

ZPrinter[®] 150/250/350



Troubleshooting Guide

Part Number 09922

Revision B



Z CORPORATION[®]

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Preface

Troubleshooting Z Corporation's line of 3D printer can sometimes be a frustrating, complex and tedious process but it doesn't have to be this way. Often a technician goes into a situation with blinders on, focusing on one problem and jumping to conclusions that have fixed other machines. Every encounter with an error or problem should start the same way. There are a few simple steps and processes that can help you to narrow down the problem you are facing and get you the help you need quickly and efficiently.

In the Preface section Troubleshooting 101 you will find a list of steps that you should perform EVERY time you encounter a problem on one of Z Corporations line of 3D printers and in the Preface section Getting Help from ZCentral 101 you will find a checklist of items that the ZCentral Dept. needs in order to help you more efficiently and effectively. Remember that ZCentral is there to be your second support option and provide you with the help that you need but can only do so with the proper information.

Troubleshooting 101:

1. Understand the problem at hand! (Example: Printer Won't Boot= Not very descriptive. Printer Won't Boot= I turn the printer on and do not get any lights or readout on the monitor plugged into the machine) is much more descriptive.
2. Check to make sure that the customer is following proper storage procedures for consumables and that their products are not expired.
3. Clean the machine thoroughly! This includes all parts of the service station, axis rails, pulley teeth and top deck. Remove any debris build up at the ends of travel, on the axis rail and even on axis rail supports.
4. Perform a quick inspection of the machine, remove side panels and covers, lubricate the machine and re-tension all belts. During the inspection you should be looking for any signs of leaks, loose screws or nuts and worn parts. Badly worn items should be replaced during this service visit, screws and covers need to be tightened and leaks should be fixed immediately.
5. Turn the machine off, wait one minute, move the carriage and fast axis to the middle of the build bed and re-boot the machine. It is very important that you watch, study and become familiar with the boot process of the Z Corp 3D printer you are working on.

Many problems can be identified and possibly solved by simply performing these 5 steps but sometimes it takes a little more work.

6. Once the machine has rebooted and come back "Online" take a quick look through the printers log file and take a look at the print head report. In the log file look for trends leading up to the error or problem you are experiencing(example: repeated 1006 Head Too Hot errors with a head will lead to 40800 Head Check Failed or other errors). With the same points in mind, a clear print head with over 1000ml on it or a color print head with over 500ml of binder through it may start to experience 1006 Head Too Hot errors which are normal.

If you haven't found the problem you were looking for by now you are actually just getting ready to start the troubleshooting process. Change one part at a time. We are trying to find the root cause of an issue not only to help this customer but to make our equipment better. If that part does not fix the problem then it needs to be removed and placed back into your spares kit or sent back to Z Corp.

Getting Help from ZCentral:

Having the below information ready for the ZCentral team WILL make your initial information inquiry more fruitful and help you to get your customer up and running in the least amount of time.

1. Serial Number
2. Customer Name
3. Log File (Service Menu> View Printer Log: Save As)
4. .INI File (Service Menu> Edit .INI File: Save As)
5. .CSV File(Z350, Z450 and Z650: Service Menu> Receive File: Type spread.csv)
6. Head Report Information
7. Binder/Powder Type
8. Binder/Powder Expiration
9. EXACT Error Code/ Description of Problem
 - a. Understand and be descriptive of the problem at hand. (Remember example: Printer Won't Boot= Not very descriptive. Printer Won't Boot= I turn the printer on and do not get any lights or readout on the monitor plugged into the machine)
 - b. What's changed? If you have recently replaced an EBox, Fast Axis or any other part and are now having a different problem or even the same problem then it's best for you and for the ZCentral service staff to have and know this information.

Failure to follow the above steps and provide the above information can result in your questions not being answered to you or your customers' satisfaction and definitely lead to a more drawn out service call.

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Proprietary Information

Information contained in this document is the confidential property of Z Corporation. Recipient shall not disclose such Information to any third party, and shall not use it for any purpose whatsoever other than what is required to install and use the ZPrinter 350.

Use of Equipment

Z Corporation's Equipment, and use of the Equipment, may be subject to limitations imposed under patents licensed to or owned by Z Corp., and is to be used solely for the fabrication of appearance models and prototypes using new Z Corporation-supplied consumables from Z Corporation or its authorized distributors in the original packaging. Other uses may be restricted; contact Z Corporation for further information. Consult the User's Manual before operation of any Z Corporation Equipment. The Equipment may be covered by the following U.S. Patents and/or U.S. Patent Applications:

5,204,055	5,340,656	5,387,380	6,007,318	6,375,874	5,902,441
6,416,850	6,610,429	6,403,002	5,660,621	5,851,465	6,397,922
6,036,777	6,989,115	7,037,382	7,291,002	7,387,359	7,087,109
7,332,537	11/335,282	11/860,087	60/558,940	12/118,899	11/000,100
11/606,960	60/808,721	11/807,325	11/807,329	11/807,175	11/807,237

09/706,350 09/835,292 11/453,695 60/472,221 60/499,220 11/732,490
60/879,703 11/952,727 12/035,743.

The Equipment is designed to be used by design engineers and other professionals in the production of early-stage 3D appearance models and prototypes. The Equipment is not to be used to produce, either directly or indirectly, medical or other products that may require precise dimensions or tolerances to ensure the safe and effective operation of such products. You agree to indemnify, defend and hold Z Corporation and its officers, directors and employees harmless from and against any and all claims, losses, damages, costs and expenses resulting from any use of the Equipment other than for the production of early-stage appearance models and prototypes.



Warranty

Your ZPrinter is guaranteed to be free of defects in materials and workmanship, when used for production of early-stage appearance models and prototypes and with Z Corporation consumables, for the period described below under WARRANTY PERIOD. All consumables and materials are guaranteed to perform as described in their specifications when stored and used as directed, up to the expiry date printed on the label. THE COMPANY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND DISCLAIMS ALL WARRANTIES INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY OTHER OBLIGATIONS OR LIABILITIES WHETHER IN CONTRACT, WARRANTY, NEGLIGENCE OR OTHERWISE. THE COMPANY IS NOT LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL OR INCIDENTAL DAMAGES INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS OR BUSINESS INTERRUPTION ARISING OUT OF THE USE OR INABILITY TO USE PRODUCTS OR SERVICES SOLD HEREUNDER. IN NO EVENT WILL THE COMPANY'S LIABILITY EXCEED THE TOTAL CHARGE OF THIS Z PRINTER 350.

WARRANTY PERIOD: In the U.S., warranty is for 90 days and covers service, parts and training material. In the EU, warranty is for 1 year and covers service, parts and training material.

Symbols

The following symbols are used on the ZPrinter 350 and in this manual.

	General Caution: User should use care to avoid possible damage to equipment.
	High Voltage: User should use appropriate electrical safety precautions.

Printing Errors: Print Head and Pogo Issues:

1003: I2C Read Failed for Head 0			
1003 is HP 11 Specific. This error is caused by the printer not being able to read the data off of the HP11 print head's smart chip			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
1003: I2C Read Failed for Head 0	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
1003: I2C Read Failed for Head 0	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1003: I2C Read Failed for Head 0	Carriage Component Failure	Replace Carriage Assembly	Carriage, Pogo, Pogo Cable Replacement
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting. If the problem remains after trying the above contact the ZCorp service Dept.			

1004: Printhead Power Fail

This error is caused by the printer not being able to power the print heads. The most common cause for this error is a short between the print head and Pogo PCB, a dead print head, or a short on the Pogo PCB.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
1004: Print head Power Fail	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
1004: Print head Power Fail	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1004: Print head Power Fail	Carriage Component Failure	Replace Carriage Assembly	Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1004: Print head Power Fail	Head Card Failure	Replace 06631 Head Card	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1004: Print head Power Fail	PC104 to Head Card Wiring Harness Failure	Replace 06632 Igus Chain Assembly with Cables and Tubing	08899 ZPrinter 450 Igus Chain Assy Removal and Replacement
1004: Print head Power Fail	PC104 Failure	Replace 50218 PC104 PCB	85094 ZPrinter 350 E Box Field Repair Procedure
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting.			

