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Battery Rail Drill

User and Maintenance Guide

Part No. 100001

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1. ISSUE CHANGES

Issue	Changes made	Date	Pages changed	Changed by
1	New Issue	23.04.13		MJK
2	Complete change	12.01.2018		MJK
3	Service Parts added	09.04.18	Sec 8 included	CDM
4	Clamp & spare parts list amended	04-09-18	Various	CDM

2. INTENDED USE

Specialised Tools and Equipment Ltd has developed the industry's first genuinely portable, versatile and incredibly light weight rail drill weighing in at just 17kg!.

The STEL BRDM18-FUEL Rail drill is designed to drill fishplate or bonding holes to facilitate track maintenance. The drill can be used with readily available templates for setting hole heights and pitch. All other custom sizes to suit rail designations and hole positions are available upon request.

A range of accessories and tools is available e.g. drilling templates, carry case, magnetic swarf wand etc. Please contact STEL for further information.

3. SAFETY

To ensure that the BRDM18-FUEL Drill is operated correctly, and any risks minimised to the operator, the following should be observed:

In addition to any PPE equipment required by local regulations, as a minimum, safety footwear, gloves and glasses must be worn when using and drill.

Only trained and competent people can use the drill.

Do not use the drill if it is damaged, or if any parts are missing.

Do not use the drill on live 3rd or 4th rail electrified lines.

Do not exceed the limitations specified in the Technical Specification, or use the drill for purposes other than those defined in the Intended Use.

Do not attempt to replace a cutter whilst a battery is fitted to the motor.

Do not wear loose clothing when using the drill.

Maintenance must be undertaken by competent personnel only.

Ensure that the templates fitted are the ones to suit the rail being drilled.

4. TECHNICAL SPECIFICATION

4.1. Drill Nomenclature

4.2. Drill Specification

- Weight: 17kg
- Dimensions: H = 370
  W = 120
  L = 470
- Voltage: 18v
- No load speed: 400/690 rpm
- Hand Arm Vibration reading: <2.5m/s^2
- Sound pressure level: 88dB(A) at 380 and 101dB(A) at 680
- Max. drilling capacity: Ø32mm core drill, Ø13mm solid drill bit

4.3. Hole cutting capabilities

The following is a guideline based upon the use of a new cutter in each case and the amount of charge held by the battery is also a governing factor.

Cutter Details		Number of holes (per battery)
Annular Broach cutter	Ø32mm (1 ¼")	11
	Ø22mm (1 1/8"	25
Solid drill bit	Ø13mm (1/2")	13
	Ø9mm (3/8")	30
	Ø5.6mm (7/32")	42

Note: All values are per battery. Each drill is supplied with 2 batteries. Charging time per 9Ah battery approximately 120mins.

4.4. Compliance

In accordance with the following Directive(s):-

CE

Machinery Directive 2006/42/EC, EN 61029, EN60745,
Directive 93/68/EEC CE Marking, EMC Directive 2006/95/EC
RIS170-PLT

4.5. Storage

Ensure that the drill is placed in its storage case immediately after use. Place all of the templates and other ancillaries in the case after use. Ensure that the case and its contents are stored in a dry clean environment.

4.6. Transporting/shipping

Ensure that the drill is transported in its storage case.

5. OPERATING INSTRUCTIONS

To ensure correct and safe operation, the described sequence should be followed prior to use:

5.1. Pre-use

1. Prior to arriving at the worksite, ensure that all the batteries have full charge.
2. Check that the correct cutters and ejection pins are available and in good condition.
3. Check the correct templates are fitted or are available.
4. Check that there is sufficient coolant available to complete the job.

5.2. Fitting a Broaching Cutter

Prior to fitting or changing a cutter – ALWAYS remove the battery, failure to do so could result in serious injury.

- Disconnect the battery from the drill.
- Insert the pilot pin in the broaching cutter. The main function of the pin is to ensure ejection of the slug at the end of each drilling cycle.
- Retract the motor slide using the cutter feed handle to provide more space to fit the cutter.

pilot

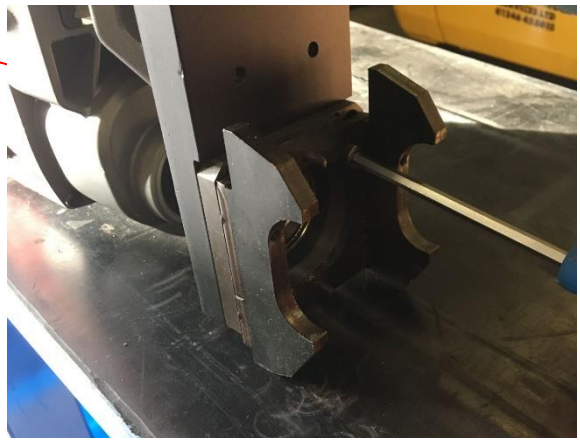
- Twist the body of the arbor and insert the cutter into it. Align the flats of the cutter with alignment marks on the arbor body.

- Insert the cutter firmly into the arbor then release the collar ensuring that it returns to its initial position.

5.3. Fitting Rail Shoe templates

Prior to fitting or the templates – ALWAYS remove the battery, failure to do so could result in serious injury

- Remove the two cap screws retaining the template.
- Remove the template and replace as necessary.



5.4. Coolant System

5.4.1. 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

5.4.2. 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.

5.4.3. 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.

5.4.4. Removing the lubricant from the drill

- Turn the valve on the pipe to ‘OFF’ to stop the coo

- Remove the pipe by pressing the release ring on the coolant adapter.

