

Service Manual

Interchangeable Lens for Digital Camera

MEGA
O.I.S.



H-FS045200E
H-FS045200GK
H-FS045200PP

Vol.1



Specifications

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

Focal length	f=45 mm to 200 mm (35 mm film camera equivalent: 90 mm to 400 mm)
Aperture type	7 leaf shutters/iris diaphragm/circular diaphragm
Aperture range	F4.0 (Wide) to F5.6 (Tele)
Minimum aperture value	F22
Lens construction	16 elements in 13 groups (no aspherical lenses)
In focus distance	1.0 m (3.28 feet) to ∞ (from the focus distance reference line)
Maximum image magnification	0.19 \times (35 mm film camera equivalent: 0.38 \times)
Optical image stabilizer	Available
Mount	“Micro Four Thirds Mount”
Angle of view	27° (Wide) to 6.2° (Tele)
Filter diameter	52 mm (2.05 inch)
Max. diameter	70 mm (2.76 inch)
Overall length	Approx. 100 mm (3.94 inch) (from the tip of the lens to the base side of the lens mount)
Mass (Weight)	Approx. 380 g (13.4 oz)

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.

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1 Service Navigation

1.1. INTRODUCTION

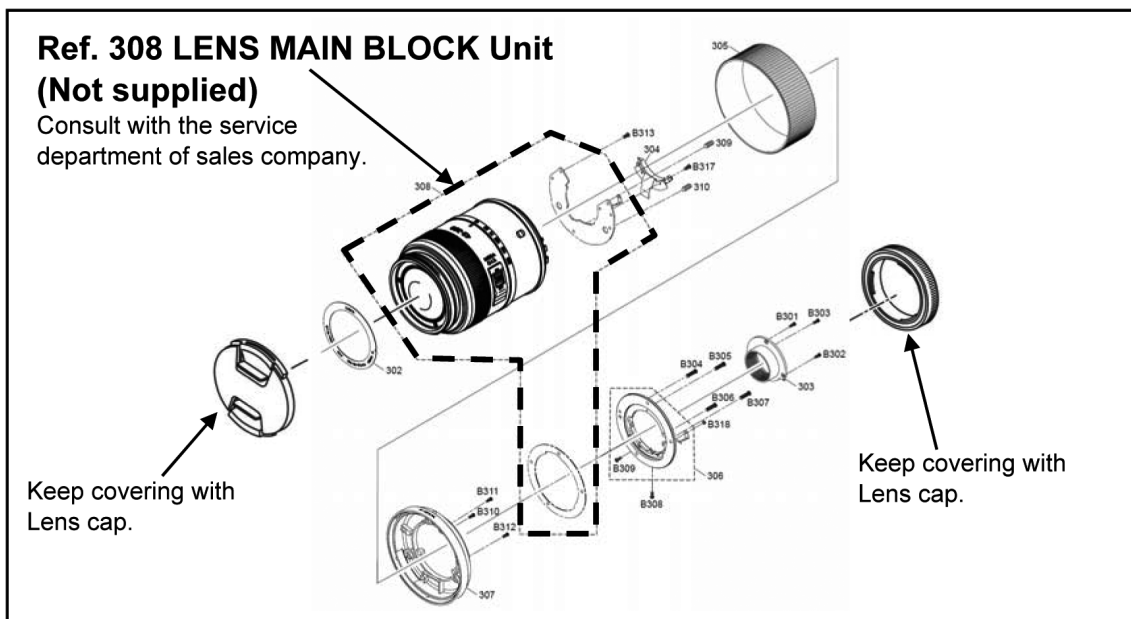
This service manual contains technical information, which allow service personnel's to understand and service this model.

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 service manual to be controlled with original service manual.

1.2. Important Notice

1. This Service Manual does not contain the repair service information for "LENS MAIN BLOCK UNIT"(Ref.308), because it requires special facilities and equipment.
2. "LENS MAIN BLOCK UNIT" performance must be confirmed with the "7.Troubleshooting Guide" section of service manual Vol.1 (Order No.DSC0810042CE) for DMC-G1K series.
3. In case of the "LENS MAIN BLOCK UNIT" defect, contact to the service department of sales company.



1.3. BEFORE USE

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.

