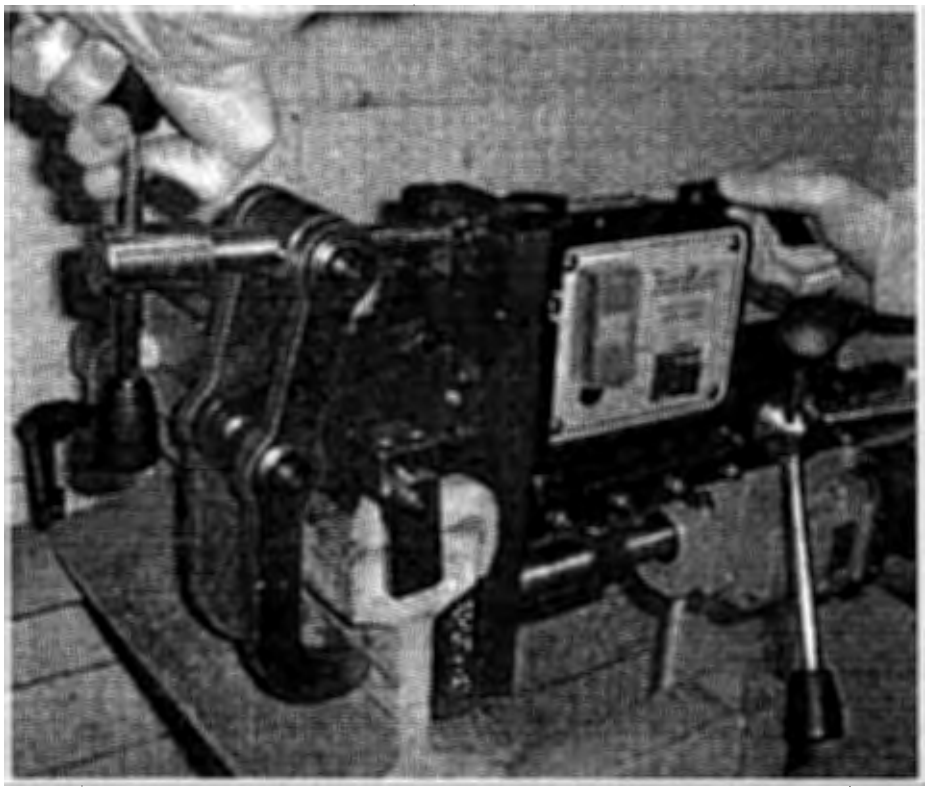
Operating and Service Manual



Electric Rail Drill

TM1000E 110V

Racine Railroad Products
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Contents