1006: Head Temp Too High

This error is caused by a print head overheating due to low binder flow, poor cleaning of the print head by the service station or a failed electrical circuit including the print head. This is a common error when print heads have reached their life expectancy.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
1006: Head Temp Too High	Service Station is not clean or station is damaged	Clean Service Station	User Manual Z350=95000 Z150/250=95007
1006: Head Temp Too High	Out of ZC10	Add ZC10	User Manual Z350=95000 Z150/250=95007
1006: Head Temp Too High	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
1006: Head Temp Too High	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1006: Head Temp Too High	Binder is past expiration	Sanitize System: DO NOT USE BLEACH: Use 06965 Sanitation Kit	08855 ZPrinter 450 Sanitization Procedure
1006: Head Temp Too High	Air in Fluid System	See Fluids	
1006: Head Temp Too High	Binder system is leaking	See Fluids	
1006: Head Temp Too High	Air Vent is clogged (May happen during transport)	Replace Air Vent	
1006: Head Temp Too High	Out of binder and float switch is failed	Troubleshoot float switch and add binder	
1006: Head Temp Too High	Lines are contaminated or Clogged	Sanitize System: DO NOT USE BLEACH: Use 06965 Sanitation Kit	08855 ZPrinter 450 Sanitization Procedure
The first steps in troubleshooting should always be to check the print head life and try another print head! Once a print head has thrown an over temp error the print head is usually dead and must be replaced.			

1007: Head Current Too high

This error is caused by the current for a specific print head being too high. This error can also be displayed as 1007: Head current too high 255v. This voltage comes from the PC104+ card, through the festoon cables, Adapter PCB, and carriage cable to power the Pogo PCB.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
1007: Head Current Too high	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
1007: Head Current Too high	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1007: Head Current Too high	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1007: Head Current Too high	Head Card Failure	Replace Head Card	See appendix D
1007: Head Current Too high	PC104 Failed	Replace 50218 PC104 PCB	See appendix D E Box Field Repair Procedure
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting. If the head current is displayed as 255v then the problem may be located in the carriage. If the problem remains after trying the above contact the ZCorp Service Dept.			

1009: Head Fire Voltage Stuck

This error is caused by the current for the print heads being locked on. In the ZPrinter 150/250 and 350, this voltage comes from the PC104 card, through the Igus Assembly, Adapter PCB, and carriage cable to power the Pogo PCB.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
1009: Head Fire Voltage Stuck	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
1009: Head Fire Voltage Stuck	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1009: Head Fire Voltage Stuck	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1009: Head Fire Voltage Stuck	PC104 Failed	Replace 50218 PC104 PCB	See appendix D E Box Field Repair Procedure
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting. If the problem remains after trying the above contact the ZCorp service Dept.			

1010: Invalid Head Temperature

This error is caused by a bad reading of the print head temperature. Log Example: Head Alarm 10: 256 = invalid temp reading

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
1010: Invalid Head Temperature	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
1010: Invalid Head Temperature	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
1010: Invalid Head Temperature	Carriage Component Failure	Replace Carriage Assembly	See appendix D E Box Field Repair Procedure
The main cause of this error is fluid getting onto the Pogo and print head contacts. A clean service station is key to keeping the machine free of this error. This error can usually be troubleshot by cleaning the electrical contacts on the Pogo PCB and print head or replacing the print head.			

40006: Weak Sensor Reading

This error is caused by the alignment sensor not being able to read a contrast change.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40006:Weak Sensor Reading	Dirty sensor Window	Clean Window and Retry	User Manual Z350=95000 Z150/250=95007
40006:Weak Sensor Reading	Build bed is not Flat	Perform Fill Bed	User Manual Z350=95000 Z150/250=95007
40006:Weak Sensor Reading	Poor Spread	"See Spread Issues"	"See Spread Issues"
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40006:Weak Sensor Reading	Dirty Sensor on Pogo	Clean sensor on Pogo and clean inside the carriage and Retry	
40006:Weak Sensor Reading	Pogo Card is crooked or sensor is not snapped in	Realign the pogo card	See Appendix C
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40006:Weak Sensor Reading	Bad Carriage Component	Replace Carriage	See appendix D Carriage Removal and Replacement
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40006:Weak Sensor Reading	PC104 Failure	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main cause of this error is a dirty sensor window. The alignment window should be cleaned before every build.			

40007: Auto Alignment Failed

This error is caused by the sensors lack of ability to properly align the heads.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40006:Weak Sensor Reading	Dirty sensor Window	Clean Window and Retry	User Manual Z350=95000 Z150/250=95007
40006:Weak Sensor Reading	Build bed is not Flat	Perform Fill Bed	User Manual Z350=95000 Z150/250=95007
40006:Weak Sensor Reading	Poor Spread	"See Spread Issues"	"See Spread Issues"
40007: Auto alignment failed	Stripy printing	"See Part Quality Troubleshooting"	"See Part Quality Troubleshooting"
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40007: Auto alignment failed	Dirty Sensor on Pogo	Clean sensor on Pogo and clean inside the carriage and Retry	
40007: Auto alignment failed	Pogo Card is crooked or sensor is not snapped in	Realign the pogo card	See Appendix C
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40007: Auto alignment failed	Bad Carriage Component	Replace Carriage	See appendix D Carriage Removal and Replacement
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40007: Auto alignment failed	PC104 Failure	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main causes of this error are a dirty sensor window and or poor print quality. The alignment window should be cleaned before every build and the print quality evaluated using a stripe test.			

40008: AUTOALIGN: Can't Pick Reference Head

This error is caused by the sensors lack of ability to read the yellow ink just before the alignment pattern is printed.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40008 AUTOALIGN: Can't Pick Reference Head	Dirty sensor Window	Clean Window and Retry	User Manual Z350=95000 Z150/250=95007
40008 AUTOALIGN: Can't Pick Reference Head	Build bed is not Flat	Perform Fill Bed	User Manual Z350=95000 Z150/250=95007
40008 AUTOALIGN: Can't Pick Reference Head	Poor Spread	"See Spread Issues"	"See Spread Issues"
40008 AUTOALIGN: Can't Pick Reference Head	Stripy printing	"See Part Quality Troubleshooting"	"See Part Quality Troubleshooting"
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40008 AUTOALIGN: Can't Pick Reference Head	Dirty Sensor on Pogo	Clean sensor on Pogo and clean inside the carriage and Retry	
40008 AUTOALIGN: Can't Pick Reference Head	Pogo Card is crooked or sensor is not snapped in	Realign the pogo card	See Appendix C
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40008 AUTOALIGN: Can't Pick Reference Head	Bad Carriage Component	Replace Carriage	See appendix D Carriage Removal and Replacement
After performing the above step try performing a service print head and alignment. If the machine performs both tasks the problem should be solved.			
40008 AUTOALIGN: Can't Pick Reference Head	PC104 Failure	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main causes of this error are a dirty sensor window and or poor print quality. The alignment window should be cleaned before every build and the print quality evaluated using a stripe test.			

40800: Head Check Failed			
40800 is HP 11 Specific. The Printer cannot find the HP 11 Print HEAD			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40800: Head Check Failed	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
40800: Head Check Failed	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40800: Head Check Failed	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40800: Head Check Failed	Head Card Failure	Replace Head Card	See appendix D
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting. If the problem remains after trying the above contact the ZCorp service Dept.			

40801: Headcard Power Failed			
40800 is HP 11 Specific. The Printer cannot find the HP 11 Print HEAD			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40801: Headcard Power Failed	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
40801: Headcard Power Failed	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40801: Headcard Power Failed	Head Card Failure	Replace 06631 Head Card	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40801: Headcard Power Failed	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting. If the problem remains after trying the above contact the ZCorp service Dept.			

40901 TEMPCONTROL: Sensor Error

This error is failure of the circuit that reads the heater temperature

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40901 TEMPCONTROL: Sensor Error	Sensor miss-Read	Reboot	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40901 TEMPCONTROL: Sensor Error	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40901 TEMPCONTROL: Sensor Error	Head Card Failure	Replace Head Card	See appendix D
Please follow the above listed suggestions and remember that a bad print head can cause the same error so it is always beneficial to use new print heads while troubleshooting. If the problem remains after trying the above contact the ZCorp service Dept.			

