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**ENGLISH**

# RAIL DRILL TYPE LD-2EY



**PATENTED**



**OPERATION AND MAINTENANCE  
MANUAL**

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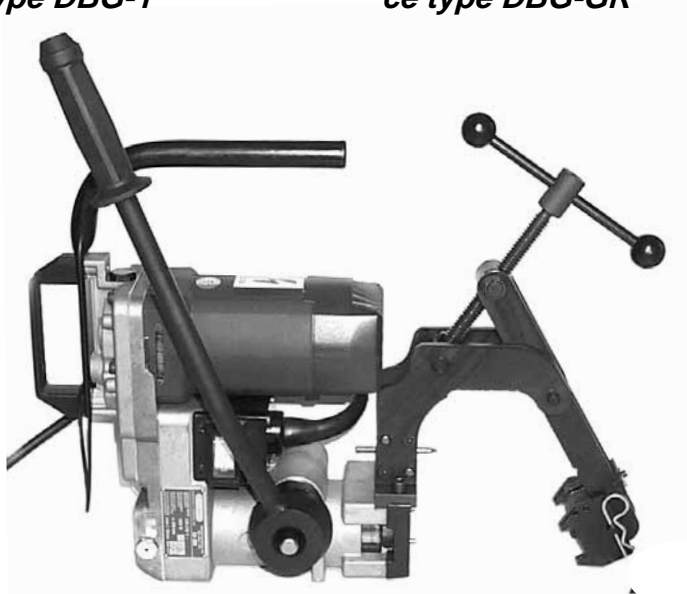
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**Ref. LD-2ENY:**  
*basic drill without clamping device*



**Ref. LD-2EY:**  
*(LD-2ENY + DBG-Y)*  
*basic drill complete*  
*with railweb clamping*  
*device type DBG-Y*

**Ref. LD-2EYGR:**  
*(LD-2ENY + DBG-GR)*  
*basic drill complete*  
*with railweb clamping device*  
*type DBG-GR*



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**ATTENTION**

- Before using the rail drilling, carefully read the instructions contained in this manual.  
**SAVE THESE INSTRUCTIONS:** this manual contains important safety and operating instructions for the drilling machine.
- The degree of protection of the drilling machine against moisture is classified "ordinary" (EN 50144-1 Standard).  
Do not expose the rail drilling to rain and moisture; possible infiltrations of water inside the electric motor determines the risk of electric shocks.  
Mobile electric devices used outdoor must be connected to the supply by interposing a safety interrupter for breakdown current.
- **DISCONNECT** always the power supply when servicing the drill: before removing the broach cutters, spiral bits, positioning templates etc.
- During drilling keep your hands outside the danger area.
- Always wear protective glasses and working gloves.
- Avoid wearing clothes which may present a risk to personal safety.

**RAIL DRILL TYPE LD-2ENY**

**1. GENERAL CHARACTERISTICS**

- **Drilling capacity:** ..... Ø 9/32" to 1 1/2"  
*(with special twist drill bits: hole diameters of 9/32" to 1-1/8" on rails up to 3 1/2" thick)*  
*(with broach cutters: hole diameters of 3/4" to 1-1/2" on rails up to 2 3/4" thick)*
- **Speed without load:** ..... 310 rpm
- **Electric motor:**
  - single phase, double insulation
  - **supply voltage:** ..... 120 V AC / DC
  - **power rating:** ..... 1800 W
  - protection against overheating caused by a current overload and against unintentional start up following a drop in voltage, by means of an automatic switch equipped with thermal cut-out and underpower relay.
- **Weight:** ..... 31 lbs
- **Weight:** with "DBG-Y" clamping device ..... 38 lbs
- **Recommended gear sump oil:**

<b>MOBIL DTE OIL LIGHT</b>	<i>or</i>
<b>ESSO TERESSO 32</b>	<i>or equivalent</i>
- For "Air noise" and "Risk due to vibration", see page 28.

## 2. ACCESSORIES SUPPLIED WITH THE RAIL DRILL

**2.1) Pilot bits** for controlling the cooling system:  
for use with short broach cutters (7/8 " depth of cut)

– 1 pc **PPC 2**

for use with long broach cutters (2 " depth of cut)

– 1 pc **PPL 2**



**2.2) Spacer**, type **DPE**, for use with spiral bits and APE adaptor for controlling the cooling system, do not required for APED adaptor.



**2.3) Adapter**, type **ARE**, for external cooling, to be used with the SR5000 cooling unit.



**2.4) Grub screw, M8x10**

– 4 pcs for clamping cutters or bits on the spindle shaft.



**2.5) Socket head cap screws, M6x16**

– 4 pcs for securing positioning shoes to the front plate.



**2.6) Socket head cap screws, M6x25**

– 4 pcs for securing special positioning shoes to the front plate.



**2.7) Range of tools:**

– 1 pc 5 mm **allen key**

– 1 pc 6 mm **allen key**

– 1 pc 4 mm **allen key with handle**

– 1 pc **brush** (for removing the drilling swarf)

