

BEF320-1A

Operating Manual

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BEF320-1A

OPERATING MANUAL

This manual covers to the best of our knowledge, the operation and maintenance of the BEF320 Multi-plane. Before operation of the equipment the operating manual must be read and understood by the operator. The safety regulations must be followed at all times. Service of electrical and hydraulic components should be carried out by authorised personnel. Failure to follow these instructions could result in damage to the machine and/or serious personal injury or death.

WARNING

Failure to follow this instruction may result in serious personal injury or death. SPE disclaims all responsibility for damage to persons or objects arising as a consequence of incorrect handling of the machine, failure to inspect the machine for damage or other faults that may influence the operation prior to starting work, or failure to follow the safety regulations listed or applicable to the job site.

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STARTING WORK

CHECK the following prior to starting the equipment:

- Check condition of cutter drum assembly
- Check all bolts for tightness
- Check drive belt condition and tension
- Check drive pulleys are undamaged and clean
- Check all leads, pipes and hoses for damage
- Check electrical cables/plugs
- Check RCD protection is fitted and working

1. Ensure power supply is correct. BEF320-1A requires a 380/415v 32amp supply from the mains or generated by a minimum of 25kva on 50 cycles.
2. After connecting the machine to the power supply turn the red isolator (on the front of electric panel) to the on position. Red light will illuminate on panel.
3. BEFORE starting the machine ensure the cutter drum assembly is clear of the ground. If not adjust using hand wheel.
4. ENSURE the drive control levers are in the non-drive/neutral (central) position and speed control knob is turned to OFF position.
5. Connect vacuum hose to dust port at side of machine if dust control vacuum is being used.
6. START the electric motor using the green button on top of the electric panel. Check that the three phase power supply is phased to suit the machine. The electric motor should be turning in direction of arrow on cooling fan cover ie clockwise when viewed from the non drive side of machine. If not the electric motor will be turning in reverse and hydraulic drive systems will not operate. (To reverse phases see page 3).
7. OPERATE the hydraulic lift/lower lever allowing the machine to fall to its lowest position
8. SLOWLY rotate the hand wheel until the cutters make contact with the surface to be treated.
9. Push both drive control levers forward and slowly open the speed control knob until machine is moving at satisfactory speed.
10. Adjust hand wheel to desired cutting depth and engage hand wheel locking pin.
11. To raise and lower machine use hydraulic lift lever to the left of hand wheel.
12. To turn machine around at end of run raise out of cut, reduce forward speed and pull either drive control lever back through neutral and into reverse. Pulling the left lever will make machine turn left and the right one turn right.



GENERAL OPERATION

It is essential that the cutters are not lowered too far and too hard onto the surface as serious damage could be caused to the machine and cutter drum assembly.

THE cutters must be allowed to "float" on the cutter shafts without excessive downward pressure. This floating action allows the cutters to perform as the designer intended i.e. as cutters rather than as grinders or picks. Do not pull the control levers into reverse when cutting as this could result in the machine reversing quickly in an uncontrolled manner.

The machine should operate smoothly with a minimum of vibration. When the depth of cut is correctly set very little effort should be required to operate the machine.

EXCESSIVE downward pressure on the cutters may marginally improve the work rate/finish but the definite increase in wear rates on the cutter drum assembly and machine components is the negative result. Remember two light passes are quicker and more cost effective than one slow heavy pass. Tests have proven conclusively that heavy downward pressure reduces cutter and drum life by over 50%.

The BEF320 should always be operated in a forward direction. The operator varies the speed of travel to determine the final finish having already pre-set the depth control. It is recommended that the machine is not operated in reverse whilst the cutters are in contact with the surface. When lifting the cutter drum from the work surface it is not necessary to turn the hand wheel - lift upwards by simply operating the hydraulic lift lever.

Always use the shortest possible length of extension cable. To avoid voltage drop the cable must be a minimum of 6mm. Maximum length of cable can then be up to 75 metres.