5.5. Depressurizing the coolant bottle

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

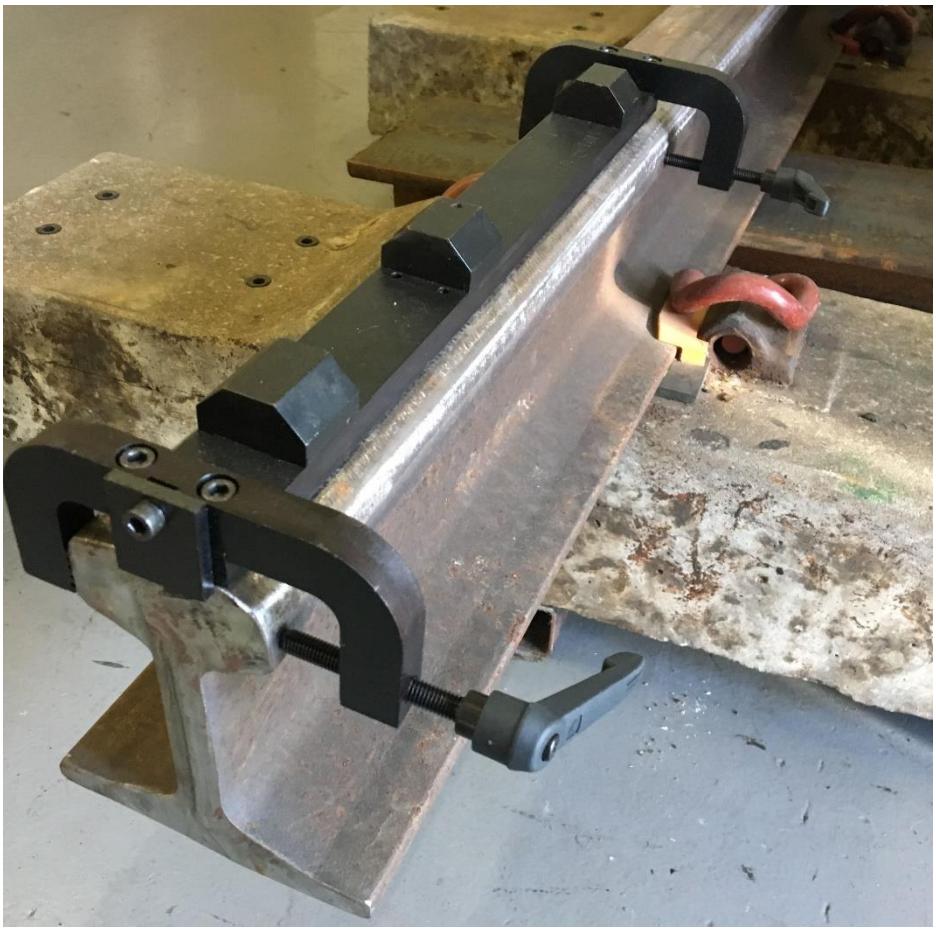
5.6. Using the Indexing Plate

5.6.1. The machine is normally used with hole positioning indexing plates for 113FB, 95LB, U69 and aluminium rail.

5.6.2. Fit to rail head.

5.6.3. Make sure the end stop is tight against the end of the rail.

5.6.4. Tighten locking screw(s).



To avoid damage to the clamp, do not over tighten the clamping handle. See section 5.7.

5.7. Using the Over Rail Clamp

Ensure that the cutter is retracted sufficiently to avoid touching the rail prior to clamping the drill to the track.

The clamping handle can be lifted out of the clamping arms as shown here. Manoeuvre the drill up and over the rail.

Lower into position on the index plate taking care to align it over the positioning block. Ensure that the rail shoe template sits fully into the rail web.

Position the threaded boss on the clamping handle back into the clamp arms. And begin to tighten the clamping handle.

Continue to tighten the clamping handle until the rollers contact the rail head. Finally, raise and lower the drill body slightly whilst tightening the clamp.

Fit the cutter feed handle square drive into the drill (this can be fitted for either left or right hand operation)

5.8. Drilling a Hole

- Switch on coolant supply and check that no swarf is restricting the arbor movement through drill baseplate.
- Switch on the motor.
- Drill the first hole. Apply a small amount of drilling pressure until the cutter is engaged in rail web. Whilst drilling, do not force the cutter. Listen to the tone of the motor whilst rotating the feed handle. Allow the cutter to feed through at its own pace.
- Check the slug has been ejected at the end of each drilling cycle.
- Un-clamp the Rail Drill.
- Retract the cutter making sure the cutter is again clear of rail web.
- Turn off the motor and coolant supply.
- Clean between the rail shoes with a hand brush to clear all swarf.
- Repeat above procedure for drilling the second/third hole.

5.9. Do's and Don'ts when using the BRDM18-FUEL Rail Drill.

Follow these points closely to ensure safe and correct use of the drill!!

- Do not carry the drill or manoeuvre the drill with the battery connected.
- Do not change the cutter whilst the battery is fitted to the machine.
- 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 worn or 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 people 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 always.
- Do always wear the correct P.P.E. when operating the machine, including safety glasses/goggles.

6. ROUTINE MAINTENANCE

Ensure that the battery is removed from the drill before any maintenance or adjustments made to the machine. All maintenance must be carried out by trained personnel.

The following outlines the **minimum** requirements for the maintenance for the Rail Drill.

6.1. Slide Adjustment

- After repeated use the cradle may become loose and will need to be tightened.
- Insert a 2mm Allen Key into the head of the slide adjustment screw. Rotate clockwise to tighten the slide.
- Gently tighten the 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

6.2. Changing the Battery

Press in the two battery retaining clips and withdraw the battery from its seat.

Fitting is the reversal of removal.

6.3. Looking after your batteries

Ensure that all batteries are fully charged prior to use. Avoid running the batteries completely flat as this will decrease the lifespan of the battery. Press the red power button on the side of the battery to display charge level.

When the battery is no longer holding its charge re-cycle in line with current legislation. Do not dispose of the battery in domestic waste.

6.4. Rack and slide lubrication

To lubricate the rack, rotate the capstan handle so that the drill is fully extended and that the rack and slides can be seen from above. Apply a small amount of general purpose lithium grease to the rack and slide-way before rotating the capstan in the opposite direction. Wipe away any excess.

6.5. Fixings

Prior to use ensure that all fixings are present and tight.

6.6. Labels and warning Instructions

Ensure that all warning instructions and labels are fitted and clearly visible.