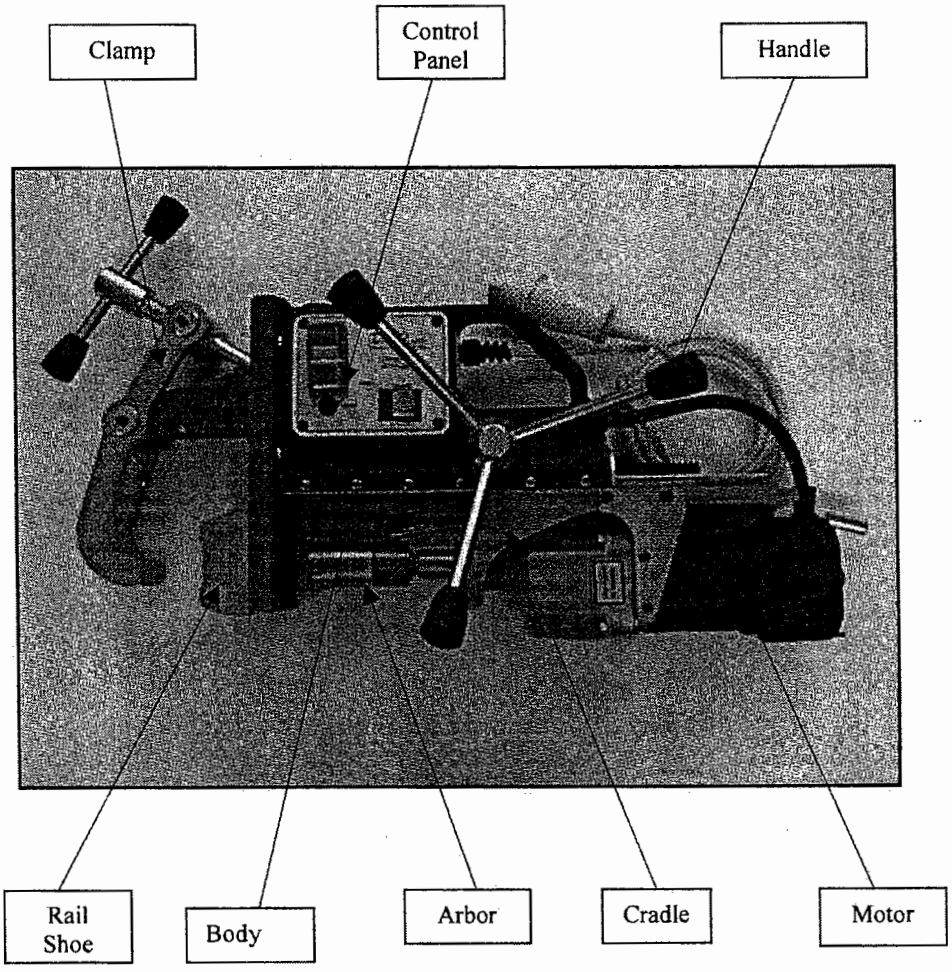
1.0 Introduction

Congratulations on choosing your new TM1000E Multipurpose Lightweight Rail Drill. The drill is a quality product with unique features that make this the perfect solution for your entire rail drilling requirements.

- Easy to use and rugged design makes the TM1000E a cost effective solution to drilling clean, accurately positioned holes in rail sections for bonds, and fishplates.
- Powered by a 110V motor with a speed of 430 rpm freespeed.
- Can drill up to 36mm with annular broaching cutters.
- The new integral arbor support gives guaranteed hole tolerance and ensures no burring of hole.
- The totally enclosed cutter action ensures operator safety.
- The new and unique Tommy bar clamping system facilitates clamping in confined spaces such as check rail.
- The hard wearing and tough metal carry case provides protection for your drill in transit. The spacious design leaves enough room for all of your tools and ancilliaries.

2.0 Getting To Know Your TM1000E

Before you use your new TM1000E please take the time to familiarize yourself with the functions and controls.



3.0 TM1000E Ancillary Components/Equipment

3.1 The Coolant Bottle

The Pressurized Coolant System designed to give maximum coolant and lubrication will help to prolong cutter life. As well as ensuring a clean hole every time.
NB. Always use recommended cutting fluid.

3.2 Storage Case

This hard wearing and tough metal carry case provides protection for your drill in transit. The spacious design leaves enough room for all of your tools and ancilliaries.

3.3 Index Drilling Plate

Used to ensure holes are correctly distanced from end of rail and centre to centre, guaranteed to provide complete accuracy.

3.4 Rail Shoes

Manufacturing from hardened tool steel, ensuring accuracy and repeatability.

3.5 Broaching Cutters

Universal broaching cutters provide an unrivaled quality and accuracy allowing you to drill with confidence.

3.6 Chuck Adapter

This Chuck adapter can be used to fit any standard stub drill to the TM1000E giving you the ability to cut any hole upto a maximum diameter of 13mm.

4.0 Operating Instructions

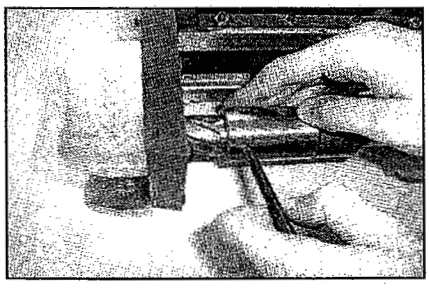
4.1 Fitting A Broaching Cutter

4.1.1 To fit a Broaching Cutter

- Disconnect machine from power supply.
- Insert the pilot pin in the broaching cutter. The main function of the pilot pin is to ensure ejection of the slug at the end of each drilling cycle.
- Loosen the grub screws so the shank of the cutter fits neatly into the arbor.
- Align the flats of the cutter with the grubscrews.
- Insert the cutter firmly into the arbor compressing the internal spring until the shoulder of the cutter meets the end of the arbor and tighten the grub screws.
- Always have damaged grub screws replaced.

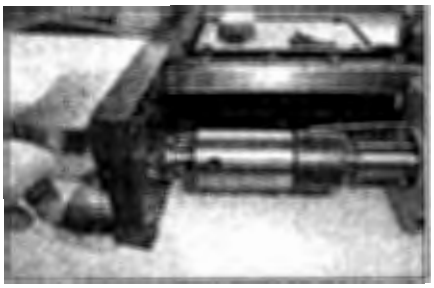
4.1.2 To Remove a Broaching Cutter

- Loosen the grub screws.
- The cutter will move out of the arbor under spring pressure.
- Remove the cutter from the arbor
- NB it is advisable to store the drill with the grub screws wound in.



