	
552	1	CYL. PIPE	DIN 19532 DN 50 PN 16	uPVC	
551	1	REDUCER		uPVC	
550	1	SUCTION PIPE	DIN 19532 DN 65 PN 10	uPVC	

Rev. No.	drawn by	Date	L02.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	CYLINDER: PARTS	L-02
			JULY 1991			

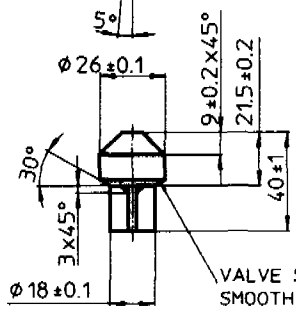
REVISION 2-1994



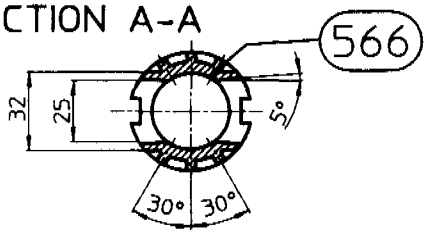


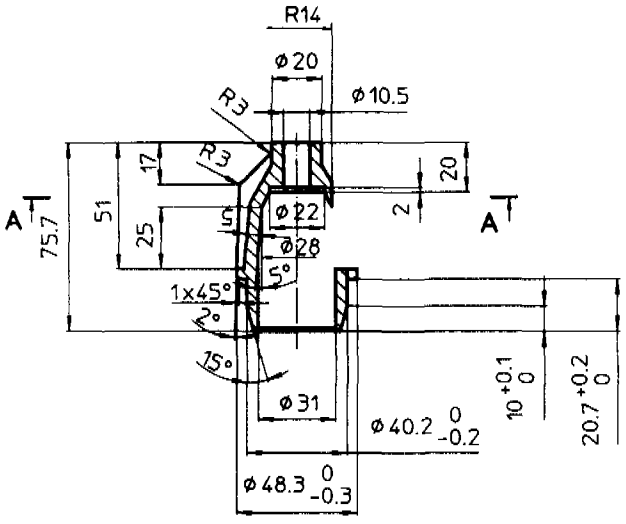
AFTER SPINWELDING 100% TENSILE TESTING REQUIRED:
TEST LOAD 3500 N

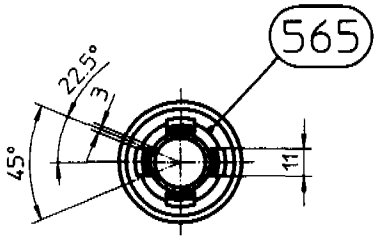
'O' RING GROOVE MACHINED AFTER SPINWELDING AND TESTING

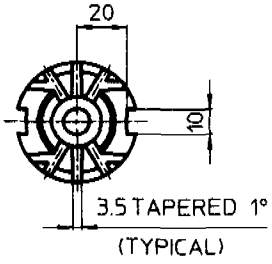


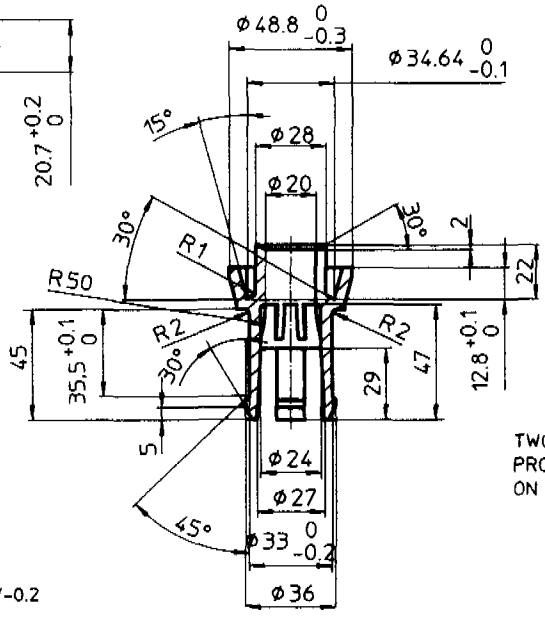
SECTION A-A

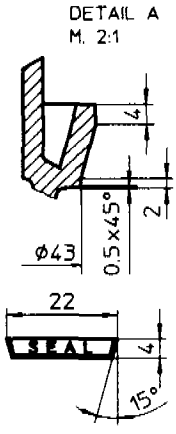












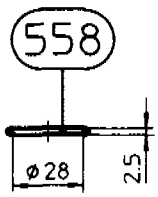
TWO ENGRAVED SYMBOLS
PROTRUDING 0.1mm
ON TAPERED PORTION

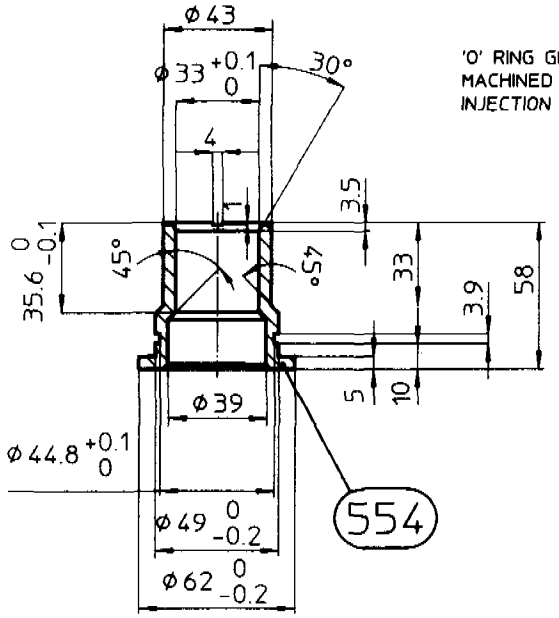
ALL RADII R2 U.O.S.
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.2

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
566	2	PLUNGER-FOOTVALVE UPPER PART		POM NC	
565	2	PLUNGER-FOOTVALVE LOWER PART		POM NC	
555	2	VALVE BOBBIN	BS 2751/3222	NBR BA 80	SH 80°

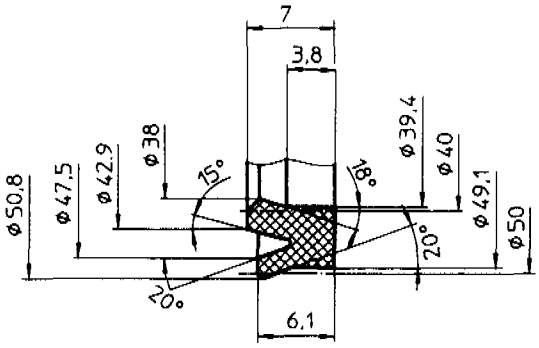
Rev. No.	drawn by	Date	L03.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	CYLINDER: PLUNGER/FOOTVALVE	L-03
			JUL. 1991			

REVISION 2-1994

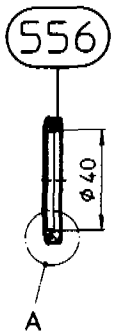


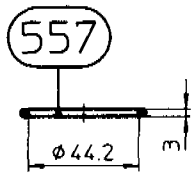


'O' RING GROOVE MACHINED AFTER INJECTION MOULDING



DETAIL A: SCALE 5:1





NOTE: DIMENSIONS REFER TO UNASSEMBLED SEAL

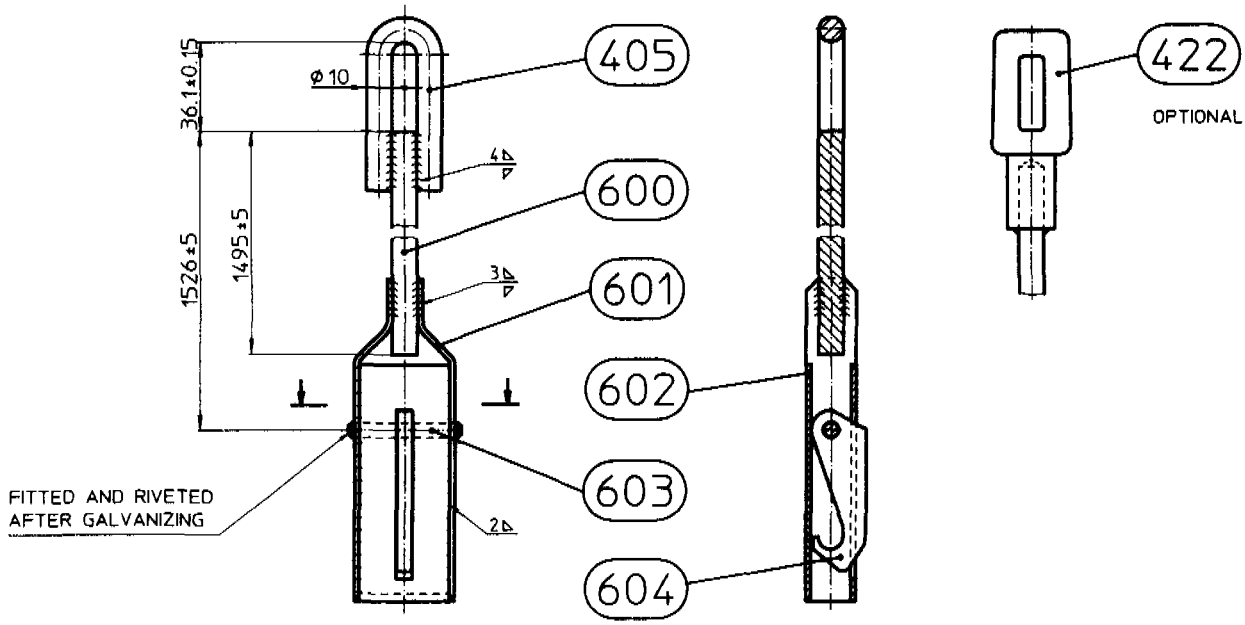
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.1

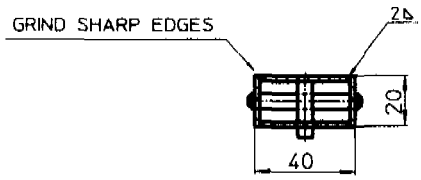
* FREUDENBERG SIMRIT AG CATALOGUE NUMBERS

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
558	1	O-RING (FOOTVALVE)	28x2.5 BS 2751/3222	70 NBR (769)*	SH 70°
557	1	O-RING (RECEIVER)	44x3 BS 2751/3222	70 NBR (769)*	SH 70°
556	1	U-SEAL (PLUNGER) NA 150	50x40x7	80 NBR (878)*	SH 80°
554	1	FOOTVALVE RECEIVER		POM NC	

Rev. No.	drawn by	Date	L04.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	CYLINDER: PARTS	L-04
			JULY 1991			

