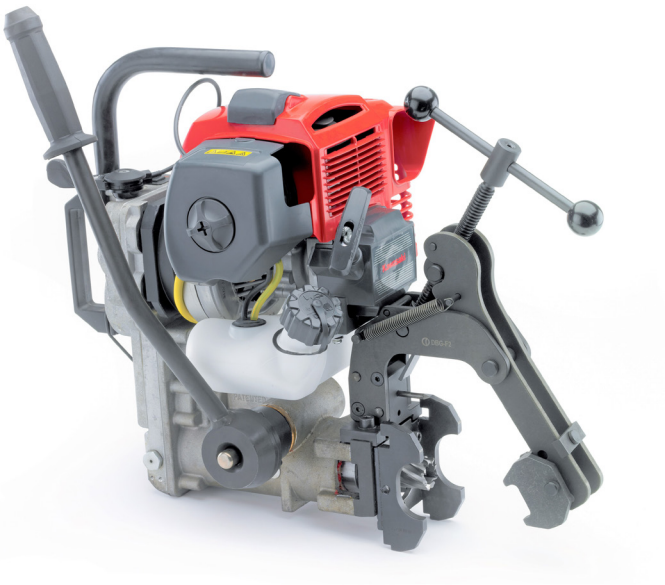
CEMBRE

RAIL DRILL

LD-1PY-ECO



ENGLISH

OPERATION AND MAINTENANCE MANUAL
(Translation of the original instructions)

12M007U_0124_6261140

WARNINGS

- **Before using the drill, carefully read the instructions contained in this manual. SAVE THESE INSTRUCTIONS: this manual contains important safety and operating instructions for the drill.**
- **STOP THE ENGINE when servicing the drill: before removing the broach cutters, spiral bits, positioning templates etc.**
- **During operation keep hands away from the danger zone.**
- **Always wear protective glasses and work gloves.**
- **Avoid wearing clothes which may present a risk to personal safety.**

Ref. LD-1PNY-ECO:

basic drill without clamping device (Fig. 1).

FIG. 1

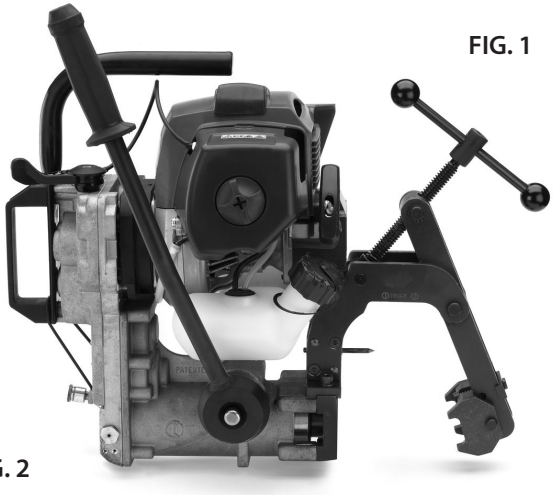


FIG. 2

Ref. LD-1PY-ECO:

(LD-1PNY-ECO + DBG-Y) basic drill complete with railweb clamping device type DBG-Y (Fig. 2).

1. GENERAL CHARACTERISTICS

– **Drilling capacity:** ..... Ø 9/32" to 1 9/16"
(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 1-9/16" on rails up to 2 3/4" thick)

– **Speed without load:** ..... n° 270 rpm

– **Combustion engine:**

Type: ..... Forced air cooled, 2 cycle, horizontal shaft, single cylinder
Model: ..... KAWASAKI TJ45E
Displacement: ..... 45.4 cm^3
Power (SAE J1349): ..... 1.4 kW (1.9 hp) / 7500 rpm
Fuel tank capacity: ..... 0.24 US gal (0.9 litres)
Clutch: ..... centrifugal with automatic intervention
Starter: ..... recoil sarter (with spring damper)
Ignition: ..... solid state ignition (C.D.I. type)
Spark plug: ..... NGK BPMR7A or equivalents
Fuel: ..... 2% (1:50) oil/gasoline mixture (see § **12**)
Fuel consumption: ..... 470 g/kW.hr / 350 g/hp.hr
Emissions: ..... according to "Phase 2" EPA regulation engines class V and European Directives 97/68/EC, 2001/63/EC and 2002/88/EC

– **Weight:** ..... 34.5 lbs

– **Weight:** with **"DBG-Y"** clamping device ..... 41.5 lbs

– **Gear sump:**
Recommended oil: ..... MOBIL SUPER MULTIGRADE 10-30-SAE *or*
ESSO UNIFARM 10 W 30 *or equivalent*

– **Acoustic noise (Directive 2006/42/EC, annexe 1, point 1.7.4.2 letter u)**
– The weighted continuous acoustic pressure level equivalent A at the work place L_{pA} is equal to ..... 99.5 dB (A)
– The maximum value of the weighted acoustic displacement pressure C at the work place L_{pCPeak} is equal to ..... 116.3 dB (C)
– The acoustic power level emitted by the machine L_{WA} is equal to ..... 107.6 dB (A)

– **Risks due to vibration (Directive 2006/42/EC, annexe 1, point 2.2.1.1)**
Tests carried out in compliance with the indications contained in EN ISO 5349-1/2 Standard and under operating conditions much more severe than those normally found, certify that **the weighted root mean square in frequency of the acceleration the upper limbs are exposed is 4.36 m/sec² max.**

2. ACCESSORIES SUPPLIED WITH THE DRILL

2.1) Guide bits for controlling the coolant system:
for broach cutters suitable for drilling thickness up to 25 mm
PP 1 (1 pc) diameter 7 mm.
PP 2 (1 pc) diameter 8 mm.
for broach cutters suitable for drilling thickness up to 50 mm
PPL 1 (1 pc) diameter 7 mm.
PPL 2 (1 pc) diameter 8 mm.

2.2) Spacer, type DPE, (1 pc) for controlling the coolant system, use with APE adapter for special spiral bits.

2.3) Adapter, type ARE (1 pc) for external coolant connection, use with SR5000 coolant unit.

2.4) Grub screw, M8x10 (1 pc as a spare) for securing broach cutters or spiral bits with Weldon shank on spindle shaft.

2.5) Transverse threaded pin (1 pc as a spare) for securing broach cutters or spiral bits with push/turn shank on spindle shaft.

2.6) Wing nuts (2 pcs) complete with fixing washer for securing positioning inserts type KPAF to front plate.

2.7) Screws M6x16 (4 pcs) for securing positioning templates to front plate.

2.8) Screws M6x25 (4 pcs) for securing special positioning templates type MPD... & MPR... to front plate.

2.9) Range of tools:
5 mm **Allen key** (1 pc)
6 mm **Allen key** (1 pc)
4 mm **T-handle Allen key** (1 pc)
1 pc **spark plug key**
Brush (1 pc)

2.10) Measuring cup for preparing the mixture.

2.11) 3.4 fl oz (100 ml) oil bottle for gear sump.

(Accessories from pos. 2.1 to pos. 2.8 are included in the **"Kit of accessories"** having the code **6001356**).

2.12) Type SR5000 cooling unit.

3. OPTIONAL ACCESSORIES (to be ordered separately)

3.1) "DBG-Y" device with moving arm for clamping the drill to the rail web and track fittings, complete with the **TDB 6** termination.
This device is supplied with the drill type LD-1PY-ECO


TDB 6


TDB 3

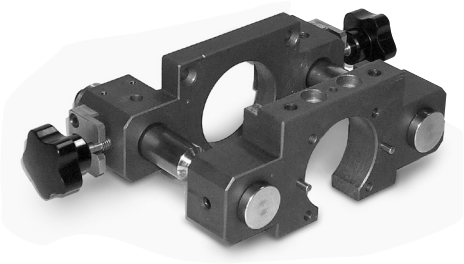
3.1.1) "DBG-LY" device specific for clamping the drill to the girder rails (for example 128 GR or GGR 118, Ri60).
With the specific shoes allows the positioning on both sides of the rails, complete with the **TDB 3** termination.

3.1.2) "DBG-GR" device for clamping the drill in correspondance of guard rail, complete with the **TDB 1** termination.
This device is supplied with the drill type LD-1PYGR-ECO.

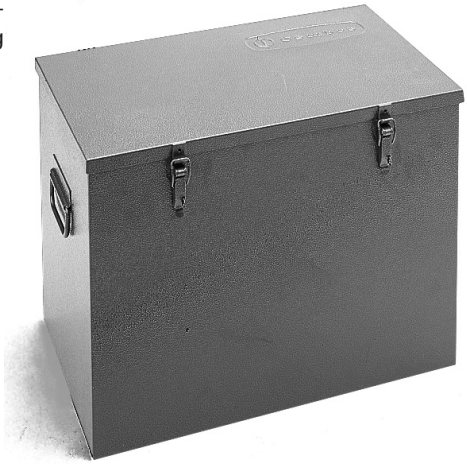

TDB 1

3.1.3) DBSN device for clamping the drill to flange rails, for use in conjunction with the MPAF rail shoes.
Using this device the rail drill can remain clamped in the drilling position even when trains pass over it.

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).

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

Suitable for positioning the drill on running and guard rails

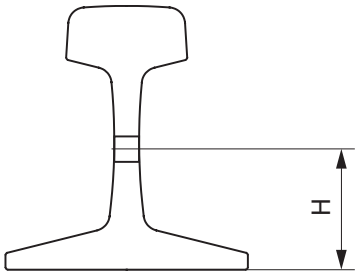
Enable the automatic position of the machine onthe drilling axis (H) of each specific rail.

• Note: Please contact CEMBRE for other types of rail.

