

Pre-Use Inspection and Functional Check of a Multi-Articulating Upper Limb Prosthesis

DOCUMENT CONTROL

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REVISION HISTORY

Version	Date	Author	Summary of Change
1.0	August 10, 2026	T. Gerundo	Initial release.
1.1	August 16, 2026	T. Gerundo	Added document control block and revision history. Added scope note on manufacturer instructions.

1 PURPOSE

This procedure describes a basic pre-use inspection and functional check of a multi-articulating upper-limb prosthesis. It is intended to help identify visible damage, fit concerns, power issues, or unexpected hand behavior before normal use.

Perform the check before normal daily use, after an impact or unusual event, or whenever the prosthesis begins behaving differently than expected.

2 BEFORE YOU BEGIN

1. Move to a well-lit area where the prosthesis can be inspected safely.
2. Place the prosthesis and any accessories on a clean, stable surface.
3. Gather any items normally used with the prosthesis.
 - i. Prosthesis charger, if needed.
 - ii. Liner or other interface material, if used.
 - iii. Donning aid, if used.
 - iv. Protective glove or cover, if applicable.
 - v. Manufacturer application or control interface, if applicable.
4. If the prosthesis is powered on, place it in a stable resting position and avoid activating it during the visual inspection.

3 INSPECT THE PROSTHESIS

1. Examine the prosthetic hand in a well-lit area.
2. Check the resting position of the fingers and thumb.
 - i. Compare the position of the fingers and thumb with Figure 1, Acceptable Resting Position.
 - ii. Look for a finger or thumb that is visibly twisted, displaced, or positioned differently from the reference image.
 - iii. Check for looseness, cracks, separation, or other visible damage.

[INSERT DEVICE-SPECIFIC RESTING-POSITION REFERENCE IMAGE]

Figure 1. Acceptable Resting Position (representative)

3. Inspect the protective glove or cover, if installed.
 - i. Look for tears, punctures, or worn areas.
 - ii. Check the fingertips and thumb for increased wear.
 - iii. Verify that the covering is seated correctly and does not restrict finger or thumb movement.
4. Inspect visible wrist and connection areas.
 - i. Look for looseness or unexpected movement.
 - ii. Verify that components are fully seated at their connection points.
 - iii. Check for visible damage or unusual wear.
5. Determine whether the prosthesis passes the visual inspection.
 - i. **If no damage or abnormal condition is identified:** Continue to Section 4, Don the Prosthesis and Check Fit.
 - ii. **If damage or an abnormal condition is identified:** Do not continue normal use. Continue to Step 6 below.
6. If the prosthesis does not pass the visual inspection:
 - i. Do not force a damaged or displaced component back into position.

- ii. Note the affected component and observed condition.
- iii. Photograph the condition if a visual reference would help with troubleshooting or support.
- iv. Follow the appropriate manufacturer or prosthetist support process.

4 DON THE PROSTHESIS AND CHECK FIT

1. Inspect the socket and any interface materials used during donning.
 - i. Check the inside and outside of the socket for visible cracks, sharp or damaged areas, and debris.
 - ii. Check any liner, sleeve, or other interface material for tears, folds, debris, or moisture that could interfere with fit or comfort.
 - iii. Check visible suspension or locking components for damage, blockage, or anything that would prevent normal engagement.
 - iv. Remove any loose debris that can be safely removed without disassembling the prosthesis.
2. Determine whether the socket and interface materials are ready for use.
 - i. **If no condition is identified that could affect fit, comfort, or suspension:** Continue to Step 3 below.
 - ii. **If damage or another condition is identified:** Do not don the prosthesis. Correct the condition only if it can be addressed through normal user care. If it cannot, contact the appropriate prosthetist or manufacturer support resource.
3. Use the donning method established for the prosthesis and socket configuration.

METHOD	PROCEDURE
Direct donning	i. Align the residual limb with the socket opening. ii. Insert the residual limb directly into the socket. iii. Continue until the limb reaches the seated position established during prosthetic fitting.
Liner-assisted donning	i. Apply the liner without folds or twists. ii. Align the lined residual limb with the socket opening. iii. Insert the residual limb until it reaches the seated position established during prosthetic fitting.
Pull-in donning	i. Position the pull-in material or donning aid used for the socket. ii. Guide the residual limb into the socket until it is fully seated. iii. Remove the donning aid using the method established during fitting or user training.

4. Confirm that the prosthesis is fully seated.
 - i. Verify that the prosthesis has reached the position established during fitting or user training.
 - ii. Confirm that any suspension or locking mechanism has engaged as designed, if applicable.
 - iii. Check that no liner, sleeve, fabric, or other interface material is folded, twisted, or pinched between the residual limb and socket.
 - iv. Check that the prosthesis does not shift when the arm is moved gently.
5. Evaluate comfort and security.
 - i. Move the arm through a comfortable range of motion.
 - ii. Check for concentrated pressure, pinching, rubbing, or pain that was not present during the established fit.
 - iii. Check for lifting, rotation, or other movement between the residual limb and socket.
 - iv. Confirm that the prosthesis remains secure during the movement check.
6. Determine whether the prosthesis fits correctly.
 - i. **If the prosthesis is secure and no unexpected discomfort or movement is present:** Continue to Section 5, Verify Power and Basic Hand Movement.
 - ii. **If the prosthesis feels loose, produces unexpected discomfort, or moves excessively within the socket:** Remove the prosthesis and repeat the applicable donning method from Step 3.
7. Evaluate the fit after re-donning.
 - i. Repeat the comfort and security checks in Step 5.
 - ii. Compare the fit with the secure and comfortable fit established during prosthetic fitting or prior successful use.
8. Determine whether re-donning corrected the condition.
 - i. **If the fit is now secure and comfortable:** Continue to Section 5, Verify Power and Basic Hand Movement.
 - ii. **If the fit remains loose, uncomfortable, or otherwise different from the established fit:** Discontinue use and contact the appropriate prosthetist.