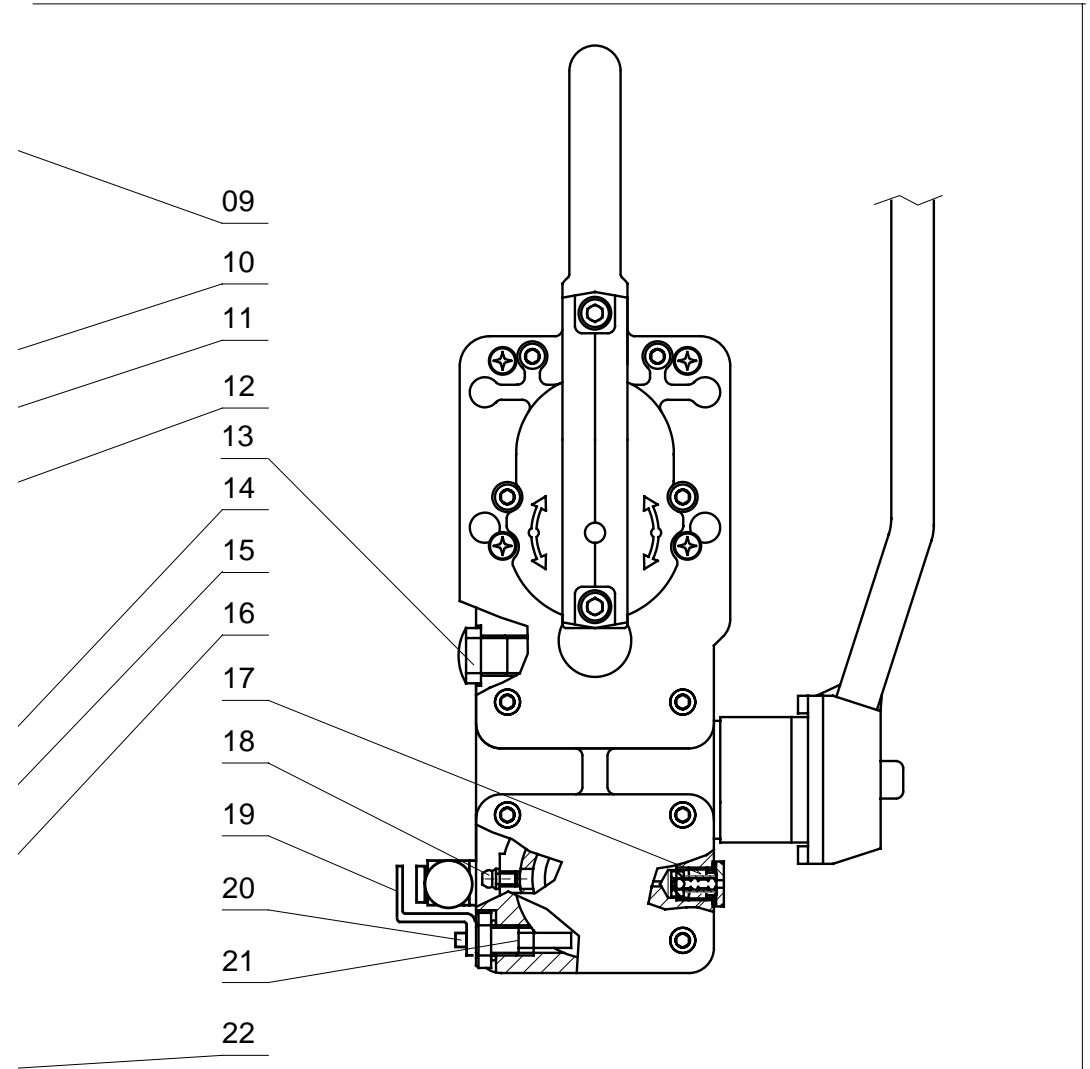


**2.8) 4.7 fl oz (140 ml) oil tank for the gear reduction.**

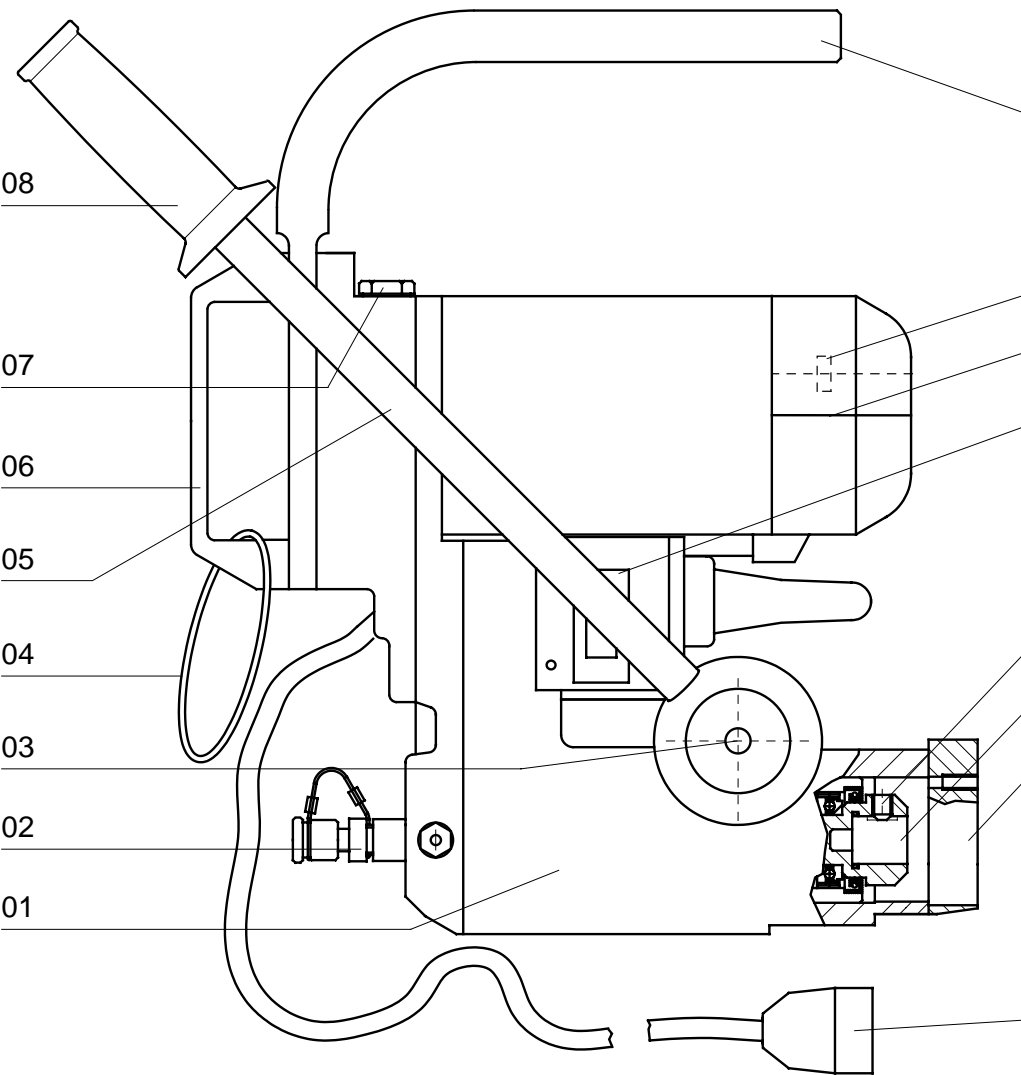


**2.9) Type SR5000 coolant unit.**

(Accessories from pos. 2.1 to pos. 2.8 are included in the "Kit of accessories for LD-2ENYY" having the code 6001909)



-	22	Electric plug	1	6001368	11	Electric motor	1
6001209	21	Magnetic cap	1	6001422	10	Brush	2
6900060	20	Screw M 4x8	2	6380316	09	Handle	1
6001731	19	Guard	1	6380330	08	Handgrip	1
6001198	18	Lubricator	1	6001210	07	Cap	1
6001397	17	Complete air valve	1	6001238	06	Carrying handle	1
6001144	16	Front plate	1	6001262	05	Spindle advance lever	1
6001146	15	Drilling spindle	1	6360480	04	O-ring	1
6340160	14	M 8x10 grub screw	2	6001176	03	Lever release pawl	1
6001195	13	Transparent inspection cover	1	6001428	02	Complete coolant connection	1
6001818	12	Automatic switch	1	6001997	01	Complete body	1
Code No	Item	Description	Qty	Code No	Item	Description	Qty



When ordering spare parts always give the following information:

- spare part code
- spare part description
- rail drill model
- rail drill serial number.

**FIG. 28 – RAIL DRILL ASSEMBLY**

### 3. OPTIONAL ACCESSORIES (to be ordered separately)

**3.1) "DBG-Y" device** with moving arm for clamping the rail drill to the rail web and track fittings, complete with the **TDB 6** termination.

\* Always supplied with rail drill ref. LD-2EY



**3.1.1) "DBG-LY" device** specific for clamping the rail drill to the girder rails (for example 128 GR or GGR 118). With the specific shoes allows the positioning on both sides of the rails, complete with the **TDB 3** termination.

**3.1.2) "DBG-GR" device** for clamping the rail drill in correspondance of guard rail, complete with the **TDB 1** termination.

Always supplied with rail drill ref. LD-2EYGR



**3.2) "TST 50" two stage template**

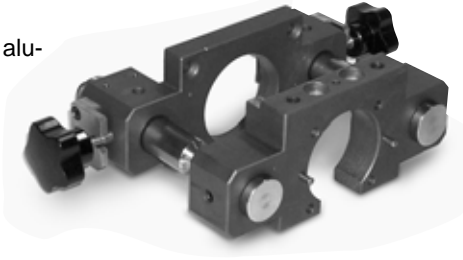
(to be used with specific DBG-AY clamp)

This device enables the drilling of 150 lb and aluminium composite contact rails from one side.

Restart of work stroke: 1,97"

Typical application:

- Aluminium composite rail.
- 150 lbs contact rail.



**3.3) "VAL LD" steel carrying case for**

accommodating the complete drill with the clamping device.

22 1/2" (L) x 13 1/2" (W) x 17 1/2" (H)



**3.4) "VAL MPA" suitable for storage of rail shoes,**

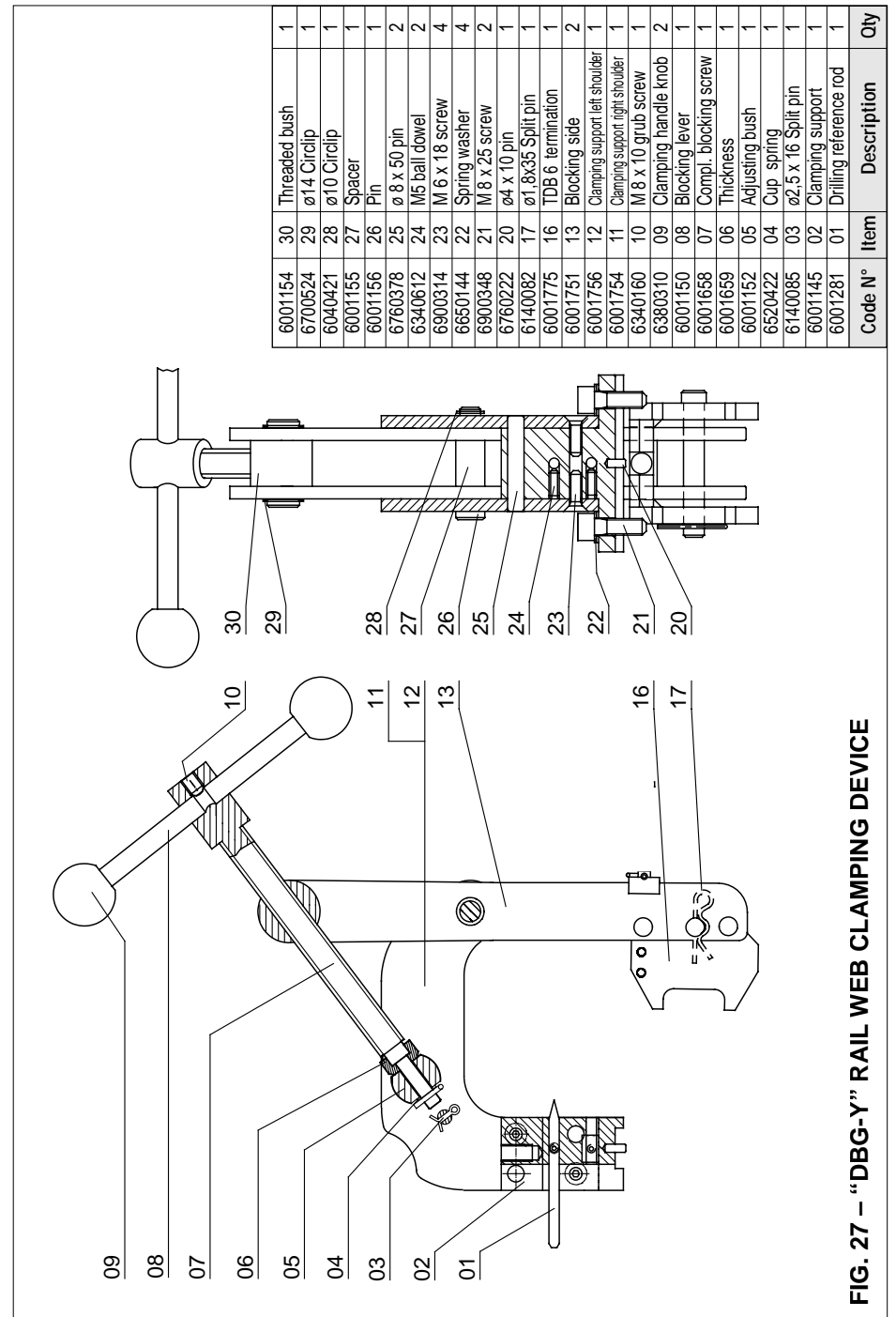
cutters and accessories

- 15 1/2" (L) x 13 3/4" (W) x 2 1/4" (H)



**3.5) "MPAU" UNIVERSAL RAIL SHOE** for rail or for special applications such as drilling #20 high speed switch points (positioning not automatic).

**3.5.1) "MPAU-10" UNIVERSAL SHORT RAIL SHOE** for rail or for special applications (positioning not automatic).



**FIG. 27 – "DBG-Y" RAIL WEB CLAMPING DEVICE**

## 15. RETURN TO Cembre FOR OVERHAUL

In the case of a breakdown contact our **Area Agent** who will advise you on the problem and give you the necessary instructions on how to dispatch the tool to our **nearest service Centre**; if possible, attach a copy of the Test Certificate supplied by **Cembre** together with the tool or, if no other references are available, indicate the approximate purchase date and the tool serial number.



### 3.5.2) "MPAF..." SPECIFIC RAIL SHOES

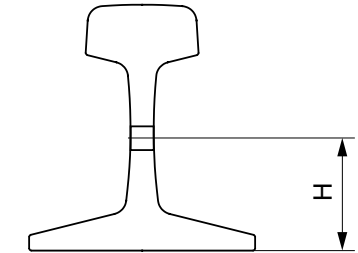
Suitable for positioning the drill on running and guard rails.

