

# Keeler

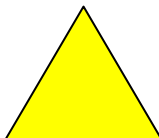
# Vantage +

Indirect Ophthalmoscope

## Service Manual



**This Service Manual Covers Product  
Manufactured from 18/01/2011**



ALWAYS READ THE INSTRUCTIONS

**A**  
**HALMA GROUP**  
**COMPANY**

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## **Introduction**

This manual covers servicing of both the Bulb and LED illuminated versions.

All drawings refer to both Bulb and LED Module versions.

## **Service Principles**

The Vantage + comprises a number of modules which have been built and aligned in the factory. These modules can not be reliably aligned without the special jigs and should not therefore be disassembled further than described in this manual. There is a strong possibility of the unit developing diplopia or hyperphoria if the Viewing Optics are disassembled or adjusted.

Where a sub-assembly is quoted it cannot normally be reliably repaired without special tools, adhesive and/or jigs.

## Tools Required

Most of the tools required will be in standard electro-mechanical toolkit.

The following special tools will make assembly and disassembly easier.

TD351                      Lock Ring Key for Eyepieces.

## Precautions

Care should be taken to carry out any repair work on a clean soft surface to minimise damage to the outside of the unit.

Solvents should **not** be used for cleaning.

## Disassembly

Virtually all repairs inside the head unit except changing the Centre Mirror involve removing both the Viewing Optics Assy and the Illumination Assy from the Rear Cover. This involves removing the whole Optics Assy from the Browbar.

## Remove the Optics Head from the Browbar

1. Unplug the power supply from the Dimmer Block.
2. Remove the Browbar from the Headband by undoing the knobs.
3. Remove 3 off No2 x  $\frac{3}{8}$ " PT screws (18) holding the Dimmer Block to the Browbar.
4. Carefully unsolder the 2 wires from the PCB (26). It may be easier to remove the PCB Assy from the Dimmer Housing (7).
  - 4.1. Slide the Blue Indicator Pin (20) out of the Control Knob (6).
  - 4.2. Slacken the Allen Screw holding the Knob to the Dimmer Control and remove the Knob.
  - 4.3. Undo the Nut on the Dimmer Control
  - 4.4. Remove the Dimmer PCB Assy.

Note that these wires will need to be re-soldered after the repair is completed and there is insufficient spare length to strip the wires again.
5. Undo the Hinge Clamp from the Hinge Pin and remove the Hinge Pin taking care not to lose the Spacer or the washer under the Hinge Clamp.
6. The Optics Head can now be separated from the Browbar.

