GUIDE

LOSS OF EXTRUSION

Occasionally, the system's head may experience loss of extrusion. This will be evident by observing one of the following:

- The head is moving with no material coming out of either tip.
- The height of the model and support materials are not equal.
- Sagging structures due to lack of support materials.

Gloves: The head area is hot. Use gloves when working in this area of the system.

1. From the display panel press **Cancel** and remove parts from the system.
2. Insert a new modeling base.
3. From **Idle**, press **Maintenance**.
4. Press **Machine**.
5. Press **Head**. The head will move to the center of the chamber and the Z platform will change position. The display will read: **Model Drive Motor Stopped**.
6. Determine if there is a model material extrusion problem by pressing **Forward** (command will be available after head reaches operating temperature). Watch the model tip (right tip) for any extrusion (material purge).

Note: You may need to wait up to 30 seconds before extrustion will begin as the tip may need to reach operating temperature.

7. Press **Stop** to stop the extrusion.
8. If material did NOT flow from the model tip, see "Recovering from loss of extrusion" on page 5. If material steadily flowed from the model tip, the model tip is functioning properly.
9. Test the support material tip by choosing: **Select Drive**.
10. Determine if there is a support material extrusion problem by pressing **Forward**. Watch the support tip (left tip) for any extrusion (material purge).
11. Press **Stop** to stop the extrusion.
12. If material did NOT flow from the support tip, see "Recovering from loss of extrusion" on page 5. If material steadily flowed from the support tip, the support tip is functioning properly.
13. Return the system to the Maintenance state - Press **Done**.
14. Display will ask **Which Materials Loaded?** Press **Both**.
15. Press **Done** until back at **Idle**.

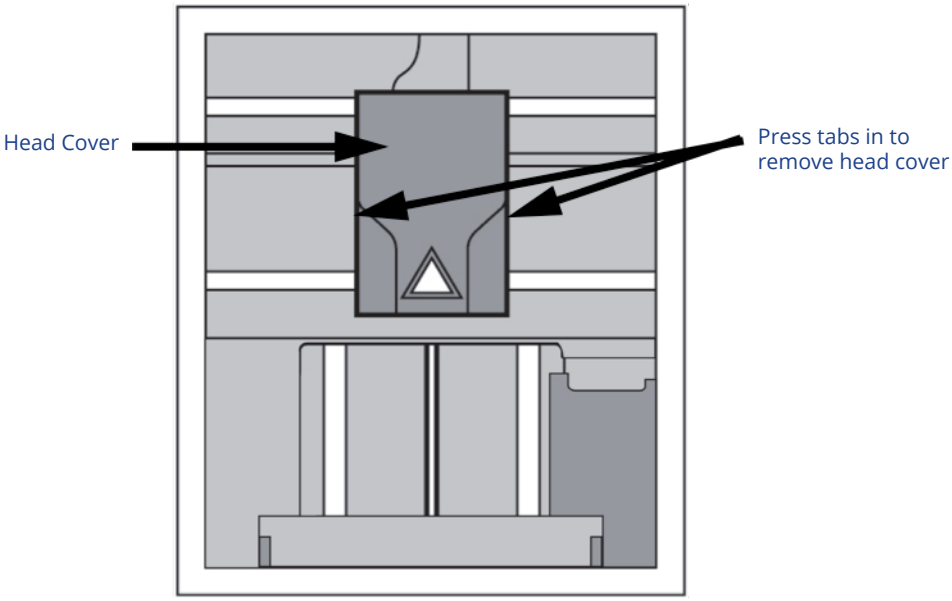
CLOGGED TIP

Occasionally, a tip may clog with material. This will often result in a loss of extrusion (LOE). A clogged tip will prohibit material load and part building.

1. Remove the head cover by pressing the tabs in and pulling away from the head. See Figure 1.

Gloves: The head area is hot. Use gloves when working in this area of the system.

