

Service Manual

Interchangeable Lens for Digital Camera

Model No. **H-FSA45200PP**

H-FSA45200E

H-FSA45200GK



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

© Panasonic Corporation 2017 Unauthorized copying and distribution is a violation of law.

1 Safety Precautions

1.1 Information for Your Safety

Keep the unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games, radio transmitters, high-voltage lines etc.).

- Do not use the camera near cell phones because doing so may result in noise adversely affecting the pictures and sound.
- If the camera is adversely affected by electromagnetic equipment and stops functioning properly, turn the camera off and remove the battery and/or the connected AC adaptor. Then reinsert the battery and/or reconnect the AC adaptor and turn the camera on.

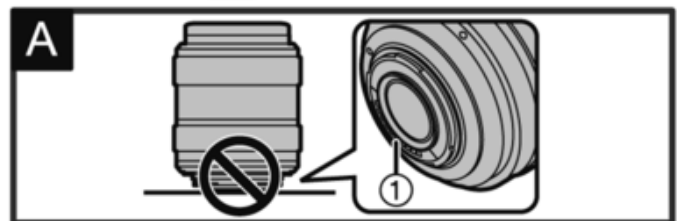
The lens can be used with a digital camera compatible with the lens mount standard for the "Micro Four Thirds™ System".

- It cannot be mounted on the Four Thirds™ mount specification camera.
- The appearance and specifications of products described in this manual may differ from the actual products you have purchased due to later enhancements.
- Micro Four Thirds™ and Micro Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries.
- Four Thirds™ and Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries.
- G MICRO SYSTEM is an interchangeable lens type digital camera system of LUMIX based on a Micro Four Thirds System standard.
- Other names of systems and products mentioned in these instructions are usually the registered trademarks or trademarks of the manufacturers who developed the system or product concerned.

Precautions

■ Lens Care

- This lens has a dust-proof and splash-proof construction. When using it, please be careful of the following. If the lens is not working properly, consult the dealer or your nearest Service Center.
 - Please attach the lens to a dust-proof and splash-proof digital camera.
 - When detaching the lens from the digital camera, take care to ensure that sand, dust, splashes of water etc., do not get into the lens or the terminals.
 - This lens is not waterproof and cannot be used to record underwater. For splash-proofing, the lens is constructed to resist the entry of water. If splashes of water etc. do adhere to the lens, wipe after use with a soft dry cloth.
- To improve the dust-proofing and splash-proofing of this lens, a lens mount rubber is used in the mounting portion. After changing the lens a number of times, you may find that the lens mount rubber has marked the mount portion of the digital camera body, which does not affect its performance. For information on changing the lens mount rubber, contact your nearest Service Center.
- Do not press the lens with excessive force.
- When there is dirt (water, oil, and fingerprints, etc.) on the surface of the lens, the picture may be affected. Lightly wipe the surface of the lens with a soft, dry cloth before and after taking pictures.
- To prevent dust and other particles from accumulating on or entering the lens, attach the lens rear cap when the lens is not in use.
- To protect the lens contact points ①, do not place the lens with its mount surface facing down. In addition, do not allow the lens contact points to become dirty. (See illustration **A**)



■ About Condensation (Fogging of the Lens)

- Condensation occurs when there are differences in temperature and humidity as described below. Condensation can cause the lens to become dirty and lead to mold and malfunctioning, so exercise caution in the following situations:
 - When the camera is brought indoors from outside during cold weather

during cold weather

- When the camera is brought into an air-conditioned car
 - When cold air from an air conditioner is directly blown onto the lens
 - In humid places
- If condensation occurs, turn the power off and leave it for about two hours. Once the camera acclimatizes to the surrounding temperature the condensation will go away naturally.

1.2 Cautions for use

Take care not to drop or knock the lens. Also take care not to put a lot of pressure on the lens.

- Take care not to drop the bag that you inserted the lens in as it may strongly shock the lens. The camera may stop operating normally and pictures may no longer be recorded. Also, the lens may be damaged.
- When carrying the digital camera with the lens attached, hold both the digital camera and the lens.

When using pesticides and other volatile substances around the camera make sure that they do not get onto the lens.

- If such substances get onto the lens they can damage the exterior case or cause the paint to peel.

Do not point the lens at the sun or other strong light sources.

- This could cause the lens to collect an excessive amount of light, resulting in fire and malfunction.
- Under no circumstances should the unit be stored in any of the following locations since doing so may cause problems in operation or malfunctioning.
 - In direct sunlight or on a beach in summer
 - In locations with high temperatures and humidity levels or where the changes in temperature and humidity are acute
 - In locations with high concentrations of sand, dust or dirt
 - Where there is fire
 - Near heaters, air conditioners or humidifiers
 - Where water may make the unit wet
 - Where there is vibration
 - Inside a vehicle

- Refer also to the owner's manual of the digital camera.
- When the unit is not going to be used for a prolonged period, we recommend storing with a desiccant (silica gel). Failure to do so may result in performance failure caused by mold, etc. It is recommended that you check the unit's operation prior to use.
- Do not leave the lens in contact with rubber or plastic products for extended periods of time.
- Do not touch the lens contact point. Doing so can cause failure of the unit.
- Do not disassemble or alter the unit.

Do not use benzine, thinner, alcohol or other similar cleaning agents to clean the lens glass or exterior cabinet.

- Using solvents can damage the lens or cause the paint to peel.
- Wipe off any dust or fingerprints with a soft, dry cloth.
- Use a dry, dust cloth to remove dirt and dust on the lens mount rubber, zoom ring, or focus ring.
- Do not use a household detergent or a chemically treated cloth.

Troubleshooting

A sound is heard when the camera is turned on or off.

- This is the sound of lens or aperture movement and is not a malfunction.

2 Service Navigation

2.1 Introduction

This service manual contains technical information, which allow service personnel's to understand and service this model

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, the information will be followed by supplement service manual.