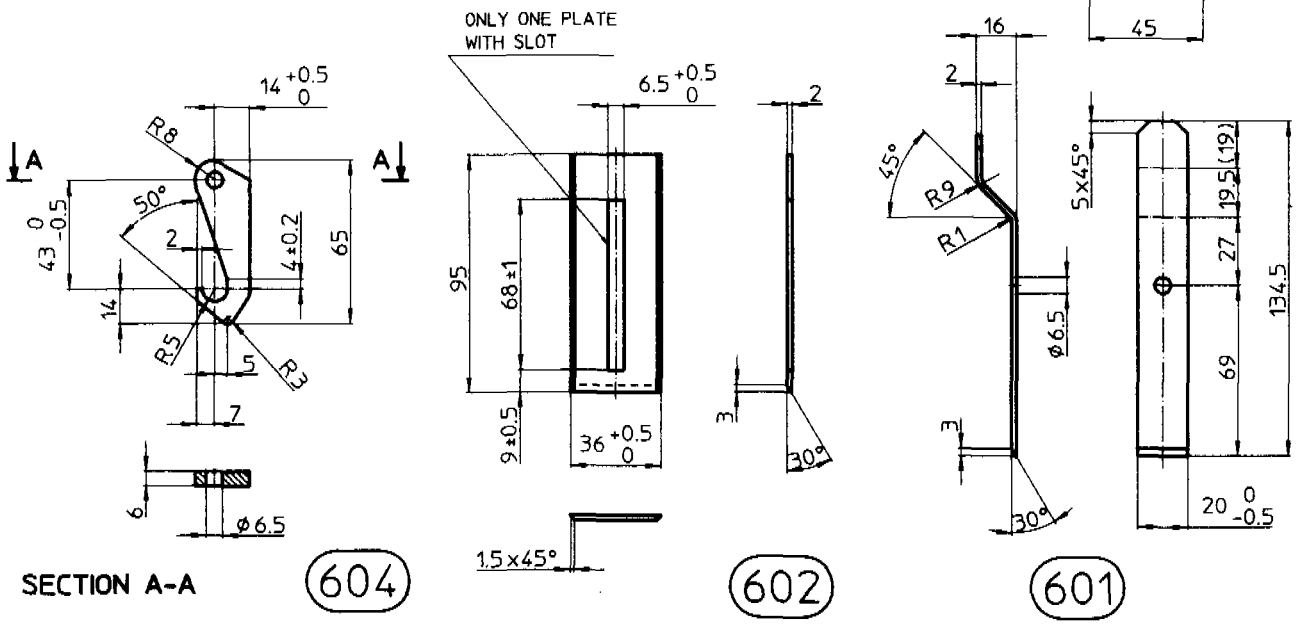
REVISION 2-1994





SURFACE FINISH: HOT DIP GALVANIZED TO DIN 50976

NOTE: BODY MAY BE FABRICATED DIFFERENTLY,
EG FROM 2 ANGLE PLATES

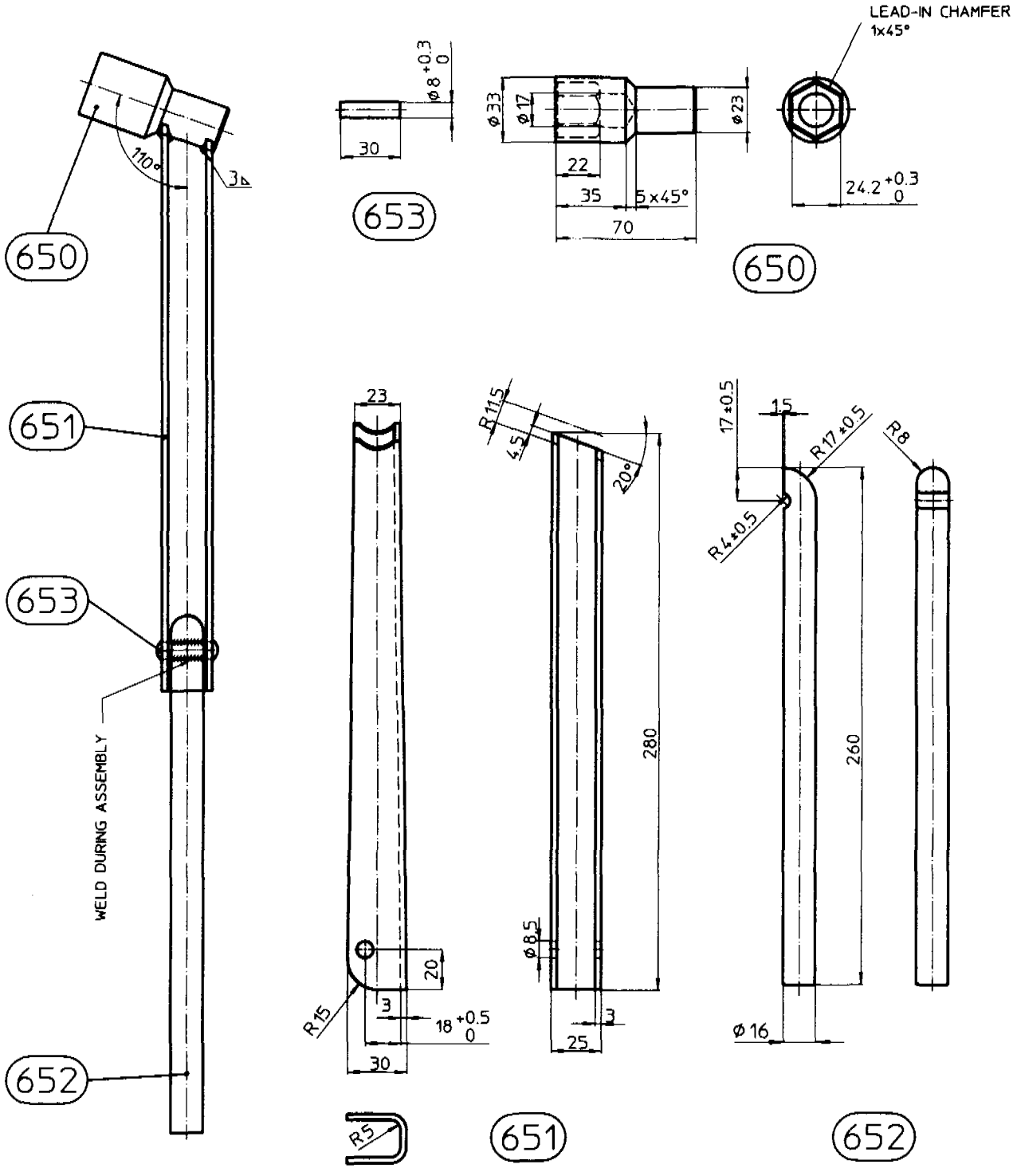


GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.4

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
604	1	FISHING HOOK		St 37	
603	1	PIN		AISI 304	
602	2	SIDE PLATE		St 37	
601	2	COVER PLATE		St 37	
600	1	ROD		St 37	

Rev. No.	drawn by	Date	M00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1		
			JULY 1991		FISHING TOOL	M-00

REVISION 2-1994



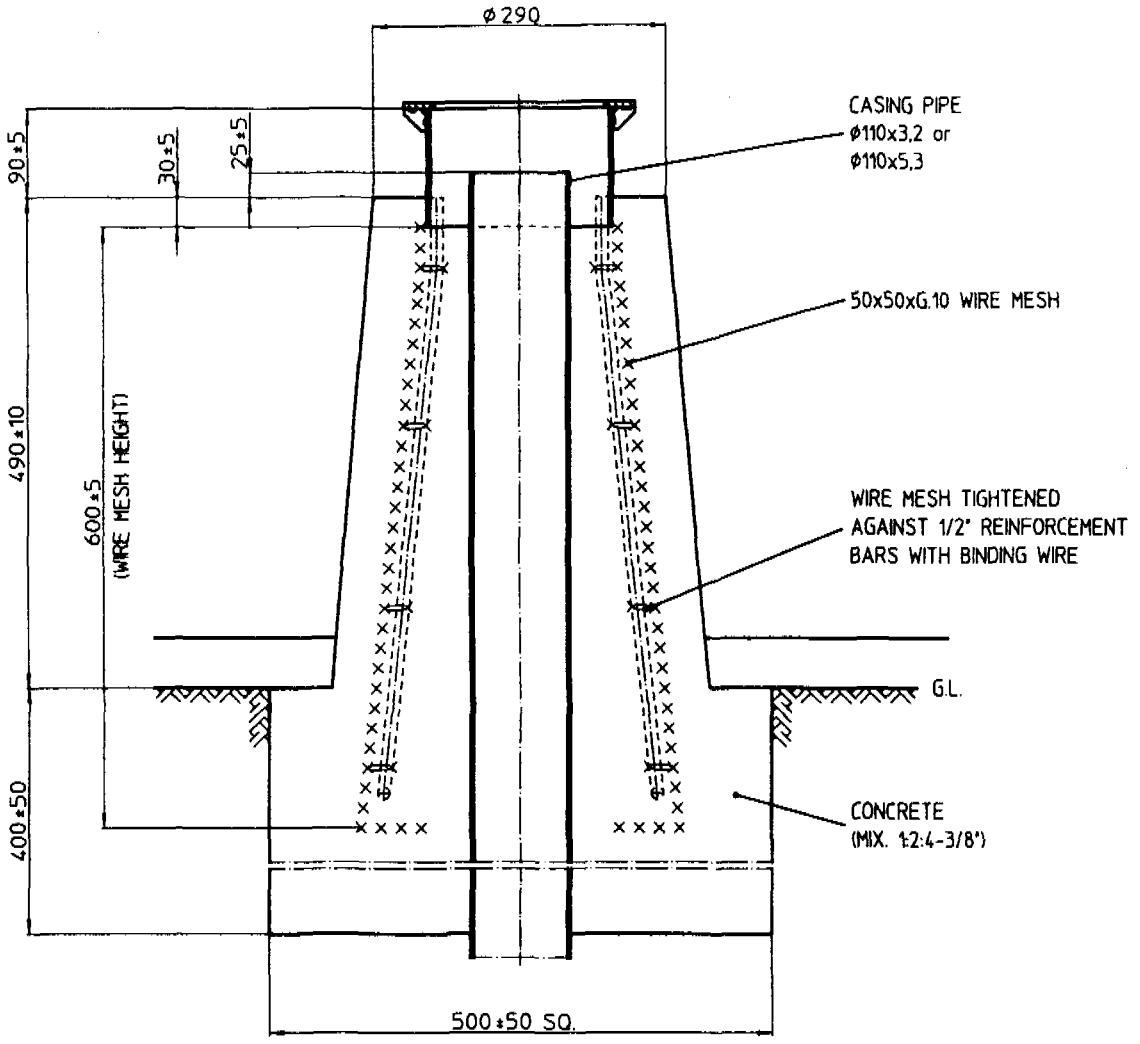
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

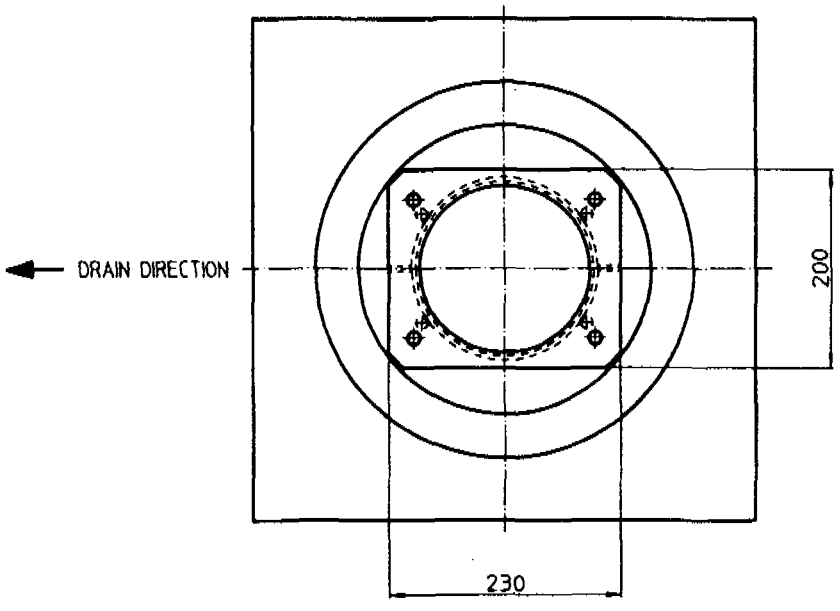
SURFACE FINISH: CHROMPLATED OR ELECTROGALVANIZED TO DIN 50961

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
653	1	PIN		St 42	
652	1	HANDLE EXTENSION		St 37	
651	1	HANDLE		St 42	
650	1	SPANNER SOCKET		St 42	

Rev. No.	drawn by	Date	N00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	FOLDABLE SPANNER	N-00
			JULY 1991			

