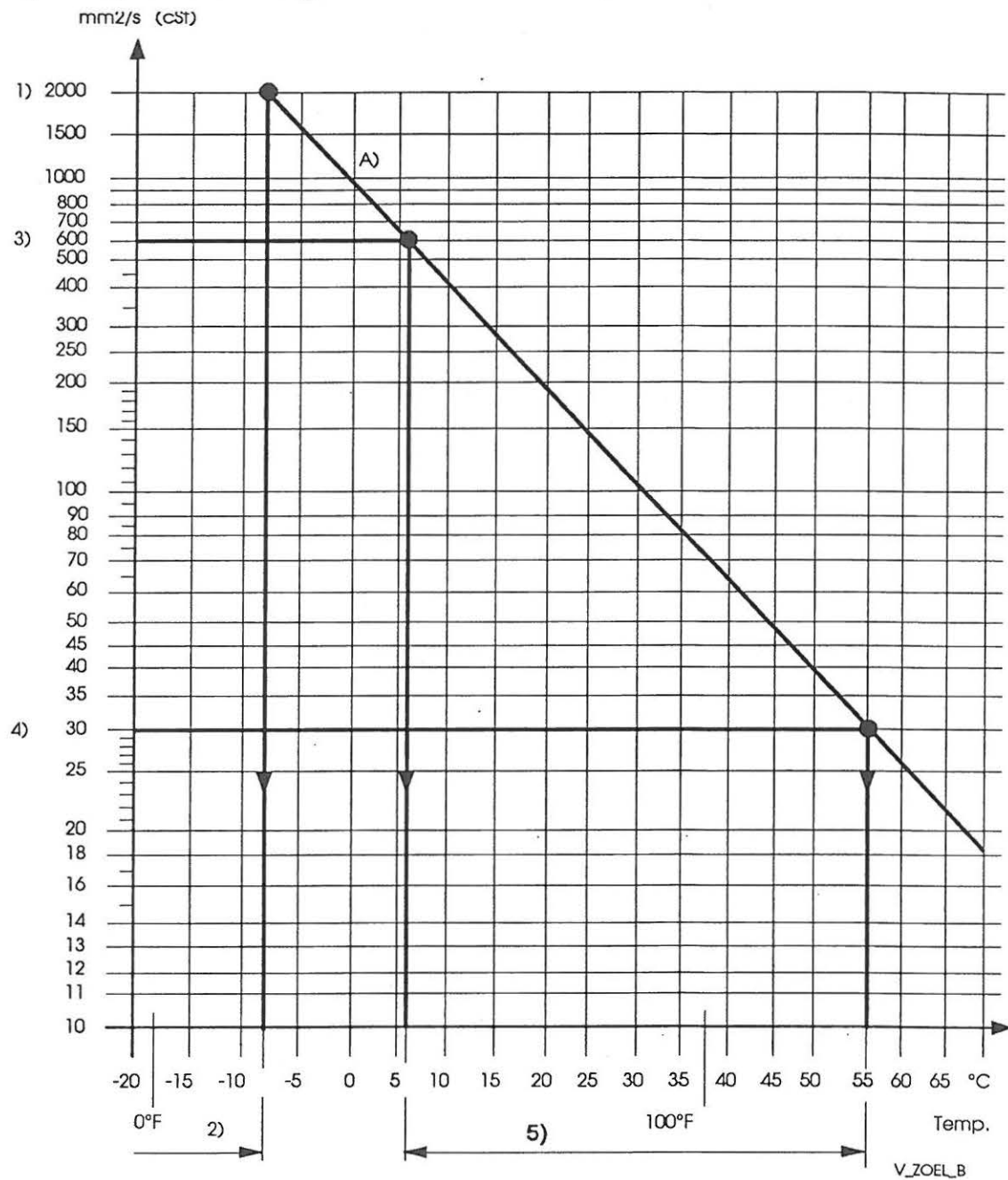


Viscosity-temperature diagram



Manufacturer	Product	Viscosity mm ² /s (cSt) at	
		20°C	40°C
A) BP	Energol GHL 68	185	63

ENVZOELA

6.2.2 Operating conditions

Legend to viscosity-temperature diagram

The viscosity-temperature line of a CGLP lubricating oil (DIN 51502) which meets the requirements as stated under Par. 6.2.3, example A), is shown in the viscosity-temperature diagram.