60400 FPGA: Comm Error on Pogo Card			
The PC104 card cannot read the pogo card			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60400 FPGA: Comm Error on Pogo Card	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
60400 FPGA: Comm Error on Pogo Card	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60400 FPGA: Comm Error on Pogo Card	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60400 FPGA: Comm Error on Pogo Card	Head Card Failure	Replace Head Card	See appendix D
While print heads may cause this error the most common cause of this error is a cable disconnect, bad cable or a bad pogo. This error can be diagnosed through the control panel on the machine by going through the PC104 and Pogo tests.			

60402 FPGA: Load Failed on Pogo			
The PC104 card cannot load the FPGA on the pogo card at boot.			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60402 FPGA: Load Failed on Pogo	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
60402 FPGA: Load Failed on Pogo	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60402 FPGA: Load Failed on Pogo	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60402 FPGA: Load Failed on Pogo	Head Card Failure	Replace Head Card	
While print heads may cause this error the most common cause of this error is a cable disconnect, bad cable or a bad pogo. This error can be diagnosed through the control panel on the machine by going through the PC104 and Pogo tests.			

60501: Pogo Power SPI

This error is caused by a fluctuation in the power being read by the pogo pcb.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60501: Pogo Power SPI	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
60501: Pogo Power SPI	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60501: Pogo Power SPI	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60501: Pogo Power SPI	Head Card Failure	Replace Head Card	See appendix D
While print heads may cause this error the most common cause of this error is a cable disconnect, bad cable or a bad pogo. This error can be diagnosed through the control panel on the machine by going through the PC104 and Pogo tests.			

60502: Pogo Power Read Error

The PC104 card cannot read the pogo card

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60502: Pogo Power Read Error	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
60502: Pogo Power Read Error	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60502: Pogo Power Read Error	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60502: Pogo Power Read Error	Head Card Failure	Replace Head Card	See appendix D
60502: Pogo Power Read Error	PC104 to Head Card Wiring Harness Failure	Replace Igus Chain Assembly with Cables and Tubing	08899 ZPrinter 450 Igus Chain Assy Removal and Replacement
60502: Pogo Power Read Error	PC104 Failure	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
While print heads may cause this error the most common cause of this error is a cable disconnect, bad cable or a bad pogo. This error can be diagnosed through the control panel on the machine by going through the PC104 and Pogo tests.			

60520: HP11 Command SPI Timeout

The PC104 card cannot read the pogo card

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60520: HP11 Command SPI Timeout	Print head not seated properly/contacts dirty	Clean print head contacts and pogo pins then reinsert print head	User Manual Z350=95000 Z150/250=95007
60520: HP11 Command SPI Timeout	HP11 Print Head Failure	Replace HP11 Print Head	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60520: HP11 Command SPI Timeout	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
The most common cause of this error is a cable disconnect, bad cable or a bad pogo. This error can be diagnosed through the control panel on the machine by going through the PC104 and Pogo tests.			

Motion Errors: Axis Problems

2303:0 MOVER: Axis 0 Excessive Position Error			
This error is caused by the presence of or the appearance of excessive friction on the slow axis rail (front to back).			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
2303:0 MOVER: Axis 0 Excessive Position Error	Gantry is obstructed	Remove obstruction	
2303:0 MOVER: Axis 0 Excessive Position Error	Service station is dirty and carriage is jammed	Clean the service station and reassemble if necessary	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
2303:0 MOVER: Axis 0 Excessive Position Error	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
2303:0 MOVER: Axis 0 Excessive Position Error	Slow Axis bearing needs grease	Grease Slow Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
2303:0 MOVER: Axis 0 Excessive Position Error	Slow axis motor pulley is dirty	Clean Pulleys with a dental Pick	
2303:0 MOVER: Axis 0 Excessive Position Error	Slow Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace slow axis idler pulley 06564	
2303:0 MOVER: Axis 0 Excessive Position Error	Slow axis belt is loose/worn	Re-tension the slow axis belt or Replace the belt	
2303:0 MOVER: Axis 0 Excessive Position Error	Slow axis motor is damaged/ Pulley is worn	Replace Slow axis motor	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
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2303:0 MOVER: Axis 0 Excessive Position Error	Slow axis bearing is damaged	Replace 50207 Slow Axis Bearing and Fitting	08867 ZPrinter 450 Slow Axis Bearing Removal and Replacement Procedure
2303:0 MOVER: Axis 0 Excessive Position Error	PC104 Failed	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

2303:1 MOVER: Axis 1 Excessive Position Error

This error is caused by the presence of or the appearance of excessive friction on the fast axis rails (left to right).

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
2303:1 MOVER: Axis 1 Excessive Position Error	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
2303:1 MOVER: Axis 1 Excessive Position Error	Fast Axis bearing needs grease	Grease Fast Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
2303:1 MOVER: Axis 1 Excessive Position Error	Fast axis motor pulley is dirty	Clean Pulley with a dental Pick	
2303:1 MOVER: Axis 1 Excessive Position Error	Fast Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace fast Axis idler pulley 06920	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
2303:1 MOVER: Axis 1 Excessive Position Error	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
2303:1 MOVER: Axis 1 Excessive Position Error	Fast axis motor is damaged/ Pulley is worn	Replace Fast Axis Motor	See appendix D
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved. If not continue next page.			
2303:1 MOVER: Axis 1 Excessive Position Error	PC104 Failed	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

2305:0 MOVER: Axis 0 Didn't Settle

This error typically happens while the print heads are trying to service and can be caused by the same things that can cause the other 230x errors.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
2305:0 MOVER: Axis 0 Didn't Settle	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
2305:0 MOVER: Axis 0 Didn't Settle	Slow Axis bearing needs grease	Grease Slow Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
2305:0 MOVER: Axis 0 Didn't Settle	Slow axis motor pulley is dirty	Clean Pulleys with a dental Pick	
2305:0 MOVER: Axis 0 Didn't Settle	Slow Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace slow axis idler pulley 06564	
2305:0 MOVER: Axis 0 Didn't Settle	Slow axis belt is loose/worn	Re-tension the slow axis belt or Replace the belt	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
2305:0 MOVER: Axis 0 Didn't Settle	Slow axis bearing is damaged	Replace 50207 Slow Axis Bearing and Fitting	08867 ZPrinter 450 Slow Axis Bearing Removal and Replacement Procedure
2305:0 MOVER: Axis 0 Didn't Settle	Slow axis motor is damaged/ Pulley is worn	Replace Slow axis motor	See appendix D
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

2305:1 MOVER: Axis 1 Didn't Settle

This error typically happens while the print heads are trying to service and can be caused by the same things that can cause the other 230x errors.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
2305:1 MOVER: Axis 1 Didn't Settle	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
2305:1 MOVER: Axis 1 Didn't Settle	Fast Axis bearing needs grease	Grease Fast Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
2305:1 MOVER: Axis 1 Didn't Settle	Fast axis motor pulley is dirty	Clean Pulley with a dental Pick	
2305:1 MOVER: Axis 1 Didn't Settle	Fast Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace fast Axis idler pulley 06920	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
2305:1 MOVER: Axis 1 Didn't Settle	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
2305:1 MOVER: Axis 1 Didn't Settle	Fast axis motor is damaged/ Pulley is worn	Replace Fast Axis Motor	See appendix D
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

2400:0 REZERO: Axis 0 Can't Find End of Travel

This error is caused by the printer not being able to reach it's desired slow axis location (front to back)

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
2400:0 REZERO: Axis 0 Can't Find End of Travel	SKIP_REZERO is set to 1 in the ini file	Let the machine come online and then edit the .ini file through the ZPrint Software and delete the line item for SKIP_REZERO 1	
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:0 REZERO: Axis 0 Can't Find End of Travel	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
2400:0 REZERO: Axis 0 Can't Find End of Travel	Slow Axis bearing needs grease	Grease Slow Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
2400:0 REZERO: Axis 0 Can't Find End of Travel	Slow axis motor pulley is dirty	Clean Pulleys with a dental Pick	
2400:0 REZERO: Axis 0 Can't Find End of Travel	Slow Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace slow axis idler pulley 06564	
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:0 REZERO: Axis 0 Can't Find End of Travel	Slow axis belt is loose/worn	Re-tension the slow axis belt or Replace the belt	
2400:0 REZERO: Axis 0 Can't Find End of Travel	Slow axis motor is damaged/ Pulley is worn	Replace Slow axis motor	See appendix D
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:0 REZERO: Axis 0 Can't Find End of Travel	PC104 Failed	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main cause of this error is the line item SKIP_REZERO 1 in the ZPrinter's INI file.			