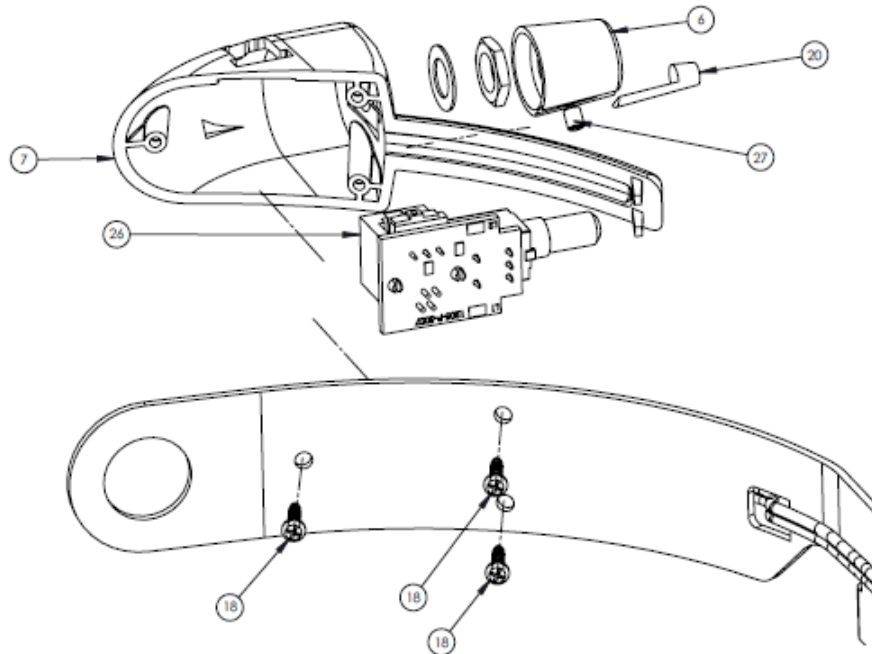
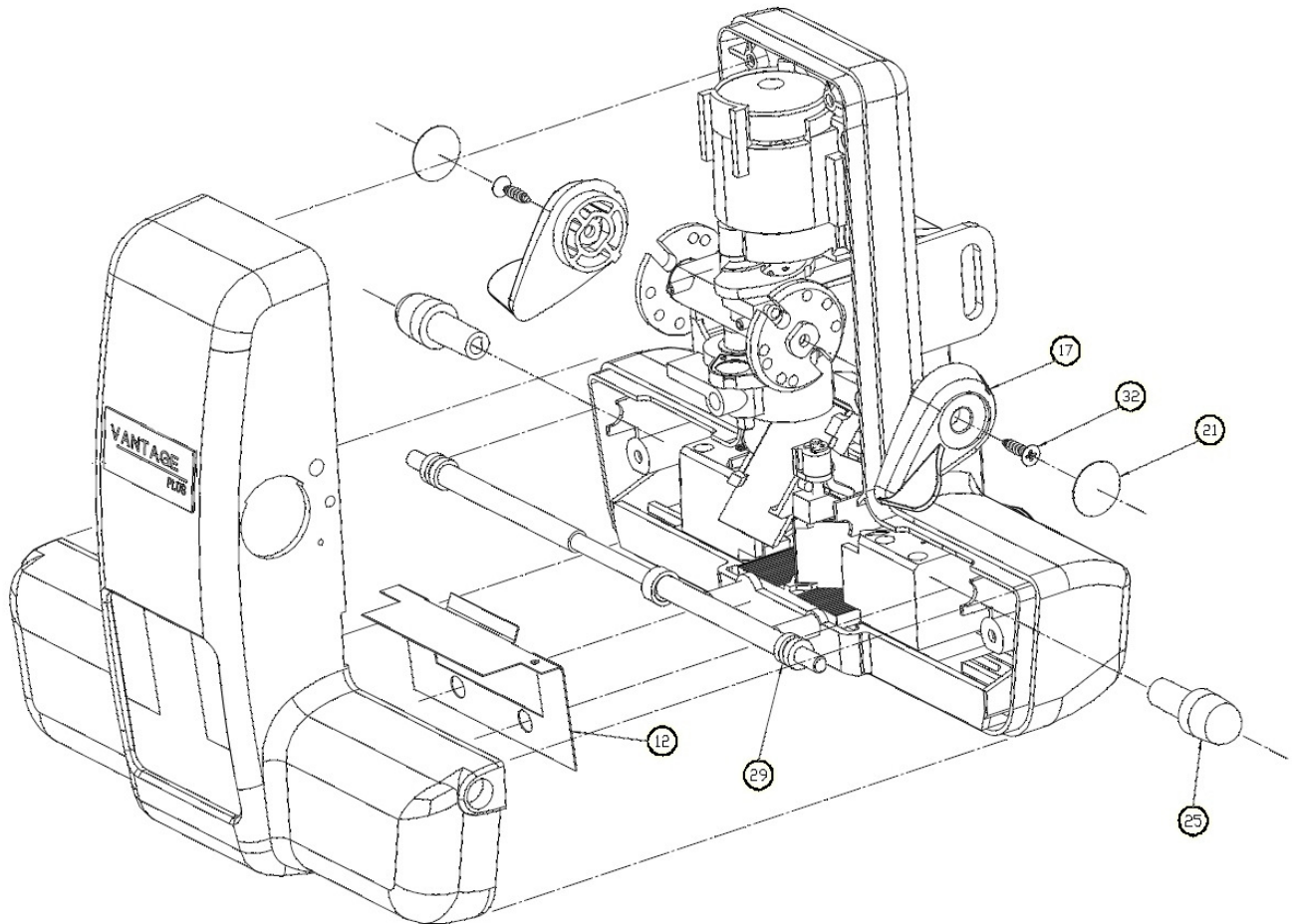


Figure 1

## Remove the Front Cover

1. Remove 2 off Mirror Spindle Knob (25) by gently pulling.
2. Carefully lift 2 off Control Knob Label (21) with the point of a sharp blade. They are self adhesive.

Figure 2



3. Remove 2 off M2 x 8 Csk PT Screws (32) from the centre of the 2 Control Knobs.
4. Remove the 2 Control Knobs (17).
5. Turn the Optics Head over and slide the Eyepieces to the middle to reveal 2 off M2 x 8 Csk PT Screws. Remove these screws.
6. Remove 2 off M2 x 8 Csk PT Screws from the top of the unit above the Browbar Mount.
7. Lift the Front Cover off by carefully prising the sides by the filter controls apart to allow the cover to slide over the filter controls.
8. Carefully remove the Light Shield (12).
9. Remove the Mirror Spindle (29).