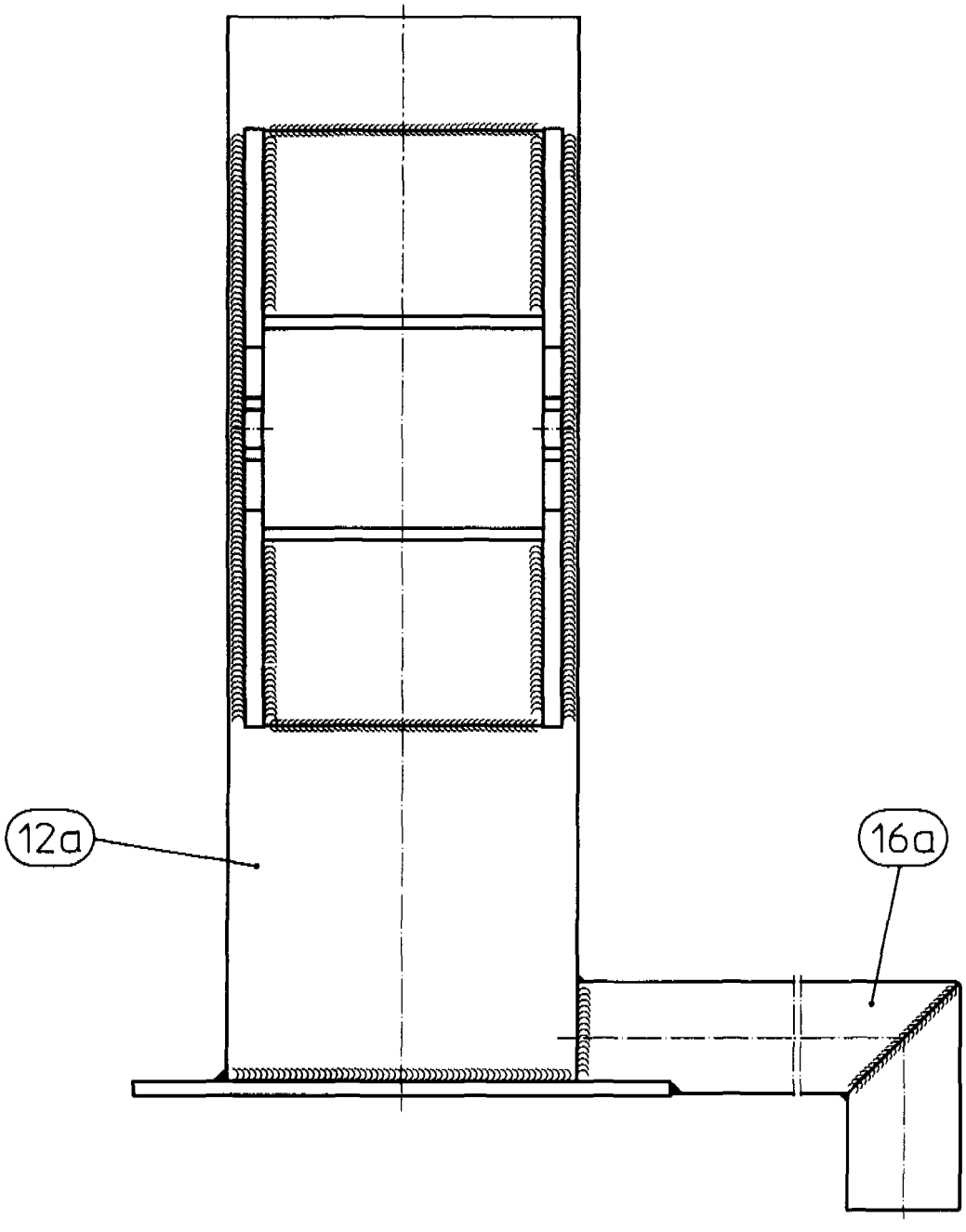
REVISION 2-1994





Rev. No.	drawn by	Date	P00.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:2,5	CONCRETE PUMP PEDESTAL	P-00
			JULY 1991			

REVISION 2-1994

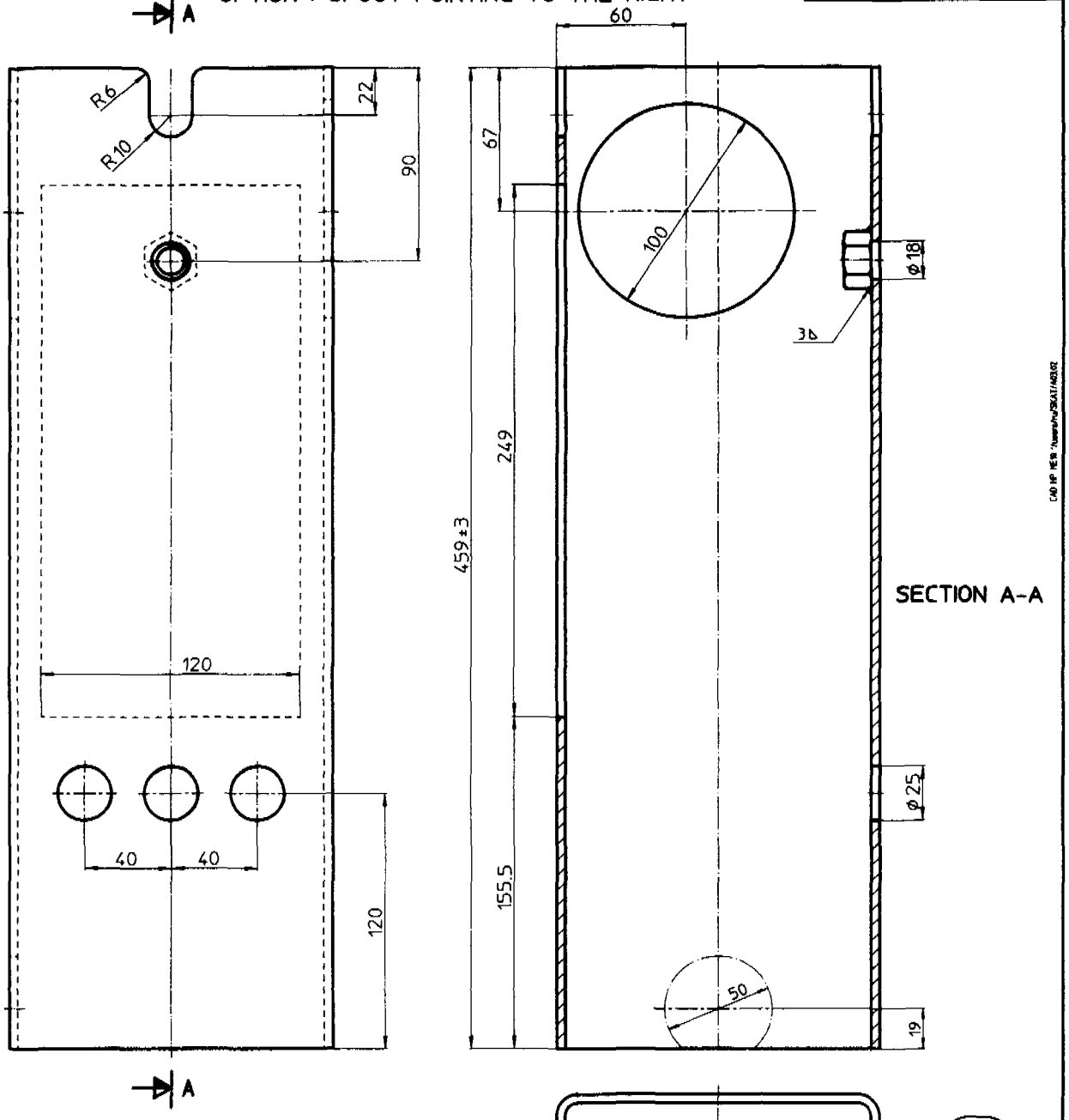


OPTION : SPOUT POINTING TO THE RIGHT

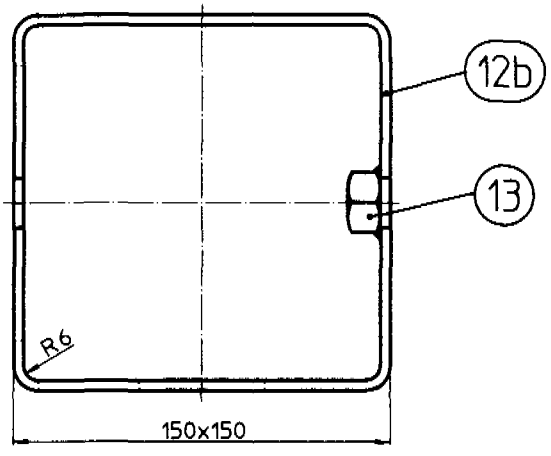
Rev. No.	drawn by	Date	A00a.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: ASSEMBLY	A-00a
			JULY 1991			

REVISION 2-1994

OPTION : SPOUT POINTING TO THE RIGHT



SECTION A-A



NOTE: RHS 150x150 CAN BE FABRICATED FROM 4MM SHEET.

THE WELDS SHALL BE PLACED SUCH THAT THEY DO NOT IMPEDE THE FUNCTION OF THE PUMPHEAD.
THE WELDS TO BE CONTINUOUS ON INSIDE AND OUTSIDE.
NOT TO BE GROUND.

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
13	1	HEX. NUT	DIN 934 M16	CLASS 4	
12	1	RHS-BODY	150x150x4	St 37-2	DIN 59411

