



Service Manual for Bravo 4200 Series Disc Publisher





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1 • Cover

1.1

Loosen 4 screws securing back of cover.



1.2

Remove 3 screws securing front of cover. Slide picker and carrier to middle of printer.

3



Unplug cable from control panel on underside of cover. While lifting cover off of printer, reach in and unplug blue LED board cable from mainboard. Remove cover.



2 • Control Panel

2.1

Remove cover (page 3). Remove 3 screws securing control panel. After replacing control panel, press buttons to verify they click properly.



3 • Blue LED Board

3.1

Remove cover (page 3). Remove 2 screws securing blue LED board. Unplug cable from end of board.



4 • USB3 Hub

4.1

Remove 2 screws securing cover plate. Remove plate.



4.2

Unplug any sata cables from hub. For 2 drive units, keep track of which cable is plugged into which port. Remove 3 screws securing hub.

7



When replacing hub, be sure pins properly plug into connectors on mainboard. Plug any sata cables back in. If locations of drives in dual drive units need to be reset consult **Drive Alignment** (page 63).



5 • Mainboard

5.1

Remove USB3 hub (page 07). Unplug all cables and flex cables from mainboard.



5.2

Remove 4 screws securing mainboard. Lift mainboard out of unit.



9

Remove 2 screws securing static brush to mainboard. Remove 3 standoffs. Secure static brush and standoffs to new mainboard.



5.4

When replacing mainboard, make sure hole in corner is resting on small post before replacing 4 screws. Attach USB3 hub and plug in all cables and flex cables. Be sure to plug carrier and feed motors into correct location. Drive and maintenance fans can be plugged into either location.



6 • Print Tray

6.1

Remove mainboard (page 09). Remove 2 screws securing print tray guide to print tray. Lift guide up off of tray (leave attached to belt).



6.2

Lift back end of print tray slightly and pull back against rear cover plate.



Remove screw securing front tray guide. Lift guide out of base.



6.4

Pull print tray out of printer.



7 • Power Resistor

7.1

Cut tie wrap securing power resistor cable to power supply cable. Unplug power resistor from mainboard.



7.2

While holding resistor mount bracket with fingers or needle-nose pliers, remove 2 screws securing to rear cover plate.



Remove 2 screws securing power resistor to resistor mount bracket. Replace resistor.



8 - Encoder Wheel Sensor

8.1

Cut tie wrap securing cables. Unplug encoder wheel sensor from mainboard.



8.2

Remove 2 screws securing sensor to bracket.



When replacing sensor, be sure encoder wheel is centered in slot.



9 • Encoder Wheel

9.1

Peel encoder wheel off of gear. Clean area with alcohol before adhering new encoder wheel.



9.2

Be sure replaced encoder wheel is centered in sensor slot. Clean encoder wheel with alcohol after handling.



10 • Drive Mount

10.1

Tip printer up. Remove 6 screws securing drive mount base plate to base.



10.2

Tip drive mount forward. Align slot on drive mount base plate with tab on rear cover plate and remove.



Unplug all cables from back of drive(s) to detach drive mount from printer. In 2 drive units, keep track of which sata cable goes with which drive.



11 • Power Supply

11.1

Remove drive mount (page 18). Unplug power supply from mainboard. Cut tie wraps securing power supply cable.



11.2

Remove 5 screws securing power supply to rear cover plate.



Lift power supply out of printer. Pull drive power cable out through opening on bottom of base.



11.4

When replacing power supply route drive power cable to underside of printer. Be sure it is not pinched beneath or on side of power supply.



12 • Drive Fan

12.1

Remove drive mount (page 18). Cut tie wrap securing fan and sata cables. Unplug drive fan from mainboard.



12.2

Remove 2 screws securing fan to inside of rear cover plate.



Tip printer up and remove drive fan, pulling cable out through opening on base. When replacing fan, be sure cable is oriented to lower left as shown.