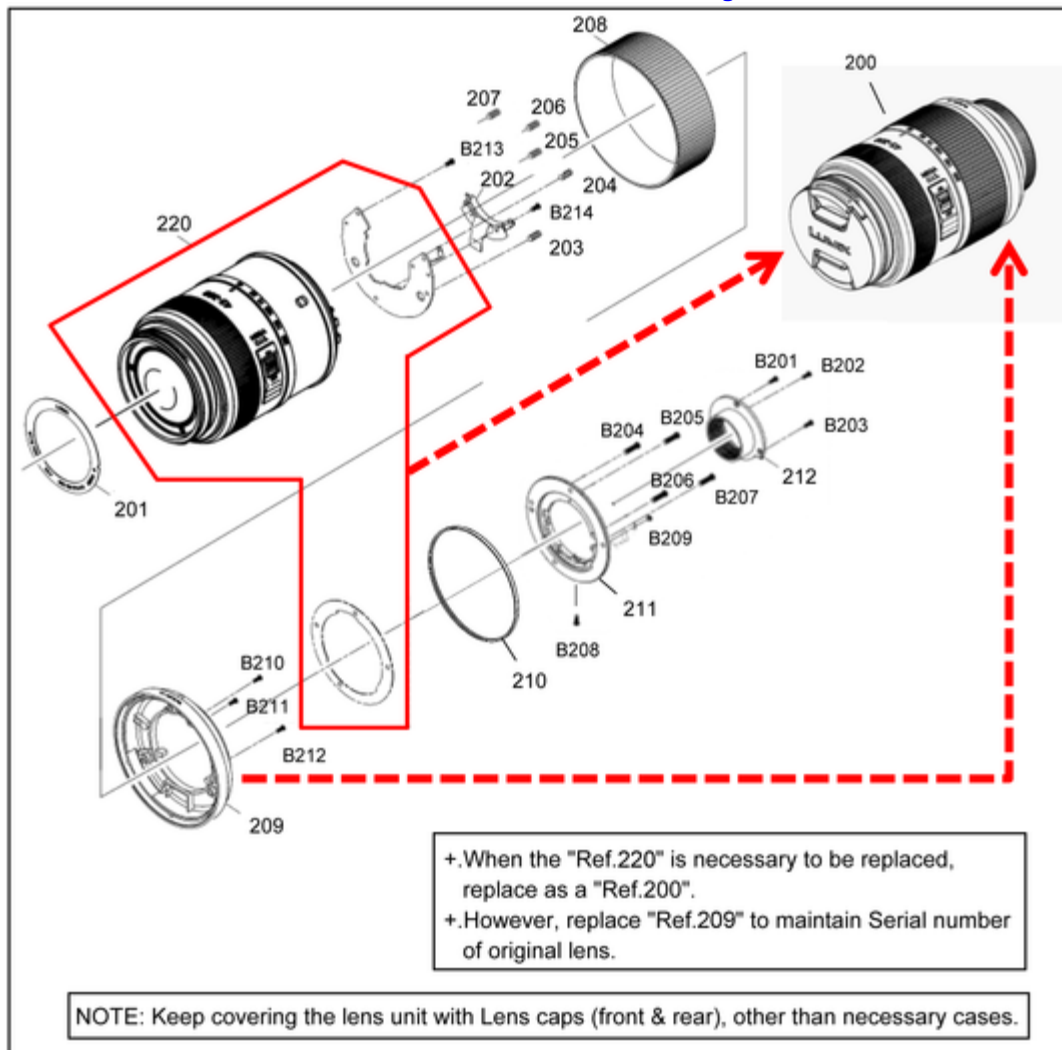
2.2 Important Notice

2.2.1 About LENS MAIN UNIT (Ref. 220)

1. LENS MAIN UNIT (Ref. 220) is not supplied due to difficulty of the transportation issue (Fragile, Dust-free packing), and requires critical lens adjustments.

Therefore, any needs of the "LENS MAIN UNIT" (Ref. 220), carefully confirm its performance in advance.
2. Once "LENS MAIN UNIT" (Ref. 220) is confirmed as defective, place order "LENS Unit" (Ref. 200) and replace REAR FRAME UNIT (Ref. 209), to maintain Serial number of owner's original lens.

Fig. 1-1



3. No adjustment is required when replacing the part mentioned on Fig.1-1. But, when tighten the concerned screws, apply proper torque

mentioned on "6. Disassembly and Assembly Instruction" section.

3 Specifications

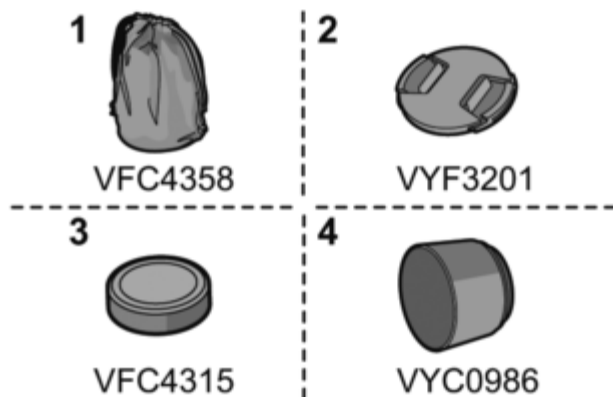
3.1 Specifications (Rated)

Specifications are subject to change without notice.

INTERCHANGEABLE LENS FOR DIGITAL CAMERA
“LUMIX G VARIO 45-200 mm/F4.0-5.6 II /POWER O.I.S.”

Focal length
f=45 mm to 200 mm (35 mm film camera equivalent: 90 mm to 400 mm)
Aperture type
7 diaphragm blades/circular aperture diaphragm
Maximum aperture
F4.0 (Wide) to F5.6 (Tele)
Minimum aperture value
F22
Lens construction
16 elements in 13 groups (3 ED lenses)
In focus distance
1.0 m (3.3 feet) to ∞ (from the focus distance reference line)
Maximum image magnification
0.19 \times (35 mm film camera equivalent: 0.38 \times)
Optical image stabiliser
Available
[O.I.S.] switch
Available (Switching ON/OFF)
Mount
“Micro Four Thirds Mount”
Angle of view
27° (Wide) to 6.2° (Tele)
Filter diameter
52 mm
Max. diameter
Approx. 70 mm (2.8 inch)
Overall length
Approx. 100 mm (3.9 inch) (from the tip of the lens to the base side of the lens mount)
Mass
Approx. 370 g (0.81 lb)
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Dust-proof and splash-proof
Available

