

*En İyisi - The Best*

# TIGERLINE II

**Maintenance and Instructions Manual**

## **WARNING**

### **SET-A Makina**

**This manual contains important information on safety. Before carrying out any handling or use operation consult this use and maintenance manual.**

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**All data contained in this manual are indicative and not binding, given that SET-A Makina reserves the right to modern or vary its machines without any previous warning.**

## **General Information**

### **Manual content and use**

*Keep this manual in a dry and safe place for future reference, so that it is not ruined and is always available for consultation.*

*This manual cannot replace the user's experience but it does supply all the information for correct machine use.*

*If you need copies or up-dates, exclusively contact the SET-A Makina, which will supply indications on the matter and solve any problems.*

## CONTENTS

CONTENTS .....	2
PRESENTATION .....	4
GENERAL NOTES ON DELIVERY .....	5
Guarantee .....	5
Parts subject to wear are not covered by the guarantee. ....	5
Modifications To The Machine .....	5
Identification Of Spare Parts .....	5
TECHNICAL DESCRIPTION .....	6
Accessories available on request: .....	6
TECHNICAL CHARACTERISTICS .....	7
Dimensions .....	7
TECHNICAL CHARACTERISTICS .....	8
Weights .....	8
SAFETY .....	9
General Information Concerning Safety .....	9
Safety Prescriptions .....	9
HANDLING AND TRANSPORTATION .....	10
MACHINE POSITIONING .....	11
Positioning The Track .....	11
Positioning the track for vertical drilling: .....	11
Joining the tracks (Figure 13-14).....	13
Positioning the Column for Vertical Drilling .....	14
Positioning The Column For Horizontal Drilling.....	15
Column Direction.....	17
AIR CONNECTIONS.....	18
Tigerline II with Manual Sliding.....	18
Tigerline II with Motorised Translation.....	18
VERIFICATIONS AND ADJUSTMENT .....	19
CARRIAGE TRANSLATION .....	20
USING THE MACHINE .....	21
Before starting drilling .....	21
Changing the rock drill .....	21
MACHINE STOP AND REMOVAL.....	22
MAINTENANCE.....	23

Adding Oil .....	23
Periodical Controls .....	23
CARRIAGE WHEEL PLAY REGULATION .....	24
PROBLEM SOLUTION SUGGESTIONS .....	25
Appendix I .....	26
Appendix II .....	27
Appendix III .....	28

## PRESENTATION

The TIGERLINE II rock drill is an excellent drilling machine. Its heavy duty design enables its use in a range of applications, guaranteeing high performance, precision and low maintenance costs.

The drill is totally pneumatic and consists of an column which can be fitted with 1-4 drill pieces.

The column is fitted to a track-mounted translating carriage, guaranteeing that drill bores are perfectly in line; in addition, the column can be tilted on the carriage enabling bore holes to be drilled at different angles.

The column support translation carriage can be provided with manual or pneumatic translation.

The special design features of the TIGERLINE II drill enable anchoring holes to be drilled for the machine on the subsequent drilling line, eliminating superfluous drill holes and reducing waste. The drill can also be used as TIGERLINE II for horizontal, rather than vertical, drilling.

## GENERAL NOTES ON DELIVERY

On receipt of the machine, open the package and check that:

- The equipment is not damaged.
- In the case of transport damage, inform the forwarder and / or the transport insurance company in a detailed way, immediately on delivery.
- The supply corresponds to the order specifications

If any pieces are missing, immediately inform the SET-A Makina within 8 days of receipt.

### Guarantee

The machine is supplied and guaranteed to be free from fabrication faults or defective material for a period of 1 year from the date on the transport document.

This guarantee, concerning faults and defects due to material, manufacturing and processing, is valid on condition of reporting them within 8 days time after the relative identification.

Parts proved to be defective will be repaired or replaced, at the discretion of the SET-A Makina, on condition that the said defect does not depend on failure to observe the use and maintenance instructions, bad or unsuitable use of the equipment or on normal wear.

The parts to be replaced or repaired will be made available ex-our workshop.

The user shall sustain the shipment and transport costs, plus those for the labour, travel and board, if the repair should necessitate the presence of one of our technicians.

Parts subject to wear are not covered by the guarantee.

### Modifications To The Machine

SET-A MAKİNA reserves the right to make all necessary modifications to the machines it manufactures without any prior notice.

### Machine identification

The machine is identified by the number indicated on the card.

### Identification Of Spare Parts

When requesting spare parts, always indicate the machine's serial number found on the test card and the no. of the required part taken from the enclosed lists of spares.

## TECHNICAL DESCRIPTION

MOD. SERIAL No. TL \_\_\_\_\_



Figure 1

Pneumatic drilling unit comprised of:

- Drill support column
- Column support carriage
- Guide and positioning track
- Control panel

The advance of the drill on the column is ensured by a chain driven by a pneumatic gear motor. Column support carriage translation on the track is obtained through a rack and pinion with manual advance or motorised advance with a pneumatic gear motor (optional).

The machine is supplied as standard with:

- Drill support column - 2900 mm (114 in) for the start of drilling with a 2400 mm (94 in) rock drill
- 1 guide track - 4000 mm (157 in)
- 3 position cross-members complete with crank operated stabilisers and securing strips
- Column support carriage with manual translation
- Control group with 1 distributor (for manual translation)
- Anchoring pins with conical tapered pegs

The composition of the machine described is entirely indicative; in fact, a series of accessories supplied on request permits customisation for better

operator requirement satisfaction.

Accessories available on request:

- Accessory group for the motorised translation of the column support carriage (motor, distributor, supply pipes)
- Drill support plate for two rock drills
- Device for horizontal drilling – Tigerline II (cross-members; stands; column support)
- Extra long pegs (56 cm.)
- 3700 mm (145 in) column arranged for starting the drilling with a 3,2 mm rock drill.
- 5 or 6 m rails
- Rock drills

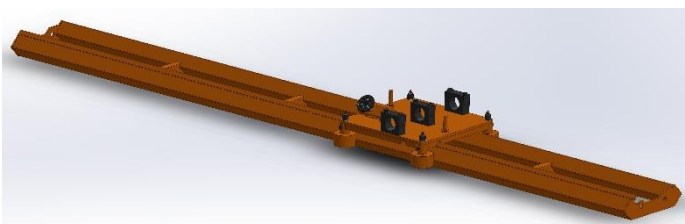


Figure 2

- Sharpener for rock drills
- Screw rods for drilling
- Device for drilling with water
- Dust extractor.