6.7. Routine maintenance schedule

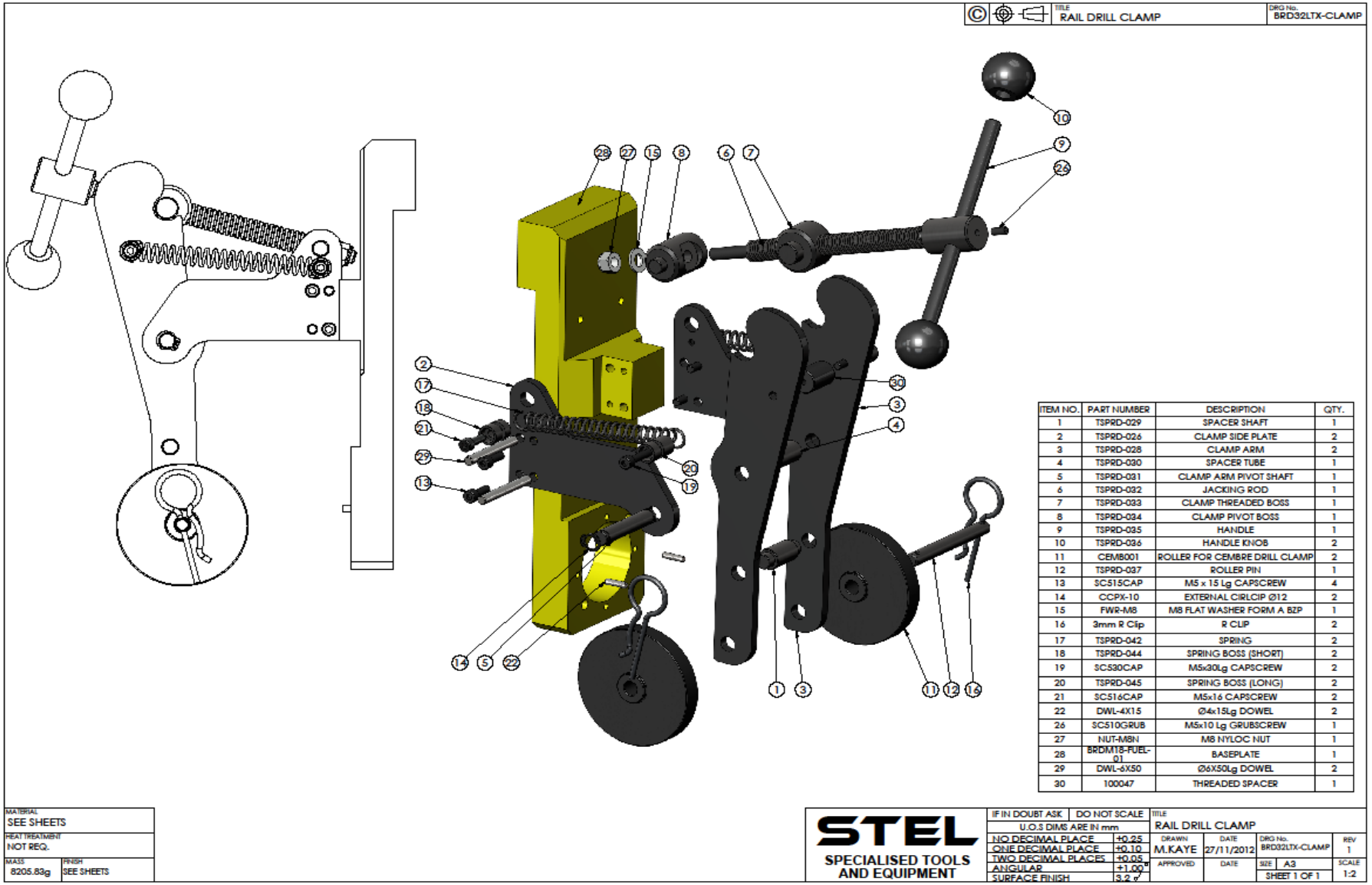
Description of work		Maintenance interval		
		3 monthly	**6 monthly**	**Yearly**
6.7.1	Slide Adjustment Check/adjust	**√**		
6.7.2	Batteries replace	When required		
6.7.3	Rack and Slide Lubrication	**√**		
6.7.4	Fixings	**√**		
6.7.5	Labels and warning instructions	Every Use		
6.7.6	Replace Motor Brushes	(N/A Brushless Motor)		

7. TECHNICAL DRAWINGS

7.1. BRDM18-FUEL Main Assembly Parts List

Item No.	Part Number	Description	Qty
1	2788-20	MILWAUKEE DRILL BODY	1
2	100024	CLAMP ASSEMBLY	1
3	VARIES	RAIL SHOE (TO SUIT PROFILE TO BE DRILLED)	1
4	100004	CUTTER FEED HANDLE	1

7.2. BRDM18-FUEL Clamp Assembly (Pt No 100024)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TSPRD-029	SPACER SHAFT	1
2	TSPRD-026	CLAMP SIDE PLATE	2
3	TSPRD-028	CLAMP ARM	2
4	TSPRD-030	SPACER TUBE	1
5	TSPRD-031	CLAMP ARM PIVOT SHAFT	1
6	TSPRD-032	JACKING ROD	1
7	TSPRD-033	CLAMP THREADED BOSS	1
8	TSPRD-034	CLAMP PIVOT BOSS	1
9	TSPRD-035	HANDLE	1
10	TSPRD-036	HANDLE KNOB	2
11	CEMB001	ROLLER FOR CEMBRE DRILL CLAMP	2
12	TSPRD-037	ROLLER PIN	1
13	SC515CAP	M5 x 15 Lg CAPSCREW	4
14	CCPX-10	EXTERNAL CIRCLIP Ø12	2
15	FWR-M8	M8 FLAT WASHER FORM A BZP	1
16	3mm R Clip	R CLIP	2
17	TSPRD-042	SPRING	2
18	TSPRD-044	SPRING BOSS (SHORT)	2
19	SC530CAP	M5x30Lg CAPSCREW	2
20	TSPRD-045	SPRING BOSS (LONG)	2
21	SC516CAP	M5x16 CAPSCREW	2
22	DWL-4X15	Ø4x15Lg DOWEL	2
26	SC510GRUB	M5x10 Lg GRUBSCREW	1
27	NUT-M8N	M8 NYLOC NUT	1
28	BRDM18-FUEL-01	BASEPLATE	1
29	DWL-6X50	Ø6X50Lg DOWEL	2
30	100047	THREADED SPACER	1