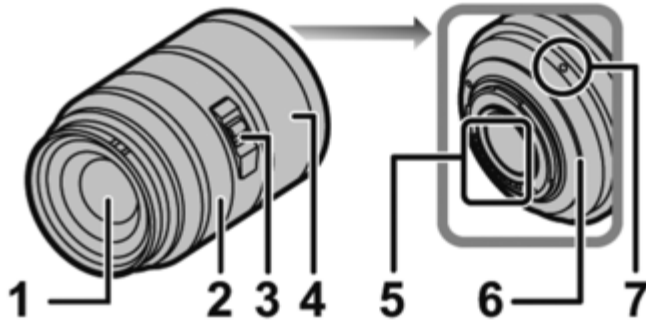
3.2 Accessories



- 1** Lens Pouch
- 2** Lens Cap
- 3** Lens Rear Cap
- 4** Lens Hood

- The lens rear cap and lens cap are attached to the interchangeable lens at the time of purchase.

4 Location of Controls and Components



- 1** Lens surface
- 2** Focus ring
Rotate to focus when taking pictures with manual focus (MF).
- 3** [O.I.S.] switch
When the lens is attached to the camera the stabilizer function is set to activate if the O.I.S. switch is set to [ON].
 - We recommend setting the O.I.S. switch to [OFF] when using a tripod.
- 4** Zoom ring
Rotate the zoom ring when you wish to take large (tele) or wide (wide angle) pictures.
- 5** Contact points
- 6** Lens mount rubber
- 7** Lens fitting mark





Note

- If you zoom after focusing, focusing errors may occur. After zooming, please perform the focusing again.
- In very quiet situations Auto Focus operating sounds may be recorded during motion picture recording. This is not a malfunction. In such situations, switching to Manual Focus will improve the situation.
- If you set the O.I.S. to [ON] when recording a motion picture, operating sounds may be recorded. If they become bothersome, we recommend setting the O.I.S. switch to [OFF] and mounting the camera on a tripod.

5 Service Fixture & Tools

5.1 Service Fixture and Tools

The following Service Fixture and Tools are used for Checking & Servicing for this unit.

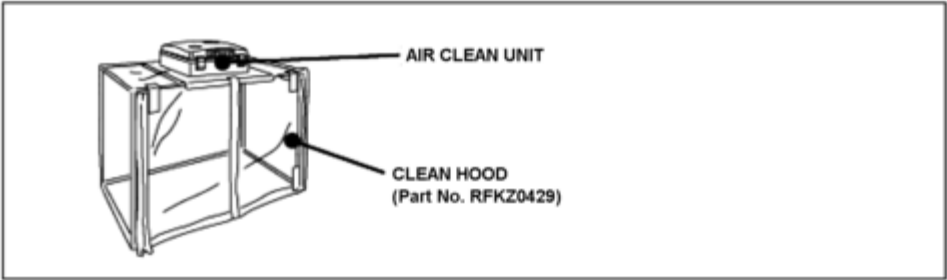
Lens Cleaning Kit (BK) VFK1900BK	Torque Driver RFKZ0542	Driver VFK1390
 * Only supplied 10 set/box.	 Spec: 2-30N・cm (Equiv.0,1-3kgf/cm)	
Name Ring Fixture RFKZ0507		
		

5.2 Clean Box

- The repair quality is considered, and it is recommended working in the environment of satisfied clean level less than class 10,000 (Federal Standard 209D).

[NOTE]

- Work in the environment of satisfied clean level less than class 10,000 (Federal Standard 209D) for cleaning the inside of the lens.



6 Disassembly and Assembly Instructions

6.1 Outline

Please be disassembly and assembly with reference to the flow chart and illustrations drawings.

Important:

- 1. It is recommended dealing with Clean Box, to keep maintaining the dustproof environment.
(Refef to " **5.2. Clean Box** " section of this Service Manual for details.)
- 2. To minimize the possibilities/risk of getting the dust/dirt on the lens surface, keep covering the lens unit with lens caps (front & rear), other than necessary cases.
- 3. Do not touch the surface of the lens glasses with your fingers.
- 4. Blow off the dust on the surface of the lens with a blower brush.
- 5. Use lens cleaning KIT (BK)(VFK1900BK).

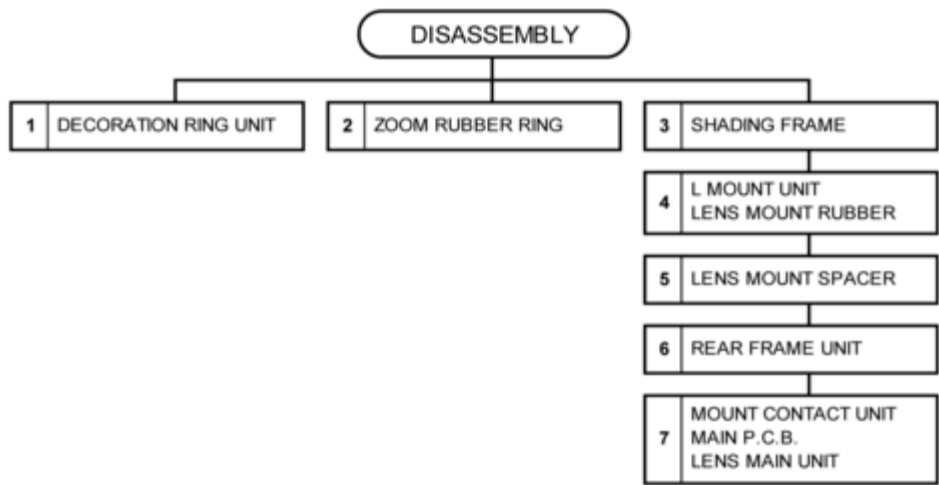
NOTE:

- 1. When installing the screws, be sure to use the torque driver (RFKZ0542) and tighten the screws with specified torque, mentioned on the following.

Caution

Keep covering the lens unit with Lens caps (front & rear), other than necessary cases.

6.2 Disassembly Flow Chart



6.3 Disassembly Procedure

Important:

It must be performed inside of satisfied clean level.