# TECHNICAL CHARACTERISTICS

## Dimensions

Figure 3

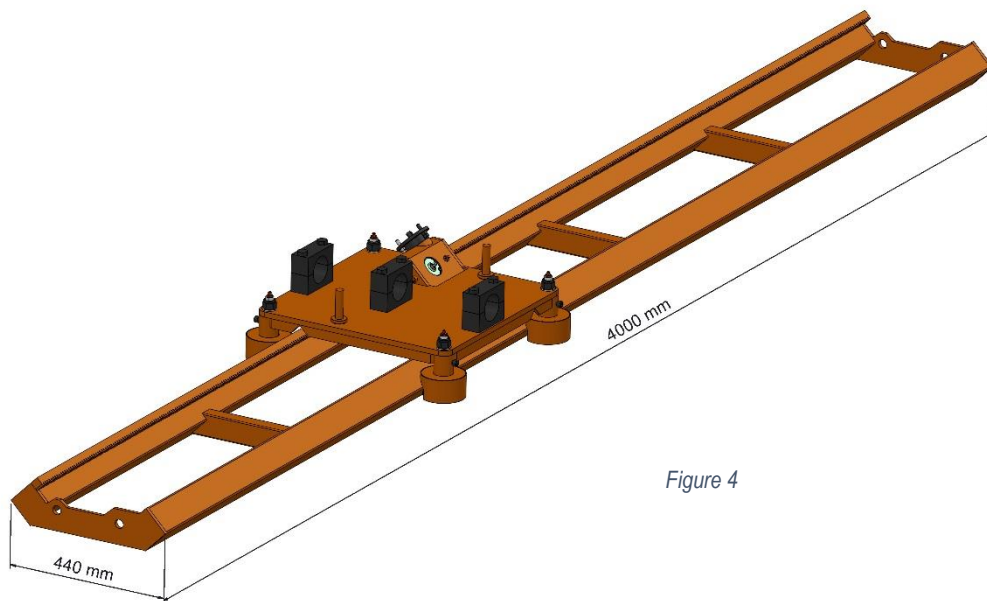
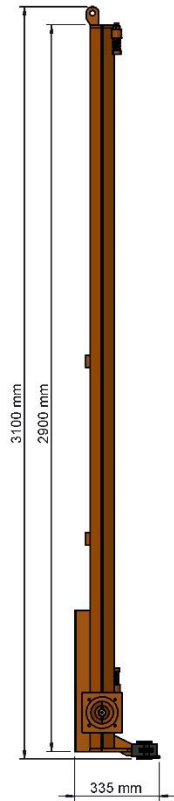


Figure 4



## TECHNICAL CHARACTERISTICS

### Weights

	<b>kg</b>	<b>lbs</b>
2900 mm column (114") for 1 drill	150	331
3700 mm (145") column weight for drills (excluding rock drills)	159	351
Track 3950 mm (155")	103	227
Manual translation control group	102	225
Motor-driven traverse carriage	115	253
Manual translation control group	20	44
Traverse unit with pneumatic motor	23	51
Anchoring cross-member for vertical drilling (complete with pins, strips, etc.)	45	99
Complete equipment for horizontal drilling: (2 cross-members, 2 stands, column support)	120	264

#### Standard supply weights (vertical drilling)

	<b>kg</b>	<b>lbs</b>
with 2900 mm (114") column	150	331
Manual traverse unit	20	44
Manual traverse carriage	102	225
3950 mm (155") track	103	227
3 anchoring cross-members	135	297
<b>Total weight</b>	<b>510</b>	<b>1125</b>

#### Weight of standard supply (horizontal drilling)

	<b>kg</b>	<b>lbs</b>
2900 mm (114") column	150	331
Manual traverse unit	20	44
Manual traverse carriage	102	225
3950 mm (155") track	103	227
Equipment for horizontal drilling: (2 complete anchoring cross-members, 2 stands, 1 column support)	120	264
<b>Total weight</b>	<b>495</b>	<b>1092</b>

#### Air consumption during drilling

with 26 kg. drill 4500 l/min at 6 bar (164 cfm at 87 psi)

**Consumption of lubricating oil:** 2 l every 8 working hours

Idrill start with 2.4 m. drill bit; subsequent sequence: 4; 5.60 drill bits; etc.

Depending on the type of material to drill, the type of drill to use and with the use of special screw rods, it is possible to reach depths in excess of 20 m.

## SAFETY

### General Information Concerning Safety

The design and manufacturing of this machine in conformity with the Machinery Safety Directive 2006/42/AT, 2006/95/AT LVD Directive, 2004/108/AT EMC Directive (specify relevant provisions and other applicable directives, if any).

In particular, measures designed to prevent risks to operators were adopted during the design and construction phases.

The complete documentation of the safety measures adopted is contained in the technical dossier deposited at the offices of the SET-A Makina.

For some risks it was not possible to find solutions at the design level. In these cases, this manual indicates the safety prescriptions to adopt to operate in the safest way.

**WARNING: SET-A Makina recommends complying with the instructions, procedures and recommendations of this manual, to adopt all precautions suggest by the technique and to comply with the accident prevention regulations in force.**

### Safety Prescriptions

- The installation, maintenance, and use of the machine is reserved to specialised staff.
- Before performing any cleaning or maintenance intervention, check that the power supply is disconnected.
- Do not remove the fixed protections of the machine protecting the mobile elements.
- Do not put your hands in the pairs where there is a danger of being crushed or trapped.
- The operator should stay by the control group in the most distant and protected position.
- When working and performing control operations the operator must always position himself behind the control group.
- When the machine or its parts are handled it must idle and the power supply must be disconnected. This must be performed by specialized staff with the appropriate tools.
- If it is necessary to replace machine components, exclusively use original spare parts.

## HANDLING AND TRANSPORTATION

**WARNING:** the handling and transportation of the machine should be carried out by specialised or adequately trained staff with the support of the adequate lifting equipment.

The TIGERLINE II rock drill consists of two main parts: a track with a translating carriage and a drill column. The machine parts should be handled and transported separately (see figs. 5, and 6)

However, the complete machine can also be moved, without disassembly, i.e. with the column fitted to the translation carriage. In this case, place the translation carriage with column at the centre of the track (figs. 6 and 7) and hoist by a cable or hook attached to the ring at the top of the column.

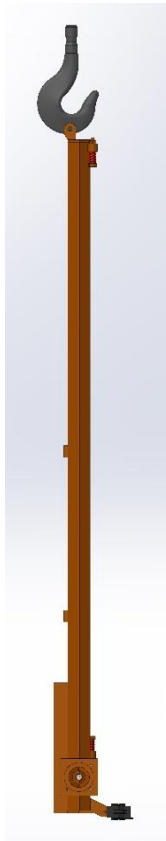


Figure 5

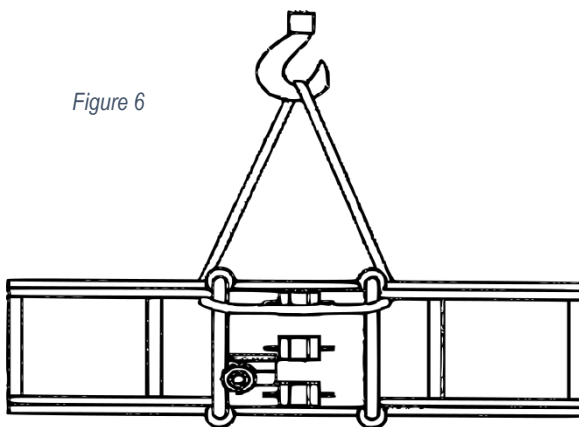


Figure 6



Figure 7

## MACHINE POSITIONING

### Positioning The Track

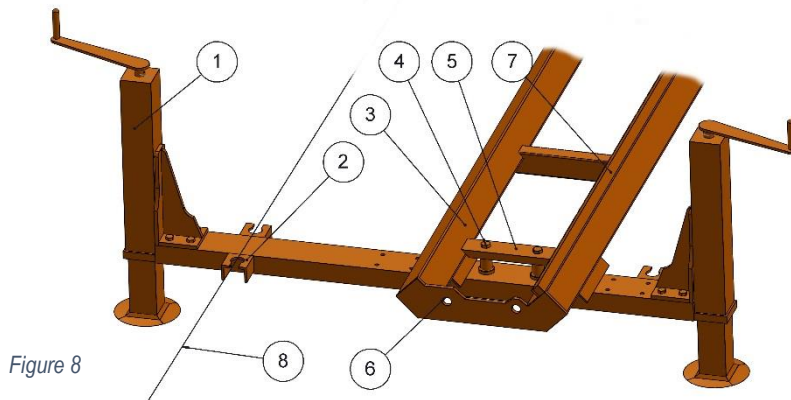


Figure 8

1. Crank-operated stabilizers
2. Anchoring brackets with slots for fixing pins
3. Track
4. Bolts for track cross-members
5. Track strip
6. Track joint bolts
7. Rack
8. Drill line