5 VERIFY POWER AND BASIC HAND MOVEMENT

1. Power on the prosthesis using the device's designated power control.
2. Observe the prosthesis during startup.
 - i. Look for the expected power indicator used by the device, such as a light, tone, vibration, or application status.
 - ii. Check for any warning, error, or low-power indication.
 - iii. Listen for grinding, repeated clicking, scraping, or another irregular mechanical sound.
 - iv. Watch for finger or thumb movement that occurs without user input.

3. Determine whether startup completes successfully.
 - i. **If the expected power indication occurs and no warning or unintended movement is observed:** Continue to Step 4 below.
 - ii. **If the prosthesis does not power on, displays a warning, or behaves unexpectedly:** Continue to Section 7, Respond to an Unexpected Condition.
4. Position the prosthetic hand where all fingers and the thumb are clearly visible.
5. Open the hand using the user's normal control input.
6. Observe the fingers and thumb while the hand opens.
 - i. Confirm that each digit begins moving in response to the control input.
 - ii. Check that no digit remains stationary while the others move.
 - iii. Check for hesitation, stopping, or unintended changes in direction.
 - iv. Listen for grinding, repeated clicking, scraping, or another irregular mechanical sound.
7. Close the hand using the user's normal control input.
8. Repeat the observations in Step 6 while the hand closes.
9. Determine whether basic hand movement passes the functional check.
 - i. **If the fingers and thumb respond consistently through one complete open-and-close cycle:** Continue to Section 6, Check Common Grip Functions.
 - ii. **If a digit fails to move, stops unexpectedly, moves without intended input, or produces abnormal mechanical behavior:** Do not continue cycling the hand. Continue to Section 7, Respond to an Unexpected Condition.

6 CHECK COMMON GRIP FUNCTIONS

1. Select a grip the user regularly uses during daily activities.
2. Activate the selected grip without holding an object.
3. Observe the final position of the fingers and thumb.
 - i. Compare the activated grip with the reference for that grip in the manufacturer's instructions, grip guide, or control application, when available.
 - ii. Confirm that each finger and the thumb involved in the selected grip move into the referenced positions.
 - iii. Check for a digit that hesitates, stops, or moves differently from the referenced grip pattern.
 - iv. Check for an unintended change to another grip pattern.
4. Release the grip.
5. Observe the hand during release.
 - i. Confirm that the grip releases in response to the user's control input.
 - ii. Confirm that the fingers and thumb return to the position specified by the device after release.
 - iii. Check for a digit that remains closed or does not release with the others.
6. Repeat Steps 1 through 5 using any additional grips the user relies on regularly.
7. Determine whether the tested grip functions pass the functional check.
 - i. **If each selected grip activates and releases consistently:** Continue to Section 8, Completion Criteria.
 - ii. **If a selected grip fails to activate, fails to release, changes unexpectedly, or includes abnormal digit movement:** Continue to Section 7, Respond to an Unexpected Condition.

NOTE: Do not use a heavy object or excessive resistance solely to test grip operation.

7 RESPOND TO AN UNEXPECTED CONDITION

1. Stop the functional check.
2. Place the prosthesis in a position where it cannot unintentionally grip, strike, or damage an object.
3. Identify the condition observed during the check.
 - i. Identify the affected finger, thumb, grip, socket area, or other component.
 - ii. Record what the user was attempting to do when the condition occurred.
 - iii. Record what the prosthesis did instead.
 - iv. Note whether the condition occurred once or during more than one attempt.
 - v. Record any warning, error, light pattern, vibration, or application message associated with the condition.
4. Determine whether the device can be safely restarted.
 - i. **If there is visible physical damage, a loose component, significant fit concern, or another condition that could be worsened through continued movement:** Do not restart the prosthesis. Continue to Step 8 below.
 - ii. **If no visible damage or unsafe condition is present and the manufacturer permits a user-initiated restart:** Continue to Step 5 below.
5. Power off the prosthesis using the normal shutdown method.
6. Restart the prosthesis.
7. Repeat only the functional check associated with the original condition.
 - i. If the condition occurred during startup, repeat the startup check in Section 5.
 - ii. If the condition occurred during basic hand movement, repeat the applicable movement check in Section 5.
 - iii. If the condition occurred during grip activation, repeat the affected grip check in Section 6.
8. Determine whether the condition remains.
 - i. **If the condition does not recur:** Complete the applicable functional check, then return to the normal procedure path.
 - ii. **If the condition recurs or the device was not safe to restart:** Discontinue use of the prosthesis and continue to Step 9 below.
9. Document the unresolved condition.
 - i. Record the affected component or function.
 - ii. Describe the expected behavior.
 - iii. Describe the behavior actually observed.
 - iv. Record any warning or error information.
 - v. Photograph or record the condition when doing so would help demonstrate the issue to a support resource.
10. Follow the appropriate manufacturer or prosthetist support process.

DO NOT Force a damaged component, repeatedly cycle a malfunctioning hand, or disassemble components intended for manufacturer or prosthetist service.

8 COMPLETION CRITERIA

The pre-use check is complete when:

- The prosthesis has passed the visual inspection.
- The prosthesis is properly donned and remains secure during comfortable arm movement.
- Startup has completed without a warning or unintended movement.
- The fingers and thumb respond consistently during the basic movement check.
- Commonly used grip functions have been checked against available reference configurations.
- No unresolved condition remains that would make normal use unreliable.

Complete the pre-use check only when all criteria above are met.