ThinkSystem SR780a V3 GPU Water Loop Service Guide

Attention:

- Read “Installation Guidelines” and “Safety inspection checklist” in the *ThinkSystem SR780a V3 Hardware Maintenance Guide* to ensure that you work safely.
- Touch the static-protective package that contains the component to any unpainted metal surface on the server; then, remove it from the package and place it on a static-protective surface.
- Two people and one lifting device on site that can support up to 400 lb (181 kg) are required to perform this procedure.
- Make sure you have the required tools listed below available to properly replace the *NVSwitch cold plate module*:

Torx T15 head screwdriver	Phillips #1 head screwdriver
Flat head screwdriver	Phillips #2 head screwdriver
NVSwitch PCM Kit	NVSwitch putty pad kit
Alcohol cleaning pad	

- Make sure you have the required tools listed below available to properly replace the *front or rear H100/H200 cold plate module*:

Torx T10 head screwdriver	Torx T15 head screwdriver
Phillips #1 head screwdriver	Phillips #2 head screwdriver
Flat head screwdriver	Alcohol cleaning pad
H100/H200 PCM Kit	SR780a V3 water loop putty pad kit
SR780a V3 water loop service kit	

- Make sure you have the required tools listed below available to properly replace the *GPU complex or GPU baseboard*:

Torx T10 head screwdriver	Torx T15 head screwdriver
Phillips #1 head screwdriver	Phillips #2 head screwdriver
Flat head screwdriver	Alcohol cleaning pad
2 x H100/H200 PCM Kit	2 x SR780a V3 water loop putty pad kit
NVSwitch PCM Kit	NVSwitch putty pad kit
SR780a V3 water loop service kit	GPU baseboard handles

Important: Putty pad/phase change material (PCM) replacement guidelines

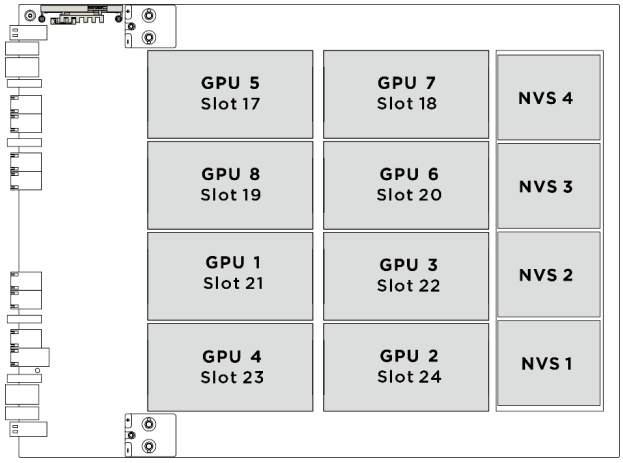
- Before replacing the putty pad/PCM, gently clean the hardware surface with an alcohol cleaning pad.
- Hold the putty pad/PCM carefully to avoid deformation. Make sure no screw hole or opening is blocked by the putty pad/PCM.
- Do not use expired putty pad/PCM. Check the expiry date on putty pad/PCM package. If the putty pads/PCM are expired, acquire new ones to properly replace them.

Before you start, see the *ThinkSystem SR780a V3 Hardware Maintenance Guide* to remove the following:

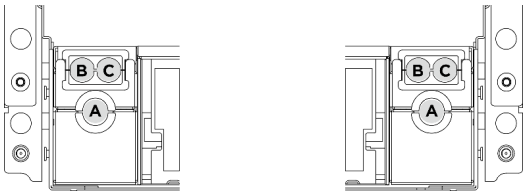
- Front top cover.

- Rear top cover.
- CPU complex.
- Power complex.
- Front fan cage.
- Rear fan cage support bracket.
- Make a list of each cable and remove all the cables from the GPU complex.

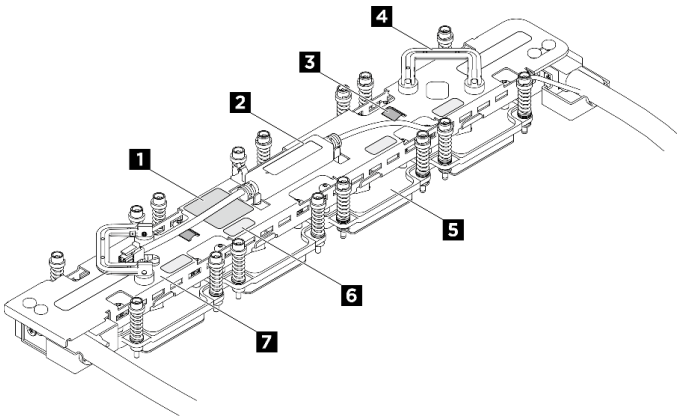
GPU numbering and corresponding slot numbering in XCC



Hose holder location

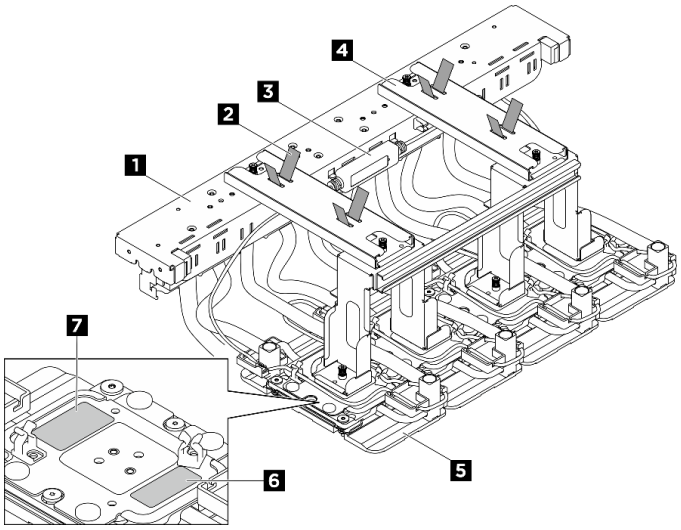


NVSwitch cold plate module components



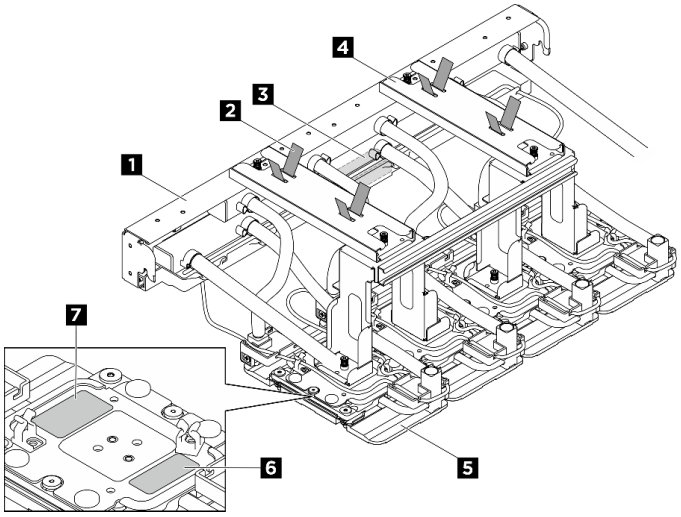
1. NVSwitch cold plate torque label
2. Leakage sensor module
3. Hose tie
4. Handle
5. NVSwitch cold plate
6. NVSwitch slot number label
7. Manifold

Rear H100/H200 GPU cold plate module components



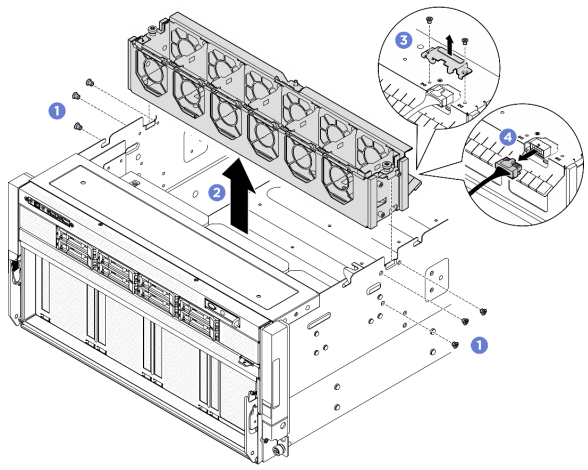
1. Manifold
2. Hose tie
3. Leakage sensor module
4. Shipping bracket
5. GPU cold plate
6. GPU slot number label
7. GPU cold plate screw torque label

Rear H100/H200 GPU cold plate module components



1. Manifold
2. Hose tie
3. Leakage sensor module
4. Shipping bracket
5. GPU cold plate
6. GPU slot number label
7. GPU cold plate screw torque label

Make preparation for this task



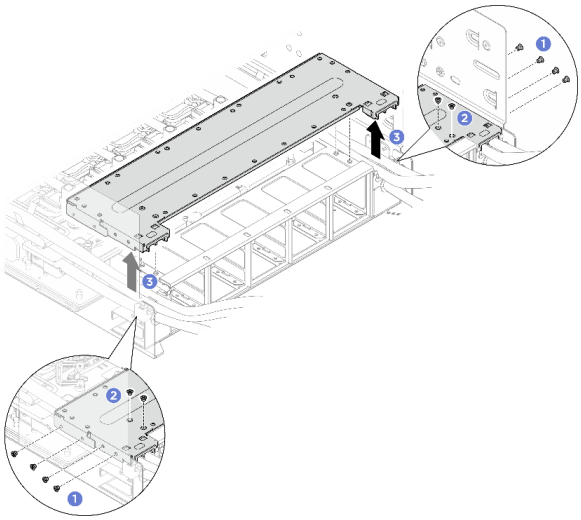
1. Remove the fan cage.

   1 Unfasten the six M3 screws that secure the fan cage to the server.

   2 Lift the fan cage out of the server.

   3 Unfasten the two screws to remove the connector bracket.

   4 Disconnect the power cable from the front fan control board.



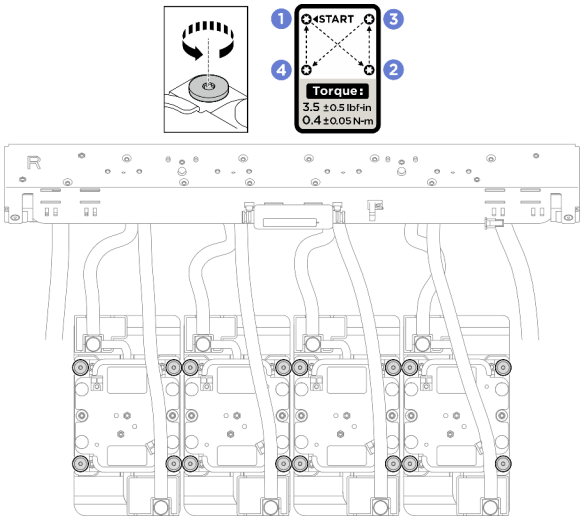
2. Remove the rear fan cage support bracket.

   1 Unfasten the eight M3 screws (W1-W2, RF1-RF2) that secure the fan cage support bracket to the chassis.

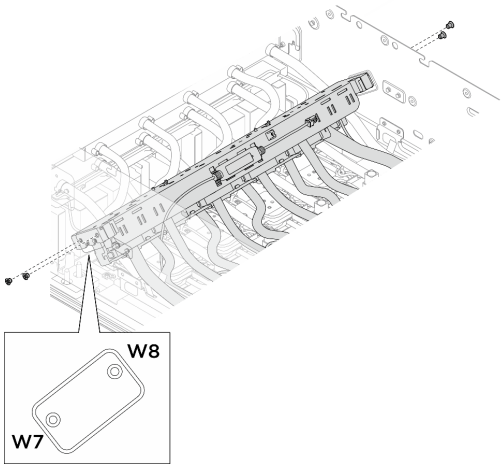
   2 Unfasten the four M3 screws that secure the rear fan cage support bracket to the fan cage.

   3 Grasp the rear fan cage support bracket to lift it from the fan cage.

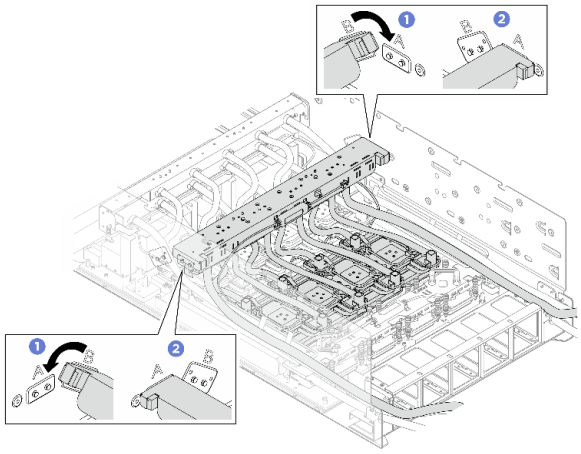
Follow the following steps to remove *rear* H100/H200 GPU cold plate module



3. Follow the screw sequence ❶❷❸❹ specified on the cold plate label, and fully loosen the sixteen Torx T10 screws with a torque screwdriver set to the proper torque (0.4±0.05 newton-meter, 3.5±0.5 pound-inch). Ensure the captive screws are completely loosen before removing the cold plate module.
Note: If necessary, use a flat screwdriver to gently separate the cold plate and the GPU from the corner of the cold plate. Ensure not the damage the GPU or the cold plate.



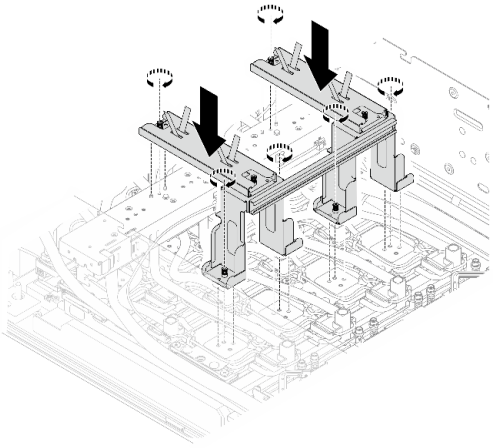
4. Unfasten the four M3 screws (W7-W8) that secure the rear GPU cold plate module manifold to the chassis.



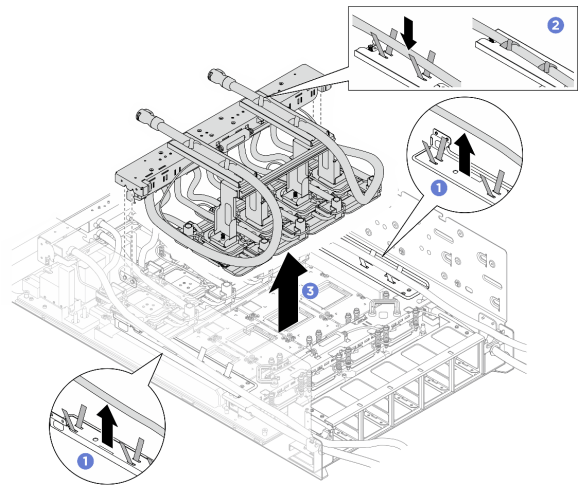
5. Reposition the manifold.

❶ Disengage the manifold from the guide pins marked with B; then, move the manifold to the guide pins marked with A.

❷ Ensure the guide slots on the manifold are securely engaged with the guide pins marked with A.



6. Align the guide pins on the shipping brackets with the guide holes on the manifold and the cold plates; then, lower the shipping brackets onto the rear GPU cold plate module. Tighten the six captive screws (PH1, M3 x 6, 0.5 newton-meters, 4.3 inch-pound) to secure the shipping brackets to the rear GPU cold plate module.

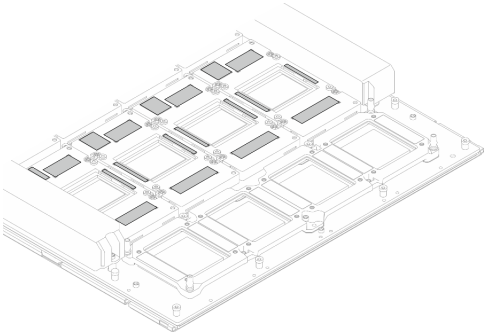


7. Hold the shipping brackets to remove the front GPU cold plate module from the chassis.

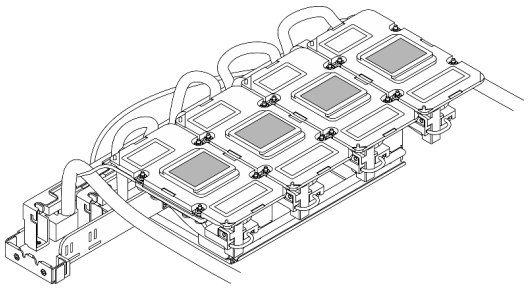
   1 Release the hoses from the hose ties that secure them to the hose guides.