The motor is fitted with thermal overload protection. Should the thermal trip be activated then it must be allowed to cool and reset. Almost without exception if a motor trips out it is an indicator of a fault elsewhere either on the machine or with the power supply or simply that the machine is being overloaded.

Note: the thermal trip on the motor is a fail safe device and is not intended to be continuously reset.

If the motor repeatedly cuts out then it will be damaged.

Possible causes are: An inadequate or faulty power supply.

Overloading of the machine.

Mechanical fault on the machine e.g. bearing or cutter drum failure.

The machine can only be overloaded by setting the depth of cut to low. When overloaded the machine can vibrate which will in turn damage the electrical switch components.

The electric control panel is fitted with two safety devices which further protect the motor from damage. The switches are set by the manufacturer and under no circumstances should be adjusted.



DUST CONTROL

To control any dust created by the operation connect an industrial dust collector or vacuum to the 50mm port at the rear of the machine. We recommend the SPE 316 for almost 100% dust control. In the absence of a dust control unit it is acceptable to spray water onto the surface or to feed water down the vacuum port. Cutter drum assembly life is increased by around 10% when operating the machine in this way. **(Note: Electrical motors and switches are not waterproof, take care to protect them from splashes.)**

PHASE REVERSING

If the electrical motor is turning anti clockwise when viewed from the non drive end and the hydraulic drive system is not working the power supply to your BEF320 is incorrectly phased. The correct carry out the following.

1. Isolate power supply.
2. Open electric panel door.
3. Turn phase reverse switch to opposite position.
4. Close panel door.
5. Re connect power supply and retest.

Note: If machine is still turning in reverse seek advice of qualified electrician.

The BEF320 machine should always be moved by its own hydraulic power driven system as pushing the machine continually around by hand could result in internal damage to the hydraulic motor and pump system.



MAINTENANCE

PRIOR TO ANY MAINTENANCE OR ADJUSTMENT ISOLATE POWER SUPPLY AND STOP EQUIPMENT

After use: Clean the machine to remove all build up of dust and surface residues. If using a hose pipe or pressure washer take care that water is not directed onto electrical components and switches.

Note: Motors and switches are not waterproof

Drum Removal:

Remove bolts on side plate and then screw two bolts back into the two tapped holes in the side plate. Continue winding in and this will push side plate off dowel pins. Pull off side plate, remove key from shaft. Pull out cutting drum. Fitting a new cutter head is simply a reversal of the above procedure, a little care must be taken to align the drive shaft, cutter drum and support end drive bush.

EXCESSIVE FORCE SHOULD NOT BE NEEDED TO REFIT THE CUTTER DRUM.

Cutter Drum Maintenance:

When changing cutter drum always check that the flail shafts are not worn with pronounced grooves and also that the centres of cutters and spacers are not elongated and beginning to "mushroom". The drum assembly is hitting concrete with great force 650 times every minute! Expenditure on consumables must be expected and built into all job costing.

While changing the drum the condition of the drive shaft and side plate bearings should be checked. If any roughness, side play or leakage of grease is detected then new bearings should be fitted. Lightly oiling the drive shaft will prevent a build up of rust which could cause difficulty when changing the drum. At the same time check belt tension and condition also checking the pulley grooves are clean and undamaged.

The drive shaft is manufactured from high quality steel to produce the special properties required. The shaft is extremely strong and virtually unbreakable when used as intended. If however sideways pressure is exerted on the shaft while it is not supported by the side plate bearing it can be bent.

With the drum removed check that the vacuum port is free from blockages and that the dust skirts are in good condition.

Remove all build up and deposits of material from the under side of the drum housing. On certain applications, e.g. the removal of damp self levelling compounds, it may be necessary to clean away deposits hourly! Failure to do so could result in overload of the drum assembly, drive motor and drive belts



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Height Adjustment Maintenance:

Ensure the height screw thread is cleaned and then lightly oiled. Periodically it should be removed and the female threaded section cleaned out and oiled. At the same time the self-aligning bearing should be greased.