4.1.3 Problems

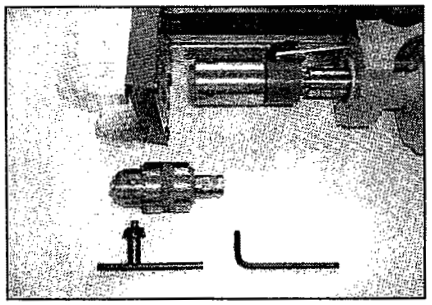
- The cutter will not insert into the arbor.
- Check that the grub screws are wound out and the arbor is free from debris.
- Always make sure the screws clamp onto the flats. Failure to do so could result in the screws standing proud of the arbor and therefore causing damage to the guide bush.



4.2 Using the Chuck Adapter

4.2.1 Fitting the Chuck Adapter

- The chuck adapter is fitted in exactly the same way as a broaching cutter. (See section 4.1)



4.2.2 Using a Twist Drill in the Chuck Adapter

- Insert the drill in the chuck.
- Tighten the chuck first by hand then using the chuck key provided.

4.3 Fitting Rail Shoes

4.3.1 To Fit Rail Shoes

- Ensure the ejector grub screw is wound back into the base plate.
- Push the shoe firmly onto the locating pins.
- Insert the 2 hex cap bolts and tighten.

4.3.2 Removing Rail Shoes

- Loosen and remove the two hex cap bolts.
- Remove the rail shoe.

Note:If the shoe is tight use the ejector grub screw to force the rail shoe off.

4.4 Coolant System

4.4.1 Filling the pressurized sprayer bottle

- Remove the pump mechanism by turning the handle anticlockwise.
- Fill with recommended lubricant.
- Replace the pump mechanism and fasten clockwise

4.4.2 Preparing the bottle for use

- Ensure the bottle has sufficient lubricant.
- Pump the handle 4 to 5 times or until resistance is met.
- Depress the handle and turn clockwise to lock.

4.4.3 Attaching the Lubricant to the drill

- Push the pipe from the bottle into the coolant adapter.
- Turn the valve on the pipe to the 'ON' position to start coolant flow.

4.4.4 Removing the lubricant from the drill

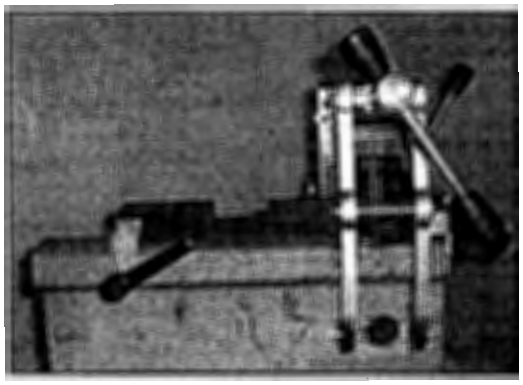
- Turn the valve on the pipe to 'OFF' to stop the coolant flow.
- Remove the pipe by pressing the release ring on the coolant adapter.

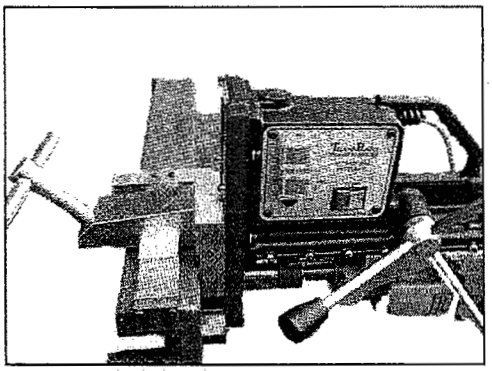
4.4.5 Depressurizing the coolant bottle

- Turn the pressure release valve anticlockwise to release the pressure.
- Close the valve by turning it clockwise.

4.5 Using the Indexing Plate

- The machine is normally used with hole positioning indexing plates for 113FB, 95LB, U69 and ALU rail
- Fit to rail head.
- Make sure the end stop is to end of rail.
- Tighten locking screw.
- Locate the Clevis arm into the index slot, and clamp the Rail Drill as described in section 4.6.1.
- Drill the first hole
- Un-clamp the Rail Drill as described in section 4.6.2
- Clean between the rail shoes with a hand brush to clear all swarf.
- Repeat above procedure for drilling the second hole.