2400:1 REZERO: Axis 1 Can't Find End of Travel

This error is caused by the printer not being able to reach it's desired fast axis location (left to right)

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
2400:1 REZERO: Axis 1 Can't Find End of Travel	SKIP_REZERO is set to 1 in the ini file	Let the machine come online and then edit the .ini file through the ZPrint Software and delete the line item for SKIP_REZERO 1	
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:1 REZERO: Axis 1 Can't Find End of Travel	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
2400:1 REZERO: Axis 1 Can't Find End of Travel	Fast Axis bearing needs grease	Grease Fast Axis bearing (reset the Maintenance reminder)	User Manual Z350=95000 Z150/250=95007
2400:1 REZERO: Axis 1 Can't Find End of Travel	Fast axis motor pulley is dirty	Clean Pulley with a dental Pick	
2400:1 REZERO: Axis 1 Can't Find End of Travel	Fast Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace fast Axis idler pulley 06920	
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:1 REZERO: Axis 1 Can't Find End of Travel	Carriage Component Failure	Replace 50202 Carriage Assembly	85097 ZPrinter 350 Carriage, Pogo, Pogo Cable Replacement
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:1 REZERO: Axis 1 Can't Find End of Travel	Fast axis motor is damaged/Pulley is worn	Replace Fast Axis Motor	See appendix D
After performing the above step try spreading a layer. If the machine performs both tasks the problem should be solved.			
2400:1 REZERO: Axis 1 Can't Find End of Travel	PC104 Failed	Replace 50218 PC104 PCB	See appendix D E Box Field Repair Procedure

The main cause of this error is the line item SKIP_REZERO 1 in the ZPrinter's INI file.

3012 SEQUENCER: Spurious Interrupt

This error is caused by the fast axis drive not keeping up with the printer's location requests

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
3012 SEQUENCER: Spurious Interrupt	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
3012 SEQUENCER: Spurious Interrupt	Fast Axis bearing needs grease	Grease Fast Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
3012 SEQUENCER: Spurious Interrupt	Fast axis motor pulley is dirty	Clean Pulley with a dental Pick	
3012 SEQUENCER: Spurious Interrupt	Fast Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace fast Axis idler pulley 06920	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
3012 SEQUENCER: Spurious Interrupt	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
3012 SEQUENCER: Spurious Interrupt	Fast axis motor is damaged/ Pulley is worn	Replace Fast Axis Motor	See appendix D
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved. If not continue next page.			
3012 SEQUENCER: Spurious Interrupt	PC104 Failed	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

3013 SEQUENCER: Timed Out Finishing Swath

This error is caused by the fast axis drive not keeping up with the printer's location requests

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
3013 SEQUENCER: Timed Out Finishing Swath	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
3013 SEQUENCER: Timed Out Finishing Swath	Fast Axis bearing needs grease	Grease Fast Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
3013 SEQUENCER: Timed Out Finishing Swath	Fast axis motor pulley is dirty	Clean Pulley with a dental Pick	
3013 SEQUENCER: Timed Out Finishing Swath	Fast Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace fast Axis idler pulley 06920	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
3013 SEQUENCER: Timed Out Finishing Swath	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
3013 SEQUENCER: Timed Out Finishing Swath	Fast axis motor is damaged/ Pulley is worn	Replace Fast Axis Motor	See appendix D
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved. If not continue next page.			
3013 SEQUENCER: Timed Out Finishing Swath	PC104 Failed	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

60300 REZERO: Fast Axis length Out of Tolerance

This error is caused by the fast axis length being out of tolerance while rebooting

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60300 REZERO: Fast Axis length Out of Tolerance	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
60300 REZERO: Fast Axis length Out of Tolerance	Fast Axis bearing needs grease	Grease Fast Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
60300 REZERO: Fast Axis length Out of Tolerance	Fast axis motor pulley is dirty	Clean Pulley with a dental Pick	
60300 REZERO: Fast Axis length Out of Tolerance	Fast Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace fast Axis idler pulley 06920	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60300 REZERO: Fast Axis length Out of Tolerance	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60300 REZERO: Fast Axis length Out of Tolerance	Fast axis motor is damaged/ Pulley is worn	Replace Fast Axis Motor	
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

60301 REZERO: Slow Axis Length Out of Tolerance

This error is caused by the slow axis length being out of tolerance while rebooting

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60301 REZERO: Slow Axis Length Out of Tolerance	Rails are dirty	Clean rails	User Manual Z350=95000 Z150/250=95007
60301 REZERO: Slow Axis Length Out of Tolerance	Slow Axis bearing needs grease	Grease Slow Axis bearing (reset the Maintenance in the software)	User Manual Z350=95000 Z150/250=95007
60301 REZERO: Slow Axis Length Out of Tolerance	Slow axis motor pulley is dirty	Clean Pulleys with a dental Pick	
60301 REZERO: Slow Axis Length Out of Tolerance	Slow Axis idler pulley is dirty/worn	Clean Pulley with a dental Pick. If worn, replace slow axis idler pulley 06564	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
60301 REZERO: Slow Axis Length Out of Tolerance	Slow axis belt is loose/worn	Re-tension the slow axis belt or Replace the belt	
60301 REZERO: Slow Axis Length Out of Tolerance	Slow axis motor is damaged/ Pulley is worn	Replace Slow axis motor	See appendix D
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication.			

40204 TI: Build Piston Driver Overload or Piston is not Moving

This error is caused by a failed piston drive.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
40204 TI: Build Piston Driver Overload or Piston is not Moving	Piston motor cables disconnected	Reconnect piston motor cables	08857 ZPrinter 450 Piston Drive/Vibration Motor Removal and Replacement
40204 TI: Build Piston Driver Overload or Piston is not Moving	Powder is over packed in the piston	Vacuum powder into feeder (Piston will need to be re-zeroed)	08857 ZPrinter 450 Piston Drive/Vibration Motor Removal and Replacement
40204 TI: Build Piston Driver Overload or Piston is not Moving	Piston seal is sticking to feeder wall	Clean or replace 30623 Piston Seal	08857 ZPrinter 450 Piston Drive/Vibration Motor Removal and Replacement
40204 TI: Build Piston Driver Overload or Piston is not Moving	Shaft screws came loose	Retighten screws (Piston will need to be re-zeroed)	08857 ZPrinter 450 Piston Drive/Vibration Motor Removal and Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40204 TI: Build Piston Driver Overload or Piston is not Moving	Piston Motor Failed	Replace 30695 Piston Motor	08857 ZPrinter 450 Piston Drive/Vibration Motor Removal and Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
40204 TI: Build Piston Driver Overload or Piston is not Moving	PC104 Failed	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
The main reason for this error and the piston getting stuck in a position is the triangular plate and guide rods getting a little twisted. All that is needed to fix the error is to loosen the screws holding the plate and re-tighten. The piston must be re-zeroed after this procedure.			

EBox Issues: EBox Problems, Boot Failures

Blank or Black Front Panel LCD			
A monitor must be plugged into the back of the printer in order to troubleshoot this problem.			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Disk Boot Failure	Flash Drive Failure	Replace 50217 Flash Drive	85094 ZPrinter 350 E Box Field Repair Procedure
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Ready for Debugger Commands	Cabling	Check all Cables for missed connections and reconnect all connections	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Ready for Debugger Commands	PC104 Failure	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
Ready for Debugger Commands	Motherboard is not working properly	Replace 50752 Motherboard PCB	See appendix D E Box Field Repair Procedure
Troubleshooting this problem is entirely dependent on the error message or monitor readout. Please contact ZCentral for further help in troubleshooting.			