### Positioning the track for vertical drilling:

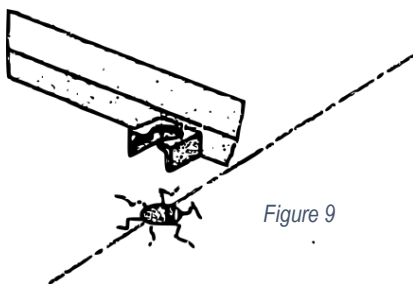


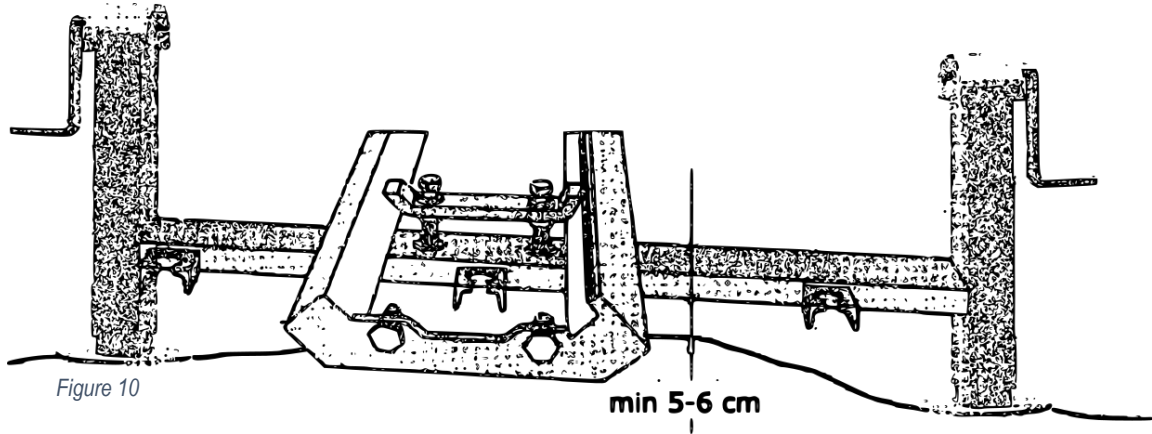
Figure 9

1. Fix the cross-members to the ends of the carriage support track, using the small cross-member provided (see fig.8).
2. Block the small cross-member on the track without over-tightening the bolts 6 so as not to deform the same.
3. Position the rail so that the drill line 8 passes through the cross-member fixing hole 2 (closest to the rail).
4. Use a  $\text{Ø}34 \times 400$  rock drill to drill two holes in the rock, corresponding to the fixing holes in the cross-members at the ends of the track and on the drill line.

*Only 2 anchoring pins are required to anchor the machine.*

**WARNING:** For drilling on tilted surfaces, anchor the machine cross-members on the opposite side from the drill line.

- Level off the track using the cranks. Make sure that there are at least 5/6 cm between the work surface and the cross-member.



- Fit the pins into the holes in the cross-members, making sure the grooved profile is in the right position for the tapered peg.

**WARNING: Never insert the grooved pins as far as to touch the bottom of the hole otherwise you will experience serious difficulty in extracting them later.**

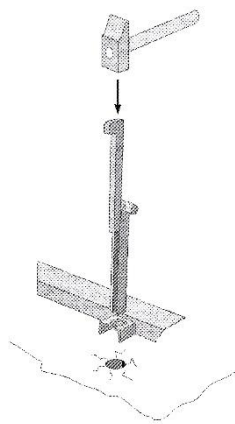


Figure 11

- Insert the conical pins into the grooves of the fixing pins and block everything by applying a few hammer blows.

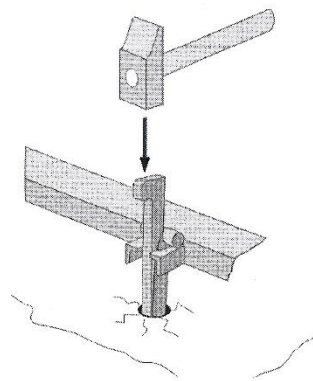


Figure 12

- Use the cranks to lower the stabilisers into position.
- Check that the track is anchored. If these operations have been performed correctly, the track with the translation carriage will now be positioned and anchored correctly.

## Joining the tracks (Figure 13-14)

If an extension track is required, act as follows:

1. Fit the cross-members on the extension track as previously described.
2. Position the extension track in line with and at the same height as the first, so as to be able to insert the joint bolts.
3. Insert the bolt between the ends of the two tracks and block them.

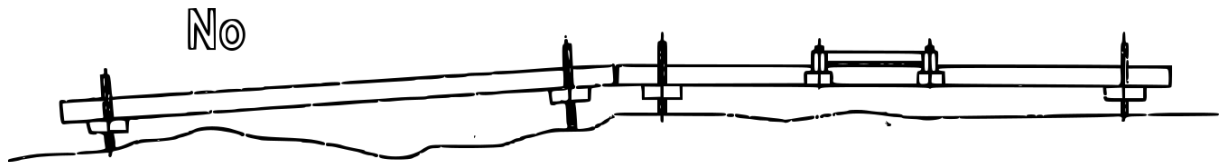


Figure 13

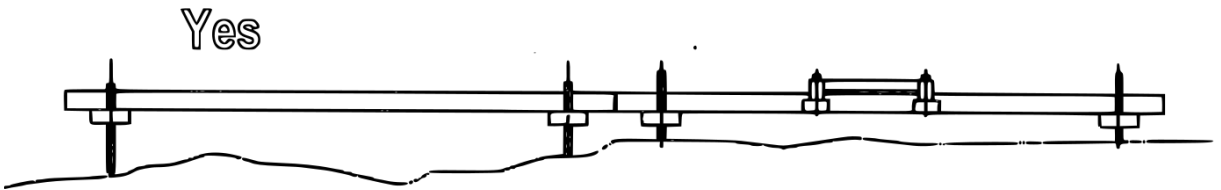


Figure 14

4. Adjust the levelling bolts of the added track cross-members to stabilise it on the ground and block with the counter wing-nuts. Check its stability.

## Positioning the Column for Vertical Drilling

1. Unscrew and remove the upper parts of supports (pos. 6).
2. Place the spider (pos. 5) on the carriage supports (pos 6)
3. Replace the parts previously removed and tighten to secure the spider.
4. Tighten the levelling screws on the column (pos 11) until they touch the carriage; this also prevents the accidental falling of the column.
5. Remove column plate supports (pos 7) by loosening
6. Place the column so that the free part of the spider is on the column plate supports.
7. Replace the two supports previously removed and secure the column to the spider by tightening the screws.