Rev. No.	drawn by	Date	A03.02	Scale
2	RU	JULY 1994	TREFF AG	M. 1:1
			JULY 1991	

AFRIDEV HANDPUMP

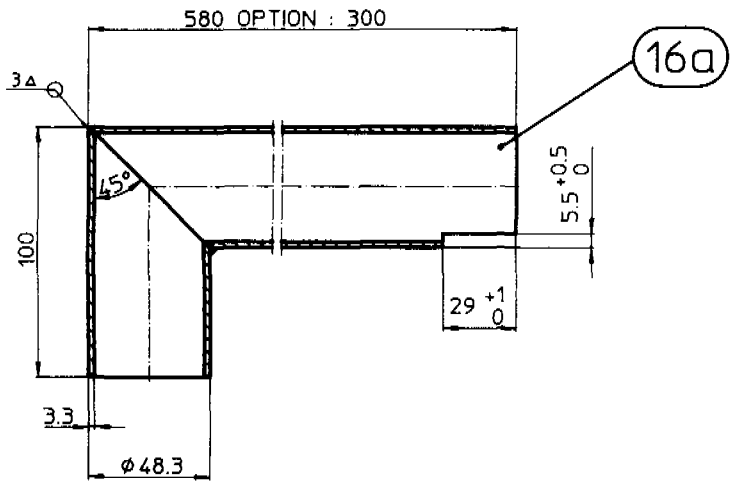
PUMPHEAD: PARTS

SKAT

A-03 a

REVISION 2-1994

OPTION : SPOUT POINTING TO THE SIDE

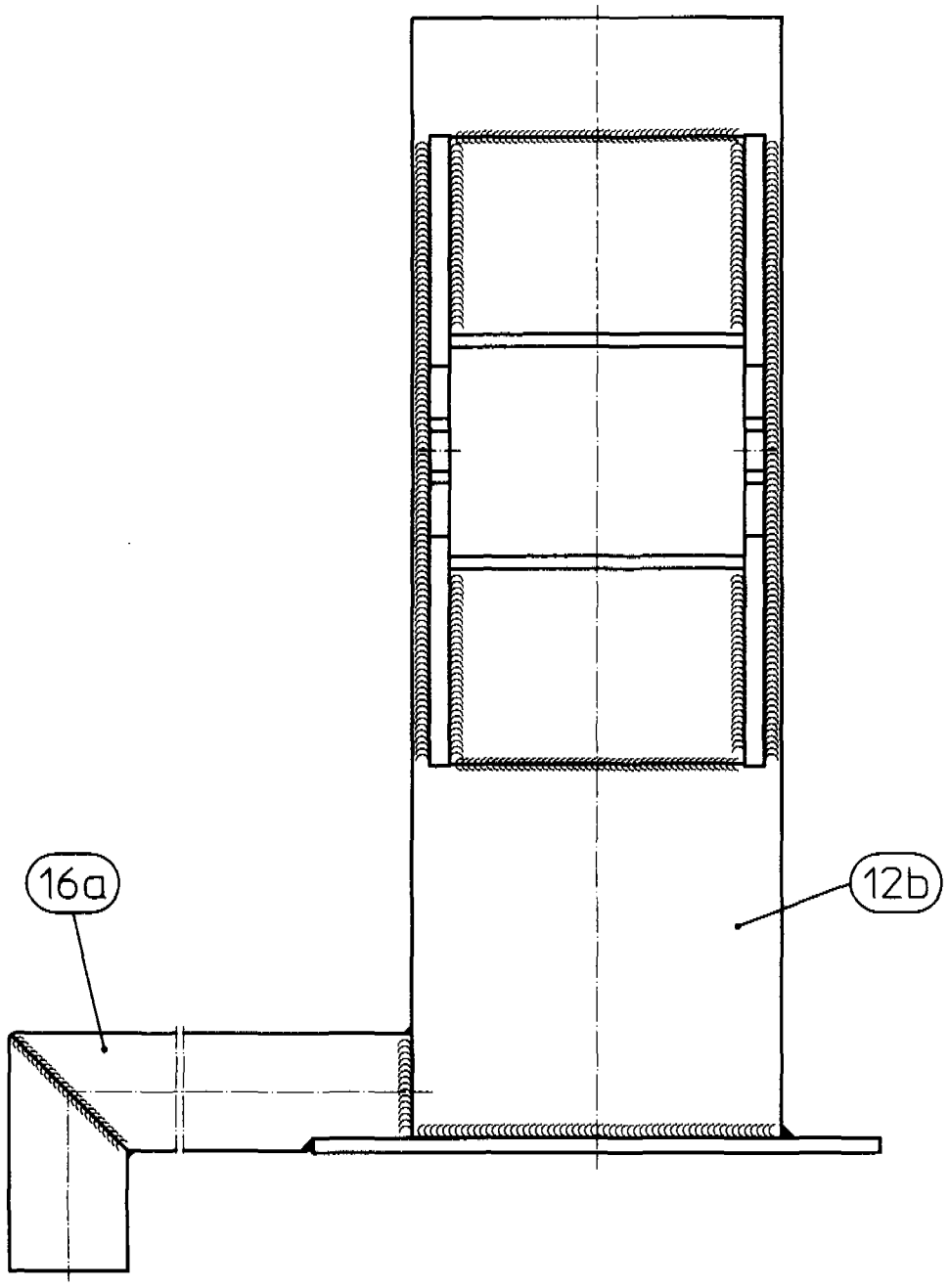


GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-1.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
16a	1	SPOUT	ø48,3x3,3	St 37-2	DIN 2458

Rev. No.	drawn by	Date	A04.02	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: PARTS	A-04 a
			JULY 1991			

REVISION 2-1994

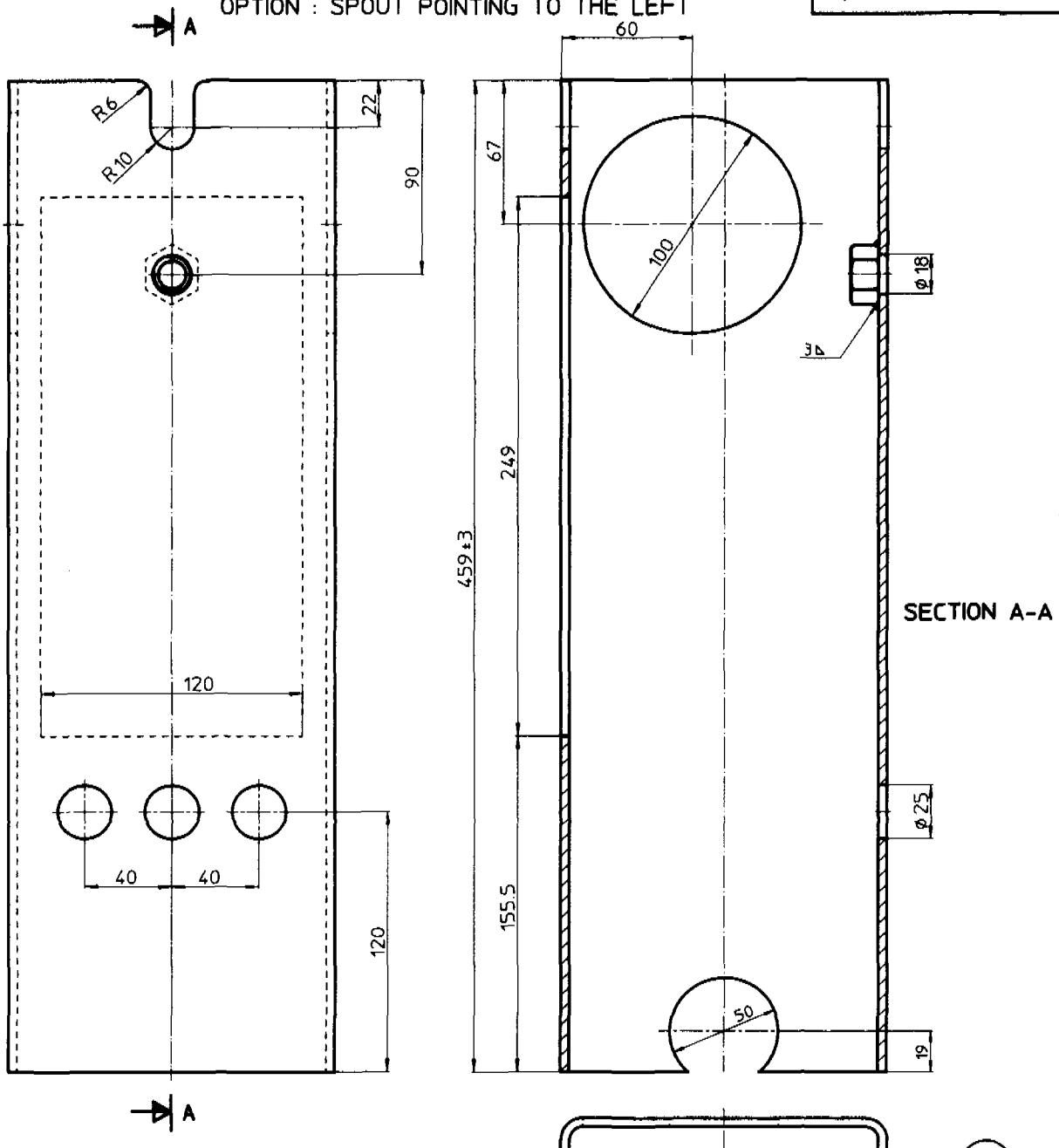


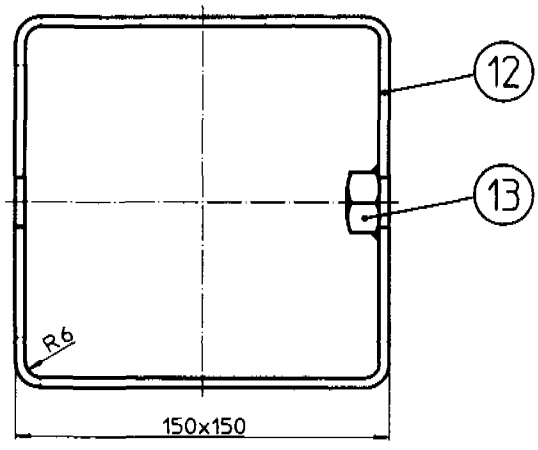
OPTION : SPOUT POINTING TO THE LEFT

Rev. No.	drawn by	Date	A00b.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: ASSEMBLY	A-00b
			JULY 1991			

REVISION 2-1994

OPTION : SPOUT POINTING TO THE LEFT





NOTE: RHS 150x150 CAN BE FABRICATED FROM 4MM SHEET.

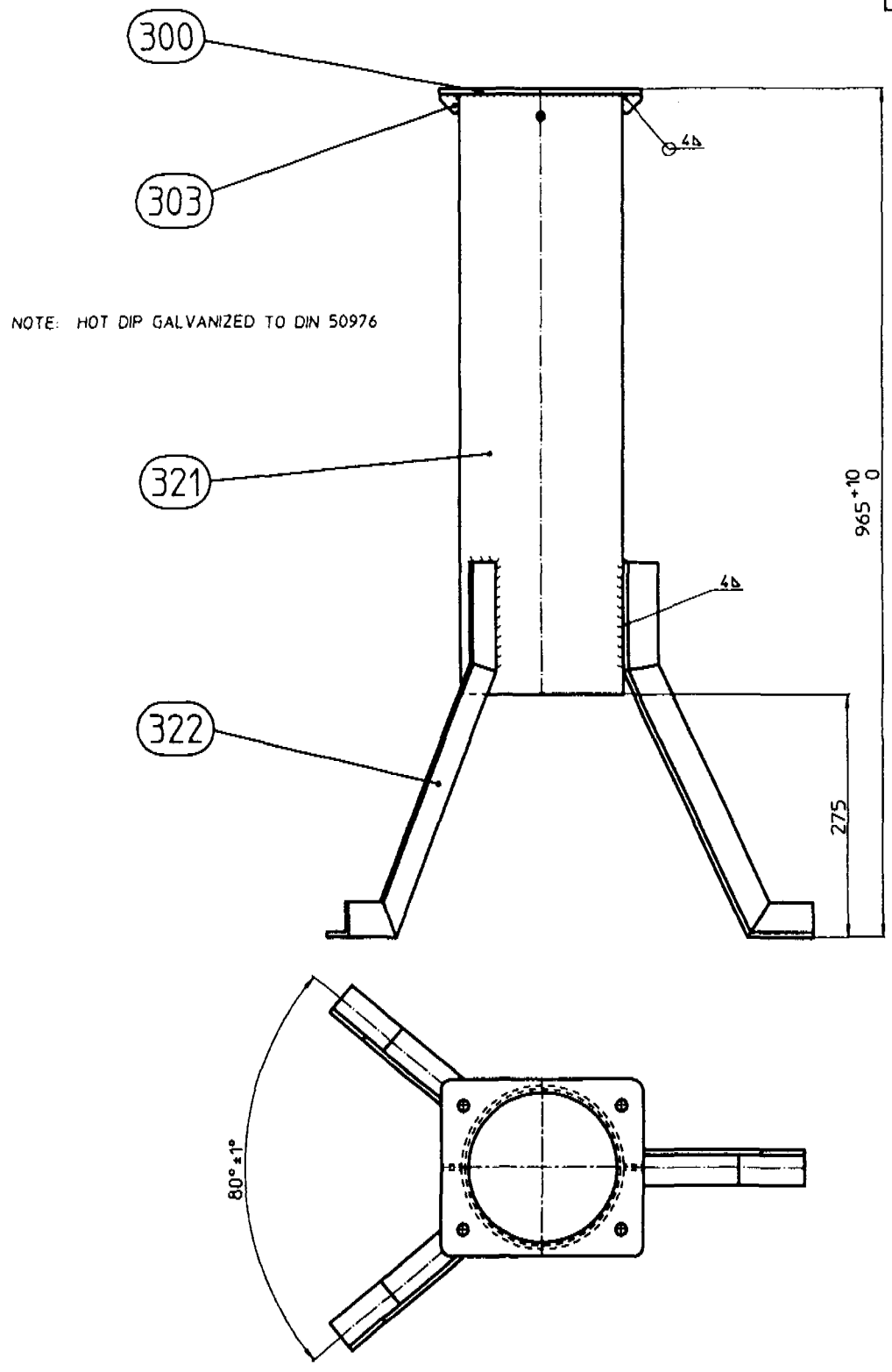
THE WELDS SHALL BE PLACED SUCH THAT THEY DO NOT IMPEDE THE FUNCTION OF THE PUMPHEAD.
THE WELDS TO BE CONTINUOUS ON INSIDE AND OUTSIDE.
NOT TO BE GROUND.

