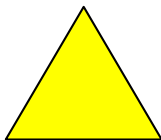


Keeler

Spectra +

Service Manual



ALWAYS READ THE INSTRUCTIONS

A
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COMPANY

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Introduction

This manual covers the repair of the Spectra+ Indirect Ophthalmoscope.

Service Principles

Some parts are only available as assemblies where special tools and adhesives are used in the manufacturing process.

The remainder of parts are available either individually or as kits of relevant parts.

Tools Required

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

In addition the following special tools will make the job easier.

TD351 Lockring Key

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 and lenses.

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

Head Unit

Disassembly

1. Remove 2 off M3 x 20 CSK PT Screws (17) and 2 off M2.5 x 25 CSK PT Screws (51) holding the Rear Cover (22) to the Front Cover (82)
2. Carefully lift off the Front Cover (82)
3. Lift out the Crank Assy from under the Illumination Barrel Assy. Do not dismantle the Crank Assy further unless parts need to be replaced.

Viewing Optics

1. Unscrew 2 off Eyepiece Cap (41) from viewing telescopes and carefully remove 2 off +2D Eye lenses (39)
2. Remove 2 off Eyepiece Lockrings (37) using TD351 Lockring Key
3. Remove 2 off PD Adjuster (73)
4. Remove 2 off M1.7 x 5 Screws (63) holding the Viewing Optics Assy to the Rear Cover (22)

The Viewing Optics assembly is set up on a laser jig in the factory. Any further disassembly or adjustment will probably result in misalignment of the telescopes.

Illumination Optics Assembly

1. Remove 1 off M2 x 4 CSK PT Screw (3) from the Top Cover (66)
2. Slide the Top Cover (66) back along the Cable (16)
3. Carefully unhook the Spring (34) from the Illumination Barrel Assy (81)
4. Remove 2 off M2 x 8 CSK PT Screws (65) and remove the Illumination Optics Assy.
5. If required the Lemo Plug (15) will just pass through the opening left when the Top Cover (66) is removed.

Further disassembly of the Illumination Optics Assy should only be carried out if replacements within the assembly are required.

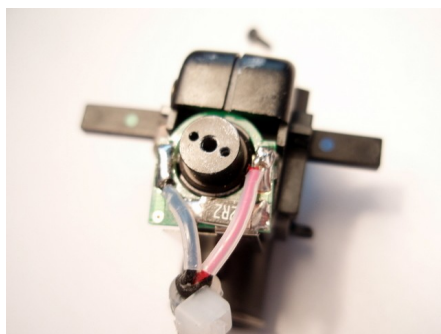
1. Remove 2 off M2.5 x 12 CSK Screws (49) holding the Left Optics Moulding (19) to the Right Optics Moulding (18). Take care not to lose the Filter Detent Ball (71) and Detent Spring (60) as the two parts are parted.
2. The Illumination Barrel Assy (81), Illumination Assy (79), Filter Holder (80) and Push Bar (52) can now be removed.

Reassembly

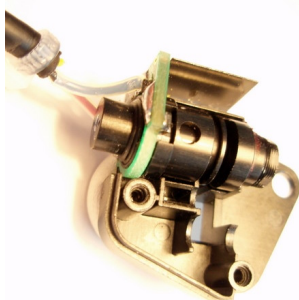
Any parts or assemblies being replaced should be substituted for the old ones.

Illumination Optics Assembly

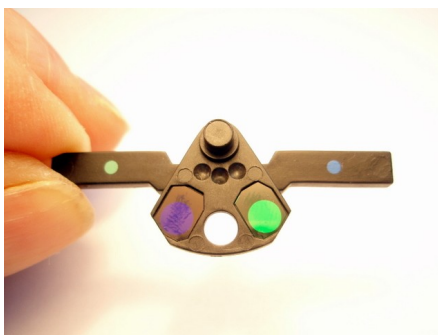
1. If the Illumination Assy (79) including the LED is to be changed carefully unsolder the Cable (16) from the old unit and resolder it to the new unit noting the polarity – Red Wire is connected to A and the Black wire to K Ensure that the cable still passes through the Top Cover.



2. Fit the Illumination Assy (79) to the Right Optics Moulding (18)



3. Place the Push Bar (52) together with the Filter Holder (58) as shown. Note the orientation of the parts with each other.