No Power and/or Monitor Readout

The printer has no power at all. No LED's, control panel power or movement

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
No Power and/or Monitor Readout	Power not connected	Plug in to appropriate voltage (Universal Power Supply)	
No Power and/or Monitor Readout	Loose Cabling inside E-Box	Check cabling inside E-box	
No Power and/or Monitor Readout	Loose LCD connection	Remove front panel and check LCD connection	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
No Power and/or Monitor Readout	PC104 Failure	Replace PC104 PCB	See appendix D E Box Field Repair Procedure
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
No Power and/or Monitor Readout	Motherboard is not working Properly	Replace 50752 Motherboard PCB	See appendix D E Box Field Repair Procedure
Take a look through the EBox to make sure everything is connected and reseal the connections throughout.			

3202: Monitor Thread Took Too Long

This is an internal communication error coming from the motherboard.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
3202: Monitor Thread Took Too Long	Motherboard is not working Properly	Replace 50752 Motherboard PCB	See appendix D E Box Field Repair Procedure

This error is usually caused by an obstruction or defect in the fan for the motherboard processor.

Communication Issues: Network and Packet Timeout Issues

3900 SOCKETS: Can't Initialize WinSock Interface

This is usually a setup error or network problem.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
3900 SOCKETS: Can't Initialize WinSock Interface	Printer is not plugged into the network or the cable is damaged	Reseat the network cable and perform the network setup procedure	08605 Ethernet Setup Procedure

The most common cause of this error is the printer not being plugged into the network.

No Printers Found On Network

This is usually a setup error or the printer has been turned off.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
No Printers Found On Network	Printer is not turned on or has lost its connection	Turn the printer on or reboot the printer and try to connect to the printer via "3D Print Setup"	
No Printers Found On	Printer is on a different	Type the IP Address of the printer into the	

Network	IP tier or Subnet	window next to the find command in ZPrint and click OK.	
The most common cause of this error is not setting a default printer at installation or the customer opening a .BLD file. Reconnecting through ZPrint and the 3D Print Setup will solve this error most of the time.			

Packet Timeout Error

This is a network communication error.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Packet Timeout Error	Printer is not ONLINE	Put printer ONLINE or troubleshoot accordingly	Printer is not ONLINE
Packet Timeout Error	Power Management Is Enabled	Disable all power management	
Packet Timeout Error	PC does not meet required specs	Upgrade System to proper Specifications	User Manual Z350=95000 Z150/250=95007
Packet Timeout Error	A temporary increase in network traffic may have caused Z Print data to slow down	Try running the printer on a Network Crossover Cable	08605 Ethernet Setup Procedure
Packet Timeout Error	Printer is not keeping up with Z Print Demands	PC may be over tasked. Z Print requires a dedicated PC	

The most common cause of this error is high network traffic. A crossover cable and spare PC may be needed to troubleshoot this error.

Sensors and Switches: Errors Involving the Sensors and Switches

Top Cover Open			
The top cover is open or the printer thinks it is			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Top Cover Open	Top Cover is Open	Close Top Cover	
Top Cover Open	Cover Switch is damaged	Replace 31383 Top Cover (Interlock) Switch	
The most common cause of this error is the top cover not closing properly.			

1008: Head Cover Open			
There is no cover sensor over the heads. This cover is caused by the top cover having been opened			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Top Cover Open	Top Cover is Open	Close Top Cover	
Top Cover Open	Cover Switch is damaged	Replace 31383Top Cover (Interlock) Switch	
The most common cause of this error is the top cover not closing properly.			

1011: Out of Binder

If the software thinks the reservoir it is empty (or actually is). This will come up if doing a purge or an a small test job form the control panel.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Out of binder	Out of binder	Add binder only if existing Cartridge is empty	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Binder Reservoir is Empty, but the Binder Cartridge is Full	Binder Cartridge not inserted properly	Reseat Binder Cartridge	User Manual Z350=95000 Z150/250=95007
Binder Reservoir is Empty, but the Binder Cartridge is Full	Binder Cartridge Damaged or valve not working	Try a new Binder Bottle	User Manual Z350=95000 Z150/250=95007
Binder Reservoir is Empty, but the Binder Cartridge is Full	Binder Intake Valve not functioning	Replace 06595 Binder intake valve	
Binder Reservoir is Empty, but the Binder Cartridge is Full	Pinched binder line	Check binder system for kinks or clogs	
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Binder Reservoir is Full	Float switch in reservoir not reading properly, due to foam in reservoir	Let the bottle settle for a while	
Binder Reservoir is Full	Float switch in reservoir stuck in the down position	Remove switch and rinse with distilled water	
Binder Reservoir is Full	Float switch in reservoir not reading properly. (To Bypass, circuit should be closed to read a full bottle)	Replace Binder Reservoir	
Sometimes this problem can be a perception issue or misjudgment. Make sure that the software says the binder is low and not print head life and ensure that a full binder cartridge is plugged in.			

Fluids System Issues: Leaks, Clogs and Binder Required

Service Station is Full of Fluid or is Overflowing			
Service Station drain has backed up			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Service Station is Full of Fluid or is Overflowing	Service Station Drain is Clogged	Clean drain area	
Service Station is Full of Fluid or is Overflowing	Waste line is clogged	Use a syringe to back wash the system from the Waste Tray up.	See Appendix B
The most common cause of this problem is a powder blockage in the tubing.			

Binder on Top Deck			
Binder has leaked onto the top deck			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Binder on Top Deck	Binder bottle connection on side panel undone	Connect binder bottle connection	
Binder on Top Deck	Binder cartridge not plugged in	Reinsert Cartridge	User Manual Z350=95000 Z150/250=95007
Binder on Top Deck	Binder Cartridge Leaking	Replace Cartridge	User Manual Z350=95000 Z150/250=95007
Binder on Top Deck	Binder Intake Valve Leaking	Replace 06595 Binder Intake Valve	
Binder on Top Deck	Septum is leaking	Replace 06419 Septum Clean; POGO CARD	
Binder on Top Deck	Reservoir is leaking	Tighten float switch nut	
Once the leak is located and fixed make sure to clean up any binder spills.			

Binder is Leaking from the Bottom of the Printer

Binder is leaking and building up under the printer

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Binder is Leaking from the Bottom of the Printer	Waste Tray is overflowing	Replace 15933 Waste Tray	User Manual Z350=95000 Z150/250=95007
Binder is Leaking from the Bottom of the Printer	Loose fitting	Remove panels and check binder fittings for potential leak	

Once the problem is located and fixed make sure to clean up any binder spills.

Software Keeps Asking to Add Binder

Reservoir thinks it is empty (or actually is). This will come up just before a job

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Out of binder	Out of binder	Add binder only if existing Cartridge is empty	User Manual Z350=95000 Z150/250=95007
After performing the above step perform a check status to see if the issue is resolved.			
Binder Reservoir is Empty, but the Binder Cartridge is Full	Binder Cartridge not inserted properly	Reseat Binder Cartridge	User Manual Z350=95000 Z150/250=95007
Binder Reservoir is Empty, but the Binder Cartridge is Full	Binder Cartridge Damaged or valve not working	Try a new Binder Cartridge	User Manual Z350=95000 Z150/250=95007
After performing the above steps perform a check status to see if the issue is resolved.			
Binder Reservoir is Empty, but the Binder Cartridge is Full	Binder Intake Valve not functioning	Replace 06595 Binder Intake valve	
After performing the above step perform a check status to see if the issue is resolved.			
Binder Reservoir is Full	Float switch in reservoir not reading properly, due to foam in reservoir	Let the bottle settle for a while	
Binder Reservoir is Full	Float switch in reservoir stuck in the down position	Remove switch and rinse with distilled water	
After performing the above steps perform a check status to see if the issue is resolved.			
Binder Reservoir is Full	Float switch in reservoir not reading properly. (To Bypass, circuit should be closed to read a full bottle)	Replace 06609 Binder Reservoir	
After performing the above step perform a check status to see if the issue is resolved.			
Binder Reservoir is full	Float switch in reservoir not reading properly, but bypass does not work	Check/Replace Cabling	
Continue Next Page			
Binder Reservoir is full	Float switch in reservoir not reading properly, but	Replace 50218 PC104	See appendix D

	bypass does not work	PCB	E Box Field Repair Procedure
Sometimes this problem can be a perception issue or misjudgment. Make sure that the software says the binder is low and not print head life and ensure that a full binder cartridge is plugged in.			

