

FOX-200-H

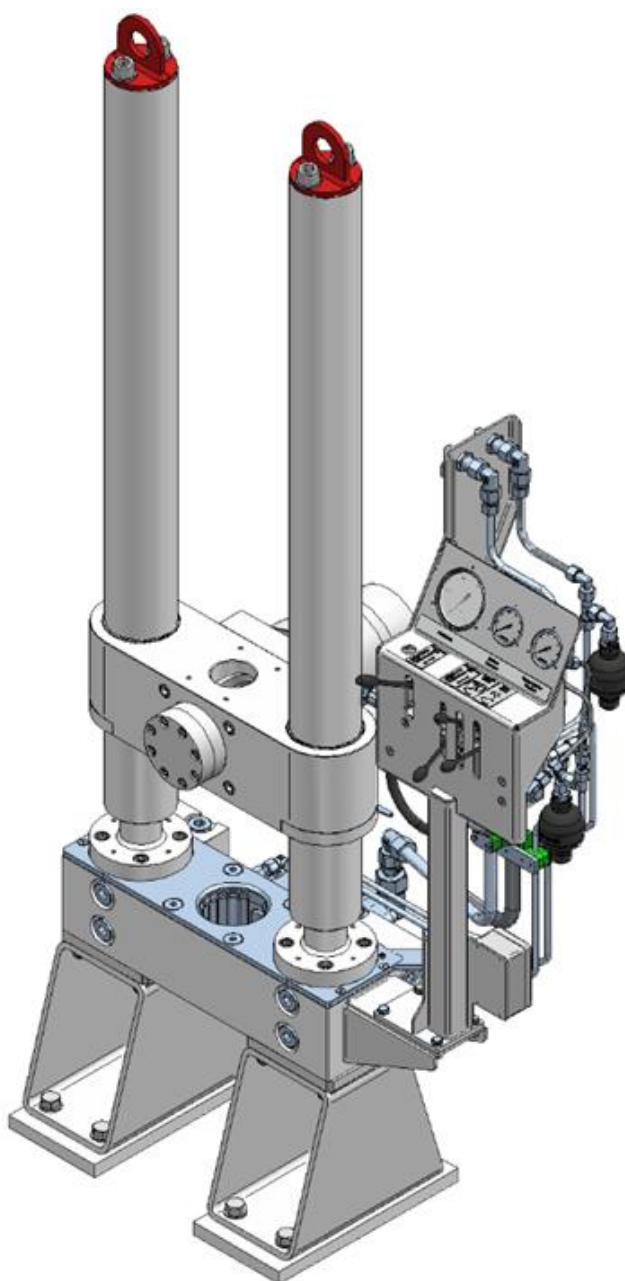


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1 General information

1.1 *Description*

This CPT Push Frame is exclusively designed for CPT (related) operations. The Push Frame allows to push-in or pull-out CPT tubes with a diameter of 36 mm, as well as casing tubes with a diameter of 55 mm. The maximum bore of the push-pull bridge is 96 mm.

The CPT Push Frame has a pushing capacity of 200kN. The maximum pulling capacity is 200kN.

1.2 *Terms and conditions*

Geomil applies the terms and conditions of the Metaalunie to the delivered products. These are the standard conditions of delivery and payment issued by the 'Metaalunie', referred to as the METAALUNIE CONDITIONS and previously as the SMECOMA CONDITIONS, filed at the Registry of the District Court in Rotterdam on 1 January 2008. Terms and conditions are available upon request.

*Alteration to article 14 Warranty 14.1: Geomil warrants the proper execution of the agreed performance for a period of two years after delivery or completion.

*Alteration to article 14 Warranty 14.2: If it transpires that the delivered construction or the materials used are unsound, the contractor shall repair or replace them. The parts which the contractor is to repair or replace must be sent to him free of charge. The dismantling and assembly of these parts and any travelling and accommodation expenses incurred shall be borne by the customer. This does not apply to the delivered construction or materials inside the Netherlands.

1.2.1 *Warranty of quality*

A warranty of two years applies on all by Geomil Equipment delivered materials and labor, provided the maintenance of the Push Frame conform the maintenance schedule is assigned to Geomil Equipment.

In case the equipment is located outside The Netherlands, the warranty applies exclusive of travel- and accommodation expenses.

This warranty does not apply for the materials provided by the user, or for materials provided by third parties.

Normal wear and tear is also excluded from this warranty.

1.2.2 Training

Working with this CPT Push Frame requires qualified personnel. Geomil recommends a 2 person crew.

Geomil Equipment strongly recommends training and can provide and/or support such training.

1.2.3 Redistribution

When the owner redistributes/sells on the delivered equipment to third parties, the responsibility for the equipment fully lies with the owner. Translation of any documents by the owner of the equipment also applies to this rule. Translated documents must be marked with 'translation' (e.g. 'ORIGINAL MANUAL' -> 'TRANSLATION OF THE ORIGINAL MANUAL').

1.2.4 CE-marking

This CPT Push Frame is designed and constructed according to the Machine Directive 2006/42/EG.

Any alterations made by the owner, to this machine as delivered, immediately invalidates the CE marking.





Without the CE marking all warranties applied and responsibilities by Geomil Equipment BV are invalidated.

In case the owner wants alterations to be implemented on the machine, a written request must be handed over to Geomil Equipment BV.






Alterations to this machine can only be executed after written approval by Geomil Equipment BV.

2 Safety requirements

2.1 Table of safety and precaution terms

	<p>Information</p> <p>Additional information for the user.</p>
	<p>Attention</p> <p>A note with additional information for the user. Alerts the user to possible problems.</p>
	<p>Caution</p> <p>The product could be in danger. This signifies possible damage to the product if the user does not carefully comply with the procedures.</p>
	<p>Danger</p> <p>Warning for danger. The user could get (seriously) harmed, wound himself or do serious damage to the product. A warning signifies damage to the user or to the product, if the user does not carefully comply with the instructions.</p>

2.2 Recommended safety precautions

	<i>Necessary knowledge of safety and operation instructions.</i>		<i>Wear working gloves.</i>
	<i>Wear working clothes.</i>		<i>Wear eye protection.</i>
	<i>Wear safety shoes with steel toe caps.</i>		<i>Wear hearing protection.</i>

2.3 High-risk situations

2.3.1 (Un-)loading the FOX-200-H from a transport vehicle

- Use a crane to (un-)load the FOX-200-H.

NOTE: the hoisting points on top of the push frame are only for lifting the FOX-200-H (WLL 1.000kg).

2.3.2 (Un-)loading the POWERPACK-200* from a transport vehicle

- Use a crane or forklift to unload the POWERPACK-200* (see Fig. 20 AN).

2.3.3 FOX-200-H

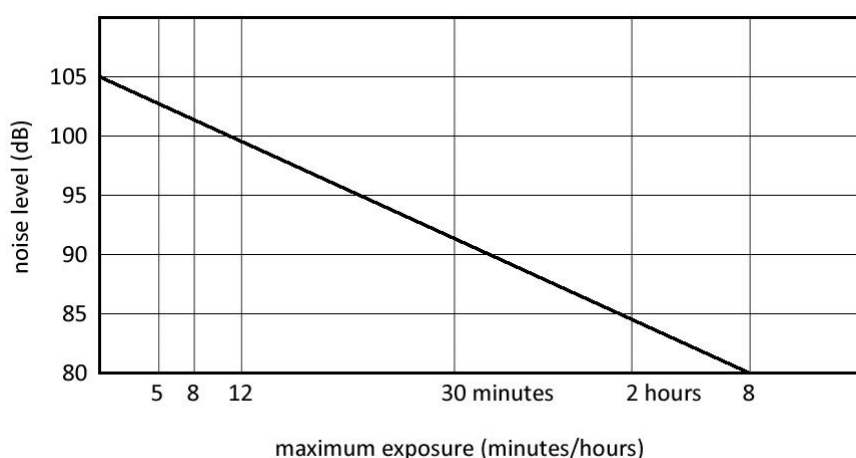
- Keep hands and fingers clear from moving parts while un-/screwing, pushing and pulling CPT tubes.