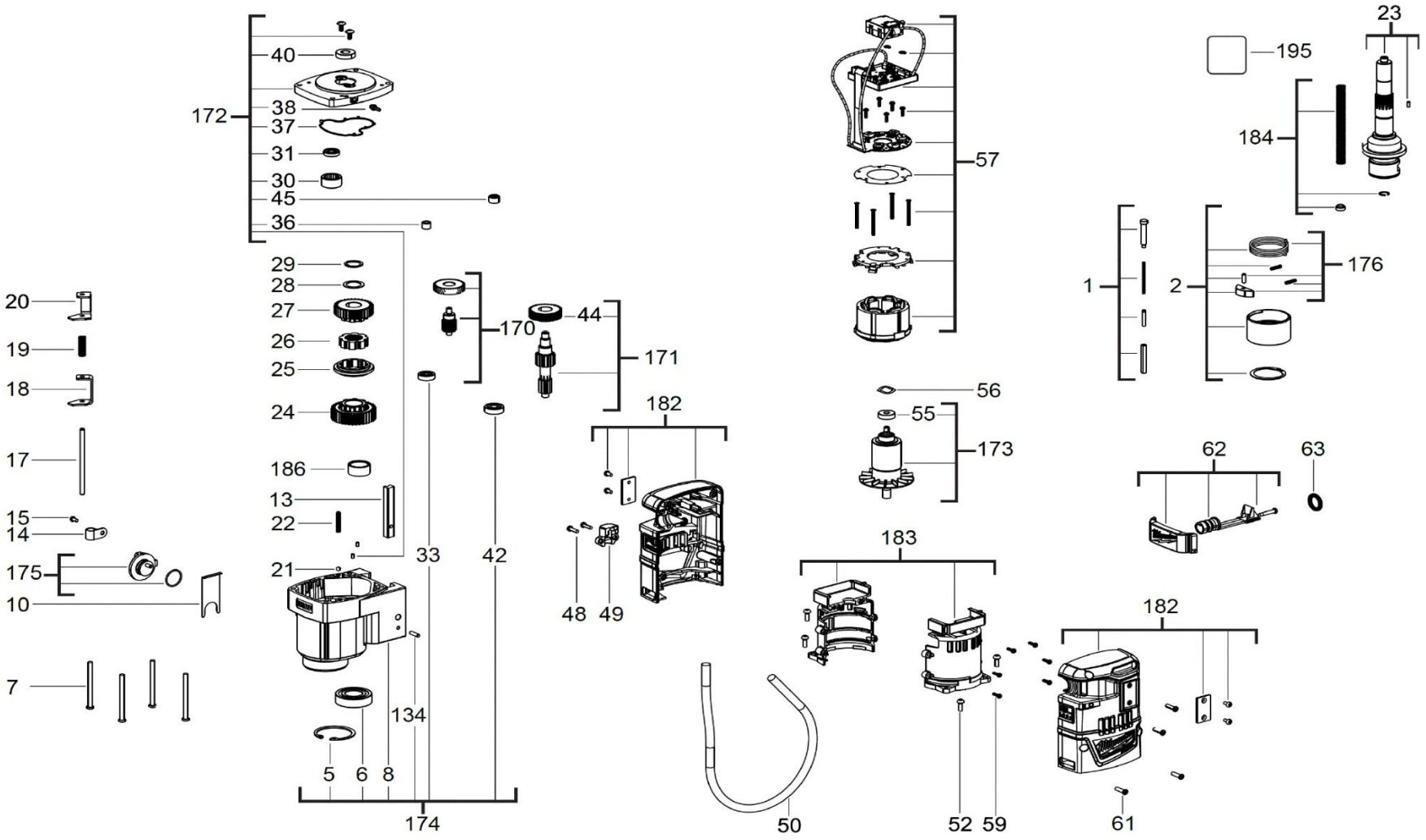
MATERIAL: SEE SHEETS
HEAT TREATMENT: NOT REQ.
MASS: 8205.83g
FINISH: SEE SHEETS