**WARNING: Tightening carriage and plate screws does not stabilise the column. This is done by securing the column to the carriage by screw coupling pos. 8**

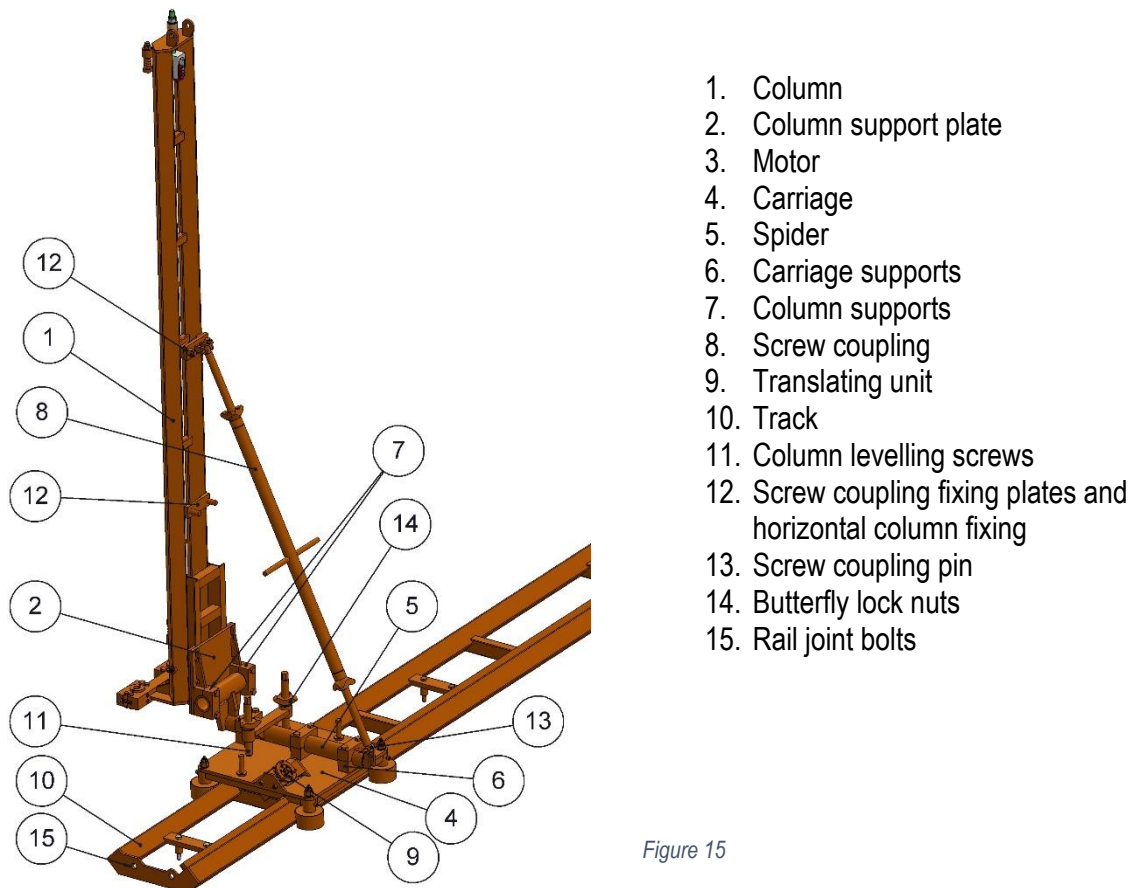


Figure 15

Secure the screw coupling pos.8 to the carriage and the column (see fig. 16), making sure the short side faces upwards. The screw coupling must be fitted to the column by means of the plates pos.12 and to the spider by the pin pos. 13; it should then be tightened by screw sleeve with butterfly lock nuts pos.14.

**WARNING: when tightening the screw coupling, make sure upper and lower sides of the threaded sleeve are tightened in the same way (see fig.16).**

After tightening all support screws, positioning the screw coupling and making sure the column is stable, remove the temporary column support.

## Positioning The Column For Horizontal Drilling

To carry out horizontal drilling, the Tigerline II rock drill must be converted to a Tigerline II Horizontal rock drill. This is done by means of the following accessories: 2 stands (Fig. 17); 1 column support (fig. 18)

Raise the rail and place it on the stands which must be bolted to anchoring cross-members.

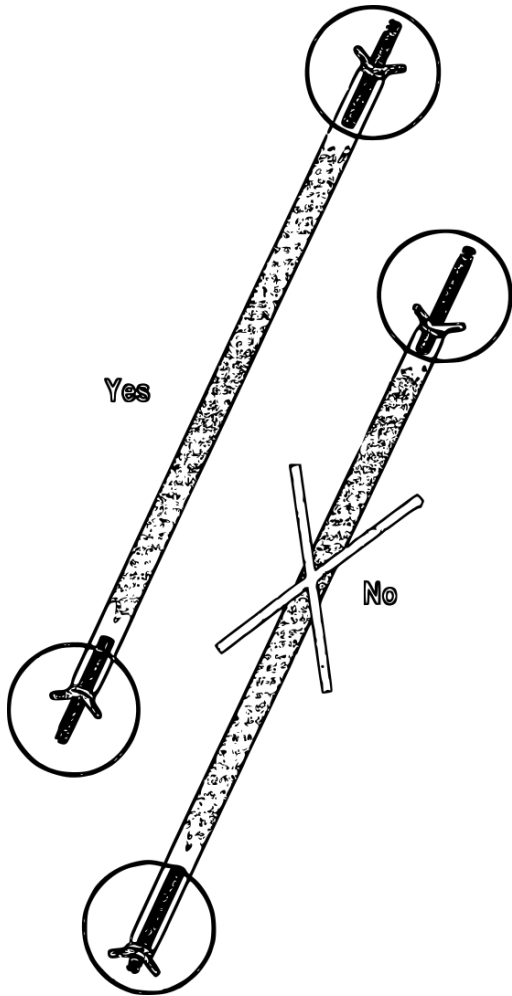


Figure 16

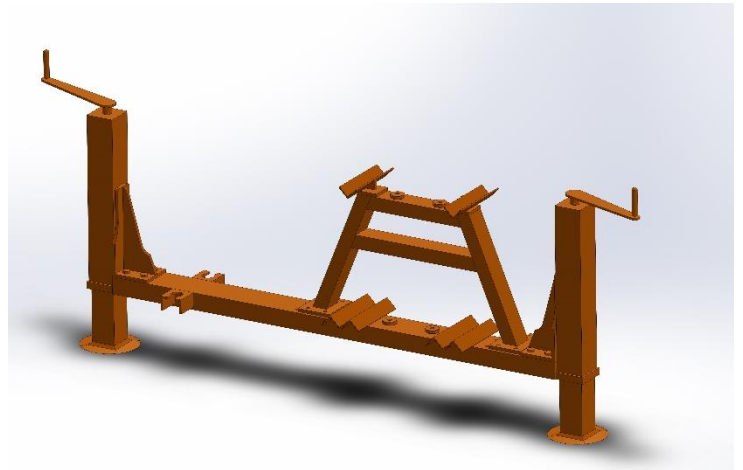


Figure 17

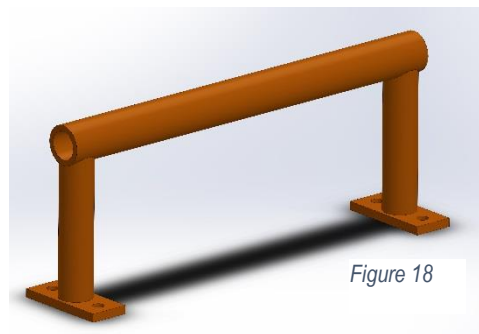


Figure 18



**Warning: Track guides on the cross-members are not centred; for horizontal drilling, cross-members should be placed with the short side facing the drilling line.**

1. Fit the track onto the stands, using the strips, as in vertical drilling.
2. Tighten the screws.
3. Position the column support pipe for horizontal drilling on the carriage supports, as in spider positioning for vertical drilling. (Figure 18).
4. Fit the column to the column support pipe, using the attachments (Figure 19).