Enable the automatic position of the machine on the drilling axis (H) of each specific rail.

• Note: Please contact **Cembre** for other types of rail.

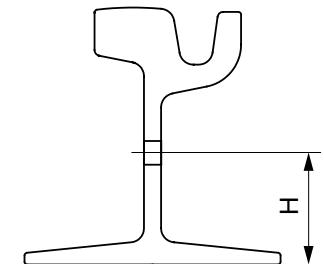
#### RAIL SHOES DRILLING ON RUNNING RAILS

TYPE OF RAIL	H (inches)	RAIL SHOE
40 LB ASCE	3 1/16"	MPAF 40 LB ASCE
60 LB ASCE	3 1/16"	MPAF 60 LB ASCE
80 LB ASCE	2 3/16"	MPAF 80 LB ASCE
85 LB ASCE	2 17/64"	MPAF 85 LB ASCE
85 LB PRR	2 1/16"	MPAF 85 LB PRR
85 LB PS	2 15/64"	MPAF 85 LB PS
90 LB ARA-A	2 9/16"	MPAF 90 LB ARA-A
90 LB ASCE	2 45/128"	MPAF 90 LB ASCE
100 LB ARA-A	2 3/4"	MPAF 100 LB ARA-A
100 LB ARA-B	2 65/128"	MPAF 100 LB ARA-B
100 LB ASCE	2 65/128"	MPAF 100 LB ASCE
100 LB DY	2 5/8"	MPAF 100 LB DY
100 LB NYNH&H	2 39/64"	MPAF 100 LB NH
100 LB RE	2 45/64"	MPAF 100 LB RE
100 LB RE-HF	2 45/64"	MPAF 100 LB RE-HF
100 LB PRR	2 9/32"	MPAF 100 LB PRR
100 LB PS	2 31/64"	MPAF 100 LB PS
105 LB DY/110 LB RE	2 43/64"	MPAF 105 LB DY
112/115/119 LB RE	2 7/8"	MPAF 115/119 LB RE
122 CB	2 7/8"	MPAF 122 CB
127 LB DY	3 1/8"	MPAF 127 LB DYM
130 LB RE/HF-A	2 3/4"	MPAF 130 LB RE
130 LB RE-HF	3 1/16"	MPAF 130 LB RE-HF
130 LB HF-B	3 3/8"	MPAF 130 LB HF-B
130 LB PS	2 3/4"	MPAF 130 LB PS
131 LB RE	3 1/2"	MPAF 131 LB RE
132 LB RE	3 3/32"	MPAF 132 LB RE
133 LB RE	3"	MPAF 133 LB RE
136 LB RE	3 3/32"	MPAF 136 LB RE
136 LB LE VAL	3 1/16"	MPAF 136 LB LVM
140 LB RE/140 PS	3"	MPAF 140 LB RE
141 LB AB/ 141 LB RE	3 3/32"	MPAF 141 LB AB
152 LB PS	3 3/4"	MPAF 152 LB PS *
155 LB PS rail	3 3/8"	MPAF 155 LB PS *



#### RAIL SHOES DRILLING ON GUARD RAILS

TYPE OF RAIL	H (inches)	RAIL SHOE (Using DBG-GR clamp)
100 LB ARA-B	2 1/4"	MPAF 100 LB ARA-B GR
112/115/119 LB RE	2 5/8"	MPAF 115/119 LB RE GR
115 LB-RE-3132	3 1/32"	MPAF 115 LB-RE-3132
132 LB RE	3 9/32"	MPAF 132 LB-RE-3932
136 LB RE	3 1/4"	MPAF 136 LB-RE-314



#### RAIL SHOES DRILLING ON GIRDER RAILS

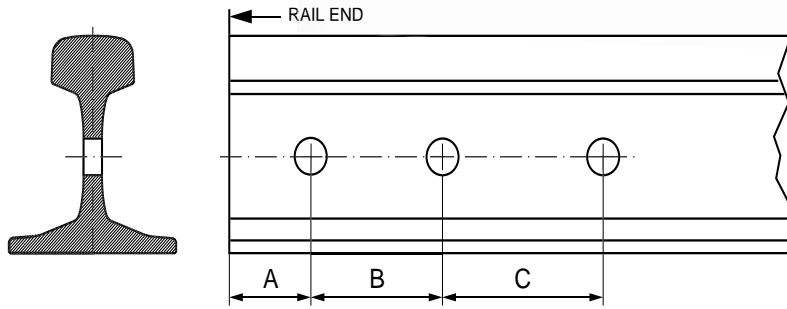
TYPE OF RAIL	H (inches)	RAIL SHOE (Using DBG-LY clamp and 2" depth cutters)
128/149 LB	3"	MPAF 128/149 LB GR
128/149 LB	2 3/4"	MPAF 128/149 LB GR 234
149 LB	2 3/4"	MPAF 149 LB GR 234
GGR 118	2 3/8"	MPAF GGR 118
RI60/RI60N	2.87"	MPAF RI 60 N
NP4A/NP4AM	2.87"	MPAF NP4AM
180-105 LB	2.87"	MPAF BA9101

(\*) to be used with PFA 1 arbour extension and PPL5 Pilot Bit.



### 3.6) JOINT BAR POSITIONING GAUGES

Positioning gauges MRF-Y... for drilling joint bar holes at pre-defined distances between rail end and holes center lines.



POSITIONING GAUGE	HOLES DISTANCES		
	A	B	C
<b>MRF Y10</b>	2 21/32"	7 1/4"	5 1/2"
	3 1/2"	6"	6"
<b>MRF Y11</b>	2 21/32"	7 1/4"	5 1/2"
	3 1/2"	4 3/4"	4 3/4"
<b>MRF Y12</b>	2 23/32"	6"	7"
	3 1/2"	6"	6"
<b>MRF Y13</b>	3"	6"	-
	2 7/16"	5"	-
<b>MRF Y14</b>	2 7/16"	7"	-
<b>MRF Y15</b>	2 3/8"	7"	-
	2 3/4"	6 3/4"	6 3/4"
<b>MRF Y16C</b>	2 11/16"	5 1/2"	5 1/2"
	3 1/2"	6"	6"

**MRF Y10:** suitable for drilling the following rails 100 ARA-B, 115 and 119 LB RE

**MRF Y11:** suitable for drilling the following rails 100 ARA-B, 105 DL&W

**MRF Y12:** suitable for drilling the following rails 115, 119, 132, 136, 140 LB RE, 130 and 155 PS

**MRF Y13:** suitable for drilling the following rails 80, 90 LB ASCE and 100 ARA-A

**MRF Y14:** suitable for drilling the 85 LB ASCE rail

**MRF Y15:** suitable for drilling the 130 LB RE and 136 LE.VAL rails

**MRF Y:** universal positioning gauge for all rail sizes

• *Note: other positioning gauge sizes available upon request.*

### APPENDIX "B"

**Air noise** (DIRECTIVE 2006/42/EC, Annexe 1, point 1.7.4.2, letter "u"):

- The continuous equivalent weighted level (A) of noise pressure at the working place  $L_{pA}$  is equal to ..... 85,8 dB (A)
- The maximum value of instantaneous weighted noise pressure C at the working place  $L_{pCPeak}$  is lower than ..... 130 dB (C)
- The level of noise force produced by the machine  $L_{WA}$  is equal to..... 96,6 dB (A)

#### Protection of operators against risks of exposure to noise during work.

**Cembre** drills type **LD-2EY** are designed and constructed according to EEC directives 80/1107 and 86/188 relating to the protection of operators against risks arising from exposure to chemical, physical and biological agents during work, and with particular regard to the risk of exposure to noise.

This has enabled a range of drills to be manufactured for drilling rails and track equipment, at reduced noise levels.

The degree of exposure of an operator to noise produced from this equipment depends on the duration of the loading times and the intervals between exposures, and finally on the number of holes made within the space of one working day.

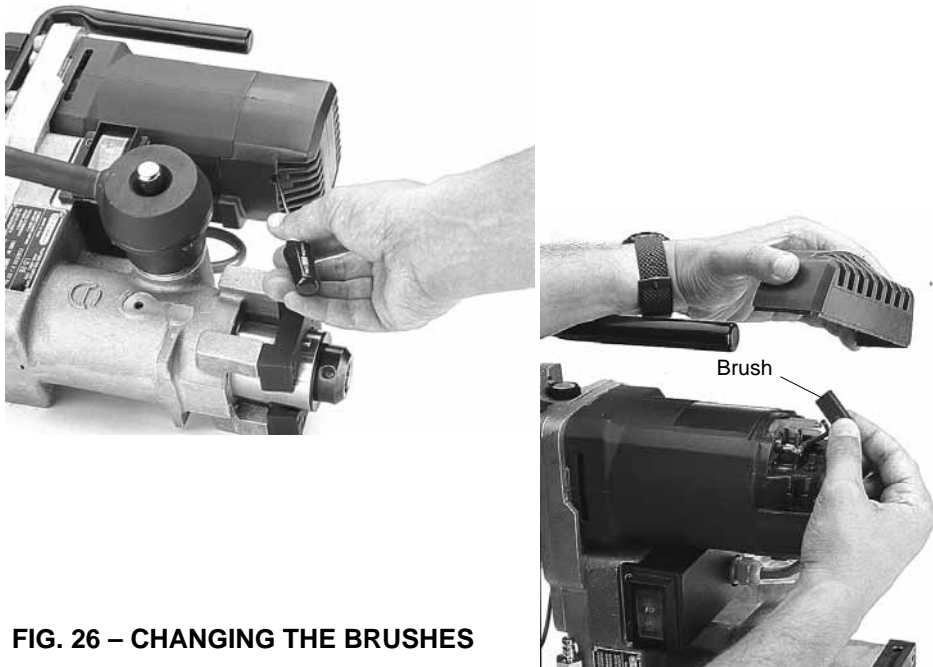
For example, an operator using the drill correctly for making holes 19 mm in diam., with a type RCV 190 broach cutter on rails classified as UIC 60, quality 900, producing up to 400 holes/day, the daily personal exposure to noise, due solely to the use of the drill, is less than 80 dB (A); under similar conditions producing 700 holes/day, the daily exposure to noise would be 82.1 dB(A).