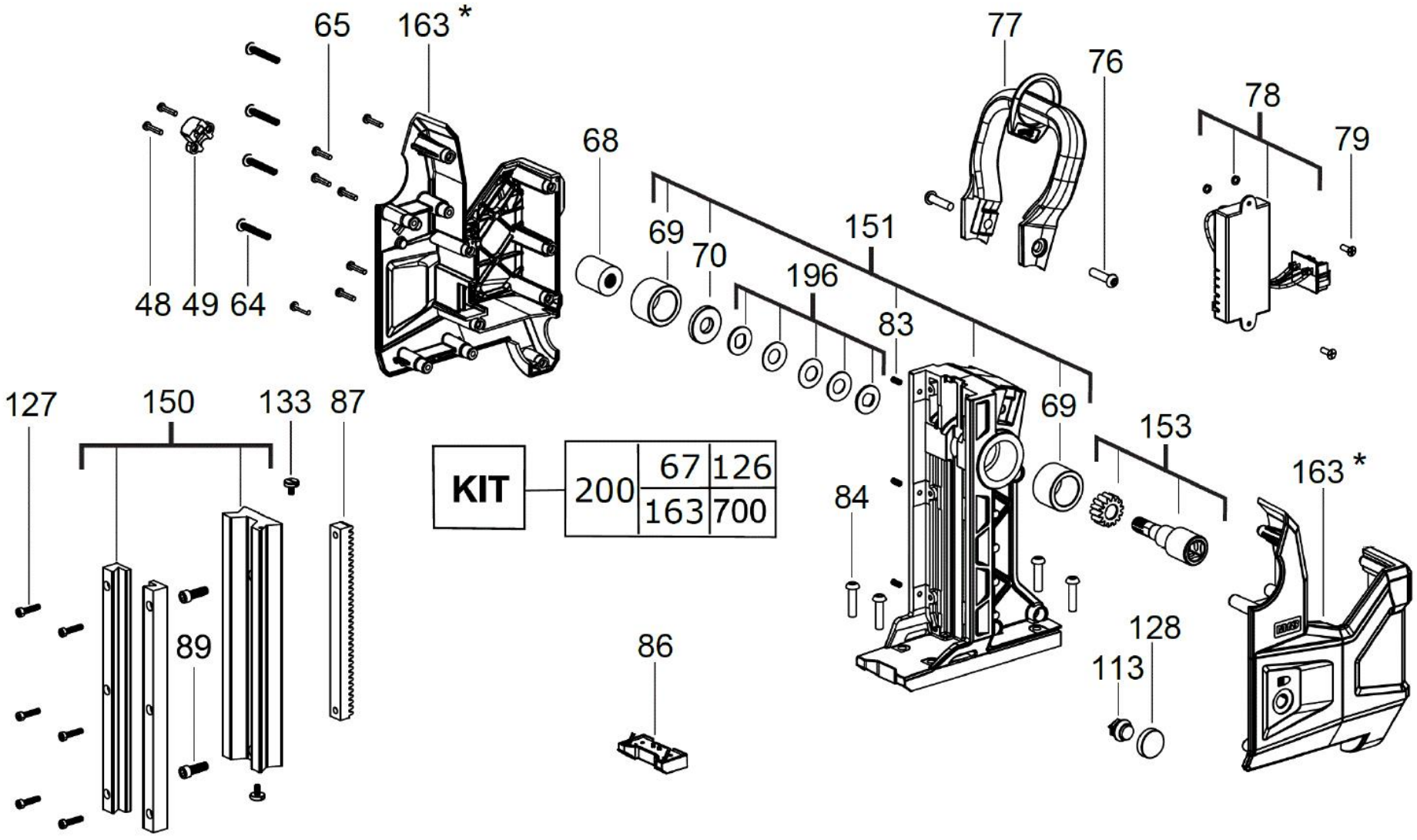
STEL SPECIALISED TOOLS AND EQUIPMENT

IF IN DOUBT ASK | DO NOT SCALE
U.O.S DIMS ARE IN mm
NO DECIMAL PLACE +0.25
ONE DECIMAL PLACE +0.10
TWO DECIMAL PLACES +0.05
ANGULAR +1.00°
SURFACE FINISH 3.2 ✓

TITLE: RAIL DRILL CLAMP
DRAWN: M.KAYE | DATE: 27/11/2012 | DRG No.: BRD32LTX-CLAMP | REV: 1
APPROVED | DATE | SIZE: A3 | SCALE: 1:2
SHEET 1 OF 1

Milwaukee Spare Parts (See table on following page for part numbers)




65
163 *
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70
151
196
83
48
49
64
127
150
133
87
KIT
200
67
126
163
700
84
69
153
163 *
89
86
128
113

8. SERVICE PARTS

Please see the attached Service Parts manual from Milwaukee for the maintenance and functionality of the drill. (spares available from STEL quoting part numbers shown on list)

9. TRAINING

Operators that operate or maintain the BRDM18-FUEL rail drill must be trained to ensure competency. As a minimum the training should include:

- Rail Drill intended use
- Part identification
- Pre-use checks
- Safe and correct operation
- Maintenance
- Theory and practical exercises

STEL can offer familiarisation training, both off site and at your facilities, so please contact us with your requirements.

10. SERVICE, TEST AND REPAIR

STEL can arrange for your products to be serviced, tested and repaired as required. We can also arrange for collection and delivery at a time that suits you.
Parts fitted are OEM or to OEM standards, thus ensuring quality and reassurance.
For more information please contact us.

WARRANTY
This unit is supplied with a 12 month warranty (Please refer to terms & conditions of sale)

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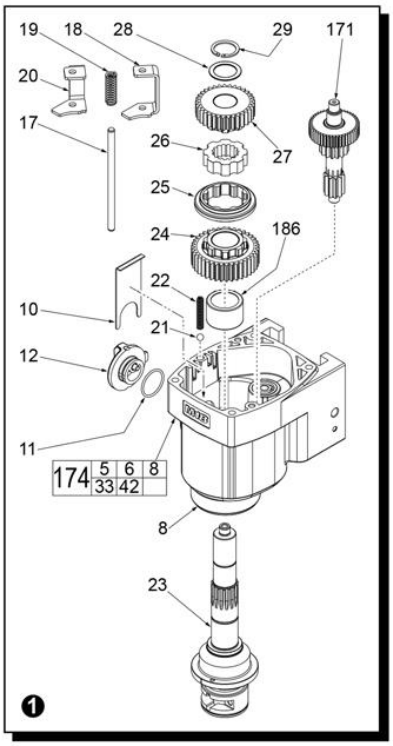
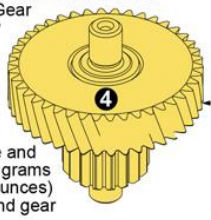
LUBRICATION:

Type "Y" Grease, No. 49-08-5270 (6 oz. tube)
Use approximately 85 grams, 3 ounces

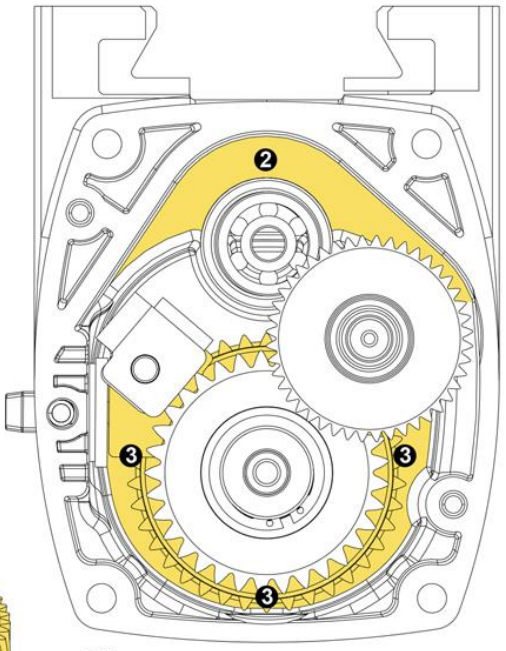
LUBRICATION NOTE: When servicing the drill motor, 90-95% of old grease must be removed prior to new grease being added.