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/- 1,0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
13	1	HEX. NUT	DIN 934 M16	CLASS 4	
12	1	RHS-BODY	150x150x4	St 37-2	DIN 59411

Rev. No.	drawn by	Date	A03.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPHEAD: PARTS	A-03 b
			JULY 1991			

REVISION 2-1994

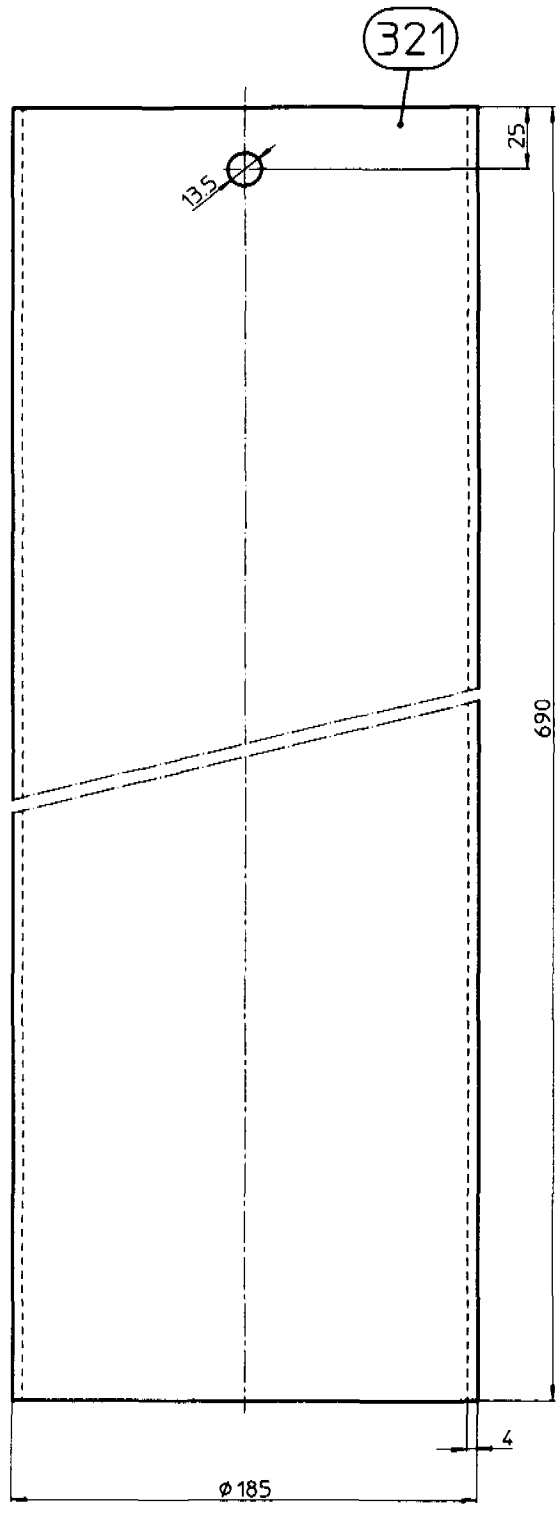


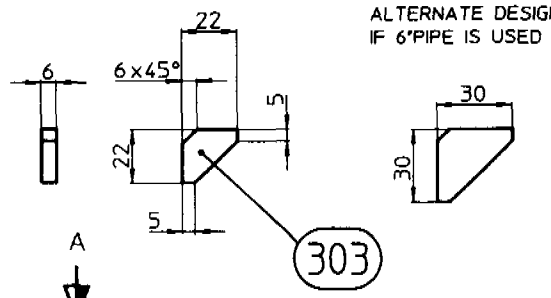
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-5.0

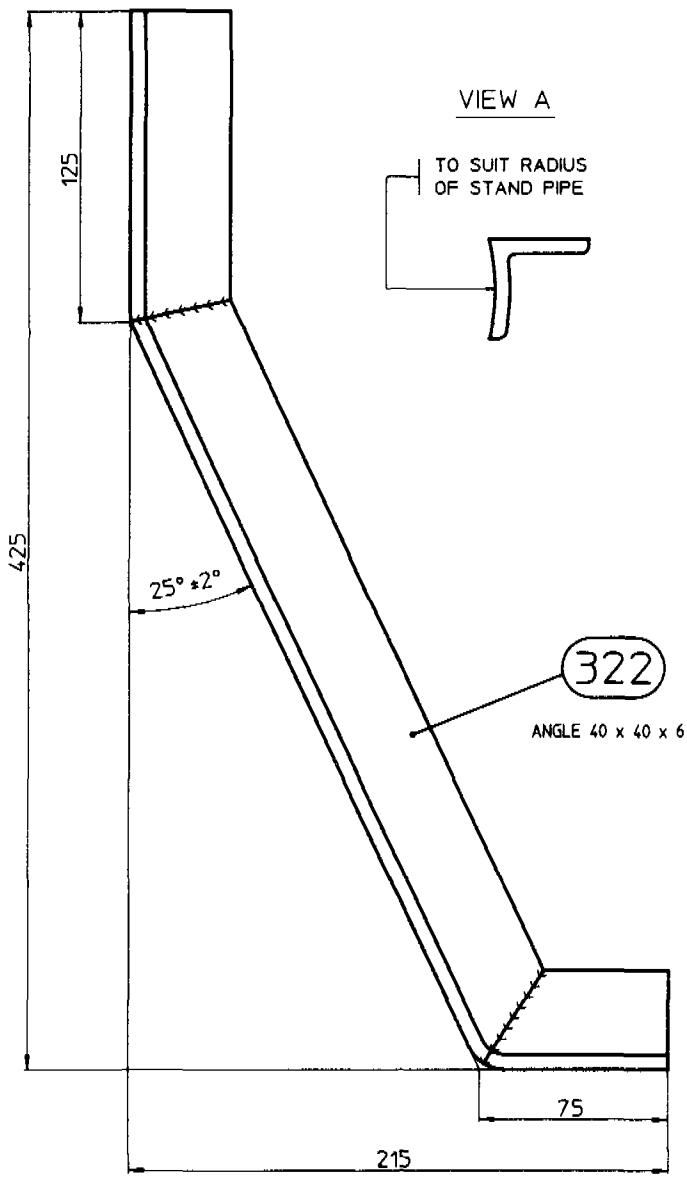
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
322	3	LEG			
321	1	STAND PIPE			
303	2	GUSSET			
300	1	STAND FLANGE			

Rev. No.	drawn by	Date	G00a.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:2.5	STAND: ASSEMBLY OPTION a	G-00a
			JULY 1991			

REVISION 2-1994







NOTE:
- BOTH ENDS TO BE FACED SQUARE TO THE OUTER PIPE
- ROLLED FROM 4mm SHEET
- WELD NOT GROUND
- IF WELL CASING PIPE UP TO 5" (125mm) IS USED, USE OF 6" (150mm) MEDIUM PIPE 695 LONG

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-3.0

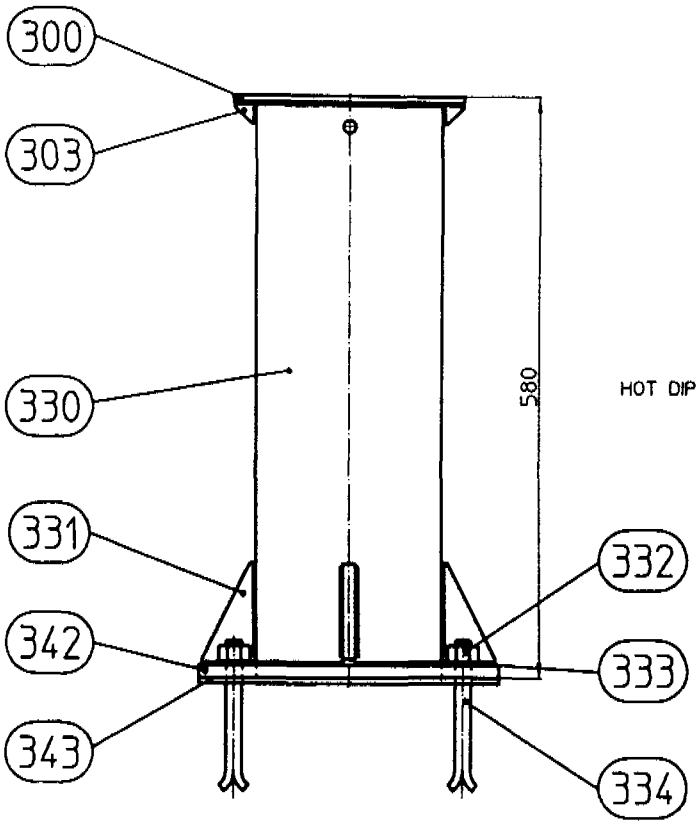
POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
322	3	LEG		St 37	
321	1	STAND PIPE		St 37	
303	2	GUSSET		St 37	

Rev. No.	drawn by	Date	G01a.01	Scale
2	RU	JULY 1994	TREFF AG	M. 1:1
			JULY 1991	

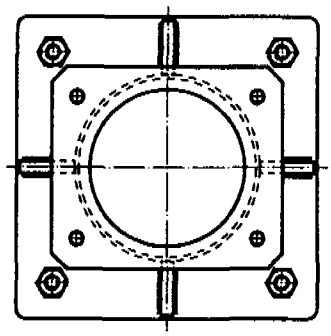
AFRIDEV HANDPUMP
STAND: PARTS OPTION a

SKAT
G-01 a

REVISION 2-1994



HOT DIP GALVANIZED TO DIN 50976

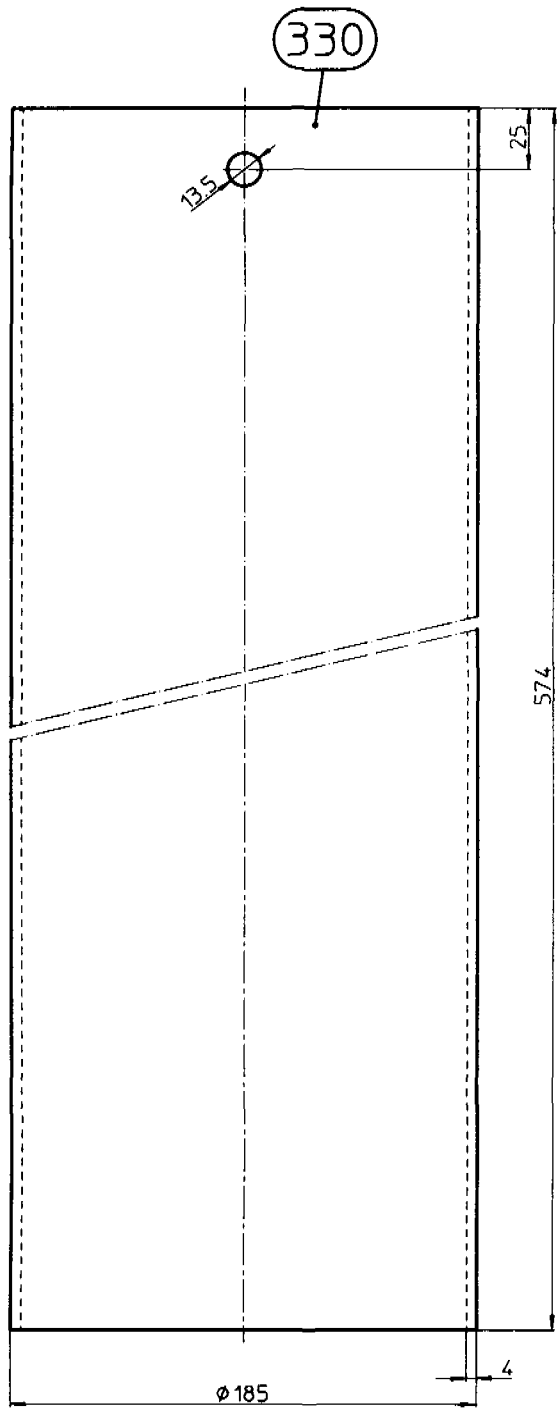


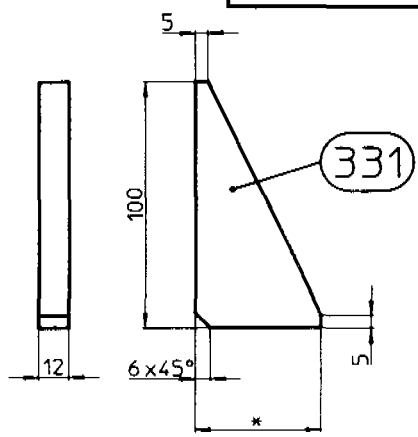
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-5.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
343	1	GASKET		RUBBER	
342	1	BOTTOM FLANGE			
334	4	FOUNDATION BOLT		AISI 316	
333	4	WASHER	DIN 125		
332	4	HEX. NUT		BRASS	
331	4	GUSSET			
330	1	STAND PIPE			
303	2	GUSSET			
300	1	STAND FLANGE			