2.3.4 CPT tubes

- Make sure that the CPT tubes are properly screwed together (shoulder to shoulder) to avoid fracture at the threaded ends.
- Handle the CPT tubes (protruding length) carefully when other persons are nearby.

2.3.5 Noise level POWERPACK-200*

- Engine, running idle: noise level 75 dBa (measured at work area).
- Engine, running at maximum load: noise level 85 dBa (measured at working area).
- When working for more than 3 hours per day at 85 dBa, wear hearing protection.
- Never let the engine run in a closed area.
- Place the POWERPACK-200* as far as possible from the FOX-200-H, regarding the noise level.



2.3.6 Other possible situations

- If it is known that there are obstacles in the ground of the area to be sampled, the CPT engineer must be certain that the CPT point is far and away from these obstacles.

Locate the obstacle(s) by manually pre-digging or pre-drilling.


If pre-drilling or pre-digging is performed, the ground must be surveyed to a depth below where the obstacle lies, with a minimum of 1,50 m below ground level.

- In case of a thunderstorm, do not perform any CPT, considering the possibility of lightning.
- If it is known that the site is polluted, protective clothing such as gas masks, gloves etc. is obligatory.
- Always return and secure all parts to their appropriate position after use.
- When using the compressed-air gun wear eye protection.
- Keep hands clear from the hot exhaust of the engine.


3 Mounting the FOX-200-H and POWERPACK-200*

3.1 General

The FOX-200-H must be positioned vertically.


	<p>Maximum deviation : 2° relative to the vertical.</p>
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3.2 Mounting the FOX-200-H

	<p>The maximum pushing force of the FOX-200-H is 200kN, and the maximum pulling force is 200kN.</p> <p>Make sure that the construction is strong enough to withstand these forces.</p>
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Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Attach the crane to the lifting points on top of the push frame.		For lifting puposes only! WWL 1000 kg	16 BJ	
2.	Weld the mounting plates to the foundation.			16 BJ	
3.	Place the FOX-200-H on the mounting plates/foundation.		Make sure the FOX-200-H is stable.		
	Keep the FOX-200-H attached to the crane!				
4.	Mount the feet to the mounting plates by using 8 bolts.				
5.	Detach the crane from the FOX-200-H.				

3.3 *Placing the POWERPACK-200**


	<p>Mind the direction of the wind when positioning the engine/pump unit regarding the exhaust gases from the engine.</p>
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Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Place the POWERPACK-200* on its spot using a crane or forklift			20AN	
2.	Detach the crane from the POWERPACK-200*, or remove the forklift.				


4 Preparations

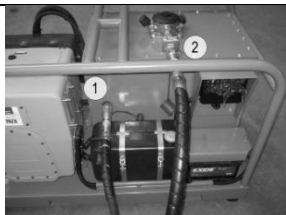
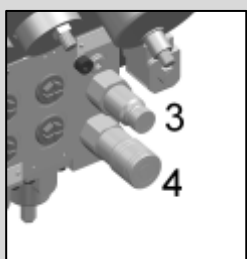
4.1 Preparing for CPT/pulling


4.1.1 Electric connections

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Connect the 12V supply cable between item 1 on the POWERPACK-200* and the datalogger box.				

4.1.2 Hydraulic connections

	<p>First clean the quick connection couplings thoroughly!</p> <p>Push the quick connection couplings <u>through firmly</u>.</p>				
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Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Connect the quick connection couplings to the POWERPACK-200*		1: pressure line 2: return line		
2.	Connect the quick connection couplings to the FOX-200-H Connection order: 1: Return line 2: Pressure line		3: pressure line 4: return line		
3.	Check if the hoses are connected properly.				
4.	If so, start the engine. (See Hatz's operating instructions).				

	<p>Never start the engine when the hydraulic hoses of the POWERPACK-200* are not connected to the FOX-200-H.</p>
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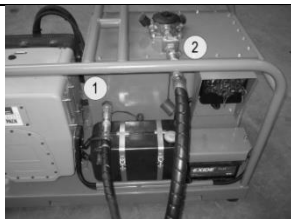
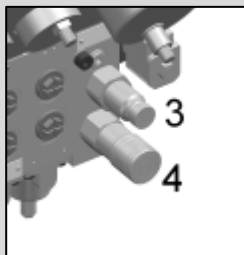
4.2 *Preparing for transport*

Stop the engine of the POWERPACK-200*.

4.2.1 Electric connections

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Disconnect the 12V supply cable between item 1 on the POWERPACK-200* and the data logger box.				

4.2.2 Hydraulic connections

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Disconnect the quick connection couplings to the POWERPACK-200*		1: pressure line 2: return line		
2.	Disconnect the quick connection couplings to the FOX-200-H Disconnection order: 1: Pressure line 2: Return line		3: pressure line 4: return line		

4.3 Dismounting the FOX-200-H

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Attach the crane to the lifting points on top of the push frame.		For lifting puposes only! WWL 1000 kg	16 BJ	
2.	Loosen the 8 bolts.			16 BJ	
	<i>Make sure the FOX-200-H is stable. Keep the FOX-200-H attached to the crane.</i>				
3.	Take away the FOX-200-H from its foundation.		Make sure the FOX-200-H is stable.		
4.	Detach the crane from the FOX-200-H.				

4.4 Removing the POWERPACK-200*

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Attach the crane to the POWERPACK-200*			20 AN	
2.	Remove the POWERPACK-200* from its spot.				
3.	Detach the crane from the POWERPACK-200*.				

5 CPT/Pulling

5.1 Operation of the control valve

#	Action	Information	Remark(s)	Fig.	Switch/item
1.	CPT lever			16 BI	1
	Lever down: FOX-200-H down at penetration speed Lever up: FOX-200-H up at unloaded speed			16 BI	
2.	Unloaded speed lever			16 BI	2
	Lever down: FOX-200-H down at unloaded speed Lever up: FOX-200-H up at unloaded speed			16 BI	
3.	Catching clamp lever			16 BI	3
	Lever down: close catching clamp Lever up: release catching clamp			16 BI	
4.	PTO / Hydraulic clamp lever			16 BI	4
	Lever down: pressure on B port / close hydraulic clamp Lever up: pressure on A port / open hydraulic clamp				
5.	Total force gauge 0-400kN			16 BI	6
6.	System pressure gauge 0-400bar			16 BI	7
7.	Catching clamp pressure gauge 0-400bar			16 BI	8

5.2 CPT


5.2.1 Preparations

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Install a measuring device, e.g. clamp or drive head		See referring manuals		
2.	Install the CPT material.		See referring manuals		
3.	If electronic recording is used, connect the cables and adjust the recording equipment.		See referring manuals		
4.	Set the HATZ engine to approx. 1200rpm		Use lever on engine, set halfway		
5.	Start the CPT operation				

5.2.2 CPT operation

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Mount a new CPT tube				
2.	Optionally activate 'CATCHING CLAMP'		Lever down	16 BI	3
3.	Use unloaded speed lever to raise the push-pull bridge		Lever up	16 BI	2
4.	Release 'CATCHING CLAMP' if closed		Lever up	16 BI	3
5.	Use the CPT lever to start the CPT operation (push in the CPT tube)		Lever down	16 BI	1

5.3 Pulling

	<p>Pull the tubes after reaching the desired depth, or when an alarm (e.g. overload alarm) is displayed on the computer screen. Close the CPT in the data acquisition software (see referring manuals).</p>
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Pull the CPT tubes once the desired depth or the maximum capacity of the FOX-200-H is reached.