RAIL SHOES DRILLING ON RUNNING RAILS

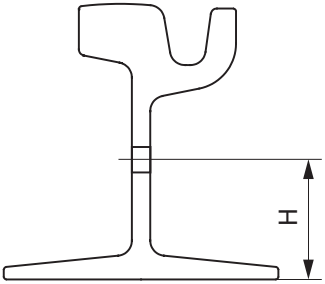
TYPE OF RAIL	H (inches)	RAIL SHOE
40 LB ASCE	3 1/16"	**MPAF 40 LB ASCE**
60 LB ASCE	3 1/16"	**MPAF 60 LB ASCE**
80 LB ASCE	2 3/16"	**MPAF 80 LB ASCE**
85 LB ASCE	2 17/64"	**MPAF 85 LB ASCE**
85 LB PRR	2 1/16"	**MPAF 85 LB PRR**
85 LB PS	2 15/64"	**MPAF 85 LB PS**
90 LB ARA-A	2 9/16"	**MPAF 90 LB ARA-A**
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 ***

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



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**

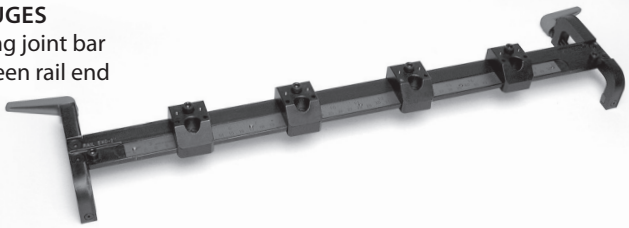


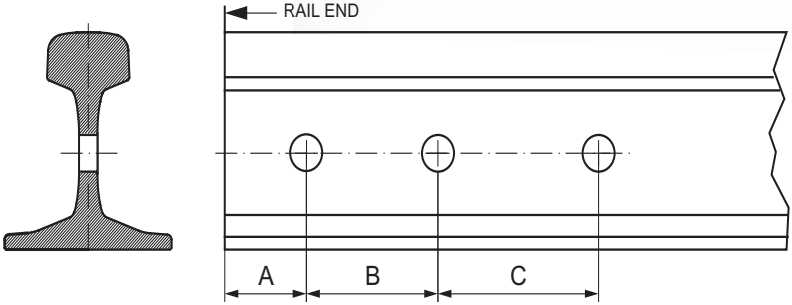
RAIL SHOES DRILLING ON GIRDER RAILS

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**

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
MRF Y10	2 21/32"	7 1/4"	5 1/2"
	3 1/2"	6"	6"
MRF Y11	2 21/32"	7 1/4"	5 1/2"
	3 1/2"	4 3/4"	4 3/4"
MRF Y12	2 23/32"	6"	7"
	3 1/2"	6"	6"
MRF Y13	3"	6"	-
	2 7/16"	5"	-
MRF Y14	2 7/16"	7"	-
MRF Y15	2 3/8"	7"	-
	2 3/4"	6 3/4"	6 3/4"
MRF Y16C	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.

3.7) BROACH CUTTERS

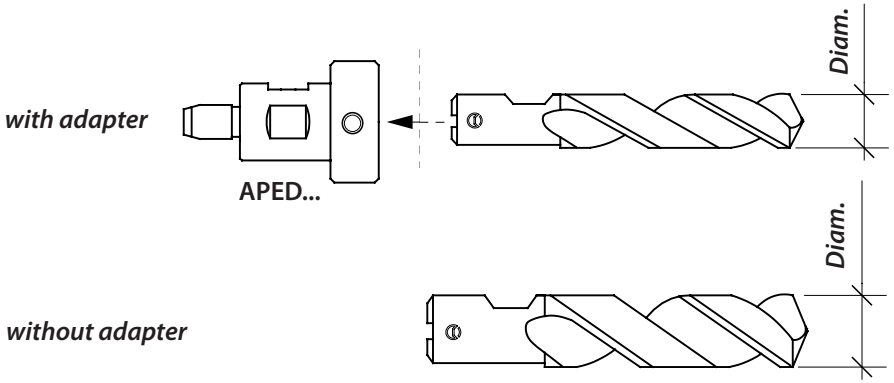
These cutters rapidly produce high quality, accurate holes in a single pass. The automatic lubrocooling system reduces friction and eliminates heat build up during the drilling operation. Under standard conditions a broach cutter can drill 40-50 holes, depending on the hardness of the rail.

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**	**3-10528**	3 "
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

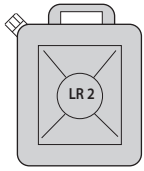
Using these bits guarantees optimum performance during the drilling operations. As a rule, under normal conditions, a spiral bit can drill 70-100 holes, depending on the hardness of the rail.



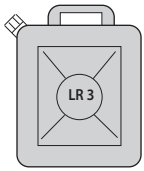
HOLE DIAMETER (inches)	SPIRAL BIT	ADAPTER	SPACER	ADDITIONAL ACCESSORIES
9/32″	**PE70**	APED70	included in the APED 70	not required
3/8″	**PE95 C**	APED 3/8 Y	included in the APED 3/8 Y	not required
1/2″	**PE130**	APED 130	included in the APED 130	not required
5/8″	**PE160**	APED135/165	included in the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



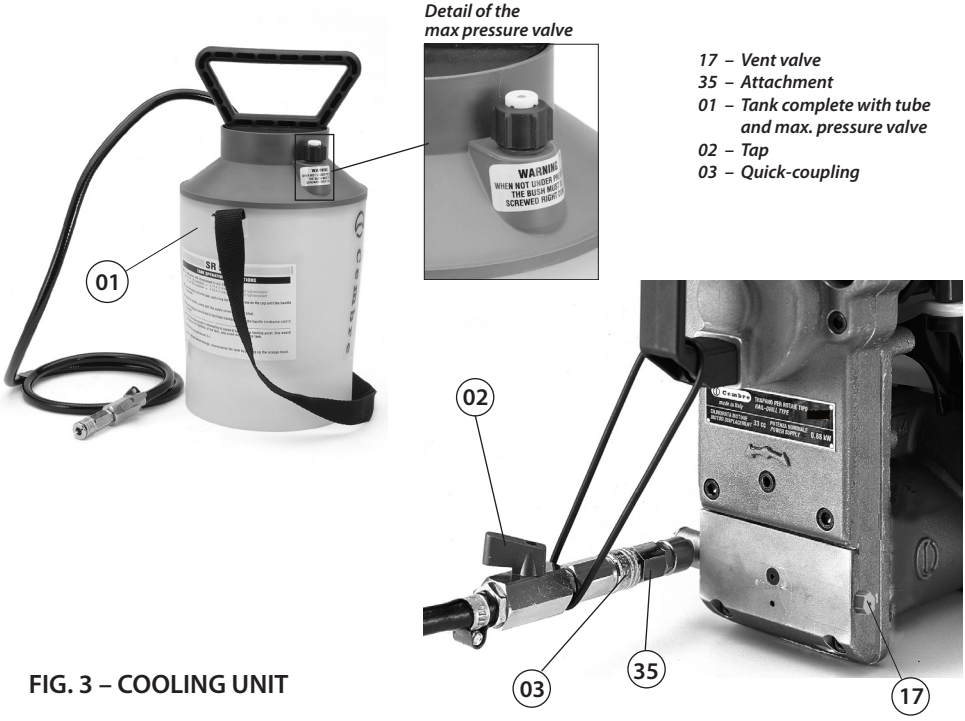
4. TYPE SR5000 COOLANT UNIT (Ref. to Fig. 3)

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, by 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.***



17 – Vent valve
35 – Attachment
01 – Tank complete with tube and max. pressure valve
02 – Tap
03 – Quick-coupling

FIG. 3 – COOLING 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 into the vacant coolant valve seat.

- ***When temperatures fall below 32° F (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.

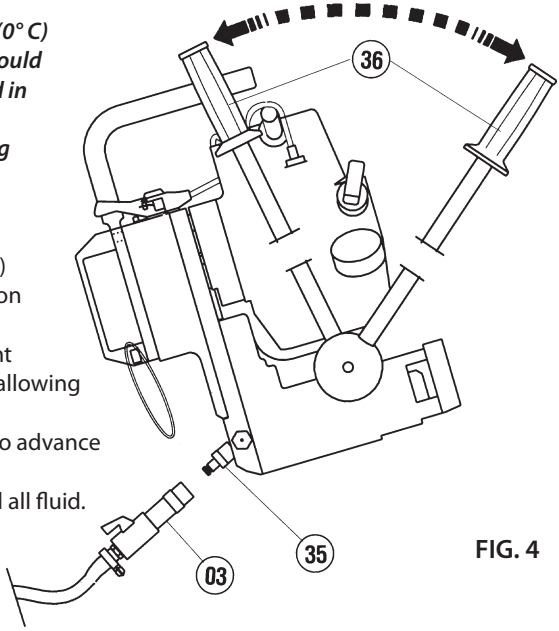


FIG. 4

4.1) ARE adaptor

For use with type **SR5000 coolant unit**. The **ARE** adaptor is inserted in the quick-coupling of the tank tube (ref. 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.