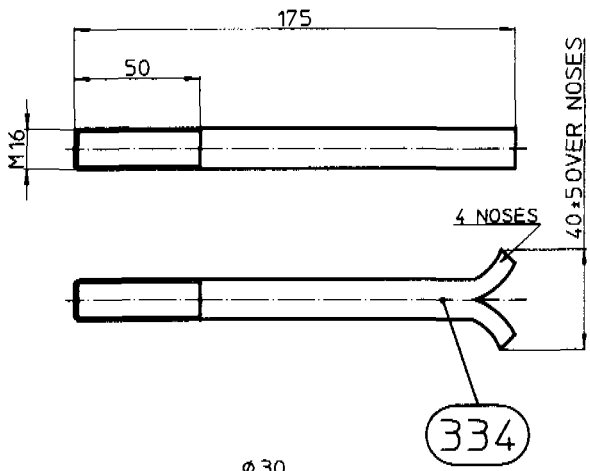
Rev. No.	drawn by	Date	G00b.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:2.5		
			JULY 1991		STAND ASSEMBLY: OPTION b	G-00 b

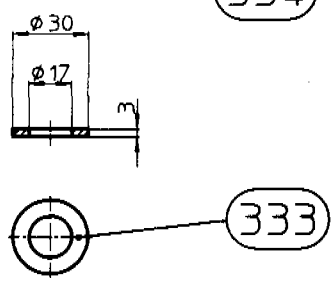
REVISION 2-1994

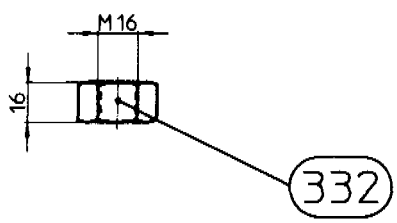




ADAPT TO FLANGE SIZE







NOTE: - BOTH ENDS TO BE FACED SQUARE TO THE OUTER PIPE
- ROLLED FROM 4mm SHEET
- WELD NOT GROUND
- IF WELL CASING PIPE UP TO 5" (125mm) IS USED, USE OF 6" (150mm) MEDIUM PIPE 580 LONG

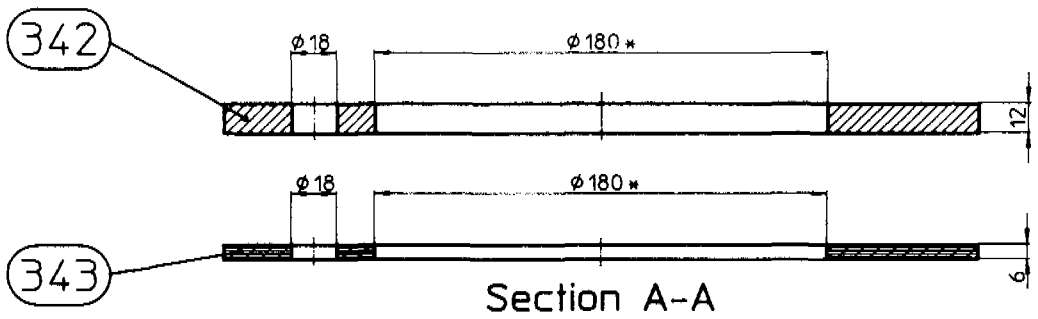
GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-3.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
334	4	FOUNDATION BOLT		AISI 316	
333	4	WASHER	DIN 125 B	Cu Zn 37	BRASS
332	4	HEX.NUT	DIN 934	Cu Zn 37	BRASS
331	4	GUSSET		St 37	
330	1	STAND PIPE		St 37	

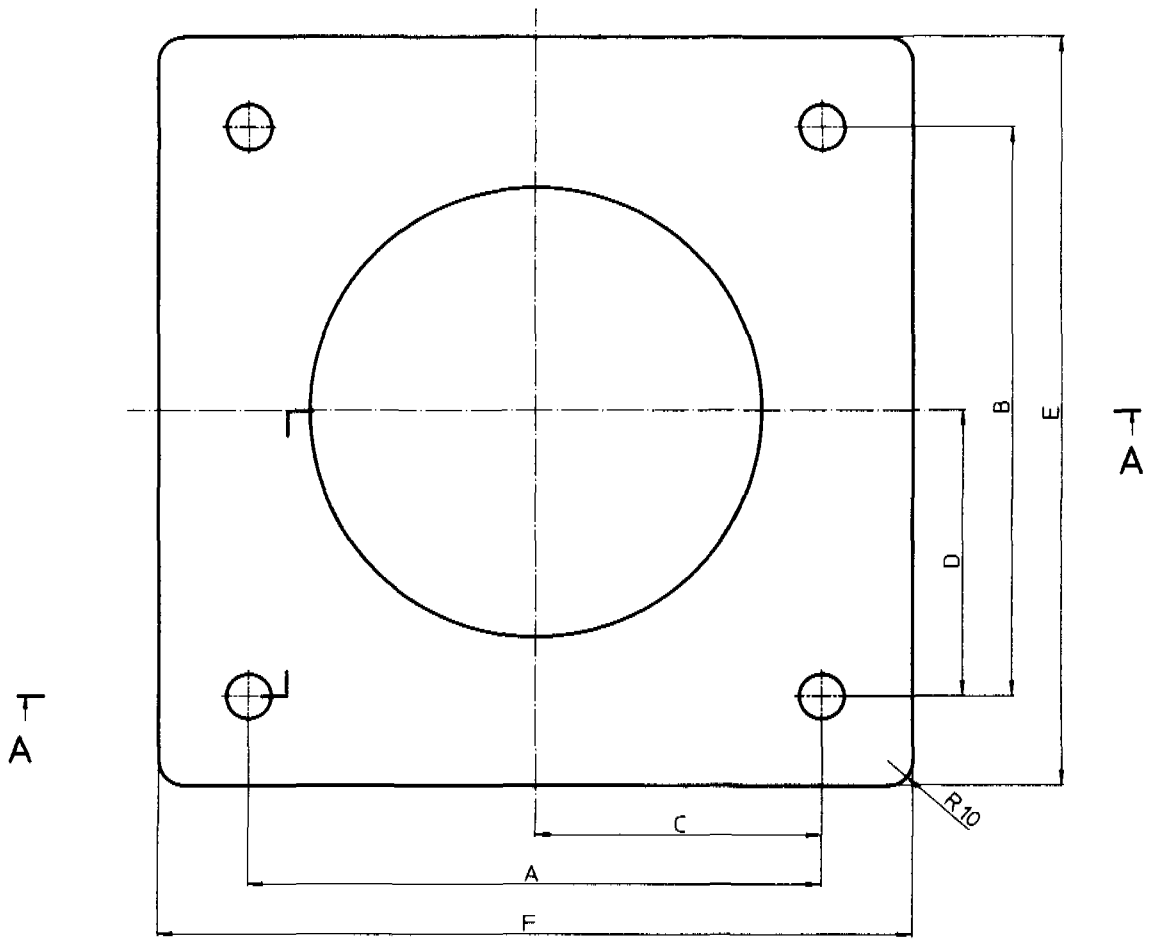
Rev. No.	drawn by	Date	G01b.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	STAND: PARTS OPTION b	G-01 b
			JULY 1991			

REVISION 2-1994

* NOTE: IF 6" PIPE IS USED
ø 180 WILL BE ø 156



Section A-A



NOTE: DIMENSIONS A,B,C,D,E,F TO BE SPECIFIED BY PURCHASER

GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-1.0

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
343	1	GASKET		NEOPRENE	SH 50°-60°
342	1	BOTTOM FLANGE		St 37	