13 • Drives

13.1

Remove drive mount (page 18). Remove 4 screws securing drive(s) to be replaced.



13.2

Slide drive(s) out from the front. Slide new drive into bracket and secure with 4 screws (use front set of holes).



Use side-cutters to snip off 4 small tabs on inside of new drive(s). After installing new drives consult **Drive Alignment** (page 63).



14 • Maintenance Felt

14.1

Remove drive mount (page 18). Remove 4 screws securing maintenance felt cover. Remove old maintenance felt pads (wear gloves to avoid ink on fingers).



14.2

Stack new set of maintenance felt pads into base in sequence and orientation shown (1 on bottom, 7 on top).





15 • Maintenance Fan

15.1

Cut tie wrap securing fan and sata cables. Unplug maintenance fan from mainboard.



15.2

Remove maintenance felt (page 26). Remove 2 screws securing fan mount bracket. Remove fan, pulling cable out through opening. When replacing fan and bracket use a low torque as screws can easily strip. Consult Step 14.2 (page 26) for proper replacement of maintenance felt.



16 • Encoder Strip

16.1

Unhook encoder fence spring from tab.



16.2

Pull left end of encoder strip off of tab first. Then rotate other end of strip 90° to remove from flared end of right tab (2nd pic).





Be sure new encoder strip is routed through sensor slot on back of carrier. Clean encoder strip with alcohol after handling.





17 - Carrier Drive Motor

17.1

Cut tie wrap securing cables. Unplug carrier drive motor from mainboard.



17.2

Loosen screw securing carrier belt tensioner.



Remove 2 screws (T8 driver) securing carrier drive motor to carrier frame. Remove motor.



17.4

When installing new carrier drive motor be sure to include spacer between motor and carrier frame. Loop belt around motor pulley and retighten screw on carrier belt tensioner.



18 • Carrier Frame

18.1

Unplug cables and flex cables indicated from mainboard.



18.2

Remove 2 screws indicated from back of carrier frame.



Remove 2 screws indicated from back of carrier frame. Remove control panel cable from wire saddle.



18.4

Loosen screw on belt tensioner.



While pressing in on belt tensioner to add slack, pull belt off of pulley on tray drive shaft. Remove 2 screws indicated from carrier frame.



18.6

Remove screw indicated from carrier frame. Lift carrier frame off of printer.



When replacing carrier frame, be sure it is properly seated in all slot and posts on base before securing screws. Loop belt around tray drive shaft before retightening belt tensioner. Some early versions required different washers between carrier frame and base. If one or more washer(s) was included, be sure to place them back in same location. More recent revisions require no washers.



19 • Feed Drive Motor

19.1

Remove carrier frame (page 32). Remove screw (T8 drive) and washer from end of tray drive shaft. Pull pulley off of end of shaft. Remove retaining ring from shaft.



19.2

Pull tray drive shaft out of carrier frame. When replacing shaft, be sure bearing is located on outside of carrier frame and washer is between inside of frame and retaining ring.



Remove 2 screws (T8 driver) securing feed drive motor to bracket. Remove motor.



19.4

When replacing tray drive shaft, be sure encoder wheel is centered in sensor slot. If necessary, remove encoder wheel sensor and re-secure with encoder wheel in slot.



20 • Maintenance Sled

20.1

Remove screw (T8 driver) and washer from end of tray drive shaft. Pull pulley and belt off of end of shaft. Remove retaining ring from shaft.



20.2

Pull tray drive shaft out of carrier frame. When replacing shaft, be sure bearing is located on outside of carrier frame, washer is behind retaining ring and encoder wheel is in sensor slot (2nd pic).



Unhook spring from frame. Pull up on post on left side of maintenance sled while pushing in on right side to pop sled out of frame.



20.4

Instructions for modifying old versions of maintenance sled. Snip off plastic tabs and ridges indicated. Clean any excess ink. Discard and do not replace foam pad.



21 - Carrier

21.1

Remove screw (T8 driver) and washer from end of tray drive shaft. Pull pulley and belt off of end of shaft. Remove retaining ring from shaft.