(Satisfied clean level:

Less than class 10,000(Federal Standard 209D))

6.3.1 Removal of the Decoration Ring Unit

1. The Decoration Ring Unit is stuck on the 1st Lens Frame Unit.
2. Put the sheet so that the lens glass is fully covered.
3. Insert the small flat blade screwdriver to Gap (between the Decoration Ring Unit and lens glass), and peel off the Decoration Ring Unit gently.



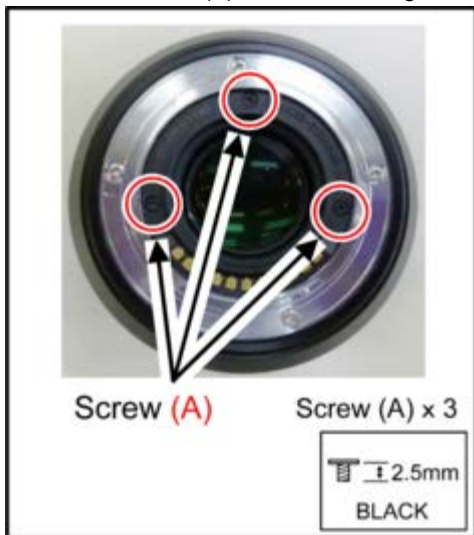
6.3.2 Removal of the Zoom Rubber Ring

1. Remove the Zoom Rubber Ring.



6.3.3 Removal of the Shading Frame

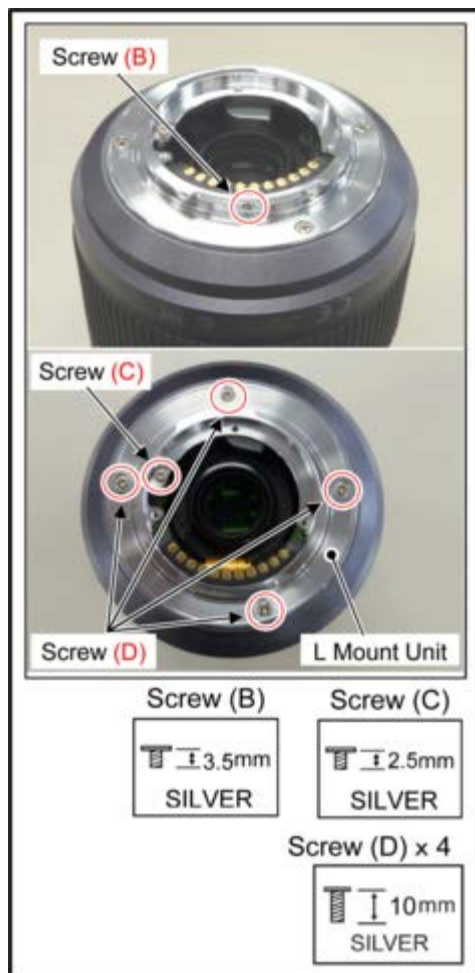
1. Remove 3 screws (A) and the Shading Frame.