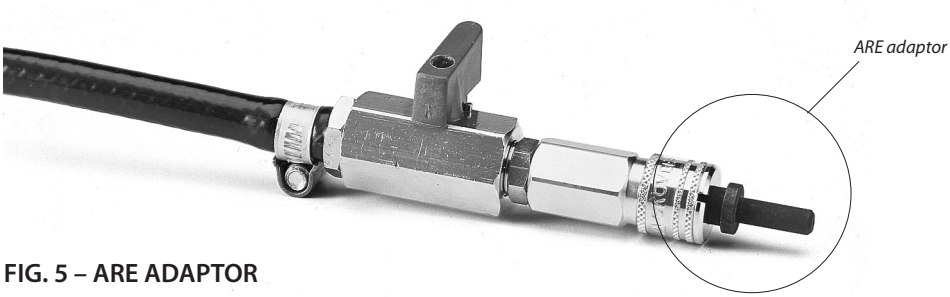
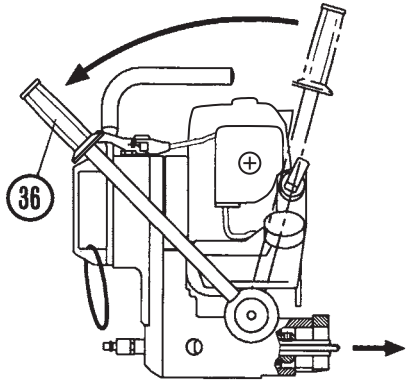


FIG. 5 – ARE ADAPTOR

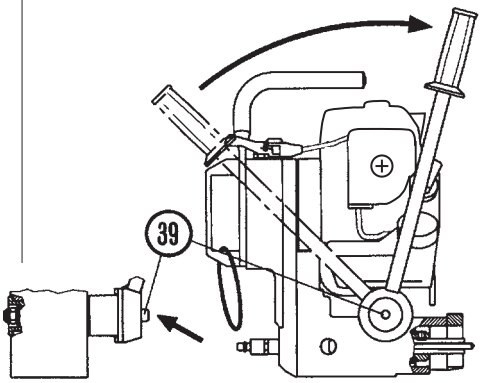
5. SPINDLE ADVANCE LEVER (Ref. to Fig. 6)

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).

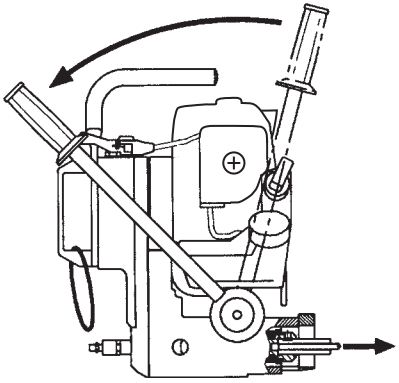
FIG. 6



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



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

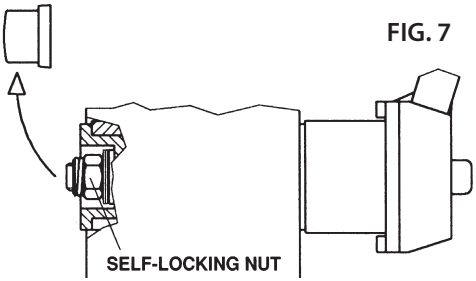


6c - With the hub released, moving the lever towards the operator causes a corresponding advance of the spindle.

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 DRILL

6.1) Assembling broach cutters (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 (33) in the crankcase of the drill (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 (18).

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

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

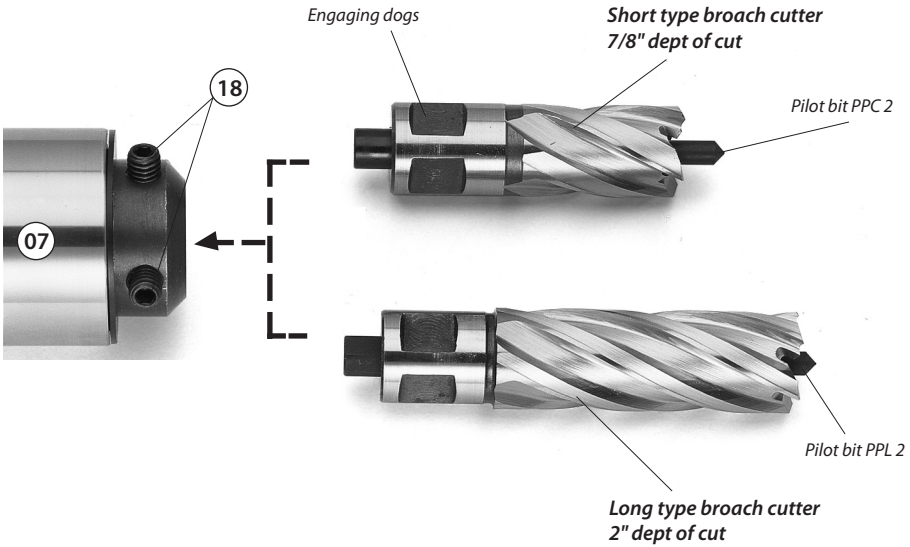


FIG. 8 – ASSEMBLING BROACH CUTTERS

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

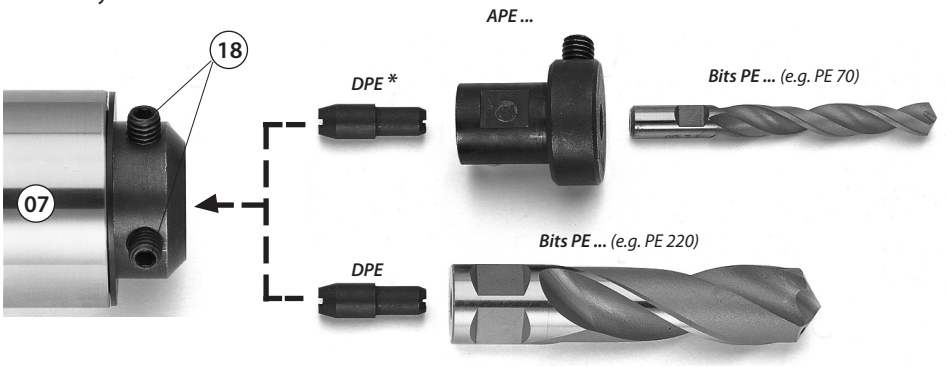
6.2.1) Using the advance lever, position the spindle shaft so that both grub screws become accessible and sufficient space is provided to insert the spiral bit; if necessary rotate the spindle shaft manually and sufficiently by inserting the 4 mm male hexagon key in the appropriate intermediate gear housing (33) in the crank-case of the drill corresponding to the feed handle (see Fig. 11).

6.2.2) Insert into the spindle shaft, the **DPE** spacer required to activate the coolant system. If it 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 TWIST BITS

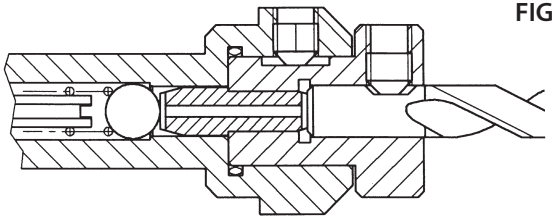


FIG.10 – ASSEMBLING THE BIT-SPACER UNIT

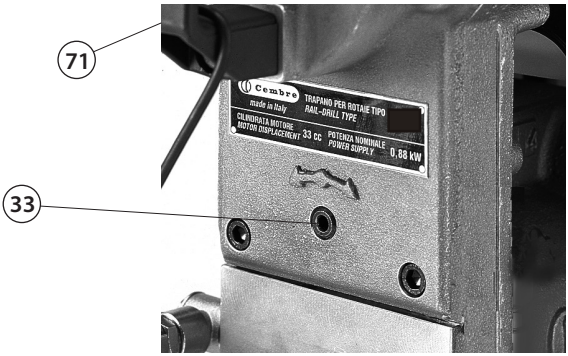


FIG. 11 – MANUAL SPINDLE ROTATION

7. DRILL TYPE LD-1PY-ECO

The reference **LD-1PY-ECO** relates to the entire LD-1PNY-ECO 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 **M 8x25** (2 pcs).
- Spring washers (4 pcs).
- Reference pin.

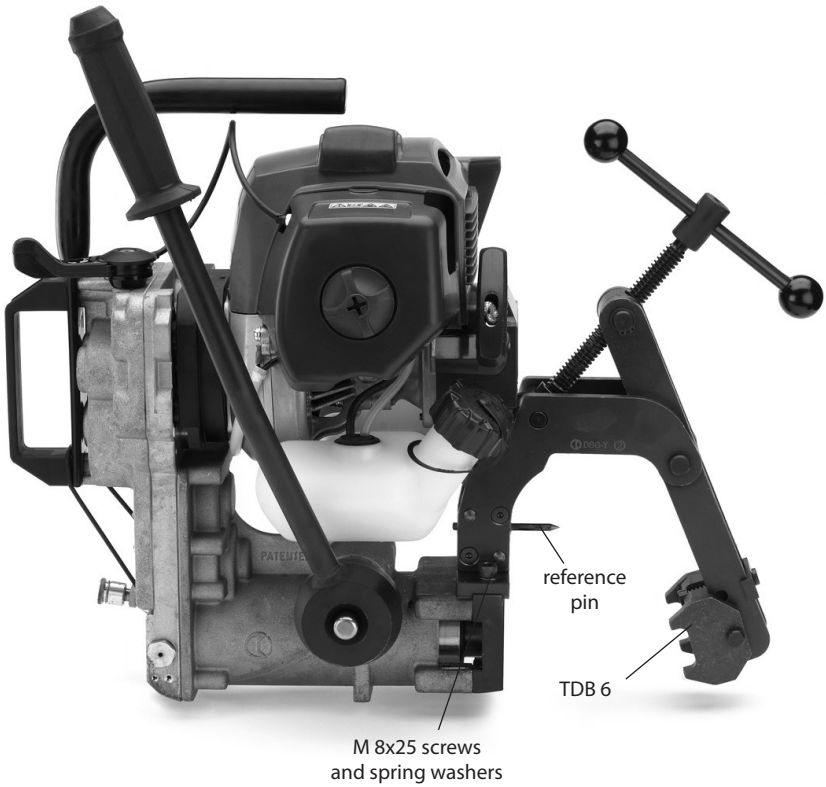


FIG. 12 – DRILL LD-1PY-ECO

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.**

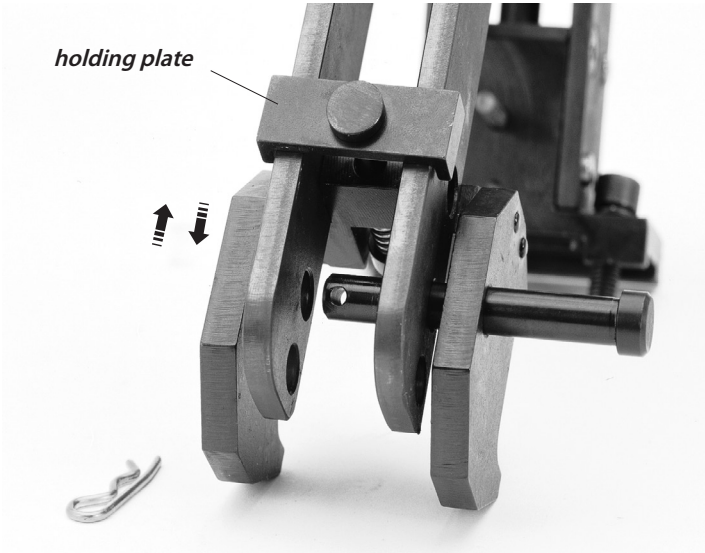


FIG. 13 – ASSEMBLY OF THE TERMINATION

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 **M 8x25** (35) also supplied. The assembly is illustrated in Fig. 14.