## Remove the Optics Head and Illumination Assy.

1. Unscrew 2 off Eye Cap (3) being careful not to lose the +2D Eye Lenses (2).
2. Unscrew 2 off Eyepiece Lock Ring using TD351 Lock Ring Key.
3. Remove 2 off P D Slider (18)

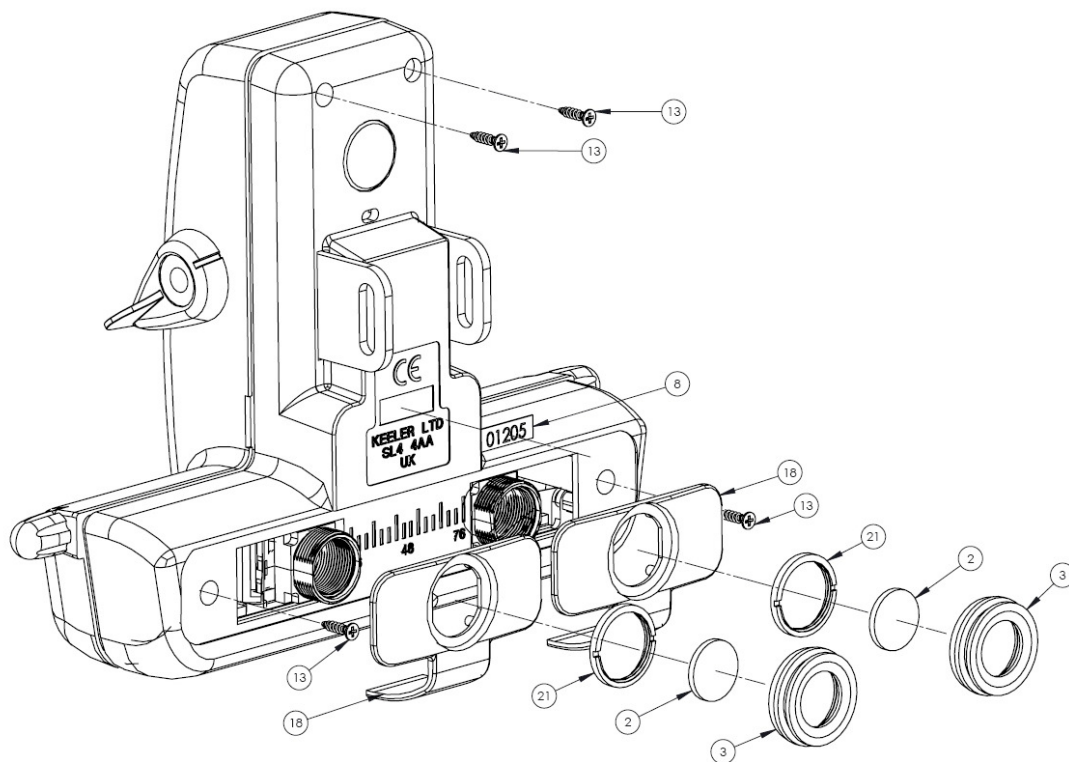


Figure 3

4. Turn the unit over



5. The Viewing Assy (24) and Illumination Assy (25) are joined by the Centre Spindle (21) and must be removed together.
6. Remove 2 off M2 x 8 Csk PT Screws (12) from the Viewing Assy (24).
7. Remove 4 off M2 x 8 Csk PT Screws (12) from the Illumination Assy (25)
8. Carefully lift the 2 assemblies together from the Rear Cover Moulding (16)
9. The 2 assemblies can now be separated.

Further disassembly of either the Illumination Assy or the Viewing Assy is not advised as special tools and jigs are required to reassemble and align.