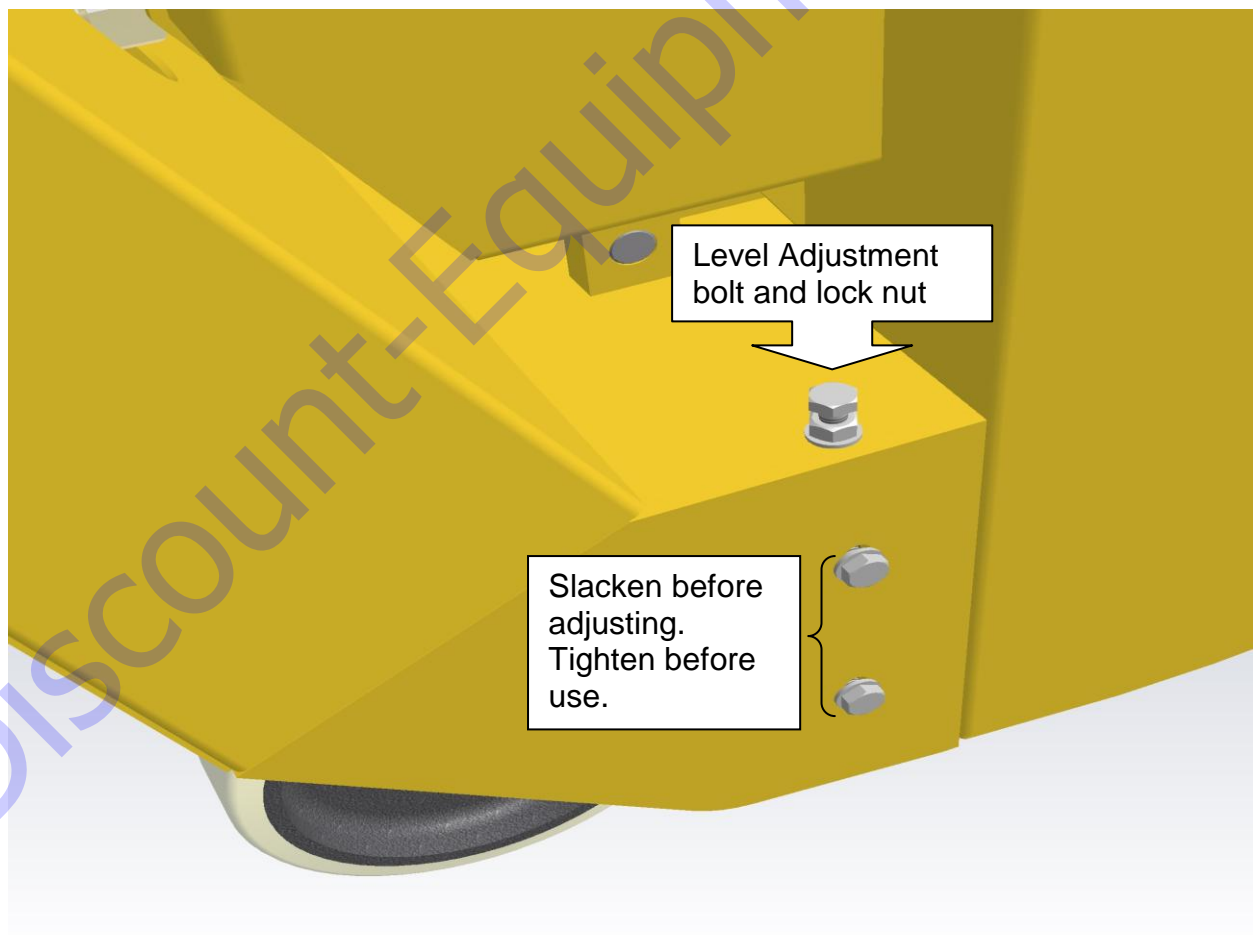
The clevis pin should be oiled regularly to maintain a light, smooth height adjustment.