   2 Secure the hoses to the shipping brackets with the hose ties on the shipping brackets.

   3 Hold the shipping brackets and lift the rear H100/H200 GPU cold plate module out of the chassis.



8. **Immediately** clean the PCM and putty pads off from the GPU and the cold plate module with alcohol cleaning pads. **Gently** clean the PCM and putty pads to avoid GPU damage.



9. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the GPU cold plate module.

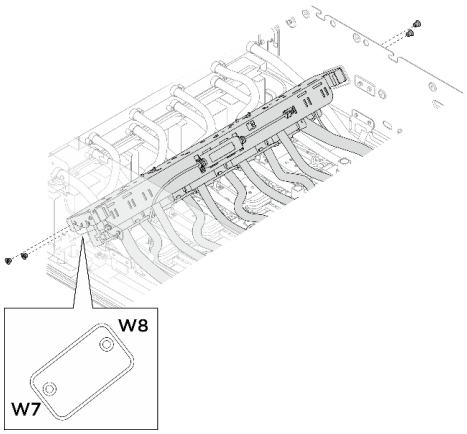
Attention:

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damage.

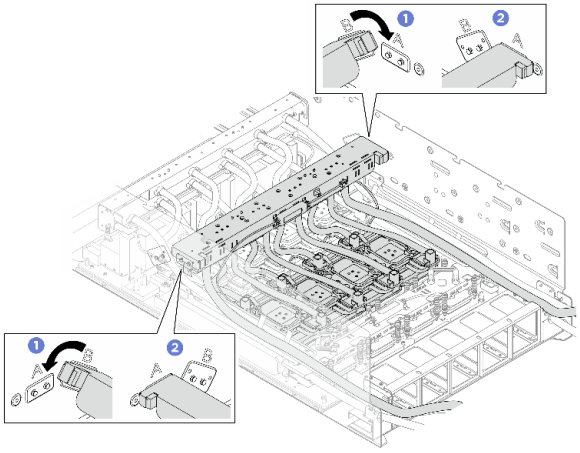
Follow the following steps to remove *front* H100/H200 GPU cold plate module

Note: Skip **step 1** and **step 2** if rear GPU cold plate module is already removed.

Reposition the **rear** H100/H200 GPU cold plate module to create space for front H100/H200 GPU cold plate module.



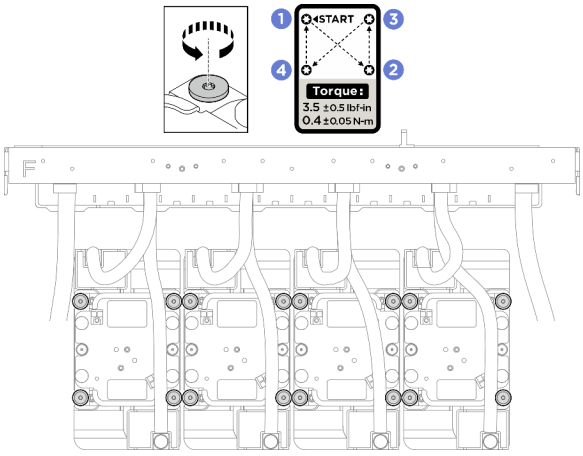
1. Unfasten the four M3 screws (W7-W8) that secure the rear GPU cold plate module manifold to the chassis.



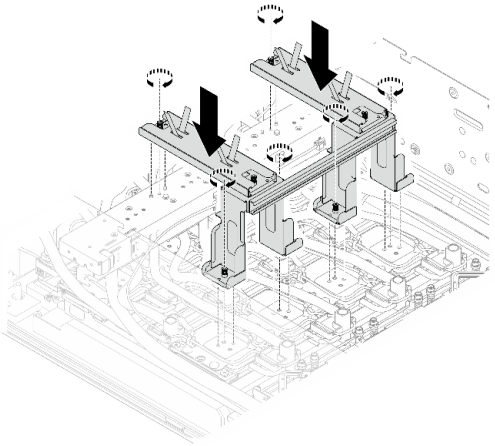
2. Reposition the rear manifold from the chassis.

   1 Disengage the manifold from the guide pins marked with B; then, move the manifold to the guide pins marked with A.

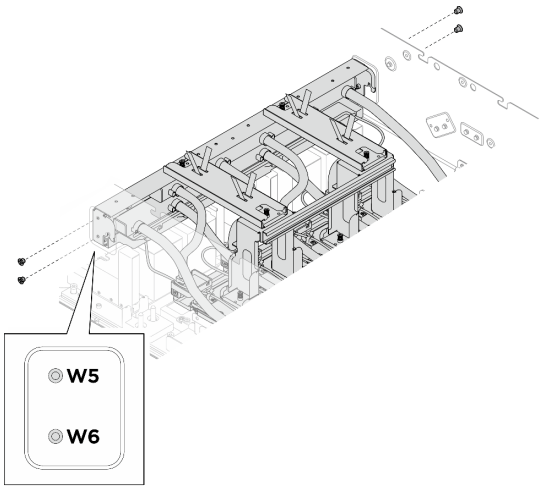
   2 Ensure the guide slots on the manifold are securely engaged with the guide pins marked with A.



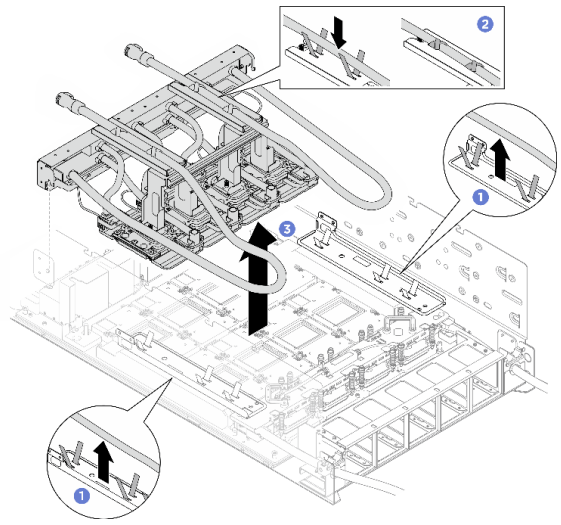
3. Follow the screw sequence 1 2 3 4 specified on the cold plate label, and fully loosen the sixteen Torx T10 screws with a torque screwdriver set to the proper torque (0.4±0.05 newton-meter, 3.5±0.5 pound-inch). Ensure the captive screws are completely loosen before removing the cold plate module.
Note: If necessary, use a flat screwdriver to gently separate the cold plate and the GPU from the corner of the cold plate. Ensure not the damage the GPU or the cold plate.



4. Align the guide pins on the shipping brackets with the guide holes on the manifold and the cold plates; then, lower the shipping brackets onto the front GPU cold plate module. Tighten the six captive screws (PH1, 6 x M3, 0.5 newton-meters, 4.3 inch-pound) to secure the shipping brackets to the front GPU cold plate module.

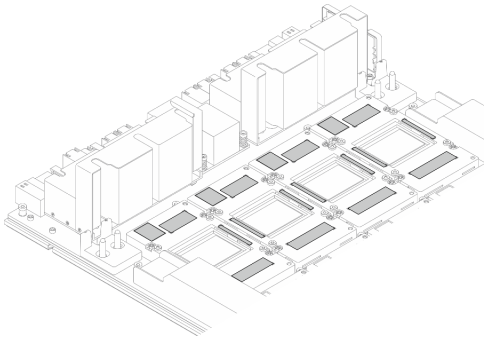


5. Unfasten the four M3 screws (W5-W6) that secure the front H100/H200 GPU cold plate module manifold to the chassis.



6. Remove the front H100/H200 GPU cold plate module from the chassis.

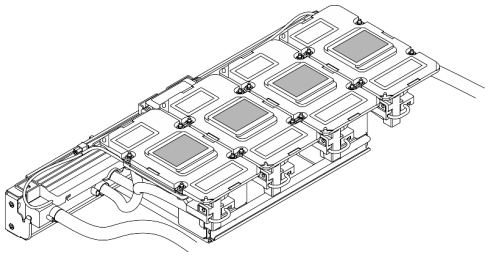
1. Release the hoses from the hose ties that secure them to the hose guides.
2. Secure the hoses to the shipping brackets with the hose ties on the shipping brackets.
3. Hold the shipping brackets and lift the front H100/H200 GPU cold plate module out of the chassis.



7. **Immediately** clean the PCM and putty pads off from the GPU and the cold plate module with alcohol cleaning pads. **Gently** clean the PCM and putty pads to avoid GPU damage.

Attention:

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damage.

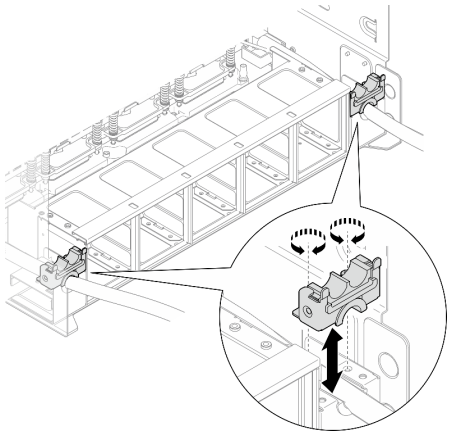


8. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the GPU cold plate module.

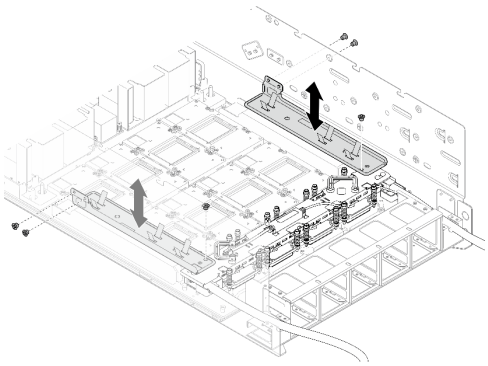
Attention:

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damage.

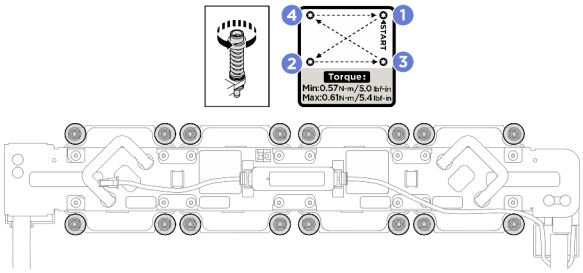
Follow the following steps to remove the NVSwitch cold module



1. Unfasten the two captive screws that secure the hose holder in place; then, remove hose holder B/C. Repeat to remove hose holder B/C on the other side.



2. Unfasten the three M3 screws that secure the hose guide to the chassis and the manifold; then, remove the hose guide. Repeat to remove the hose guide on the other side.



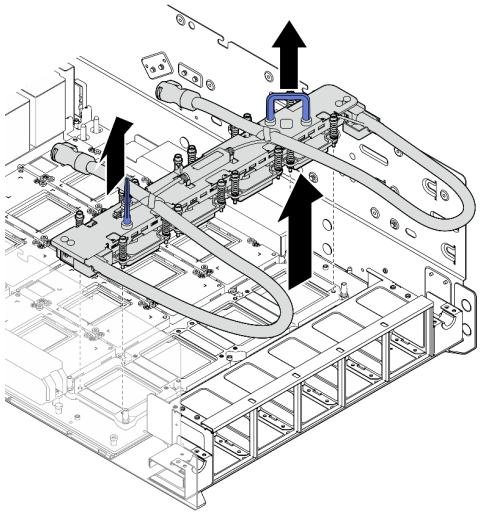
3. Follow the screw sequence specified on the cold plate label, and repeat to fully loosen the sixteen Torx T15 screws with a torque screwdriver set to the proper torque.

   Set the torque screwdriver to 0.57-0.61 newton-meter, 5-5.4 pound-inch.

   Loosen the screws 720 degrees following the screw sequence: 1 2 3 4

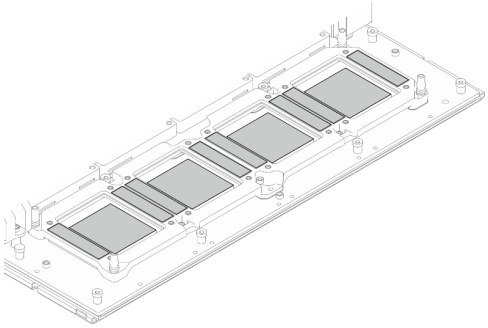
   Repeat until all screws on the four cold plates are fully loosened. Ensure the captive screws are completely loosen before removing the cold plate module.

Note: If necessary, use a flat screwdriver to gently separate the cold plate and the NVSwitch from the corner of the cold plate. Ensure not the damage the NVSwitch or the cold plate.

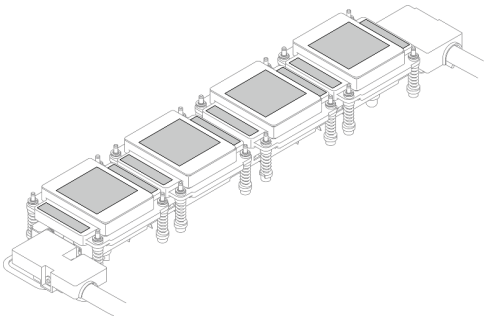


4. Secure the hoses to the manifold with the hose ties. Hold the handles to lift the NVSwitch cold plate module out of the chassis.

NVSwitch



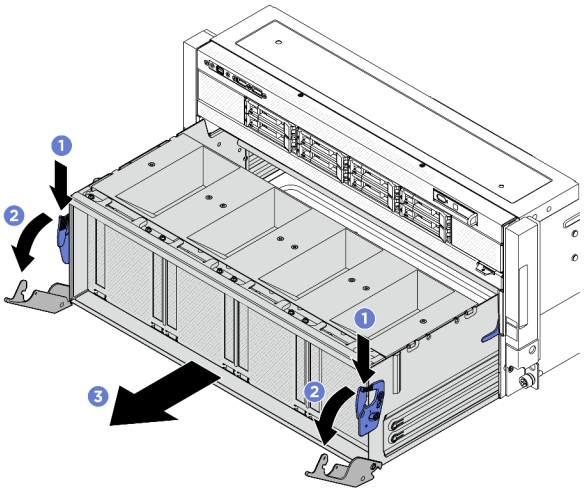
Cold plate module



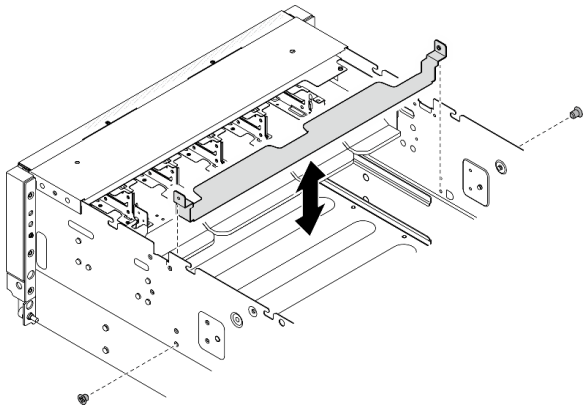
5. **Immediately** clean the PCM and putty pads off from the NVSwitches and the cold plate module with alcohol cleaning pads. **Gently** clean the PCM and putty pads to avoid NVSwitch damage.
Attention:

- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damage.

