

FEIN Repair Tools



WSB 10 - 115 T / WSB 14 - 125 T



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Summary

1. Technical data
2. Maintenance
3. Function check
4. Dismantling
5. Assembly
6. Tools
7. Special information
8. Differences between the WSB 10 T and the WSB 14 T

Spare parts drawings / spare parts lists can be found at:

www.fein.de / FEIN Service / Ersatzteile

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1. Technical data

Order number		7 221 46 00 23 0	/	7 221 47 00 230
Model		<u>WSB 10 - 115 T</u> / <u>WSB 14 - 125</u>		
Idling speed	rpm	10.000		10.000
Power consumption	watts	800		1200
Power output	watts	550		750
Type of current				1~
Protection class				II
Length of cable with plug				4 m
Weight (delivery condition without cable)	kg	1,8		2,1
Ø of grinding discs	mm	115		125
Thickness of grinding discs	mm			1 - 6
Ø of elastic sanding pad	mm	115		125
Max. peripheral speed	m/sec			80
Mounting hole	mm			22,23



2. Maintenance

Please note that power tools may only be repaired, maintained and checked by a trained electrician, as improper repair can result in serious risks to the user (BGV A2). Repeated inspections are to be carried out in accordance with V DE 0702-1. The regulations in accordance with VDE 0701 Part 1 should be observed after repairs. Only use original FEIN spare parts!

The relevant accident prevention regulations of the employers' liability insurance association are to be observed when commissioning. The law on technical equipment (Equipment Safety Act) applies for correct use.



3. Electrical function checks

- 3.1. Basic function check
- 3.2. Extensive function check 1
- 3.3. Extensive function check 2
- 3.4. Connection line
- 3.5. Connection diagram
- 3.6. Safety test



3.1. Basic function check

Machine must not be started up with open clamping lever!!!

3.1.1. Self-start lock check

- Grinder is switched on (1 button pressed), unplug mains plug. Plug the mains plug back in, **the grinder must not be started up** - or this will damage the electronics.
- Release button, restart the grinder again (press 2 buttons - observe switching sequence) - **grinder must restart.**

3.1.2. Check the idling speed = 10 000 rpm



3.2. Extensive function check

Fault	Possible causes	Possible checks
Motor is not starting up	Switching sequence not observed	Switch motor off and on again
	Interruption on the mains cable or on the plug connections	Check passage
	Switch is defective	Check passage
	Carbon brushes worn	Visual check, measure length
	Motor is defective	Check motor without electronics - Disconnect motor / electronic - Run motor via transformer with approx. 75 % mains voltage
Electronics are defective	Electronics are defective	Check electronics without motor - Disconnect motor / electronic - Connect equivalent load (100 W bulb) at approx. 110 - 130 V



Only possible with variable isolating transformer





3.3. Extensive function check

Fault	Possible causes	Possible checks
Motor switches off "for no reason".	Loose contact (loose contact in the mains cable leads to e.g. the self-start lock being activated).	Check passage.
	Electronics are defective.	See above.
Speed fluctuates.	Additional mechanical load (transmission, bearing, vibrations, ...) Collector, carbon brushes are defective.	See above. Check. Visually check for brush sparking.
Machine too weak	Motor is defective (hums, runs slower)	Check field and armature for short circuit in coil
Motor starts up when the machine is switched on and plugged into the mains.	Electronics are defective.	No further checks required.

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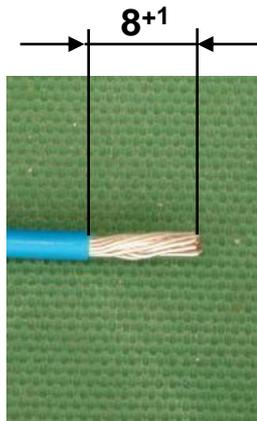


3.4. Connection line

Stranded wires:

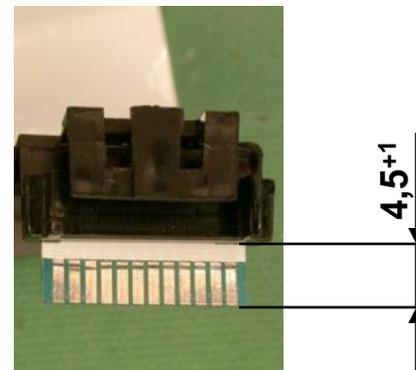
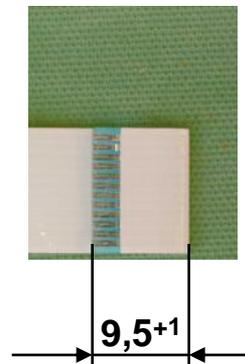
**! do not solder
or use wire end sleeves !**

Stripped insulation: 8⁺¹ mm



Ribbon cable:

Ensure a "sharp" bending edge so that the ribbon cable does not slip through the plug holder when plugging in the electronics and the plug connection sits correctly.



Bending edge





3.6. Safety test in accordance with VDE 0701

Safety test procedure

1. 15 min. test run (unloaded)
2. Switch test:
-the machine **must not switch on** when the lever is open (480).
3. Voltage recurrence test
4. Insulation test: apply electrical contact to (135) transmission housing.
5. High voltage test:
-transmission housing (405)
-5 motor housing screws (320)
6. Idling current test
7. Idling speed test
9. Type plate check

High voltage test:

Test voltage: 3.5 kV

Tripping current max: 5 mA

Application time min: 3 seconds/measuring point

Armature:

Protective insulation due to shaft insulation

Insulation test:

Insulation resistance: > 2.0 mohm

Application time min: 3 seconds/measuring point



4. Dismantling the grinder

- 4.1. Preparation
- 4.2. Removing flange and safety hood
- 4.3. Removing motor housing and cable
- 4.4. Bearing plate, transmission housing, carbon holder
- 4.5. Disconnecting armature / field magnet unit
- 4.6. Removing armature
- 4.7. Dismantling electronics
- 4.8. Dismantling switch module
- 4.9. Taking apart the armature
- 4.10. Drive shaft
- 4.11. Transmission housing



4.1. Preparation

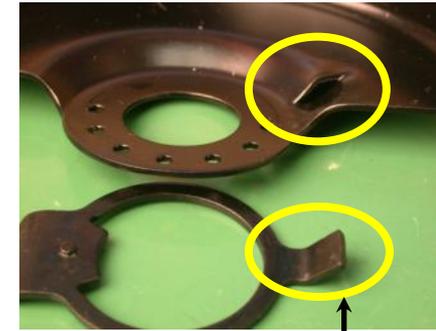


1. Disconnect machine from mains
2. Fold clamping lever as far forward as possible and remove clamping unit and clamped accessory.

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4.2. Removing flange and safety hood



1. Lever flange from spindle with extractor tool
2. Remove circlip - **Warning:** Ring is subject to preload- **Risk of injury**
3. Remove circlip, spring washer, stop ring, spring and safety hood
4. **!!! Warning, new safety hood with stop, new safety regulations !!!**

Tool:

- Extractor tool
- Circlip pliers external, straight

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4.3. Removing motor housing and cable for WSB 10 / 14



1. Loosen housing screws (5x)
2. Remove upper section of housing
3. Remove traction relief (2 screws) and bottom section of housing
4. Disconnect mains cable from electronics using screwdriver

Tools:

- Screwdriver
Torx 20
- Screwdriver
(to disconnect
the cable)

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4.4. Bearing plate, transmission housing, carbon holder for WSB 10 / 14



1. Remove 4 screws from transmission cover
2. Take off transmission cover and remove grease if necessary
3. Remove 4 screws from transmission cover - **Warning:** screw lengths vary
4. Remove dust cover from upper carbon holder
5. Pull out both carbon holders and carbon brush from field magnet unit

Tools:

- Screwdriver
Torx 20
- Flat nose pliers

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4.5. Disconnecting the armature / field magnet unit for WSB 10 / 14