5.3.1 Preparations


Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Set the HATZ engine to approx. 2800rpm		Use lever on engine, set to full		
2.	Start the pulling operation				


5.3.2 Pulling operation

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Use the lever to lower the push-pull bridge (to pull the CPT tube)			16 BI	2
2.	Deactivate catching clamp			16 BI	3
3.	Use the unloaded speed lever to raise the push-pull bridge to the highest position			16 BI	2
4.	Activate catching clamp			16 BI	3
5.	Use the unloaded speed lever to lower the push-pull bridge			16 BI	2
6.	Remove CPT tube				
7.	Continue from step 2 to repeat pull operation				

6 Maintenance

6.1 General

	<ul style="list-style-type: none"> • Do not use force when assembling or disassembling. • Repair any possible mechanical damages suffered, and remove dirt from all moving parts. • Ensure that all CPT material (cones, tubes, and rods) remains operational. After use, clean them thoroughly and lubricate them well. • Dispose used oil, grease, etc. through a recognized processing company.
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	<ul style="list-style-type: none"> • Before performing maintenance activities make sure the HATZ engine is off. Take out the key and keep it with you. • Before performing any welding activities, make sure the main power switch is deactivated and the batteries are disconnected.
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6.2 Maintenance summary

Activity	Refer to:	Maintenance interval
Visual inspection		Daily
Clean/ tidy up		Daily
Check hydraulic oil level	FIG. 20AN POS. 3	Daily
Check dirt indicator	FIG. 20AN POS. 3	Daily
Change hydraulic filter when dirt indicator is in red area or	Chapter 8.3	500 H or every 2-3 months
Change hydraulic oil	Chapter 8.3	1000 H or every 6-12 months
Change batteries		Every 1-2 years

6.4 **Spare parts**

When ordering spare parts, please state:

1. Product
2. Serial number
3. Part number
4. Figure number

6.5 **Consumables**

6.5.1 **FOX-200-H general**

#	Part description	Part number	Brand	Brand number
1.	Hydraulic oil	7010000046	BP	BARTRAN HV 46
2.	Ball bearing grease	9703020306	SHELL	Darina (or equivalent)
3.	Return line filter element	2022043201	PARKER	937893Q (PXWL4-10)
4.	Battery 12V 71Ah	3090011260	-	-

6.5.2 **Hatz 1D81C engine**

#	Part description	Part number	Brand	Brand number
5.	Fuel filter	Refer to Hatz manual		
6.	Air filter	Refer to Hatz manual		
7.	Oil filter	Refer to Hatz manual		
8.	Engine oil	Refer to Hatz manual		

6.6 Maintenance activities

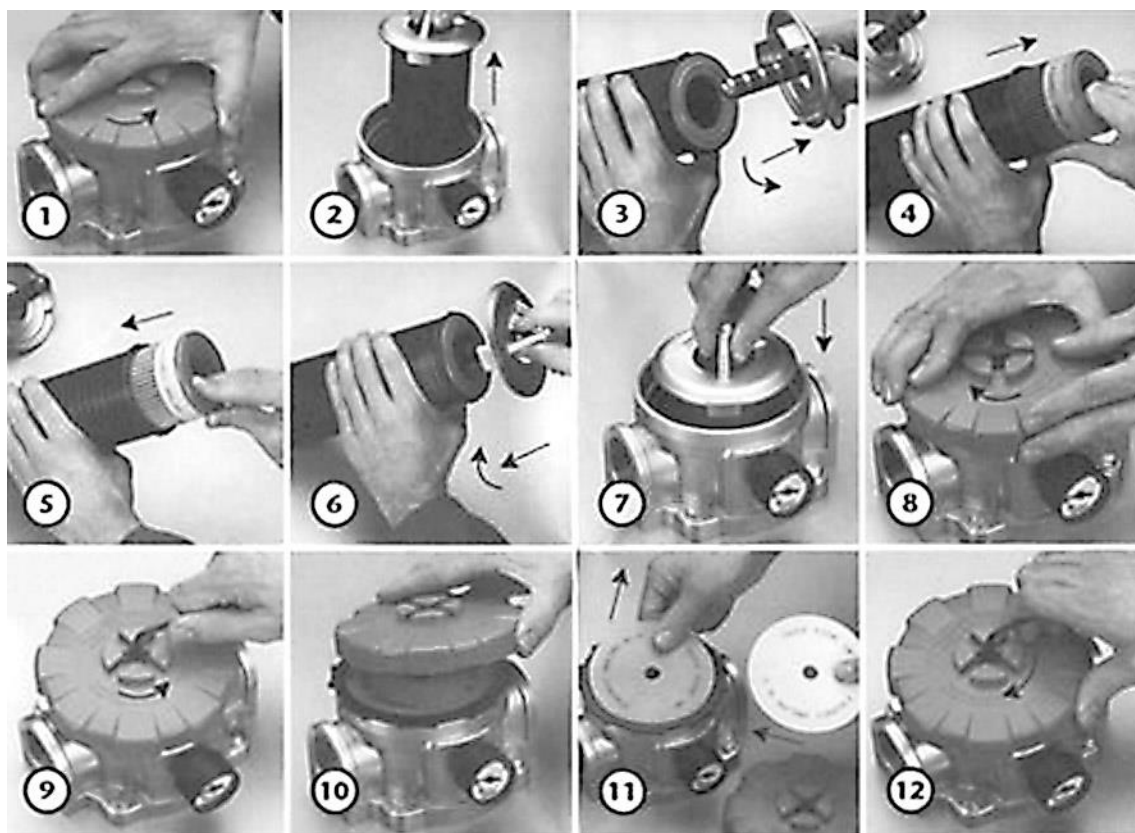
6.6.1 Engine

Follow Hatz's operating and maintenance instructions.

6.6.2 Hydraulic system, exchanging the oil filter element

After first use from new, exchange the oil- and air filter element after approximately 40 working hours.


The oil filter is located on the oil tank, under the tube rack. To access the oil filter the tube rack must be placed in its extended position to the left of the crawler. Make sure to secure the tube rack!



- When the dirt-indicator needle of the filter stays in the red area, renew the oil- and air filter element.
- Change the hydraulic oil after every 1000 working hours

Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Unscrew the cover of the filter housing			1	
2.	Take out the complete filter bowl			2	
3.	Remove the cap of the filter bowl			3	
4.	EMPTY THE UNFILTERED OIL			4	
5.	Take out the filter element and replace it by a new one			5	
6.	Put the cap back onto the filter bowl			6	
7.	Install the complete filter bowl into the filter housing			7	
8.	Tighten the cover of the filter housing manually			8	

Step	Action	Information	Remark(s)	Fig.	Switch/item
9.	Unscrew the socket-screw of the cover of the filter housing			9	
10.	Take off the cover			10	
11.	Remove the air-filter element and replace it by a new one			11	
12.	Place the cover of the filter housing and screw in the socket screw.			12	


	Filter elements cannot be used twice.
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6.6.3 Hydraulic system, exchanging the oil







Step	Action	Information	Remark(s)	Fig.	Switch/item
1.	Drain the oil tank completely. To do this, remove the plug at the side of the oil tank.				
2.	Dismount the cover from the oil tank and clean the oil tank.				
3.	Renew the oil- and air filter element		Refer to chapter 8		
4.	Remount everything, fill up the oil tank with the recommended oil (refer to Fig. 5 A), start the engine and let it run at idle speed .				

6.6.4 Battery

The batteries are maintenance free.

