Before operating an endoscope, it should be thoroughly inspected to avoid adverse effects caused by lens damage. Do not use a damaged endoscope.

The intention of this document is to reduce the cost of repair however; it is not a perfect solution and cannot prevent all circumstances that may damage an endoscope.¹

**Lens Damage**

**Light Guide Lens – illuminate the body cavity**

- Impaction is the main cause for light guide lens damage. This may occur during transport, inspection and maintenance. For example, the distal end can fall on the floor or strike against peripheral equipment. The main concern is that a broken distal end lens may have a problem distributing light or a broken seal around the lens may cause fluid invasion during reprocessing.

**Objective lens – captures the image in the body cavity**

- Impaction is the main cause for objective lens damage. This may occur during transport, inspection and maintenance. For example, the distal end can fall on the floor or strike against peripheral equipment. Impaction, abrasion and contact with equipment are all possible causes for scratches on the objective lens. Insufficient drying of the air/water supply tube, suction tube, and the forceps raiser pipe can cause residue on the objective lens. The image from a damaged objective lens may result in a foggy or blurred image.

**Preventative Action**

Awareness is key to prevent distal end lens damage. Personnel who handle the endoscope should be aware that the lens (glass) at the distal end is delicate and should be handled with care.

- Hold the distal end properly to protect the distal end.²³
- Avoid using an abrasive brush to clean the lens surface.
- Store the endoscope properly. Protect the distal end and keep the lens dry.

¹ Please read the instruction manual and the pamphlet that was enclosed with the endoscope.
² The embedded CCD on the videoscope can be easily damaged when the distal end is subjection to impact.
³ Damaged lenses may require an expensive repair.
Potential Damage Areas

Below are the primary inspection areas on the endoscope.

**General**
- EL Connector
  - Fluid invasion
- Biopsy Channel
  - Pinhole (puncture, crack)
- Insertion Tube
  - Crushed, buckled
- Stopper End (Insertion Tube)
  - Wrinkle

**Control Section**
- Scope Connector
  - Fluid invasion
- Switch
  - Pinhole

**Fiberscope**
- Scope Connector
  - Fluid invasion

**Damage Analysis**

- Chipped/Cracked Cover Glass: 8.1%
- Fluid Invasion in CCD: 6.5%
- Dent/Crack on Distal End Cap: 6.2%
- Water Leak in Control Body: 4.7%
- Water Leak on LG Mount Unit: 4.6%
- Electrical Leak on C-body: 9.7%
- Pinhole on Bending Cover: 12.2%
- Damage on Connecting Tube: 13.3%
- Chemical Damage on Bending Cover: 13.3%
- Other: 53%

Investigated: Jun 2005 to Dec 2005

**Inspection Prior to Use**

This section is an excerpt from the “Inspection of the endoscope” in the instruction manual. Before using an endoscope, inspection should not only include the endoscope but also the scope function, ancillary equipment, and the function as a system when the endoscope and the ancillary equipment are connected as instructed in the instruction manual.

Do not use the endoscope that is suspect. Any malfunction or abnormally may compromise patient or user safety, and may also result in more severe equipment damage. It is strongly recommended that each part of the endoscope be inspected and in good working order before using an endoscope in a procedure.

*Distal end, straight view endoscope*

1. **General**
   - Scope Connector
     - Large crack, deformation
   - Bond at bending cover and insertion tube
     - Crack, kink, swelling
   - Distal End, Bending and Insertion Tube
     - Crack, dent, swelling, sharp, scratch, metallic projectile, protrusion, deterioration, deformation, buckle, detached part
   - Control unit
     - Large crack, deformation

2. **Distal End**
   - Nozzle
     - Bent, dented, deformation
   - Lens
     - Scratch, chip, residue

- Gently hold the insertion tube with one hand.
- Carefully run the fingertips over the entire length of the insertion tube.
- Verify that objects or metallic wires are not protruding and that the insertion tube is not abnormally stiff.
- With both hands, bend the insertion tube.
- Verify that the entire tube can be bent in a smooth arc and that the insertion tube is pliable.