Since noise levels vary according to the many different operating conditions, **Cembre** engineers are available to give further details on the correct use of the drills.

#### Risks due to vibration (Directive 2006/42/EC, Annexe 1, point 2.2.1.1).

The weighted root mean square acceleration value to which the arms of an operator are subjected when using the drill machine does not exceed 2,5 m/s<sup>2</sup>.





**FIG. 26 – CHANGING THE BRUSHES**

**APPENDIX “A”**

**Factors which influence the number of holes that can be made according to the tool used.**

- **Hardness of the material to be drilled.**
- **Thickness to be drilled.**
- **Stability of the drill clamp** and correct assembly of the cutter/bit.
- **Suitable lubrocooling (lubrication/cooling)** to keep the temperature of the tool low so as not to compromise the efficiency of the cutting edges, whilst at the same time facilitating the removal of the swarf.
- **Contact time of the cutting edges of the cutter/bit with the material to be drilled;** bear in mind that the faster the hole is made the greater the efficiency.
- **Observance:**
  - 1) **Commence drilling by exerting light pressure on the advancing lever, progressively increasing and then relaxing it when the tool is in the exit phase.**
  - 2) Avoid pressure jolts and only advance according to the drilling diameter to avoid scratching the material or damaging the cutting edges of the cutter/bit.
  - 3) Remember that a tool with efficient cutting edges requires a pressure lower than that applied to one with which a certain number of holes have already been made.
  - 4) **When holes are made close to raised lettering on the rails, commence drilling with very light pressure** until the lettering disappears, to avoid possible breakage of the tool.
  - 5) Bear in mind that when operating on very hard rails, as in the case of quality 1100 steel, it is advisable to increase the lubrocoolant flow rate.

**3.7) BROACH CUTTERS**

These cutters rapidly produce high quality, accurate holes in a single pass. The automatic lubrocooling system reduces friction and eliminates heat build up during the drilling operation. Under standard conditions a broach cutter can drill 40-50 holes, depending on the hardness of the rail.

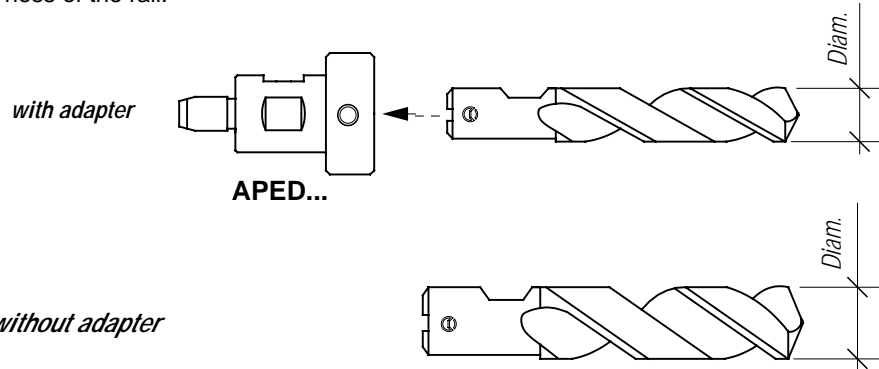


HOLE DIAMETER (inches)	BROACH CUTTER	PILOT BIT	MAX. DEPTH OF CUT (inches)
7/8"	15128	Ref. PPC 2	7/8 "
15/16"	15130		
1"	15132		
1 1/16"	15234		
1 1/8"	TSC 1 1/8"		
1 3/16"	15138		
1 1/4"	TSC 1 1/4"		
1 5/16"	TSC 1 5/16"		
1 3/8"	15144		
1 7/16"	15146		
1 1/2"	TSC 1 1/2"		
3/4"	TSC 3/4"		
7/8"	01354	Ref. PPL 2	2 "
15/16"	01355		
1"	01356		
1 1/16"	01357		
1 1/8"	01358		
1 3/16"	01359		
1 1/4"	01360		
1 5/16"	01361		
1 3/8"	01362		
1 7/16"	01363		
1 1/2"	01364		
9/16"	12218		
3/4"	3-12224		
13/16"	3-12226		
7/8"	3-12228		
15/16"	3-12230		
1"	3-12232		
1 1/8"	3-12236		

All the broach cutters allow automatic cooling by means of the **SR5000** unit supplied with the drills.

### 3.8) SPECIAL SPIRAL TWIST BITS

Using these bits guarantees optimum performance during the drilling operations. As a rule, under normal conditions, a spiral bit can drill 70-100 holes, depending on the hardness of the rail.

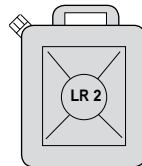


HOLE DIAMETER (inches)	SPIRAL BIT	ADAPTER	SPACER	ADDITIONAL ACCESSORIES
9/32"	PE70	APED70	included in the APED 70	not required
3/8"	PE95 C	APED 3/8 Y	included in the APED 3/8 Y	not required
1/2"	PE130	APED 130	included in the APED 130	not required
5/8"	PE160	APED135/165	included in the APED 135/165	not required
3/4"	PE190	without adapter	DPE	not required
7/8"	PE220	without adapter	DPE	not required
1/2"	PE130L-AR	APED 130	included in the APED 130	TST50 + DBG-AY
3/4"	PE3/4"-L1-AR	without adapter	DPE	TST50 + DBG-AY
7/8"	PE7/8"-L1-AR	without adapter	DPE	TST50 + DBG-AY
1"	PE1"-L1-AR	without adapter	DPE	TST50 + DBG-AY
1 1/8"	PE1-1/8"-L1-AR	without adapter	DPE	TST50 + DBG-AY
1 1/4"	PE1-1/4"-L1-AR	without adapter	DPE	TST50 + DBG-AY

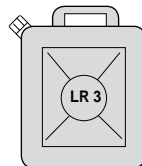
For tools of other types, check the dimensional compatibility (particularly the size of the attachment and the length).

### 3.9) "LR2" LUBROCOOLER CONCENTRATE, 1 or 5 gallons for optimum operation of both the broach cutters and the spiral bits.

This product of vegetable origin, to be watered down in the percentage 95% water, 5% oil, will provide a white colour mixture very effective for the drilling operations resulting in no heating at the rail or the drilling machines.



### 3.10) "LR 3" ANTIFREEZE CONCENTRATE of 1 or 5 gallons added to the lubrocooling mixture with the right percentage will maintain the lubrocooling mixture fluid in negative temperature conditions.



#### Every 50 hours of operation

#### 13.1.3) Checking the bolts

Check and retighten all bolts.

#### 13.1.4) Lubrication (Ref. to Figs. 27 and 28)

Lubricate the spindle support housing by means of the appropriate lubricator (18), the screw (07) of the clamping device with moving arm **DBG-Y**.

#### 13.1.5) Cleaning of the coolant filter (Ref. to Fig. 25)

The coolant system of the drilling machine is provided with anti-impurity filter; should an evident decrease of the flow of the lubrocoolant be verified, it could be necessary to clean it in the following way:

- Using a 14mm key, unscrew the coupling (02).
- Extract the filter and clean it carefully.
- Reassemble the filter into the coupling (02) as shown in the Fig. 25, fully tighten the coupling.

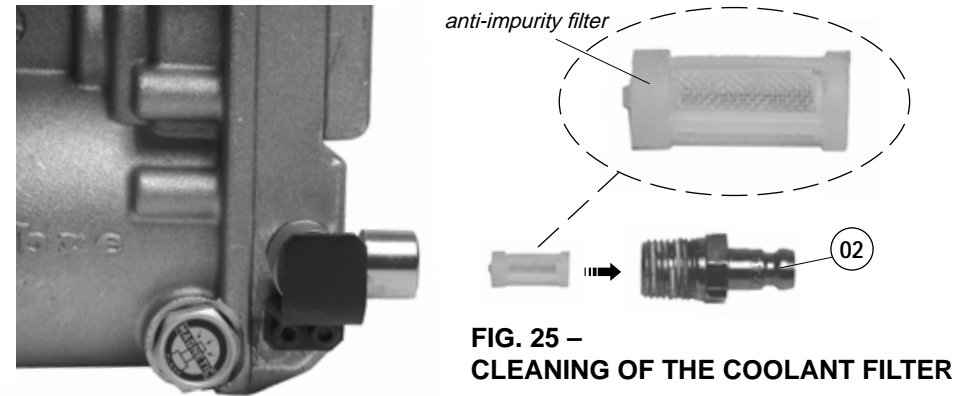


FIG. 25 – CLEANING OF THE COOLANT FILTER

### 13.2) ORDINARY MAINTENANCE OF THE MOTOR

#### Every 50 hours of operation

#### 13.2.1) Changing the brushes (Ref. to Fig. 26)

After disconnecting the power plug check the degree of wear of the brushes; if necessary replace them by proceeding as follows:

- Unscrew with a screwdriver the two screws located underneath the protective covers.
- Remove the two protective covers.
- Replace the brushes.
- Reassemble the two protective covers.
- Tighten the locking screws.

## 13. MAINTENANCE

**⚠ Before servicing or maintenance, stop the motor and disconnect the plug from the electric source**

**After first 10 operating hours, proceed with sump oil change, as follows:**

(Ref. to Fig. 28)

- Remove the cap with the magnetic insert (21).
- Remove oil filler cap (07).
- Make sure that all the oil comes out by slightly tilting the drill.
- Clean up the cap (21) (see § 13.1.2).
- Reassemble the cap (21).
- Fill the sump with oil to the level indicator (see § 13.1.1) using the oil supplied with the drilling machine; it will be necessary to use about 4.7 fl oz oil.
- Replace the filler cap (07).

**13.1) ORDINARY MAINTENANCE OF THE MACHINE** (Ref. to Figs. 24 and 28)

Every 20 hours of operation

### 13.1.1) Topping up oil

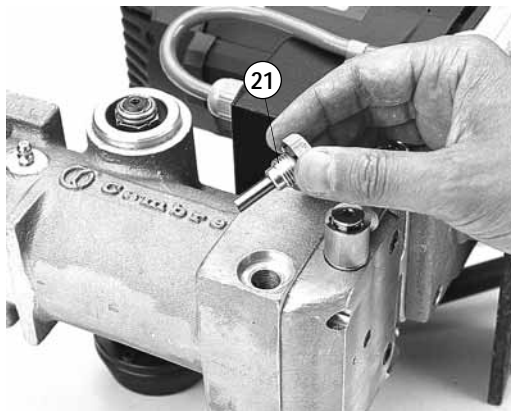
With the drill switched off and placed on a flat surface, check the oil level in the crankcase by looking through the appropriate transparent inspection cover (13).