21.2

Pull tray drive shaft partially out of carrier frame. When replacing shaft, be sure bearing is located on outside of carrier frame, washer is behind retaining ring and encoder wheel is in sensor slot (2nd pic).



Remove screws from each end of carrier shaft.



21.4

Unplug both carrier flex cables from mainboard. Press in on tab on flex holder to remove from carrier frame. Pull flex cables out through frame.



Loosen screw on belt tensioner. Pull belt off of tensioner and carrier motor.



21.6

Press down slightly on encoder fence to pull it out of sensor slot and route behind carrier.





Pull out on right end of carrier shaft to pop it out of frame. Slide carrier off of shaft and remove.



21.8

When replacing carrier, be sure picker and carrier are properly captured on top edge of carrier frame. Press carrier shaft back into frame, tightening both screws at the same time to prevent it from spinning. Be sure flex cable is straight with frame for before securing flex holder. Be sure belt is not twisted. Pull encoder strip back into sensor slot on back of carrier. Replace tray drive shaft.



22 - Alignment Sensor

22.1

Remove carrier from unit (page 40). Remove 2 screws indicated.



22.2

Press up on corner of lower capture lever just enough to access screw indicated (do not completely remove lever). Loosen screw with T8 driver (do not completely remove screw).



Slightly pry both frames apart just enough to pull alignment sensor wires out from tab.



22.4

Remove screw securing quad sensor carrier bracket.



Unplug alignment sensor from carrier flex pc. Connect new alignment sensor.



22.6

When reassembling carrier be sure to snap end of quad sensor carrier bracket onto tab on frame before replacing screw. Be sure to route alignment sensor wires behind tab before replacing 2 screws and retightening 1 screw.



23 - Carrier Flex PC

23.1

Remove carrier from unit (page 40). Remove 3 screws indicated.



23.2

Press up on lower capture lever to detach from unit. Lift lever off of unit, pulling belt through opening. Save small spring that falls out.



Remove screw securing quad sensor carrier bracket. Remove 2 screws (T8 driver). As both frames separate, lift carrier flex pc out of assembly.



23.4

Use a small flathead screwdriver to pry and pop sensor out of quad sensor carrier bracket. Press sensor from new carrier flex pc into bracket until it snaps into place. Be sure sensor is snapped properly in place so that both tiny round tabs are in notches on bracket (2nd picture).





Fold and crease carrier flex pc in locations shown. Place holes onto tiny tabs on bracket. Plug alignment sensor in. Place new carrier flex pc into frame.



23.6

When reassembling carrier be sure to snap end of quad sensor carrier bracket onto tab on frame before replacing screw. Be sure to route alignment sensor wires behind tab before replacing 4 screws securing both frames together. Be sure bottom corners of carrier flex pc are pinched between both frames.





Gripping spring with tweezers, slide it in between lower capture lever and carrier base. Hold spring in center and snap lower capture lever back into place while removing tweezers. Spring should remain captured between parts. Be sure spring is centered and sitting straight up and down.



23.8

Measure out 4 11/16 inches from carrier and place holder onto flex cables.



24 • Picker

24.1

Remove screw (T8 driver) and washer from end of tray drive shaft. Pull pulley and belt off of end of shaft. Remove retaining ring from shaft.



24.2

Pull tray drive shaft partially out of carrier frame. When replacing shaft, be sure bearing is located on outside of carrier frame, washer is behind retaining ring and encoder wheel is in sensor slot (2nd pic).



Remove screws from each end of carrier shaft.



24.4

Unplug picker flex cable from mainboard. Peel flex cable off of double-sided tape and route out through slot on carrier frame.



Loosen screw on belt tensioner (do not remove belt).



24.6

Pull out on right end of carrier shaft to pop it out of frame. Slide picker off of shaft and remove.