Powder Handling: Issues with Depowdering and Vacuum System

Short Spreading/ Feeder Is Not Dispensing Enough Powder			
The build bed is not completely full of powder.			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Short Spreading	Snowplows are damaged or not sitting properly	Reseat/Replace 06839 Left Snowplow and 06840 Right Snowplow	
Short Spreading	Feeder values do not machine the ini values	Check the ini file	08862 ZPrinter 450 Feeder Removal and Replacement
Short Spreading	Powder is compacted in the feeder	Perform a fluidize powder command and then a tune feeder control	08862 ZPrinter 450 Feeder Removal and Replacement
Short Spreading	Piston is a tiny amount too low when at Peak Position	Adjust FILL BED SPREAD setting in INI	09925 ZPrinter 150 and 250 Installation Manual
After performing the above steps perform a Prep Build Chamber(350), Access Build Plate(150,250) command and then a fill bed command. If this works well try printing a test part.			
Short Spreading	Fast Axis not seated Properly	Reseat 06566 Fast Axis Assembly	85096 ZPrinter 350 Fast Axis Removal and Replacement Procedure
After performing the above steps perform a Prep Build Chamber(350), Access Build Plate(150,250) command and then a fill bed command. If this works well try printing a test part.			
Short Spreading	Feeder is damaged	Replace 06544 Feeder	See Appendix A and 08862 ZPrinter 450 Feeder Removal and Replacement
The main cause of this problem is that the powder has compacted into the feeder or the fast axis or snow plows are not sitting correctly on the machine. A tune feeder control and fill be command should be run when encountering this problem.			

60004 AIRVALVE: Driver Overload

The metering wheel in the feeder is not able to move

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60004 AIRVALVE: Driver Overload	Vacuum valve is stuck in a position	Check for obstructions and rezero the vacuum valve through the service menu	
60004 AIRVALVE: Driver Overload	Vacuum valve motor is bad	Replace 06597 vacuum valve or motor 31052	08864 ZPrinter 450 Vacuum Valve Removal and Replacement Procedure

The most common cause of this problem is the vacuum valve not being in the correct position. Rezeroing or rebooting the printer should help.

60104 FEEDER: Feeder Motor Stalled

The metering wheel in the feeder is not able to move

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60104 FEEDER: Feeder Motor Stalled	Powder has compacted in the feeder	Fluidize powder through the Service menu	
After performing the above step try a Fill Bed operation. If that works then the problem should be solved.			
60104 FEEDER: Feeder Motor Stalled	Powder has compacted in the feeder	Remove powder from the feeder and try a fill bed	
After performing the above step try a Fill Bed operation. If that works then the problem should be solved.			
60104 FEEDER: Feeder Motor Stalled	Bad feeder motor	Replace 30762 Feeder Motor	

The most common cause of this problem is powder settling in the feeder. Fluidizing the powder should help.

60105 FEEDER: Overflow Failed to Empty or Front/Rear Overflow is Full of Powder or Not Emptying

The overflows have not emptied after a print job

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
60105 FEEDER: Overflow Failed to Empty or Front/Rear Overflow is Full of Powder or Not Emptying	Air Valve is not in proper position	Re-zero Air Valve	
60105 FEEDER: Overflow Failed to Empty or Front/Rear Overflow is Full of Powder or Not Emptying	Vacuum hose has a leak	Check hose for leaks	
After performing the above steps try emptying the overflows through the Service menu.			
60105 FEEDER: Overflow Failed to Empty or Front/Rear Overflow is Full of Powder or Not Emptying	Bad/Improper cabling	Check Air Valve Cabling	
60105 FEEDER: Overflow Failed to Empty or Front/Rear Overflow is Full of Powder or Not Emptying	Bad Motor or Gear work	Replace 06597 vacuum valve or motor 31052	08864 ZPrinter 450 Vacuum Valve Removal and Replacement Procedure
After performing the above steps try emptying the overflows through the Service menu.			
60105 FEEDER: Overflow Failed to Empty or Front/Rear Overflow is Full of Powder or Not Emptying	PC104 Failed	Replace 50218 PC104 PCB	See appendix D E Box Field Repair Procedure
The most common cause of this problem is the vacuum valve not being in the correct position. Rezeroing or rebooting the printer should help.			

No/Light Suction on User Hose

The user hose has light suction, which when plugged in, the other vacuum functions may not work well.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
No/Light Suction on User Hose	Air Valve is not in proper position	Re-zero Air Valve	
No/Light Suction on User Hose	Hose is split	Replace 30861 User Hose	
No/Light Suction on User Hose	Hose is Clogged	Unclog hose	
No/Light Suction on User Hose	Feeder Cover is unlatched	Latch Cover	
No/Light Suction on User Hose	Feeder filter is not seated properly	Reseat filter	
No/Light Suction on User Hose	Debris Separator is clogged	Empty Separator	
No/Light Suction on User Hose	Tighten Hose Clamps	Tighten Hose Clamps	
<p>One of the most common causes of this problem is the vacuum valve not being in the correct position. Re-zeroing or rebooting the printer should help.</p>			

Powder Seeping out of the Printer

Powder is coming from various spots on the printer

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Powder Blowing Out Back Panel	Feeder filter installed upside-down	Install a new filter correctly. Replace vacuum motor.	Powder blowing out back Panel
Powder Blowing Out Back Panel	Feeder Filter is not seated correctly	Clean Filter, reseal filter and replace 50187 120V Vacuum Motor or 50193 240V Vacuum Motor	Powder blowing out back Panel
Powder Coming from Feeder	Feeder Filter is torn	Replace 30502 Filter, 06828 Feeder Cover and 50187 120V Vacuum Motor or 50193 240V Vacuum Motor	Powder coming from feeder
Inspect the filter for tears or holes and if needed replace.			
Powder Coming from Feeder Metering Bearings	Metering bearing seals are worn	Replace 06544 Feeder	08862 ZPrinter 450 Feeder Removal and Replacement
Powder Coming from Below the Machine	Piston seal leaking	Replace the 30623 Piston Seal	
Powder will accumulate in the bottom of the printer and should be cleaned out while doing a PM.			

Depowdering Chamber is Full of Powder While De-powdering (350 only)

Powder is not emptying the depowdering chamber

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Depowdering Chamber is Full of Powder While Depowdering	Air Valve is not in proper position	Re-zero Air Valve	
Depowdering Chamber is Full of Powder While Depowdering	Vacuum hose has a leak	Check hose for leaks	
Depowdering Chamber is Full of Powder While Depowdering	Bad/Improper cabling	Check Air Valve Cabling	
Depowdering Chamber is Full of Powder While Depowdering	Bad Motor or Gear work	Replace 06597 Vacuum Valve Assembly	08864 ZPrinter 450 Vacuum Valve Removal and Replacement Procedure
Depowdering Chamber is Full of Powder While Depowdering	PC104 Failure	Replace 50218 PC104 PCB	See appendix D E Box Field Repair Procedure
All of the above items should be checked before replacing any parts. Listening for the air leak can sometimes help.			
Vacuum not running	Vacuum Motor is not working	Replace 50187 120V Vacuum Motor or 50193 240V Vacuum Motor	
Vacuum not running	Vacuum Controller PCB Failure	Replace 50189 Vacuum Controller PCB	See appendix D E Box Field Repair Procedure
One of the most common causes of this problem is the vacuum valve not being in the correct position. Re-zeroing or rebooting the printer should help.			

No Compressed Air or Not Enough Compressed Air

The compressor is not kicking on.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
No Compressed Air or Not Enough Compressed Air	Compressor is not working (there are no adjustments)	Replace 06797 Compressor	08859 ZPrinter 450 Compressor Removal and Replacement
If there is no error and the compressor is the only thing that does not work it should be the problem.			
No Compressed Air or Not Enough Compressed Air	PC104 Failure	Replace 50218 PC104 PCB	85094 ZPrinter 350 E Box Field Repair Procedure
Powder will accumulate in the bottom of the printer and should be cleaned out while doing a PM.			