BEF320 Cutter Drum Adjustment:

Should the machine be cutting more heavily on one side. Stop machine and isolate power supply, adjust lock nut/bolt assembly on top of right hand side of chassis. By adjusting up or down the cutting action can be reset level again. Retighten all bolts. Test on sample area and if required reset until cutting correctly.

Great care should be taken to ensure belts have correct tension and also correct alignment. Serious damage could be caused to the drive shaft, drive shaft bearings and drive motor if the belts are excessively tight.

Note: Never operate the BEF320 without belt guard fitted





BASIC MAINTENANCE/CHECKLIST

DAILY: (or every 8hrs to 10hrs)

- Check cutters
- Check flail shafts
- Check all bolts and nuts for tightness
- Check belt tension
- Check plugs/cables
- Check hydraulic oil level.
- Clean any debris from drum enclosure and ensure drum turns freely.

WEEKLY:

- All the above with following:-
- Grease all moving parts on height adjustment mechanism
- Remove side plate
- Check drum/bushes
- Check side plate bearing
- Check drive bushes
- Check drive shaft
- Check support wheels
- Check hydraulic drive system

MONTHLY:

- All the above with following:-
- Change hydraulic oil
- Strip down fully winding mechanism
- Clean all threads and re-grease



SAFETY

In the interest of site safety the BEF320 should never be operated unless some form of residual current circuit breaker is fitted (RCD).

Only trained operatives should be allowed to work the BEF320.

All operatives should wear ear defenders, goggles and an effective dust mask.

Note: It is possible that the noise level produced by the BEF320 could exceed 90dbA. Personal noise protection must be worn.

To control dust it is recommended that an SPE dust control unit/vacuum is fitted.

Never leave the BEF320 unattended while in use. Always stop the motor and raise the height adjustment fully up before leaving the machine.

Always ensure that all power leads and hoses are disconnected before attempting to service the machine. Never remove the side plate or belt guard until the cutter drum has come to a complete standstill. Never tip the machine backwards until the cutters have come to rest.



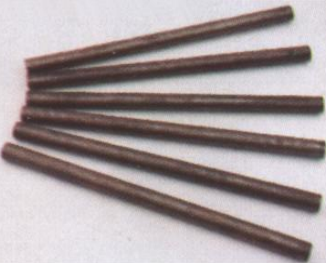
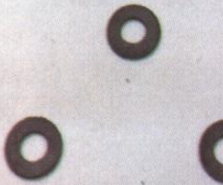

The BEF320 should never be used in wet/damp conditions and should be stored under cover and kept dry at all times.

Noise and vibration will occur at various levels dependant on the attachments and work being completed. SPE have assessments conducted under test conditions detailed in the operating manual. (See page 26). However it is recommended that additional tests are taken on site to provide the operator with accurate information on using the equipment within the guidelines laid down by the health and safety executive.

ACCESSORIES

	Part number	Description	Application
	32001	Heavy duty drum complete with T.C.T. cutters and spacers.	Hardened steel cutter with tungsten inserts, for all concrete texturing, scabbling, planing and grooving applications. Removal of bridge deck and car park membranes, heavy industrial contamination, epoxy coatings and road markings. Use on heavy applications for longer life and higher output.
	32002	Heavy duty drum complete with beam flails	Heat treated steel cutter for the removal of paint coatings and laitence from new floors. Also used for removing of grease build ups, dirt and ice deposits, keying and light scabbling of concrete when a "fine textured" surface is required.
	32003	Heavy duty drum complete with milling cutters and spacers.	For the removal of thermoplastic road/runway markings. Very efficient and cost effective with none of the problems associated with burning off thermoplastics. Also for removal of bituminous materials and rubber deposits.
	80800	T.C.T. Cutter: 8 point hardened steel cutter with tungsten carbide insert.	For all concrete texturing scabbling, planing and grooving applications. Removal of bridge deck and car park membranes, heavy industrial contamination, epoxy coatings and road markings. Use on heavy applications for longer life and higher output.
	80120	Beam cutter: Heat treated steel cutter.	For the removal of paint coatings and laitence from new floors. Also used for the removing of grease build ups, dirt and ice deposits, keying and light scabbling of concrete when a "fine textured" surface is required.