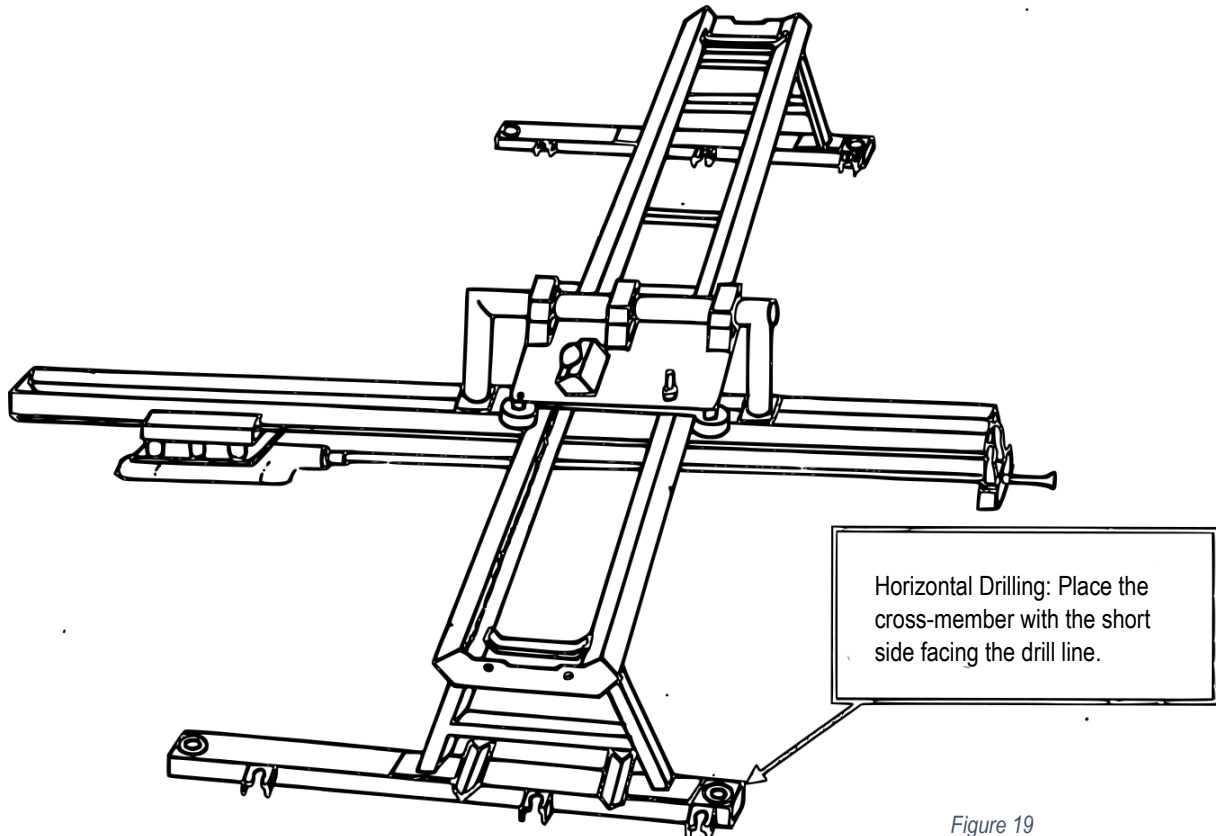


Figure 19

The TIGERLINE II can now be moved to the work site and anchored to the ground by pins and pegs in the cross-members. See rail positioning.

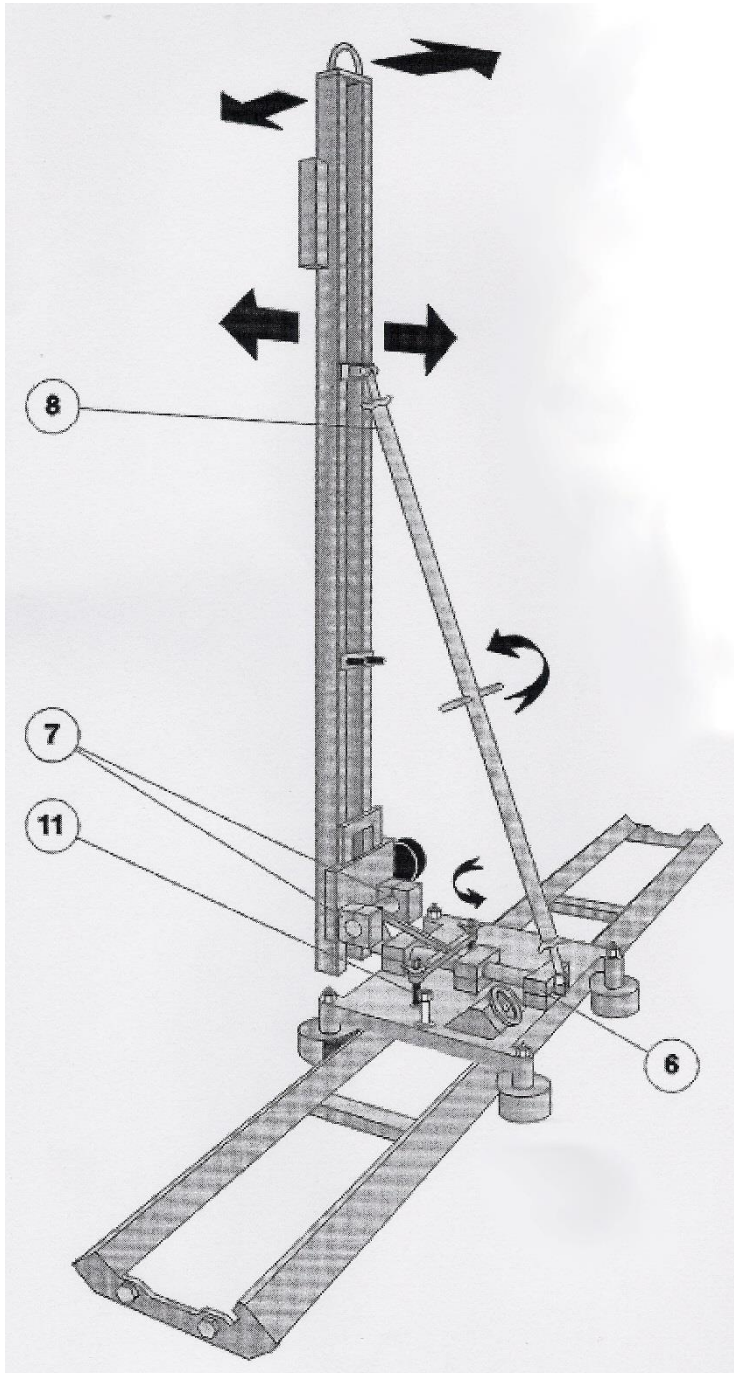
In this case, for anchoring purposes, the holes in the cross-members -further from the drill line - are sufficient.

## Column Direction

### Forward tilt:

Loosen the support screws pos.7 on the column support plate and move the screw coupling sleeve pos.8 to tilt the column forwards.

Tighten support screws in the required position, and tighten the screw coupling butterfly lock nuts.



### Side tilt:

Loosen the screws on the three spider supports pos.6; loosen and tighten the levelling screws pos.11 at the required angle of tilt. Tighten the butterfly lock nuts.

Figure 20

## AIR CONNECTIONS

### Tigerline II with Manual Sliding

1. Place the control unit on the pin and find the most suitable position for operations (control unit support).
2. Block the control group by tightening the lock nut provided.
3. Close the main compressed air inlet valve. (Appendix III, Poz. 1)
4. Connect up the feed hoses for raising and lowering the drills (Appendix III, Poz. 13) to the corresponding attachments on the raising-lowering reduction gear motor, making sure the rapid connectors match up.
5. Position the advance distributor lever (Appendix III, Pos. 7) to the closed position (central position)
6. Connect up the compressed air feed hose to the main feed valve (Appendix III, Poz 1) on the lubricating oil unit.