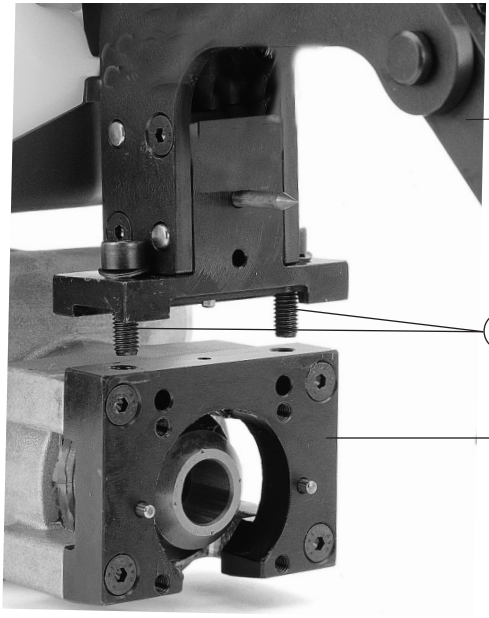


FIG. 14 – ASSEMBLY OF THE TYPE "DBG-Y" CLAMP

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.

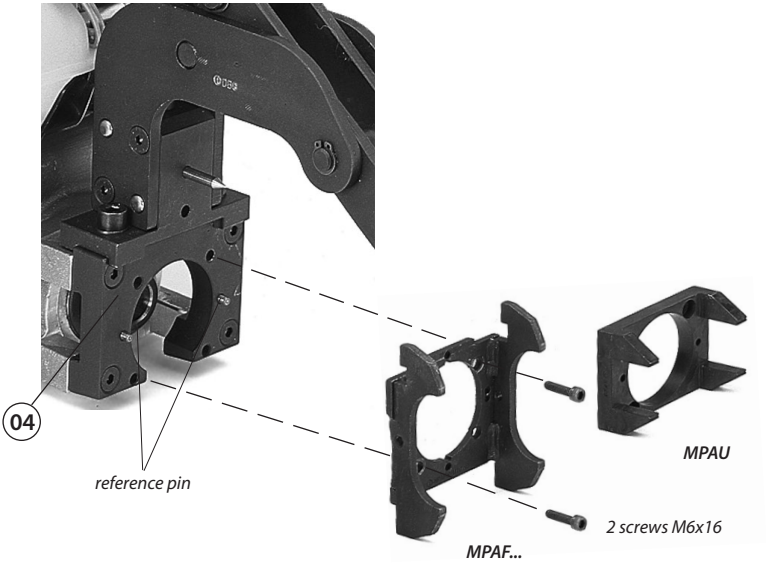


FIG. 15 – ASSEMBLY OF THE POSITIONING SHOES

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 drill, 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 drill 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).

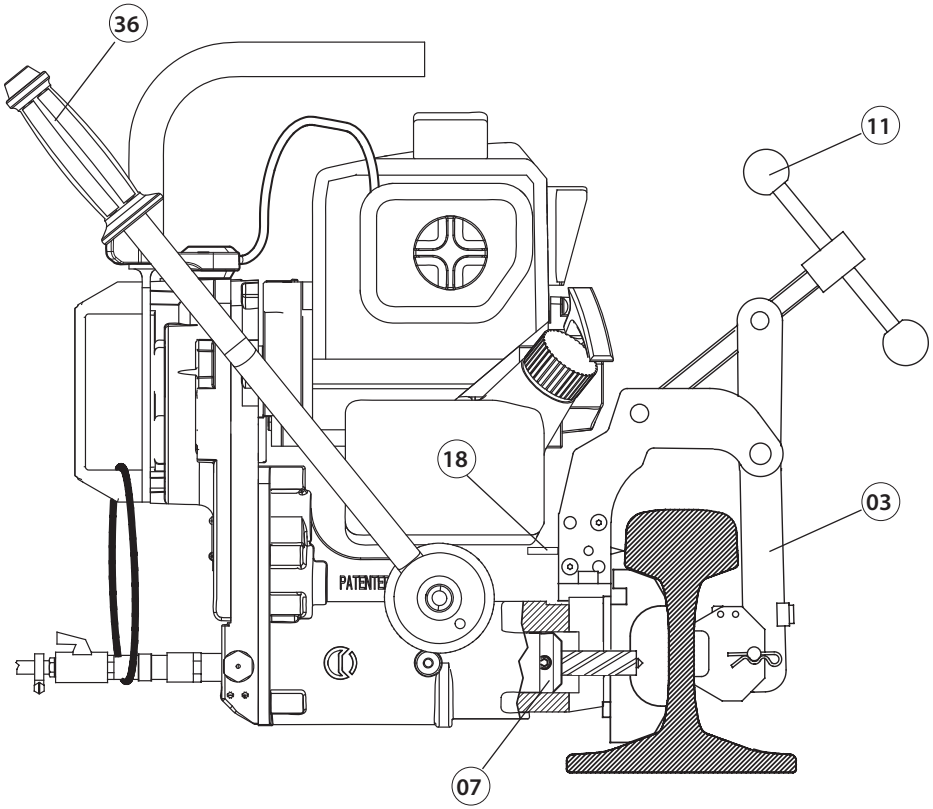


FIG. 16 – POSITIONING OF THE DRILL

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

⚠ **N.B.: switch on the cooling system before starting the drill (§ 4)**

8.1) 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 jig (§ 7.2), the drill being clamped to the rail (§ 7.3), as follows:

8.1.1) Connect the female quick-coupling of the **SR5000** cooling 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.

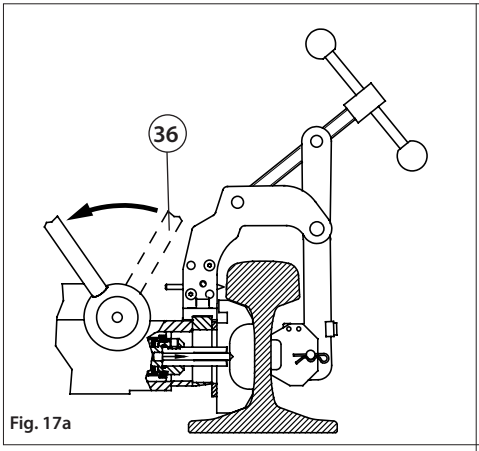


Fig. 17a

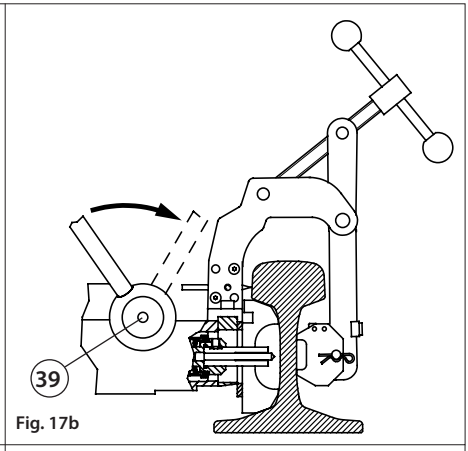


Fig. 17b

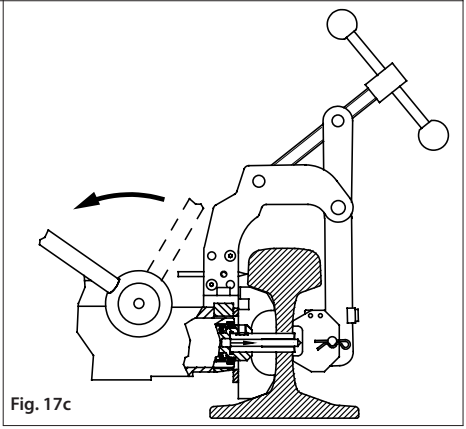


Fig. 17c

FIG. 17 – DRILLING

8.1.4) Start the engine, following instructions on § 11.

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 engine by pressing the switch to "OFF" position**, and make sure that drilling swarf is removed before recommencing drilling.

8.1.8) After drilling it is advisable to remove with the brush all swarf from the tool and spindle area.