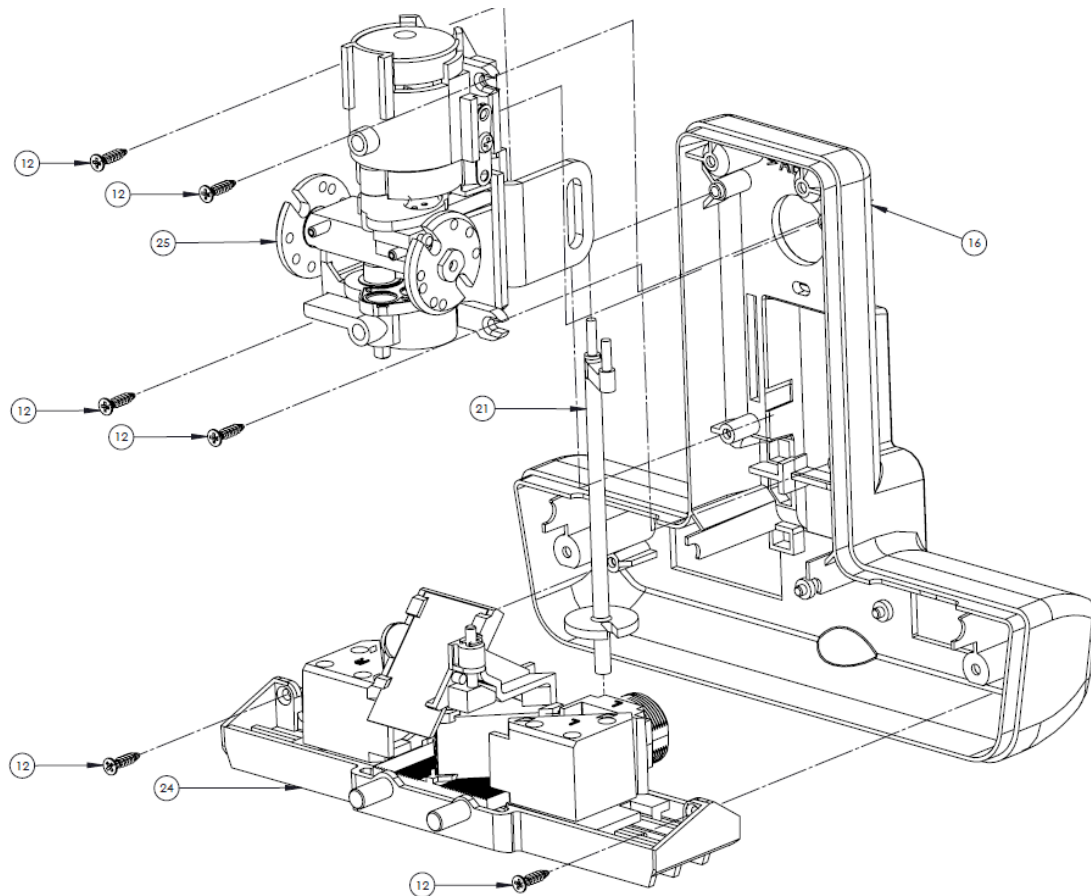


Figure 4

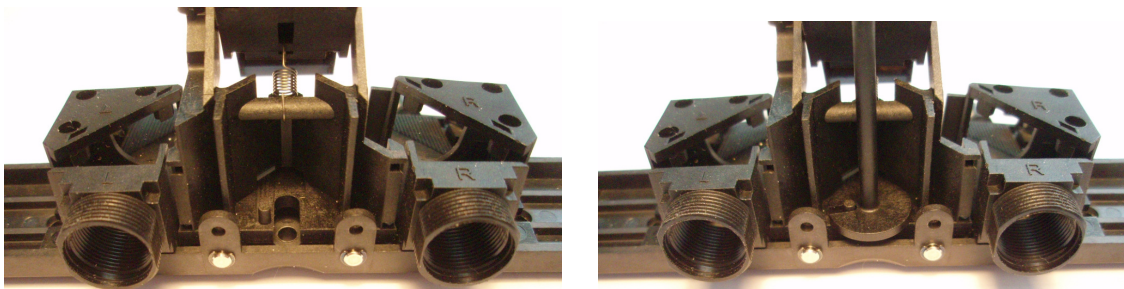
## Reassembly

### Refit Illumination Assy and Viewing Assy

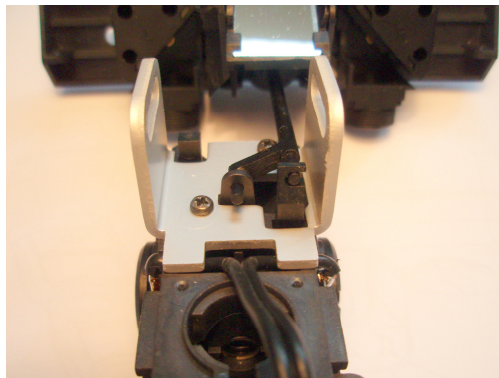
Great care must be taken to avoid any strain on the Eyepiece Mirror Mounts as these have been carefully aligned on the laser jig during manufacture. Avoid holding the Viewing Assy by the Mirror Mounts.