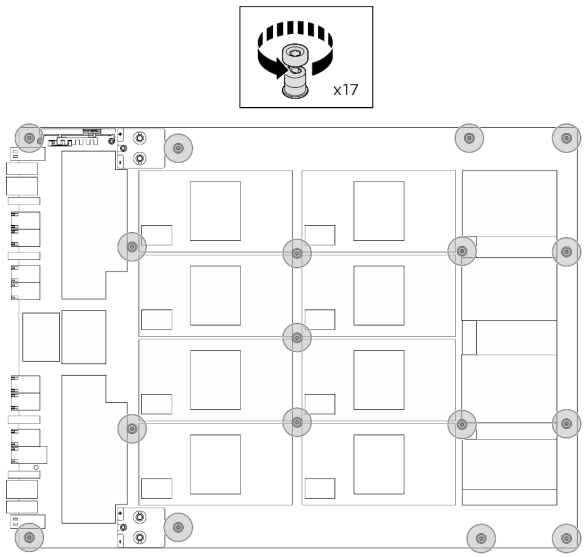
Follow the following steps to remove the H100/H200 GPU complex and GPU baseboard



1. Remove the PCIe switch shuttle.
   1. Press the two lock latches on both sides of the PCIe switch shuttle.
   2. Slid the PCIe switch shuttle fully forward and remove it from the chassis.

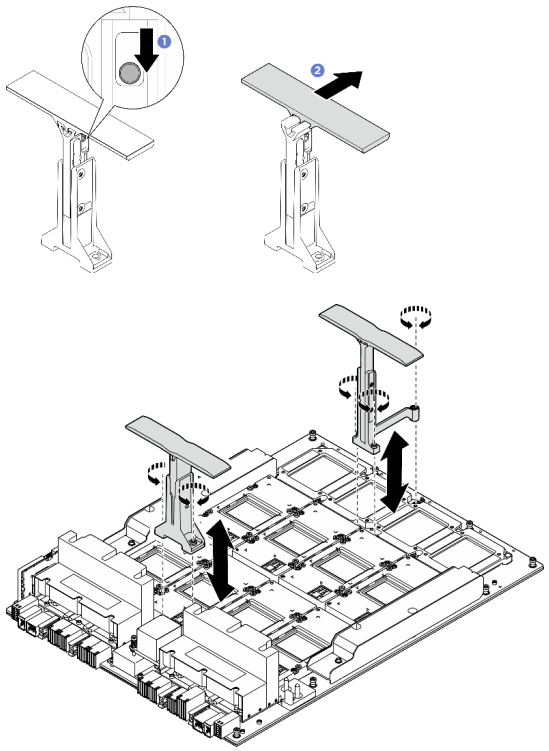


2. Unfasten the two M3 screws to remove the GPU connector protective bracket.



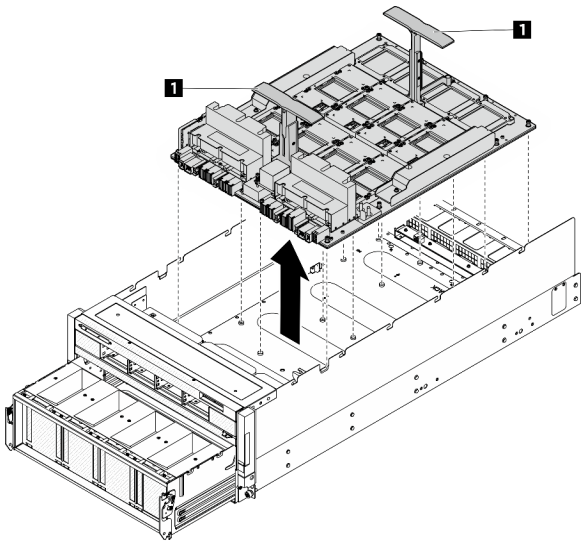
3. Unfasten the seventeen Torx T15 captive screws on the GPU baseboard.

Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.



4. Install the handles.

1. Press the button on the side of the handles to adjust the handles and create space for the screwdriver.
2. Align the handles with the screw holes and lower them onto the GPU baseboard; then, fasten the five M3 screws (5 x M3, 0.5 newton-meters, 4.3 inch-pound) to secure the handles to the baseboard.

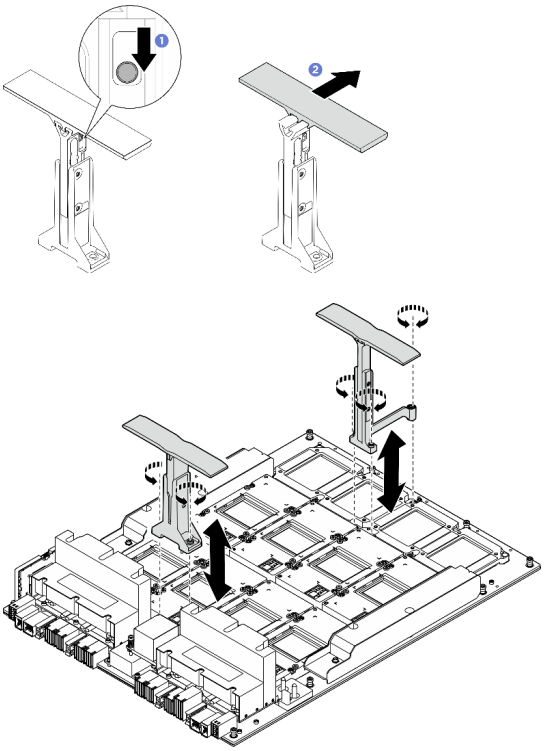


5. Hold the two handles to lift the GPU complex out of the chassis.

Note:

Make sure two people stand on either side of the GPU complex, and lift it by holding the two handles (1).

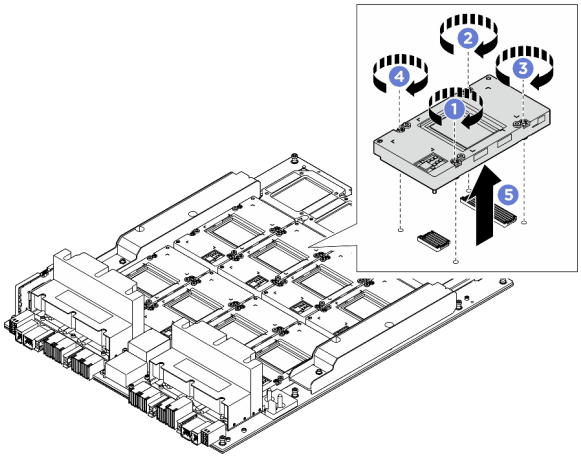
Note: Continue with **step 6** and **step 7** if you are replacing the GPU baseboard.



6. Remove the handles.

   1 Carefully lay the GPU complex on a flat, static protective surface; then, press the button on the side of the handles to adjust the handles and create space for the screwdriver.

   2 Unfasten the five M3 screws that secure the handles to the baseboard.



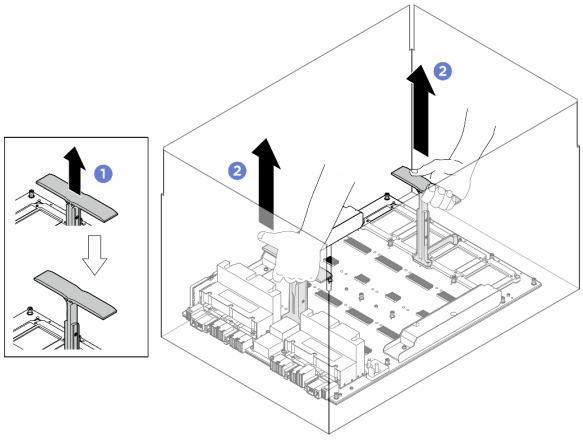
7. Remove the GPUs from the GPU baseboard.

   Follow the screw sequence shown in the illustration 1 2 3 4, and fully loosen the sixteen Torx T15 screws with a torque screwdriver set to the proper torque (0.6 newton-meters, 5.3 inch-pounds).

   Carefully repeat and remove all the GPUs from the baseboard.

Follow the following steps to Install the H100/H200 GPU complex and GPU baseboard

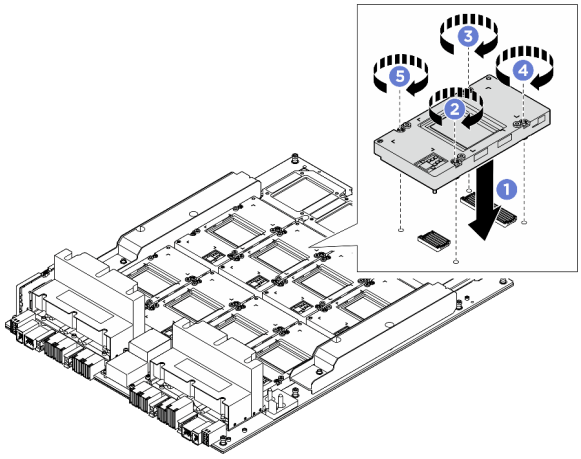
Note: Skip **step 1** and **step 2** if you are replacing GPU complex.



1. Remove the GPU baseboard from the package box.

   1 Extend the two handles on both sides of the GPU baseboard.

   2 Hold the two handles, and remove the GPU baseboard out from the package box.



2. Install the GPUs.

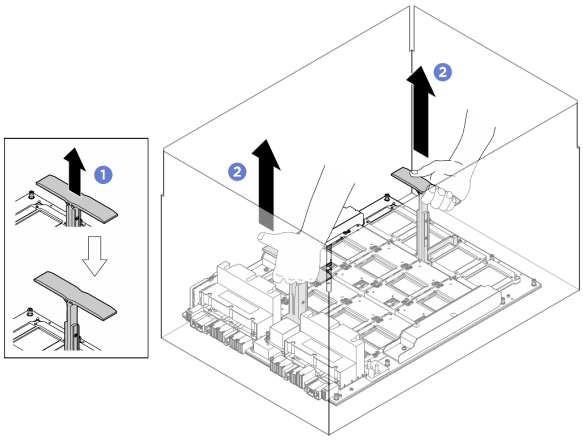
   Carefully lay the GPU onto the GPU baseboard.

   Follow the screw sequence shown in the illustration 1 2 3 4, and fully tighten the sixteen Torx T15 screws with a torque screwdriver set to the proper torque.

   First set the torque screwdriver to 0.1-0.12 newton-meters, 0.9-1.1 inch-pounds to fasten the screws for a few rounds. Then set the torque screwdriver to 0.58-0.62 newton-meters, 5-5.5 inch-pounds to fully fasten the screws

   Repeat to install all the GPUs.

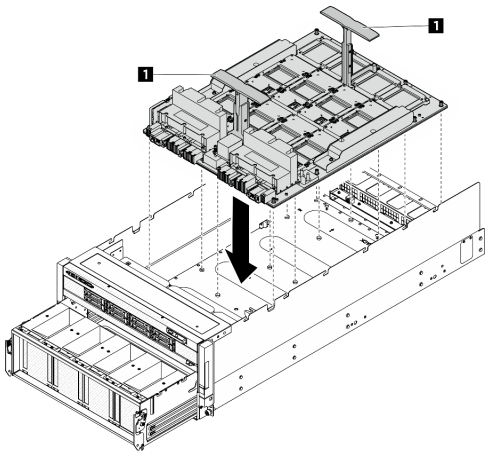
Note: Skip **step 3** if you are replacing GPU baseboard.



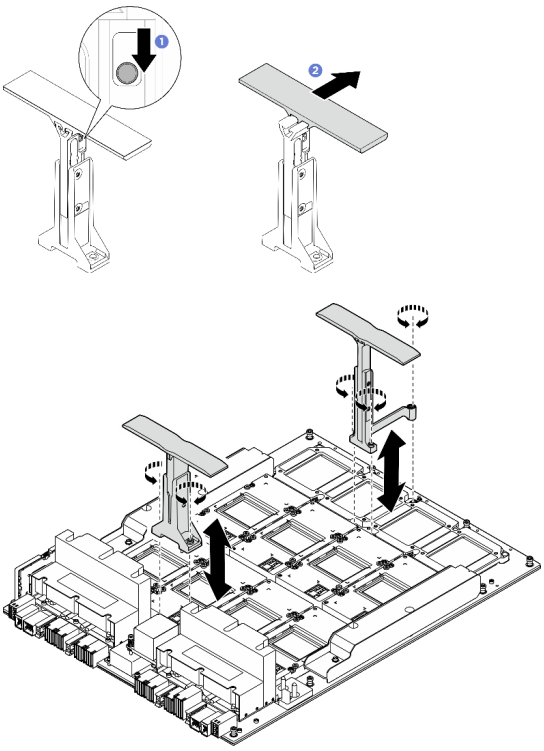
3. Remove the GPU complex from the package box.

   1 Extend the two handles on both sides of the GPU complex.

   2 Hold the two handles, and remove the GPU complex out from the package box.

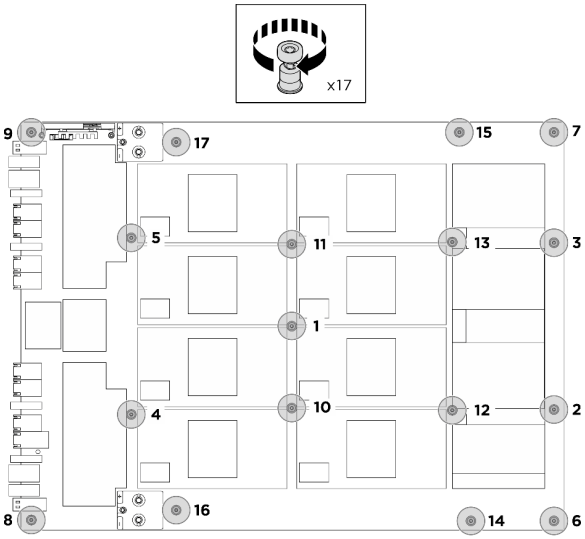


4. Hold the (1) on both sides of the GPU baseboard in the correct orientation as illustrated; then, align the GPU complex with the seventeen standoffs on the GPU complex adapter plate, and carefully place it onto the adapter plate.

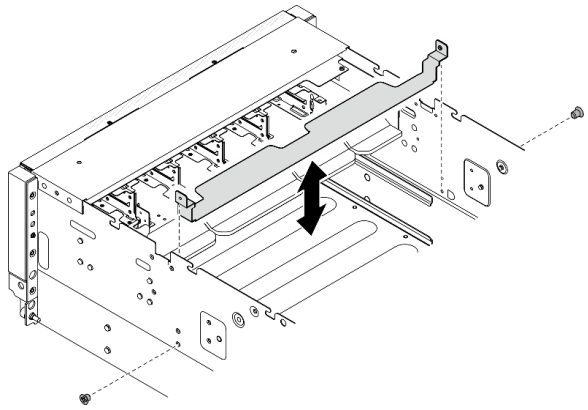


5. Remove the handles.

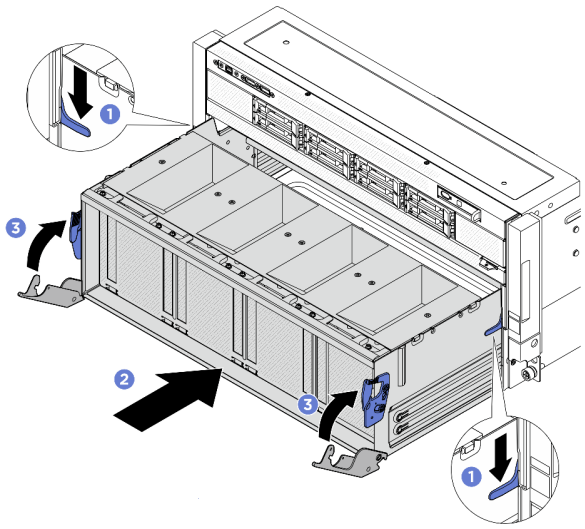
   1. Carefully lay the GPU complex on a flat, static protective surface; then, press the button on the side of the handles to adjust the handles and create space for the screwdriver.
   2. Unfasten the five M3 screws that secure the handles to the baseboard.



6. Follow the sequence shown in the illustration to fasten the seventeen Torx T15 captive screws to secure the GPU complex.
Important: Do not overtighten the screws to avoid damage.
Note: Loosen or tighten the screws with a torque screwdriver set to the proper torque. For reference, the torque required for the screws to be fully loosen or tighten is 0.6 newton-meters, 5.3 inch-pounds.