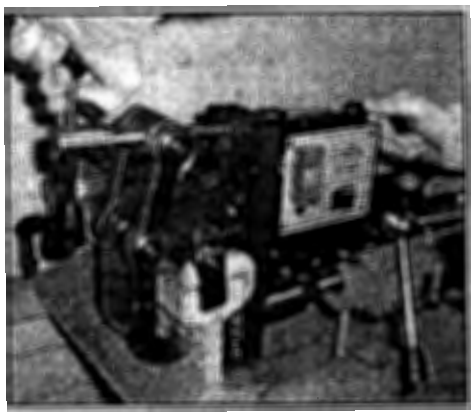




4.6 Using the Over Rail Clamp

4.6.1 Attaching the Drill

- Before attaching the rail drill ensure that the rail surface is free from debris and swarf from previously drilled holes.
- Place the rail drill over the rail section and locate the clevis arm into the first slot of the indexing plate (If used).
- Locate the rail shoes correctly in the web of the rail.
- Pull the tommy bar shaft away from the drill unit, turn and locate the end into it's pocket on the locking block.
- Secure the drill by rotating the tommy bar shaft clockwise, drawing machine firmly onto the rail.
- Ensure that the rail shoes fit squarely into the rail web.

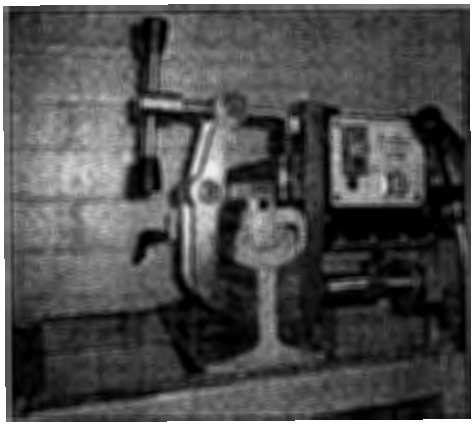


4.6.2 Removing the Drill

- Once a hole has been drilled, release the rail drill by turning the tommy bar shaft anti-clockwise until it is possible to pull the end of the shaft out of the locking block pocket.
- Fold the tommy bar shaft back against the rail drill base plate and lift the drill clear of the rail or indexing strip. (If used)
- Clear swarf

After every hole is drilled, always make sure that the Nylube Bush is clean from any swarf, as it may cause the bush to wear. If the Arbor starts to wobble the Nylube Bush is ready for replacing.

- Repeat from 4.6.1 for second hole using second slot on indexing plate. (If used)



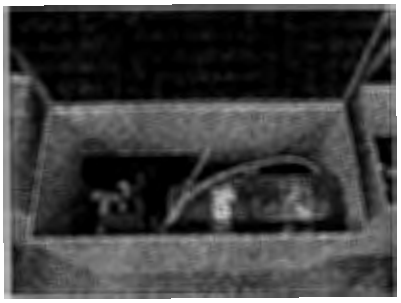
4.7 Drilling a Hole

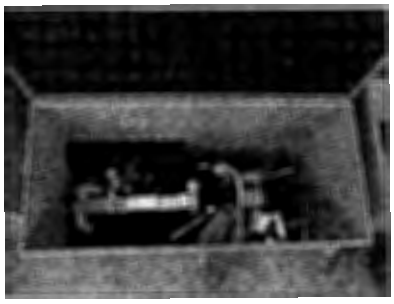
- Having fitted the indexing plate (see section 4.5) and clamped the machine to the rail.
- Ensure the correct power supply (110V) is connected.
- Switch on mains indicated by red neon.
- Ensure the cutter is clear of rail web
- Switch on coolant supply and check that no swarf is restricting the arbor movement through the nylube bush.
- Switch on the motor.
- Apply a small amount of drilling pressure until the cutter is engaged in rail web.
- Increase pressure making sure not to overload the motor.
- Check the slug has been ejected at the end of each drilling cycle.
- Retract the cutter making sure the cutter is again clear of rail web.
- Turn off the motor and coolant supply.

4.8 Storing and Packing the TM1000E

4.8.1 To Pack the TM1000E Rail Drill

- Place the drill into the case
- Put any cutters rail shoes etc into the bottom of the case.
- Place the indexing strips across the top of the drill.
- Finally put the Pressure bottle across the top.