Rev. No.	drawn by	Date	G02b.01	Scale
2	RU	JULY 1994	TREFF AG	M. 1:1
			JULY 1991	

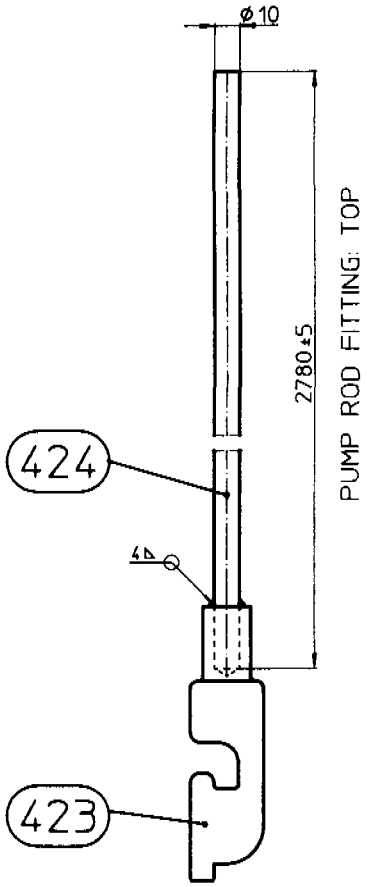
AFRIDEV HANDPUMP

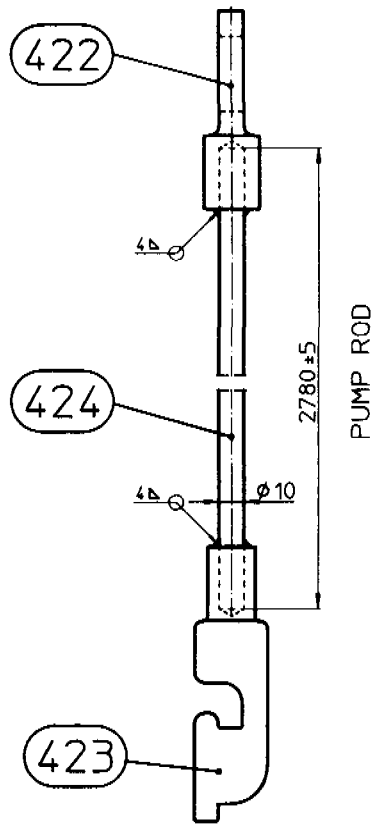
STAND: PARTS OPTION b

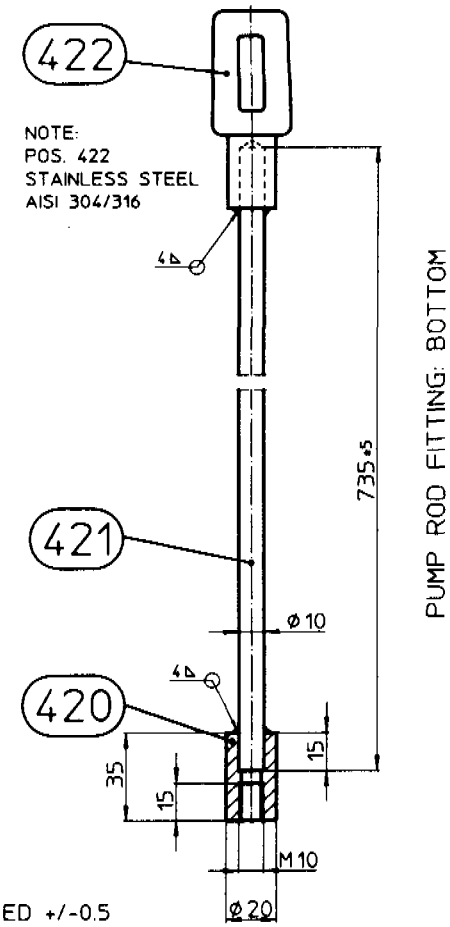
SKAT

G-02 b

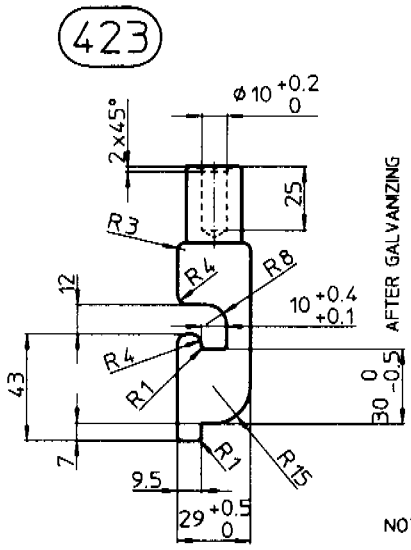
REVISION 2-1994

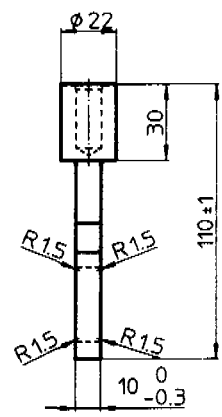


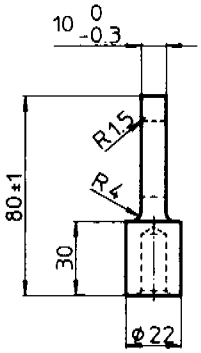


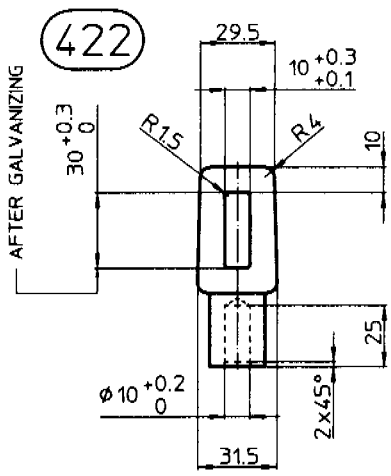


GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5









NOTE: MATERIAL MILDSTEEL HOT DIP GALVANIZED TO DIN 50976
(IF PH VALUE IS BELOW 6.5 THEN STAINLESS STEEL)

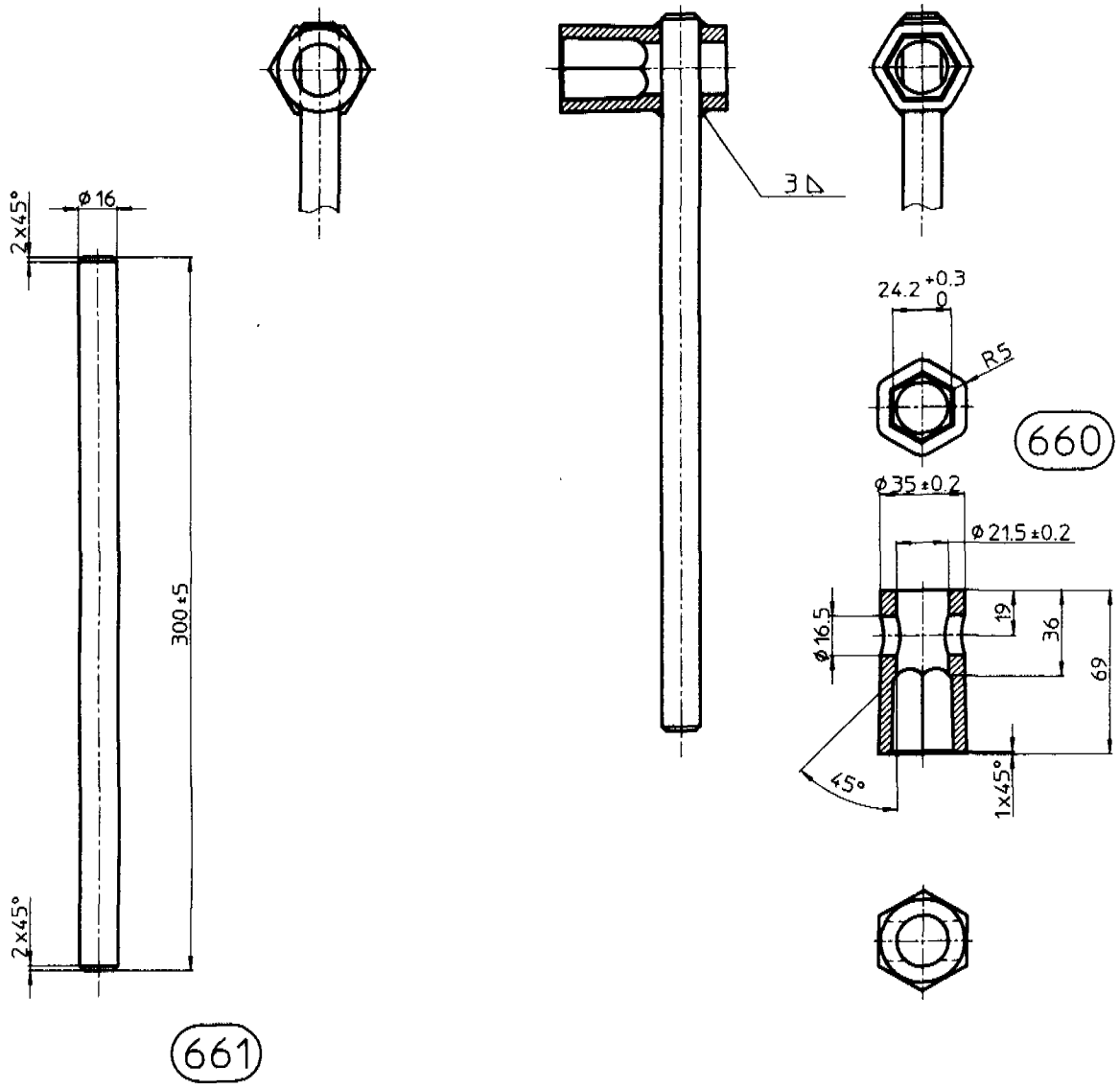
STAINLESS STEEL RODS TO BE BUFFED AFTER WELDING

TAPER OPTIONAL

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
424	X	ROD	DIN 668	St 37/AISI 304/316	
423	X	HOOK CONNECTOR		St 37/AISI 304/316	
422	X	EYE CONNECTOR		St 37/AISI 304/316	
421	1	PLUNGER ROD	DIN 668	AISI 304/316	
420	1	PLUNGER CONNECTOR		AISI 304/316	

Rev. No.	drawn by	Date	J00a.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	PUMPROD: OPTION a	J-00 a
			JULY 1991			

REVISION 2-1994



GENERAL TOLERANCE UNLESS OTHERWISE STATED +/-0.5

SURFACE FINISH: CHROMPLATED OR ELECTROGALVANIZED TO DIN 50961

POS.	QTY.	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
661	1	HANDLE		St-37	
660	1	SPANNER SOCKET		St-42	

Rev. No.	drawn by	Date	N00a.01	Scale	AFRIDEV HANDPUMP	SKAT
2	RU	JULY 1994	TREFF AG	M. 1:1	SPANNER	N-00a
			JULY 1991			

POS NO	QTY	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
A-00	1	**PUMPHEAD ASSEMBLY**			
A-10	1	BASE FLANGE		ST 37	
A-12	1	RHS-BODY	DIN 59411	ST 37-2	150,0 x 150,0 x 4,0
A-13	1	HEX. NUT	DIN 934	CLASS 4	M16
A-14	2	FULCRUM BRACKET		ST 37	
A-15	2	STOPPER PLATE		ST 37	
A-16	1	SPOUT	DIN 2458	ST 37-2	Dia 48,3 x 3,3
A-17	1	OVER FLOW COVER		ST 37	
A-18	1	HEX. BOLT	DIN 933	CLASS 4.6	M16 x 25
A-19	4	HEX. BOLT	DIN 933	CLASS 4.6	M12 x 35
A-20	4	HEX. NUT	DIN 934	CLASS 4	M12
B-00	1	**PUMPHEAD: COVER ASSEMBLY**			
B-50	1	COVER PLATE		ST 37	
B-51	2	SIDE PLATE		ST 37	
B-52	3	SHROUD	DIN 2458	ST 37-2	Dia 60,3 x 2,3
B-53	1	DEFLECTOR		ST 37	
C-00	1	**PUMPHEAD: BEARING SET**			
C-100	4	BEARING BUSH INNER		PA 6.6 NC	
C-101	4	BEARING BUSH OUTER		POM NC	
C-01	1	**PUMPHEAD: FULCRUM AND HANGER PINS**			
C-124	1	FULCRUM PIN		ST 37	
C-125	1	SLEEVE		AISI-304	
C-126	2	HEX. NUT SPECIAL M16		ST 42	EL. GALV
C-127	4	LOCK PIN	DIN 7	ST 37	EL. GALV 6,0 x 16,0
C-128	4	WASHER	DIN 125	ST 37	EL. GALV 8,4
C-129	1	RODHANGER PIN		ST 37	
C-130	1	SLEEVE		AISI-304	
C-131	2	HEX. NUT	DIN 934	CLASS 4	EL. GALV M16
D-00	1	**PUMPHEAD: HANDLE ASSEMBLY FRONT**			
D-150	1	HANDLE FORK LEFT		ST 37	
D-151	1	HANDLE FORK RIGHT		ST 37	
D-152	1	FULCRUM HOUSING		ST 37	
D-153	1	SLEEVE		AISI-304	
D-154	1	HANDLE PIPE	DIN 2458	ST 37-2	Dia 60,3 x 4,0
D-155	1	SPACER		ST 37	
D-156	1	SET SCREW	DIN 933	CLASS 4.6	M16 x 25
D-157	1	SOCKET		ST 37	

POS NO	QTY	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
E-01	1	**HANDLE ASSEMBLY REAR**			
E-200	1	T-BAR		ST 37	
E-201	1	HANDLE EXTENSION PIPE	DIN 2458	ST 37-2	Dia 48,3 x 4,0
E-202	1	ENDPLATE		ST 37	
F-00	1	**PUMPHEAD: ROD HANGER ASSEMBLY AND PARTS**			
F-250	1	HANGER BUSH		ST 37	
F-251	1	SLEEVE		AISI-304	
F-252	1	RODHANGER CONNECTOR		ST 37	
F-253	1	RETAINER BUSH	DIN 2458	ST 37-2	Dia 26,9 x 2,65
F-255	1	HEX. BOLT	DIN 933	CLASS 4.6	M16 x 25
G-00	1	**STAND ASSEMBLY**			
G-300	1	STAND FLANGE		ST 37	
G-301	1	STAND PIPE		ST 37	
G-302	2	LEG		ST 37	
G-303	2	GUSSET		ST 37	
H-00	1	**STEEL CONE ASSEMBLY**			
H-350	1	STEEL CONE		Q ST 52-3	DEEP DRAW
H-351	2	EYE		ST 37	
H-352	1	FLANGE PLATE		ST 37	
J-00	X	**PUMPROD ASSEMBLY AND FOOTVALVE FITTING**			
J-400	1	FOOTVALVE CONNECTOR		AISI-304/316	
J-401	1	U-HOOK		AISI-304/316	
J-402	1	PLUNGER CONNECTOR		AISI-304/316	
J-403	1	PLUNGER ROD		AISI-304/316	
J-404	X	WASHER		ST 37 or AISI-304/316	
J-405	X	EYE-HOOK	DIN 668	ST 37	
J-406	X	SPACER		ST 37	
J-407	X	HOOK	DIN 668	ST 37	
J-408	X	ROD	DIN 668	ST 37	