By means of this line the operating-temperature range and the minimum permissible starting temperature can be determined.

- 1) Absolute maximum permissible viscosity
- 2) Minimum permissible starting temperature at 2000 cSt for VG68
- 3) Maximum operating viscosity
- 4) Minimum operating viscosity
- 5) Operating-temperature range for VG68

6.2.3 Application of other products

If, due to local conditions, priority is given to other products the central lubricating oil must fulfil following requirements:

- CGLP lubricating oil, viscosity class ISO-VG68 for an operating temperature range of approx.. 2°C to 65°C.
- Compatibility with metal: lubricating oils and their decomposition products may not cause corrosion of metal (e.g. of steel, bronze, aluminium).
- The lubricating oil must not contain any substances which attack the usual sealing materials.

6.2.4 Directions on maintenance

The level of the lubricating oil in the tank must never drop below the minimum.

Check the level of the lubricating oil at regular intervals, also when the tank is fitted with automatic level control.

Particularly every time after servicing and repairs check the level of the lubricating oil.

Before initial starting up and then once every year clean the lubricating oil tank.

Always when servicing observe utmost cleanliness.

Note

Always use the same brand of lubricating oil with the same quality. Lubricating oils of different brands and quality must not be mixed.

6.3 Lubricating oils for the pneumatic system

Use exclusively lubricating oil according to the table below

Manufacturer	Product	Viscosity mm ² /s (cSt) at 40°C
ARAL	ARAL VITAM GF 22	22
ARAL	ARAL VITAM GF 32	32
BP	ENERGOL HLP 22	22
ESSO	AROX EP 15	13.5
Klüber	AIRPRESS 15	15
MOBIL	MOBILARAMA 522	29
SHELL	TORCULA OIL 32	32
TEXACO	ROCK DRILL LUBRICANT 32	32
VALVOLINE	PT OIL ETC 15	15
WAPO	WAPO-OIL A89	32

ENHPOELA

6.4 Lubricants for plunger lubricating unit

Use exclusively lubricants as given in the table.

Viscosity range of the lubricant : 20 - 11000mm ² /s (cSt)		
Manufacturer	Product	Temperature range
Klüber	METALSTAR PA 72K	graphite
Klüber	METALSTAR PA 73K	graphite
Klüber	METALSTAR FE 82K	without graphite
GEIGER	TRENNEX AUTOMATIC 656	graphite
ACHESON	DAG-5250	dilute with water 1: 5
SCHINDLER	PLUNGER LUBRICANT	

ENHGOELA

6.5 Lubricating grease for Buhler die casting machines

Lubricating grease for:

- tie-bar bearings of the fixed platen
- die-mounting surface
- casting height adjustment

Use white multi-purpose lubricating paste (see table below) with high pressure resistance, fretting-corrosion and corrosion-inhibiting properties.

Requirements

- temperature range: -25°C min. + 125°C
- mineral-oil based
- penetration: DIN 51804 : approx. 250 x 0.1 mm
- VKA, DIN 51350 : approx. 4200 - 5200 N

Manufacturer	Product	Temperature range
Gleitmolybdän Schmierstoffe GmbH	Gleitmo 810	- 25°C + 125°C
Klüber	Altempo Q NB 50	- 30°C + 150°C
Dow Corning	MOLYKOTE DX	- 25°C + 125°C

ENHFETTA

6.6 Lubricating grease for electric motors

Lubricating grease for plain and roller bearings at high loads (see table below)

Manufacturer	Product
AGIP	GR MU/EP 2
ARAL	Aralub HLP 2
ASEOL	LITEA EP 6 - 077
BP	Energrease LS - EP 2
ESSO	BEACON EP 2
FUCHS	RENOLIT FWA 160
Klüber	STABURAGS NBU 8 EP
MOBIL	Mobilplex 47
SHELL	Alvania EP Grease 2
TEXACO	Multifak EP 2
TOTAL	MULTIS EP 2
VALVOLINE	EP - LB Grease No. 2

ENHEFETA

6.7 Nitrogen N₂

General properties

Gaseous nitrogen is colourless, non odorous and tasteless and at equal temperatures, is slightly lighter than air. The volume proportion of nitrogen in the air is approx. 78%. Gaseous nitrogen is not corrosive and non-combustible. Nitrogen is not toxic.