5.0 Do's and Don'ts.

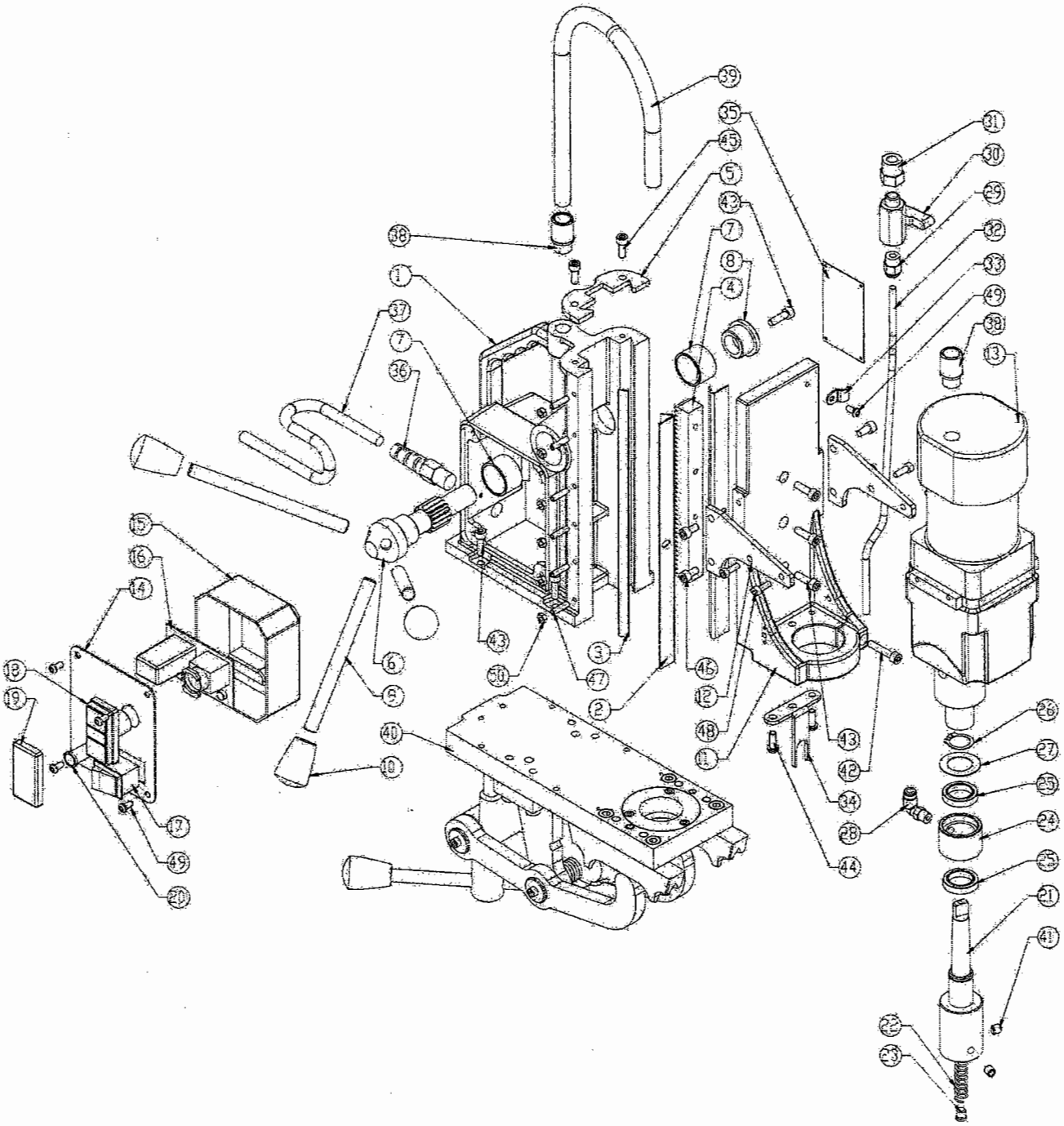
- Do not attempt to connect the machine to any power supply other than 110V AC single phase.
- Do not change a cutter with the machine connected to it's power supply.
- Do make sure that you have the correct rail shoes fitted for the rail section to be drilled and are using the correct hole positioning indexing plate.
- Do make sure you have installed the correct size cutter for the rail section to be drilled.
- Do make sure the cutter fitted is sharp without any of its cutting edges damaged.
- Do not use unnecessary pressure to force the cutter through the rail. This may damage both the machine and the rail. It may also result in personal injury.
- Do always use coolant when drilling holes.
- Do not allow other persons into the area in which you are operating the machine.
- Do remember the slug which is ejected at the end of the drilling process can cause injury. Keep the area clear at all times.
- Do always wear the correct P.P.E. when operating the machine, including safety glasses/goggles.