	<p><i>Remark concerning the environment:</i></p> <ul style="list-style-type: none"> • <i>Replace a defective battery, and dispose of the old battery through a certified processing company.</i>
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7 Practical suggestions

	<p>Before driving off</p> <p>Make sure that the FOX-200-H, the bellows construction and the leveling jacks have been fully retracted.</p>
	<p>Maintenance</p> <p>Never perform welding work on the oil tank while the reservoir is filled with oil.</p> <p>If the tank has to be welded, drain the oil.</p> <p>After welding, clean the tank thoroughly.</p>
	<p>CPT tubes</p> <p>Make sure that the CPT tubes are properly screwed together (shoulder to shoulder), to avoid fracture at the threaded ends.</p> <p>Always use a supporting tube between the vehicle and ground level in order to avoid bending the tubes.</p>
	<p>Pulling the CPT tubes</p> <p>After the CPT has ended, the tubes should be withdrawn as soon as possible. Otherwise the increased shaft friction could make pulling the tubes impossible.</p>
	<p>Avoid damage</p> <p>Prevent mechanical damages and fouling of all moving parts.</p> <p>Never use force while placing or securing the measuring elements.</p>
	<p>Prevent dirt</p> <p>It is strongly recommended to use a tube cleaner through which the CPT tubes are driven into the ground. When the tubes are retracted, they will be swept clean.</p>

8 Appendices

8.1 *Technical specifications FOX-200-H*

8.1.1 CPT Push Frame 200kN

Subject	Details
Capacity	Maximum driving capacity: 200 kN Maximum pulling capacity: 200 kN
Hydraulic cylinders	2 double-acting cylinders - bore : \varnothing 100 mm - piston rod : \varnothing 70 mm - stroke : 1150 mm - working area: bottom side 78.5 cm ² ; piston side 40.1 cm ²
CPT speed	2 cm/s, adjusted by means of mechanical stop
Unloaded speeds	Upward: 0 – 12.5 cm/s Downward: 0 – 16.5 cm/s
Control valve	Hawe counterbalance valve SL2/2AL-0-A-4/180-BL-0
Pressure gauge	0-400 kN filled with glycerin total force 0-400 bar filled with glycerin system pressure / catching clamp
Main hydraulic clamp	1 double-acting cylinder 140/60/70; adjusted to 180 bar
Catching clamp	1 double-acting cylinder 40/22/10; adjusted to 220 bar

8.1.2 Dimensions FOX-200-H

Dimension	
Width	990 mm
Height	Retracted cylinders: 2180 mm Extended cylinders: 3330 mm
Depth	570 mm; required free space at the back ± 600 mm
Mass	Approx..670 kg

8.2 *Technical specifications Powerpack-200**

8.2.1 Powerpack-200

Subject	Details
Engine	Hatz 4-stroke, 1 cylinder, diesel engine Type: 1D 81 C Engine power: 9.5 kW at 2800 rpm. Direction of rotation: counter-clockwise
Pump	Axial piston pump with power regulator Capacity : min. 14 l/min Capacity: max. 78 l/min Maximum working pressure : 260 bar Direction of rotation : clockwise
Drive	Directly by coupling
Oil tank	Capacity approx. 150 l with built-on oil filter and air-breather
Hydraulic oil	BP Energol SHF-HV 46

8.2.2 Dimensions POWERPACK-200*

Dimension	
Length	1450 mm
Width	800 mm
Height	920 mm
Mass	550 kg

8.3 Summary of drawings

Drawing No.	Subject
0050101037	FOX-200-H
0050501052	Hydraulic diagram FOX-200-H

8.4 Figures

8.4.1 Table of figures

Figure No.	Subject
5 A	Recommended oils
50 H	Installation of mudwiper on CPT tube
50 F	Installation of support tube
50 R	Removal of support tube
50 V	FOX-200-H
68 B	Hydraulic clamp cylinder
16 BI	Control valve block
16 BJ	Push frame FOX-200-H dimensions
20 AN	Powerpack 200 dimensions
26 M	Hydraulic oil tank

8.4.2 Fig. 5 A Recommended hydraulic fluids

FIG. 5 A

RECOMMENDED HYDRAULIC FLUIDS
EMPFOHLENE OELSORTEN
HUILES HYDRAULIQUES RECOMMANDEES
AANBEVOLEN OLIESOORTEN

* ALL MINERAL HYDRAULIC FLUIDS ACCORDING TO THE FOLLOWING SPECIFICATIONS
* ALLE MINERALE HYDRAULISCHE VLOEISTOFFEN OVEREENKOMSTIG DE VOLGENDE SPECIFICATIES
HVLP ACCORDING 51524 Part 3
ISO CLASSIFICATION L-HV ACCORDING ISO 6743/4
Vickers 1-286-S AND 1-2952-S
Cincinnati Milacron P68, P69, P70

* ANALYSE RESULTS	
* GEANALYSEERD MEETRESULTAAT	
Viscosity at 40° C	± 46 mm ² /s
Viscosity Index	> 150

- * All these fluids provide a high degree of equipment protection, over a wide operating temperature.
* Al deze vloeistoffen zorgen voor een hoog niveau van bescherming, over een breed temperatuurbereik.

* GEOMIL EQUIPMENT RECOMMENDS	
* GEOMIL EQUIPMENT BEVEELT AAN	
SHELL	TELLUS T46
BP	BARTRAN HV 46
BP	BIOHYD SE - S - 32

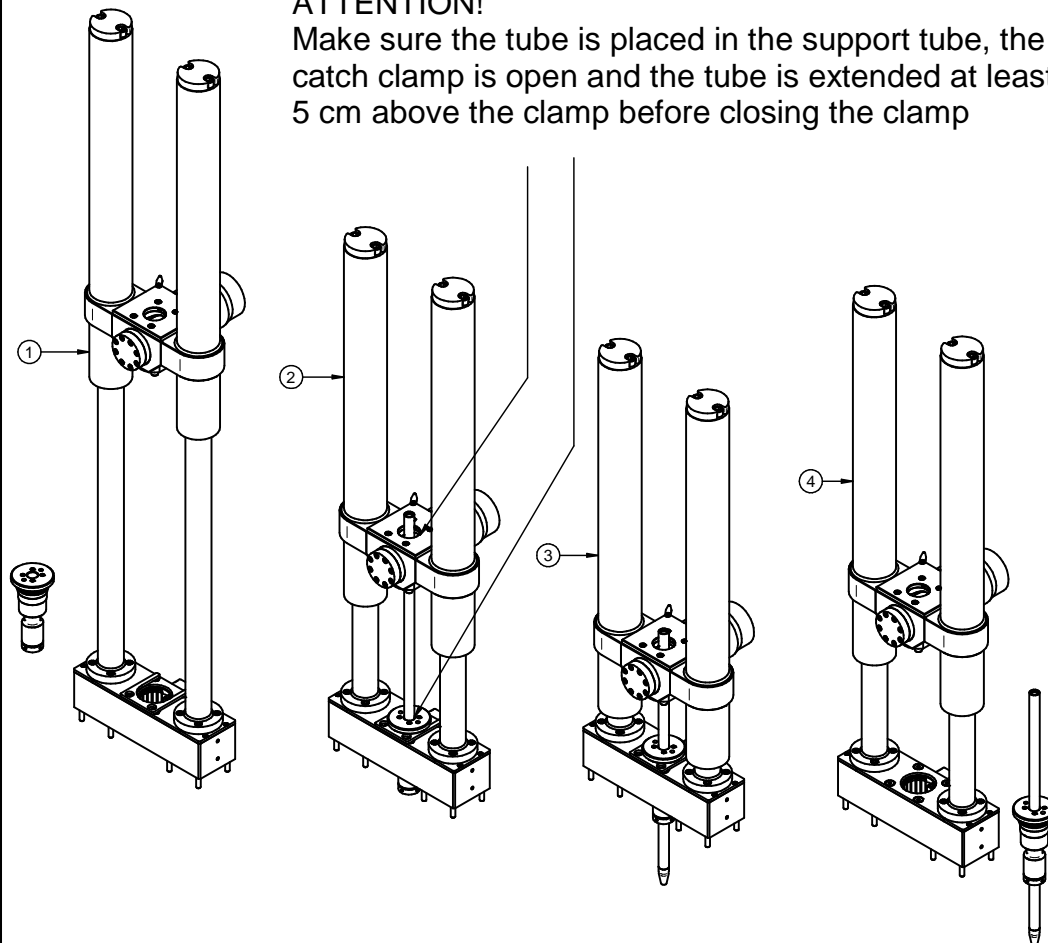
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8.4.3 Fig. 50 H Installation of mudwiper on CPT tube