8.2) Drill fitted with "long" type broach cutter (for drilling thicknesses of up to **2"**).
Follow the sequence described in § 8.1, taking care to position the drill on the rail by keeping **the spindle fully withdrawn.**

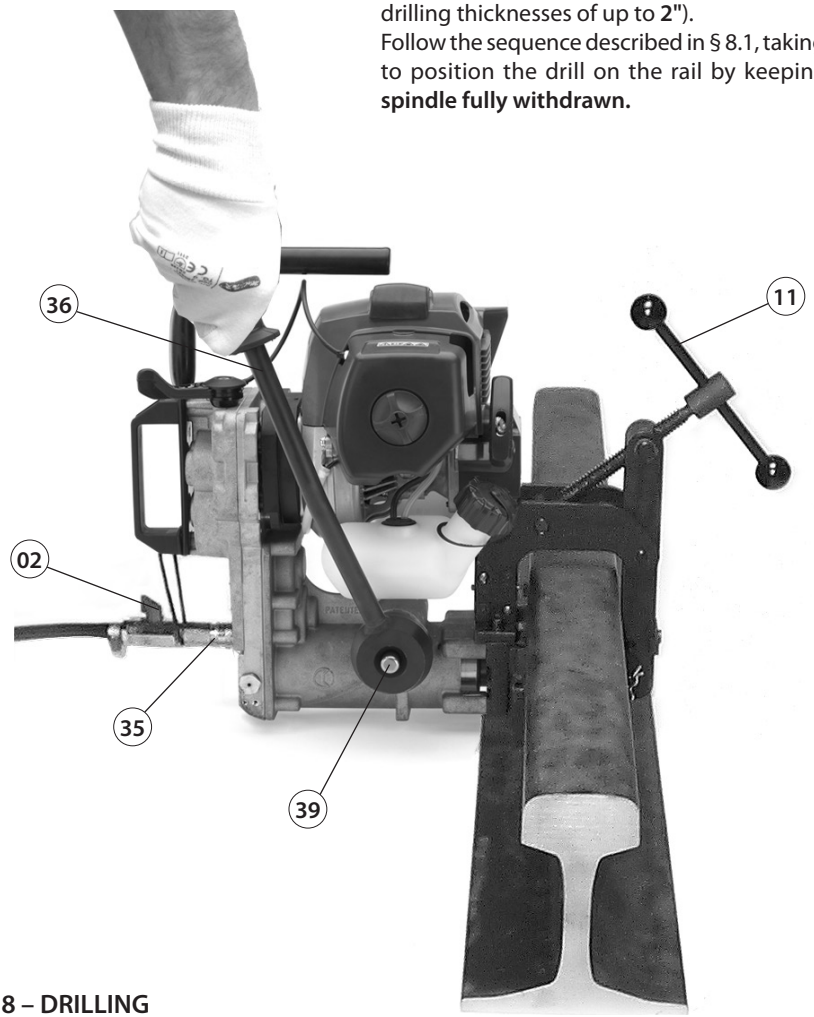


FIG. 18 – DRILLING

9. EXAMPLE OF OTHER RAIL DRILL APPLICATIONS

– **Use on girder rail** (Ref. to Fig. 19 a-b, example for 128 GR or GGR 118)

FIG. 19a – Side 1

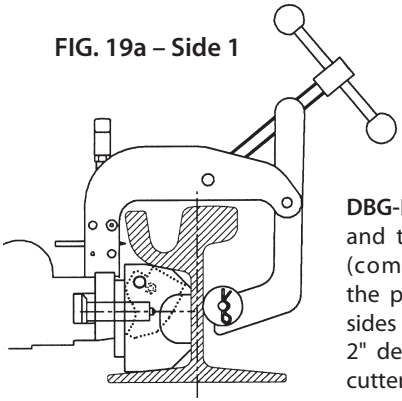
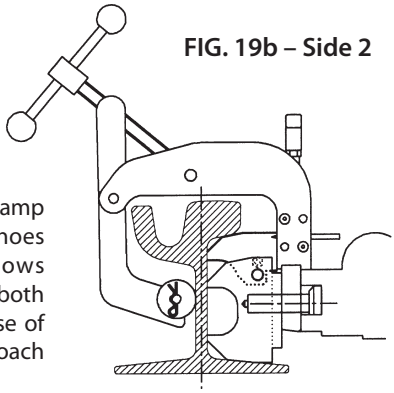


FIG. 19b – Side 2



DBG-LY over rail clamp and the specific shoes (combination) allows the positioning onboth sides of the rails. Use of 2" depth of cut broach cutters.

– **Use on running rails** (Ref. to Fig. 20)
(narrow passage of the articulated arm)

DBG-GR over rail clamp equipped with TDB 1 termination

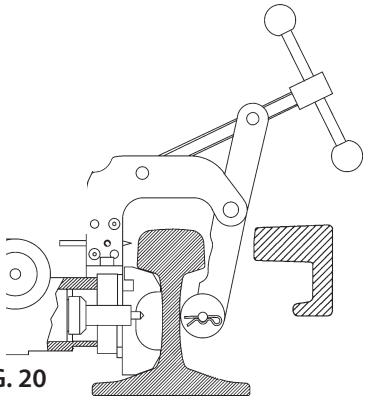


FIG. 20

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[1]* *MPAF 84 CF COMP[2]* *MPAF 84 CP COMP[3]*	*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 manufactered by FOSTER
2 = For drilling 56 lb aluminium bar manufactered by PORTER
3 = For drilling 84 lb aluminium bar manufactered by PORTER

11. STARTING THE ENGINE

Before starting the engine, make sure that:
- **the spindle is completely retracted (see § 5).**
- **the accelerator control lever is completely closed (0).**

11.1) Move engine "ON/OFF" switch to the "**ON**" position (Fig. **a**).

11.2) Repeatedly operate the fuel pump until fuel flows through the overflow pipe (Fig. **b**).

11.3) Make sure that the accelerator lever is in position "0".

Only with a cool engine, set the 'choke lever' upwards, on the left side in starting position (Fig. **c**); when engine is warm or in case of high ambient temperature, set this lever downward in working position (Fig. **f**).

11.4) Pull sharply on the starting rope and then release slowly; the engine before ignition, may require more than one operation (Fig. **d**).

Do not over-extend the starting rope and always release it slowly once the engine is running; a sudden release could damage the starting system.

If the engine does not start, do not repeatedly pull the starting rope with the 'choke lever' in start position. This could create a fuel excess in the cylinder and make ignition more difficult. In this case, set the lever in working position and repeat the starting operation. Once started change the speed of the engine twice to allow the remaining air to leave the carburettor.

11.5) Just after starting, accelerate the engine gradually before starting any activity, then set the accelerator lever in "1" position (Fig. **e**) till the 'choke lever' automatically returns, then set it again in "0" position.

11.6) Allow the engine to warm up for approximately 2 minutes then set the accelerator lever in "1" position of maximum acceleration and start to drill.

11.7) To stop the engine move the "ON/OFF" switch to the "**OFF**" position.

11.8) Idling speed adjustment: if necessary, adjust the idling screw (Fig. **f**), so that the engine maintains a stable idling speed (2800 rpm).

11.9) Carburetor adjustment

The carburetor has been factory previously adjusted.

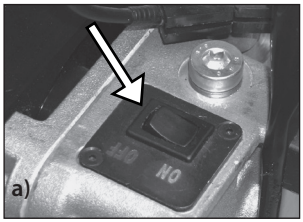
The control system of the gas emissions applied to this engine consists of a carburetor and ignition system which guarantee the best results.

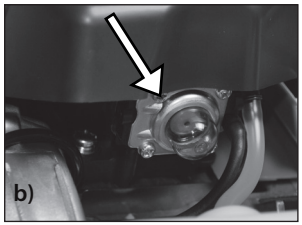
The carburetor is so adjusted to provide the air/fuel mixture required to achieve low consumptions and low emissions of injurious gas.

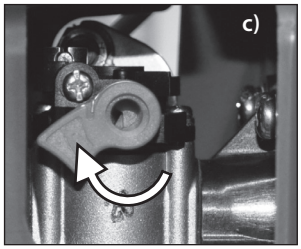
: speed increases

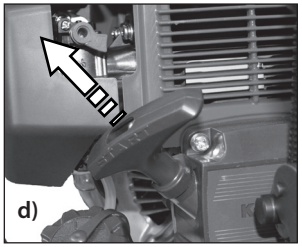
: speed decreases

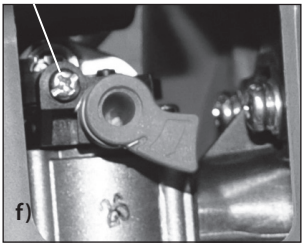
The engine will perform at its optimum after a "running-in" period of approximately 200 drilling operations.

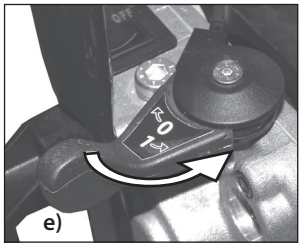












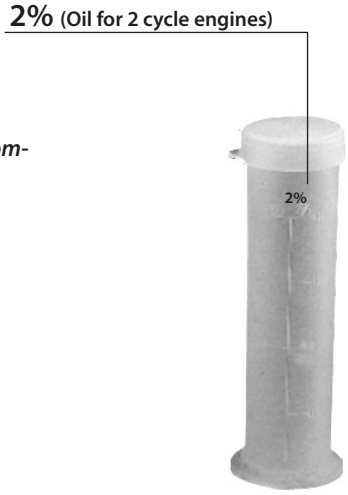
12. FUEL MIXTURE PREPARATION

WARNING	
	**- Gasoline is extremely flammable and explosive.** **- DO NOT SMOKE.** **- Refuel in a well ventilated area away from flame or sparks.** **- Stop the engine and allow it to cool before refueling.**
	**- Exhaust gas contains carbon monoxide, an odourless and deadly poison.** **- Do not run engine in an enclosed area.**
	**- To avoid a serious burn, do not touch a hot engine or exhaust.** **- The engine becomes hot during operation.**

The drill engine is two cycle and functions on an **oil-gasoline mixture**.
To ensure the correct amount of oil is used in the mixture, use the calibrated measure provided (see figure).
To get the best performance from the engine we suggest using oil for 2 cycle engines in the ratio of 1:50 (2 %).