Figure 1: *Remove the head cover*



2. Inspect top of tips for material build up. If there is excess material build up see “Recovering from loss of extrusion” on page 5. If there is no excess material build up close the chamber door and continue.
3. From the display panel press **Maintenance**.
4. Press **Machine**. The system will calibrate which will take approximately 3 minutes.
5. Press **Head**. The head will heat up to operating temperature which will take approximately 3 minutes.
6. Press **Select Drive** and choose the drive that may have the clogged tip.
7. Press **Forward**, the drive wheel will turn the selected drive forward.
8. Press **Blower Off**, this will turn the head cooling fan off for 10 seconds, allowing the tip to heat up beyond operating temperature. If material starts to extrude the tip is no longer clogged. If material does not extrude see “Recovering from loss of extrusion” on page 5.
9. Press **Done**.

10. Replace head cover.

Note: If the headcover is not replaced, the system may not function properly.

11. Display will ask **Which Materials Loaded?** Press **Model** if only model material is loaded, press **Support** if only support material is loaded or press **Both** if both model and support material are still loaded. Press **None** if neither are loaded.
12. Press **Done** until back to **Idle**.

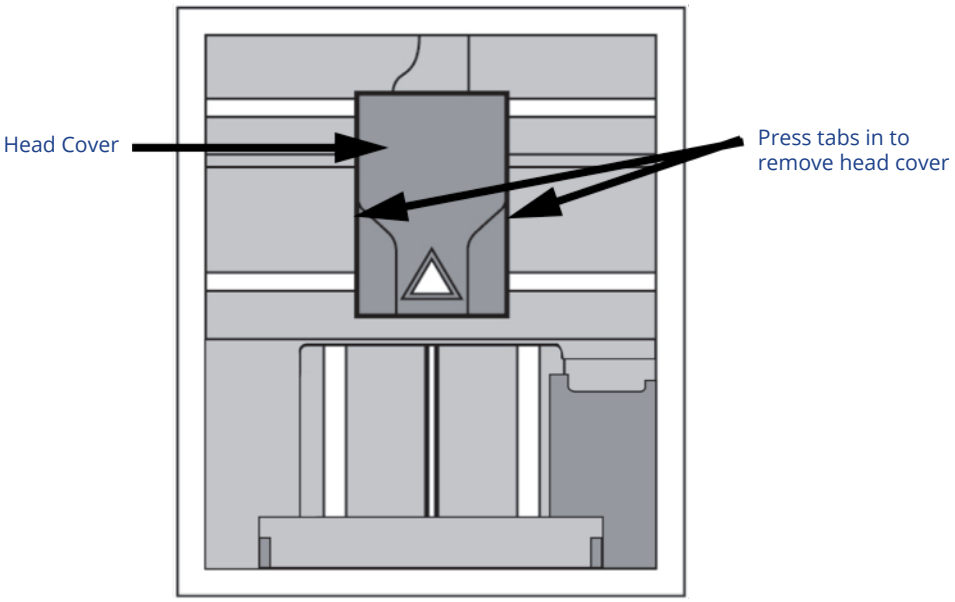
MATERIAL JAM

Occasionally, material may become jammed in the head. The system will notify you of a material jam through a message shown on the display panel. If a material jam is detected, follow these steps to clear the jam.

1. From the display panel, press **Continue**.
2. Press **Maintenance**.
3. Press **Machine**.
4. Press **Head**.
5. Once in head maintenance mode, remove the head cover by pressing the tabs in and pulling away from the head. See Figure 2.