The level must be approximately half way up the cover; if the level is low top up the oil by unscrewing the cover (07) at the top of the crankcase and adding the quantity of oil required.

**Only use the oil grade recommended in § 1.  
Never use regenerated or used oil.  
The oil must be clean.**

### 13.1.2) Removal of metallic residue from the crankcase

When the drill is positioned as shown in Fig. 24 unscrew the appropriate cap, with magnetic insert (21) on which any metallic residue will have collected. Carefully clean the magnetic insert with a clean rag and screw it back in the appropriate housing.



**FIG. 24 – REMOVAL OF METALLIC RESIDUE**

## 4. Type SR5000 COOLANT UNIT (Ref. to Fig. 3)

The type SR5000 coolant unit consists of a tank complete with tube and maximum pressure valve (01), fitted with a pump device for pressurisation, which must be connected to the attachment (35) on the drill by means of its quick-coupling (03).

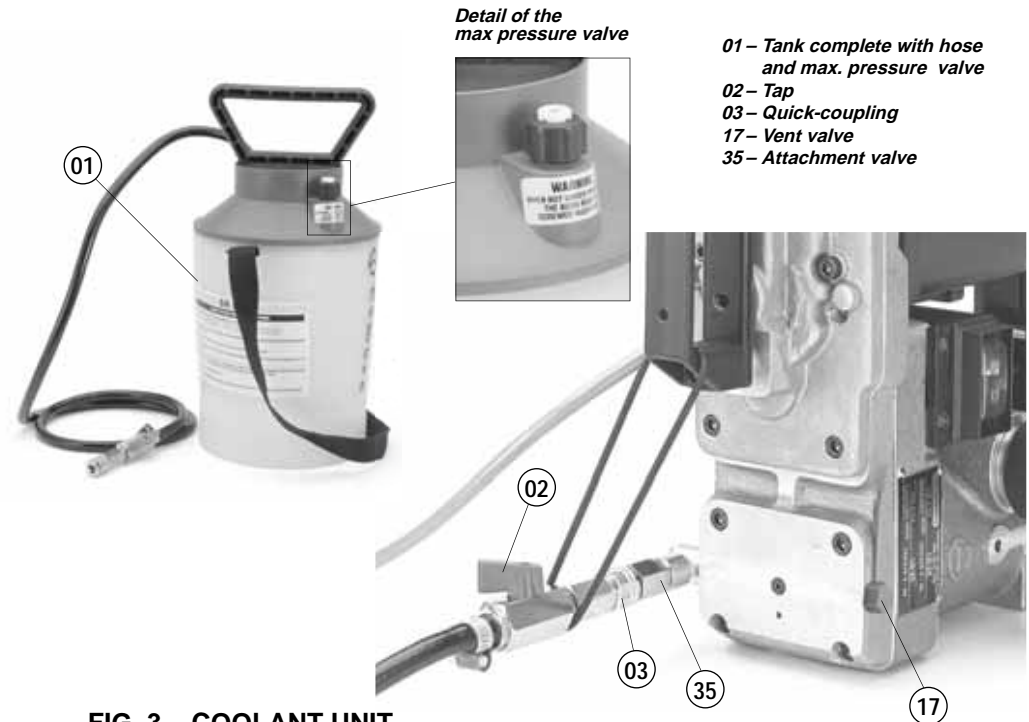
**The delivery and shut-off of the lubrocoolant are controlled automatically, when drilling with a broach cutter, from the position of the guide bit; when drilling with a spiral bit, delivery and shut-off of the fluid must be effected manually by operating the tap (02).** The use of the lubrocoolant supplied by **Cembre**, in the recommended concentrations, guarantees optimum use of the drilling tools.

**Consumption of the lubrocoolant depends both on the variable degree of opening of the tap (02) and the inner pressure of the tank: it is therefore advisable to open the tap a little when the tank is at maximum pressure, while it must be fully opened when the pressure in the tank is low.**

When using the coolant system, pay careful attention to the instructions on the tank label.

**Warning:**

- **When the tank is not under pressure, check that the bush on the maximum pressure valve is screwed right down.**
- **To fill tank with lubrocoolant, turn handle anticlockwise approximately 2 turns to release handle locking mechanism. Remove handle/piston assembly from tank.**



**FIG. 3 – COOLANT UNIT**

- The drill is equipped with a coolant attachment valve (35) and a vent valve (17) which are located as shown (Fig. 3).  
If under certain operating circumstances they need to be interchanged, proceed as follows:

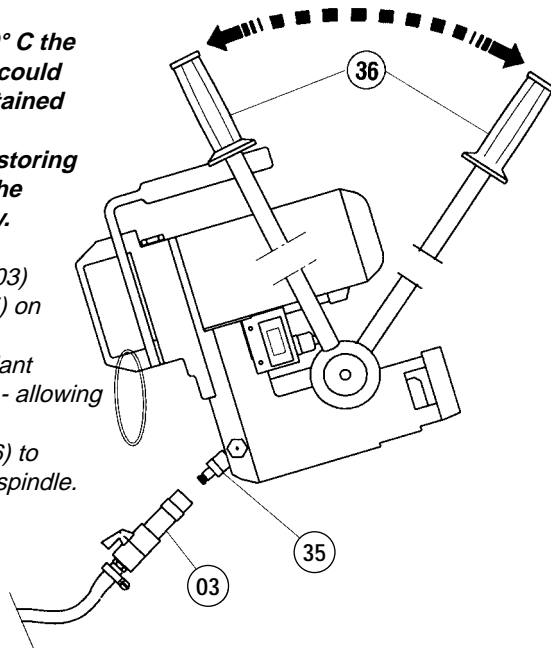
- Using a 17 mm hexagonal spanner unscrew the vent valve from its seat.
- Using the 4 mm allen key provided with the drill, remove the appropriate coolant valve from its seat and fit into the vent valve seat.
- Fit the vent valve into the removed coolant valve seat.

- When temperatures fall below 0° C the lubrocoolant may freeze which could cause damage to the seals contained in the drill coolant system.

It is therefore advisable, when storing the drilling machine, to empty the lubrocoolant system completely.

Proceed as follows (Fig. 4):

- Disconnect the quick coupling (03) from the coolant attachment (35) on the drilling machine.
- Tilt the machine so that the coolant attachment is at its lowest point - allowing for natural drainage.
- Operate the advancing lever (36) to advance and retract the drilling spindle.
- Gently shake the machine to expel all fluid.



#### 4.1) ARE adaptor

For use with type **SR5000 coolant unit**. The **ARE** adaptor is inserted in the quick-coupling of the tank tube (refer to Fig. 5), it may be used to provide manual external cooling when cutters are used to enlarge existing holes, or when using spiral bits not designed for automatic cooling.

If necessary the **ARE** adaptor can also be used to clean various parts of the drill, by means of the lubrocoolant pressure jet, e.g. parts such as the tool clamping seat in the spindle shaft, seats for the fixing screws, etc.



FIG. 5 – ARE ADAPTOR

## 12. WARNINGS

- 12.1) Always disconnect the electrical supply when working on the drill to replace cutters, bits, positioning jigs and/or end pieces for maintenance.
- 12.2) Regularly check for correct tightening (torque) of the fixing screws of the drilling tools and positioning shoes.
- 12.3) Avoid pressure jolts on the advancing lever during drilling.
- 12.4) Always make sure that the drilling swarf is properly removed before starting to drill a new hole.
- 12.5) Incomplete clamping of the drill on the rail to be drilled may lead to the breakage or accelerated wear of the drilling tool and damage to the spindle shaft bearings.
- 12.6) If it is necessary to operate the drill without the cutter inserted, remove the locking grub screws from the spindle shaft.
- 12.7) Avoid leaving the **SR5000** tank under pressure and exposed to sunlight for long periods of time.
- 12.8) Should the **DBG-Y** clamping device be removed, make sure that by reassembling it, the 2 locking screws with 4 washer are firmly fastened.

## 11. STORING THE RAIL DRILL

When work has been completed, store the drill by proceeding as follows:

- 11.1) Depressurise the tank of the **SR5000** coolant unit (see § 4), close the tap (02) on the hose and disconnect the quick-coupling (03).
- 11.2) Carefully clean the machine, particularly in the spindle area, removing machining waste (swarf, etc.) and any deposits of lubrocoolant.
- 11.3) Fully withdraw the spindle.
- 11.4) Place the rail drill and the SR5000 coolant unit in a sealed place free from dust, moisture and the risk of accidental impact.

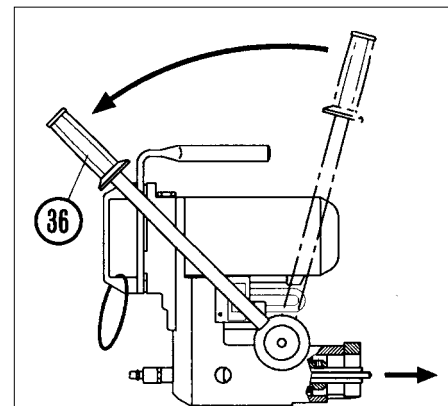
For better protection **Cembre** recommends the use of the **VAL LD** metal case designed for this purpose (see § 3.3). The DBG-Y moving arm device allows the drill to be housed and locked in the case. A suitable housing is also provided in this **VAL LD** for the **VAL MPA** box containing the most commonly used accessories.