### Tigerline II with Motorised Translation

1. Place the control unit on the pin and find the best position for operations.
2. Secure the control unit by tightening the lock nut.
3. Close the main compressed air inlet valve.
4. Connect the feed hoses for raising and lowering the drills (Appendix III, pos. 8) to the corresponding attachments on the raising-lowering reduction gear motor.
5. Connect the feed for the sliding carriage to the corresponding attachments of the motor reduction gear on the carriage (Appendix I, pos. 6).
6. Close the distributor lever (Appendix III, pos. 7) (central position)
7. Close the translation distributor lever (Appendix III, pos. 9) (central position)
8. Connect the compressed air feed to the main feed valve (Appendix III, pos. 1) of the control unit.

## VERIFICATIONS AND ADJUSTMENT

**WARNING: if the machine is new or has been idle for a long period, pour some oil directly into the drill supply pipes for more rapid initial lubrication.**

- Make sure there is enough lubricating oil in the tank (Appendix III, pos.2). The tank is fitted with a level gauge (Appendix III, pos. 4). If the oil needs topping up, see (Maintenance: topping up with oil)
- Make sure the air compressor moves the pressure gauge (Appendix III, pos.6) hand into the green area, between 5.5 - 7 bar.

**WARNING: this pressure should be kept constantly in the green area during the drill (ideal pressure 6 bar).**

Regulate the passage of the correct amount of oil using the adjustment screw (Appendix III, pos.3).

**RECOMMENDED: For proper lubrication, disconnect the feed hose and supply compressed air. The air should be slightly oily (check with the palm of the hand).**

## CARRIAGE TRANSLATION

**ATTENTION:** Before translating the column support carriage, stand away from the track at a safe distance and check that the carriage can translate freely.

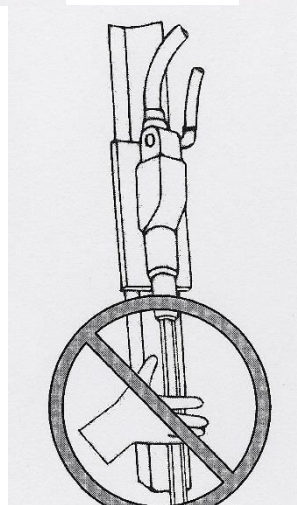
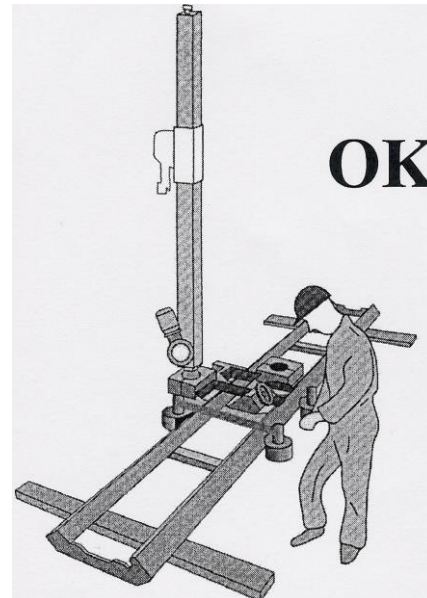
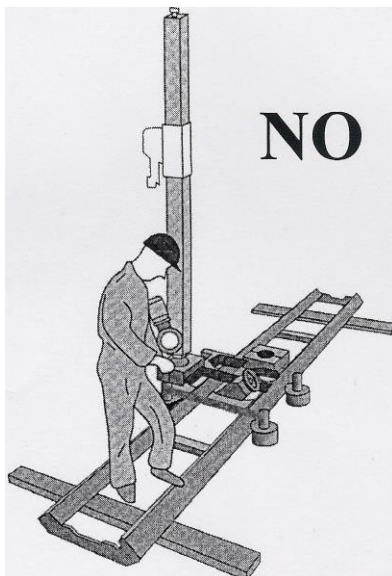
The column support carriage can be translated manually (standard) or through the use of a pneumatic motor (optional).

### Manual carriage sliding

1. Close the control unit supply (Appendix III, Poz. 1)
2. Fit the crank supplied to the pin of the translation group and rotate it to move the carriage to the desired position.

### Motorised translation

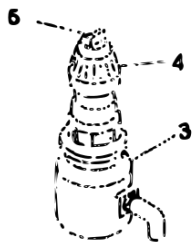
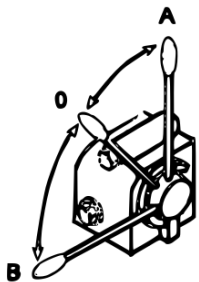
The carriage slides by raising or lowering the distributor lever (Appendix III, Poz. 7) to move the carriage to the right or left.



## USING THE MACHINE

Before starting drilling

**WARNING:** before using the machine, check that it is well anchored to the ground and that all the bolts and air hoses are correctly tightened.



1. Supply air to the control panel by opening the valve (Appendix III, Poz. 1).
2. Check that the gauge needle is in the green zone (Appendix III, Poz. 6)
3. Araise the distributor lever 1 to move the drill to the top of the column if not already in position)
4. Open the rock drill guide.
5. Insert the rock drill into the hammer and block it.
6. Close the rock drill guide.
7. Operate the hammer by opening the supply valve (Appendix III, Poz. 10)
8. Make the hammer advance by lowering the distributor lever (Appendix III, Poz. 9)
9. Adjust the hammer advance using regulator by screwing up or unscrewing knob
4. **To be able to turn the knob, pull up the knob and turn it.**
10. Open the valve to clean off dust and water (if fitted to the machine).
11. Start drilling.

### Changing the rock drill

12. Move the drill to the top of the column making sure it does not reach the stop position.
13. Close off the supply to the control unit. (Appendix III, Pos 1)
14. Remove the used rock drill.
15. Change the rock drill.

## MACHINE STOP AND REMOVAL

1. Remove the general supply from the control group.
2. Detach the supply pipes of the motors and the hammer.
3. Remove the command group.
4. Remove the column.
5. Lower the track by means of the cranks so that the pin juts out.
6. Apply a few hammer blows to the head of the pin which enters the hole and frees the conical pin, thus permitting removal of the fixing pin and the track to be freed (Figure 21)

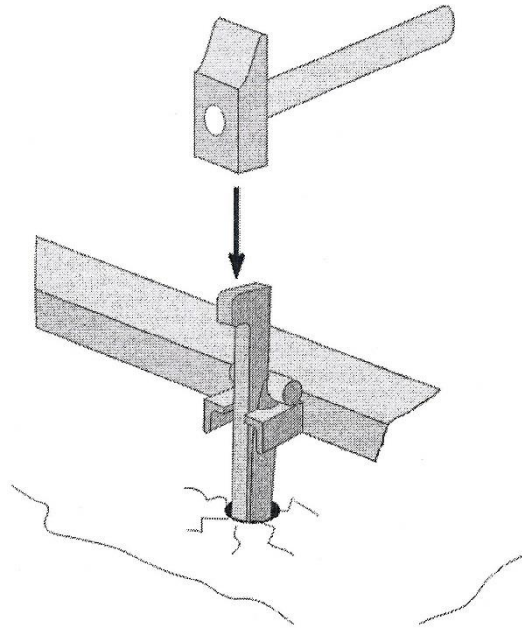


Figure 21

## MAINTENANCE

### Adding Oil

**WARNING:** before proceeding with the oil addition operations, stop the machine, cut-off the main air feed and discharge the air from the control unit. The tank filler cap **should not be removed** if the control unit is pressurised.

To top up with oil, shut the machine down and disconnect the power; remove the filler cap (Appendix III, pos. 13) and top up.

If the machine is to be stored for a long period, or after a long period of storage, pour oil directly into the rotation head inlets and the feed motor and rotate slowly for a few revolutions in order to lubricate moving parts. For lubricating the drills, pour some oil to the drill air feed hose (Appendix III, Pos 11) and run the drill for a while.