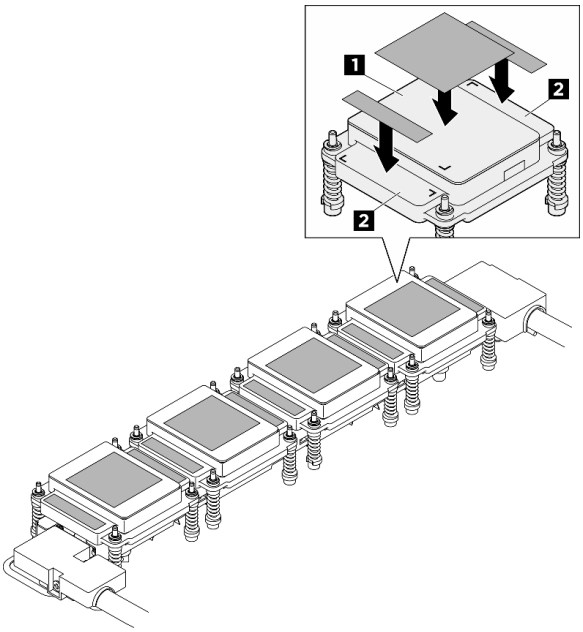
7. Align the GPU connector protective bracket with the corresponding screw holes; then, fasten the two M3 screws (PH2, 2 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the GPU connector protective bracket to the chassis.



8. Install the PCIe switch shuttle.

   1. Press the two latches on both sides of the PCIe switch shuttle.
   2. Push the PCIe switch shuttle into the chassis until it stops.
   3. Rotate the two release levers until they lock into place.

Follow the following steps to install the NVSwitch cold plate module



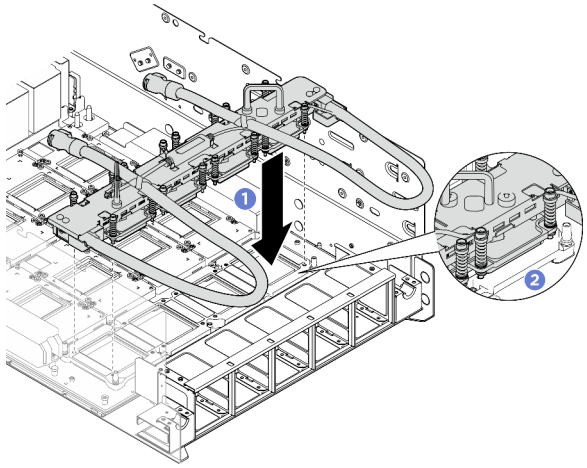
1. Replace the Phase Change Material (PCM) and putty pads on the cold plates.

   1 Remove the liner from one side of the pad. Align the PCM with the marking (1) on the bottom of the cold plate, and place it onto the cold plate; then, apply finger pressure across the entire surface area of the PCM to remove any trapped air and allow 1-2 minutes dwell time until it is firmly attached. Carefully remove the remaining top liner.

   2 Remove the liner from one side of the pad. Align the putty pad with the marking (2) on the bottom of the cold plate, and attach it to the cold plate and apply light finger pressure across the entire surface area of the pad to ensure adhesion. Carefully remove the remaining top liner.

   3 Repeat to replace the PCM and putty pads on the four cold plates.

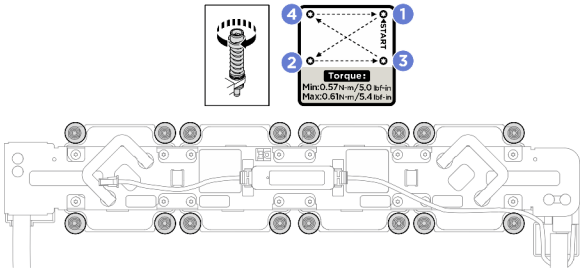
Note: PCM and putty pads cannot be reused. PCM and putty pads must be replaced with new ones every time the water loop is removed.



2. Install the NVswitch cold plate module.

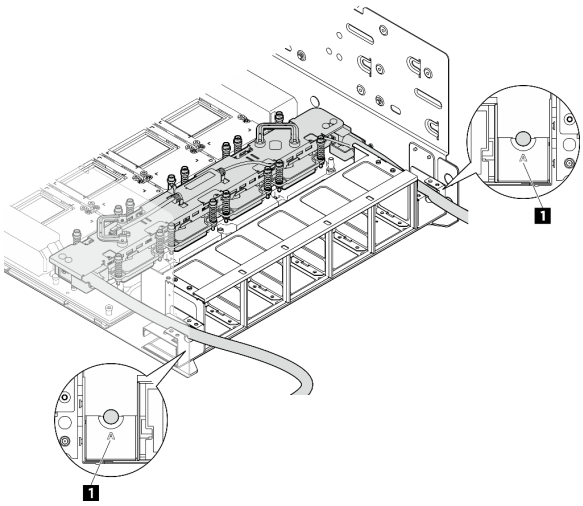
   1 Lift the NVswitch cold plate module by the handles; then, align the cold plates with the NVSwitches on the GPU baseboard, and gently place it onto the NVSwitches.

   2 Adjust the cold plates until they are securely seated in the NVSwitch sockets.



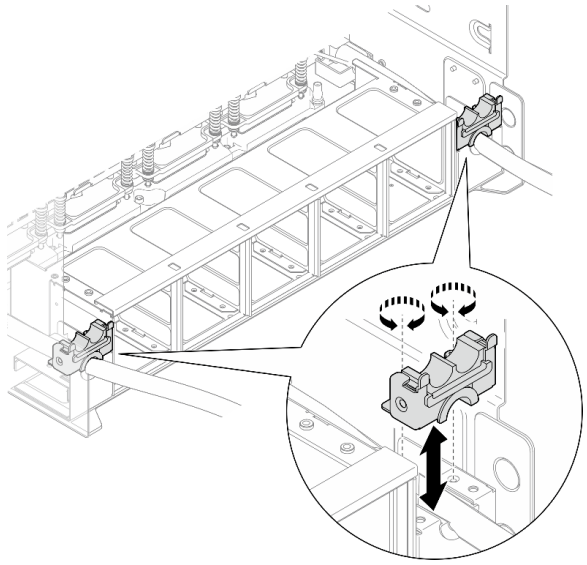
3. Follow the screw sequence specified on the cold plate label, and repeat to fully tighten the sixteen Torx T15 screws with a torque screwdriver set to the proper torque.

1. Set the torque screwdriver to 0.57-0.61 newton-meter, 5-5.4 pound-inch.
2. Fasten the screws for 720 degree following the screw installation sequence: 1 → 2 → 3 → 4
3. Repeat until all screws on the four cold plates are fully tightened.

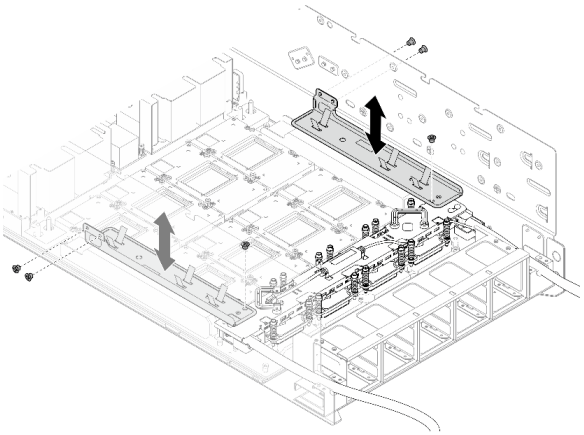
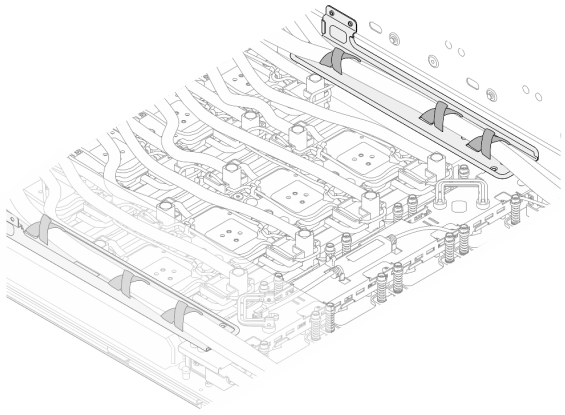


4. Place the NVSwitch hoses on (1) hose holder A.

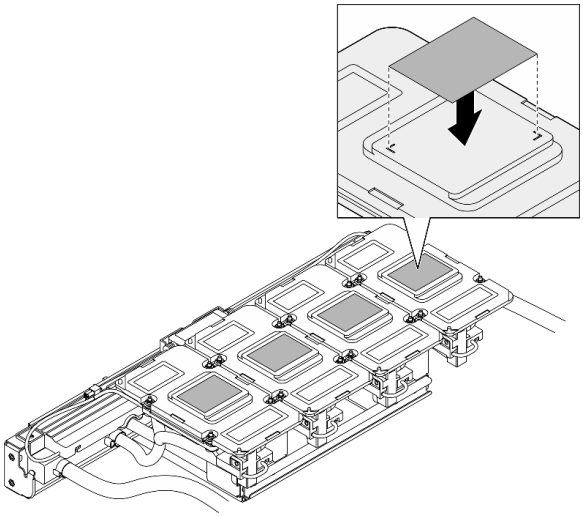
1	Hose holder A



5. Align the hose holder B/C with the two screw holes on hose holder A; then, fasten the two captive screws (PH1, 2 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure hose holder B/C on top of hose holder A. Repeat to install hose holder B/C on the other side.

<table>
<tr>
<td> 
6. Align the hose guide with the screw hole on the NVSwitch manifold and the two screw holes on the chassis; then, fasten the three M3 screws (PH2, 3 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the hose guide. Repeat to install the hose guide on the other side.</td>
<td> 
7. Place the hoses, rear fan power cable, and GPU leakage sensor module cable on the hose guides, and secure them with the hose ties. Ensure not to overlap the cables and hoses. See cable routing for more details.</td>
</tr>
<tr>
<td colspan="2">Note: Skip to the end of this document if you are only replacing NVSwitch cold plate module.</td>
</tr>
</table>

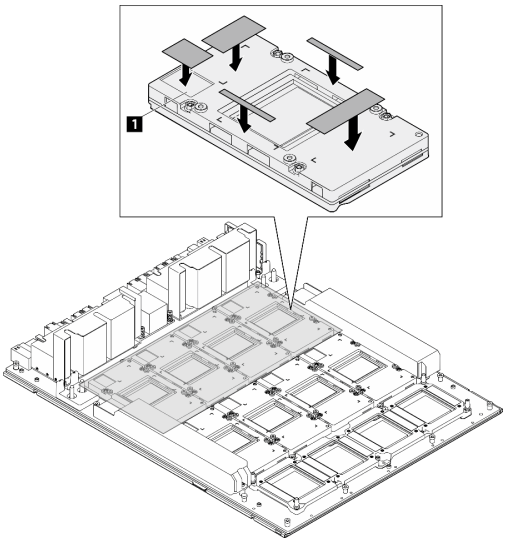
Follow the following steps to install *front* H100/H200 GPU cold plate module



1. Replace the Phase Change Material (PCM) on the cold plates.
   - (1) Remove the liner from one side of the pad.
   - (2) Align the PCM with the marking on the bottom of the cold plate, and place it onto the cold plate; then, apply finger pressure across the entire surface area of the PCM to remove any trapped air and allow 1-2 minutes dwell time until it is firmly attached. Carefully remove the remaining top liner.
   - (3) Repeat to replace the PCM on the four cold plates.

Attention:

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.

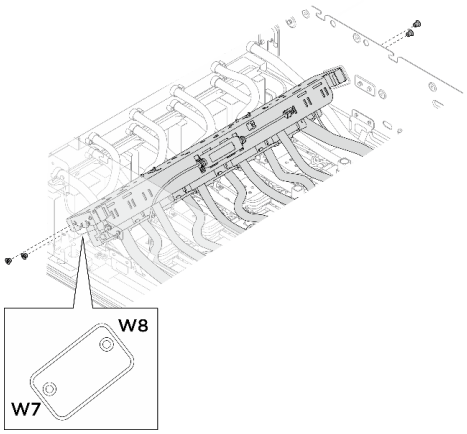


2. Replace the putty pads (x5) on the GPU.
   - (1) Remove the liner from one side of the pad.
   - (2) Make sure to align the putty pads to the GPU VR (1) and the markings on GPU; then, place the pads onto the GPU and apply light finger pressure across the entire surface area of the pads to ensure adhesion. Carefully remove the remaining top liner.
   - (3) Repeat to replace all putty pads on the four GPUs.

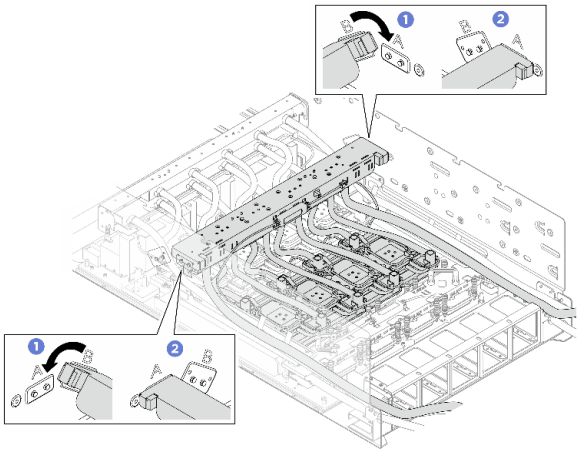
1 GPU VR (Cover the GPU VR with putty pad)

Note: Skip **step 3** and **step 4** if rear GPU cold plate module is not installed in the chassis.

Reposition the **rear** H100/H200 GPU cold plate module to create space for front H100/H200 GPU cold plate module.

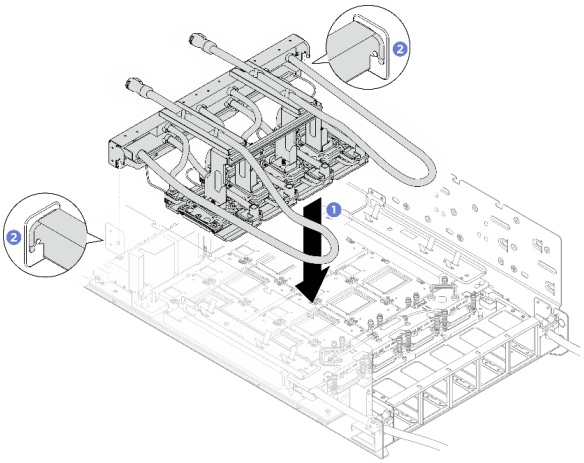


3. Unfasten the four M3 screws (W7-W8) that secure the rear GPU cold plate module manifold to the chassis.



4. Reposition the rear manifold from the chassis.

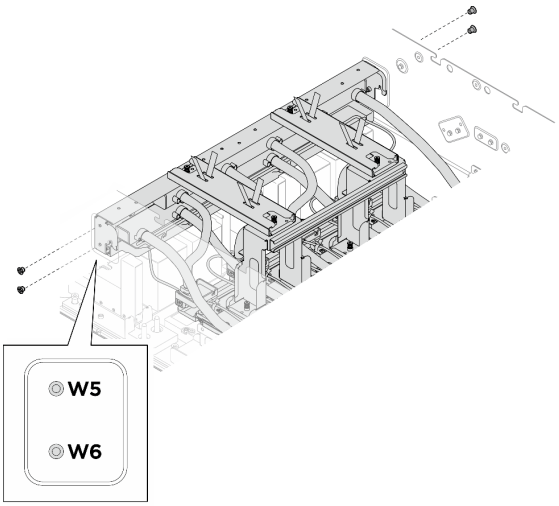
   1. Disengage the manifold from the guide pins marked with B; then, move the manifold to the guide pins marked with A.
   2. Ensure the guide slots on the manifold are securely engaged with the guide pins marked with A.



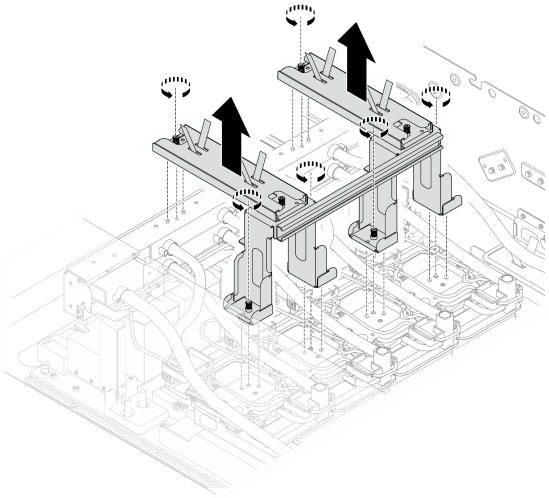
5. Install the front H100/H200 GPU cold plate module.