FIG. 23 - STORAGE CASE

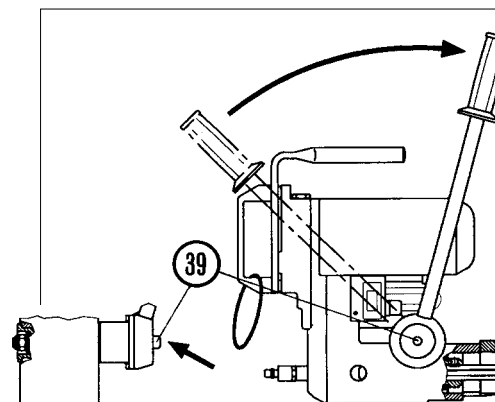
## 5. SPINDLE ADVANCE LEVER (Ref. to Fig. 6)

The spindle is advanced by moving the lever (36) (See Fig. 6 a). The lever is fitted with a release pawl (39) which, when pressed, renders it independent of the hub and hence the spindle; the operator can therefore easily vary the angular position of the lever without movement of the spindle (Fig.6).

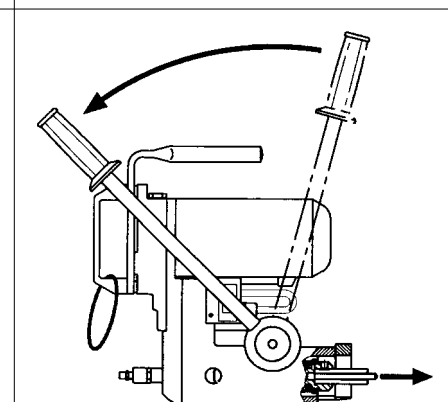


6a - Moving the lever (36) towards the operator; corresponding advance of the spindle.

FIG. 6



6b - With the release pawl (39) pressed, the lever is released from its hub and can repeat the previous travel without the spindle moving.



6c - With the hub released, moving the lever towards the operator causes a corresponding advance of the spindle.

### 5.1) Adjustment of the advance lever

The movement of the lever **must never be loose**, for adjustment proceed to tighten it by loading the cup springs by means of the associated self-locking nut, after removing the protective cap (see Fig. 7).

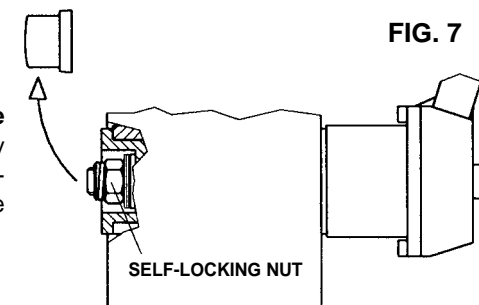


FIG. 7



## 6. PREPARING THE RAIL DRILL

### 6.1) Assembling the broachcutters (Ref. to Figs. 8-11)

6.1.1) Insert the pilot bit in the cutter from the side of the spigot.

6.1.2) Using the lever (36), position the spindle shaft (07) so that both grub screws (18) become accessible and sufficient space is provided to insert the cutter; if necessary rotate the spindle shaft manually and sufficiently by inserting the 4 mm male hexagon key in the appropriate intermediate gear housing (30) in the crankcase of the drill corresponding to the feed handle (71) (see Fig. 11).

6.1.3) Insert the cutter in the spindle shaft so that the two engaging dogs on the cutter spigot line up with the grub screws.

6.1.4) Clamp the cutter by fully tightening the grub screws by means of the 4 mm male hexagon key.

6.1.5) Check that the guide bit slides freely by applying slight pressure on it.

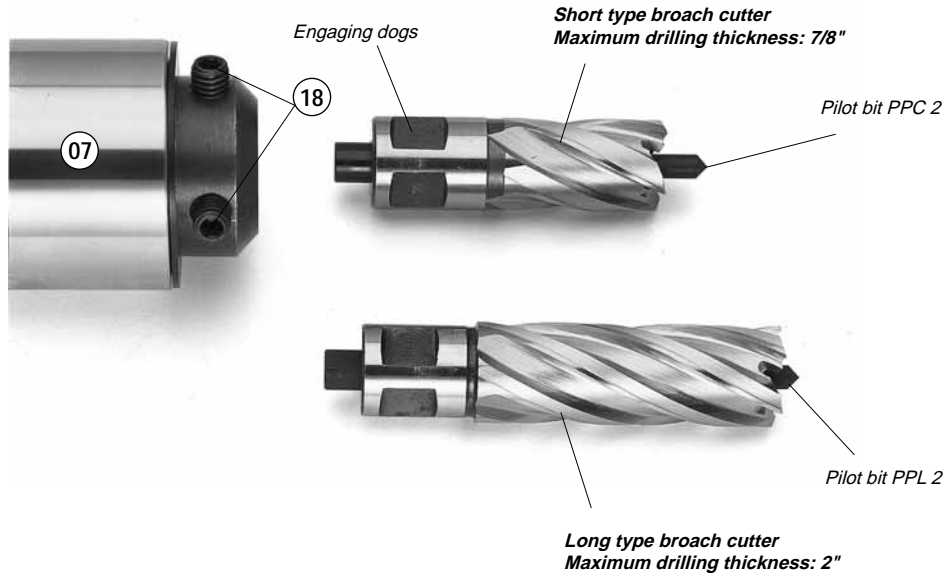


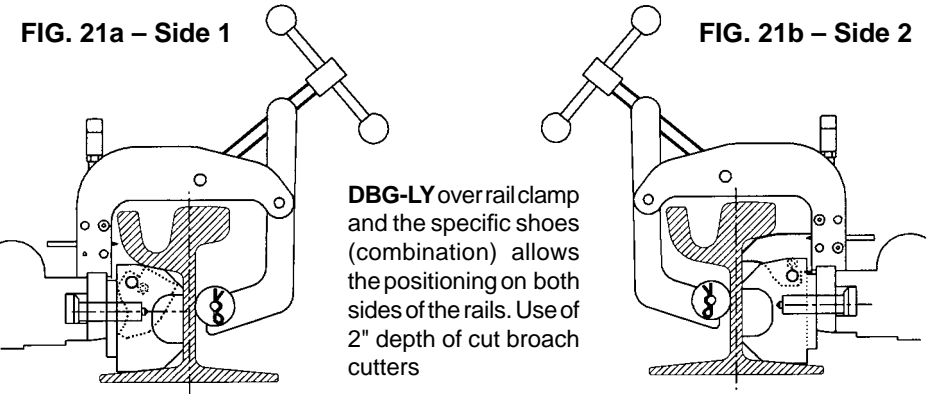
FIG. 8 – ASSEMBLING THE CUTTERS

### 6.2) Assembling the special spiral bits (Ref. to Figs. 9 - 11)

6.2.1) Using the advance lever, position the spindle shaft so that both grub screws become accessible and sufficient space is provided to insert the spiral bit; if necessary rotate the spindle shaft manually and sufficiently by inserting the 4 mm male hexagon key in the appropriate intermediate gear housing in the crankcase of the drill corresponding to the feed handle (71) (see Fig. 11).

## 9. EXAMPLE OF SPECIAL RAIL DRILL APPLICATIONS

– Use on girder rail (Ref. to Fig. 21 a-b, example for 128 GR or GGR 118)



– Use on running rails (Ref. to Fig. 22)  
(narrow passage of the articulated arm)  
**Drilling by the guard rail DBG-GR**  
over rail clamp equipped with TDB 1 termination.

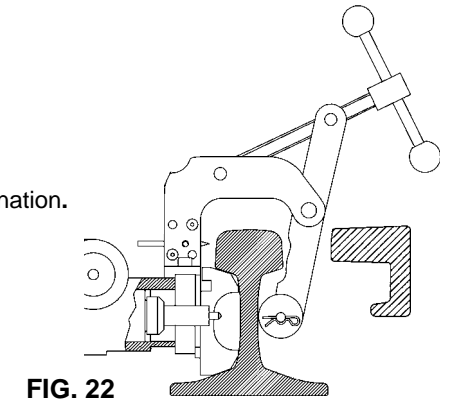


FIG. 22

## 10. SPECIAL APPLICATIONS FOR Cembre RAIL DRILLS

APPLICATION	CLAMP	TEMPLATE	CUTTERS	EXTENSION	PILOT BIT
UIC 69*	DBC	AAT	2"	PFA	PPL4
150 LB	TST 50 + DBG-AY	MPAF 150 LB-3Y	3"	PFA 1	PPDF2
Aluminum-Rail- Aluminum COMPOSITE	TST 50 + DBG-AY	MPAF 56 CF COMP <sup>1</sup> MPAF 84 CF COMP <sup>2</sup> MPAF 84 CP COMP <sup>3</sup> MPAF 85 LB ASCE	PE 130-LAR (1/2" HOLE DIAM) PE 3/4"-L1AR (3/4" HOLE DIAM) PE 7/8"-L1AR (7/8" HOLE DIAM) PE 1"-L1AR (1" HOLE DIAM) PE 1 1/4"-L1AR (1 1/4" HOLE DIAM) PE 1 1/8"-L1AR (1 1/8" HOLE DIAM)		

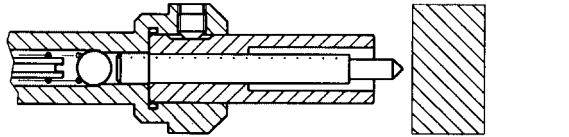
. = Application developed for narrow chairs

1 = For drilling 56 lb aluminium bar manufactured by FOSTER

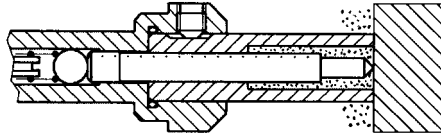
2 = For drilling 84 lb aluminium bar manufactured by FOSTER

3 = For drilling 84 lb aluminium bar manufactured by PORTER

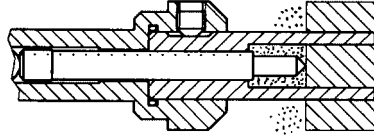
Approach



Start drilling  
with discharge of  
lubrocoolant



Drilling



Finish drilling  
with removal of swarf and  
switching off of  
lubrocoolant

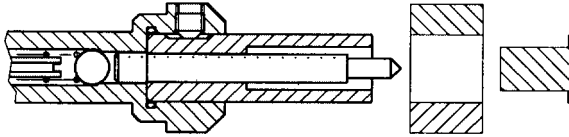
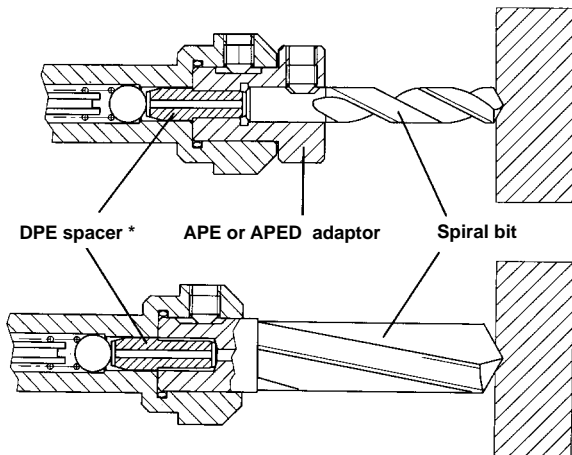


FIG. 20 – COOLING DRILLING WITH BROACH CUTTER

8.3) Rail drill fitted with special spiral bit

Follow the sequence described in § 8.1, taking care to position the rail drill on the rail by keeping the **spindle fully withdrawn**. Bear in mind that the cooling circuit, instead of being automatically opened and closed by the pilot bit, is kept open at all times by the **DPE** spacer fitted on the spigot of the spiral bit; it must therefore be activated, by opening the tap (02), before starting to drill, then switched off after drilling by closing the tap.