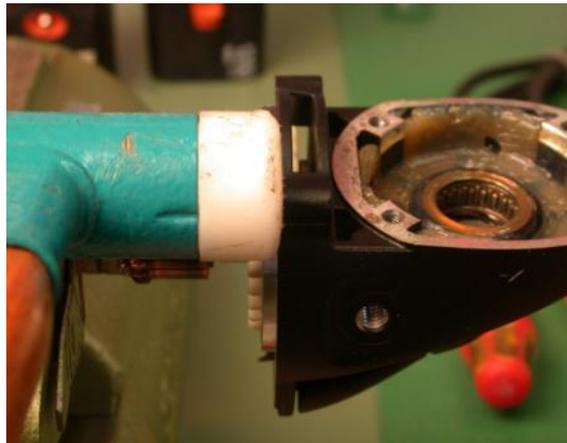
1. Lift up transmission housing from field magnet unit with armature
Please ensure that carbon holder and carbon brush have been completely removed from field magnet unit
- **Risk of breakage when pulling out armature or bending the carbon holder (carbon clip) !!!!**
2. Pull armature out of field magnet unit if rubber socket is still in field magnet unit -
Pull socket out of field magnet unit with cable hocks

Tools:
•Slotted
screwdriver

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4.6. Removing armature for WSB 10 / 14



1. Clamp armature in a vice with transmission housing
Pull out transmission housing by gently hitting with a plastic hammer

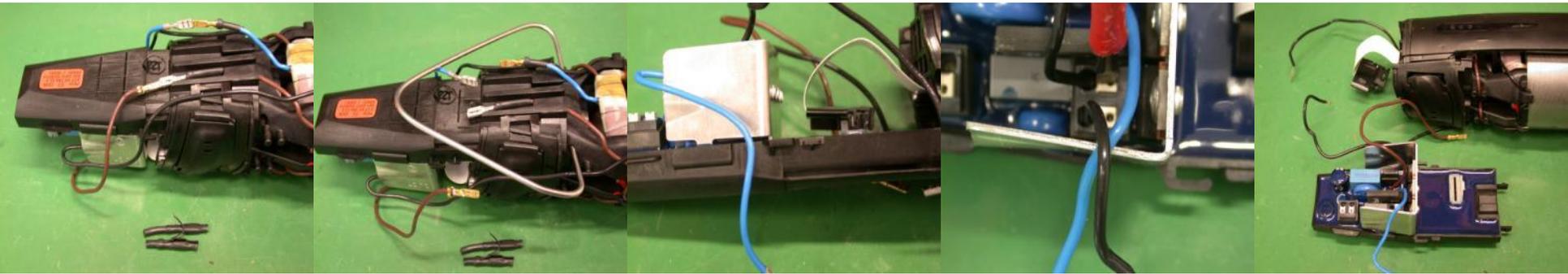
Tools:

- Plastic hammer

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4.7. Dismantling electronics for WSB 10 / 14



-
1. Cut open and remove shrink-fit hose
2. Loosen plug connection (blue and brown)
3. Disconnect electronics and clamp and pull out to the rear
4. Pull ribbon cable out of electronics
5. Loosen plug connection (black) and pull electronics all the way out

!!! Warning - because the two shrink-fit hoses must be destroyed when changing the electronics or field magnet unit, new shrink-fit hoses should always be used when undertaking repairs !!!



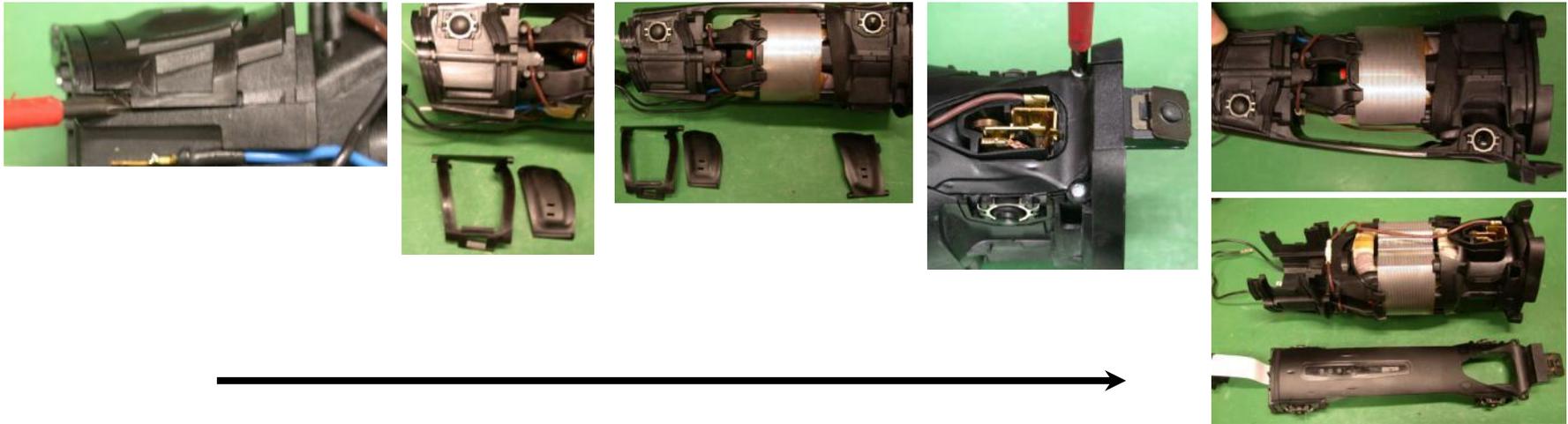
Tools:

- Clamp
- Flat nose pliers
- Screwdriver

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4.8. Dismantling switch module for WSB 10 / 14



1. Use screwdriver to release switch cover's plastic frame and remove the switch covers - **!!! Warning - danger of breakage !!!**
2. Loosen two screws and remove switch module from field magnet unit



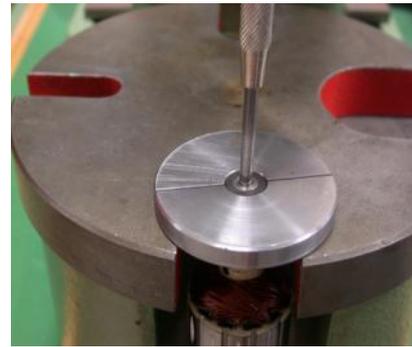
Tools:

- Slotted, cross screwdriver

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4.9. Taking apart armature for WSB 10 / 14



1. Place armature pinion in drawing-off plate and lift off using punch and an arbor press.
2. Press magnet ring and split drawing-off plate on press with a 3.9 mm punch
3. If necessary, pull out and replace ball bearing with the appropriate extractor tool, remove end plate

Tools:

- Arbor press
- Support pipe (64101002004) D=120mm
- Drawing-off plate (64102069007)
- Drawing-off plate (64102072000) Punch

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4.10. Drive shaft for WSB 10 / 14



-
1. Press shaft with ball bearing, end plate and bevel gear all the way out of bearing plate
 2. Place grooved ball bearing on sleeve and press drive shaft out of press using a second sleeve.
 3. Take strain off circlip by pressing down on pressure plate using a punch (D=6mm).

!!! Warning preloaded spring set!!! Lever circlip out with a slotted screwdriver.

!!! Insert wire or similar through spring column to prevent spring being lost or confused!!!

Tools:

- Sleeve
- Punch (D=6mm)
- Slotted screwdriver
- Wire or similar.

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4.11. Transmission housing for WSB 10 / 14



-
1. Screw transmission housing tightly in assembly fixture and clamp in a vice.
 2. Remove bolt with a punch (D =4.5mm).
 3. Sockets are driven out with a punch (D =6.5mm).
 4. Remove clamping lever, thrust bolt and eccentric
 5. The needle sleeve is driven out by gently hitting it with a hammer once the transmission housing has been heated

Tools:

- Fitter's hammer 200g
- Punch D=4.9mm
- Punch D=6.9mm
- Assembly fixture (64122020006)



5. Assembly

- 5.1. Armature
- 5.2. Transmission housing
- 5.3. Fitting clamping lever
- 5.4. Armature / transmission housing
- 5.5. Fitting switch module
- 5.6. Fitting switch cover
- 5.7. Fitting electronics
- 5.8. Connecting electronics
- 5.9. Armature / field magnet unit
- 5.10. Carbon holder / carbon brushes, drive shaft
- 5.11. Drive shaft
- 5.12. Bearing plate
- 5.13. Motor housing
- 5.14. Safety hood

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5.1. Armature



1. Place armature in press-on fixture.
2. Attach end plate, ball bearing and ball bearing support (D= 8,3), press on bearing.
3. Place bearing in support and press on
4. Heat up bevel gear (approx. 100 C) and press on.
5. Press on magnet ring using drawing-off plate as a spacer.