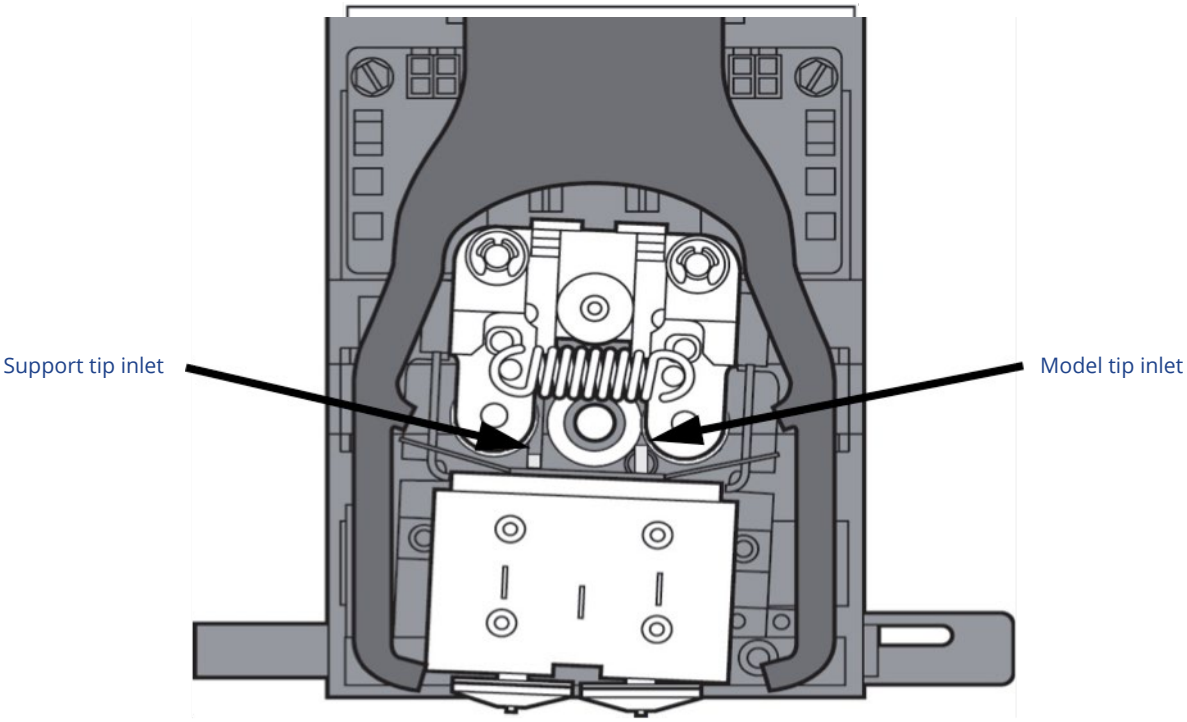
Gloves: The head area is hot. Use gloves when working in this area of the system.

Figure 2: *Remove the head cover*



6. Inspect tip inlets for material build up see Figure 3. If there is excess material build up see “Recovering from loss of extrusion” on page 5. If there is no excess material build up close the chamber door and continue.

Figure 3: *Tip inlet locations*



7. Press **Select Drive** and choose the drive that may have the clogged tip.
8. Press **Forward**, the drive wheel will turn the selected drive forward.
9. Press **Blower Off**, this will turn the head cooling fan off for 10 seconds, allowing the tip to heat up beyond operating temperature. If material starts to extrude the tip is no longer clogged. If material does not extrude see “Recovering from loss of extrusion” on page 5. If material extrudes, you can continue building your part.
10. Reinstall the head cover.

Note: If the headcover is not replaced, the system may not function properly.

11. Press **Done**.
12. Display will ask **Which Materials Loaded?** Press **Both**.
13. Press **Done** until back to Pause screen.
14. Press **Resume** to continue building the part.