6.3.4 Removal of the L Mount Unit

1. Remove screw (B), screw (C) and 4 screws (D).

2. Remove the L Mount Unit.

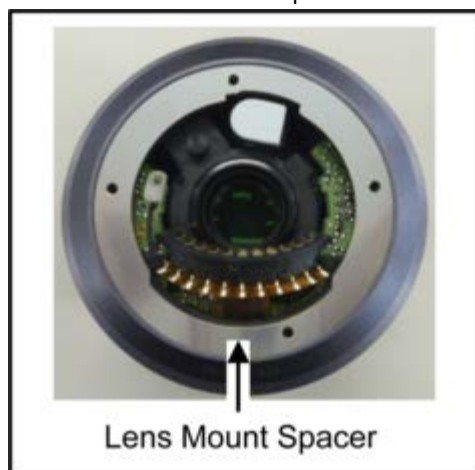


3. Remove the Lens Mount Rubber.



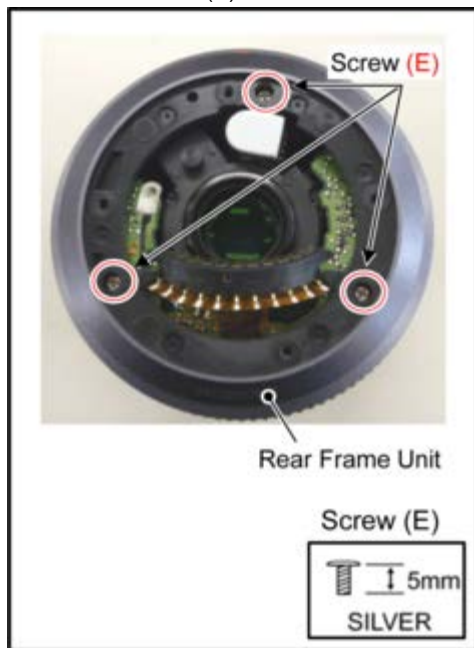
6.3.5 Removal of the Lens Mount Spacer

1. Remove the Lens Mount Spacer.



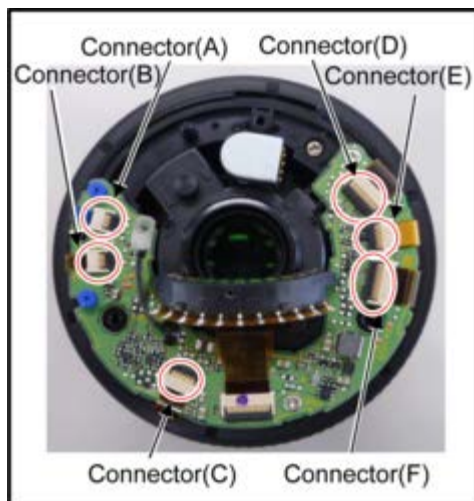
6.3.6 Removal of the Rear Frame Unit

1. Remove 3 screws (E) and the Rear Frame Unit.

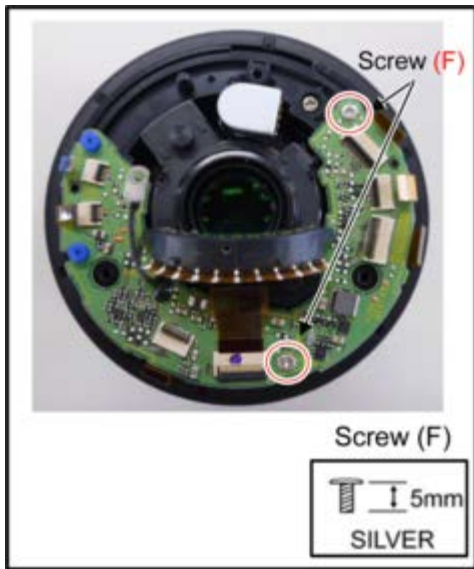


6.3.7 Removal of the Main P.C.B. and the Mount Contact Unit

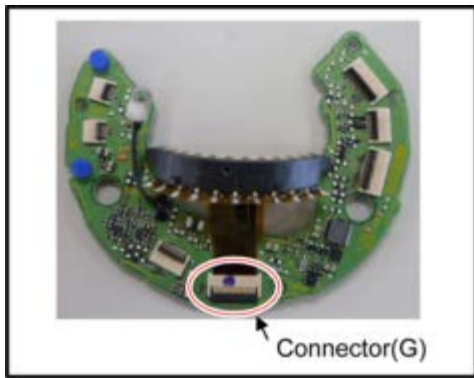
1. Disconnect the 6 Connectors of the Main P.C.B..



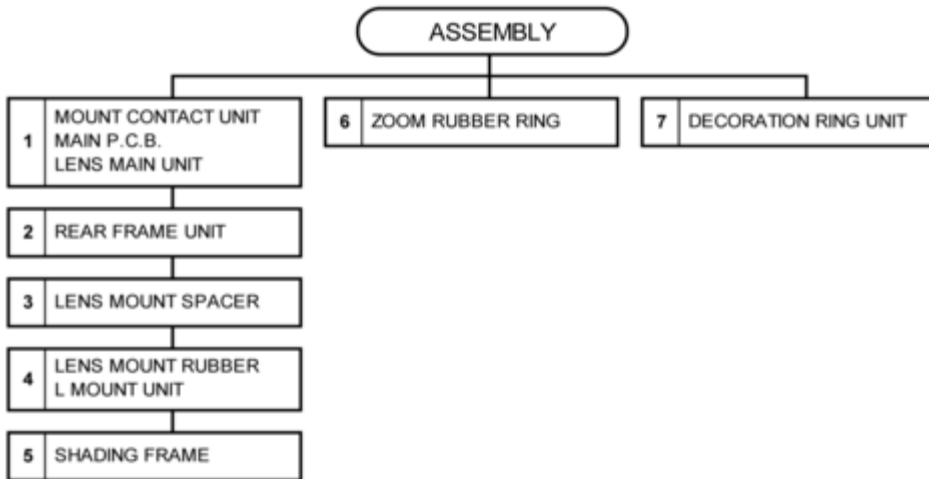
2. Remove 2 screws (F) and the Main P.C.B. with the Mount Contact Unit.



3. Remove the Mount Connect Unit from Main P.C.B..



6.4 Assembly Flow Chart



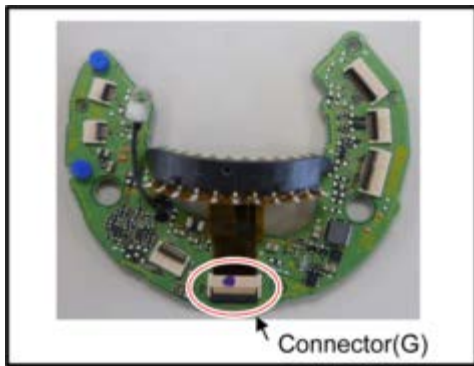
6.5 Assembly procedure

Important:

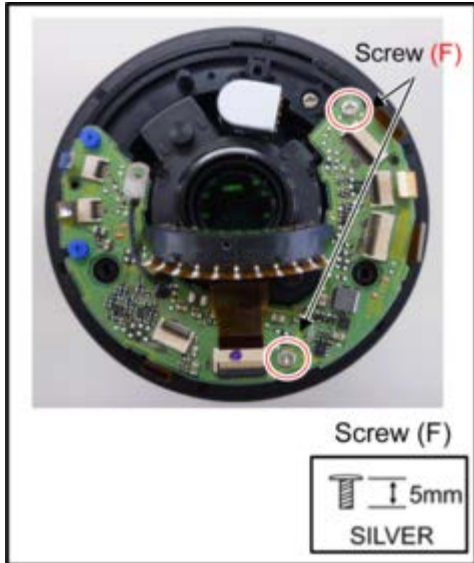
1. When tightening the screw, use a torque driver (RFKZ0542) with specified torque described in each step.

6.5.1 Installation of the Mount Contact Unit and the Main P.C.B.

1. Connect FPC of the Mount Connect Unit to connector.

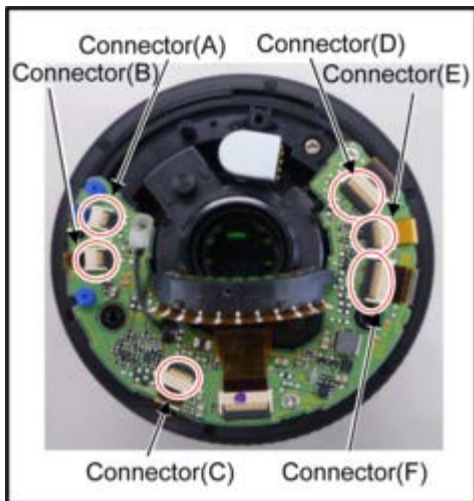


2. Installation the Main P.C.B. with the Mount Contact Unit.
3. Tighten 2 screws (F) by using the torque driver with specified torque.