ACCESSORIES

	<p>20mm 80600N</p>	<p>Milling cutter: Tipped with tungsten carbide.</p>	<p>For the removal of thermoplastic road/runway markings, rubber based deposits and cold plastic coatings from asphalt and concrete.</p>
	<p>32000</p>	<p>Heavy duty drum complete with flail shafts.</p>	<p>For use with various cutter configurations.</p>
	<p>32020</p>	<p>Heavy duty flail shaft.</p>	<p>Hardened cutter shaft.</p>
	<p>40240</p>	<p>Spacing washer.</p>	<p>Hardened spacing washer.</p>
	<p>3049</p>	<p>Hardened Bush.</p>	<p>Hardened drum inserts to carry flail shafts.</p>



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Spare Parts Breakdown



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BEF320 (B) TYPE PANEL ASSY (PART NO 3079B)

QTY	DESCRIPTION	SPE PART NO.
1	Panel Inc Back Plate (Tempo Pano)	SPE
1	Overload	SPLRD16
1	Star Delta Start Unit	SPE
1	Switch Block (Telemec)	SPZB4BZ101
1	Switch Block (Telemec)	SPZB4BZ102
1	Start Button (Telemec)	SPZB4BA3
1	Start Button (Telemec)	SPZB4BS44
1	Panel Light Lens (Telemec)	SPZB4BV04
1	Panel Lamp	SPZB4BV05
1	Isolator 40Amp (Pettereins)	SPFWA4/3C
1	Trip (Chint)	SP60HD325
1	32A 4Pin Surface Mtd Plug (Walther)	SP630-406
1	Switch	09026/320
1	Gland	9258/200
1	Brass Bush. Nut	608-222
4	Rubber Mounts	9245/320



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SPECIFICATION SHEET

Specifications	
Type	Electric
Part Number	BEF320-1A
Power Output (hp)	15
Voltage	380/415
Cycles	50
Cutter head speed (rpm)	650
Starter	Star/Delta
Travel speed mtr/min	0-12
Machine Dimensions (mm)	
Length	1230
Width	590
Height	1220
Weight (kg) c/w cutter drum	339
Working width of cutters (mm)	320
Working distance from wall (mm)	40
Hydraulic oil	HM46
Tank capacity	6 litres

ELECTRICAL REQUIREMENTS

Machine	Volts	Plug Size	Cable Size	Max Cable Length	Transformer	Generator
BEF320-1A	380/415	32Amp 4 pin	6.0 4 Core	75 Metres	-	25kva

RECORD OF NOISE AND VIBRATION ASSESSMENT

Manufacturer: Scarifier
 Type: BEF 320-1A Electric
 Model No. Concrete floor surface
 Operation : TCT cutters
 Inserted Tool: 1450 rpm
 Running Conditions: Acoustic Associates
 HAV Note:

HAND-ARM VIBRATION

Frequency Weighted Energy Equivalent Accelerations ($a_{h,w}$)

Measurement Position	Acceleration (m/s^2)
	Vector Sum
Handle	2.337

NOISE LEVELS

Sound Power Level (L_{WA})

L_{WA} at Octave Band Centre Frequency (Hz)								Sound Power Level L_{WA}
63	125	250	500	1000	2000	4000	8000	
56.9	70.0	82.9	91.8	90.9	87.4	88.8	89.8	97.2

Operator's Ear

$L_{Aeq,T}$ at Octave Band Centre Frequency (Hz)								Overall Level ($L_{Aeq,T}$)	L_{Peak} dB(C)
63	125	250	500	1000	2000	4000	8000		
36.9	49.4	66.5	74.3	75.5	68.8	69.5	69.5	79.2	101.2



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