RECOVERING FROM LOSS OF EXTRUSION

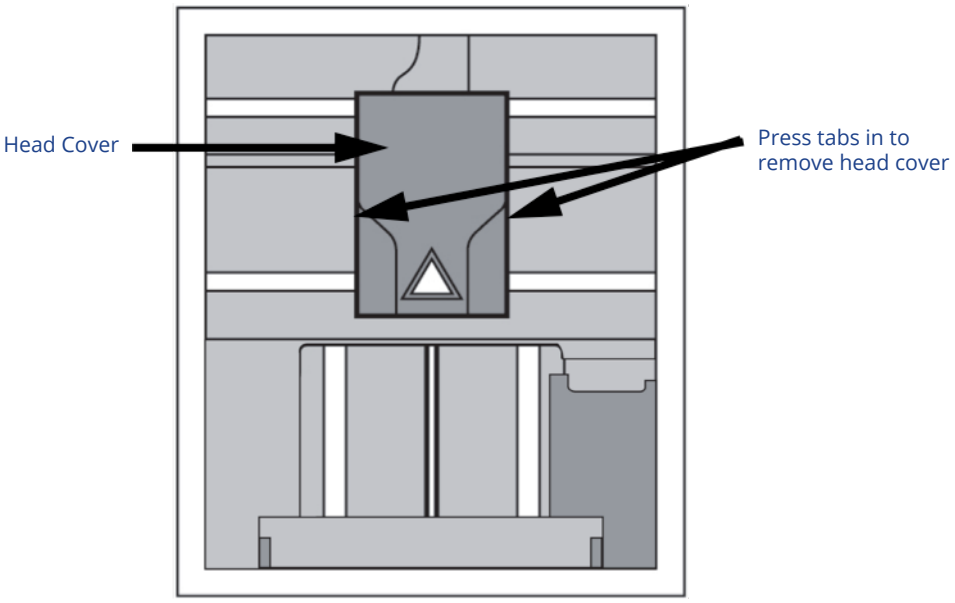
Note: It is recommended that you read and understand this entire procedure before performing any of the work.

1. Enter **Head Maintenance** mode.
   A. From **Idle**, press **Maintenance**.
   B. Press **Machine**.
   C. Press **Head**. The head will heat up to operating temperature which will take approximately 3 minutes.

Gloves: The head area is hot. Use gloves when working in this area of the system.

2. Remove the head cover by pressing the tabs in and pulling away from the head. See Figure 4.

Figure 4: *Remove the head cover*



3. Place the toggle bar in neutral position (bar will extend equally from both sides of head). This can be done manually - push on the extended bar end. See Figure 5.

Figure 5: *Head Components*

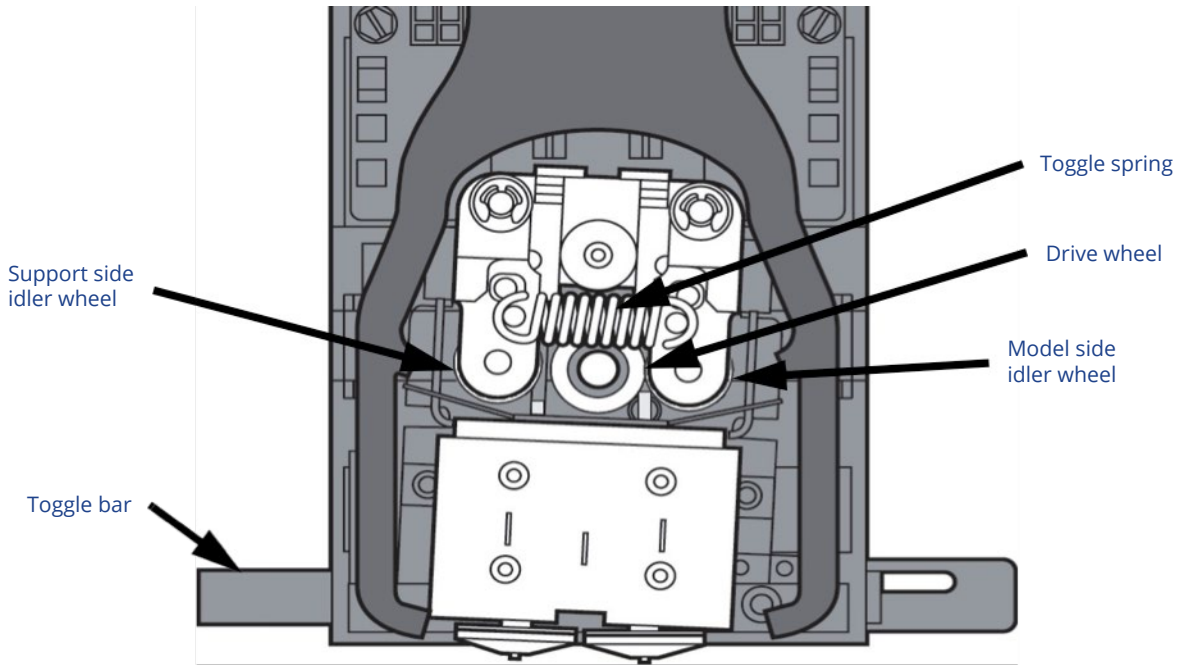
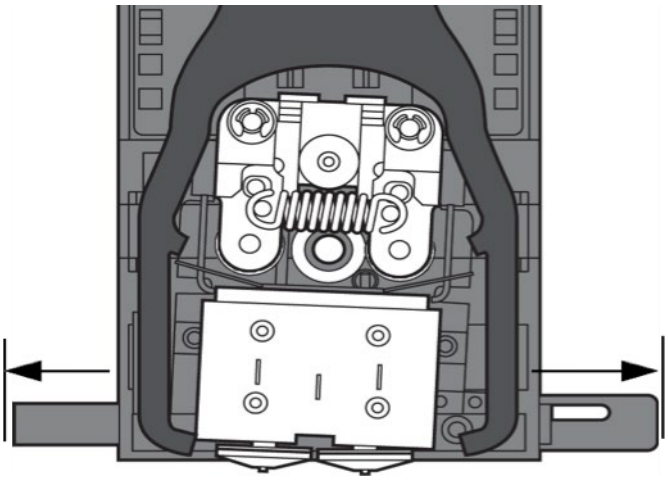