Tools:

- Forceps or similar
- Source of heat e.g. hot air gun
- Pressing fixture
- Drawing-off plate
- Ball bearing support: internal $\varnothing = 8.3 \text{ mm}$
- Arbor press

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5.2. Transmission housing for WSB 10 / 14



1. Place transmission housing in press-in fixture.
2. Place thrust washer and corrugated spring in housing.
3. Press needle sleeve into transmission housing.

!!! Warning, labelled needle bearing side faces thrust bolt!!!



Tools:

- Press-in fixture:
64114024005

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5.3. Fitting clamping lever for WSB 10 / 14



1. Place transmission housing in assembly fixture and insert thrust bolt.
2. Clamp fixture and transmission housing in a vice.
3. Fit quick-release lever with eccentric ring and bolt when "closed".
(Apply thin coat of grease to eccentric ring - Molykote D paste)
Drive bolt in using hammer and punch.

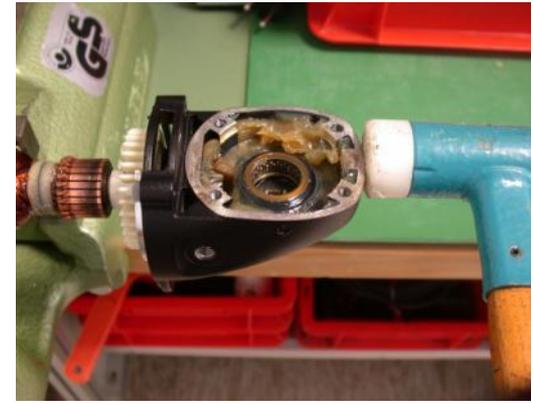
Tools:

- Assembly fixture:
64122020006
- Fitter's hammer
200g
- Punch:
D = 4.9

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5.4. Armature / transmission housing for WSB 10 / 14

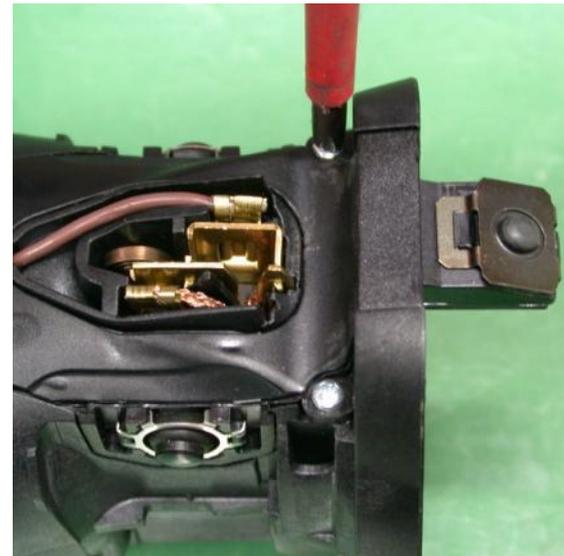


1. Clamp pre-fitted armature in vice
2. Add transmission housing and assemble
armature and transmission housing by gently hitting with a hammer

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5.5. Fitting switch module for WSB 10 / 14



1. Place switch module on field module unit
2. Screw in 2 screws

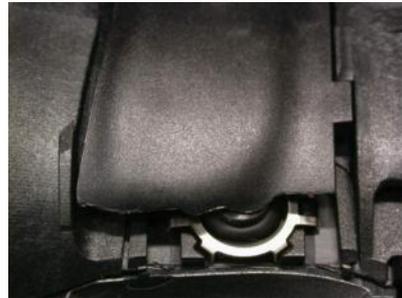
Tools:

- Cross screwdriver

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5.6. Fitting switch cover for WSB 10 / 14