FIG. 50 H

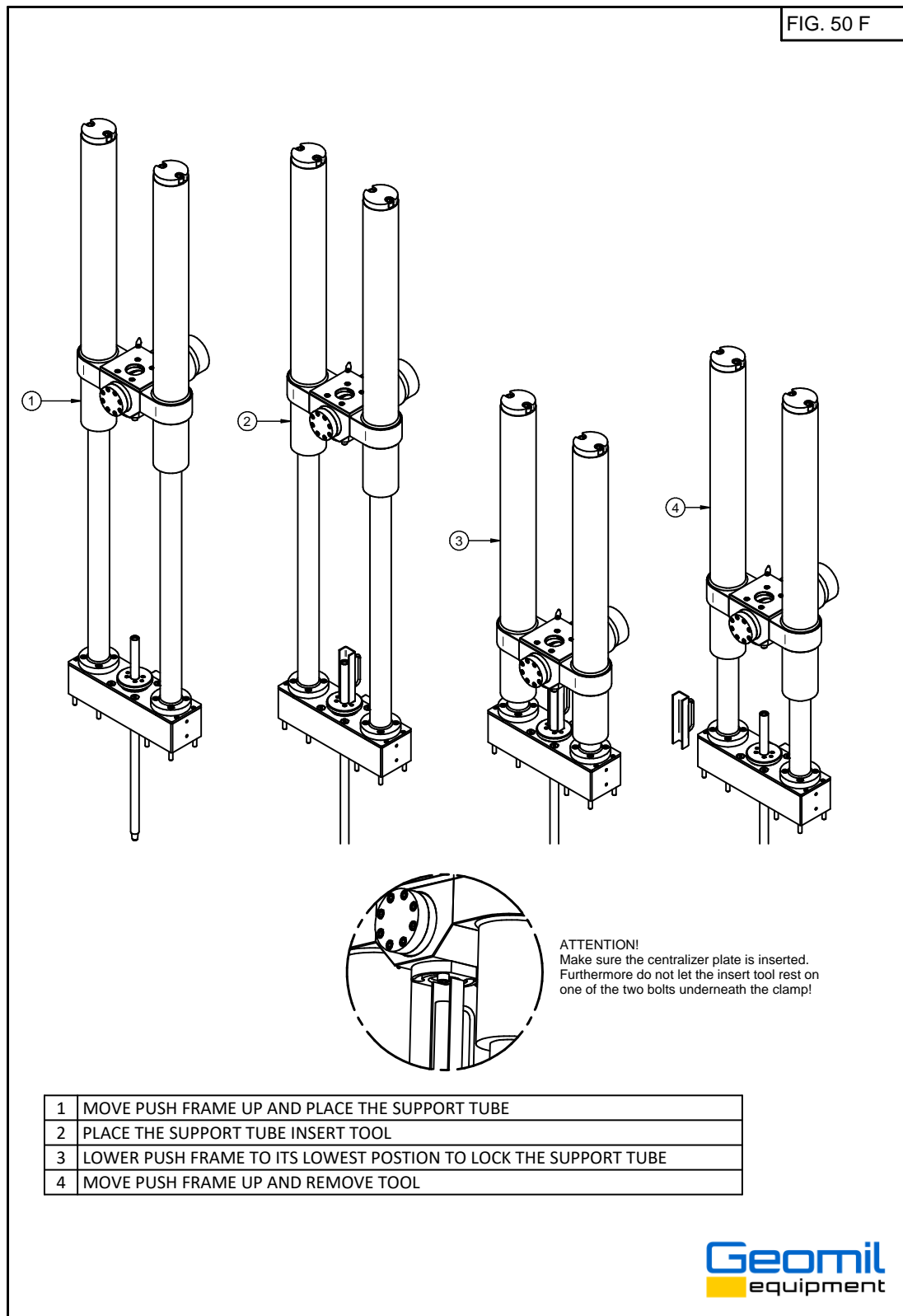
ATTENTION!

Make sure the tube is placed in the support tube, the catch clamp is open and the tube is extended at least 5 cm above the clamp before closing the clamp



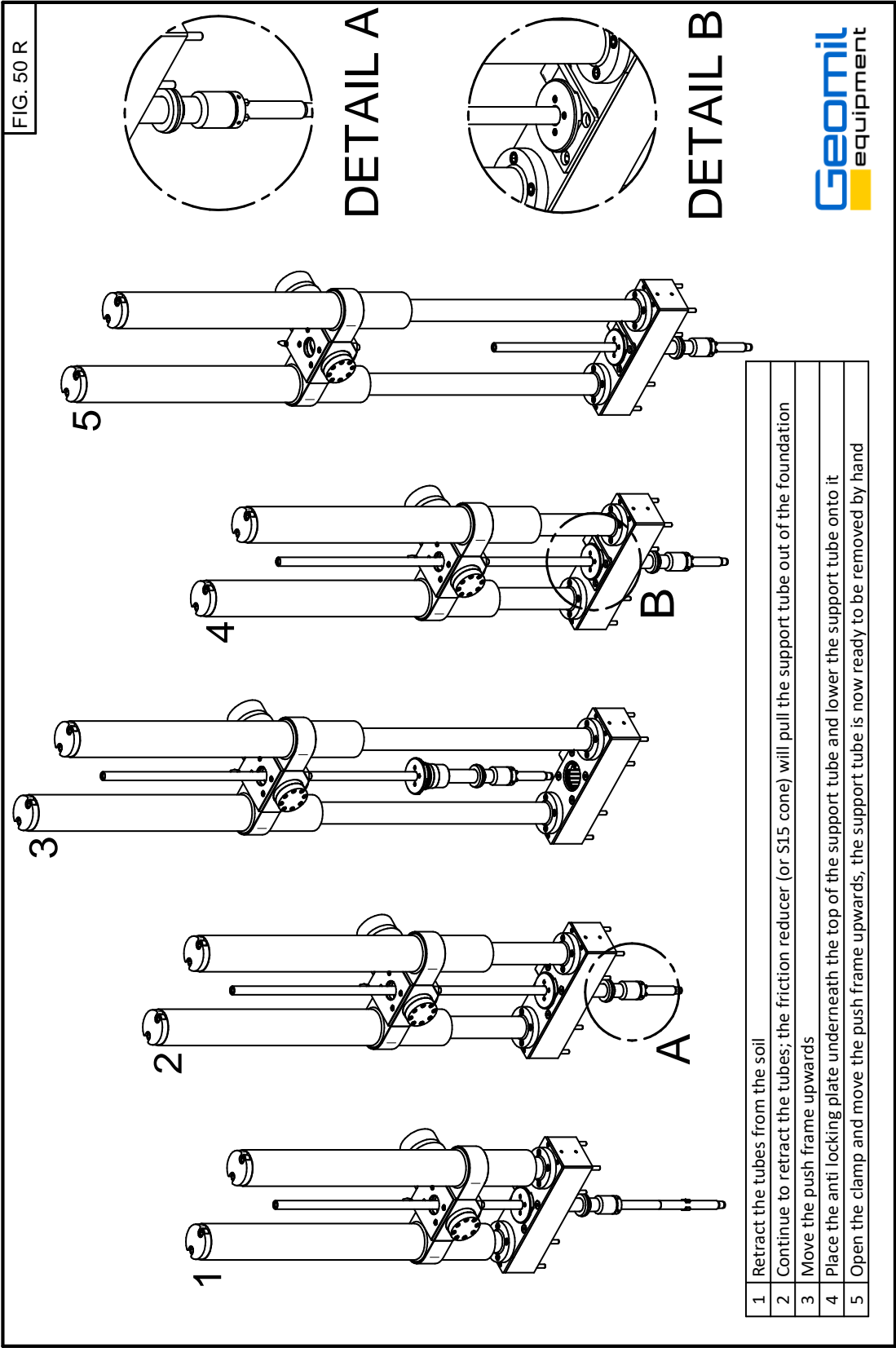
1	MOVE PUSH FRAME UP AND PLACE THE ANTI LOCKING PLATE
2	OPEN THE CLAMP, MOVE THE PUSH FRAME DOWN AND PLACE A TUBE WITH THE MUD WIPER STRETCHER THROUGH THE CLAMP AND IN THE SUPPORT TUBE
3	CLOSE THE CLAMP AND PUSH THE TUBE THROUGH THE MUD WIPER
4	MOVE PUSH FRAME UP AND REMOVE THE SUPPORT TUBE WITH THE TUBE