   1. Hold the front H100/H200 GPU cold plate module by the shipping brackets; then, align the guide slots on the manifold with the guide pins and gently place the cold plate module onto the four front GPUs.
   2. Ensure the guide slots on the manifold are securely engaged with the guide pins on the chassis.

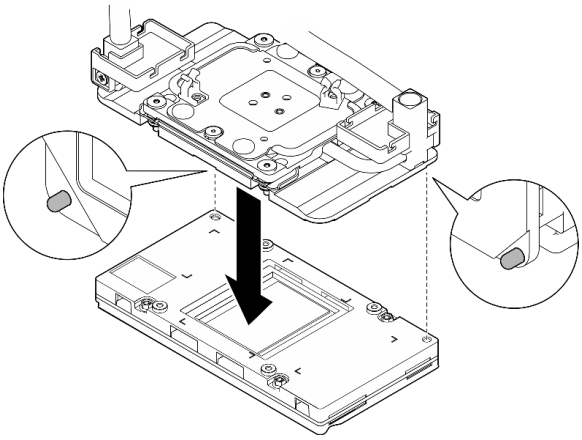
Note: Install the GPU cable holder to the front H100/H200 GPU cold plate module if it is not installed.



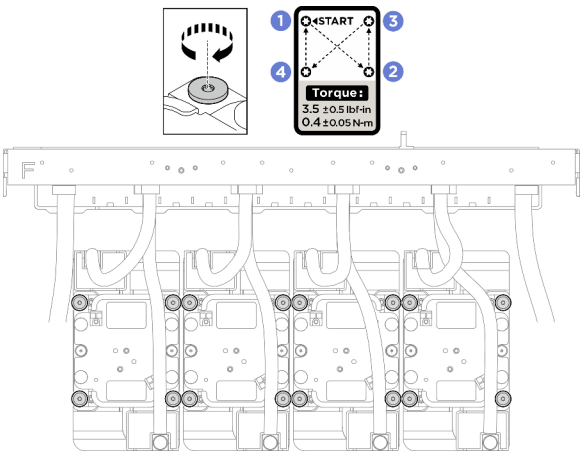
6. Fasten the four M3 screws (W5-W6) (PH2, 4 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the H100/H200 GPU cold plate module manifold to the chassis.



7. Loosen the six captive screws that secure the shipping brackets to the H100/H200 GPU cold plate module; then, remove the shipping brackets from the H100/H200 GPU cold plate module.

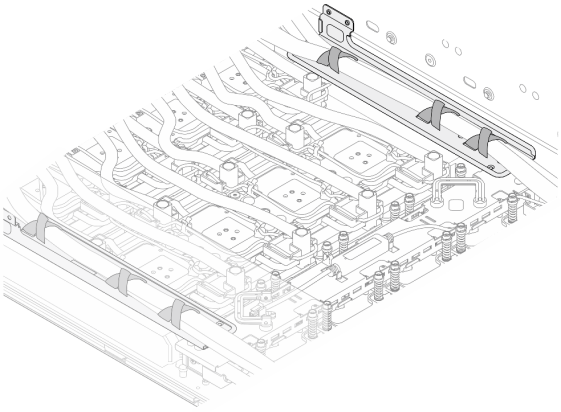


8. Adjust the cold plate until the two guide pins are seated in the guide holes on the GPU. Repeat to adjust the four cold plates.

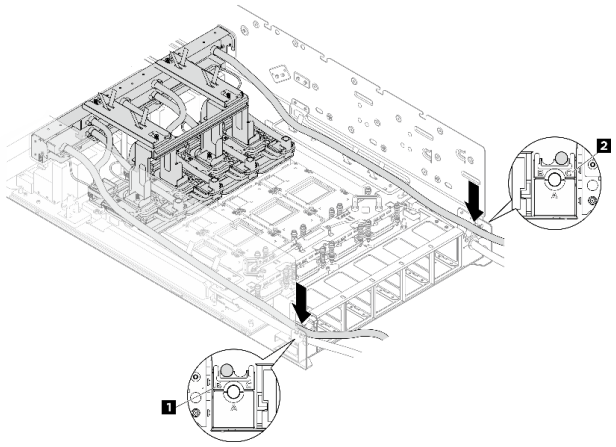


9. Follow the screw sequence specified on the cold plate label, and repeat to fully tighten the sixteen Torx T10 screws with a torque screwdriver set to the proper torque.

   1. Set the torque screwdriver to 0.4±0.05 newton-meter, 3.5±0.5 pound-inch.
   2. Fasten the screws for 720 degree following the screw installation sequence: 1 → 2 → 3 → 4
   3. Repeat until all screws on the four cold plates are fully tightened.



10. Place the front H100/H200 GPU cold plate module hoses on the hose guides and secure them with hose ties.



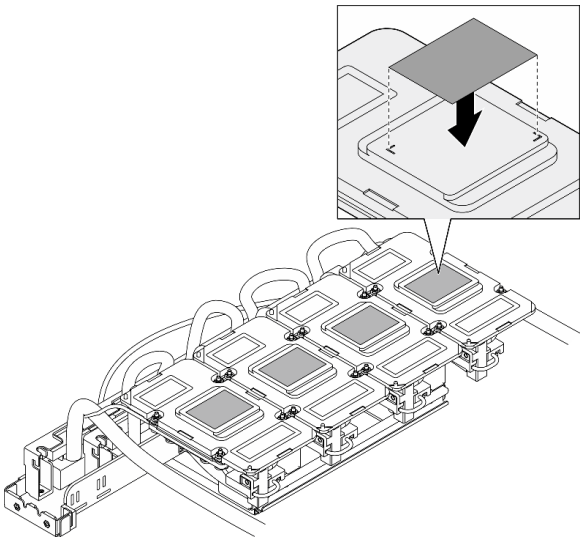
11. Place the left side hose on (1) hose holder B, and the right side hose on (2) hose holder C. Ensure the guiding labels on the hoses match with the markings on the hose holders.

1 Hose holder B	2 Hose holder C

Important: Check the guiding labels on the hoses and hose holders before installation.

Note: Skip to the end of this document if you are only replacing front H100/H200 GPU cold plate module.

Follow the following steps to install *rear* H100/H200 GPU cold plate module

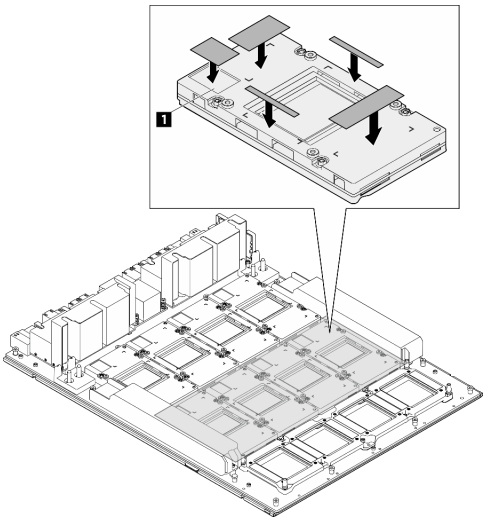


1. Replace the Phase Change Material (PCM) on the cold plates.

   1. Remove the liner from one side of the pad.
   2. Align the PCM with the marking on the bottom of the cold plate, and place it onto the cold plate; then, apply finger pressure across the entire surface area of the PCM to remove any trapped air and allow 1-2 minutes dwell time until it is firmly attached. Carefully remove the remaining top liner.
   3. Repeat to replace the PCM on the four cold plates.

Attention:

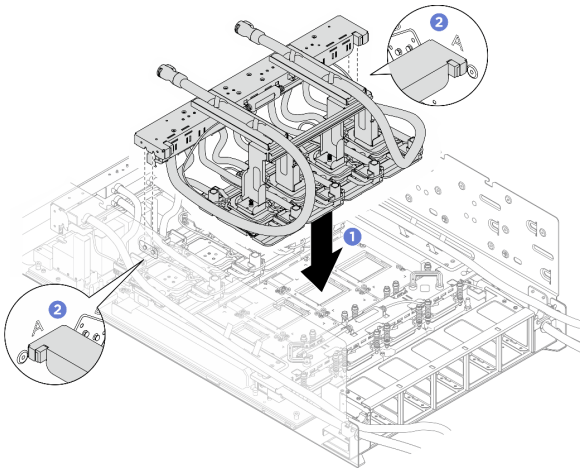
- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.



2. Replace the putty pads (x5) on the GPU.

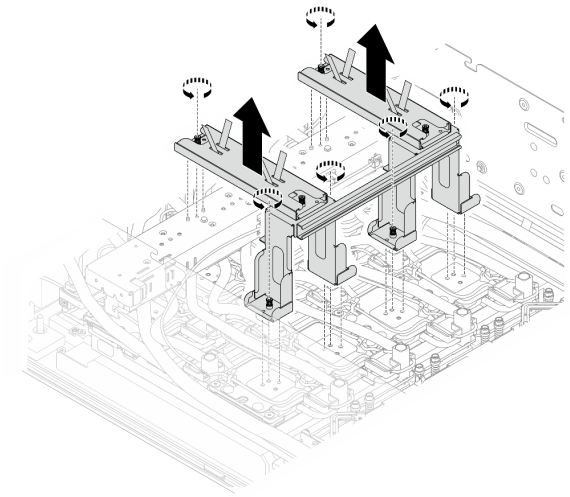
   1. Remove the liner from one side of the pad.
   2. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU; then, place the pads onto the GPU and apply light finger pressure across the entire surface area of the pads to ensure adhesion. Carefully remove the remaining top liner.
   3. Repeat to replace all putty pads on the four GPUs.

1 GPU VR (Cover the GPU VR with putty pad)

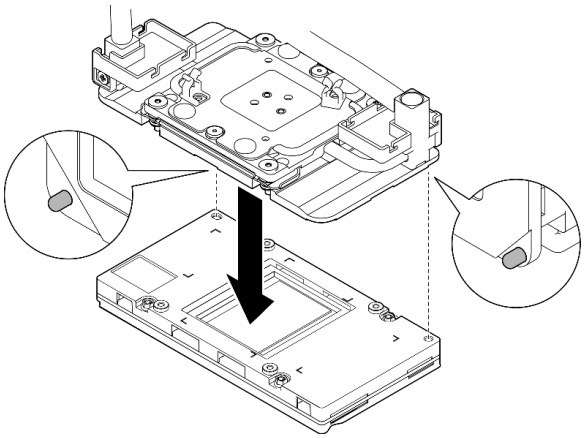


3. Install the rear H100/H200 GPU cold plate module.

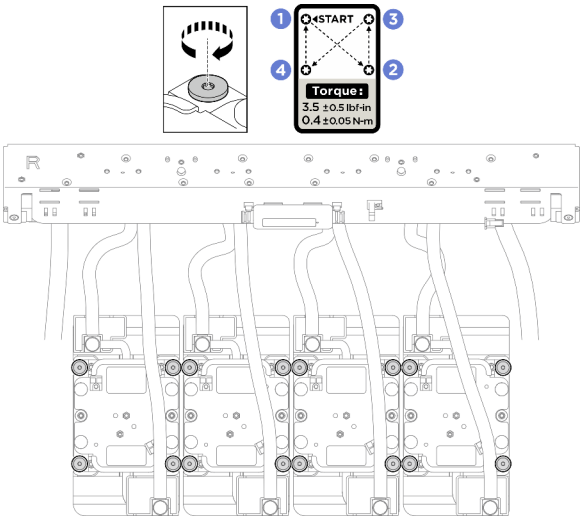
   1. Hold the rear H100/H200 GPU cold plate module by the shipping brackets; then, align the guide slots on the manifold with the guide pins on the chassis and gently place the cold plate module onto the four rear GPUs.
   2. Ensure the guide slots on the manifold are securely engaged with the guide pins marked with A on the chassis.



4. Loosen the six captive screws that secure the shipping brackets to the rear H100/H200 GPU cold plate module; then, remove the shipping brackets from the rear H100/H200 GPU cold plate module.

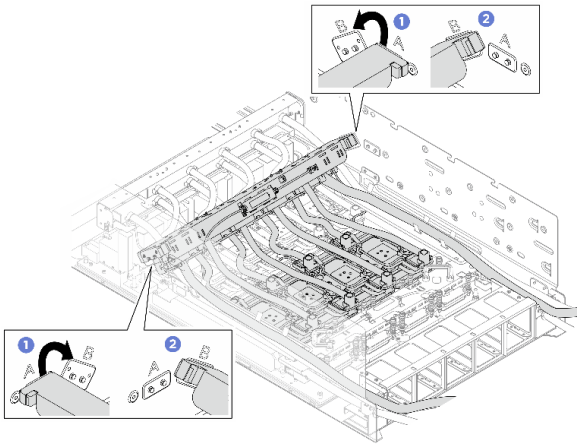


5. Adjust the cold plate until the two guide pins are seated in the guide holes on the GPU. Repeat to adjust the four cold plates.



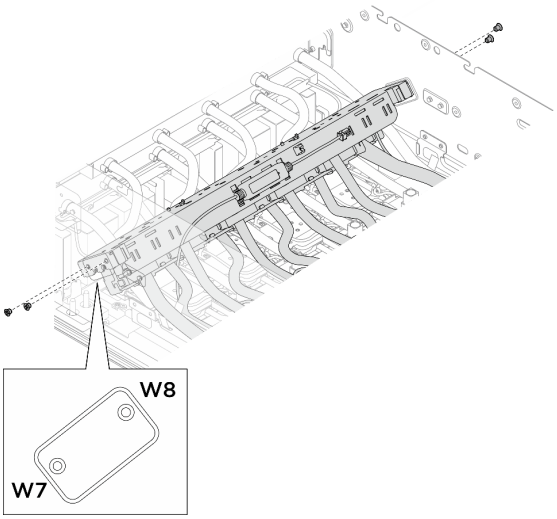
6. Follow the screw sequence specified on the cold plate label, and repeat to fully tighten the sixteen Torx T10 screws with a torque screwdriver set to the proper torque.

1. Set the torque screwdriver to 0.4±0.05 newton-meter, 3.5±0.5 pound-inch.
2. Fasten the screws for 720 degree following the screw installation sequence: 1 → 2 → 3 → 4
3. Repeat until all screws on the four cold plates are fully tightened.

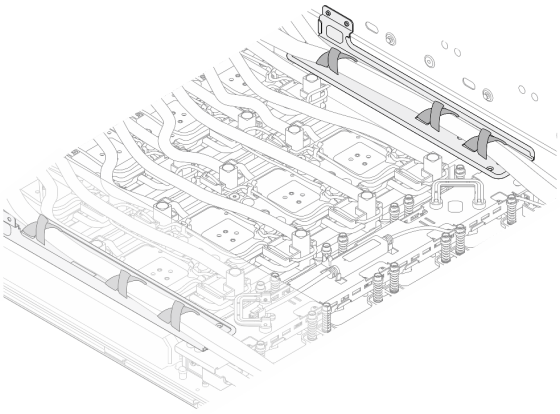


7. Reposition the manifold.

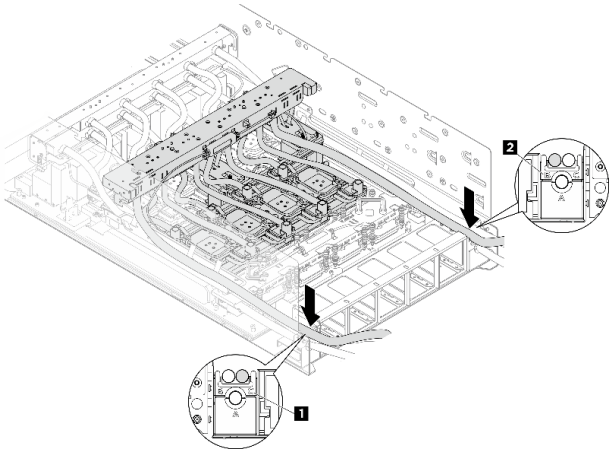
1. Disengage the manifold from the guide pins marked with A; then, move the manifold to the guide pins marked with B.
2. Ensure the guide slots on the manifold are securely engaged with the guide pins marked with B.



8. Fasten the four M3 screws (W7-W8) (PH2, 4 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the rear H100/H200 GPU cold plate module manifold to the chassis.



