

but a very sensitive detector in the body of the machine detects the pulsations in the cuff. The only parts of this machine that can be serviced are the air pump that inflates the cuff, the tubing between the cuff and the pump, and the cuff itself. Most other repairs to these machines would require specialist knowledge.

Ophthalmoscopes and otoscopes

Ophthalmoscope

An ophthalmoscope has two parts:

- the handle, which holds the batteries, the “on/off” switch, and a rheostat that controls brightness;
- the head, which holds the lenses.

Corroded batteries

If the instrument is not in use for any length of time, remove the batteries to prevent corrosion. Removal of batteries that have corroded can be difficult. If the rheostat assembly can be removed from the handle, soaking the handle in boiling water helps to dislodge the batteries. Some handles have a hole in the bottom; in this case introduce a punch through the hole to tap the batteries out. After removal of the batteries, thoroughly clean the handle.

Faulty “on/off” switch or rheostat

First check that the batteries and the bulb are in good condition. With the instrument turned on, check for voltage at the contacts; if there is no voltage, examine the rheostat more closely (and, if possible, remove the rheostat and check for continuity with a meter). Check the continuity of the handle, and also check for corrosion under the spring contact at the bottom of the handle.

The head

This is the most complicated part of the instrument. It contains many small lenses. Light from the bulb passes through a number of lens systems and a small mirror before entering the patient’s eye. Some of these systems have their own adjustments, apart from the beam-focusing lenses. Do not attempt to open the head unless you are already experienced in taking the lenses apart and re-assembling them. If the lenses need to be cleaned, try blowing them free of dust with a powerful blower; such a blower can be made from a sphygmomanometer inflation bulb with a blunted needle on the end. If the lenses are very dirty, clean them with methanol and a piece of soft cloth.

Otoscope

The handle of an otoscope is often the same as that of an ophthalmoscope.

The head

The main part of the head holds the bulb, and may also have a lens. On the front, one of a number of different sizes of speculum can be fitted. A set of five specula is

normally supplied with the instrument. On the side, there may be a small tubing connector, which is used for inflation. It is important that the head is airtight. Check this by assembling the instrument complete with the tubing connector and inflation bulb (e.g., from a blood pressure machine). With a finger over the end of the speculum, gently squeeze the bulb. There should be no obvious leaks. If there are, check as follows:

- Check that the speculum fits properly and that it is not cracked.
- Check that the tubing nipple is screwed in properly.
- Check that the rear lens fits properly; it may be that the lens is cracked or missing. If so, replacement will be necessary. If a spare lens is not available, use a thin piece of glass; shape it on a slow, water-lubricated grindstone to fit, and then glue it into place. Although the lens effect will be lost, the instrument will still be usable. Do not shape the glass on a high-speed grinder, because it may crack.

If there is no light:

- Check the bulb.
- Check the batteries and the handle as described for ophthalmoscopes.
- Check, with a meter, for continuity between the battery contact and the bulb contact. Use a needle connected to the meter probe to make contact with the bulb contact.

Laryngoscopes

A laryngoscope (Fig. 3.2) is used to examine the pharynx and larynx, and aids the passing of an endotracheal tube into the trachea. It consists of a handle which contains the batteries, and a blade which has a light bulb. The bulb lights up when the blade is opened up and locked into position for use. The blades are available in different shapes and sizes to suit different needs, e.g., for use on adults or children. The most common problem is that the bulb fails to light or just flickers. To determine the cause of the problem:

- Check that the bulb is screwed in tightly, and that it is a good one.
- Check that the batteries have power and that the contacts are clean.

Fig. 3.2. Laryngoscope.