6.0 Maintenance

6.1 Parts List for Main Body

ITEM No.	QTY	PART No.	DESCRIPTION
1	1	20348-Y	Minibor Body (1332 Yellow)
2	2	60100A	Minibor Brass Strip (Angled)
3	1	20389	Minibor G.F.S
4	1	10215	Minibor Rack
5	1	10084Z	Top Plate (Zinc)
6	1	M0042Z	Pinion-Magtron (Large)
7	2	M0081	Pinion Bush
8	1	M0072Z	Pinion End Cap (Deep) Zinc
9	3	10081Z	Handle 12mm Small Zinc
10	3	10082	Handle Knob 12mm Knock On
11	1	20145	Uni 2 Cradle
12	2	10362Z	Uni 2 Side Bracket (Zinc)
13	1	EIB01R	Uni 2 Drill 110v Eibenstock Rail
14	1	RAILPLATE	TM1000E Switch Plate
15	1	10090	Insulator Box (Unibor)
16	1	60004	PCB (LY2 110v)
17	1	20307	Magnet Switch 1/4 Neon
18	1	20311	Actuator Switch (Universal)
19	1	20361	Switch Protector (Universal)
20	1	20317	Fuse Holder
21	1	ARBOIL5	Arbor TM1000 Electric MT2
22	1	SPR101	Arbor Spring
23	1	10205A	Arbor Ejection Plug
24	1	RT019	TM1000 Arbor Coolant Ring
25	2	RTB003	TM1000 Arbor Coolant Seal
26	1	RTB002	TM1000 Arbor Coolant Circlip
27	1	RT020	TM1000 Arbor Coolant Washer
28	1	50037C	1/8" BSP - 6mm 90 Deg Push Fitting
29	1	50015F	1/4" BSP - 6mm Straight Push Fitting
30	1	CBV004	Ball Tap 1/4" BSP Male/Female
31	1	CBA006	Adapter 1/4" BSP - 18mm
32	1	50013C	6mm Oil Coolant Pipe (Long)
33	1	RT313	TM1000 Coolant Pipe Clip
34	1	10060Z	TM1000 Oilfeed Bracket

6.2 Parts Diagram for Main Body

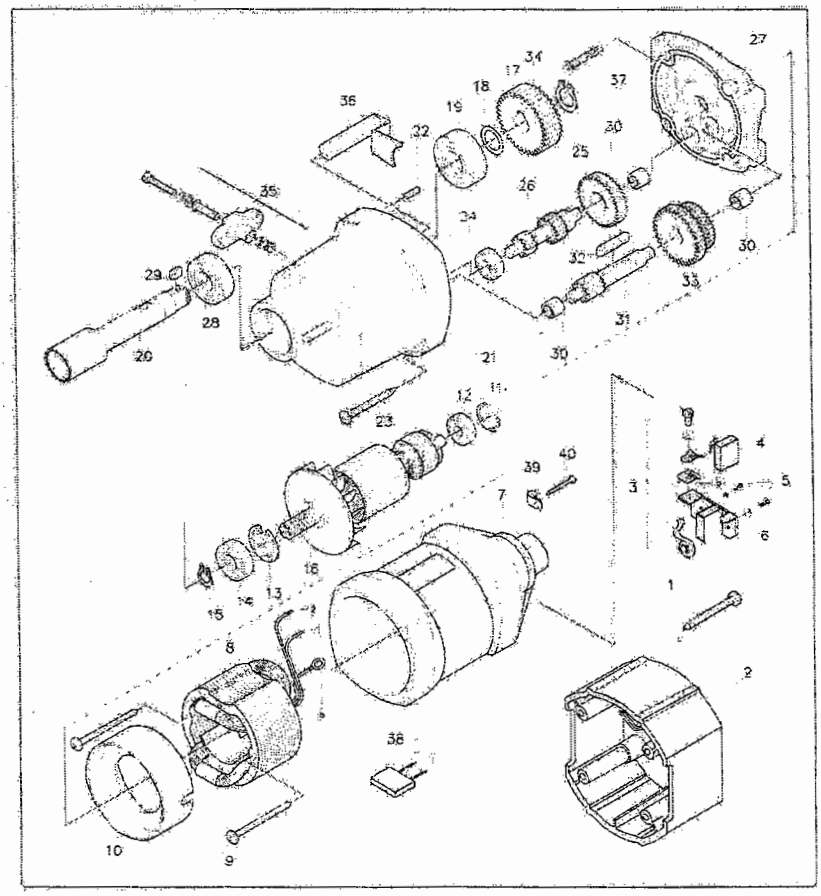


Additional Rail Shoes and Index Plates

RAIL SHOES	ITEM NUMBER	DESCRIPTION
RTS-FB	RT021	TM1000 113LB FLAT BOTTOM
RTS-BH	RT073	TM1000 95LB BULL HEAD
RTS-150LB	RT068	TM1000 150LB
RTS-CON	RT075	TM1000 AL\SS CONDUCTOR

INDEX STRIP	ITEM NUMBER	DESCRIPTION
RTS-FB	RT057	TM1000 113LB FLAT BOTTOM
RTS-BH	RT060	TM1000 95LB BULL HEAD
RTS-U69	RT053	TM1000 U69
RTS-CON	RT062	TM1000 AL\SS CONDUCTOR