\* use only for APE, not required for APED

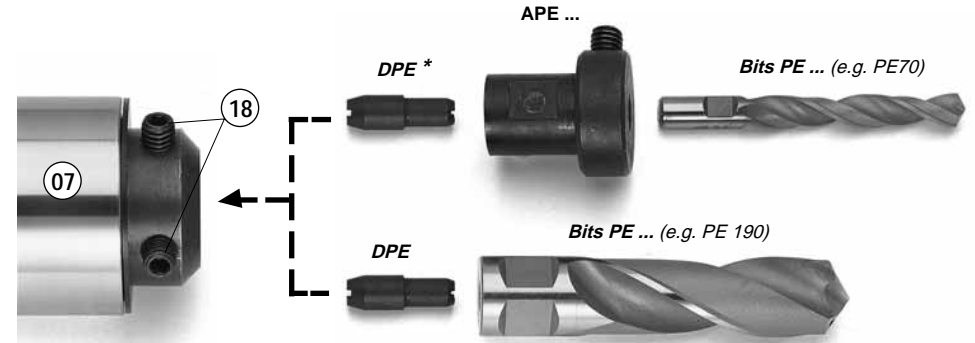
FIG. 20a – COOLING DRILLING WITH SPIRAL BIT

6.2.2) Insert into the spindle shaft, the **DPE** spacer required to activate the coolant system. If it is necessary to use an **APE...** adaptor, the bit must first be fitted into the corresponding **APE** adaptor and locked with the appropriate grub screw, then the **DPE** spacer inserted.

**Note: Adaptors type APED... (e.g. APED 3/8Y) do not require use of DPE spacer.**

6.2.3) Insert the bit-spacer unit in the spindle shaft so that the two engaging dogs on the bit spigot line up with the grub screws. **Press the bit-spacer unit home against the inner seat of the spindle: this will enable the DPE spacer to open the coolant circuit** (see Fig. 10).

6.2.4) Clamp the bit by fully tightening the two grub screws (18) using the 4 mm male allen key.



\* use only for APE..., do not required for APED...

FIG. 9 – ASSEMBLING THE SPIRAL BITS

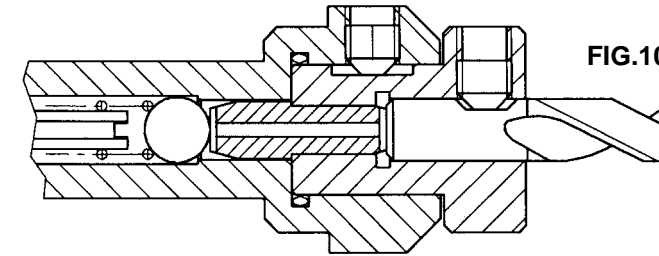


FIG.10 – ASSEMBLING THE BIT-SPACER UNIT



FIG. 11 – MANUAL SPINDLE ROTATION



## 7. TYPE LD-2EY RAIL DRILL

The reference **LD-2EY** relates to the entire LD-2ENY rail drill complete with the clamping device **DBG-Y** for clamping it to the rail web and the track fittings (Ref. to Fig. 12).

The **DBG-Y** device consists of:

- Clamping unit.
- Type **TDB 6** termination.
- Socket head cap screws **M8 x 25** (2 pcs).
- Spring washers (4 pcs).
- Reference pin.



*M 8x25 screws  
and spring washers*

FIG. 12 – RAIL DRILL LD-2EY

- 8.1.5) Proceed to drill by initially applying light pressure on the lever (36), increasing the pressure progressively, avoiding jolts, and finally relieving the pressure in the exit phase. When drilling close to raised markings on the rail the initial pressure must be extremely light until the markings disappear, otherwise the cutter may be damaged.
- 8.1.6) The pilot bit will enable the lubrocoolant to be discharged throughout the drilling process.
- 8.1.7) When drilling has been completed, fully retract the spindle, **stop the motor by pressing the automatic switch (position "0")**, and make sure that drilling swarf is removed before recommencing drilling.
- 8.1.8) After drilling it is advisable to remove all swarf from the tool and spindle area.

8.2) Rail drill fitted with "long" type broach cutter (depth of cut 2"). Follow the sequence described in § 8.1, taking care to position the drill on the rail by keeping the spindle fully withdrawn.

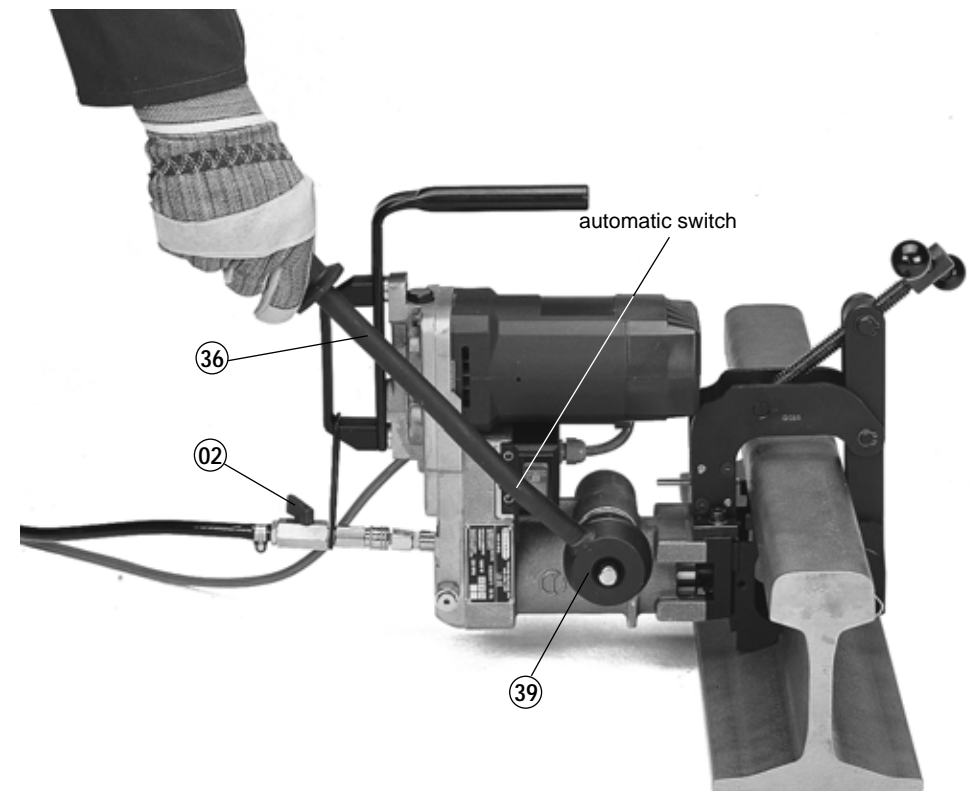


FIG. 19 – DRILLING

## 8. DRILLING (Ref. to Figs. 17 - 18 -19)

- ⚠ **Make sure that the mains voltage value corresponds to the value on the machine rating plate.**
- ⚠ **Switch on the cooling system before starting the rail drill (§ 4).**

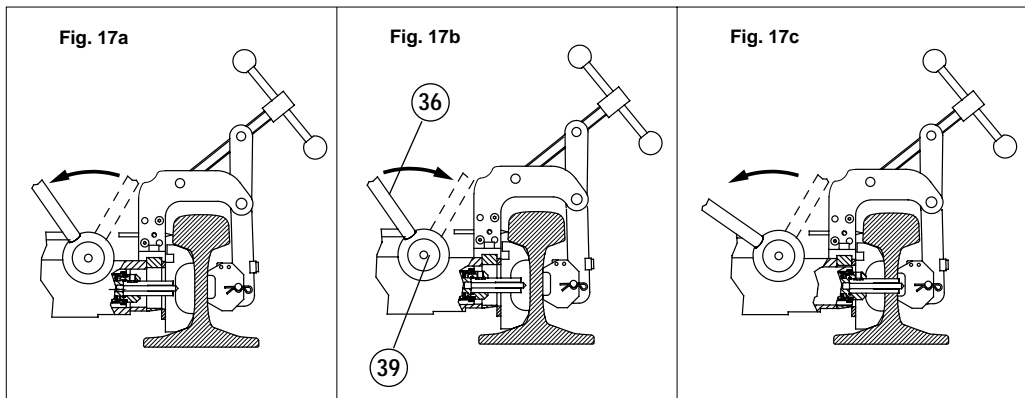
### 8.1) Rail drill fitted with “short” type broach cutter (depth of cut 7/8")

The drilling sequence may be started with the drill fitted with the broach cutter (§ 6.1), positioning shoe (§ 7.3), the drill being clamped to the rail (§ 7.4), as follows:

**8.1.1)** Connect the female quick-coupling of the **SR5000** coolant system to male coupling (35) on the drill.

**8.1.2)** Open the tap (02) fitted on the tank tube.

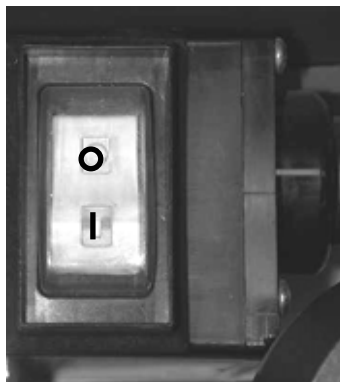
**8.1.3)** Using the lever (36) bring the guide bit almost in contact with the rail (Fig. 17a); keeping the release pawl (39) pressed, release the lever from its cup and return it to the initial position (Fig. 17b), which will enable the travel of the lever (36) to be used in the most advantageous way.