Figure 6: *Toggle bar in neutral position*



4. Remove any excess material found around the head area.

Note: Material fed to the tip can sometimes jam causing a build-up of material under the head cover.

A. Clean out as much of the material as possible using needle nose pliers, a probe, or equivalent tool.

Caution: The end of the tip where the material enters is called the extrusion tube. Extrusion tubes are fragile. Use care when working in this area so as to avoid damage to the tubes.

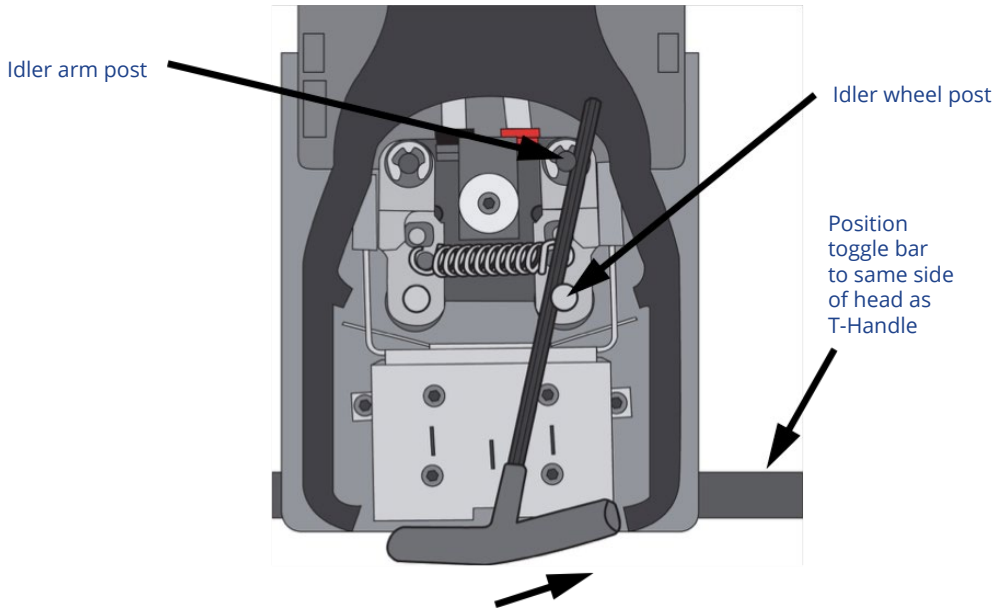
B. For easier access to areas that may need to be cleaned, move the material idler wheels out of the way (there is one idler wheel for support material and one for model material, see Figure 5.