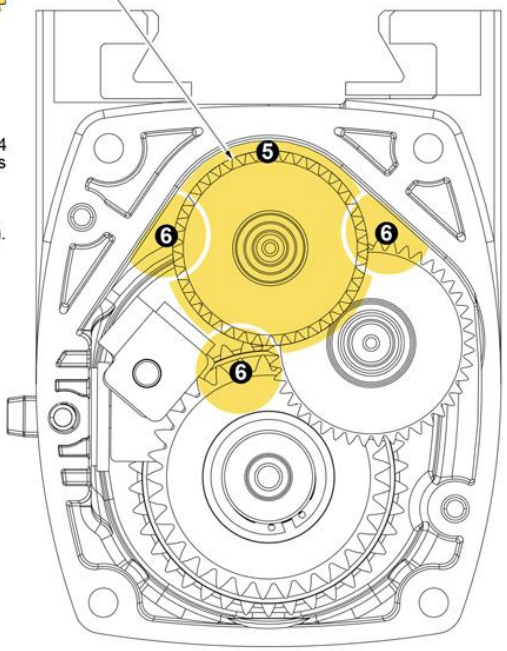


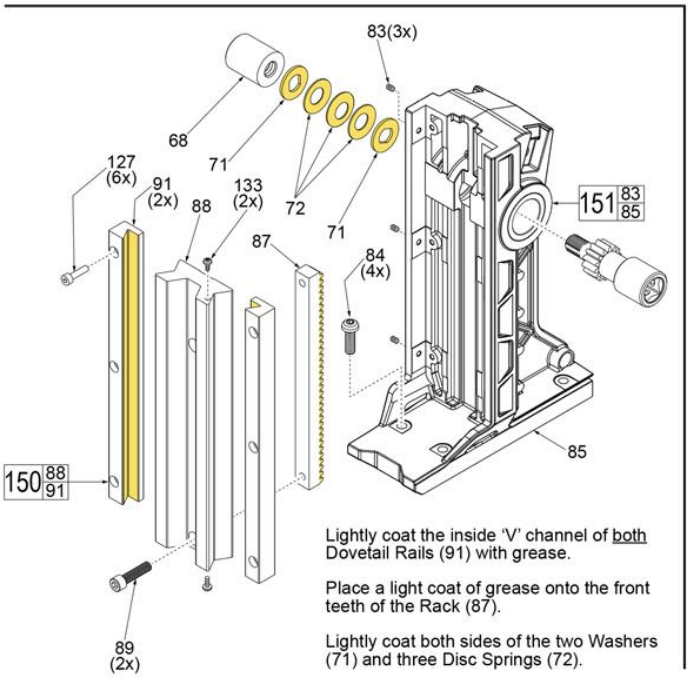
1. Install parts shown into/onto Gear Case Assembly (174) prior to applying any lubrication.
2. Apply 13 grams (approximately .45 ounces) of grease in this area of the gear case prior to installing the Pinion/1st Intermediate Gear Assembly (170).
3. With the aid of a grease gun, place 26 grams (approximately .9 ounces) in and around the gear case cavity for the 3rd Intermediate Gear system (24, 25, 26 and 27).
4. Apply a heavy coating of grease over the entire Pinion/1st Intermediate Gear Assembly (170).



5. Install the assembly (170) into gear case and place 5-8 grams (.17-.28 ounces) fully around gear space.
6. This step will require 39 grams (1.4 ounces) of grease. Place 13 grams (approximately .45 ounces) of grease <u>at each of three positions</u> over and around the Pinion/1st Intermediate Gear Assembly (170).



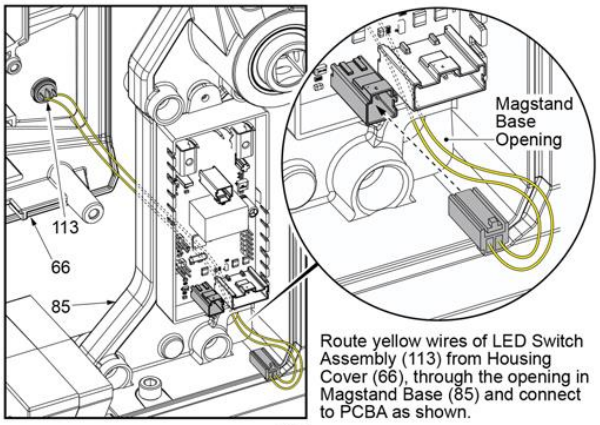




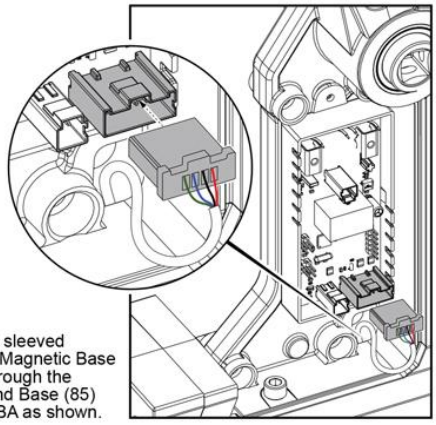
Lightly coat the inside 'V' channel of <u>both</u> Dovetail Rails (91) with grease.

Place a light coat of grease onto the front teeth of the Rack (87).

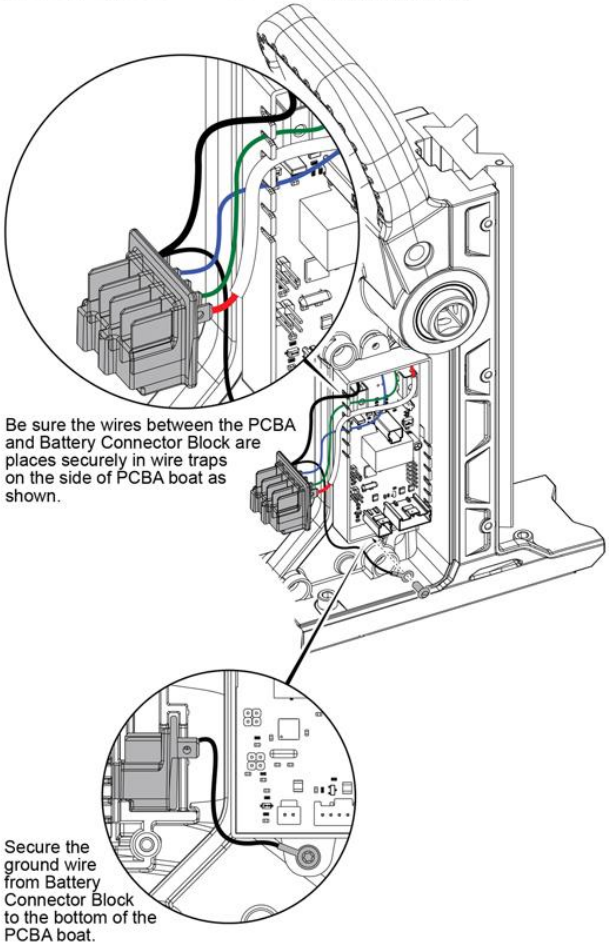
Lightly coat both sides of the two Washers (71) and three Disc Springs (72).



Route yellow wires of LED Switch Assembly (113) from Housing Cover (66), through the opening in Magstand Base (85) and connect to PCBA as shown.