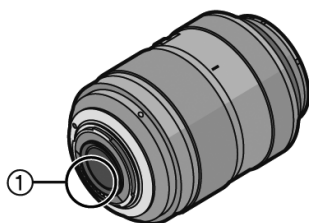
The lens can be used with a digital camera compatible with the lens mount standard for the "Micro Four Thirds System".

- It cannot be mounted on the Four Thirds™ mount specification camera.

Precautions

■ Lens Care

- **Sand and dust can damage the lens. Make sure that no sand or dust gets inside the lens or the terminals when using the lens on a beach, etc.**
- **This lens is not waterproof. If drops of water get onto the lens, wipe the lens with a dry cloth.**
- 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.
- Do not place the lens mount facing downwards. Do not allow the lens contact point ① to become dirty.



- The digital camera illustrations in these operating instructions show DMC-G1 as an example.
- The appearance and specifications of products described in this manual may differ from the actual products you have purchased due to later enhancements.
- Four Thirds™ is a trademark.
- Micro Four Thirds is a trademark.
- Other names, company names, and product names printed in these instructions are trademarks or registered trademarks of the companies concerned.

■ 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
 - 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
- Put the camera into a plastic bag to allow it to acclimate to the surrounding temperature in order to prevent condensation. If condensation occurs, turn the power off and leave it for about two hours. Once the camera acclimates to the surrounding temperature the condensation will go away naturally.

1.4. CAUTIONS FOR USE

Cautions for Use

■ About the Lens

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 damage the lens. The camera may stop operating normally and pictures may no longer be recorded.

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 carry the unit when it is still attached to the camera body.

- 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 operating instructions of the digital camera.
- When the unit is not going to be used for a prolonged period, mold and other problems may cause performance failure. 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. If the internal parts require inspection or repair, take the unit to the vendor.

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 zoom ring and the focus ring.
- Do not use a household detergent or a chemically treated cloth.

Troubleshooting

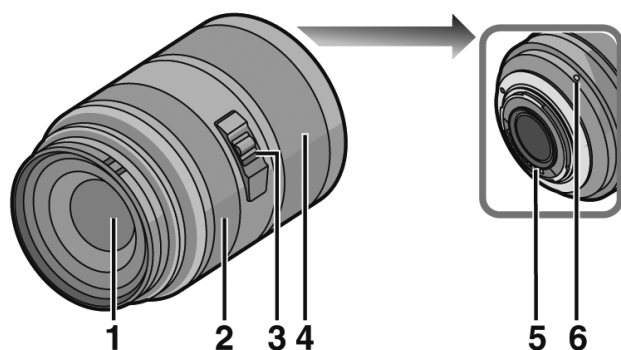
A sound is heard when the camera is turned on or off.

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

2 COMPONENTS

Names and Functions of Components

■ Lens



1 Lens surface

2 Focus ring

Rotate to focus when taking pictures with manual focus.

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.
- The stabilizer function may not be effective in the following cases.
 - When there is a lot of jitter.
 - When the zoom magnification is high.
 - When using the digital zoom.
 - When taking pictures while following a moving subject.
 - When the shutter speed becomes slower to take pictures indoors or in dark places.

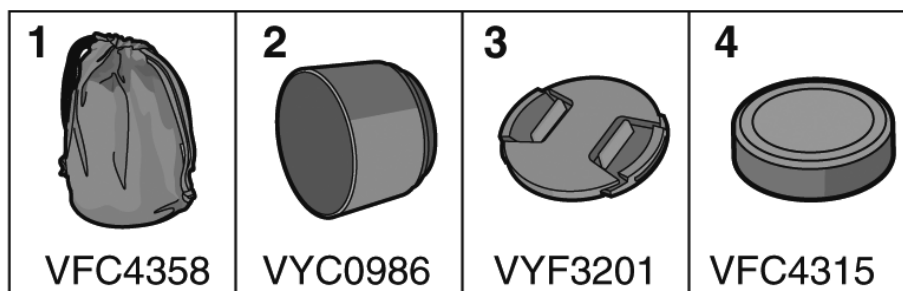
4 Zoom ring

Rotate the zoom ring when you wish to take large (tele) or wide (wide angle) pictures. (35 mm film camera equivalent: 90 mm to 400 mm)

5 Contact point

6 Lens fitting mark

2.1. ACCESSORIES



1 Lens Storage Bag

2 Lens Hood

3 Lens Cap

4 Lens Rear Cap

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

2.2. ATTACHING/DETACHING THE LENS

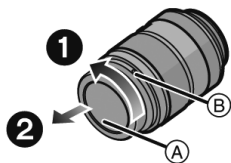
- Refer also to the camera's operating instructions for attaching and detaching the lens.