6.4 Motor Unit Diagram



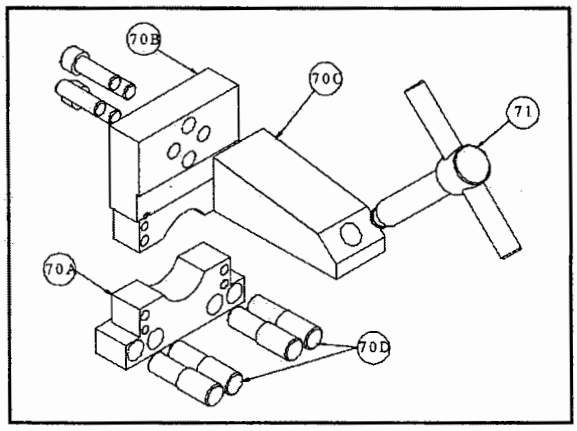
6.5 Motor Unit Parts List

Number	Item Number	Description
1	80201284	SELF TAPPING SCREW
2	74322240	CAP, INCL. PG9
3	80201196	BRUSH HOLDER COMPLETE
4	80700013	BRUSH
5	80201180	SCREW
6	80201385	SPRING WELDER
7	7122A200	MOTOR CASING
8	74222150	STATOR COMPLETE
9	80201266	SELF TAPPING SCREW
10	71323140	AIR GUIDING RING
11	83000036	O-RING
12	80410011	GROOVED BALL BEARING
13	802013333	LOCKING RING
14	80410031	GROOVED BALL BEARING
15	80201320	LOCKING RING
16	74222100	ROTOR COMPLETE
17	71323430	SPINDLE WHEEL
18	80200502	FITTING WASHER
19	80410130	GROOVED BALL BEARING
20	71323420	WORK SPINDLE
21	71323400	GEARBOX HOUSING
22	80200582	NOTCHED PIN
23	80201284	SELF TAPPING SCREW
24	80410010	GROOVED BALL BEARING
25	71323470	INTERMEDIATE WHEEL
26	71323500	SHAFT WITH 2 PINIONS
27	74222610	END SHIELD OF GEARING
28	80410152	GROOVED BALL BEARING
29	80200601	FITTING SPRING
30	80420110	NEEDLE BEARING
31	71223460	SHAFT WITH CLUSTER GEARS
32	80200602	FITTING SPRING
33	71323460	CLUSTER GEARS
34	80201322	LOCKING RING
35	71540545	GEAR SWITCH, COMPLETE
36	71323520	COUPLING BOLT, COMPLETE
37	80201296	SELF TAPPING SCREW
38	80500010	CONDENSOR
39	80600164	PLASTIC CLIP
40	80201284	SELF TAPPING SCREW

35	1	RM239	Warning Plate
36	1	10231	M16 Strain Relief Cable Gland
37	1	10237-1	110v Yellow Cable
38	2	40026	M16 Push Fit Gland
39	1	M0443	Conduit
40	1	CLA002	Clamp Assembly
41	2	SC88GRUB	M8 x 8 Grub Screw
42	1	SC630CAP	M6x 30 Cap Screw
43	8	SC620CAP	M6 x 20 Cap Screw
44	2	SC616BUT	M6 x 16 Button Head Screw
45	2	SC616CAP	M6 x 16 Cap Screw
46	4	SC612CAP	M6 x 12 Cap Screw
47	6	SC525GRUB	M5 x 25 Grub Screw
48	4	SC516CAP	M5 x 16 Cap Screw
49	5	SC510BUT	M5 x 10 Button Head Screw
50	6	NUT-M5	M5 Nyloc Nut

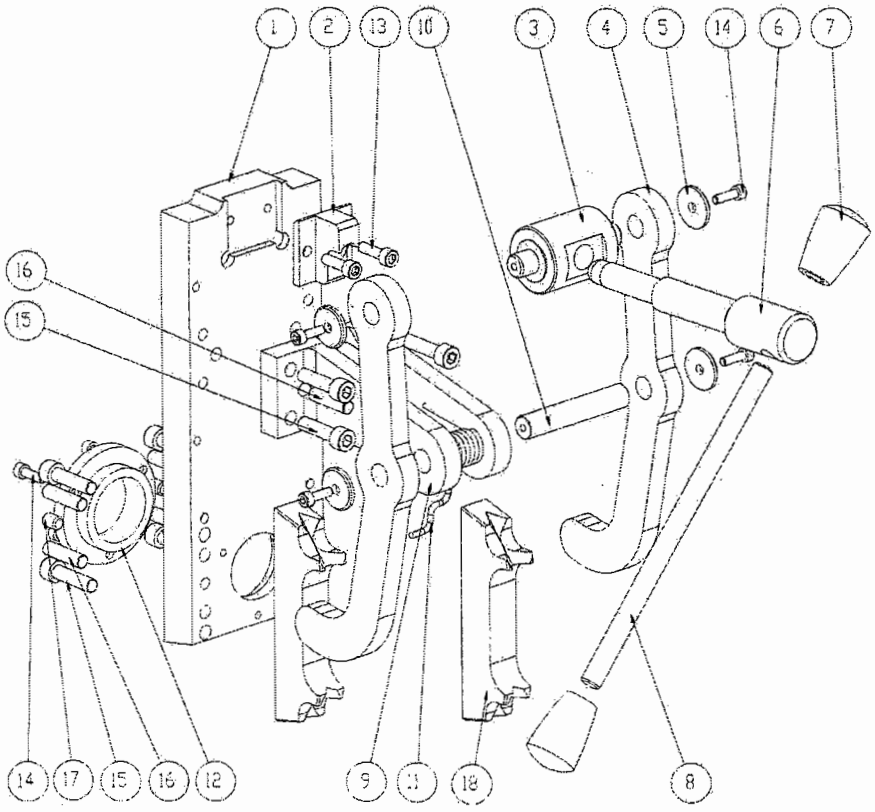
Additional Parts List (Complete assembly 70)