9. Place the rear H100/H200 GPU cold plate module hoses on the hose guides and secure them with hose ties.



10. Place the left side hose on (1) hose holder C, and the right side hose on (2) hose holder B. Ensure the guiding labels on the hoses match with the markings on the hose holders.

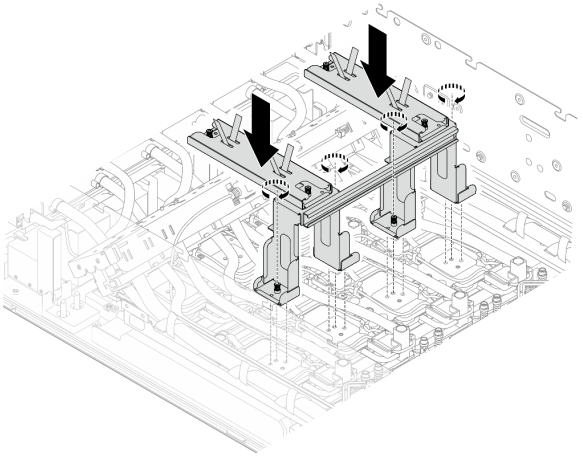
1 Hose holder C	2 Hose holder B

Important: Check the guiding labels on the hoses and hose holders before installation.

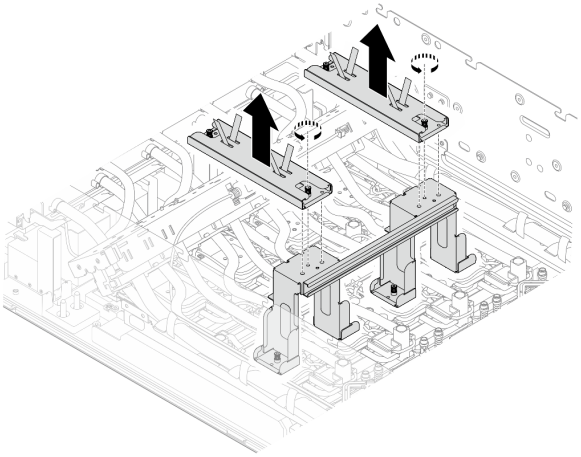
Note: Skip to the end of this document if you are only replacing rear H100/H200 GPU cold plate module.

Follow the following steps to remove a *front* H100/H200 GPU.

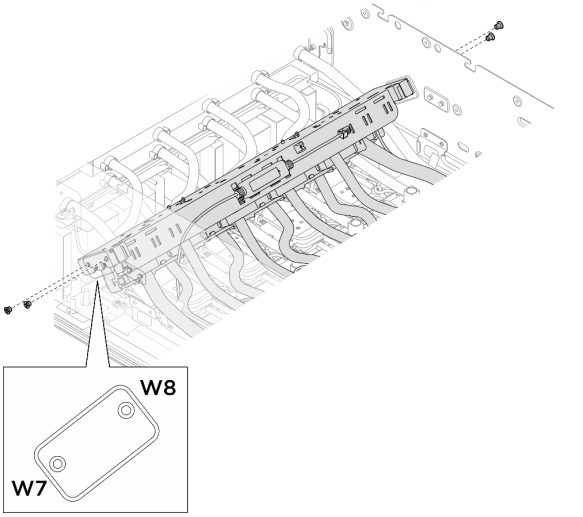
Reposition the **rear** H100/H200 GPU cold plate module manifold to create space for replacing front H100/H200 GPU.



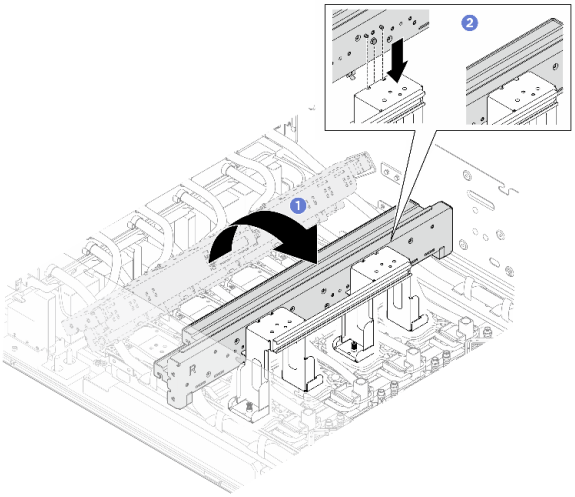
1. Align the guide pins on the shipping brackets with the guide holes on the *rear* GPU cold plates and lower it onto the cold plates; then, tighten the four captive screws (PH1, 4 x M3, 0.5 newton-meters, 4.3 inch-pounds) to install the shipping brackets onto the rear GPU cold plates.



2. Loosen the two captive screws; then, remove the handles from the shipping brackets.



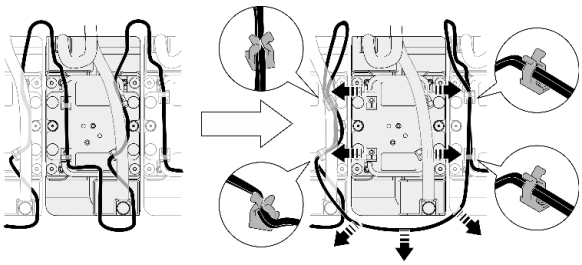
3. Unfasten the four M3 screws (W7-W8) that secure the rear H100/H200 GPU cold plate module manifold to the chassis.



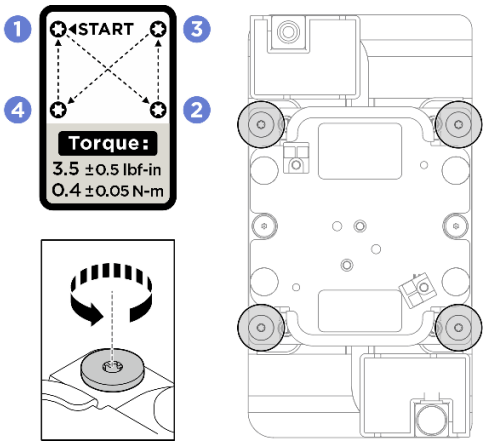
4. Reposition the rear H100/H200 GPU cold plate module manifold.

   1. Flip over the rear H100/H200 GPU cold plate module manifold as illustrated. Align the guide pins on the manifold with the guide slots on the shipping brackets; then, install the manifold onto the shipping brackets as illustrated.
   2. Ensure the guide pins on the manifold are securely engaged with the guide slots on the shipping brackets.

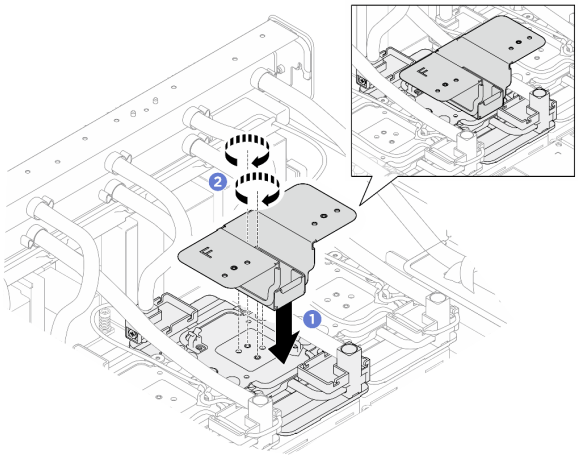
Note: Locate the front GPU that is to be removed.



5. Remove the leakage sensor module cable from the cable clips, route it away from the cold plate, and reinstall it in the cable clips adjacent to the cold plate.



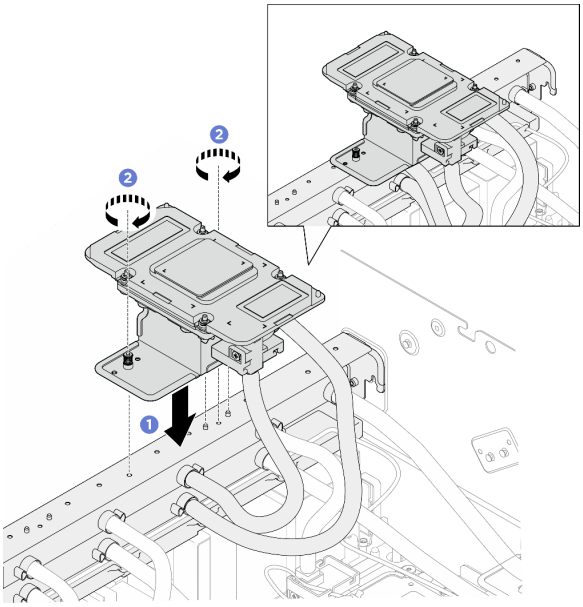
6. Follow the screw sequence ❶❷❸❹ specified on the cold plate label, and fully loosen the sixteen Torx T10 screws with a torque screwdriver set to 0.4±0.05 newton-meter, 3.5±0.5 pound-inch. Ensure the captive screws are completely loosen before removing the cold plate module.
Note: If necessary, use a flat screwdriver to gently separate the cold plate and the GPU from the corner of the cold plate. Ensure not the damage the GPU or the cold plate.



7. Install the service bracket onto the GPU cold plate.

❶ Align the two captive screws and guide pins at the bottom of the service bracket with the screw holes and guide holes on the GPU cold plate; then, lower it onto the cold plate.

❷ Fasten the two captive screws (PH1, 2 x M3, 0.5 newton-meters, 4.3 inch-pound) to secure the service bracket to the GPU cold plate.

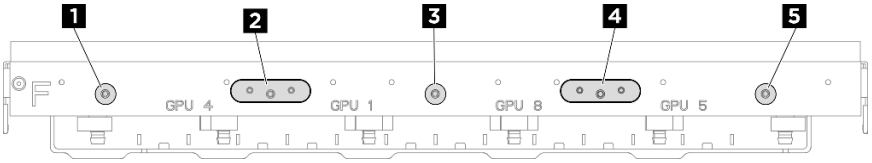


8. Install the service bracket and the GPU cold plate assembly onto the front H100/H200 GPU cold plate module manifold.

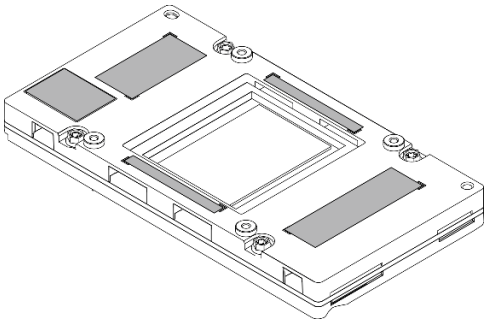
   1 Flip over the service bracket and the GPU cold plate assembly; then, align the two captive screws and two guide pins with the screw holes and guide holes on the manifold.

   2 Fasten the two captive screws (PH1, 2 x M3, 0.5 newton-meters, 4.3 inch-pound) to secure the service bracket and the GPU cold plate assembly to the manifold.

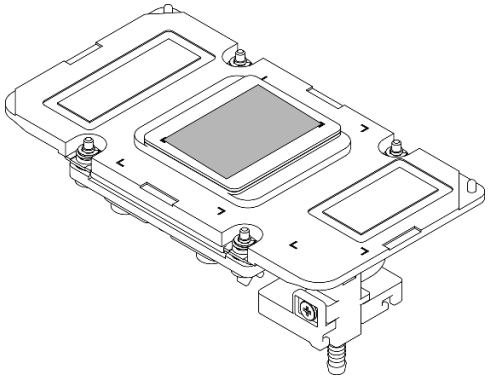
Ensure to install the service bracket and GPU cold plate assembly in the screw holes and guide holes corresponding to the specific GPU slot number.



Installation location	GPU slot number
1 and 2	GPU 4
2 and 3	GPU 1
3 and 4	GPU 8
4 and 5	GPU 5



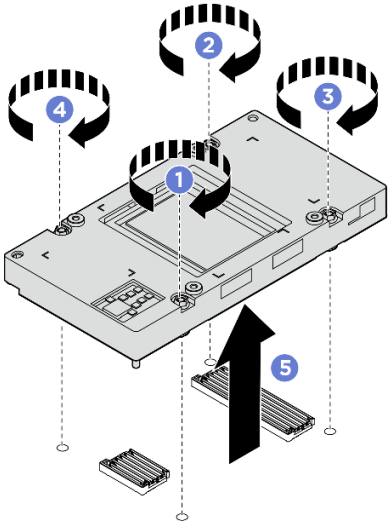
9. **Immediately** clean the PCM and putty pads off from the GPU and the cold plate module with alcohol cleaning pads. **Gently** clean the PCM and putty pads to avoid GPU damage.



10. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the GPU cold plate module.

Attention:

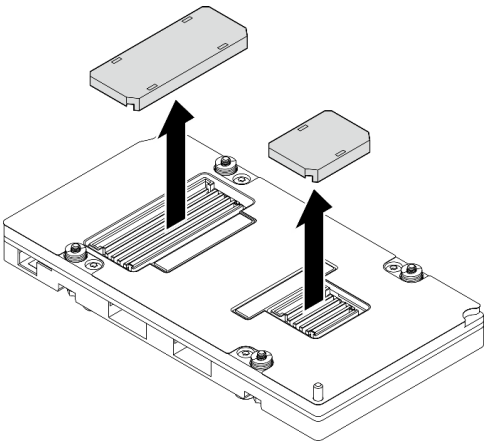
- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damage.



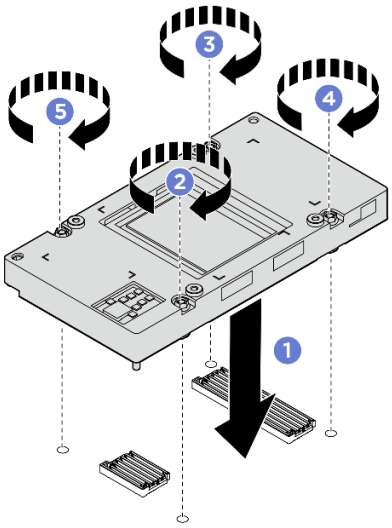
11. Remove the H100/H200 GPU.

    Follow the screw sequence shown in the illustration 1 2 3 4, and fully loosen the sixteen Torx T15 screws with a torque screwdriver set to the proper torque (0.6 newton-meters, 5.3 inch-pounds).

Follow the following steps to install a *front* H100/H200 GPU



1. For new GPU, remove the connector covers at the bottom.

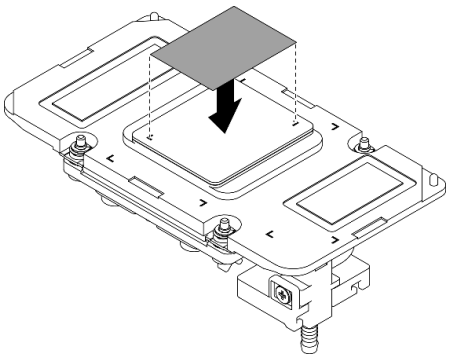


2. Install the GPU.

   Carefully lay the GPU onto the GPU baseboard.

   Follow the screw sequence shown in the illustration ❶❷❸❹, and fully tighten the sixteen Torx T15 screws with a torque screwdriver set to the proper torque.

   First set the torque screwdriver to 0.1-0.12 newton-meters, 0.9-1.1 inch-pounds to fasten the screws for a few rounds. Then set the torque screwdriver to 0.58-0.62 newton-meters, 5-5.5 inch-pounds to fully fasten the screws.



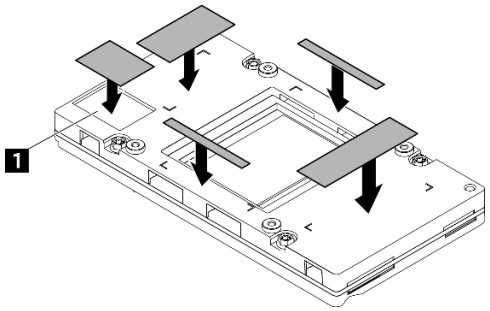
3. Replace the PCM on the GPU cold plate.

   1. Remove the liner from one side of the pad.

   2. Align the PCM with the marking on the bottom of the cold plate, and place it onto the cold plate; then, apply finger pressure across the entire surface area of the PCM to remove any trapped air and allow 1-2 minutes dwell time until it is firmly attached. Carefully remove the remaining top liner.

Attention:

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.