■ Attaching the Lens

- Check that the camera is turned off.

1 Turn the lens rear cap to detach it.

(A): Lens Rear Cap



2 Align the lens fitting marks (B) (red marks) on the camera body and the lens and then rotate the lens in the direction of the arrow until it clicks.

- Do not press the lens release button when you attach a lens.
- Do not try to attach the lens when holding it at an angle to the camera body as the lens mount may get scratched.
- Check that the lens is attached correctly.

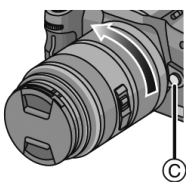


■ Detaching the Lens

- Check that the camera is turned off.

Press the lens release button (C) while turning the lens as far as possible in the direction of the arrow to detach it.

- Attach the lens rear cap so that the lens contact point does not get scratched.
- Attach the body cap to the camera so no dirt or dust will get inside the main unit.



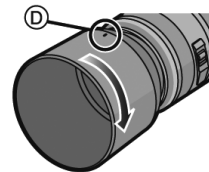
■ Attaching and Detaching the Lens Cap

- Be careful not to lose the lens cap.



■ Attaching the Lens Hood (Supplied Accessory)

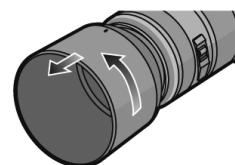
Insert the lens hood into the lens, and turn in the direction of the arrow until it stops.



(D): Fit to the mark

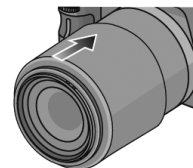
■ Temporarily Storing the Lens Hood

1 Turn the lens hood in the direction of the arrow to detach it.



2 Reverse the lens hood and then attach it in the same way as shown previously.

- When taking pictures with the flash with the lens hood attached, the lower portion of the screen may turn dark (vignetting effect) and the control of the flash may be disabled because the photo flash may be obscured by the lens hood. We recommend detaching the lens hood.
- When using the AF assist lamp in the dark, detach the lens hood.




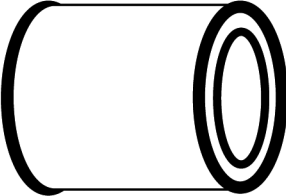

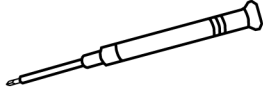
■ Attaching Filters

- Edges of pictures may be cut off if more than one PL filter (optional) or MC protector (optional) is used or if thick filters and/or protectors are used.

3 Service Fixture & Tools

3.1. Service Fixture and Tools

The following Service Fixture and tools are used for checking and servicing this unit.

Lens Cleaning Kit (BK) VFK1900BK	NAME RING FIXTURE RFKZ0507	TORQUE DRIVER RFKZ0456
 <p>* Only supplied as 10 set/box.</p>		 <p>Spec.:2-30cN・m (Equiv.0.2-3kgf/cm)</p>
Driver VFK1390		
		

3.2. Clean Box

3.2.1. Servicing the Unit

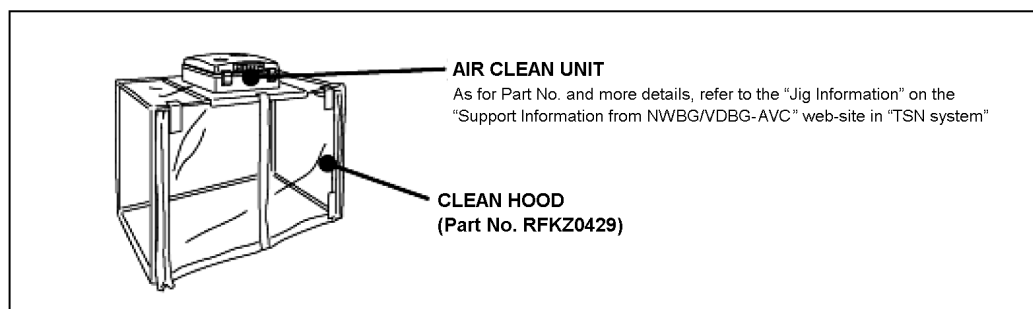
To keep dustproof environment when repairing the unit, CLEAN BOX is recommended.