Always use good quality oil.

This engine is certified to operate on unleaded regular grade gasoline only.
A minimum of 89 octane on the antiknock index is recommended.



Mix gasoline and oil together well and prepare only enough for immediate use as the mixture will age and if several weeks old may cause engine damage.
Always use the correct fuel mixture to avoid:
1 - Engine smoking and dirtying of the spark plug should the mixture be too rich with oil.
2 - Excessive overheating with consequent seizing of the engine should the mixture be lacking in oil.

13. STORAGE THE DRILL

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

13.1) Depressurise the tank of the **SR5000** cooling unit (see § 4), close the tap (02) on the tube from the tank, and disconnect the quick-coupling (03).

13.2) Carefully clean the drill, particularly in the spindle area, removing machining waste (swarf, etc.) and any deposits of lubricating coolant.

13.3) Fully withdraw the spindle.

13.4) Place the drill and the **SR5000** cooling 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 § 3.5). 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.

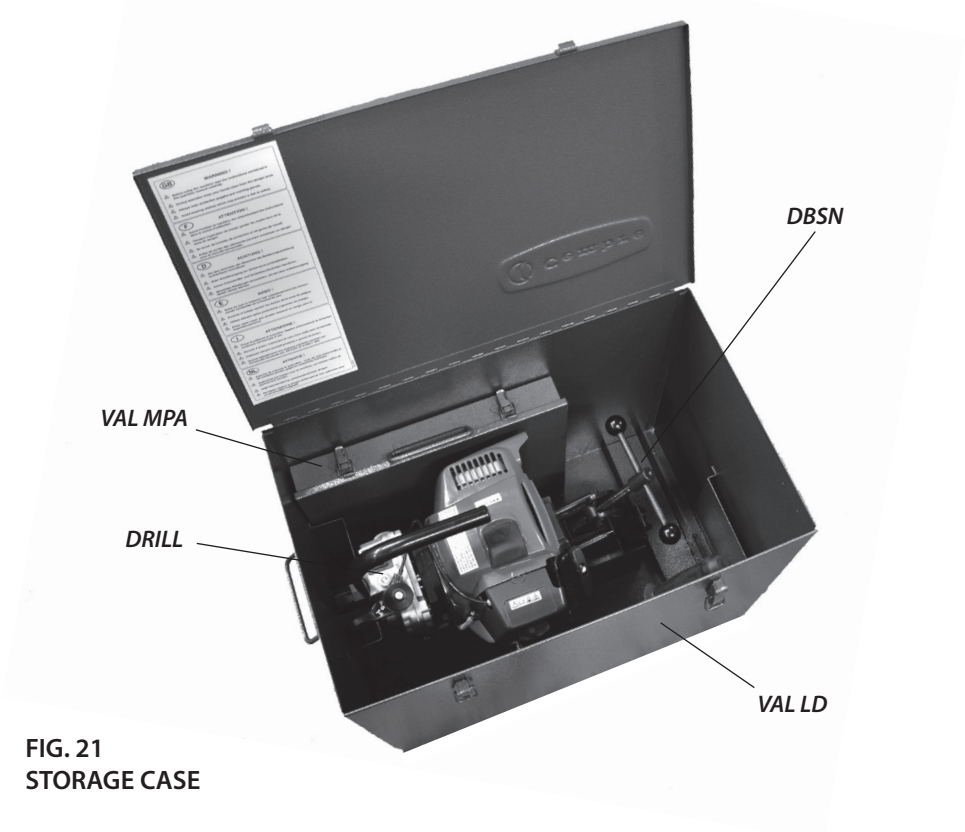


FIG. 21
STORAGE CASE

14. MAINTENANCE

Before you service or remove parts, stop the engine and allow it to cool. Always remove the spark plug cap from spark plug when servicing the engine to prevent accidental starting.

After the first 10 operating hours, proceed with oil sump change, as follows
(Ref. to Fig. 22a and 22b):

- *Remove the cap with the magnetic insert (24).*
- *Remove the oil filler cap (08).*
- *Make sure that all the oil comes out by slightly tilting the drilling machine in order to make the operation easier.*
- *Clean the cap (24) (see § **14.1.2**).*
- *Reassemble the cap .*
- *Fill up the oil sump to the level indicator (see § **14.1.1**) using the oil supplied with the drilling machine; it will be necessary to use about 100 ml.*
- *Replace the oil filler cap (08).*

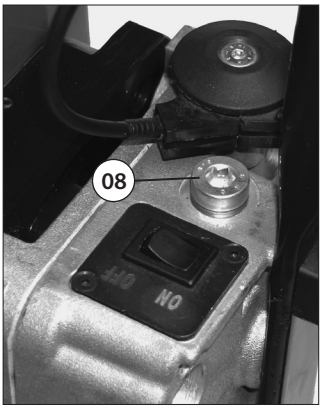


FIG. 22a

Ensure that disposal of used oil is in accordance with current legislation.

14.1) ORDINARY MAINTENANCE OF THE MACHINE

Every 20 hours of operation

14.1.1) Topping up oil (Ref. to Fig. 22a and 22b)
With the drill switched off and placed on a flat surface, check the oil level in the crankcase by looking through the transparent inspection cover (16).
The level must be approximately half way up the cover; if the level is low, top up the oil by unscrewing the cap (08) 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.

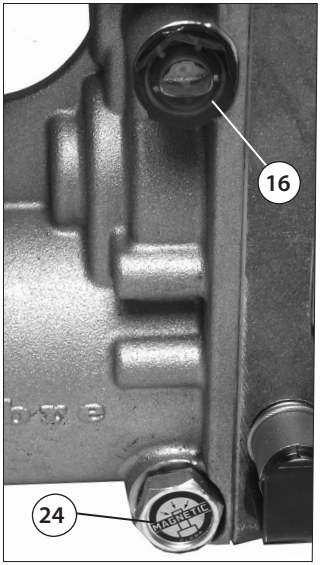


FIG. 22b

14.1.2) Removal of metal residues from the crankcase

– When the drill is positioned as shown in Fig. 22c unscrew the cap with magnetic insert (24) on which any metal residues present in the oil will have collected. Carefully clean the magnetic insert with a clean cloth and screw it back into the appropriate housing.

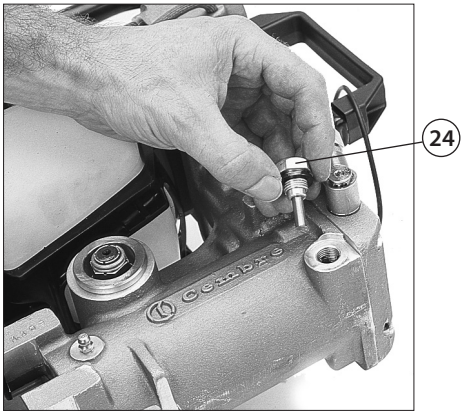


FIG. 22C – REMOVAL OF THE METALLIC WASTE

Every 50 hours of operation

14.1.3) Checking of screws

– Check and re-tighten all screws where necessary.

14.1.4) Lubrication (Ref. to Figs. 27 and 28)

– Lubricate the spindle support housing by means of the appropriate lubricator (20), the screw of the **DBG-Y** clamping device.

14.1.5) Refrigeration filter cleaning (Ref. to Fig. 23)

The refrigeration circuit of the drill is provided with anti-impurity filter; should an evident decrease of the flow of refrigeration be verified, it could be necessary to clean it in the following way:

– Using a14 mm key, unscrew the refrigeration coupling (02).
– Extract the filter and clean it carefully.
– Reasemble the filter into the coupling (02) as shown in the figure 23, fully tighten the coupling.

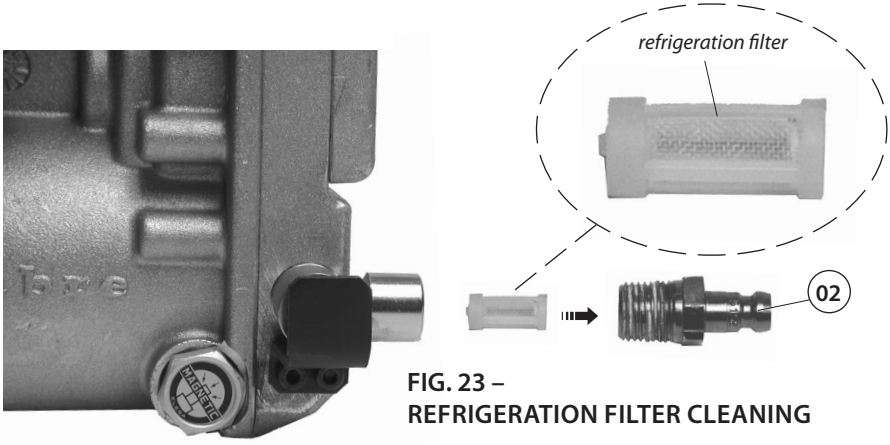
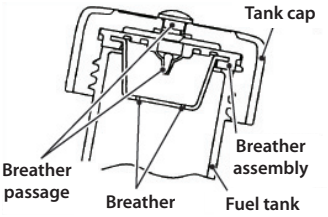


FIG. 23 – REFRIGERATION FILTER CLEANING

14.2) ROUTINE ENGINE MAINTENANCE

14.2.1) Fuel tank cap

A breather passage is incorporated in the tank cap. If this passage is clogged, the fuel will not flow into the carburetor, causing problems with starting or running the engine. At the same time, make sure that the base of the breather assembly is fitted firmly into the groove inside the tank cap, as shown.



Every 20 hours of operating

14.2.2) Fuel filter cleaning (Ref. to Fig. 24)

- Pick the grommet out of the fuel tank and remove the fuel filter assembly from the fuel tank together with the grommet and the fuel tube to keep dust, entering from the fuel filter.
- Clean the fuel filter assembly in a bath of high flash-point solvent.
- Dry the fuel filter assembly before reassemble.