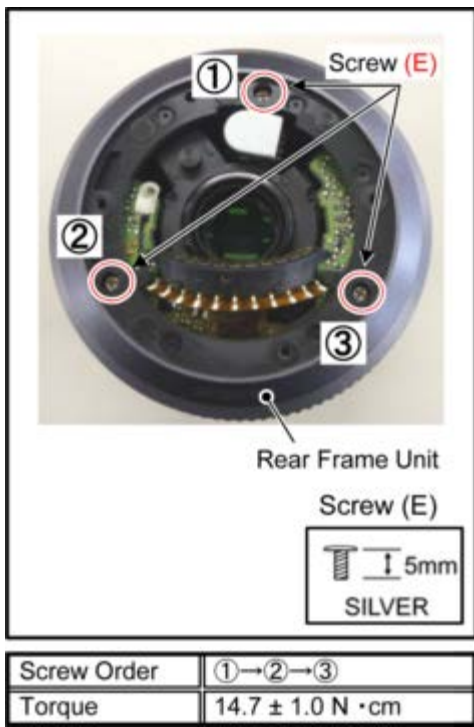
Screw Order	None specified
Torque	14.7 ± 1.0 N · cm

4. Connect FPCs to 6 connectors of the Main P.C.B..



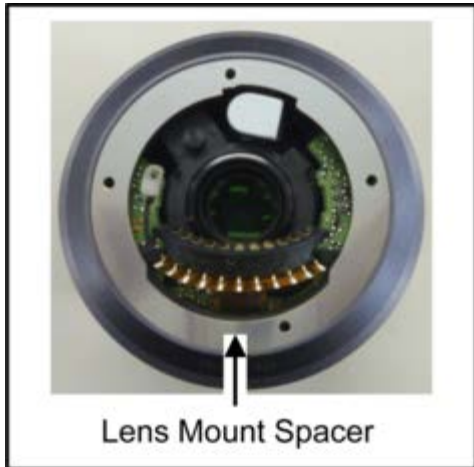
6.5.2 Installation of the Rear Frame Unit

1. Install the Rear Frame Unit.
2. Tighten 3 screws (E) in numerical order by using the torque driver with specified torque.



6.5.3 Installation of the Lens Mount Spacer

1. Install the Lens Mount Spacer.

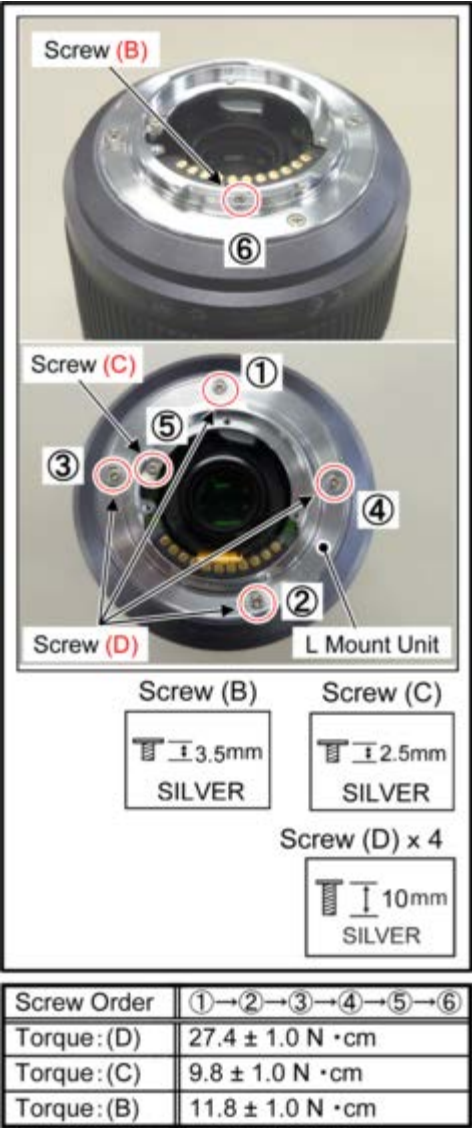


6.5.4 Installation of the Lens Mount Rubber and the L Mount Unit

1. Install the Lens Mount Rubber.

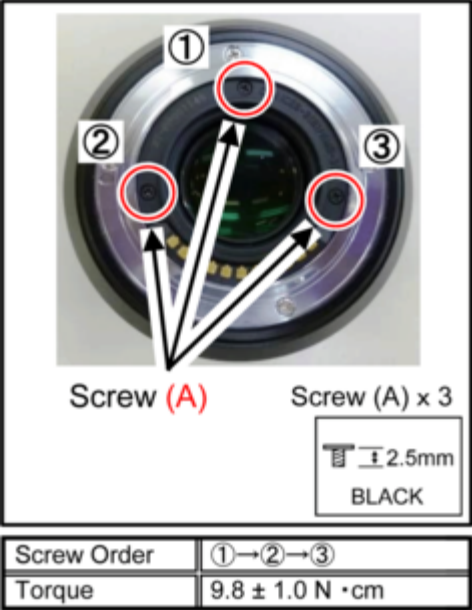


2. Install the L Mount Unit.
3. Tighten 4 screws (D), screw (C) and Screw (B) in numerical by using the torque driver with specified torque.



6.5.5 Installation of the Shading Frame

- 1. Install the Front Frame Unit.
- 2. Tighten 3 screws (A) in numerical order by using the torque driver with specified torque.



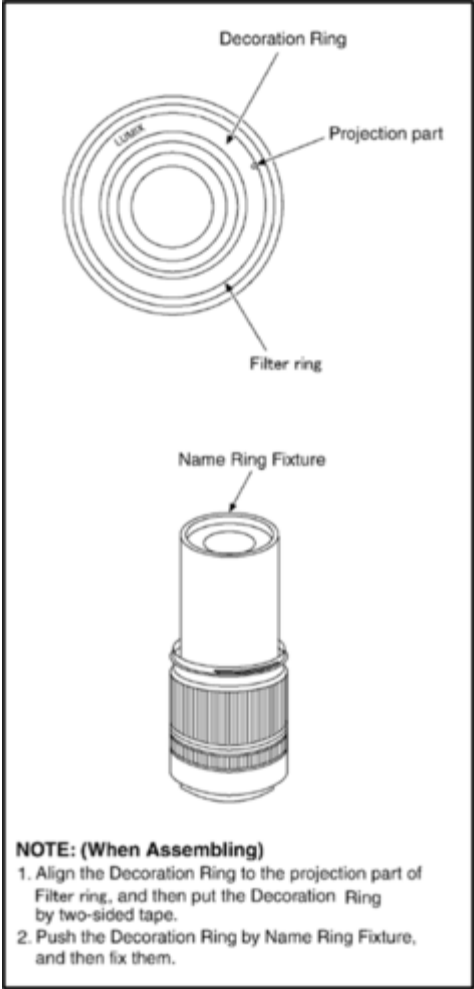
6.5.6 Installation of the Zoom Rubber Ring

- 1. Install the Zoom Rubber Ring.