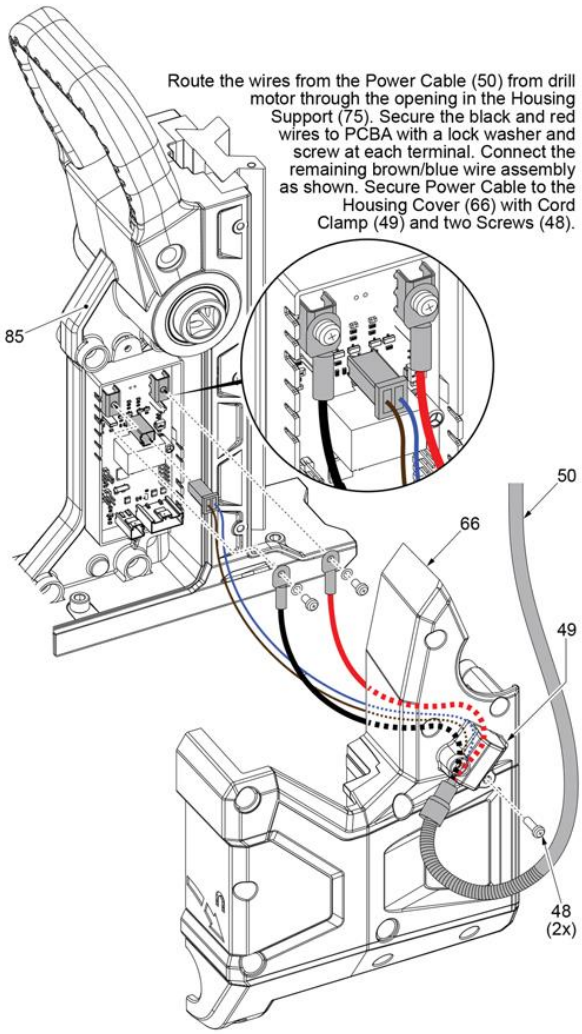


Route the four wire sleeved assembly from the Magnetic Base Assembly (155), through the opening in Magstand Base (85) and connect to PCBA as shown.

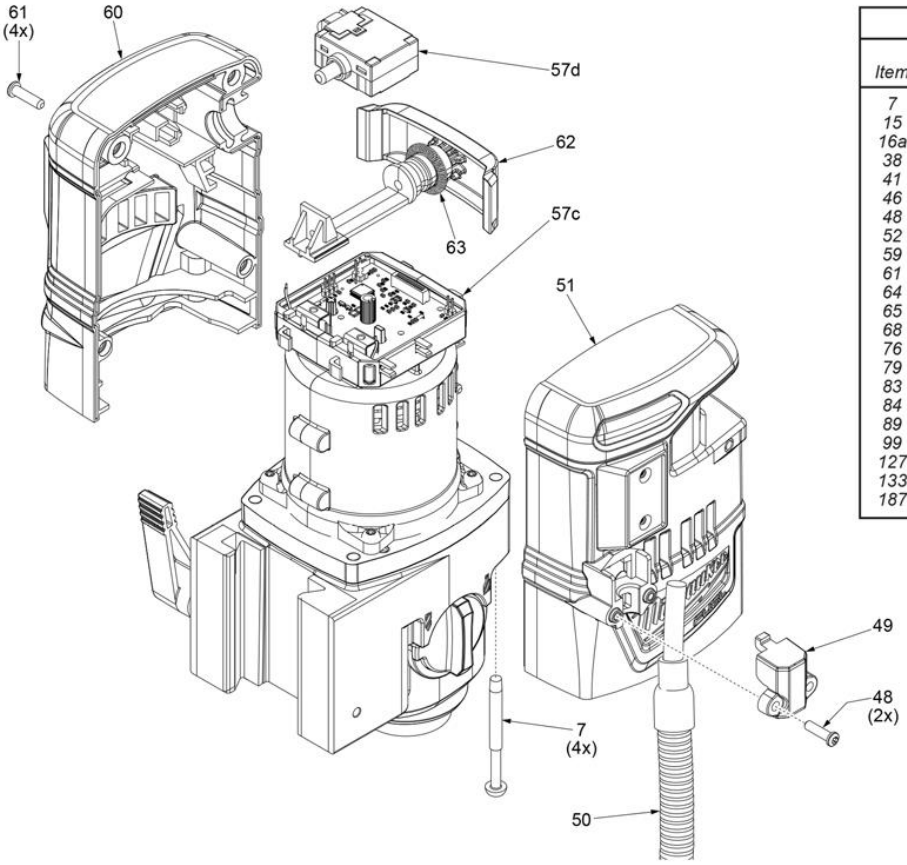


Be sure the wires between the PCBA and Battery Connector Block are places securely in wire traps on the side of PCBA boat as shown.

Secure the ground wire from Battery Connector Block to the bottom of the PCBA boat.