#### Oil to use:

- Petrol Ofisi ROCKDRILL 100
- Shell TORCULA 100
- Mobil ALMO 527

#### Grease to use:

- Petrol Ofisi SUPERGRES EP00
- Shell GADUS 00
- Mobil LUX EP00

### Periodical Controls

Daily: Check the oil level.

Weekly: Grease the chain pinion of the advance unit by grease gun.

- Check the chain tension and adjust it with the tightener if necessary check the integrity and wear of the bit.
- Grease the translation carriage wheels at the grease points provided.
- Be sure about that pinion is working without any problem on the rack.



## CARRIAGE WHEEL PLAY REGULATION

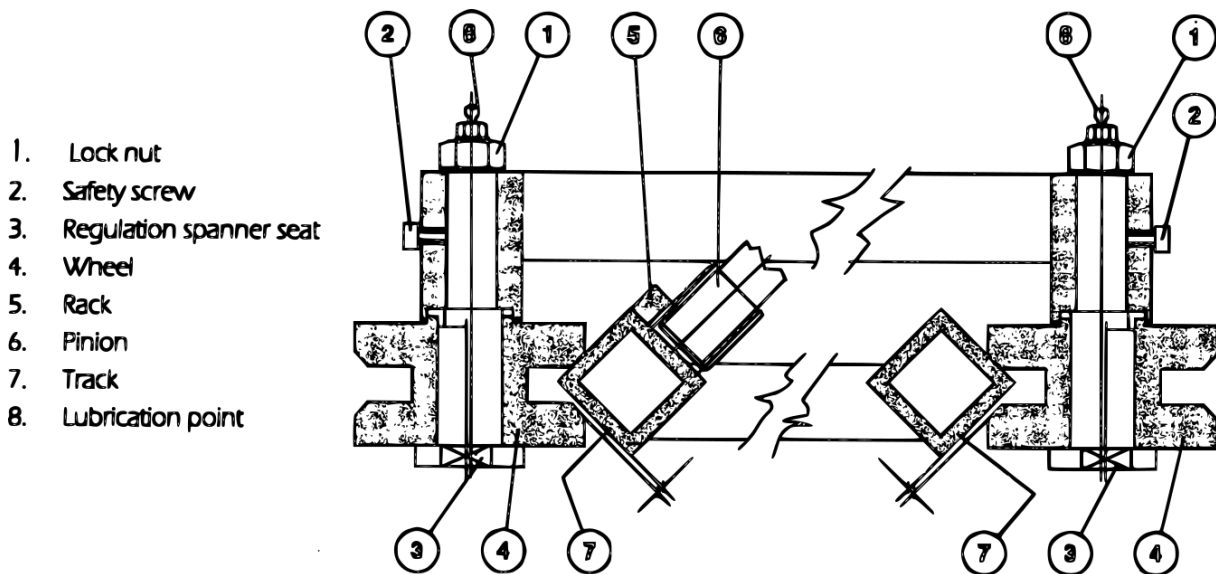
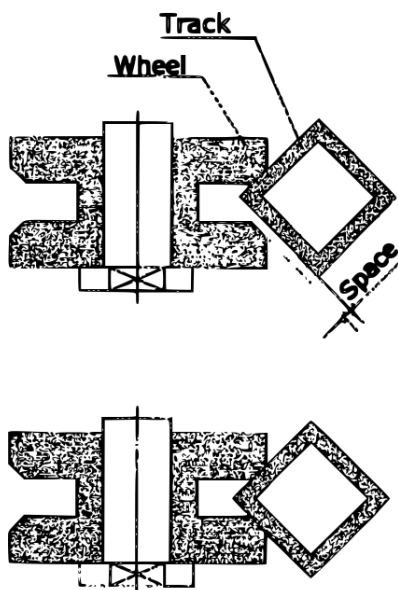


Figure 22

- Slacken the four lock nuts (1) (Fig. 22)
- Slacken the two Allen screws (2)
- Start to adjust the two wheels found on the pinion-rack side of the carriage
- Position the pinion on the rack so as to remove the play from between the pinion and the rack.
- Insert the spanner provided into seat 3 and rotate the eccentric pin to approach the wheel to the track until the wheel profile lightly touches the track (Fig. 23)
- Work in this way on the other wheel on the pinion side, keeping the carriage aligned to the track.
- Block the two wheels in this position by keeping the spanner still in 3 and by tightening nut 1.
- Tighten the screw 2.



Repeat the operation on the other two wheels. Make the carriage translate on the track to check that the 4 wheels rotate at the same time, without forcing the track.

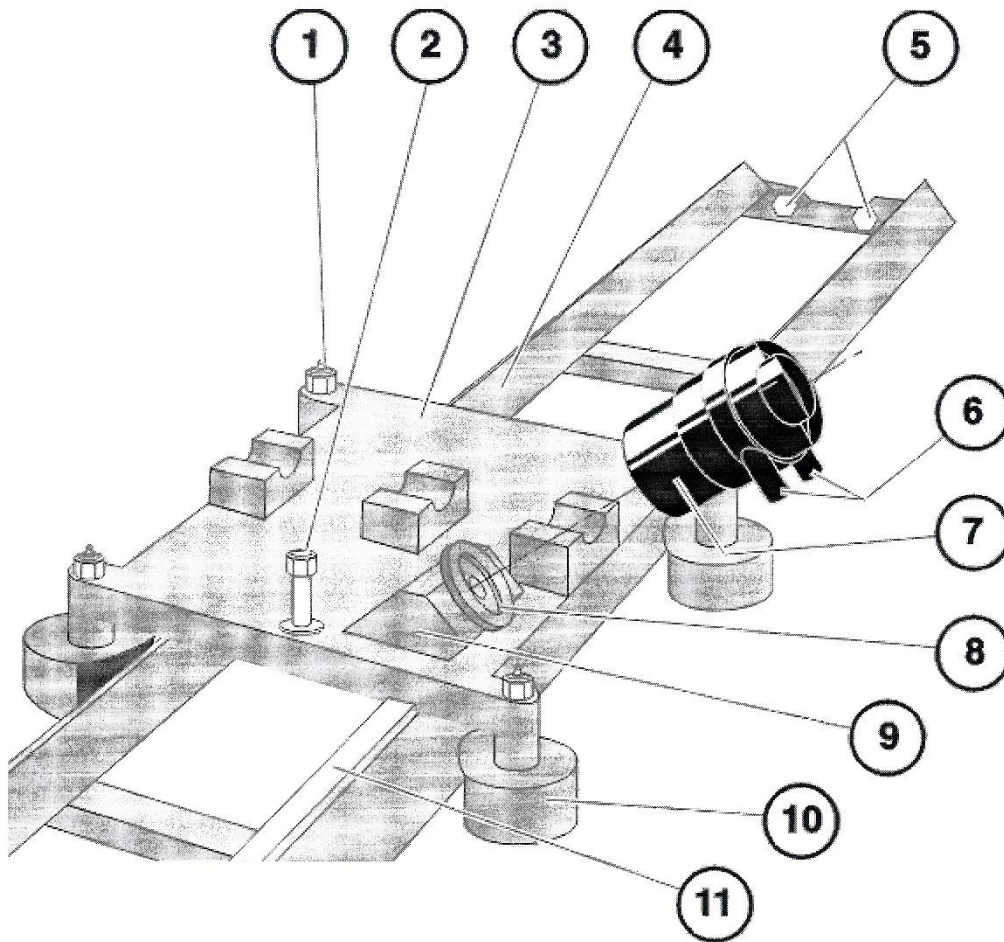
**ATTENTION:** If this operation is not performed correctly, and the wheels are too tight, the track could be damaged by crushing.