4. Slide the two parts into the Illumination Optics Assy as shown. The Filter Holder (58) fits through the Illumination Assy (79)

5. Fit the Detent Ball (71) and Detent Spring (60) as shown.



6. Fit the Left Optics Moulding (19) carefully over the assembly and secure with 2 off M2.5 x 12 CSK Screws.
7. Fit the LED Heatsink (8) to the Illumination Assy (79) using 1 off M2 x 5 Screw (7). Ensure that there is adequate Heatsink Compound between the LED Heatsink and the Illumination Assy.
8. Fit the Illumination Optics Assy assembled above using 2 off M2 x 8 CSK PT Screws to attach it to the Rear Cover (22).
9. Attach the Illumination Barrel Spring (34) to the Rear Cover (22) and Illumination Barrel (34).

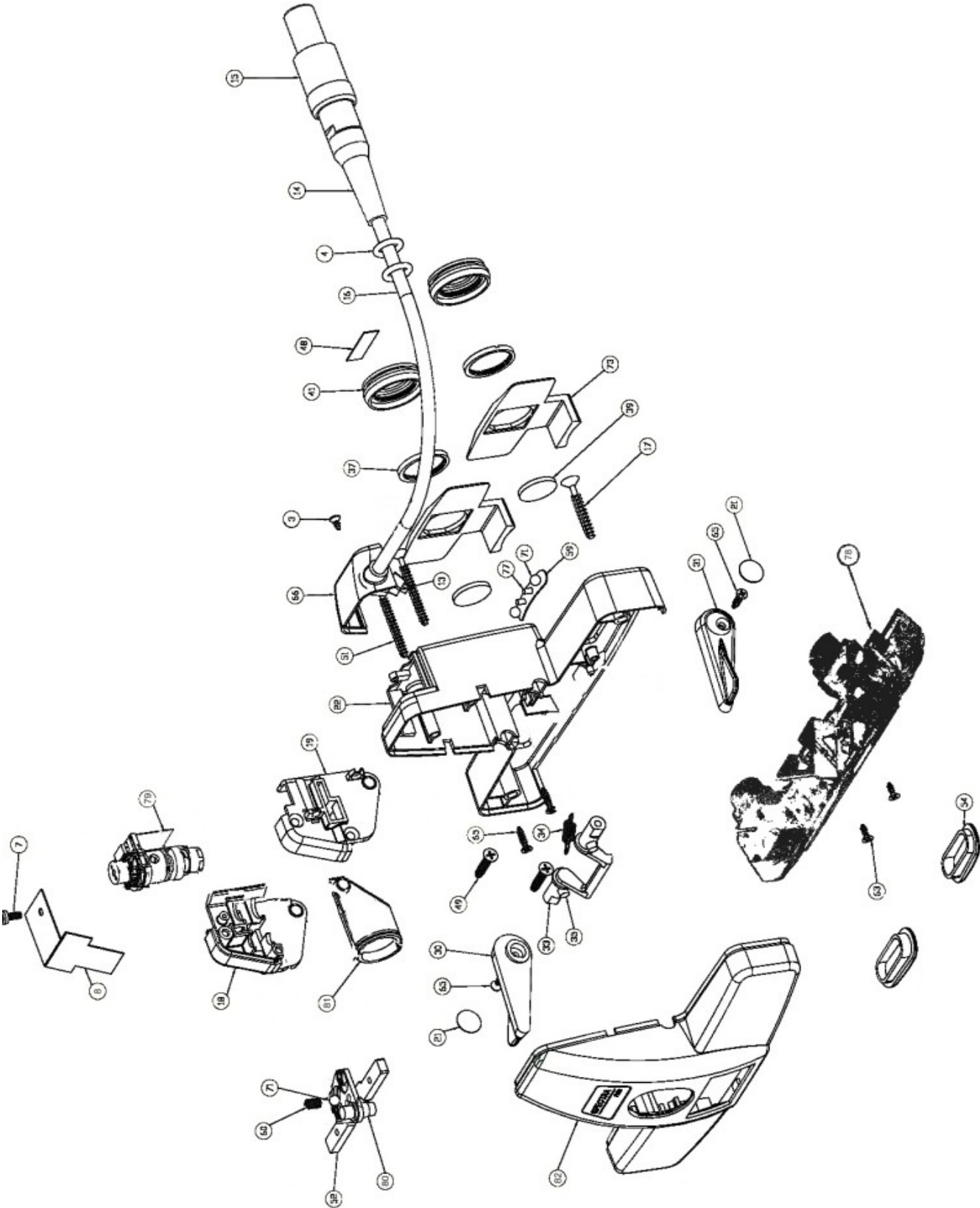
Viewing Optics Assembly

1. Lift the Illumination Barrel Assy (81) and offer the Viewing Optics Assy (78) to the Rear Cover Assy (22) taking care not to disturb any of the components mounted on it.
2. Fix the Viewing Optics Assy (78) to the Rear Cover (22) using 2 off M1.7 x 5 CSK Screws taking care not to disturb the Centre Mirror assembly on the viewing optics chassis.
3. Ensure that the two telescopes move freely without touching the edges of the cutouts in the Rear Cover (22)
4. Fit 2 off P D Adjuster (73) over the Viewing Optics telescopes.
5. Fit 2 off Lockrings (37) to retain the P D Adjusters and tighten using TD351 Lockring Key.
6. Fit 2 off +2D Eyelenses (39) to the telescopes ensuring that the curved surface is towards the user and retain them with 2 off Eyepiece Caps (41)

Final Assembly

1. Lift the Illumination Barrel Assy (81) and fit the Crank Assy
2. Check the Front Cover Assy (82) has 2 off Friction Pads (35) coloured yellow fitted by the cutouts for the Crank Assy.
3. Lift the Illumination Barrel using the Crank and carefully fit the Front Cover Assy (82).

4. Secure the Front Cover Assy (82) using 2 off M3 x 20 CSK PT Screws by the Viewing Optics and 2 off M2.5 x 25 CSK PT Screws by the Illumination Assy.