Note: Move only one idler wheel assembly at a time. Finish cleaning around the moved wheel and restore it to its normal position before moving the other idler wheel. Having both wheels out of position simultaneously could stretch the spring.

i. Place a 7⁄64" T-Handle Allen wrench between the toggle spring post and the idler wheel post as illustrated in Figure 7 (model side shown).

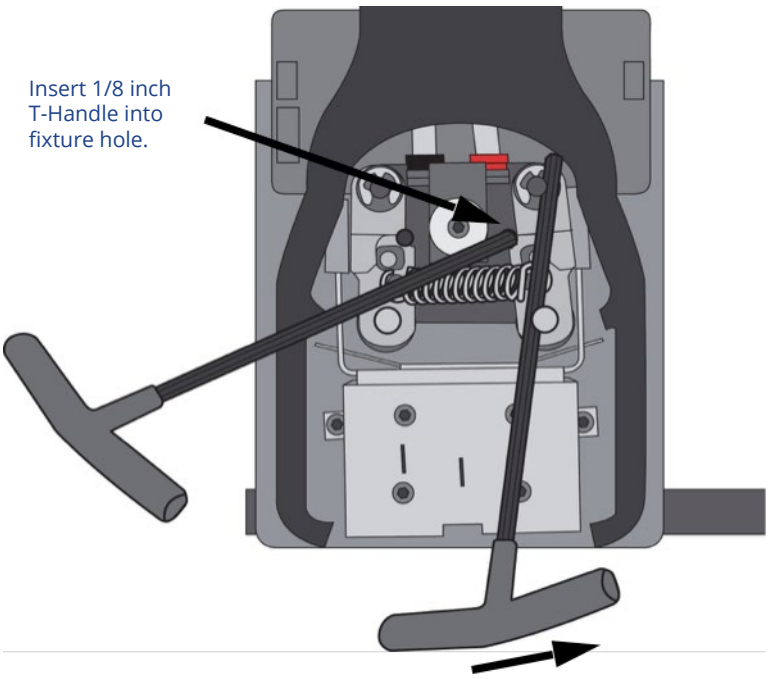
ii. Position toggle bar to the same side of the head as the T-Handle allen wrench. See Figure 7 (model side shown).

Figure 7: *Create access space for cleaning - model side shown*



iii. Move idler wheel assembly by pushing with 7⁄64" T-Handle Allen wrench against spring tension. Insert a 1⁄8" T-handled Allen wrench (from startup kit) into the fixture hole. See Figure 8.

Figure 8: *Holding access space open - model side shown*



iv. Ease pressure on the 7⁄64" T-Handle Allen wrench to carefully return the leveraged idler wheel back toward its original position - until the idler assembly is resting against the 1⁄8" T-Handle Allen wrench.

v. Remove the 7⁄64" T-Handle Allen wrench.

C. Cut the material above the idler wheel using a cutters.

D. Clean the area that is now accessible using a needle nose pliers, a probe or equivalent tool.

Note: Make sure that all loose material is removed from the affected area.

E. Reposition the 7⁄64" T-Handle Allen wrench between the toggle spring post and the idler wheel post.

F. Move idler wheel assembly by pushing with 7⁄64" T-Handle Allen wrench against spring tension and remove the 1⁄8" T-handled Allen wrench.

G. Remove the 7⁄64" T-Handle Allen wrench.

5. Repeat for the opposite side as needed.

6. Replace the head cover.

> **Note:** If the head cover is not replaced, the system may not function properly.

7. Press **Done** on the display panel.
8. Display will ask **Which Materials Loaded?** Press **Model** if only model material is loaded, press **Support** if only support material is loaded or press **Both** if both model and support material are still loaded. Press **None** if neither are loaded.
9. Display will ask you to remove the cartridge of the materials that are not loaded. Remove the cartridge and cut the excess material.
10. Press **Done** until back at **Idle**.
11. Reload the material that is not loaded.