8.4.4 Fig. 50 F Installation of support tube

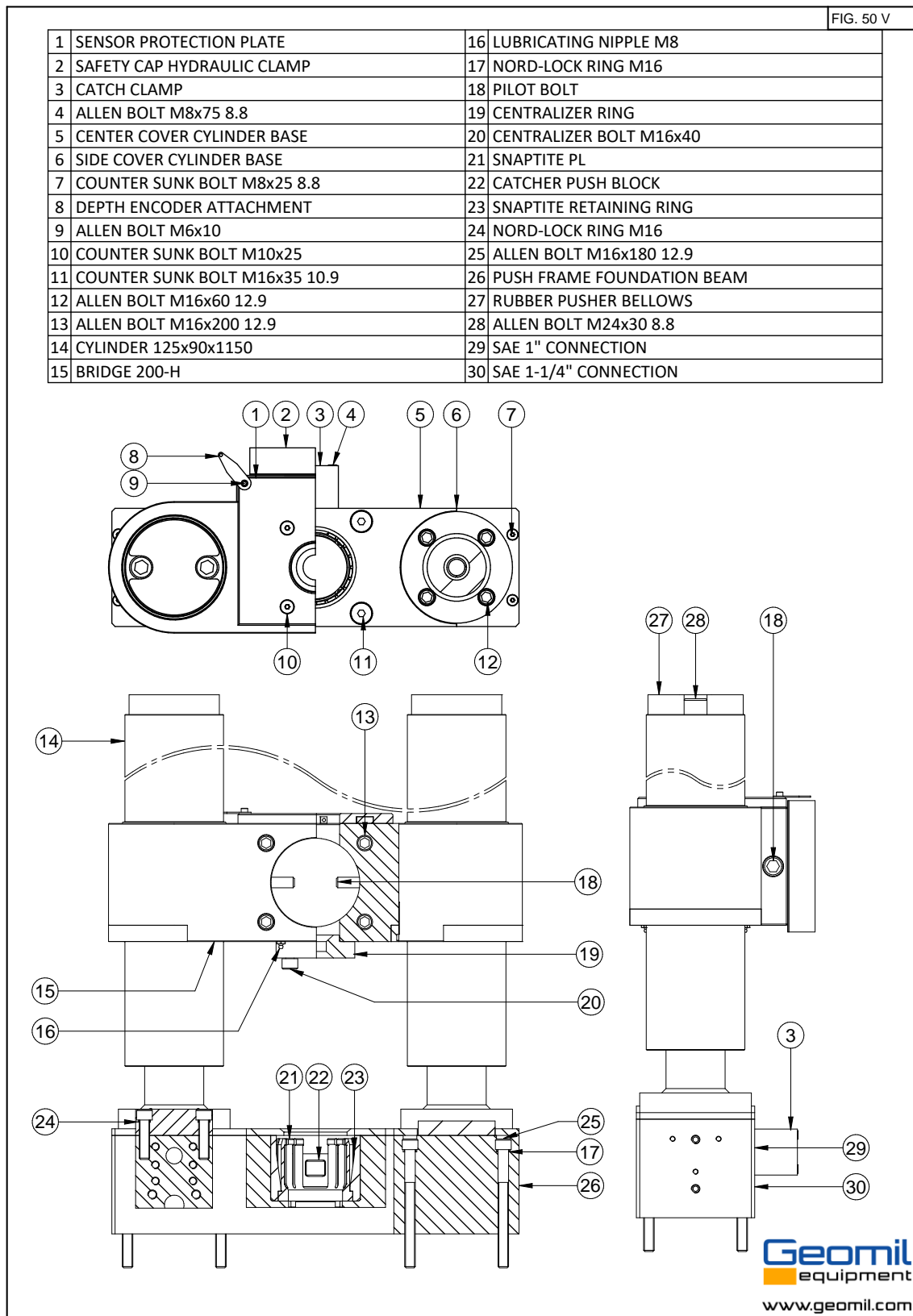


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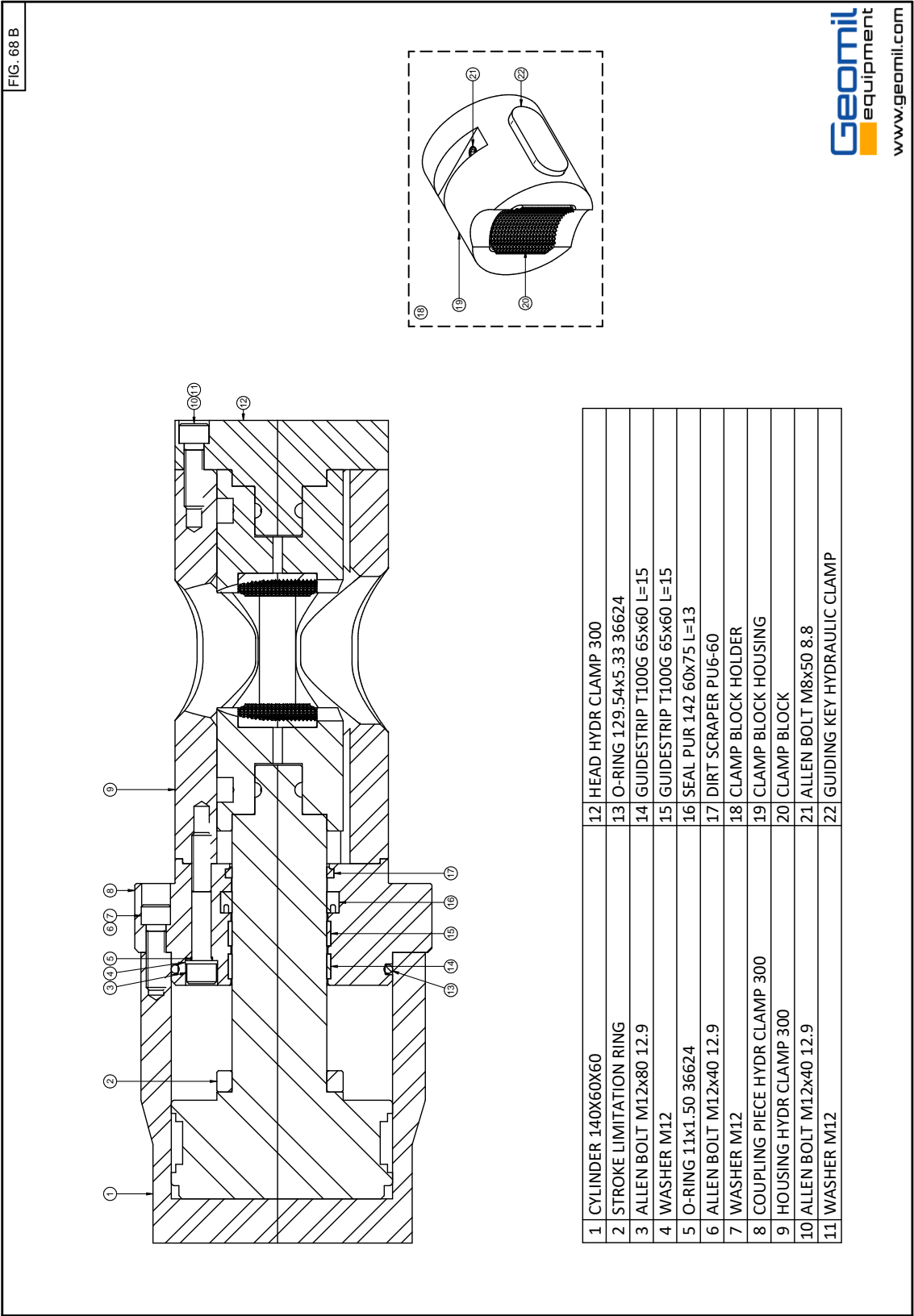
8.4.5 Fig. 50 R Removal of support tube