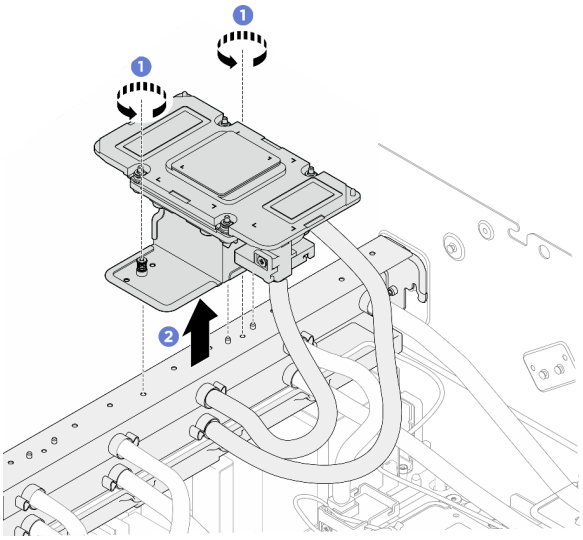
4. Replace the putty pads (x5) on the GPU.

   1. Remove the liner from one side of the pad.

   2. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU; then, place the pads onto the GPU and apply light finger pressure across the entire surface area of the pads to ensure adhesion. Carefully remove the remaining top liner.

1 GPU VR (Cover the GPU VR with putty pad)

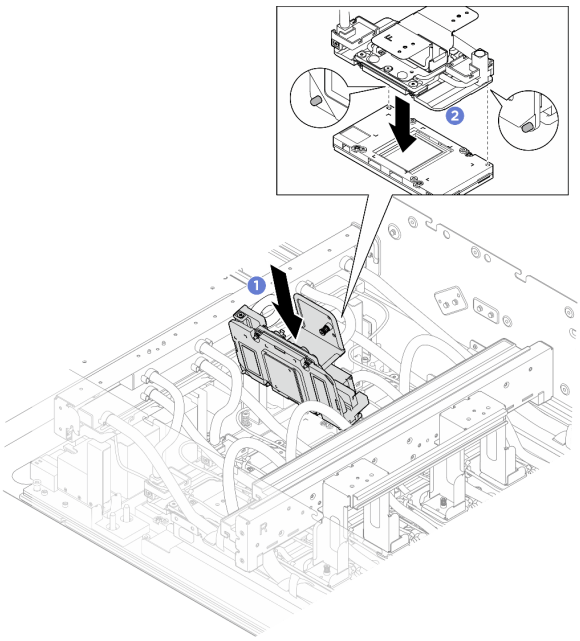
Attention: Putty pad cannot be reused. Putty pad must be replaced with new ones every time the water loop is removed.



5. Remove the service bracket and GPU cold plate assembly.

   1 Loosen the two captive screws that secure the service bracket to the manifold.

   2 Lift the service bracket and GPU cold plate assembly away from the manifold to remove it.

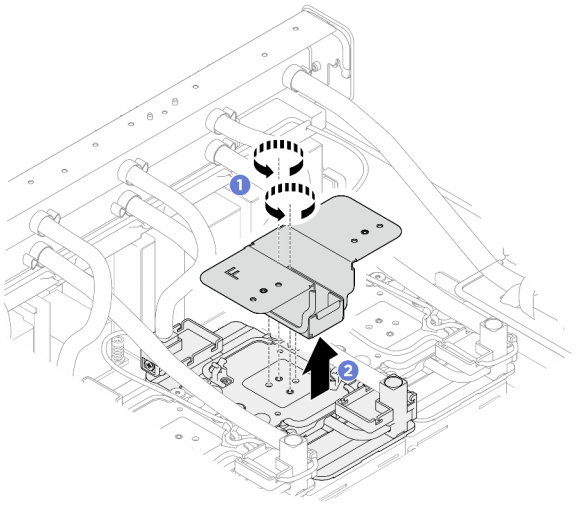


6. Place the GPU cold plate onto the GPU.

   1 Flip over the GPU cold plate assembly, slightly tilt the cold plate as illustrated to avoid interfering with the rear cold plate module hoses; then, gently place the cold plate onto the GPU.

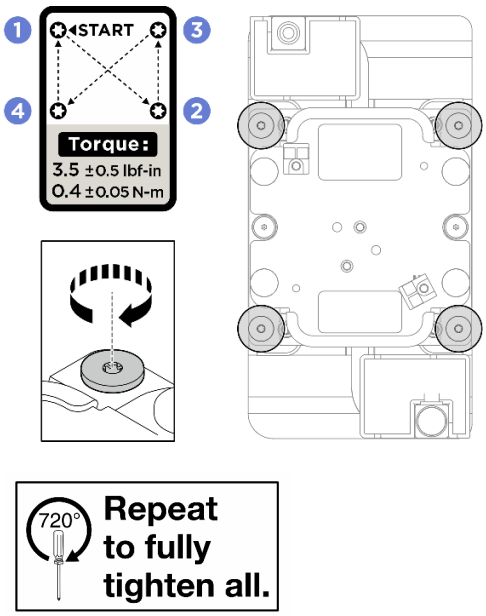
   2 Adjust the GPU cold plate until the two guide pins are seated in the guide holes on the GPU.

Note: Gently tilt the cold plate to prevent damage to the junction of the hose and the cold plate.



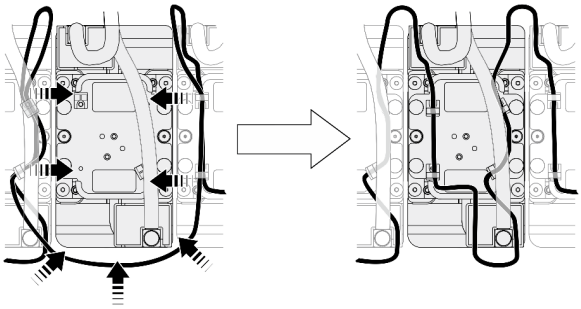
7. Remove the service bracket from the GPU cold plate.

1. Loosen the two captive screws that secure the service bracket to the GPU cold plate.
2. Lift the service bracket away from the GPU cold plate to remove it.



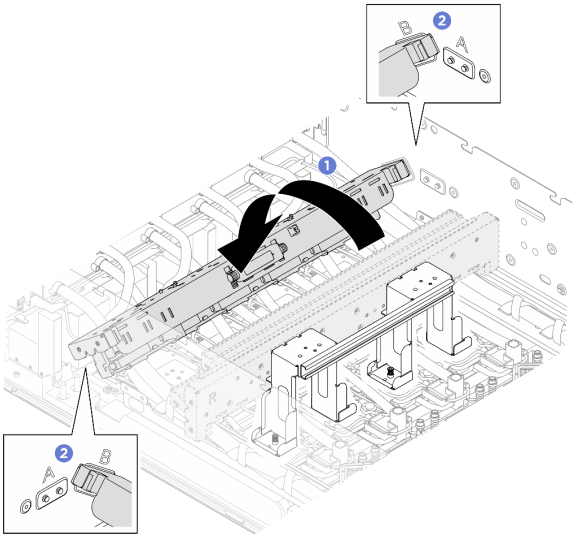
8. Follow the screw sequence specified on the cold plate label, and repeat to fully tighten the four Torx T10 screws with a torque screwdriver set to the proper torque.

1. Set the torque screwdriver to 0.4±0.05 newton-meter, 3.5±0.5 pound-inch.
2. Fasten the screws for 720 degree following the screw installation sequence: 1 → 2 → 3 → 4



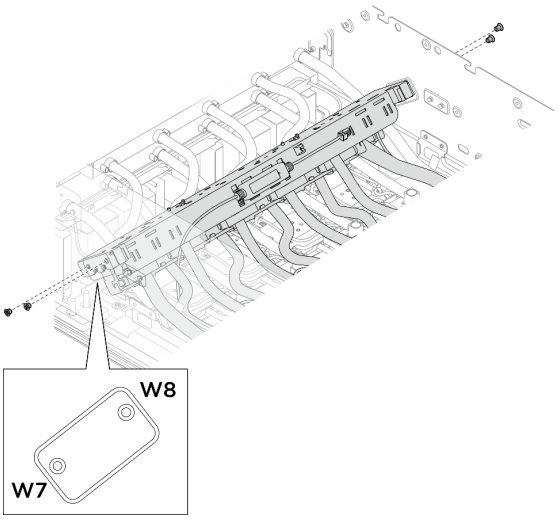
9. Reinstall the leakage sensor module cable to the GPU cold plate.

1. Remove the leakage sensor module cable from the adjacent cable clips.
2. Route the leakage sensor module cable back onto the GPU cold plate, and install it in the cable clips on the cold plate.

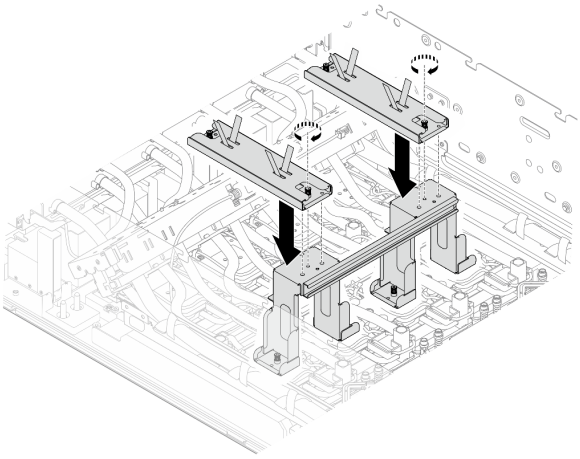


10. Reposition the rear H100/H200 GPU cold plate module manifold.

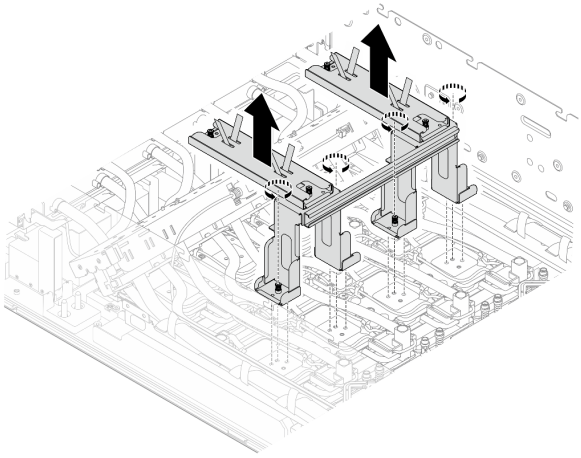
1. Disengage the manifold from the shipping bracket; then, move the manifold back to the guide pins marked with B.
2. Ensure the guide slots on the manifold are securely engaged with the guide pins marked with B.



11. Fasten the four M3 screws (W7-W8) (PH2, 2 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the rear H100/H200 GPU cold plate module manifold to the chassis.



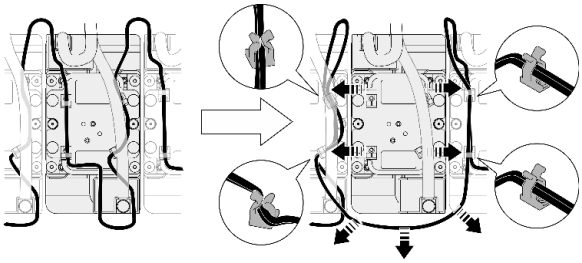
12. Reinstall the handles to the shipping brackets. Align the guide pins on the handles with the guide holes on the shipping brackets; then, fasten the two captive screws to install the two handles to the shipping brackets.



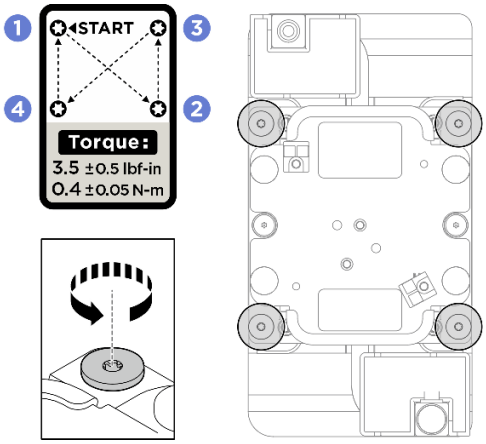
13. Fully loosen the four captive screws that secure the shipping brackets to the GPU cold plates; then, lift the shipping brackets away from the GPU cold plates to remove it.

Follow the following steps to remove a *rear* H100/H200 GPU

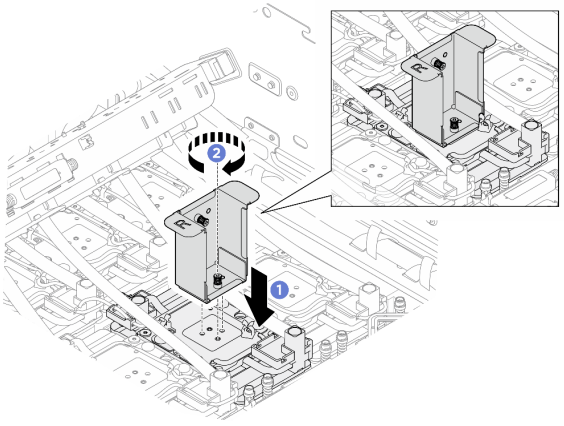
Note: Locate the rear GPU that is to be removed.



1. Remove the leakage sensor module cable from the cable clips, route it away from the cold plate, and reinstall it in the cable clips adjacent to the cold plate.



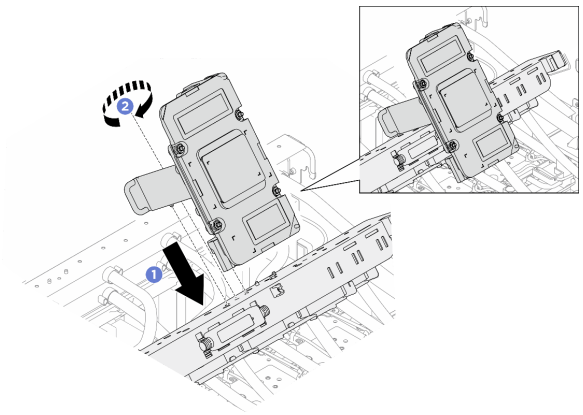
2. Follow the screw sequence ❶❷❸❹ specified on the cold plate label, and fully loosen the sixteen Torx T10 screws with a torque screwdriver set to 0.4±0.05 newton-meter, 3.5±0.5 pound-inch. Ensure the captive screws are completely loosen before removing the cold plate.
Note: If necessary, use a flat screwdriver to gently separate the cold plate and the GPU from the corner of the cold plate. Ensure not the damage the GPU or the cold plate.



3. Install the service bracket onto the GPU cold plate.

❶ Align the two guide pins at the bottom of the service bracket with the guide holes on the GPU cold plate; then, lower it onto the cold plate.

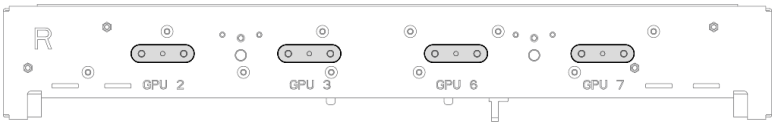
❷ Fasten the captive screw (PH1, 1 x M3, 0.5 newton-meters, 4.3 inch-pound) to secure the service bracket to the cold plate.

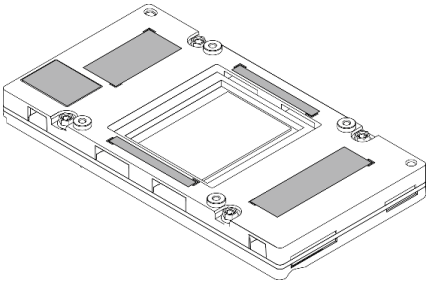


4. Install the service bracket and the GPU cold plate assembly onto the rear H100/H200 GPU cold plate module manifold.

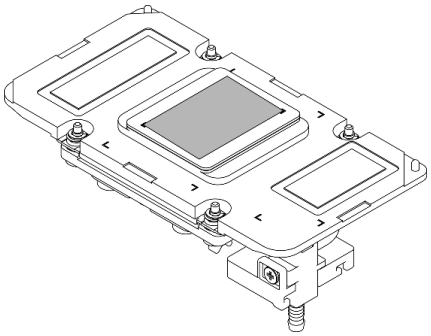
   1. Flip over the cold plate assembly; then, align the captive screw and two guide pins with the screw hole and guide holes on the manifold.
   2. Fasten the captive screw (PH1, 1 x M3, 0.5 newton-meters, 4.3 inch-pound) to secure the cold plate assembly onto the manifold.