Figure 23

## PROBLEM SOLUTION SUGGESTIONS

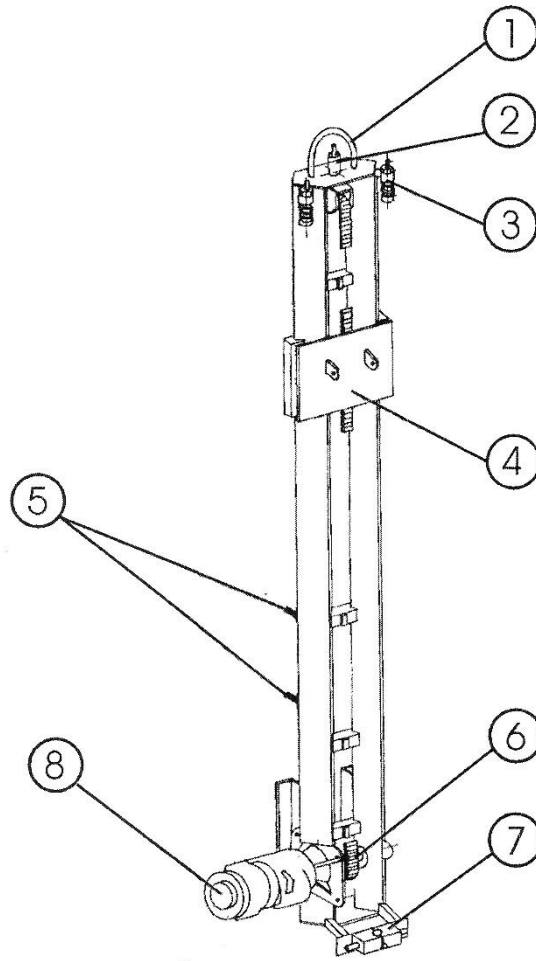
Problem	Cause	Solution
Insufficient air pressure (needle below the green field of the gauge)	<ul style="list-style-type: none"> <li>Quantity of air generated by the compressor insufficient.</li> <li>Small feeding hose section or excessive feeding hose length.</li> </ul>	<ul style="list-style-type: none"> <li>Replace the compressor with one with a higher yield (air delivery rate)</li> <li>Replace the feeding hose with one with a greater section and in proportion to the length.</li> </ul>
Low yield	<ul style="list-style-type: none"> <li>Pressure too low</li> <li>Faulty or dirty hammer</li> <li>Worn rock drill</li> </ul>	<ul style="list-style-type: none"> <li>See above</li> <li>Clean hammer.</li> <li>Repair hammer.</li> <li>Sharpen rock drill.</li> </ul>
Carriage advance cannot be adjusted.	<ul style="list-style-type: none"> <li>Faulty pressure adjuster (Appendix III, Pos. 5)</li> </ul>	<ul style="list-style-type: none"> <li>Change the pressure adjuster. (Appendix III, Poz 5)</li> </ul>
Too much pressure	<ul style="list-style-type: none"> <li>Inverted feed hoses</li> </ul>	<ul style="list-style-type: none"> <li>Invert the feed hoses</li> </ul>
Jerky carriage movement	<ul style="list-style-type: none"> <li>Wheels stick</li> <li>Worn or damaged pinion</li> <li>Worn or damaged rack</li> <li>Damaged track</li> </ul>	<ul style="list-style-type: none"> <li>Grease the tracks.</li> <li>Replace pinion.</li> <li>Replace rack.</li> <li>Repair track.</li> </ul>
Jerky drill movement	<ul style="list-style-type: none"> <li>Dirty, worn or damaged reduction gear</li> <li>Damaged slide unit</li> <li>Chain corrosion</li> </ul>	<ul style="list-style-type: none"> <li>Repair gear motor.</li> <li>Repair translation group.</li> <li>Change the chain.</li> </ul>

## Appendix I



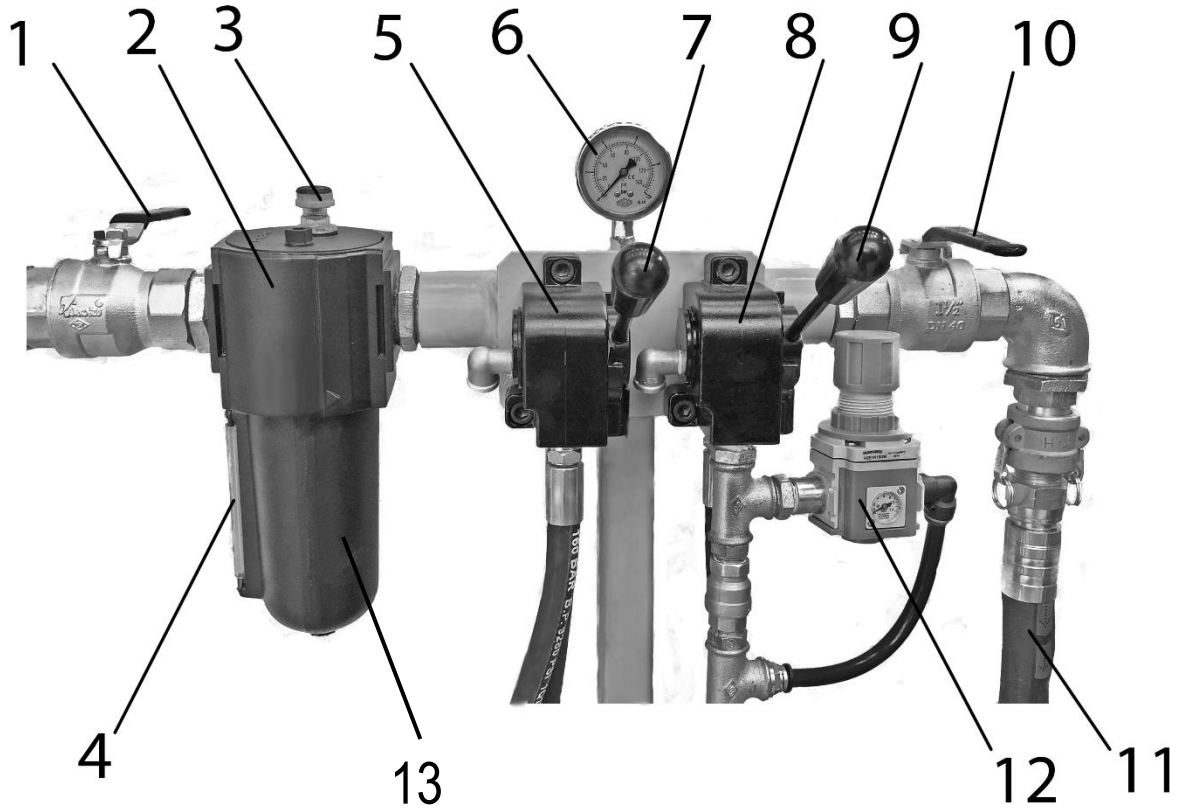
1. Grease point
2. Control unit anchoring pin
3. Column support carriage
4. Track
5. Additional bolts for tracks
6. Motor air feed
7. Motor for pneumatic translation (optional)
8. Attachment for crank or pneumatic translation motor (optional)
9. Slide unit
10. Slide wheels
11. Rack

## Appendix II



1. Hoisting eye
2. Chain tensioner
3. Limit switch
4. Drill support plate
5. Bolts for horizontal drilling or for screw coupling
6. Chain
7. Rock drill guide
8. Motor reduction feed gear

## Appendix III



1. Main compressed air inlet valve
2. Lubricator
3. Oil adjustment screw
4. Oil level gauge
5. Carriage advance pressure valve
6. Pressure gauge
7. Carriage advance lever
8. Drill advance distributor valve
9. Drill advance lever
10. Drill feed valve
11. Drill feed hose
12. Drill advance regülätör
13. Oil tank

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