Requirements

Buhler die-casting machines must be run exclusively with class 4.0 purest quality nitrogen.

- N₂ 99.99 Vol%
- O₂ 50 vpm
- H₂O approx. 30 vpm

**DANGER!**

Use exclusively purest quality nitrogen (N₂ more than 99.99 vol. %) !
Compressed air and other media are not permitted for gas filling!
Under no circumstances use oxygen! Explosion hazard!

Note

In the event that accidents happen due to neglecting of this instruction, Buhler AG reserve the right of recourse to the customer or to litigate against him in case Buhler AG is made liable.

6.8 Die spraying agents

**CAUTION !**

Various die-spraying agents contain aggressive additives which may cause damage to the die-casting machines. Furthermore, the water used to mix into the die-spraying agents should meet the quality requirements as stated under Chapter "Energy connections". Water that does not meet these quality standards can, in connection with die-spraying agents, also be a cause for damage to the die-casting machine.

We reject any guarantee claims for damage caused in connection with die spraying agents.

6.9 Disposal of operating materials

Operating materials are harmful to the environment and to health.

**WARNING !**

Detrimental to environment and health !

These liquids accumulate in the ground or escape into the atmosphere in form of vapours.

- hydraulic fluids
- lubricants
- spraying agents

Measures to be taken:

- collect fluids in a oil collecting tray and dispose of them in accordance with the local regulations.
- let vapours and smoke escape into the atmosphere only after filtering.

Regulations: observe the local regulations.

7 Transport

Contents

7.1	Scope of delivery	1
7.2	Packing	1
7.3	Degree of disassembly	2
7.4	Susceptibility	2
7.5	Preparing for transport	3
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7.9.5	Drive unit	8
7.9.6	Injection unit	9

7.1 Scope of delivery

The contents of each package as stated on the delivery note, should be checked for completeness upon receipt.

Any damage from transportation or missing parts are to be notified immediately in writing.

7.2 Packing

Deciding for the kind of packing is also the carrying distance. If not specifically agreed otherwise, the packing is conform to recommendations for packaging. Depending on the place of delivery the machine parts are shipped open or partially packed. The packing material should be disposed of in accordance with the local regulations.

7.3 Degree of disassembly

The degree to which the machine is disassembled for transport depends on the transport provisions, the local conditions and the lifting gear available.

It is aimed at to transport the DCM as much as possible in one piece.

Usually the DCM is taken apart into following sections:

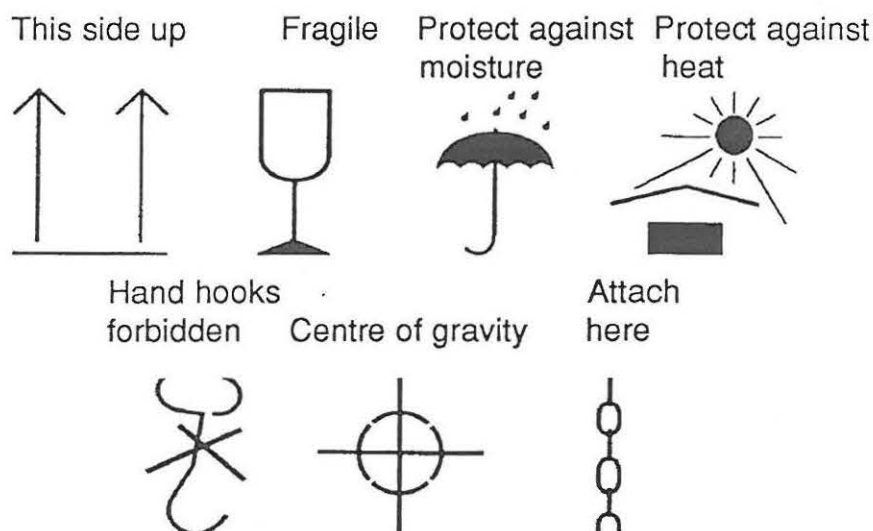
SC 10/120	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
Die closing unit	7290	2850	2420	56'000
Injection unit	3530	1870	3600	10'000
Base plate	5580	1700	800	5'000
Drive unit	1370	2850	900	2'500
Control cabinet	3200	600	2200	1'000
Control system with:				
1 control column	750	450	820	100
2 control columns	970	450	820	140