No Vacuum

The vacuum is not kicking on.

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
No Vacuum	Vacuum is not working (there are no adjustments)	Replace 50187 120V Vacuum Motor or 50193 240V Vacuum Motor	
If there is no error and the vacuum is the only thing that does not work it should be the problem.			
No Vacuum	Vacuum Controller PCB Failure	Replace 50189 Vacuum Controller PCB	85094 ZPrinter 350 E Box Field Repair Procedure
Powder will accumulate in the bottom of the printer and should be cleaned out while doing a PM.			

Part Quality Issues: Printed Part Quality Problems

Geometry/Sizing Issues			
Errors relating to a printed parts size and shape			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Poor Part Quality	Old Head	Replace Head	User Manual Z350=95000 Z150/250=95007
Poor Part Quality	Service Station dirty	Clean Service Station	User Manual Z350=95000 Z150/250=95007
Poor Part Quality	Axis rails or pulley teeth are dirty	Clean and lubricate the both the slow and fast axis rails, clean the pulley teeth and re-tension the belts	
Poor Part Quality	Out of Wash Fluid	Add Wash Fluid	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Poor Part Quality	Wick is worn	Replace 06571 Service Station	
Poor Part Quality	Squeegee is worn	Replace 06571 Service Station	
Poor Part Quality	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
The number one cause of inaccuracies in printed parts is not using bleed compensation or dialing in bleed compensation for that specific machine and environment. Please visit the ZCentral web site for more info. Bleed Comp Tweak Tool			

Weak, Crumbly Parts/De-laminations

Errors relating to a printed parts strength

<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Weak Parts/De-laminations	Old Head	Replace Head	User Manual Z350=95000 Z150/250=95007
Weak Parts/De-laminations	Service Station dirty	Clean Service Station	User Manual Z350=95000 Z150/250=95007
Weak Parts/De-laminations	Axis rails or pulley teeth are dirty	Clean and lubricate the both the slow and fast axis rails, clean the pulley teeth and re-tension the belts	
Weak Parts/De-laminations	Out of Wash Fluid	Add Wash Fluid	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Weak Parts/De-laminations	Wick is worn	Replace 06571 Service Station	
Weak Parts/De-laminations	Squeegee is worn	Replace 06571 Service Station	
Weak Parts/De-laminations	Carriage Component Failure	Replace 50202 Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Weak Parts/De-laminations	PC is Pausing in-between layers	Check PC Settings/Specs	User Manual Z350=95000 Z150/250=95007
Weak Parts/De-laminations	Rough Spread	See "Spread Issues"	See "Spread Issues"
Weak Parts/De-laminations	Short Spread	See Short Spread	See Short Spread
Weak Parts/De-laminations	Incorrect/Expired Binder	Clean binder system, Replace binder	User Manual Z350=95000

			Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Surface Finish			
Problems related to the surface finish of a printed part.			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Surface Finish	Old Head	Replace Head	User Manual Z350=95000 Z150/250=95007
Surface Finish	Service Station dirty	Clean Service Station	User Manual Z350=95000 Z150/250=95007
Surface Finish	Axis rails or pulley teeth are dirty	Clean and lubricate the both the slow and fast axis rails, clean the pulley teeth and re-tension the belts	User Manual Z350=95000 Z150/250=95007
Surface Finish	Out of Wash Fluid	Add Wash Fluid	User Manual Z350=95000 Z150/250=95007
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved. You should also determine whether the problem is fast or slow axis related.			
Surface Finish	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage, Pogo, Pogo Cable Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Surface Finish	PC104 to Head Card Wiring Harness Failure	Replace 06632 Igus Chain Assembly with Cables and Tubing	08899 ZPrinter 450 Igus Chain Assy. Removal and Replacement
After performing the above step try performing a service print head and a small test job. If the machine performs both tasks the problem should be solved.			
Surface Finish	Slow axis belt is loose/worn	Re-tension the slow axis belt or Replace the belt	
Surface Finish	Fast axis motor is damaged/ Pulley is worn	Replace 30809 Fast Axis Motor	
Surface Finish	Slow axis motor is damaged/ Pulley is	Replace 31174 Slow axis motor	

	worn		
The main cause of this error is the buildup of powder and dirt on the axis rails and poor lubrication. Most 3D printed parts will require a small amount of post processing including sanding or brushing.			

Part Quality Issues: Printed Part Quality Problems

Color Issues/Streaking, Striping and Banding			
Problems relating to a printed color part.			
<u>Monitor Read-Out or Secondary Symptom</u>	<u>Cause / Problem</u>	<u>Solution</u>	<u>Reference Documents</u>
Color Issues	Old Head	Replace Head	User Manual Z350=95000 Z150/250=95007
Color Issues	Heads are not aligned	Realign Heads	User Manual Z350=95000 Z150/250=95007
Color Issues	Service Station dirty	Clean Service Station	User Manual Z350=95000 Z150/250=95007
Color Issues	Out of Wash Fluid	Add Wash Fluid	User Manual Z350=95000 Z150/250=95007
Color Issues	Expired or Incorrect Binder	Clean binder system, Replace binder	User Manual Z350=95000 Z150/250=95007
Color Issues	Rough Spread	See "Spread Issues"	
Color Issues	Short Spread	See Short Spread	
Color Issues	Axis rails or pulley teeth are dirty	Clean and lubricate both the slow and fast axis rails, clean the pulley teeth and re-tension the belts	
The above items should be check, inspected and resolved before proceeding. Once the above steps have been done print a test piece and inspect for results.			
Color Issues	Wick is worn	Replace 30608 Service Station Wick	

Color Issues	Squeegee is worn	Replace 06571 Service Station	
Color Issues	Fast and or slow axis belt is loose/worn	Replace 06746 Fast Axis Belt and 15017 Slow Axis Belt	
After performing the above step try performing a service print head and alignment then print a test piece and inspect for results. Cont.			
Color Issues	Carriage Component Failure	Replace Carriage Assembly	See appendix D Carriage Removal and Replacement
Color Issues	PC104 to Head Card Wiring Harness Failure	Replace 06632 Igus Chain Assembly with Cables and Tubing	08899 ZPrinter 450 Igus Chain Assy Removal and Replacement
Color problems must be interpreted <u>AFTER</u> the part has been infiltrated. For more information please visit or ZCentral web site for more info. Color Quality Best Practices			

Appendix A: Understanding and troubleshooting the ZPrinter Load Cell.

The ZPrinter uses a load cell to measure the weight of the powder in the feeder. The load cell is basically a scale. The feeder sits on two bearings so that the center of gravity pushes the feeder against the load cell. The load cell is located just behind the feeder. A bearing is the only contact point between the load cell and the feeder to prevent friction from altering the weight reading.

The load cell is extremely sensitive. Simply moving the printer will alter the reading on the cell, but the printer takes many readings (20 per second) and averages them to improve the result. The load cell is also somewhat delicate, and it can be damaged by rough handling or by moving the printer over rough surfaces, particularly when there is powder in the feeder. The feeder should always be emptied of powder and the feeder should be restrained when shipping or moving the machine over any rough surface (i.e. door threshold, parking lot, etc.) See [08873 ZPrinter 350 and 450 Transportation Manual](#) for more information.