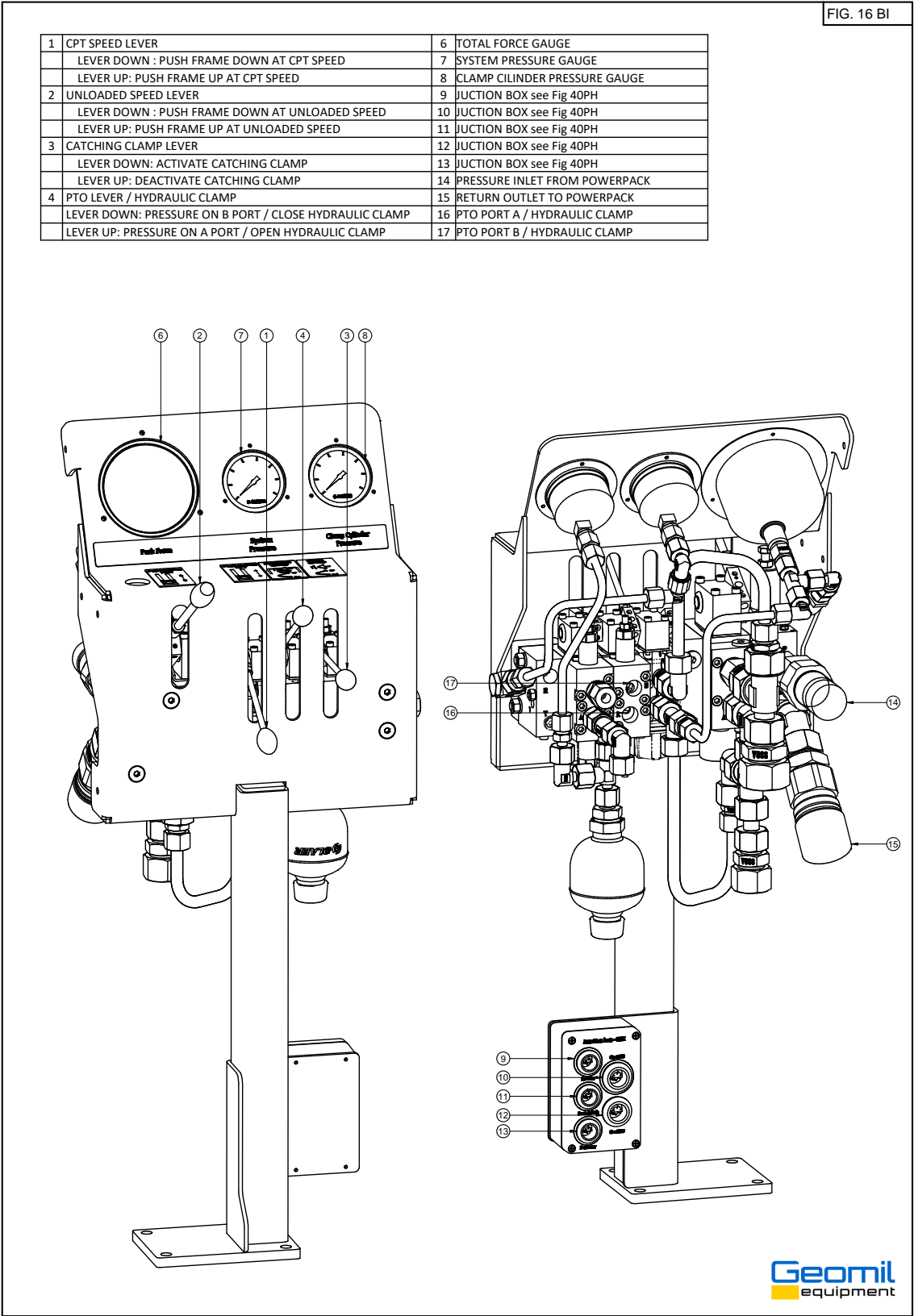
8.4.6 Fig. 50 V FOX-200-H



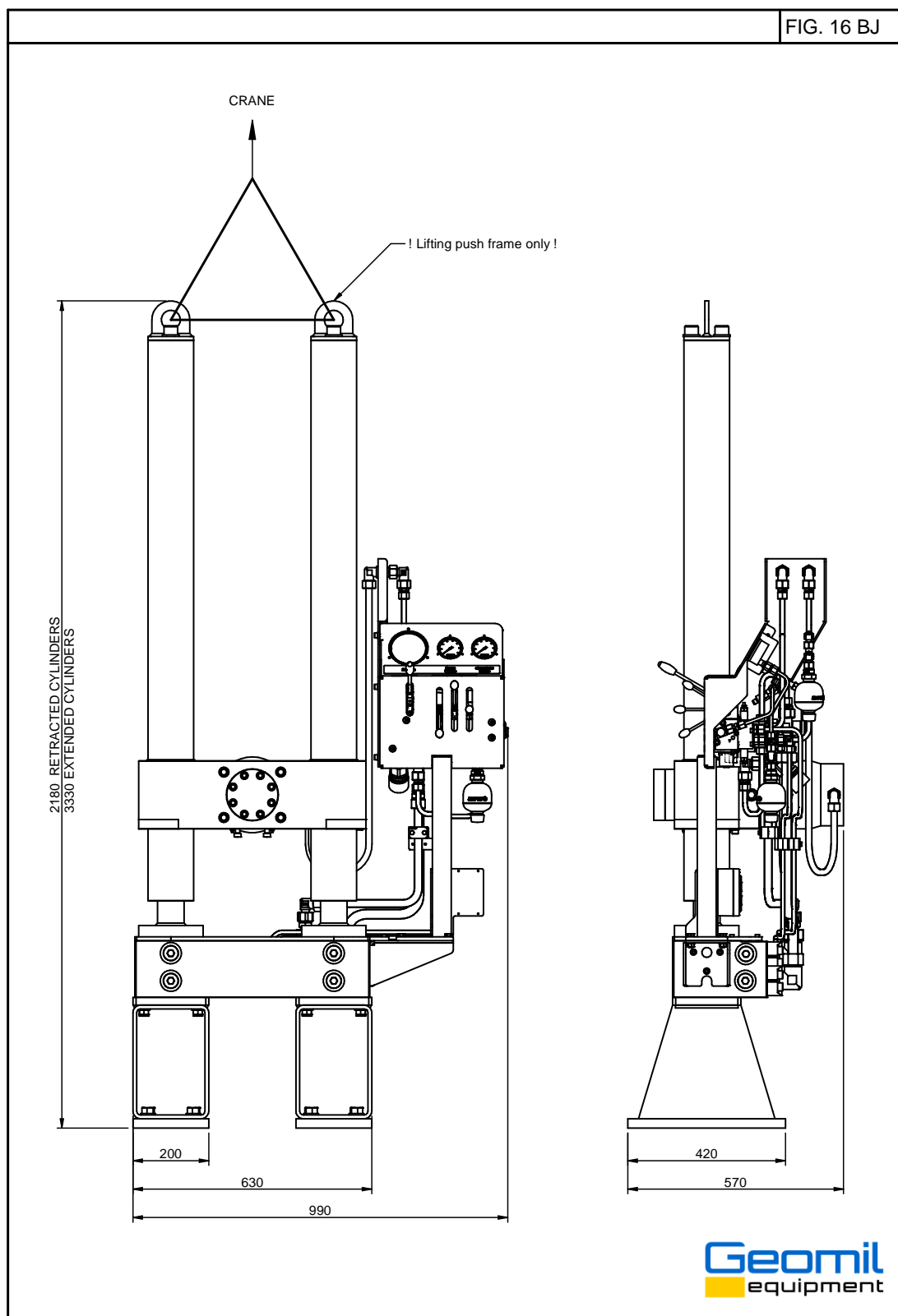
8.4.7 Hydraulic clamp cylinder



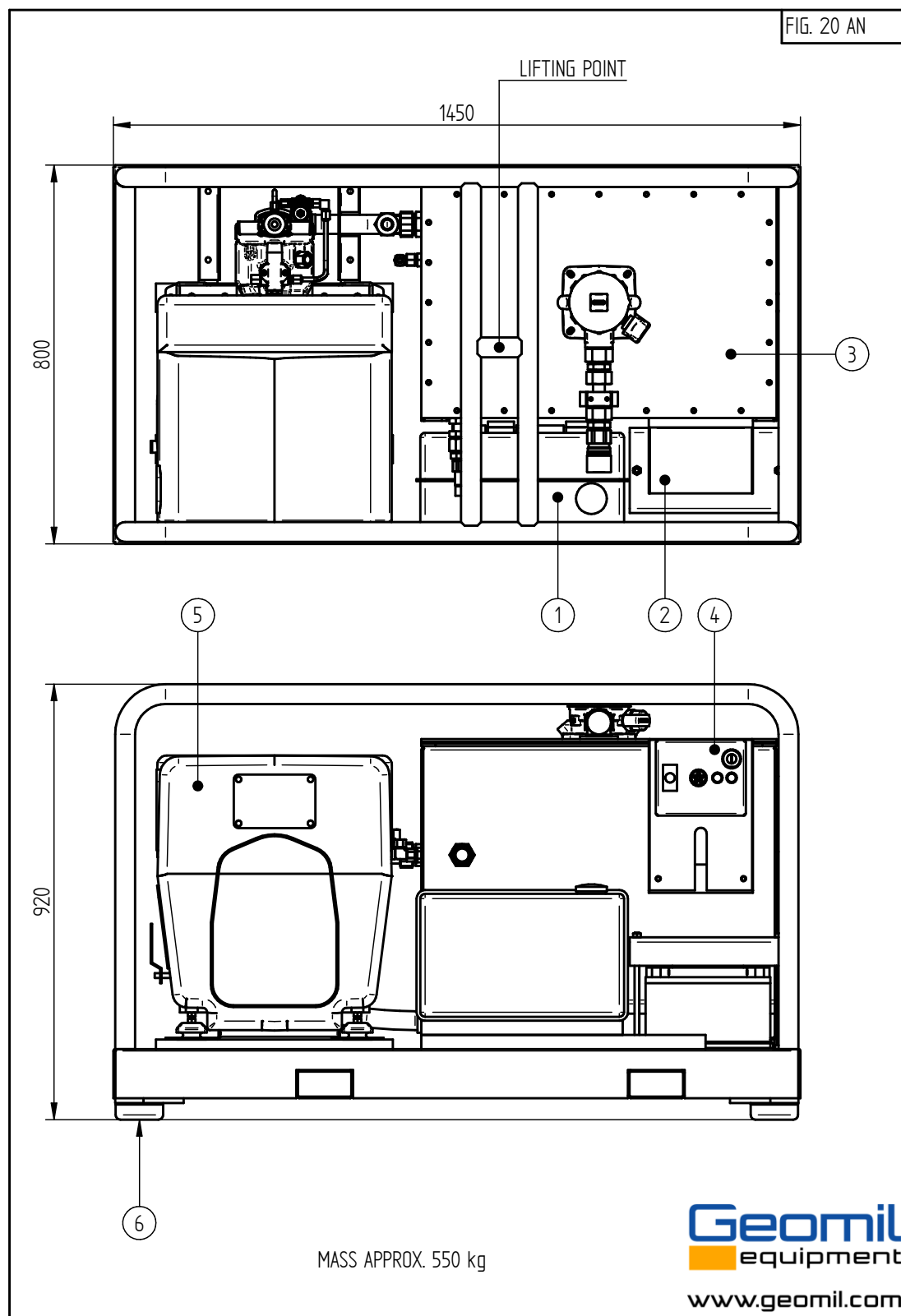
8.4.8 Fig. 16 BI Control valve block



8.4.9 Fig. 16 BJ Push frame FOX-200-H dimensions