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7.4 Susceptibility

During transportation of the DCM or DCI particular care must be taken to avoid damage through force from outside or careless loading or unloading.

Please take notice of the following symbols on the packing.



7.5 Preparing for transport

Before moving or transporting the DCM inside the factory:

- empty the nitrogen system
- empty the hydraulics tanks (closing and injection unit)

Transport the DCM according to instructions for lifting (see Par. 7.9).

7.6 Accidents during transportation

In the event of an accident during transport please inform our customer service immediately.

7.7 Storage

Leave the DCM or DCI in its original packing for storage and place it where it is protected against the influence of weather.

If this is not possible the machine or installation sections and boxes should be:

- properly covered
- protected against intensive exposure to sun
- protected against moisture

7.8 Weights and points of attachment

Please take the weights and points of attachment from the enclosed instructions for lifting (see Par. 7.9).

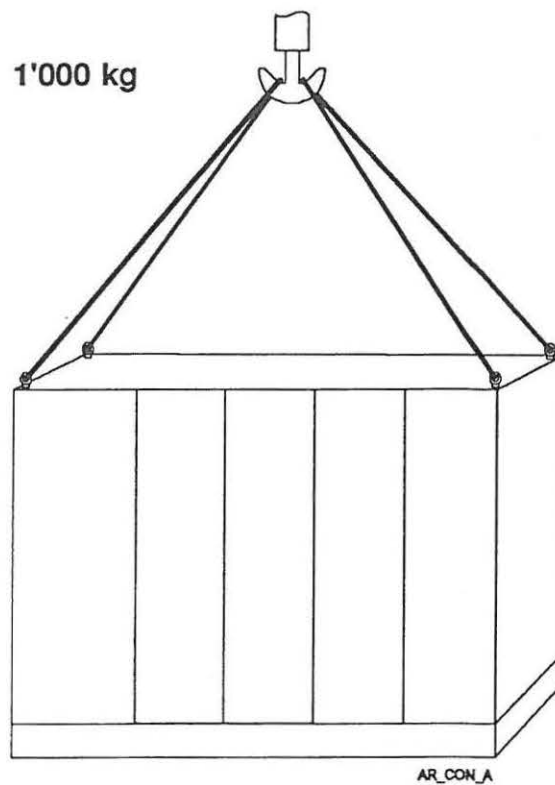


DANGER !