When replacing picker, be sure picker and carrier are properly captured on top edge of carrier frame. Press carrier shaft back into frame, tightening both screws at the same time to prevent it from spinning. Replace both pieces of double-sided tape and be sure flex cable is parallel with frame for before adhering. Replace tray drive shaft.



25 • Picker Motor

25.1

Remove 4 screws securing picker motor and picker side cover plate. Unplug picker motor from picker board and remove.



25.2

Plug new picker motor into board through opening on plate and route cable into notch (1st pic). Twist motor around once to take up excess cable slack before placing motor down into opening (2nd pic). Replace 4 screws to secure motor and plate. Manually move picker up and down to verify gears are aligned and spin smoothly.





26 - Picker Board & Flex Cables

26.1

Remove picker motor and picker side cover plate (page 55). Unplug flex cable from arm board.



26.2

Remove 3 screws securing picker board. Remove board.



When replacing picker board or flex cable(s), route flex cable(s) through slots on board as shown. Be sure flex cable(s) are plugged into port(s) in correct orientation.





27 • Arm Board

27.1

Remove picker (page 51). Unplug flex cable from arm board.



27.2

Press tab on sensor flag bracket out and up past edge of arm board to remove it from picker arm.



Unplug solenoid cable from arm board. Remove screw and washer securing arm board. Pry out on edge of arm board to pop it out of picker arm.



27.4

Before installing new arm board, apply stripe of thick tape near sensor as shown.



When replacing arm board, hook tab on bottom end of board into slot on picker arm then press top end into location. Secure with screw and washer. Connect solenoid and flex cable.



27.6

Replace sensor flag bracket. Hold picker arm up and lift up on flag. Verify that it drops down smoothly without sticking.



28 - Solenoid

28.1

Remove arm board (page 58). Pry pick finger cover off of tabs and remove.



28.2

Unhook spring from picker arm and pick finger.



Remove 2 screws securing solenoid. Remove solenoid, pulling cable out through opening.



28.4

When replacing solenoid route one cable behind post, as shown.



29 • Drive Alignment

29.1

After replacing drive(s), verify they are set in correct location. Open **PTPublisher**. Click on *Tools>Set Drives in Publisher*. Click on *Open/Close Drive* buttons for top and bottom and verify proper drive opens. If not, click on *Reset Drive Locations* and follow prompts, otherwise click *Close*.



29.2

Place a disc into bin. Click on *Tools>Printer Properties*. Click on *Calibrate the Disc Publisher* then click *Ok* on prompt. Set *Position Offsets* to *Right Bin* then click *Set and Move To*. Unit will pick disc.



Set *Position Offsets* to *Top Drive* and click *Set and Move To*. Picker will lower disc into top drive tray (2nd pic). Observe position of drive tray in relation to hovering disc. Determine if drive needs to move forwards or backwards to center disc in tray.

osition Offsets				
Left Bin Right Bin Printer				
Top Drive	-			
Bottom Drive Setting Pick Depth	Calibrate the to moved to the to proper calibratic buttons to test f	p recorder tray po pp recorder position. Use the arrow for proper calibration	isition. A disc will be picked fro on, and lowered to a hover pos is to center the disc. Use the P ion.	om the input bin, ition. Watch for Pick and Drop
		-11	Set and Move To	Pick
09 109 WEAG V2001			Move To Hover	Drop
ther Calibrations				
Calibrate Disc in	n Printer		Calibrate last Dis	SC
Calibrate Disc in Top Drive			Restore Factory De	faults
Calibrate Disc in Bottom Drive				
Full Robotics Test				



29.4

Turn screw clockwise to move drive in, counter-clockwise to move drive out. Lower disc into drive tray again to recheck position. Continue adjusting, if necessary, until disc is centered.



Set *Position Offsets* to *Bottom Drive* and click *Set and Move To*. Picker will lower disc into bottom drive tray (2nd pic). Observe position of drive tray in relation to hovering disc. Determine if drive needs to move forwards or backwards to center disc in tray.