5. Ensure that a Cable Tie (13) is very securely fitted to the Cable (16) over the sheath of the cable just before the individual wires are visible.
6. Fit the Top Cover (66) using 1 off M2 x 5 CSK PT Screw.



Spare Parts

Parts not listed are generally not available as spares.

Missing Item Numbers are part of Spares Assemblies supplied complete.

Parts marked with * or ** are supplied as part of a kit listed at the bottom.

Current prices for spare parts are available from Technical Service.

Technical Service
Keeler Ltd
Clewer Hill Road
Windsor
Berks
SL4 4AA

Phone +44 (0)1753 827110

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Spare Parts List

Item	Part No	Description	
3	SP72-00008	M2 x 4 CSK PT Screw	*
4	EP79-28988	'O' Ring	*
7	SP12-05002	M2 x 5 Screw	*
8	EP39-16648	LED Heatsink Panel	
13	EP79-40899	Cable Tie	*
14	EP79-11334	Strain Relief	
15	EP79-11326	Lemo Plug	
16	RP12-06261	Cable	
17	SP73-50000	M3 x 20 CSK PT Screw	*
18	EP39-16875	Rhd Optics Half	
19	EP39-16867	Lhd Optics Half	
21	EP39-17042	Control Label	*
22	EP19-01645	Spectra Rear Cover	
30	EP39-16736	Rhd Control Knob	*
31	EP39-16744	Lhd Control Knob	*
33	EP39-16998	Crank	*
34	EP39-04292	Spring	*
35	EP39-38513	Friction Pad	*
37	EP39-53991	Eyepiece Lockring	**
39	EP39-53721	+2D Eye lens	**
41	EP39-53641	Eyepiece Cap	**
49	SP72-50000	M2.5 x 12 CSK Screw	*
51	SP72-50003	M2.5 x 25 PT Screw	*
52	EP39-16891	Push Bar	
54	EP39-17026	Base Plate Plug	**
59	EP39-04399	Leaf Spring	*
63	SP71-82024	M1.7 x 5 Screw	*

Item	Part No	Description	
65	SP72-00001	M2 x 8 CSK PT Screw	*
66	EP39-70180	Top Cover	
71	EP79-30578	1/8" Ball	*
73	EP39-16939	P D Adjuster	**
77	SP11-65000	Screw	*
78	1941-P-7022	Viewing Optics Assy	
79	1941-P-7057	Illumination Assy	
80	1941-P-7030	Filter holder Assy	
81	1941-P-7049	Illumination Barrel Assy	
82	1941-P-7073	Front Cover Assy	
*	1941-P-7065	Fixings Kit	*
**	1941-P-7081	Viewing optics Extras Kit	**