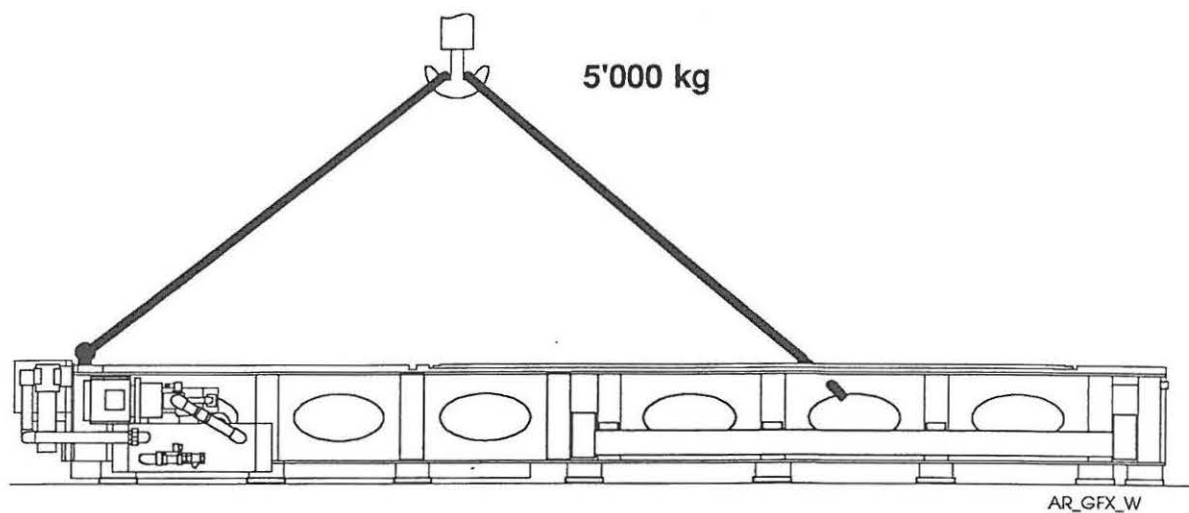
**Check the lifting gear for its permissible loading capacity.
Standing under suspended loads can be fatal.**