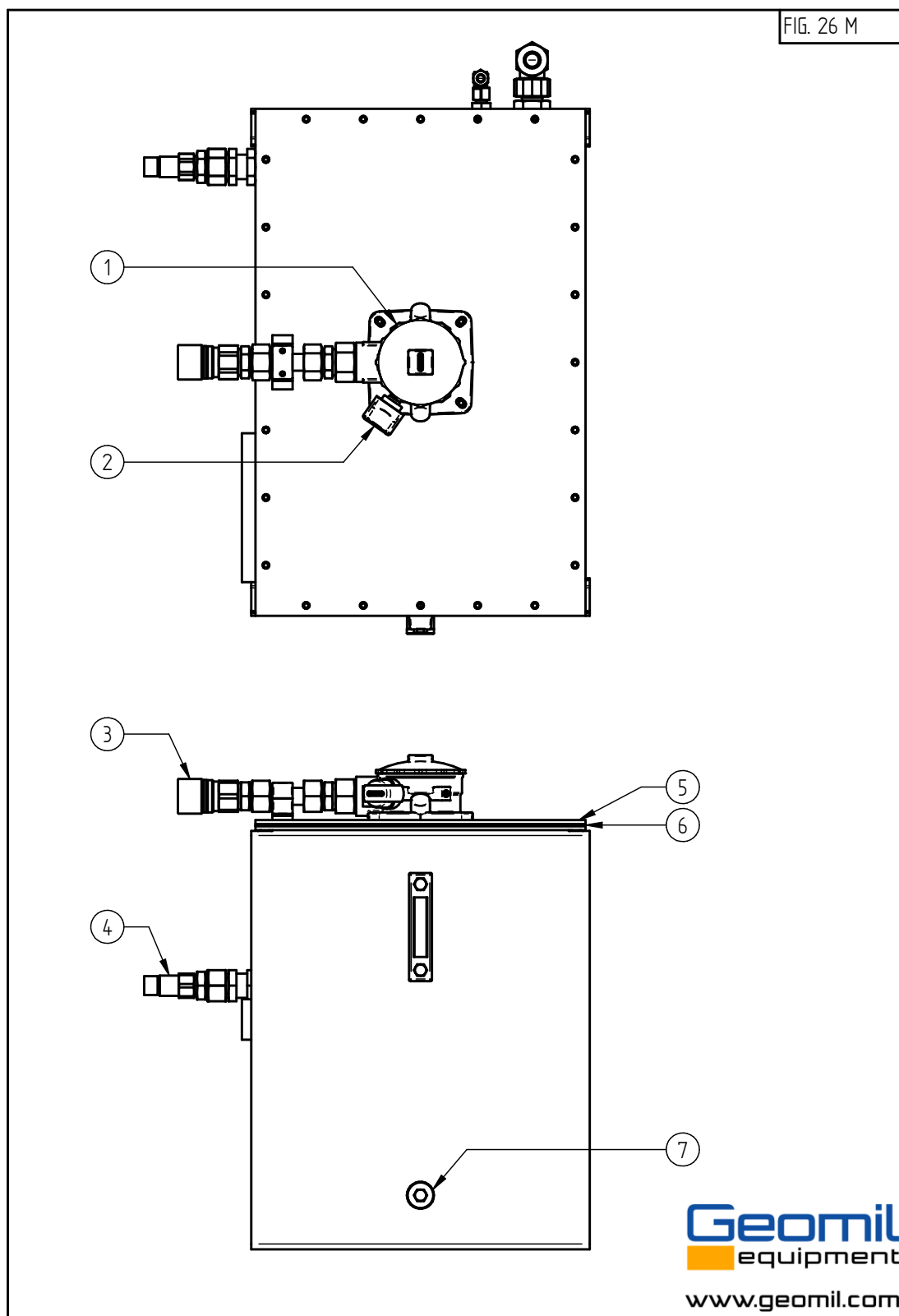


8.4.10 Fig. 20 AN POWERPACK-200* - dimensions



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8.4.11 Fig. 26 M – Hydraulic oil tank*



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