Improper use of solvents can result in fire or explosion.

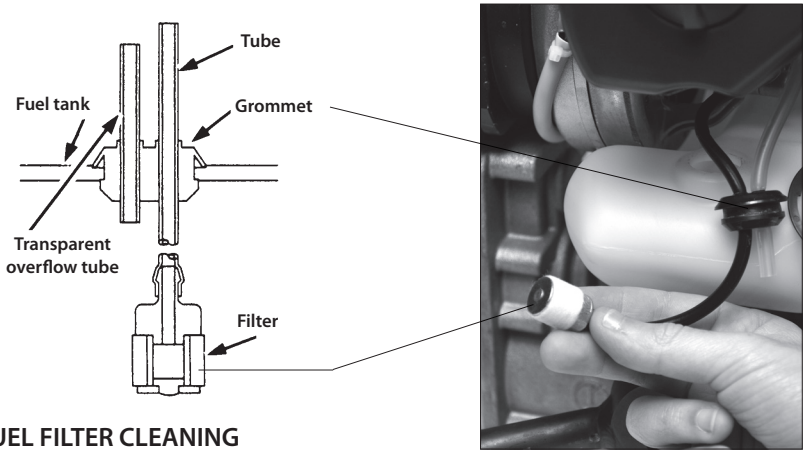


FIG. 24 – FUEL FILTER CLEANING

14.2.3) Air filter cleaning (Ref. to Fig. 25)

- Manually remove the holding screws of the air cleaner cup.
- Remove the filter element.
- Wash the filter element in detergent and water and dry it thoroughly.
- Reassemble all parts.

Operating in dusty condition may require more frequent maintenance than above.
Do not operate the engine with air filter removed.

FIG. 25 – AIR FILTER CLEANING

14.2.4) Spark plug cleaning (Ref. to Fig. 26)
- Disconnect the spark plug lead and with a spark plug key remove the spark plug.
- Clean the electrode, taking care not to damage the insulation.
- Check and adjust if necessary the electrode gap (0.023 ÷ 0.027 in.).
- Install and tighten the spark plug to 9 ÷ 12.5 lbf.ft, then connect the spark plug lead.
- In case of plug replacement, use type **NGK BPMR7A** or equivalent: **BOSCH WSR5F / DENSO W22MPR-U / CHAMPION RCJ6Y.**

FIG. 26 – SPARK PLUG CLEANING

14.2.5) Spark arrester cleaning (Ref. to Fig. 26a)
- Remove the spark arrester from the exhaust opening.
- Clean deposits from the spark arrester screen by brushing it.
- Relocate the spark arrester.

FIG. 26a – SPARK ARRESTER CLEANING

13.2.6) Checking of screws

– Check and re-tighten all screws where necessary.

13.3) SPECIAL MAINTENANCE OF THE DRILL

The special maintenance operations require the intervention of qualified personnel only, please contact CEMBRE (See **§ 16**).

13.4) STORING THE DRILL FOR LONG PERIODS

– Completely empty the fuel tank.
– Start the engine and let it run until it stops, so that all fuel is exhausted from the machine.
– Remove the spark plug.
– Pour 3-5 cm^3 of oil into the cylinder.
– Repeatedly pull gently on the starting rope so that the dispersion of the oil in the cylinder is achieved reinstall the spark plug.
– With a clean cloth wetted with engine oil, than clean all metal parts of the machine.
– Store the drilling machine in its appropriate case or in a dry environment, protecting it against accidental damage and dust.

15. WARNINGS

15.1) Regularly check for correct tightening (torque) of the fixing screws of the drilling tools and positioning shoes.

15.2) Avoid pressure jolts on the advancing lever during drilling.

15.3) Always make sure that the drilling swarf is properly removed before starting to drill a new hole.

15.4) 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.

15.5) If it is necessary to operate the drill without the cutter inserted, remove the locking grub screws from the spindle shaft.

15.6) Avoid leaving the **SR5000** tank under pressure and exposed to sunlight for long periods of time.

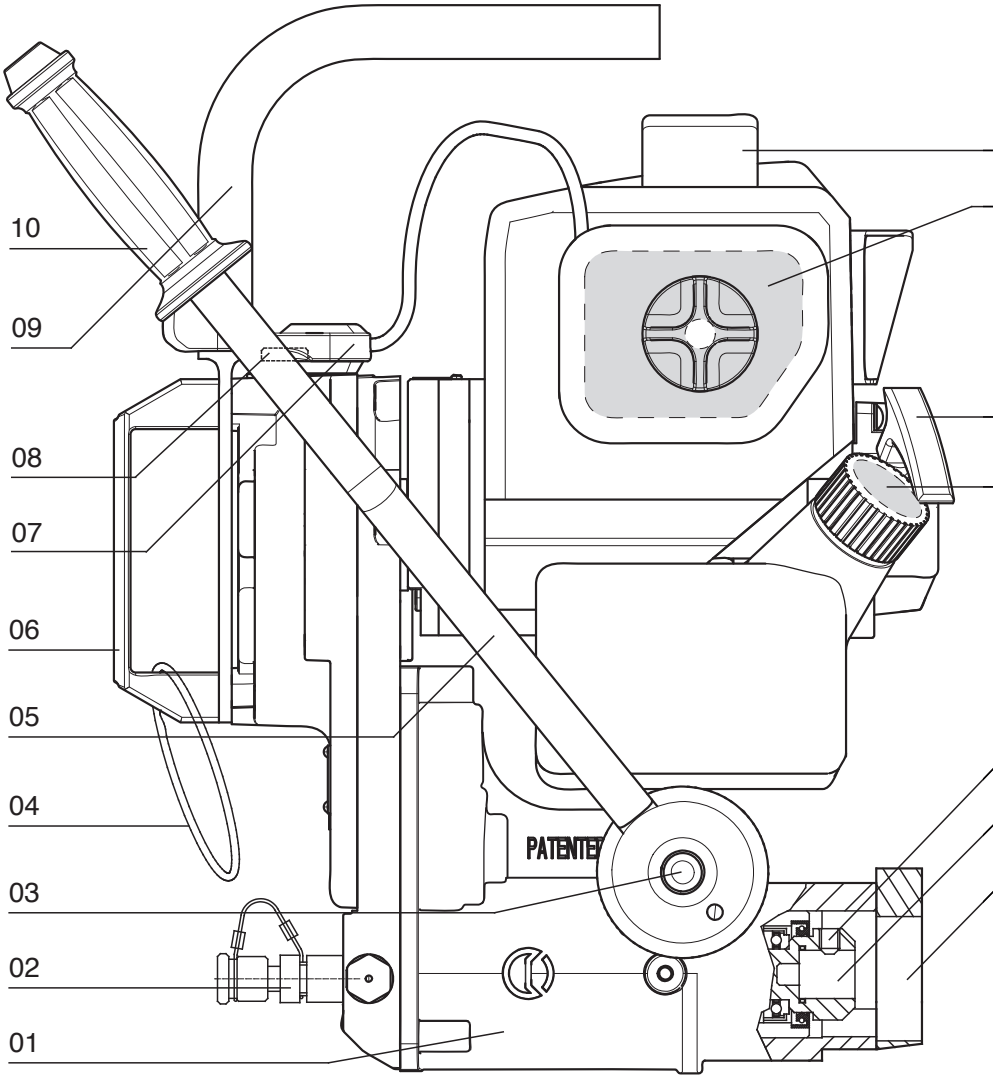
15.7) Should the **DBG-Y** clamping device be removed, make sure that by reassembling it, the two locking screws are firmly fastened.

APPENDIX "A"

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

– **Hardness of the element to be drilled.**
– **Thickness to be drilled.**
– **Stability of the drill clamping** and correct assembly of the drilling tool.
– **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 tool with the material to be drilled;** bear in mind that the faster the hole is made the greater the efficiency.
– **Observance of these basic rules:**