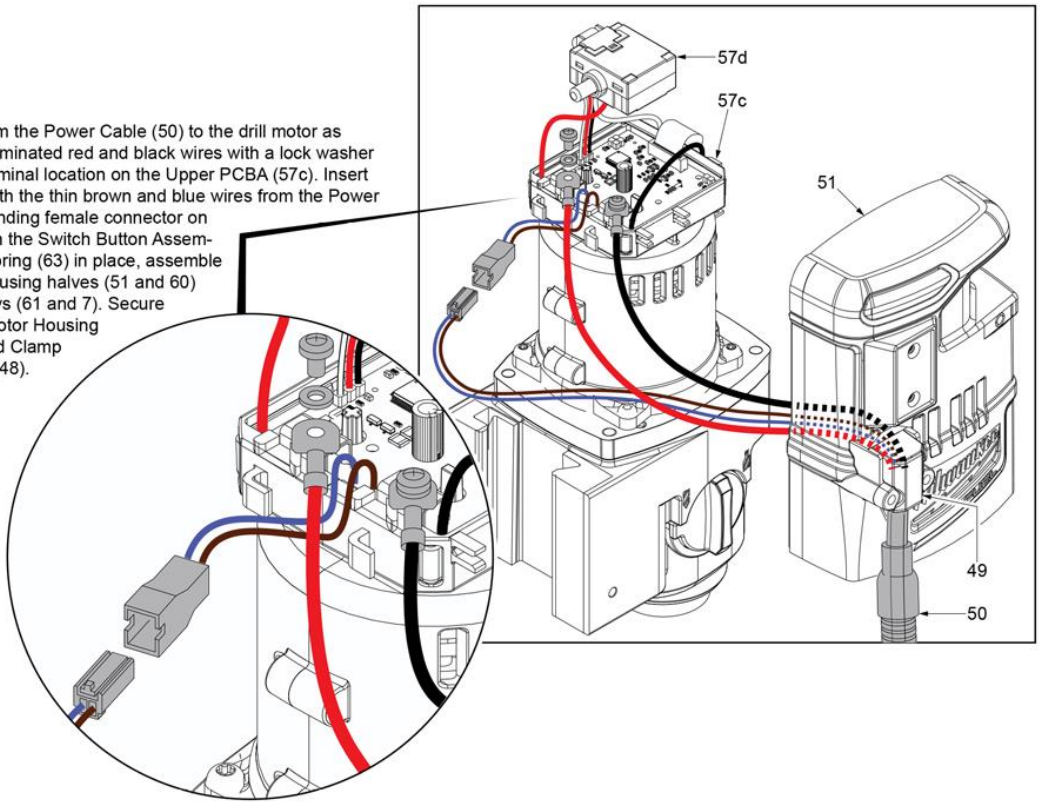


Route the wires from the Power Cable (50) from drill motor through the opening in the Housing Support (75). Secure the black and red wires to PCBA with a lock washer and screw at each terminal. Connect the remaining brown/blue wire assembly as shown. Secure Power Cable to the Housing Cover (66) with Cord Clamp (49) and two Screws (48).



SCREW TORQUE CHART			
		Seat Torque	
Item	Part Number	(Kg./cm.)	(In./lbs.)
7	06-82-0040	28-33	24-28
15	05-81-1410	4-6	3-5
16a	----------	6-10	5-8
38	43-33-0025	4-8	3-7
41	05-83-0020	15-20	13-17
46	06-81-0007	7-10	6-8
48	06-82-3006	13-17	11-14
52	05-78-0910	12-18	10-15
59	06-82-1080	10-15	8-13
61	06-82-0018	15-20	13-17
64	06-82-0009	28-33	24-28
65	06-82-0011	15-20	13-17
68	43-12-0055	460	399
76	05-74-0014	35-40	30-34
79	05-83-0010	3-7	2-6
83	06-83-0015	4	3
84	05-81-2787	28-33	24-28
89	06-75-3050	28-33	24-28
99	----------	20-25	17-21
127	05-74-0013	25-30	21-26
133	05-80-2787	10-15	8-13
187	42-04-0200	50-75	43-65

Connect the wires from the Power Cable (50) to the drill motor as shown. Secure the terminated red and black wires with a lock washer and screw at each terminal location on the Upper PCBA (57c). Insert the male connector with the thin brown and blue wires from the Power Cable to the corresponding female connector on the Upper PCBA. With the Switch Button Assembly (62) and Garter Spring (63) in place, assemble together two motor housing halves (51 and 60) and secure with screws (61 and 7). Secure Power Cable to the Motor Housing Support (51) with Cord Clamp (49) and two Screws (48).



Milwaukee Spare Parts list

Position	Quantity	Description	Part Number
0001	1	EJECTOR	4931453091
0002	1	CHUCK SHROUD	4931453092
0005	1	RETAINING RING	4931453093
0006	1	BALL BEARING	4931453094
0007	4	SCREW	4931453095
0008	1	GEAR BOX ASSEMBLY	4931453096
0010	1	RETAINING PLATE	4931453097
0013	1	LOCKING ROD	4931453098
0014	1	CABLE CLAMP	4931453099
0015	1	SCREW	4931453100
0017	4	GUIDE BOLT	4931453101
0018	1	HOLDING BRACKET	4931453102
0019	1	SPRING	4931453103
0020	1	HOLDING BRACKET	4931453104
0021	1	BALL	4931453105
0022	1	SPRING	4931453106
0023	1	OUTPUT SHAFT KIT	4931453107
0024	1	GEAR	4931453108
0025	1	COUPLING	4931453109
0026	1	HUB	4931453110
0027	1	GEAR	4931453111
0028	1	WASHER	680335077
0029	1	RETAINING RING	4931453112
0030	1	NEEDLE BEARING	4931453113
0031	1	SEAL	4931453114
0033	1	BALL BEARING	02040640
0036	1	NEEDLE BEARING	02502400
0037	1	SEAL	4931453115
0038	1	FLAT GREASE NIPPLE	4931454085
0040	1	BALL BEARING	4931453116
0042	1	BALL BEARING	4931453117
0044	1	GEAR	4931453118
0045	1	NEEDLE BEARING	5131000000
0048	4	SCREW	4931453119
0049	2	CABLE CLAMP	4931453120
0050	1	CABLE	4931453121
0052	4	SCREW	4931446540
0055	1	BALL BEARING	4931436119
0056	1	WASHER	4931453122
0057	1	ELECTRONIC	4931453123
0059	6	SCREW	660570005
0061	4	SCREW	4931453124
0062	1	SWITCH COVER	4931453125
0063	1	SPRING	4931453126
0064	4	SCREW	4931453127
0065	7	SCREW	4931453124
0067	1	COVER PLATE	4931453128
0068	1	BIT GUIDE	4931453129
0069	2	BUSHING	4931453130
0070	1	COMPENSATION PLATE	4931453131
0076	2	SCREW	4931453132
0077	1	HANDLE	4931453133
0078	1	ELECTRIC ELEMENT	4931453134
0079	2	SCREW	4931453135
0083	3	SCREW	4931435627

0084	4	SCREW	4931453138
0086	1	ELECTRIC ELEMENT	4931453139
0087	1	TOOTH RACK	4931453140
0013	1	SWITCH	4931453155
0127	6	SCREW	4931453167
0128	1	SWITCH COVER	4931453168
0129	2	LEDGE	4931453169
0131	2	PIN	4931453170
0133	2	SCREW	4931453171
0134	1	CYLINDER PIN	4931453172
0150	1	HOLDING DEVICE	4931453173
0153	1	GEAR BOX KIT	4931453175
0163	1	HOUSING	4931453178
0164	1	CYLINDER PIN	4931453179
0170	1	REDUCTION GEAR	4931453180
0171	1	REDUCTION GEAR	4931453181
0172	1	KIT	4931453182
0173	1	ARMATURE ASSEMBLY	4931453183
0174	1	GEAR BOX ASSEMBLY	4931453213
0175	1	TURNING KNOB	4931453184
0176	1	KIT	4931453185
0179	1	VALVE	4931453188
0182	1	HOUSING SET ASSY	4931453189
0183	1	HOUSING	4931453190
0184	1	EJECTOR	4931453191
0186	1	BUSHING	4931453192
0195	1	RATING PLATE	4931453195
0196	1	ADJUST. WASHER SET	4931453196
0200	1	SET POWERPACK	4931466416
0285	1	FLAT GREASE NIPPLE	4931454085

NOTES