These instructions are primarily for inspection of the RUPHIS Blade Clamp (i.e. physical condition, proper function and correct liner use) prior to use on the helicopter main rotor blade. This manual contains limited instructions for use in installing or removing the main rotor blade and users should refer to the aircraft technical manual for blade removal and installation procedures.
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Description: First revision of the RUPHIS Blade Clamp Instruction Manual.

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Revision Letter: _________________        Date: _________________

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Major Parts Identification
**Blade Clamp Pre-Use Inspection**

Prior to each use inspect blade clamp as follows:
1. Liners

1.1. Ensure that the correct liners are installed on the blade clamp. Liners correspond to helicopter platform as follows:

1.1.1. **AH-64D metal blade** – Deep purple liner with “AH-64 METAL” raised lettering on top and bottom liner.
   Top Liner P/N C101034, Bottom Liner P/N C101033

1.1.2. **UH-60A/L** – Red liner with “BLACK HAWK A/L” raised lettering on top liner and “A/L” raised lettering on bottom liner.
   Top Liner P/N 1006819, Bottom Liner P/N 1006820

1.1.3. **UH-60M, S-70i, S-92** – Black liner with “BLACK HAWK M” raised lettering on top liner and “M” raised lettering on bottom liner.
   Top Liner P/N 1006817, Bottom Liner P/N 1006818

1.2. Check that the liners wrap completely around the edges of the aluminum top and bottom plates and that the liners are flush with the plate surface.

1.3. Inspect the liners for rips or tears.

   1.3.1. Any tear that reaches the main rotor blade interface surface is cause for rejection of the liner.

   1.3.2. Any other tear or damage that affects the ability of the liner to adhere to the blade clamp plate is cause for rejection of the liner.

   1.3.3. Check that the interfacing surfaces of the liners are clean of any fluids or debris.

2. Hardware and Fasteners

2.1. Check each of the identified fasteners shown below. If any are lose or missing, do
not use blade clamp until corrected.

2.2. Inspect the front latch threaded rods and back clamp handle components. If any damage is noticeable or the components do not thread properly, do not use blade clamp until corrected.

3. Structural Components

3.1. Check the alignment of the blade clamp when closed. With the back clamp handle
fully tightened, close the bottom plate and check that the front latch threaded rods properly engage the front latch tabs on the bottom plate.

3.2. Visually inspect front latch tabs on the bottom plate for damage. Steel inserted washers must be present on front latch tabs. Scratches on the coating surface are acceptable; however, any deformation to the aluminum base material is cause for rejection of the blade clamp.

3.3. Visually inspect the components of the blade clamp for any structural damage. Any structural damage is cause for rejection of the blade clamp.

4. Main Rotor Blade Removal from Main Rotor
4.1. Inspect blade clamp as outlined above in Blade Clamp Pre-Use Inspection. (Page 2)

4.2. Prepare blade clamp as follows:

4.2.1. Ensure the liners installed on the blade clamp correspond to the model of main rotor blade being removed.

   **AH-64D** – Deep purple liner with “AH-64 METAL” raised lettering on top and bottom liner.
   Top Liner P/N C101034, Bottom Liner P/N C101033

   **UH-60A/L** – Red liner with “BLACK HAWK A/L” raised lettering on top liner and “A/L” raised lettering on bottom liner.
   Top Liner P/N 1006819, Bottom Liner P/N 1006820

   **UH-60M, S-70i, S-92** – Black liner with “BLACK HAWK M” raised lettering on top liner and “M” raised lettering on bottom liner.
   Top Liner P/N 1006817, Bottom Liner P/N 1006818

4.2.2. Unlock hoist bar, extend hoist bar and attach hoist ring to the hoisting system.

4.2.3. Loosen the front latch knobs and swing open front latch threaded rods until they catch in the upright position.

4.2.4. Open back clamp by loosening the back clamp handle all the way.

4.3. Engage rotor brake if required by aircraft manual for main rotor blade removal / installation.

4.4. Carefully guide the blade clamp over the trailing edge of the main rotor blade: Take caution to avoid contacting the trim tab.
WARNING
Make sure the blade clamp is positioned over the blade center of gravity (usually marked on blade). If blade clamp is not positioned correctly, blade may be out of balance and swing erratically when removed.

4.5. Check that the leading edge of the main rotor blade is flush with the top blade clamp liner. Close the blade clamp bottom plate to the blade. Swing both front latch threaded rods into the bottom plate front latch tabs and hand tighten knobs.