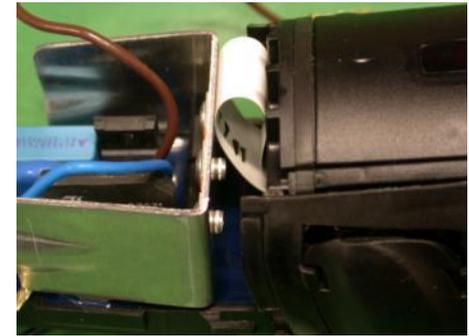
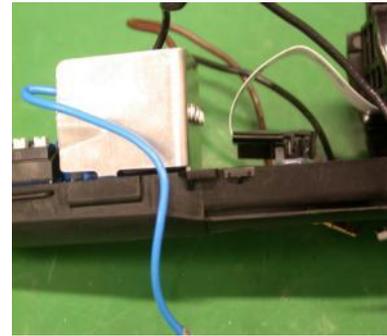
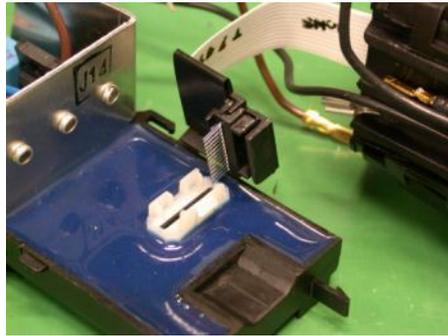


1. Attach front switch cover, fold downwards and snap into place by pressing with finger
2. Fit back switch cover, fixing framework and snap into place by pressing with finger

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5.7. Fitting electronics for WSB 10 / 14



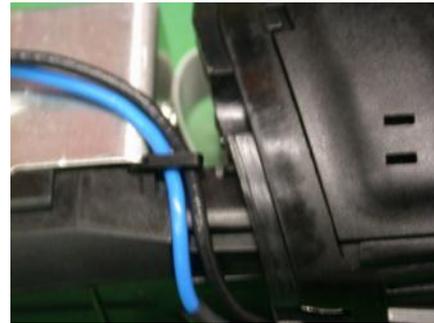
-
1. Connect ribbon cable
 2. Insert electronics in field magnet unit and slide forwards until it audibly clicks into place

!!! Warning - When sliding in electronics, ensure that the ribbon cable is not clamped !!!





5.8. Connecting electronics for WSB 10 / 14

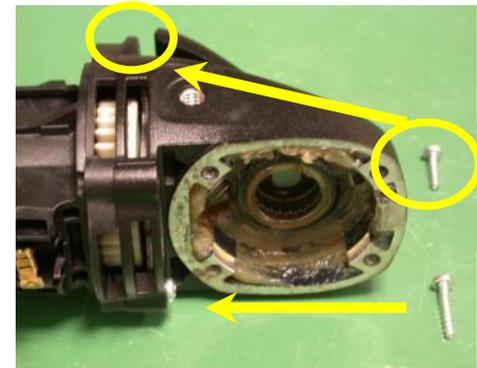


1. Connect plug contacts (blue and brown) and insulate with a shrink-fit hose
2. Insert cable into designated ducts
3. Insert black cable into terminal in the cooling plate

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5.9. Armature / field magnet unit for WSB 10 / 14



Short screw
13 mm long

Long screw
20 mm long

1. Insert armature into field magnet unit

!!! During assembly, slide rubber socket onto ball bearing on armature !!!
!!! Clamping lever in closed position !!!

2. Screw transmission housing to field magnet unit. -

!!! Warning - screw lengths vary !!!

Tool:

- Torx 20 screwdriver

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5.10. Carbon holder / carbon brushes for WSB 10 / 14



1. Insert and connect carbon holder with carbon brush in field magnet unit.

!!! Warning - Carbon holders vary, observe cable connection and insert cable in the designated ducts !!!

2. Attach carbon cover to upper carbon holder (on the switch slide).



Tools:

- Flat nose pliers
- Cable hooks

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5.11. Drive shaft for WSB 10 / 14



-
1. Insert spring set, pressure piece and pressure plate in drive shaft
!!! Observe layering of the springs !!!
 2. Press spring set together under press and insert snap ring
 3. Press ball bearing on to drive shaft
 4. Press on end plate and gear using a sleeve

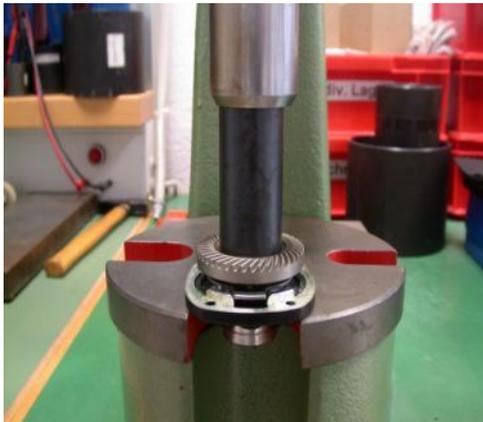
Tool:

- Punch 6mm
- Arbor press

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5.12. Bearing plate for WSB 10 / 14



1. Press pre-fitted drive shaft into bearing plate.
2. Insert entire bearing plate into transmission housing and screw into place.
3. **! Check backlash!** Adjust with compensating discs if need be.
4. Remove bearing plate and pour in 20g of transmission grease (0 40 101 01000 4).
! Only apply thin layer of grease to grease needle bearing cage, do not fill with grease !
5. Fit bearing plate.

Tools:

- Sleeve:
(D = 20.5)
- Torx 20
- Transmission
grease:

40101010004

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5.13. Motor housing for WSB 10 / 14



-
1. Connect mains cable to electronics.
 2. Insert pre-fitted motor into bottom half of housing.
 2. Fit traction relief for mains cable.
 3. Align wiring and attach upper half of housing -
the cable must not lie on the screw dome, otherwise the cable may clamp.
 4. Screw motor housing into place.

Tool:

- Torx 20

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5.14. Safety hood for WSB 10 / 14



1. Attach pressure spring, lever, safety hood and cup spring.
2. Attach circlip using circlip pliers.
3. Press on circlip with sleeve until it snaps into place.



!!! Ensure circlip is in the correct position - adjust the spring washer if necessary !!!

!!!Warning, new safety hood with stop - new safety regulations !!!

Tool:

- Sleeve 28mm
- Circlip pliers
- Arbor press



6. Tools

- 6.1. General tools
- 6.2. Special tools
- 6.3. Types / quantities of grease
- 6.4. Adhesives, sealants and auxiliary substances



6.2. Special tools

- Cable hooks	0 72 00 310 066
- Support pipe 120 mm	6 41 01 002 004
- Drawing-off plate	6 41 02 069 007
- Drawing-off socket cap	6 41 04 150 008
- Chuck cone D=19 mm	6 41 07 019 007
- Chuck cone D=26 mm	6 41 07 026 000
- Press-on fixture	6 41 01 019 008
- Press-in fixture	6 41 14 024 005
- Assembly / dismantling fixture	6 41 22 020 006
- Split drawing-off plate (magnet ring)	6 41 02 072 000



6.3. Types / quantities of grease

Type of grease Production labelling	Appearance	Technical data	Use	Part number of the entire container and the container type	Quantity of grease and item
0 40 101 0100 4 (previously Sst1)	Light brown, beige, naturally cloudy, ointment-like	Dripping point: ca 180°C Area of application: - 30°C to +120°C	Normally loaded spur gears and roller bearings, as well as friction bearings with higher speeds	Tube 85g 3 21 600 0301 4 Can 800g 3 21 320 070 1 Can 4500g 3 21 320 1001 5	Transmission (430): 20g
0 40 106 0100 1 (previously Sst6)		Dripping point: ca 190°C Area of application: - 60°C to +130°C	Roller bearing grease Very high-speed roller bearings. Neutral against E- and NE metals and resistant plastics: PA, PF, PTFE, fluoroelastomers	Tube 5g 32160005063 Tube 85g 32160003061 Can 850g 32132007033	Needle sleeve (420): 0.6 – 1g
1 40 02 011 200 Order no.			Molykote D paste	250g 14002011204	thrust bolt (380) and eccentric ring (390) Apply thin coat of grease

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6.4. Adhesives, sealants and auxiliary substances