Ensure to install the service bracket and GPU cold plate assembly in the screw holes and guide holes corresponding to the specific GPU slot number.





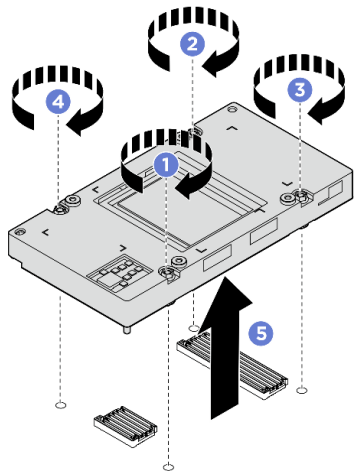
5. **Immediately** clean the PCM and putty pads off from the GPU and the cold plate module with alcohol cleaning pads. **Gently** clean the PCM and putty pads to avoid GPU damage.



6. With alcohol cleaning pads, wipe off any remaining putty pad and PCMs from the GPU cold plate module.

Attention:

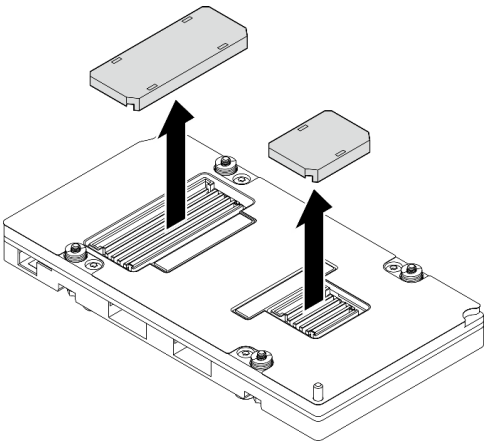
- It is recommended to clean the PCM while it is in liquid state.
- The electrical components around the die on the GPUs are extremely delicate. When removing the PCM and cleaning the GPU die, avoid touching the electrical components to prevent damage.



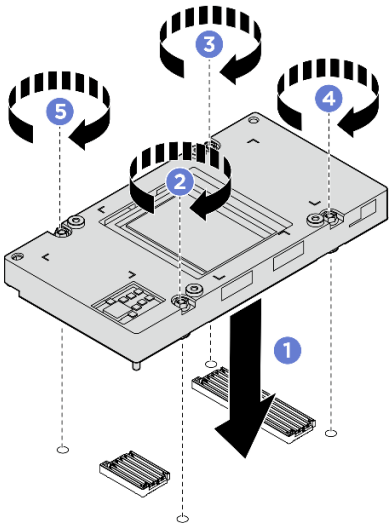
7. Remove the H100/H200 GPU.

   Follow the screw sequence shown in the illustration 1 2 3 4, and fully loosen the sixteen Torx T15 screws with a torque screwdriver set to the proper torque (0.6 newton-meters, 5.3 inch-pounds).

Follow the following steps to install a *rear* H100/H200 GPU



1. For new GPU, remove the connector covers at the bottom.

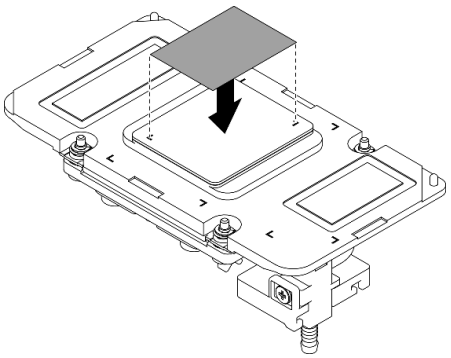


2. Install the GPU.

   Carefully lay the GPU onto the GPU baseboard.

   Follow the screw sequence shown in the illustration ❶❷❸❹, and fully tighten the sixteen Torx T15 screws with a torque screwdriver set to the proper torque.

   First set the torque screwdriver to 0.1-0.12 newton-meters, 0.9-1.1 inch-pounds to fasten the screws for a few rounds. Then set the torque screwdriver to 0.58-0.62 newton-meters, 5-5.5 inch-pounds to fully fasten the screws.

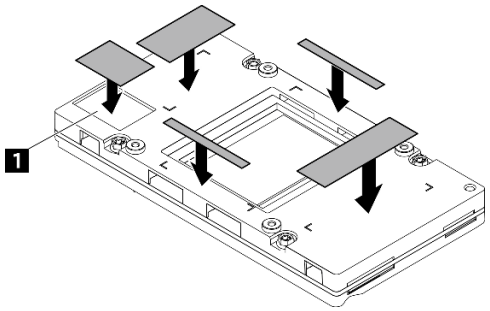


3. Replace the PCM on the GPU cold plate.

   1. Remove the liner from one side of the pad.
   2. Align the PCM with the marking on the bottom of the cold plate, and place it onto the cold plate; then, apply finger pressure across the entire surface area of the PCM to remove any trapped air and allow 1-2 minutes dwell time until it is firmly attached. Carefully remove the remaining top liner.

Attention:

- PCM cannot be reused. PCM must be replaced with new ones every time the water loop is removed.
- After PCM is replaced, there is an expected short duration of throttling before the GPU returns to normal operation. This is due to the PCM requiring a break-in period after being replaced.

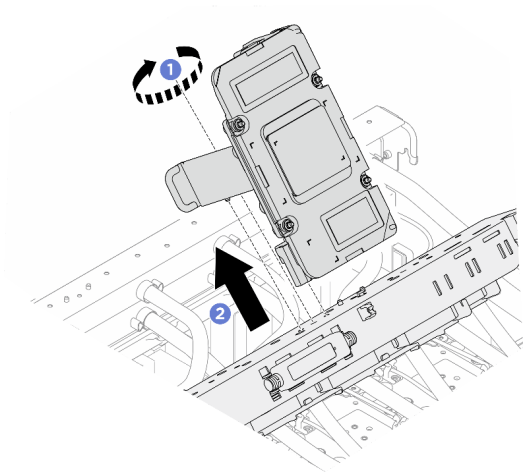


4. Replace the putty pads (x5) on the GPU.

   1. Remove the liner from one side of the pad.
   2. Make sure to align the putty pads to the GPU VR (1) and the markings on GPU; then, place the pads onto the GPU and apply light finger pressure across the entire surface area of the pads to ensure adhesion. Carefully remove the remaining top liner.

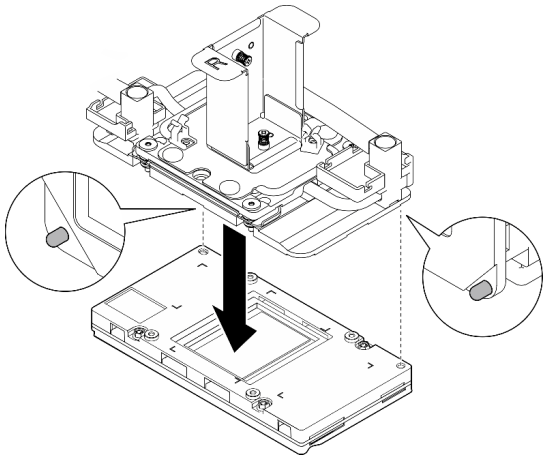
1 GPU VR (Cover the GPU VR with putty pad)

Attention: Putty pad cannot be reused. Putty pad must be replaced with new ones every time the water loop is removed.



5. Remove the service bracket and GPU cold plate assembly from the manifold.

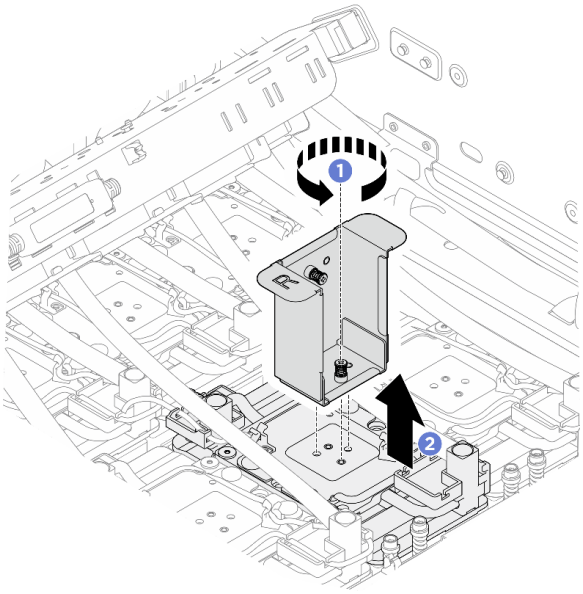
   1. Loosen the captive screw that secures the service bracket to the manifold.
   2. Lift the service bracket and GPU cold plate assembly away from the manifold to remove it.



6. Place the GPU cold plate onto the GPU.

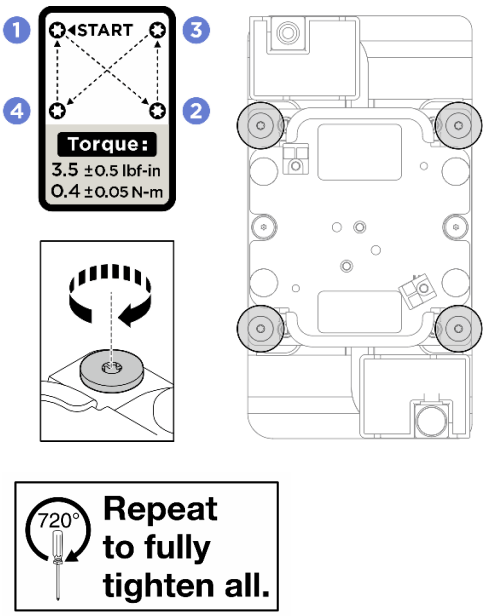
   1. Flip over the GPU cold plate assembly; then, gently place the cold plate onto the GPU.
   2. Adjust the GPU cold plate until the two guide pins are seated in the guide holes on the GPU.

Note: Gently tilt the cold plate to prevent damage to the junction of the hose and the cold plate.



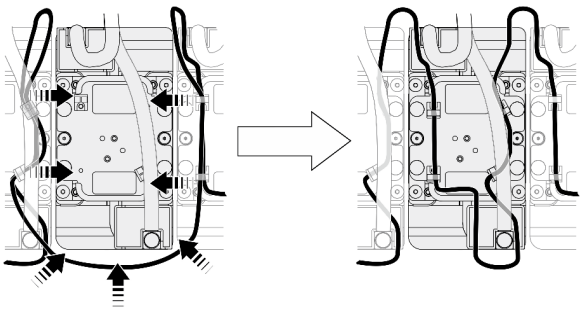
7. Remove the service bracket from the GPU cold plate.

   1. Loosen the captive screw that secures the service bracket to the GPU cold plate.
   2. Lift the service bracket away from the GPU cold plate to remove it.



8. Follow the screw sequence specified on the cold plate label, and repeat to fully tighten the four Torx T10 screws with a torque screwdriver set to the proper torque.

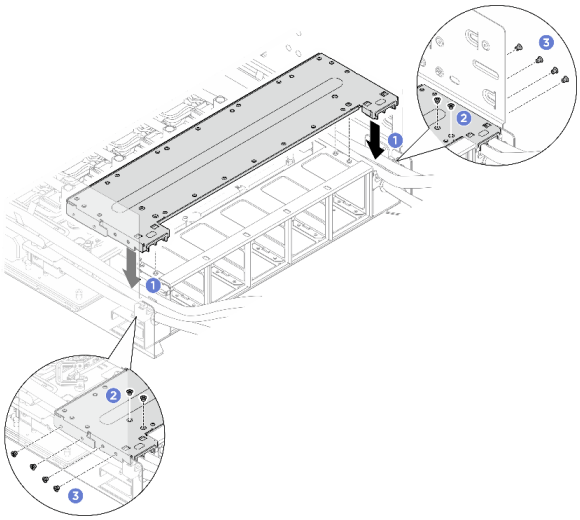
   1. Set the torque screwdriver to 0.4±0.05 newton-meter, 3.5±0.5 pound-inch.
   2. Fasten the screws for 720 degree following the screw installation sequence: 1 → 2 → 3 → 4



9. Reinstall the leakage sensor module cable to the GPU cold plate.

   1. Remove the leakage sensor module cable from the adjacent cable clips.
   2. Route the leakage sensor module cable back onto the GPU cold plate, and install it in the cable clips on the cold plate.

After you finish

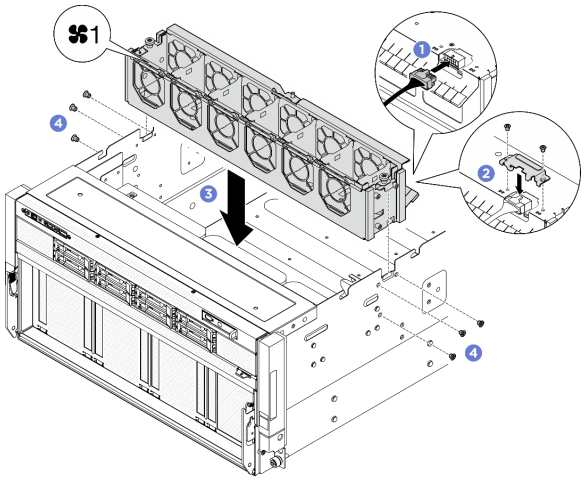


1. Install the rear fan cage support bracket.

   1 Align the rear fan cage support bracket with the corresponding screw holes; then, install the rear fan cage support bracket on top of hose holder B/C as illustrated.

   2 Fasten the four M3 screws (PH2, 4 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the rear fan cage support bracket to the fan cage.

   3 Fasten the eight M3 screws (PH2, 8 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the rear fan cage support bracket to the chassis.



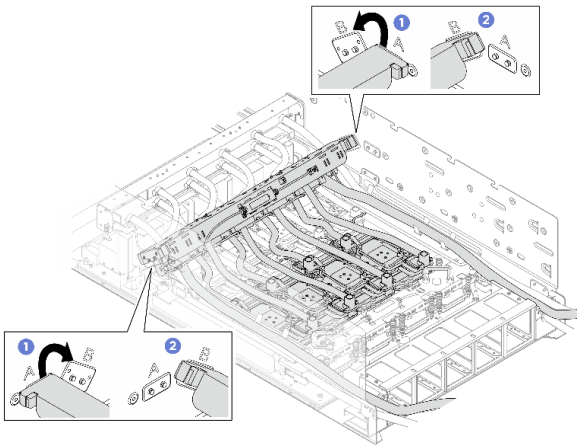
2. Install the fan cage.

   1 Connect the power cable to the front fan control board.

   2 Fasten the two screws to secure the connector bracket to the fan cage.

   3 Align the fan cage with the slots on both sides of the chassis; then, lower it into the chassis.

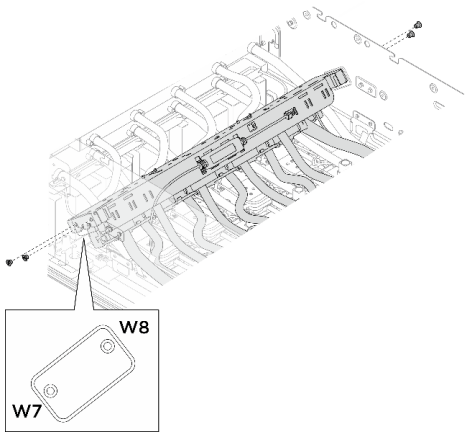
   4 Fasten the six M3 screws (PH2, 6 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the fan cage to the chassis.



3. Ensure to reinstall the rear H100/H200 GPU cold plate module manifold if it was repositioned in the replacement process.

   1 Disengage the manifold from the guide pins marked with A; then, move the manifold to the guide pins marked with B.

   2 Ensure the guide slots on the manifold are securely engaged with the guide pins marked with B.



4. Fasten the four M3 screws (W7-W8) (PH2, 4 x M3, 0.5 newton-meters, 4.3 inch-pounds) to secure the rear H100/H200 GPU cold plate module manifold to the chassis.

After you finish, see the *ThinkSystem SR780a V3 Hardware Maintenance Guide* to reinstall the following:

- Reconnect all the cables that were disconnected.
- Rear fan cage support bracket..
- Front fan cage.
- Power complex.
- CPU complex.
- Rear top cover.
- Front top cover.

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