4.6. Check again to see that the leading edge of the blade is flush against the top blade clamp liner, and then tighten the back clamp handle until blade clamp liners are flush with blade surface from leading edge to trailing edge.
WARNING
Hand tighten back clamp handle until the blade liners are flush to the surface of the blade.

4.7. Attach guide lines to the ends of the blade to ensure control once released from the aircraft.

4.8. Carefully lift the blade to release pressure on the spindle and remove the blade as instructed by the aircraft maintenance manual.

WARNING
Once released from the rotor head the blade should balance horizontally. While lifting blade it should not exceed 15° of tilt in either direction from horizontal. If the blade has excessive tilt, re-attach it to the aircraft and reposition the blade clamp.

4.9. Slowly move the hoist (and blade) away from the aircraft. Lower the hoist until the blade clamp back handle can be reached. Control the position of the blade using the guide lines attached to the ends of the blade. If storing the blade in a blade rack in the vertical position, use the back handle to rotate the blade clamp and blade so that blade hangs vertically with the tailing edge pointed up. Lock the hoist bar under the quick release pin.

4.9.1. While guiding the blade clamp and blade, use the hoist to position the blade directly over the slot in the blade rack and lower the blade into the slot until fully seated in the rack.

4.9.2. Make sure the blade clamp is no longer holding any weight of the blade. Hold the blade clamp at the back handle and release the front latches. Swing open the latches until they catch in the upright position. Then loosen the back clamp handle.
4.9.3. Using either the hoist or by hand, lift the blade clamp straight up and away from the blade. Take caution to avoid contacting the trim tab or other blades in the rack while removing the blade clamp.

5. **Main Rotor Blade Installation from Blade Rack**

5.1. Inspect blade clamp as outlined in **Blade Clamp Pre-Use Instructions.** (Page 2)

5.2. Prepare blade clamp as follows:

5.2.1. Ensure the liners installed on the blade clamp correspond to the model of main rotor blade being removed.

- **AH-64D** – Deep purple liner with “AH-64 METAL” raised lettering on top and bottom liner.  
  Top Liner P/N C101034, Bottom Liner P/N C101033

- **UH-60A/L** – Red liner with “BLACK HAWK A/L” raised lettering on top liner and “A/L” raised lettering on bottom liner.  
  Top Liner P/N 1006819, Bottom Liner P/N 1006820

- **UH-60M, S-70i, S-92** – Black liner with “BLACK HAWK M” raised lettering on top liner and “M” raised lettering on bottom liner.  
  Top Liner P/N 1006817, Bottom Liner P/N 1006818

5.2.2. Lock hoist bar under quick pin.

5.2.3. Attach guidelines to both ends of the blade.

5.2.4. Attach hoist ring to the hoisting system.

5.2.5. Loosen the front latch knobs and swing open front latch threaded rods until they catch in the upright position.

5.2.6. Open back clamp by loosening the back clamp handle all the way.

5.3. Carefully guide the blade clamp down over the trailing edge of the blade. Take caution to avoid contacting the trim tab and other blades in the rack while installing the blade clamp. It is useful to use the hoist system to hold the weight of the clamp.
**WARNING**
Make sure blade clamp is positioned over the blade center of gravity (usually marked on blade). If blade clamp is not positioned correctly it may be out of balance and swing erratically when lifted.

5.4. Check that the leading edge of the blade is flush with the blade clamp top liner. Close the clamp bottom plate to the blade so the liner sits flush against the blade. Swing both front latch threaded rods into the front latch tabs and hand tighten knobs.

5.5. Pull up on the back handle and again check to see that the leading edge of the blade is flush against the top blade clamp liner. Then tighten the back clamp handle until blade clamp liners are flush with blade surface from leading edge to trailing edge.
WARNING
Hand tighten back clamp handle until the blade liners are flush to the surface of the blade.

5.6. Ensure the hoist is directly above the blade clamp. Lift blade directly out of the blade rack with the hoist.

WARNING
Once released from the blade rack, the blade should balance horizontally. If the blade does not balance horizontally, check that the blade clamp is attached over the blade center of gravity (usually marked on blade). While lifting blade, blade should not exceed 15° of tilt in either direction from horizontal. If unbalanced, lower the blade back into the blade rack and reposition the blade clamp.

5.7. Once the blade is clear of the blade rack, hold onto the blade clamp back handle and with the other hand pull the quick pin to extend the hoist bar. Use the handle to rotate the blade clamp so the blade hangs in the horizontal position.
5.8. Attach the blade as instructed by the aircraft maintenance manual.