7.9 Instructions for lifting

7.9.1 Control cabinet

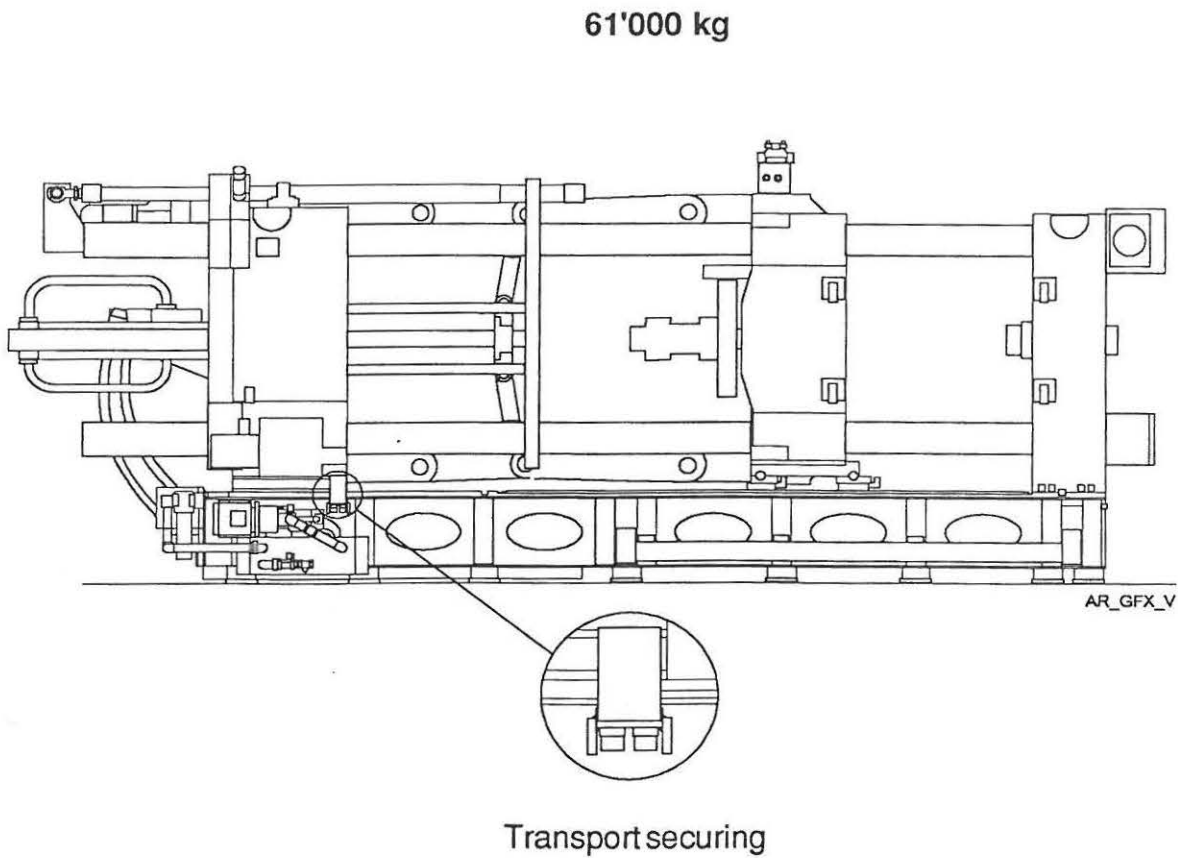
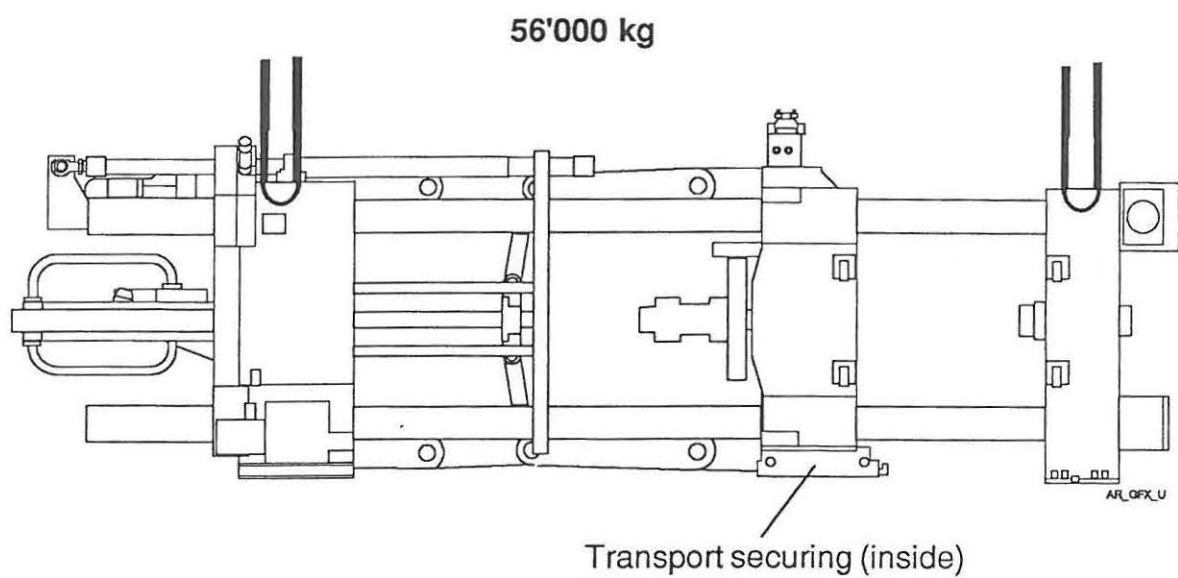