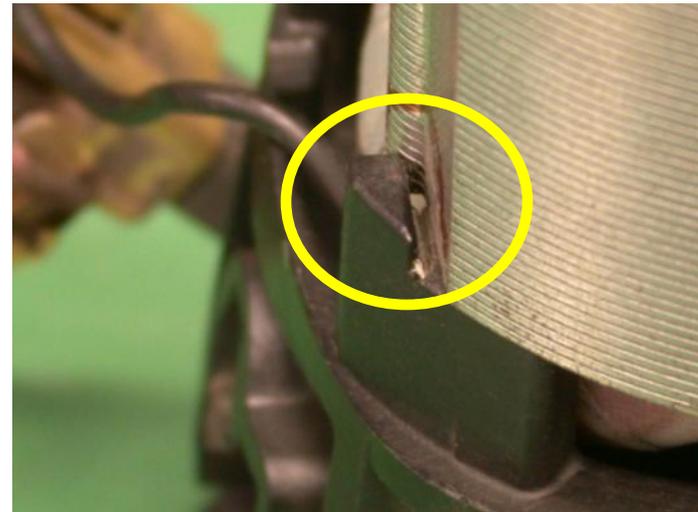
Order no.	Labelling	Colour	Contents	Description	Item quantity
09000600401	Loctite 222 (previously 221)	Purple	50 ml	Screw locking device/through thread, screw locking device low strength, for safety and sealing of screw couplings, vibration-proof, easy to remove, most favourable gap 0.05mm, max 0.12mm, for thread < M16, fine pitch thread < M36, -55C to +150C, hard to touch in 15-30 minutes, reaches final hardness in 3 hours, storage time min 12 months	If need be, secure Ejot PT

7. Special information



The picture on the left shows a stripping armature touching the field magnet (no damage to bearing).
This causes the field magnet to heat up at certain points (picture on right).

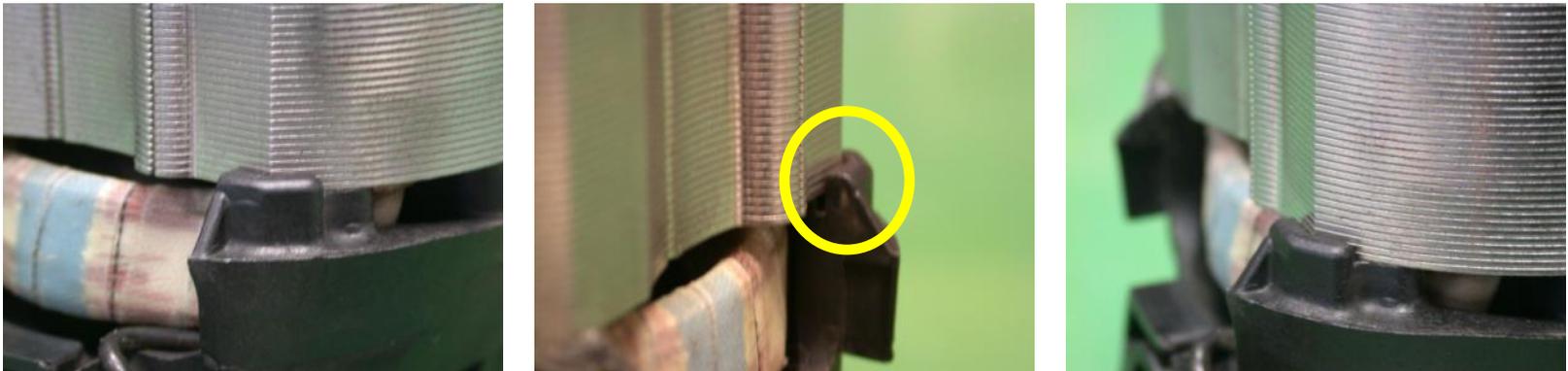
7. Special information



The armature is touching because the field magnet is incorrectly adjusted. This can be checked visually. Incorrect assembly may cause the stop to break off (picture on left). This causes an air gap between the stop and laminations on the opposite side (picture on right).



7. Special information



If the field magnet unit has been adjusted correctly, there should be no air gap between the stop and laminations. The laminations must rest against the plastic and be tightly screwed into place.

If this is the reason for the machine failing, the field magnet unit must always be replaced.

Readjustment is **not** possible.

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Differences between WSB 10 and WSB 14



WSB 10-115 T:
Motor housing approx. 245mm long



WSB 14-125 T:
Motor housing approx. 265mm long



WSB 10-115 T:
Field magnet in field magnet unit
approx. 33mm long



WSB 14-125 T:
Field magnet in field magnet unit
approx. 52mm long

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Differences between WSB 10 and WSB 14



WSB 10-115 T:
Laminations on armature approx.
35mm long

WSB 14-125 T:
Laminations on armature approx.
55mm long



WSB 10-115 T:
Switch module approx. 185 mm long

WSB 14-125 T:
Switch module approx. 205 mm long