Right Bin	
Printer	
Fop Drive	
Bottom Drive	rate the bottom recorder tray position. A disc will be picked from the in
Setting Pick Depth	Watch for proper calibration. Use the arrows to center the disc. Use the Pin and Drop buttons to test for proper calibration.
	Set and Move To Pick
O-libertion-	-9 Move To Hover Dro
or Calibrations	
Calibrate Disc	n Printer Calibrate last Disc
Calibrate Disc I	n Printer Calibrate last Disc Top Drive Restore Factory Defaults
Calibrate Disc I Calibrate Disc In Calibrate Disc In B	n Printer Calibrate last Disc Top Drive Restore Factory Defaults attom Drive



29.6

Drive adjustment screw is below cover but can still be accessed by a screwdriver coming down at an angle. Turn screw clockwise to move drive in, counter-clockwise to move drive out. Lower disc into drive tray again to recheck position. Continue adjusting, if necessary, until disc is centered.



30 • Troubleshooting

Install ink cartridge before initialization. Error codes are displayed in Bravo4200 Production Tool.

Symptoms During Initialization	Possible Solution	
No carrier or print tray movement (solenoid	Carrier drive motor (page 30)	
clicks and picker moves twice)	J10 (mainboard)	
Control panel blinks		
Error: 0 (0x00), Error2: 3 (0x03), Error3: 0 (0x00)		
No print tray (carrier moves, solenoid clicks and	Feed drive motor (page 36)	
picker moves)	J11 (mainboard)	
No carrier or print tray movement (solenoid	Encoder wheel sensor (page 15)	
clicks and picker moves once)	Print tray sensor on mainboard (page 09)	
Control panel blinks	J4 (mainboard)	
Error: 0 (0x00), Error2: 16 (0x10), Error3: 0 (0x00)		
Print tray does not fully close after movement	Encoder wheel (page 17)	
Control panel blinks		
Error: 1 (0x01), Error2: 0 (0x00), Error3: 0 (0x01)		
Carrier slams quickly to right	Encoder strip (page 28)	
Control panel blinks		
Error: 0 (0x00), Error2: 3 (0x03), Error3: 0 (0x00)		
Carrier slams quickly to right	Carrier flex PC (page 47)	
Control panel blinks	J2 (mainboard)	
Error: 2 (0x02), Error2: 3 (0x03), Error3: 0 (0x02)		
No carrier, print tray, solenoid or picker	Picker board or large flex cable (page 56)	
Control panel blinks	J16 (mainboard)	
Error: 128 (0x80), Error2: 0 (0x00), Error3: 0 (0x80)		
No carrier, print tray or picker (solenoid clicks)	Picker motor (page 55)	
Control panel blinks		
Error: 128 (0x80), Error2: 0 (0x00), Error3: 0 (0x80)		
Solenoid does not click (Carrier, print tray and	Solenoid (page 61)	
picker moves)		
Picker moves once (no carrier, print tray or	Arm board (page 58)	
solenoid)	Small flex cable (page 56)	
Control panel blinks		
Error: 0 (0x00), Error2: 3 (0x03), Error3: 0 (0x00)		
Grinding noise as picker arm attempts to move	Picker arm sensor on arm board (page 58)	
(Solenoid clicks, no carrier or print tray)		
Control panel blinks		
Error: 128 (0x80), Error2: 0 (0x00), Error3: 0 (0x80)		
Unit completely DOA	Power supply (page 20)	
	Power resistor (page 13)	

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30 • Troubleshooting

Symptoms During Operation	Possible Solution
Picker drops down onto discs in bins multiple	Solenoid (page 61)
times but does not grab disc	
Picker grabs disc but does not place in print	Arm board or sensor flag bracket (page 58)
tray, moves to home position	
Erratic carrier and picker movements before	Sensor on picker board (page 56)
eventually grabbing disc	
Does not recognize ink	Carrier flex PC (page 47)
Carrier will not move after sending print job	J1 (mainboard)

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