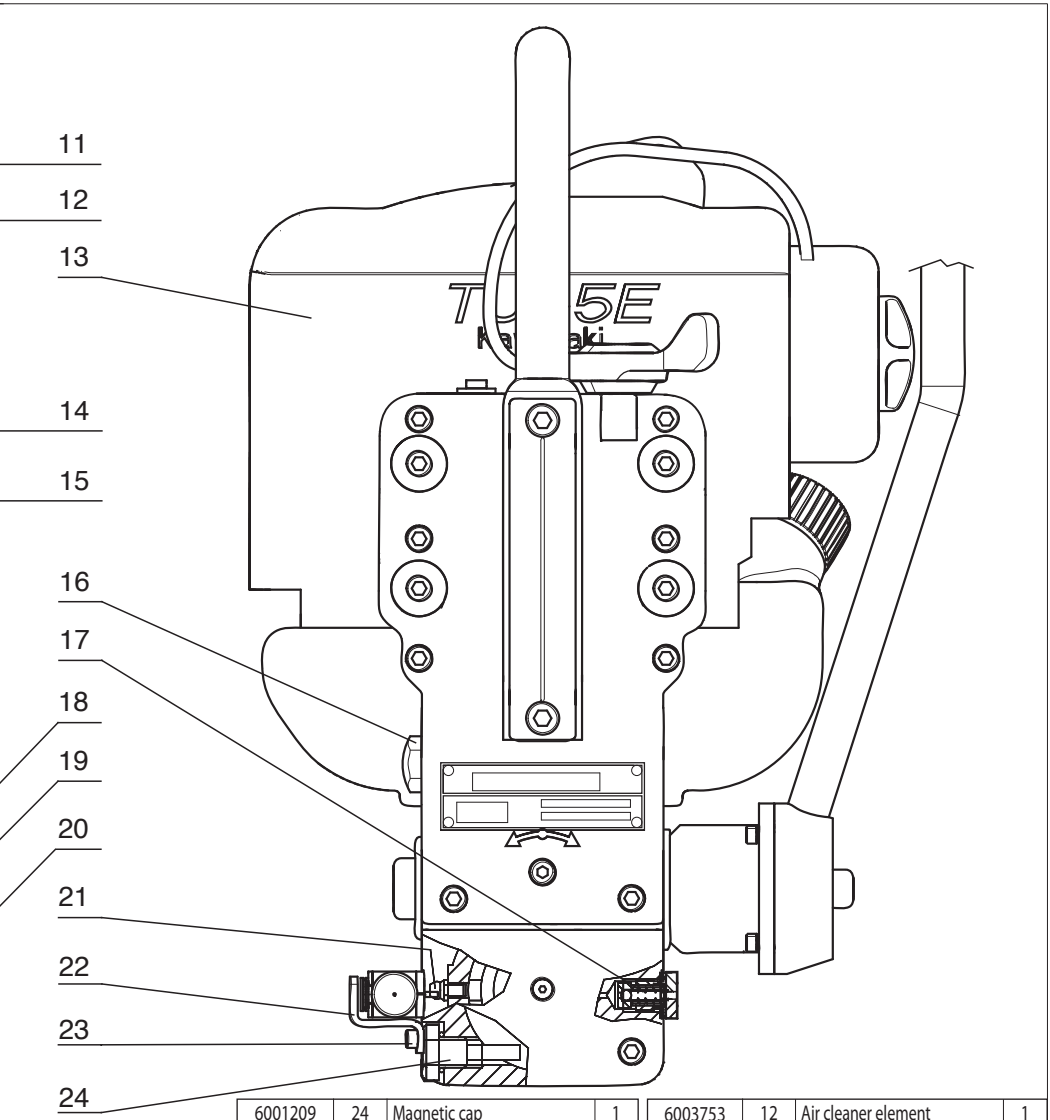
1) **Commence drilling by exerting light pressure on the advancing lever, progressively increasing and then relaxing it when the tool is in the exit phase.**
2) Avoid pressure surges and advance according to the diameter of the drilling diameter, to avoid scratching the material or damaging the cutting edges of the tool.
3) Remember that a tool with efficient cutting edges requires a lower application pressure than one that has already made a certain number of holes.
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.



The guarantee is void if parts used are not* CEMBRE *original spares.

When ordering spare parts always give the following information:
- spare part code
- spare part description
- drilling machine model
- drilling machine serial number

FIG. 27 – DRILL ASSEMBLY



Code N°	Item	Description	Qty
6001209	24	Magnetic cap	1
6900060	23	Screw M 4x8	2
6001731	22	Guard	1
6001198	21	Lubricator	1
2870261	20	Front plate	1
6001146	19	Drilling spindle	1
6340160	18	M8x10 grub screw	2
6001397	17	Complete air valve	1
6001195	16	Level gauge	1
6003754	15	Reservoir+valve cap	1
6003755	14	Starting handgrip	1
6003613	13	Engine	1

Code N°	Item	Description	Qty
6003753	12	Air cleaner element	1
6003752	11	Spark plug	1
6380330	10	Handle	1
6003612	09	Complete handgrip	1
6003034	08	Cap	1
6001166	07	Accelerator lever	1
6490050	06	Carriage handle	1
6001941	05	Complete spindle lever	1
6360480	04	O-ring	1
6001176	03	Lever release pawl	1
6001428	02	Complete cooling connection	1
6001950	01	Body	1

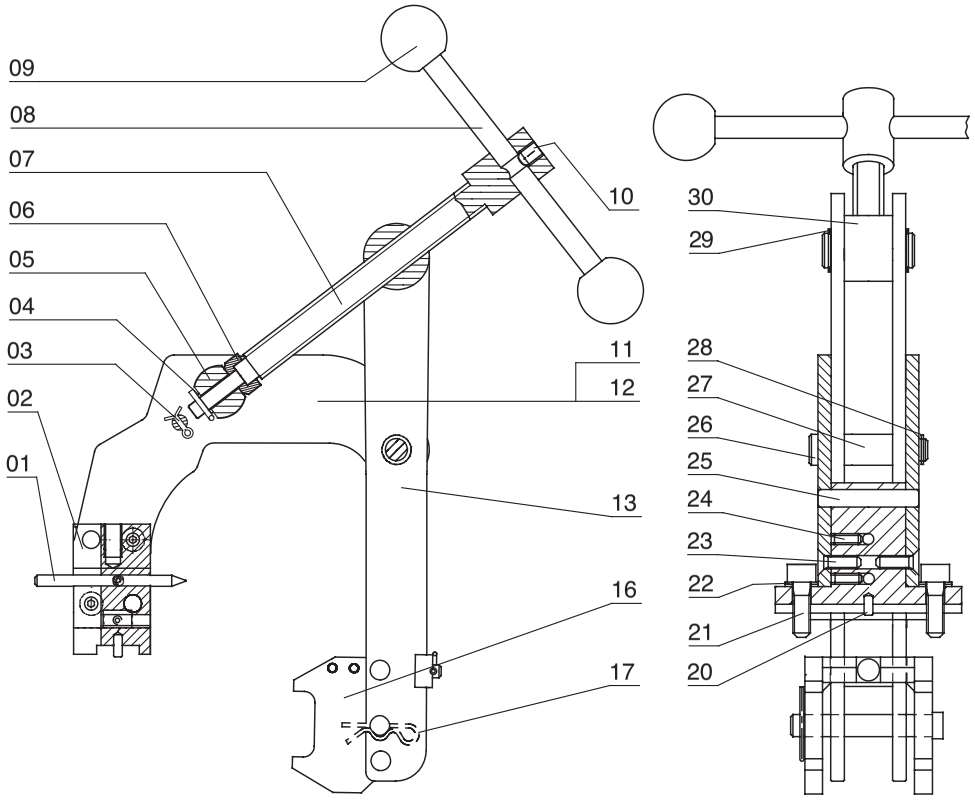


FIG. 28 – "DBG-Y" RAIL WEB CLAMPING DEVICE

Code N°	Item	Description	Qty
6001154	30	Threaded bush	1
6700524	29	ø 14 Circlip	1
6040421	28	ø 10 Circlip	1
6001155	27	Spacer	1
6001156	26	Pin	1
6760378	25	ø 8 x 50 pin	2
6340612	24	M5 ball dowel	2
6900314	23	M 6 x 18 screw	4
6650144	22	Spring washer	4
6900348	21	M 8 x 25 screw	2
6760222	20	ø 4 x 10 pin	1
6140082	17	ø 1,8x35 Split pin	1
6001775	16	TDB 6 clamping end piece	1
6001751	13	Blocking side	2
6001756	12	Clamping support left shoulder	1
6001754	11	Clamping support	1
6340160	10	right shoulder	1
6380310	09	M 8 x 10 grub screw	2
6001150	08	Clamping handle knob Blocking lever	1
6001658	07	Compl. blocking screw	1
6001659	06	Thickness	1
6001152	05	Adjusting bush	1
6520422	04	Cup spring	1
6140085	03	ø 2,5 x 16 Split pin	1
6001145	02	Clamping support	1
6001281	01	Drilling reference pin	1

16. 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 fill in and attach the form available in the "ASSISTANCE" section of the CEMBRE website.

INDEX ***page***

DECLARATION OF CONFORMITY - DECLARATION DE CONFORMITE - KONFORMITÄTSERKLÄRUNG - DECLARACIÓN DE CONFORMIDAD - DICHIARAZIONE DI CONFORMITÁ

We *Nous* Wir *Nos* Noi: **CEMBRE S.p.A. Via Serenissima, 9 – 25135 Brescia (Italy)**
Declare under our sole responsibility that the product - *Déclarons sous notre seule responsabilité que le produit* - Erklären in alleiniger Verantwortung dass das Produkt - *Declaramos bajo nuestr responsabilidad que el producto* - Dichiariamo sotto nostra unica responsabilità che il prodotto:

LD-1PNY-ECO

To which this declaration relates is in conformity with the following standard(s) or other normative document(s) - *Auquel cette déclaration se réfère est conforme à la (aux) norme(s) ou autre(s) document(s) normatif(s)* - Auf dass sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder dem/den normativen Dokument(en) über einstimmt - *Al que se refiere esta declaración, cumple la(s) norma(s) u otro(s) documento(s) normativo(s)* - Al quale si riferisce questa dichiarazione è conforme alla(e) norma(e) o altro(i) documento(i) normativo(i):

EN ISO 12100 ISO 7000 EN ISO 11148-3 EN 55012+A1 EN ISO 3744 EN ISO 5349-1 EN ISO 5349-2 EN ISO 11202 EN 13977

Following the provisions of EU directive(s) - *Conformément aux dispositions de(s) directive(s) EU* - Gemäß den Bestimmungen der EU Richtlinien - *De acuerdo con las disposiciones de la(s) directiva(s) EU* Conformemente alle disposizioni della(e) direttiva(e) EU:

2006/42/EC 2014/30/EU

Person authorised to compile the technical file - *Personne autorisée à constituer le dossier technique* - Person die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen - *Persona facultada para elaborar el expediente técnico* - Persona autorizzata a costituire il file tecnico:
Gianluca Cama via Serenissima, 9 – 25135 Brescia (Italy)

Brescia **10-01-2022**

CEMBRE
Felice Albertazzi
CHIEF SALES & MARKETING OFFICER
Cembre S.p.A.

DECLARATION OF CONFORMITY

We: **CEMBRE S.p.A. Via Serenissima, 9 – 25135 Brescia (Italy)**
Declare under our sole responsibility that the product:

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S.I. 2008/1597 S.I. 2016/1091

Brescia **10-01-2022**

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Felice Albertazzi
CHIEF SALES & MARKETING OFFICER
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CEMBRE

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