7.9.2 Base plate

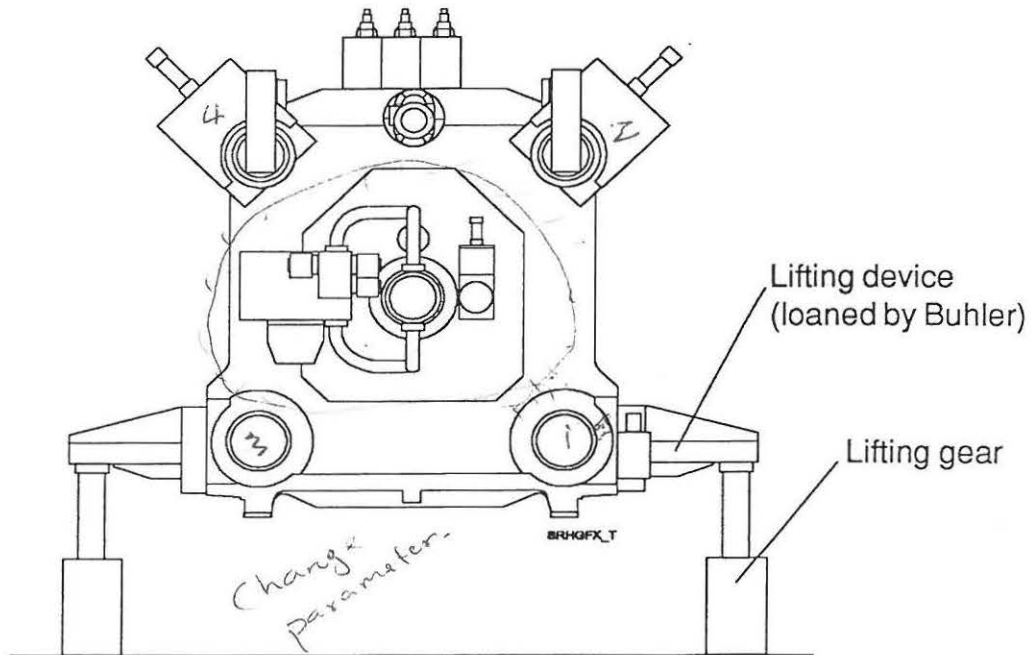


7.9.3 Die closing unit

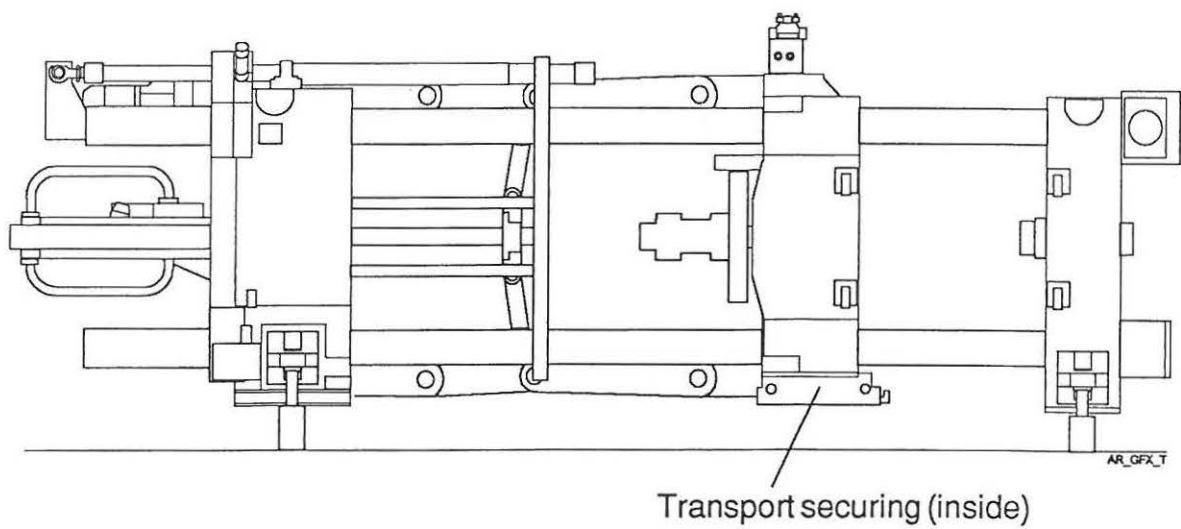
Example 1: lifting by crane



Example 2: lifting gear, e.g. hydraulic cylinders



56'000 kg



7.9.4 Unloading the die closing unit

Before placing the die closing unit 1) on the base plate 4) following preparations are to be carried out:

- loosen the bolts 6) on both sliding shoes 5)
- remove the wedges 2)
- screw in bolts 6) approx. 5 mm
- replace bolts 6) (M16x110) by the supplied bolts 7) (M16x90) and tighten these up
- the two sliding shoes 5) are lifted by the amount of the height of the wedges $A = \text{thickness of the sliding rail 8)}$
- when placing the die closing unit make sure that the two keys 9) at the left and right of the base plate locate in the two slots 3) of the fixed platen.