Refer to Figure 4

1. Stand the Viewing Assy on its base.
2. Locate the Centre Spindle (21) in the base of the Viewing Assy so that the peg on the moving Centre Mirror Assy engages with the slot on the Centre Spindle



3. Locate the Illumination Assy onto the top end of the Centre Spindle so that it engages with the Graticule Carrier. It will be necessary to rotate the Graticule Wheel to the smallest aperture so that the link is sticking out.



4. Lay the Viewing and Illumination Assemblies together as shown below ensuring that the Centre Spindle remains engaged at both ends.



5. Carefully thread the cable from the Illumination Assy up through the Rear Cover Moulding ensuring that the cable is not twisted.
6. Align the Browbar Mount with the slots on the Rear Cover Moulding and carefully locate the Rear Cover Moulding over the Viewing and Illumination Assemblies.

Refer to figure 3

7. Place 2 off P D Slider (18) over the Eyepieces
8. Carefully fit 2 off Eyepiece Locking Ring (21) using TD351 Lock Ring Key.
9. Fit 2 off +2D Eye Lens (2) into the Eyepieces.
10. Secure these in place with 2 off Eye Cap (3).
11. Turn the unit over onto the Browbar Mount.
12. Operate the Graticule Wheel and ensure that the Mirror Block on the Viewing Assy moves to and fro. If not, return to 3 above removing the items fitted to the Eyepieces first.

Refer to figure 4

13. Fit 2 off M2 x 8 Csk PT Screws (12) to retain the Viewing Assy.
14. Fit 4 off M2 x 8 Csk PT Screws (12) to retain the Illumination Assy.

Refer to figure 2

15. Refit the Mirror Spindle (29) under the Mirror, ensuring that the cam is to the right of the Mirror and that it engages in the Rear Cover Moulding.

16. Rotate the Mirror Spindle to lift the Mirror to its highest point.
17. Carefully fit the Light Shield (12) over the 2 pins in the Viewing Assy ensuring that it fits under the Mirror.
18. Carefully blow out any dust in the unit.
19. Offer the Front Cover Assy over the main assembly ensuring that the Light Shield (12) fits into the slots behind the window. It will be necessary to gently spring the Front Cover to clear the Graticule and Filter Wheels.
20. Turn the unit over and slide the Eyepieces together.
21. Fit 4 off M2 x 8 Csk PT Screws – 2 on the Viewing Assy and 2 above the Illumination Assy.
22. Fit 2 off Control Knob (17) to the Graticule / Filter Wheels using 2 off M2 x 8 Csk PT Screws. Hold the Control Knob whilst tightening the screws.
23. Fit 2 off self-adhesive Control Knob Label (21) to the Control Knobs.
24. Fit 2 off Spindle Knob (25) to the Mirror Spindle ensuring that the 'D' shaped hole mates with the 'D' shape on the Spindle.

## Refit to Browbar

1. Thread the cable through the grommet in the Browbar
2. Assemble Headunit onto Browbar ensuring Washer (20) is positioned as shown in Figure 5.