Dia No	Stock-No	Description	Qty
70A	RT053AZ	U69 SMALL BASE	1
70B	RT053BZ	U69 LARGE BASE	1
70C	RT053CZ	U69 CLAMP	1
70D	RT053DZ	DOWEL	4
71	RT088Z	U69 TOMMY BAR	1

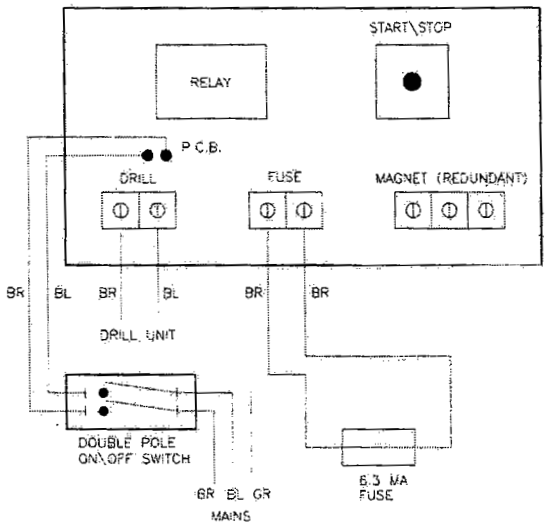


6.3 Exploded view of Clamp Assembly CLA002

Item No.	Part No.	Description	Qty
1	Rt305	TM1000 Electric Base plate	1
2	Rt302	Screw clamp locking shoe	1
3	Rt135	Screw clamp pivot shaft	1
4	Rt026	TM1000 locking arm	2
5	Rt017Z	Cam pin end cap	4
6	Rt134	Screw clamp locking shaft	1
7	10082	12mm knob	2
8	20346	Ø12 handle	1
9	Rt048	Locking arm clevis	1
10	Rt016	Cam pivot pin	1
11	Rt015	TM1000 leg release spring	1
12	Rt011	TM1000 Nylube bush	1
13	SC620cap	M6x20 capscrew	2
14	SC516cap	M5x16 capscrew	7
15	SC830cap	M8x30 capscrew	8
16	DWL-830	Ø8x30 Lg Dowel	6
17	SC810grub	M8x10 Grubscrew	2
18	As specified	Rail shoe	2

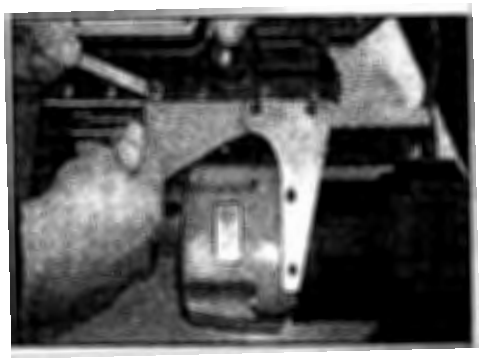


6.6 Wiring Diagram.



6.7 Slide Adjustment.

- After repeated use the cradle may become loose and need to be tightened.
- Put 2.5mm Allen Key into head of cradle retaining nuts, using 8mm Spanner undo the locking nuts anti-clockwise holding the Allen key without moving grub screws.
- Using the Allen Key gently tighten screws in series until the cradle moves freely in the slide but does not allow the motor to wobble.
- When adjustment is complete re-tighten locking nuts clockwise.



6.8 Nylube Bush.

- After every hole is drilled, always make sure that the Nylube Bush is clean from any swarf, as it may cause the bush to wear. If the Arbor starts to wobble the Nylube Bush is ready for replacing.