**8.1.4)** Connect the electric plug and press the automatic switch (position "I") (Fig. 18)

⚠ **CAUTION:** the automatic switch is equipped with protection against motor overheating and with an underpower relay; should the motor overheat or there is a fall in voltage below the relay cut-out setting, the switch will move into the "0" position. At this stage, if the conditions are correct, the switch will have to be re-set manually.

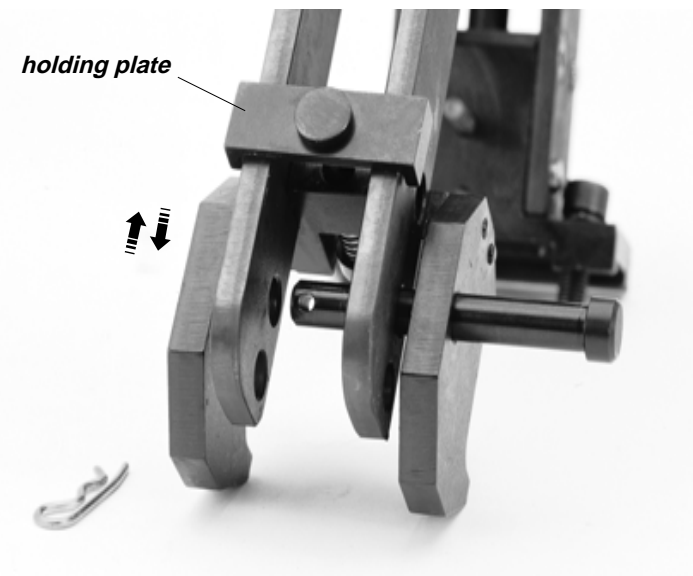
**FIG. 18  
AUTOMATIC SWITCH**



### 7.1) Assembling of the termination of the DBG-Y device with moving arm for clamping the drill to the rail web and track fittings.

The termination **TDB 6** of the **DBG-Y** device, with moving arm, have been designed for adaptation to the different operating conditions on the rails and track fittings; their assembly is shown in Fig. 13.

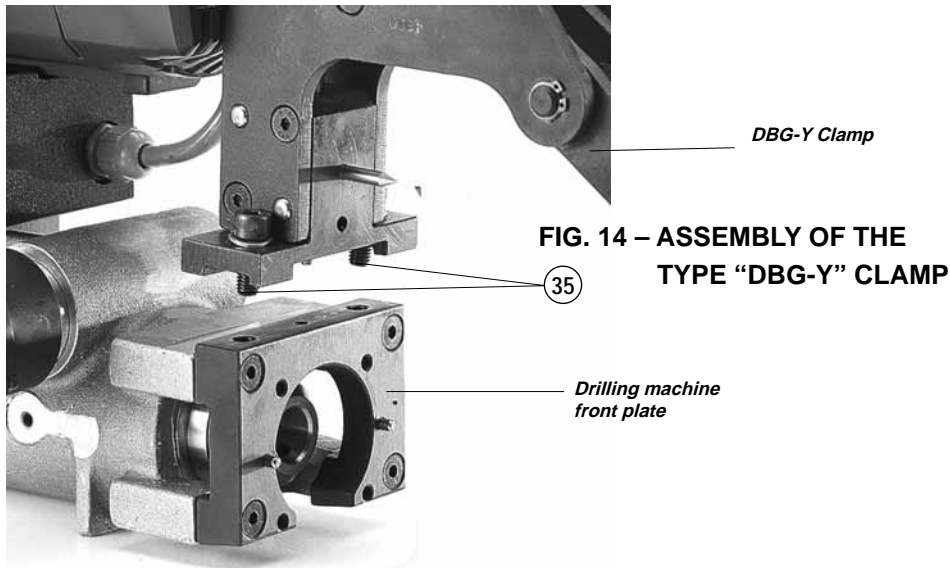
- **When disassembling the TD termination ensure that, after removing the pivot, the complete assembly is slid away downward without acting on the holding plate.**



**FIG. 13 – ASSEMBLY OF THE TERMINATION**

### 7.2) Assembly of the DBG-Y clamping device on the drill

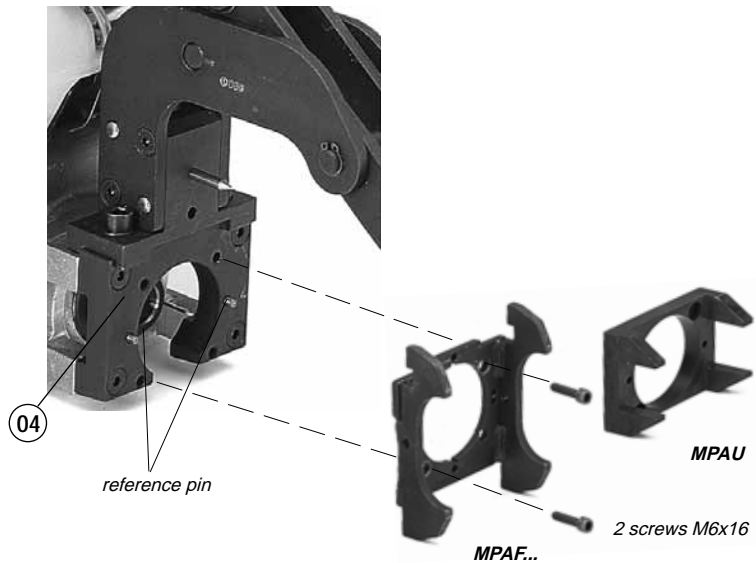
The **DBG-Y** clamping device is fitted to the front plate of the drill, centred by means of the reference pin supplied and secured with the two socket head cap screws **M8x25** (35) also supplied. The assembly is illustrated in Fig. 14.



**FIG. 14 – ASSEMBLY OF THE TYPE ‘DBG-Y’ CLAMP**

**7.3) Assembly of the positioning shoes (Ref. to Fig. 15)**

**7.3.1)** The type **MPAF ..** and **MPAU** positioning shoes are secured to the front plate (04) of the drill by means of the two socket head cap screws **M 6x16** supplied.



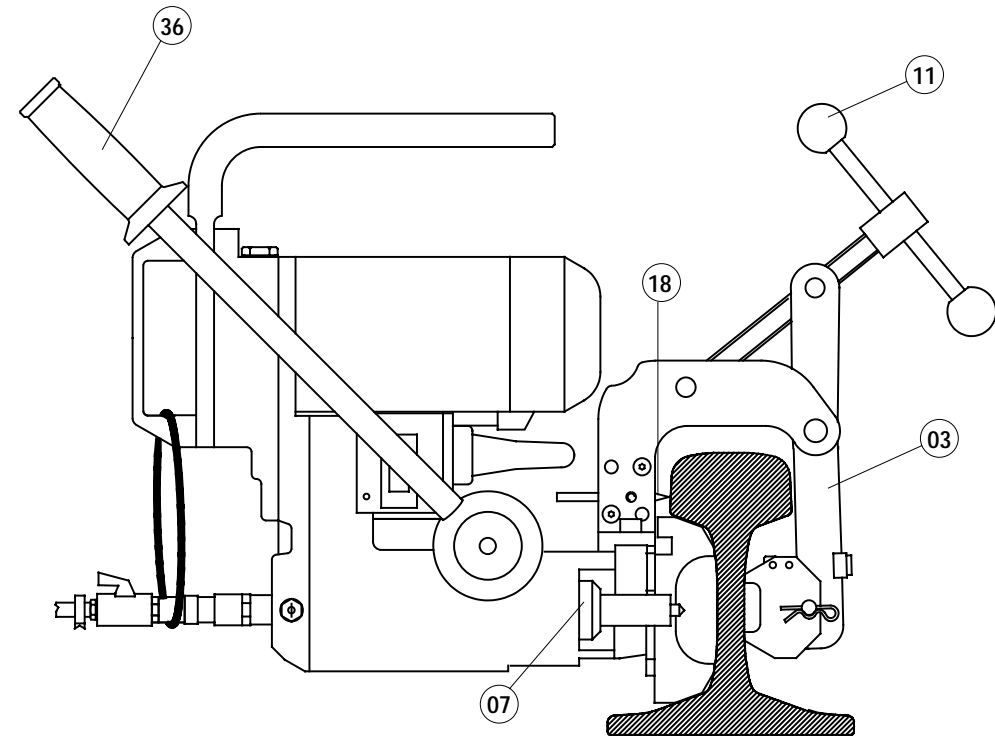
**FIG. 15 – ASSEMBLY OF THE POSITIONING SHOES**

**7.4) Clamping to the rail web (Ref. to Fig. 16)**

The special shape of the positioning shoes, each corresponding to the type of rail, enables the drill to be positioned quickly, accurately and safely on the element to be drilled.

To position the drilling machine, complete with the clamping termination (§ 7.1) and the positioning template (§ 7.3) suitable for the type of rail to be drilled, proceed as follows:

- 7.4.1)** Withdraw the spindle shaft (07) completely by means of the lever (36).
- 7.4.2)** Bring the moving arm (03) of the clamping device into the fully open position by means of the handwheel (11).
- 7.4.3)** Place the machine on the rail at the point where the drilling is to be carried out, and **clamp it by tightening the handwheel (11) right down**: the positioning shoe will automatically position the cutter or spiral bit in line with the desired axis; if accurate positioning relative to the longitudinal axis of the rail is required, use the reference pin (18).



**FIG. 16 – POSITIONING OF THE RAIL DRILL**