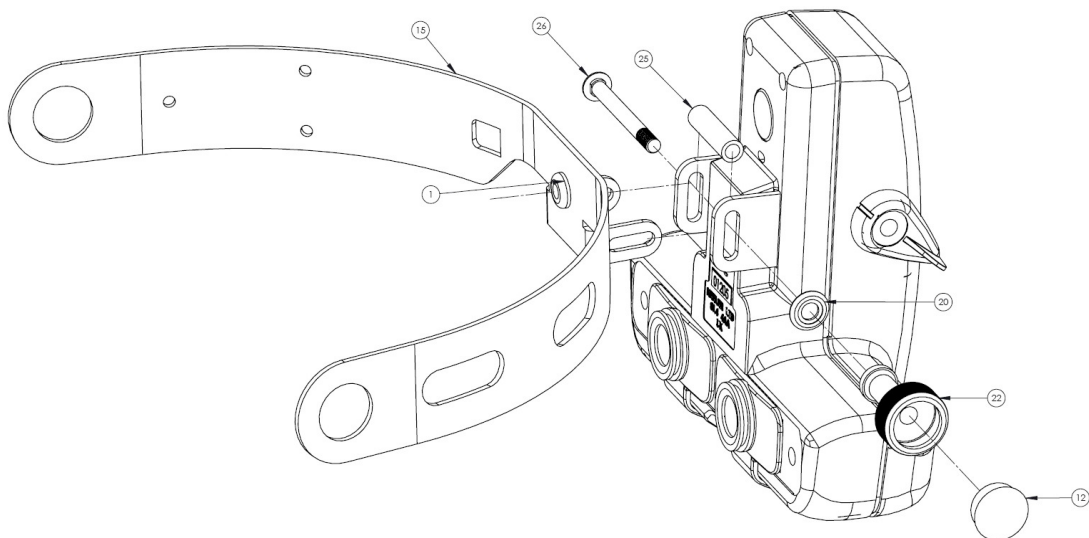


Figure 5

Refer to figure 1

3. The cable must be a total of 135mm long including the stripped ends from the Grommet in the Browbar. If a new cable has been fitted
  - 3.1 Trim the cable to 135mm from the grommet.
  - 3.2 Separate the 2 wires for 15mm from the free end
  - 3.3 Strip the covering from the wires for 3mm and tin.
4. Feed the cable through the square slot in the Browbar.
5. Solder the wires carefully to the Dimmer PCB (26). Note the polarity of the wires when reconnecting the LED version – see below. Incorrect connection may result in damage to the LED.

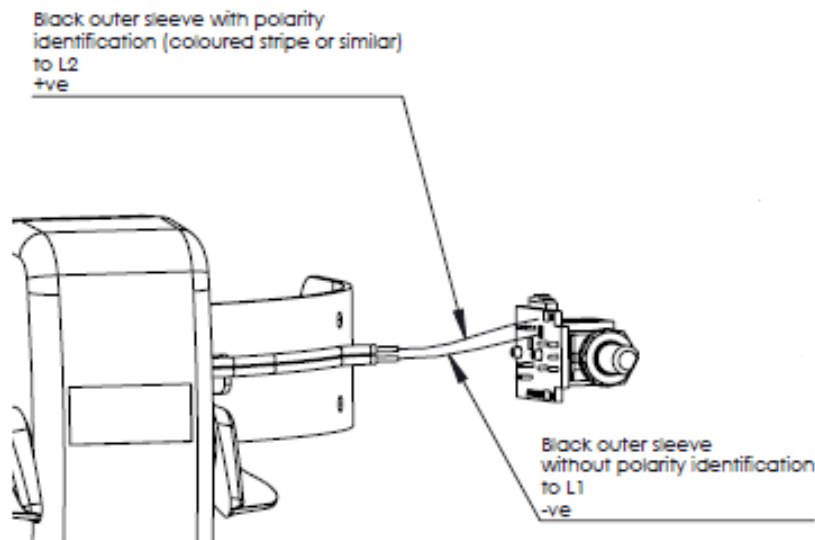


Figure 6

6. Fit the Dimmer PCB to the Dimmer Body (7) and tighten the nut
7. Fit the Dimmer Knob onto the shaft ensuring that the grub screw is positioned over the flat on the shaft. Tighten the grub screw.
8. Lay the cable along the recess in the Dimmer Body (7) and hook the body into the Browbar. Fit 3 off No2 x 3/8" PT Screws (18)

## Spare Parts List

The following parts are common to both versions

Item	Part No	Description	
1	EP79-11000	Browbar Grommet	*
2	EP39-53721	+2D Eye Lens	
3	EP39-53641	Eye Piece Cap	
4	EP39-70189	Light Shield	
5	EP39-70197	Control Knob	*
6	EP79-09795	Knob Body	
7	EP39-70178	Dimmer Control Body	
11	EP39-70174	Metalised Label	*
12	EP79-09621	Cap Plug	
13	SP72-00001	M2 x 8 Csk PT Screw	*
15	EP29-59777	Browbar	
16	EP39-70191	Spindle Knob	*
17	EP19-70005	Rear Cover Moulding	
18	EP39-70190	P.D. Slider	
19	SP70-25117	No2 x 3/8 PT Screw	*
20	EP39-05121	P.D. Washer	*
21	EP39-53991	Eyepiece Lockring	
22	EP39-24664	Hinge Clamp	
23	EP79-09808	Blue Indicator Pin	
24	EP39- 70209	Centre Spindle	
25	EP39-70245	Hinge Spacer	
26	EP39-24656	Hinge Pin	
27	1202-P-5808	Viewing Optics	
29	EP39-70215	Spindle	
32	EP39-70247	P.T.F.E. Washer	*
	1202-P-7299	Fixings Kit	

## Spare Parts

Parts marked with \* are only available as part of a spares kit (1202-P-7299).

Current prices for spare parts are available from Technical Service.

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