6.5.7 Installation of the Decoration Ring Unit

- 1. Install the Decoration Ring Unit.
- 2. Pressed evenly by the Name Ring Fixture (RFKZ0507).



7 Maintenance

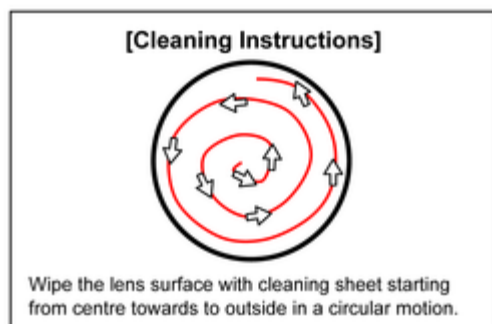
7.1 Dust / Dirt on the outer casing part(s)

1. Blow off the dust first, then sweep out the dust from narrower spaces with soft cleaning brush.
2. Wipe up the outer casing part with the dry fuzz-free cloth.

7.2 Dust / Dirt on the Lens Glasses (Lens Cleaning)


1. Blow off the dust on the Lens glass surface with the Blower, gently. (Do not blow strongly.)
2. Wipe out the dirt on the Lens glass surface with Lens Cleaning Kit (VFK1900BK) if necessary.

(Consult the instruction sheet which is included in the Lens Cleaning Kit in details.)



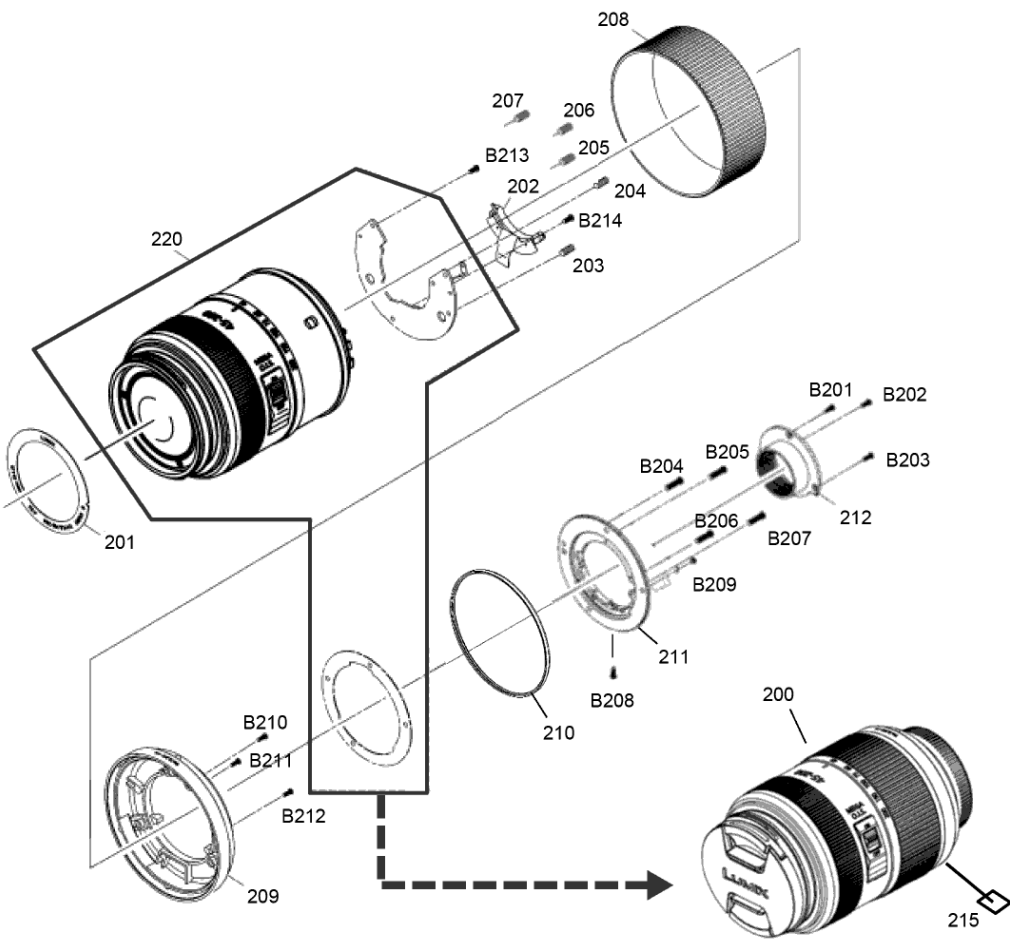
Model No. : H-FSA45200PP/E/GK Parts List Note

- Note:

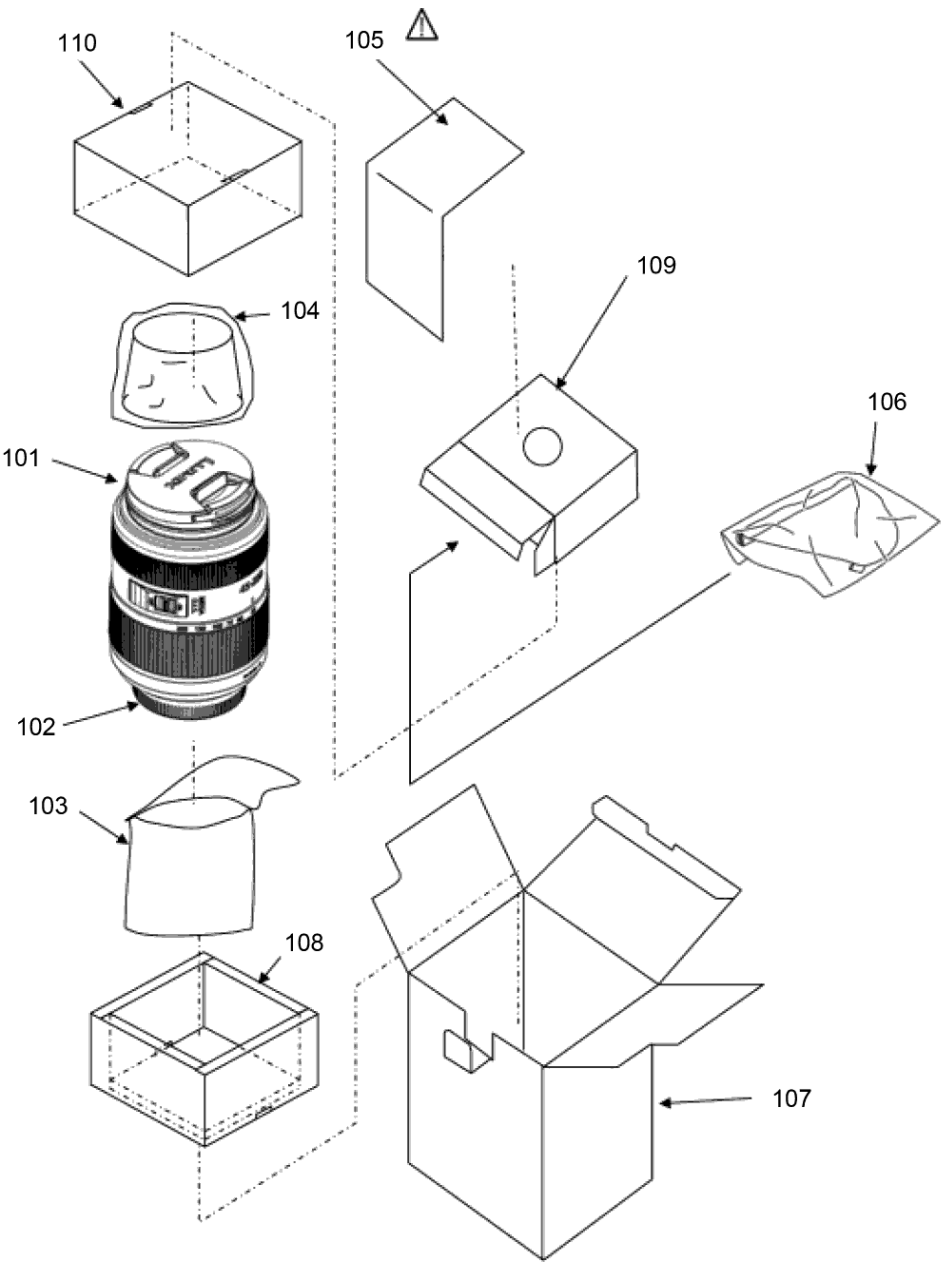
 - 1. * Be sure to make your orders of replacement parts according to this list.
 - 2. IMPORTANT SAFETY NOTICE
Components identified with the mark  have the special characteristics for safety.
When replacing any of these components, use only the same type.
 - 3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
 - 4. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.
 - 5. Supply of CD-ROM, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.

E.S.D. standards for Electrostatically Sensitive Devices, refer to PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES section.
All parts are supplied from AVC-IMAGING.

Model No. : H-FSA45200PP/E/GK Frame and Casing Section






Model No. : H-FSA45200PP/E/GK Packing Parts and Accessories



Model No. : H-FSA45200PP/E/GK Parts List

Change	Safety	Ref. No.	Part No.	Part Name & Description	Q'ty	Remarks
		101	VYF3201	LENS CAP	1	
		102	VFC4605	LENS REAR CAP	1	
		103	VPF1316	LENS BAG	1	
		104	VYC0986	LENS HOOD	1	
				OPERATING INSTRUCTIONS (ENGLISH/CA		

		105	DVQX1178Z	NADIAN-FRENCH/SPANISH)	1	PP
		105	DVQX1179Z	OPERATING INSTRUCTIONS (ENGLISH/GERMAN/FRENCH/SPANISH)	1	E
		105	DVQX1180Z	OPERATING INSTRUCTIONS (ITALIAN/CHINESE (TRADITIONAL) /RUSSIAN)	1	E
		105	DVQX1181Z	OPERATING INSTRUCTIONS (CHINESE (SIMPLIFIED))	1	GK
		106	VFC4358	LENS POUCH	1	
		107	DVPK1046Z	PACKING CASE	1	E
		107	1PE1Z115KPP	PACKING CASE UNIT	1	PP
		107	1PE1Z115KGK	PACKING CASE UNIT	1	GK
		108	VPN6762	CHSHION A	1	
		109	VPN7426	ACCESSORY BOX	1	
		110	VPN6763	CHSHION B	1	
		200	DVXE1020Z	LENS UNIT	1	
		201	PD4F100	DECORATION RING UNIT	1	
		202	P0479H0	MOUNT CONTACT UNIT	1	
		203	P04F370	FLOATING RUBBER	1	
		204	P04F370	FLOATING RUBBER	1	
		205	P04F370	FLOATING RUBBER	1	
		206	P04F370	FLOATING RUBBER	1	
		207	P04F370	FLOATING RUBBER	1	
		208	P04F900	ZOOM RUBBER RING	1	
		209	-----	REAR FRAME UNIT	1	(NOT SUPPLIED)
		210	9630230	LENS MOUNT RUBBER	1	
		211	PD48H50	L MOUNT UNIT	1	
		212	9630470	SHADING FRAME	1	
		215	VQL1V24	WEEE LABEL	1	E
		215	VQL1W22	TEN YEARS LABEL	1	GK
		220	-----	LENS MAIN UNIT	1	(NOT SUPPLIED)
		B201	0HE4025	SCREW	1	
		B202	0HE4025	SCREW	1	
		B203	0HE4025	SCREW	1	
		B204	0242050	SCREW	1	
		B205	0242050	SCREW	1	
		B206	0242050	SCREW	1	
		B207	0242050	SCREW	1	
		B208	0B44035	SCREW	1	
		B209	0554012	SCREW	1	
		B210	0242070	SCREW	1	
		B211	0242070	SCREW	1	
		B212	0242070	SCREW	1	
		B213	0257030	SCREW	1	
		B214	0257030	SCREW	1	