The load cell measures in ticks from 0 to 4095. A load cell with no load reads between 0 and 50 ticks. A load cell will not read above 4095 no matter how much weight is on it. To read the load cell:

- On the control knob, enable the *Service MENU* by scrolling to STATUS and holding the knob down until *SERVICE MENU ENABLED* is displayed
- In the service menu, scroll down until *READ FEEDER* is highlighted

SERVICE MENU ENABLED

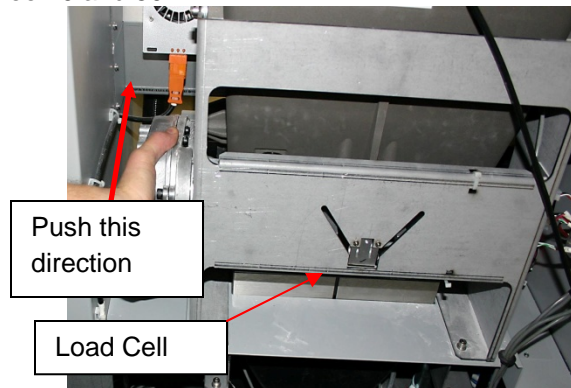
CONTINUE

REZERO FILTER
FLUIDIZE POWDER
TUNE FEEDER CONTROL
READ FEEDER
REBOOT

FEEDER LOADCELL
Raw counts: 3005
Pounds: 53.84
Percent full: 92.4%
Powder level: 7.5"

The feeder assembly is calibrated at the factory. The EBox circuit that reads the load cell is calibrated at the factory independently. These cannot be recalibrated in the field, but the net system calibration can be checked to ensure it's within expected limits and the load cell has not been damaged.

- First, verify that the calibration settings in the .INI file match those on the sticker on the back of the feeder.
- No load condition:
 - Push the feeder away from the load cell so that the bearing no longer contacts the load cell.
 - READ FEEDER” from the service menu on the control panel. Raw counts should be between 0 and 50.



Push Feeder Away from the load cell

- No powder condition:
 - Empty the feeder of ALL powder.
 - Replace the filter, diffuser and top cover
 - “READ FEEDER” from the service menu on the control panel. Raw counts should be 150 +/- 50.

NOTE: The feeder must be empty for the weight to be accurate.

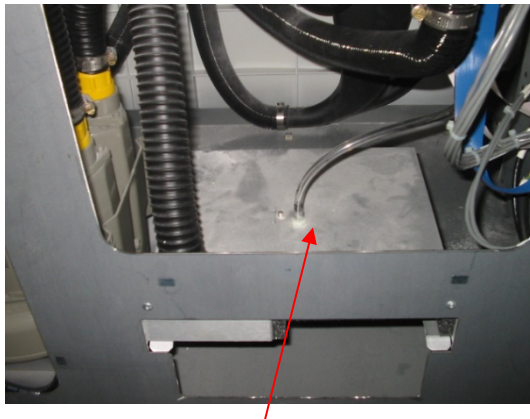


- If these two readings are accurate, then the load cell and PC104 card are working correctly. Inaccurate readings point to a damaged load cell or PC104 card, or failure to enter the feeder calibrations correctly in the INI file.

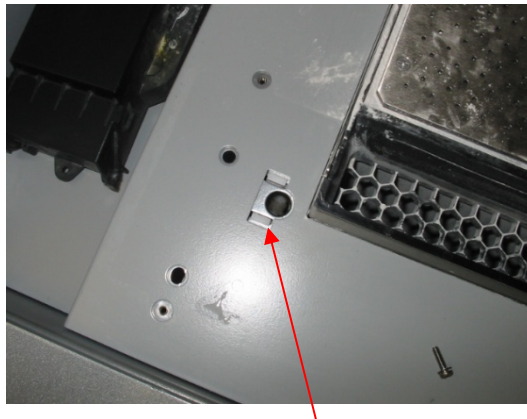
Appendix B: Cleaning the service Station

In the event of a clog in the service station, it will have to be unclogged.

1. Clean the top deck of powder
2. Shut the printer off and unplug the power and network connections
3. Remove the rear panel
4. Remove the service station
5. Disconnect the tube.
6. Plug in a syringe full of DI Water and force the water up the line until it comes out of the service station drain onto the top deck
7. Clean up water
8. Reinsert hose at bottom, panel, service station, and power/network connections



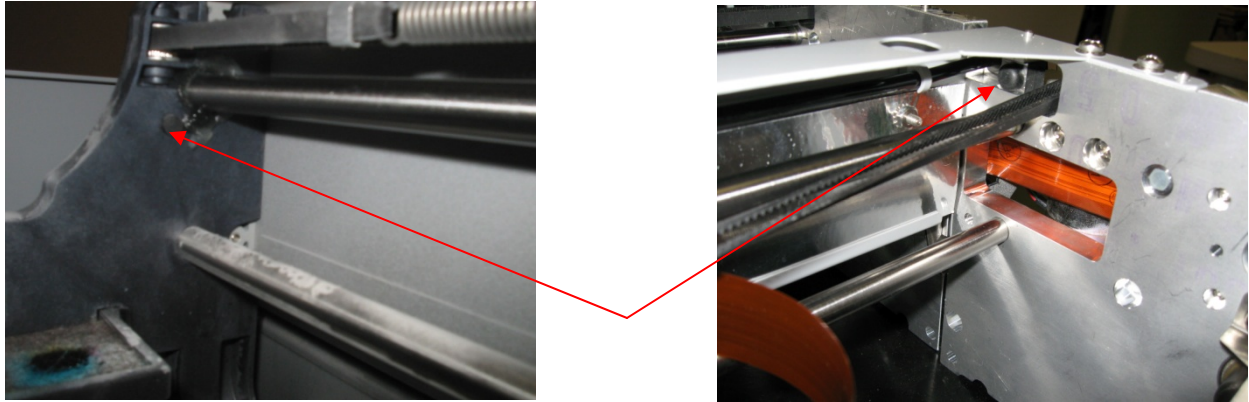
Remove this tube and force distilled water up to the top of the printer



Water will come out here. Place a towel on top of the hole to collect the water

Appendix C: Fast Axis Bumper Location

The Fast axis will measure the distance in between the two bumpers while re-zeroing. If the distance is incorrect, a 2400 error will occur. The bumpers may be missing or damaged. Below are photos of the location of the bumpers.



Appendix D: 150,250,350,450 Part Numbers

Please use the following chart as a reference for 150, 250, and 350. There are similarities between the 150 and 350 (monochrome), and the 250 and 450 (Color). Many procedures can be shared between products. Please use ZCentral Support to verify part numbers and procedures, as ZCentral will always reflect the latest procedures. Also, make sure to use only the parts listed for each model of printer. Although the systems have some similarities there are individual differences based on the functions of each system.

System	Fast Axis	Procedure	Details
150	50257	Use 85096	Color of adaptor board Black
250	50256	Use 85096	Color of adaptor board green
350	50191	85096	
450	06566	08861	
System	Adaptor board	Procedure	Details
150	50756	Use FA procedure to remove/replace Use 85096	Remove cable clamp and ground. Board sits on pins
250	50754	Use FA procedure to remove/replace 85096	Remove cable clamp and ground. Board sits on pins
350	06631	Use FA procedure to remove/replace 85096	Remove cable clamp and ground. Board sits on pins
450	06631	Use FA procedure to remove/replace 08861	Remove cable clamp and ground. Board sits on pins
System	Carriage Assy.	Procedure	Details
150	50202	Use 85097	
250	06582	Use 85097	
350	50202	85097	
450	06582	08858	
System	EBox	Procedure	Details
150	50196	Use 85094	
250	50196	Use 85094	
350	50196	85094	
450	06624	08860	

System	Pogo Board/Cable	Procedure	Details
150	Board 50190/Cable 50351	Use 85097 Adaptor board changes with system model number	Cable kit includes several mounting options. Objective is to add Ferrite 350 type mount to all.
250	Board 06547/Cable 50351	Use 85097 Adaptor board changes with system model number	Cable kit includes several mounting options. Objective is to add Ferrite 350 type mount to all.
350	Board 50190/Cable 50351	Use 85097 Adaptor board changes with system model number	Cable kit includes several mounting options. Objective is to add Ferrite 350 type mount to all.
450	Board 06547/Cable 50351	Use 85097 Adaptor board changes with system model number	Cable kit includes several mounting options. Objective is to add Ferrite 350 type mount to all.
System	PC104	Procedure	Details
150,250,350	50218	85094	
450	06989	08860	
System	Motors	Procedure	Details
150	Fast=30809	FA remove	Notice position of Fast Axis motor you are removing. Motor position may interfere with cover if not correct.
250	Roller=30834	150,250,350 =85096	
350	Slow =31174		
450		450 =08861	

Change History

Rev A ECN 2894 BWH 10/8/09
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