POS NO	QTY	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
K-00	1	**RISING MAIN: PARTS**			
K-500	1	FLAPPER		RUBBER/PE	
K-501	1	TOP SLEEVE	DIN 19532 DN50	uPVC	PN 16
K-502	1	COMPRESSION CONE	BS 2751/3222	NBR BA70	SHORE 70
K-503	X	RISING MAIN PIPE	DIN 19532 DN50	uPVC	PN 16
K-504	X	ROD CENTRALISER	BS 2751/3222	NBR BA80	SHORE 80
K-01	X	**RISING MAIN: PIPE CENTRALISER**			
K-520	X	PIPE CENTRALISER 4.0 INCH	BS 2751/3222	NBR BA80	SHORE 80
K-521	X	PIPE CENTRALISER 4.5 INCH	BS 2751/3222	NBR BA80	SHORE 80
K-522	X	PIPE CENTRALISER 5.0 INCH	BS 2751/3222	NBR BA80	SHORE 80
K-523	X	PIPE CENTRALISER 6.0 INCH	BS 2751/3222	NBR BA80	SHORE 80
K-524	X	PIPE CENTRALISER 8.0 INCH	BS 2751/3222	NBR BA80	SHORE 80
L-00	1	**CYLINDER ASSEMBLY**			
L-550	1	SUCTION PIPE	DIN 19532 DN65	uPVC	PN 10
L-551	1	REDUCER		uPVC	
L-552	1	CYLINDER PIPE	DIN 19532 DN50	uPVC	PN 16
L-553	1	LINER	DIN 17660	BRASS	CuZn20Al2/CuZn28Sn1
L-554	1	FOOTVALVE RECEIVER		POM NC	
L-555	2	VALVE BOBBIN	BS 2751/3222	NBR BA80	SHORE 80
L-556	1	U-SEAL (PLUNGER) NA 150	50,0 x 40,0 x 7,0	80 NBR (878)	SHORE 80
L-557	1	O-RING (RECEIVER)	BS 2751/3222	70 NBR (769)	SHORE 70 44,0 x 3,0
L-558	1	O-RING (FOOTVALVE)	BS 2751/3222	70 NBR (769)	SHORE 70 28,0 x 2,5
L-559	2	HEX. BOLT	DIN 933	AISI 316 A4	M10 x 35
L-565	2	PLUNGER-FOOTVALVE LOWER		POM NC	
L-566	2	PLUNGER-FOOTVALVE UPPER		POM NC	
L-575	2	PLUNGER-FOOTVALVE		POM NC	
L-576	2	WASHER	DIN 125	AISI 304 A4	Dia 10,5
L-580	1	ROPE		POLYPROPYLENE	
L-581	1	SLEEVE		NYLON	
M-00	1	**FISHING TOOL**			
M-600	1	ROD		ST 37	
M-601	2	COVER PLATE		ST 37	
M-602	2	SIDE PLATE		ST 37	
M-603	1	PIN		AISI 304	
M-604	1	FISHING HOOK		ST 37	
N-00	1	**FOLDABLE SPANNER**			
N-650	1	SPANNER SOCKET		ST 42	CHROME OR EL. GAL
N-651	1	HANDLE		ST 42	CHROME OR EL. GAL
N-652	1	HANDLE EXTENSION		ST 37	CHROME OR EL. GAL
N-653	1	PIN		ST 42	CHROME OR EL. GAL

POS NO	QTY	DESCRIPTION	SPECIFICATION	MATERIAL	REMARKS
P-00	1	**CONCRETE PUMP PEDESTAL**			
		OPTIONS			
A-00a	1	**PUMPHEAD: ASSEMBLY OPTION a**			
A-16a	1	SPOUT	DIN 2458	ST 37-2	Dia 48,3 x 3,3
G-00a	1	**STAND: ASSEMBLY OPTION A**			
G-300	1	STAND FLANGE		ST 37	
G-303	2	GUSSET		ST 37	
G-321	1	STAND PIPE		ST 37	
G-322	3	LEG		ST 37	
G-00b	1	**STAND: ASSEMBLY OPTION B**			
G-300	1	STAND FLANGE		ST 37	
G-303	2	GUSSET		ST 37	
G-330	1	STAND PIPE		ST 37	
G-331	4	GUSSET		ST 37	
G-332	4	HEX. NUT	DIN 934	Cu Zn 37	BRASS
G-333	4	WASHER	DIN 125 B	Cu Zn 37	BRASS
G-334	4	FOUNDATION BOLT		AISI 316	
G-342	1	BOTTOM FLANGE		ST 37	
G-343	1	GASKET		NEOPRENE	SHORE 50-60
J-OOa	X	**PUMPROD: OPTION A**			
J-420	1	PLUNGER CONNECTOR		AISI 304/316	
J-421	1	PLUNGER ROD	DIN 668	AISI 304/316	
J-422	X	EYE CONNECTOR		ST 37 or AISI 304/316	
J-423	X	HOOK CONNECTOR		ST 37 or AISI 304/316	
J-424	X	ROD	DIN 668	ST 37 or AISI 304/316	
N-00a	1	**SPANNER: OPTION A**			
N-660	1	SPANNER SOCKET		ST 42	CHROME OR EL. GAL
N-661	1	HANDLE		ST 37	CHROME OR EL. GAL

APPENDIX 1

SUMMARY OF MAIN CHANGES IN REVISION 2 - 1994

Please note that this appendix contains only a brief summary of changes made. It is essential to refer to the main Specification to obtain complete information.

Head and Stand

- Two optional configurations permit the pumphead spout to be fitted at 90 degrees to the pumphead handle axis, pointing either left or right, in addition to the conventional arrangement with the spout opposite the handle. (See Fig. A-00a and A-00b).

- Two spout lengths are now permitted, either 512 or 232 mm. (See Fig. A-04, A-04a).

- Locking tabs on the pumphead base flange have been deleted. (Fig. A-04).

- Welded-on hexagon nuts on rodhanger connector are now deleted. The rodhanger itself is now fabricated from 32.0 mm square bar. (See Fig. F-00).

- The depth of the parallel section of the tapered counterbore on the fulcrum brackets has been increased. (See Fig. A-02).

Hanger and Fulcrum Pins

- The distance that lock pins protrude from hanger and fulcrum pin end faces has been reduced. (See Fig. C-01).

- Two in-line lock-pins are now fitted to hanger and fulcrum pins. (Fig. C-01).

Pumprods

- The cruciform-type optional rod centraliser is now deleted. (See Fig. K-00).

Cylinder

- The cylinder liner and cylinder pipe are now chamfered both ends. This gives symmetrical components to simplify cylinder assembly. (See Fig. L-02).

Rising Main

- An optional pipe centraliser for 8.0 inch nominal diameter well casing is now included. The 6.0 inch centraliser has been modified to simplify production. (See Fig. K-01, K-02).

APPENDIX 2

INTERNATIONAL STANDARDS USED IN THE SPECIFICATION

Standard	Description	Notes
DIN 7	Parallel Pins.	
DIN 668	Bright round steel: Dimensions Permissible deviations according to ISO tolerance zone h11.	
DIN 1615	Welded circular unalloyed steel tubes not subject to special requirements.	
DIN 1785	Wrought copper and copper alloy tubes for condensers and heat exchangers.	
DIN 2463 P1	Welded Austenitic Stainless Steel Pipes and Tubes. Dimensions, Conventional Masses per Unit Length.	
DIN 7748 P1	Plastic moulding materials: unplasticised polyvinyl chloride (uPVC) moulding materials; classification and designation.	
DIN 8061	Unplasticised polyvinyl chloride pipes: General quality requirements and testing.	Preliminary only
DIN 8062	Unplasticised polyvinyl chloride (uPVC, PVC-HI) pipes: Dimensions.	Preliminary only
DIN 8551 P1 & 3	Edge Preparation for Welding: Edge Forms on Steel: Gas Welding, Manual Arc Welding and Gas-shielded Arc Welding.	
DIN 17440	Stainless steels: Technical delivery conditions for plate and sheet, hot rolled strip, wire rod, drawn wire, steel bars, forgings and semi-finished products.	Preliminary only
DIN 17660	Copper-zinc alloys (Brass), (Special brass): Composition.	
DIN 17671 P1 & 2	Wrought copper and copper alloy tubes: properties.	
DIN 17679	Wrought copper and copper alloy tubes with rolled fins for use in heat exchangers.	
DIN 19532	Pipelines of Unplasticised Polyvinyl Chloride (Rigid PVC, uPVC) for Drinking Water Supply; Pipes, Pipe joints, Pipeline Parts, DVGW Technical Rules.	
DIN 50941	Protection against corrosion: chromating of electroplated zinc and cadmium coatings; general directions, symbols and methods of test.	

DIN 50961	Electroplated coatings: Zinc and cadmium coatings on iron and steel; Chromate treatment of zinc and cadmium coatings.	
DIN 50976	Corrosion protection: Hot-dip batch galvanizing Requirements and testing.	
ISO 630	Structural steels.	equivalent DIN 17100
ISO 4017	Hexagon head screws - Product grades A and B.	equivalent DIN 933
ISO 4019	Cold-finished steel structural hollow sections - Dimensions and sectional properties.	equivalent DIN 59411
ISO 4032	Hexagon nuts, style 1 - Product grades A and B.	equivalent DIN 934
ISO 4033	Hexagon nuts (brass).	
ISO 4200	Plain end steel tubes, welded and seamless - General tables of dimensions and masses per unit length.	equivalent DIN 2458
ISO 7089	Plain washers - Normal series - Product grade A.	equivalent DIN 125
ISO 7387 P1	Adhesives with solvents for assembly of uPVC pipe elements - Characterization - Part 1: Basic test methods.	
BS 2751	Specification for general purpose acrylonitrile-butadiene rubber compounds .	
BS 3222	Specification for low compression set acrylonitrile-butadiene rubbers.	
IS 2500 P1	Sampling Inspection Tables: Part 1 Inspection by Attributes and by Count of Defects.	Extract of relevant clauses and tables only

APPENDIX 3

SPECIFICATION DRAWING LIST: REVISION 2 - 1994

Z-00 Pump Assembly Schematic
A-00 Pumphead: Assembly
A-01 Pumphead: Fulcrum Bracket Subassembly
A-02 Pumphead: Parts
A-03 Pumphead: Parts
A-04 Pumphead: Parts
B-00 Pumphead: Cover Assembly
B-01 Pumphead: Cover-Parts Details
C-00 Pumphead: Bearing Set
C-01 Pumphead: Fulcrum and Hanger Pins
D-00 Pumphead: Handle Assembly Front
D-01 Pumphead: Handle Parts
D-02 Pumphead: Handle Parts
E-00 Handle Assembly
E-01 Handle Assembly Rear
E-02 Handle Parts
F-00 Pumphead: Rodhanger Assembly and Parts
G-00 Stand: Assembly
G-01 Stand: Parts
H-00 Steel Cone: Assembly
J-00 Pumprod Assembly and Foot Valve Fitting
K-00 Rising Main: Parts
K-01 Rising Main: Pipe Centraliser
K-02 Rising Main: Pipe Centraliser
L-00 Cylinder Assembly
L-01 Cylinder Sub-Assembly
L-02 Cylinder: Parts
L-03 Cylinder: Plunger/Footvalve
L-04 Cylinder: Parts
M-00 Fishing Tool
N-00 Foldable Spanner
P-00 Concrete Pump Pedestal
A-00a Pumphead: Assembly
A-00b Pumphead: Assembly
A-03a Pumphead: Parts
A-03b Pumphead: Parts
A-04a Pumphead: Parts
G-00a Stand Assembly: Option a
G-00b Stand Assembly: Option b
G-01a Stand: Parts Option a
G-01b Stand: Parts Option b
G-02b Stand: Parts Option b
J-00a Pumprod: Option a
N-00a Spanner

Total 44 Drawings