3.2.2. Introduction of Clean box

One of our recommended clean box is as shown below. (less than class 10,000 Federal Standard 209D).

It consists of "Air clean unit" and "Clean hood".

As for the "Air clean unit", refer to the "Jig Information" on the "Support Information from NWBG/VDBG-AVC" web-site in "TSN system".



4 DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

4.1. DISASSEMBLY AND ASSEMBLY PROCEDURE FOR THE LENS 2 (H-FS045200)

Refer to the following table and the illustration for disassembly and assembly.

NOTE:

1. To keep maintaining the dustproof environment, it is recommended dealing with Clean box.
2. Do not allow dirt and dust to get into the inside part/component of the unit.
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).

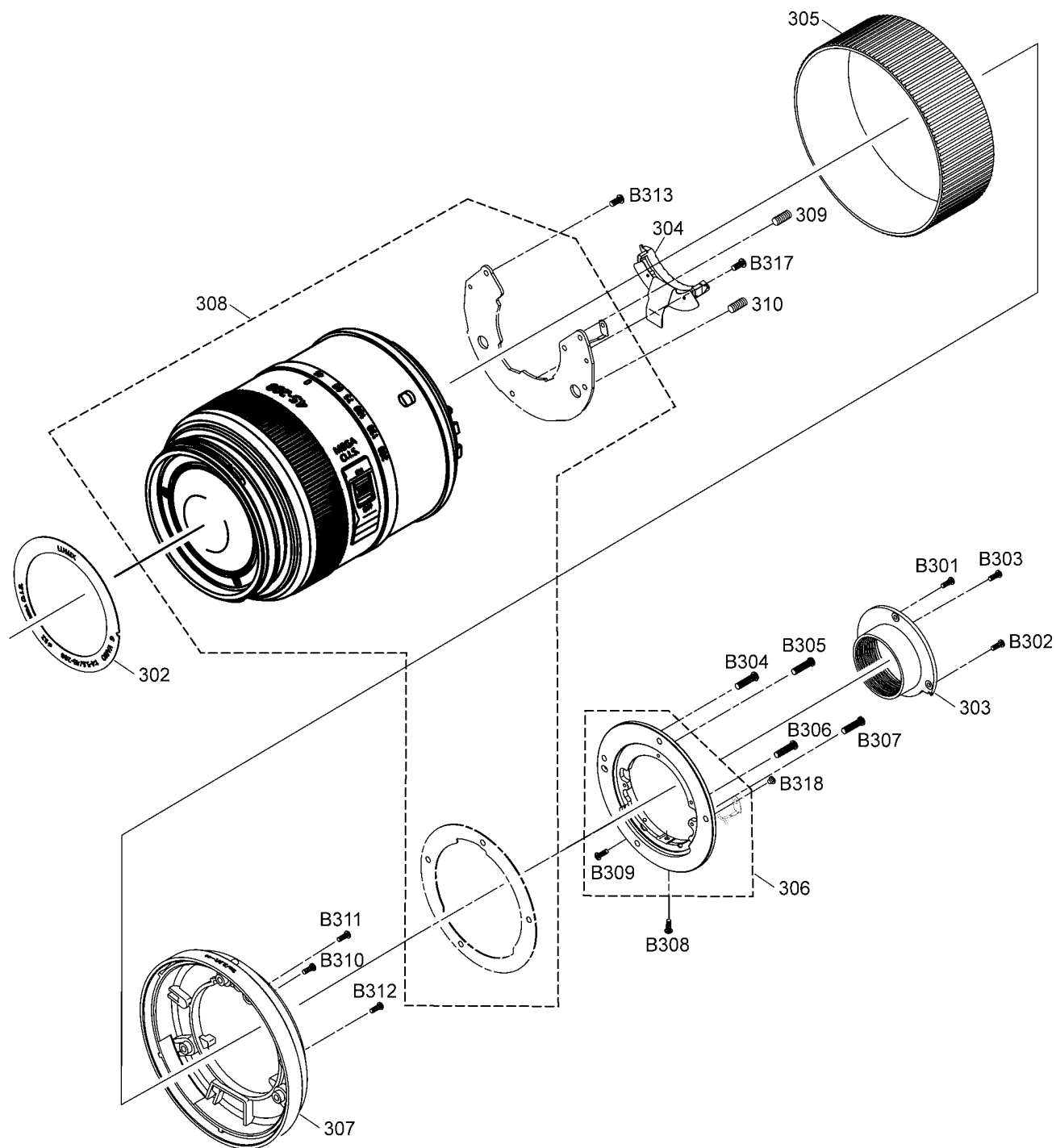
CAUTION:

Keep covering with Lens cap front, Lens cap rear, other than necessary cases.

Concerned parts		screws			Torque value	Clamping order
Part name	Ref. No.	Ref. No.	Color	Length(mm)		
Shading frame	303	B301	Black	2.5 mm	9.8±1.0 N·cm	10
		B302	Black	2.5 mm	9.8±1.0 N·cm	12
		B303	Black	2.5 mm	9.8±1.0 N·cm	11
L mount unit	306	B304	Silver	5.0 mm	19.6±1.0 N·cm	4
		B305	Silver	5.0 mm	19.6±1.0 N·cm	6
		B306	Silver	5.0 mm	19.6±1.0 N·cm	7
		B307	Silver	5.0 mm	19.6±1.0 N·cm	5
		B318	Silver	1.2 mm	9.8±1.0 N·cm	9
Mount contact unit	304	B308	Silver	2.5 mm	11.8±1.0 N·cm	8
Rear pipe unit	307	B310	Silver	7.0 mm	19.6±1.0 N·cm	2
		B311	Silver	7.0 mm	19.6±1.0 N·cm	1
		B312	Silver	7.0 mm	19.6±1.0 N·cm	3

NOTE:

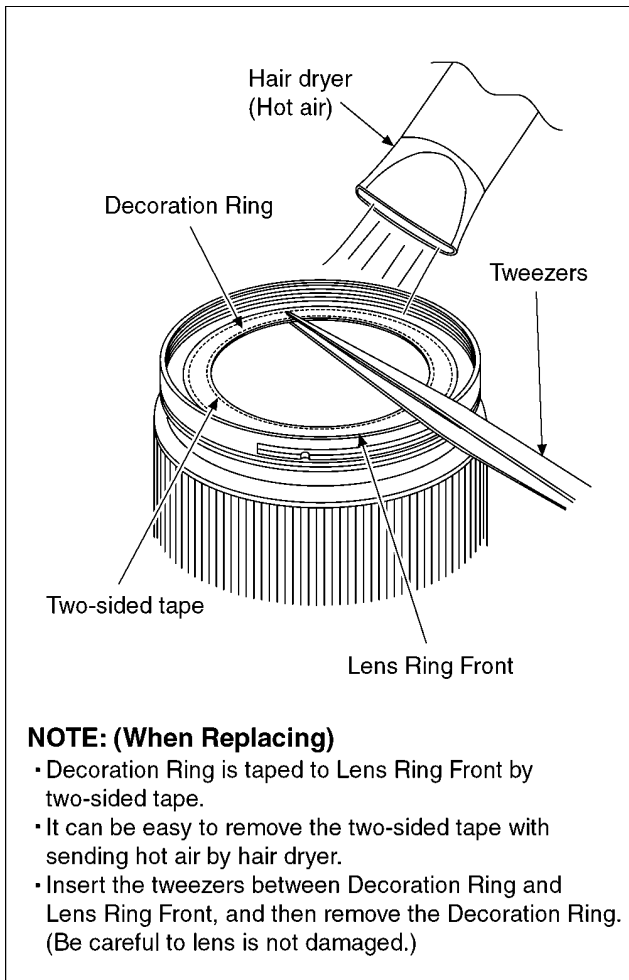
1. When installing the screws, be sure to use the torque driver (RFKZ0456) and tighten the screws with specified torque, mentioned on the above table.
2. The Ref. No. B309, B313, B317 is no need to remove/install for disassembly and assembly.
Use VFK1390 (driver) when screwing B309.



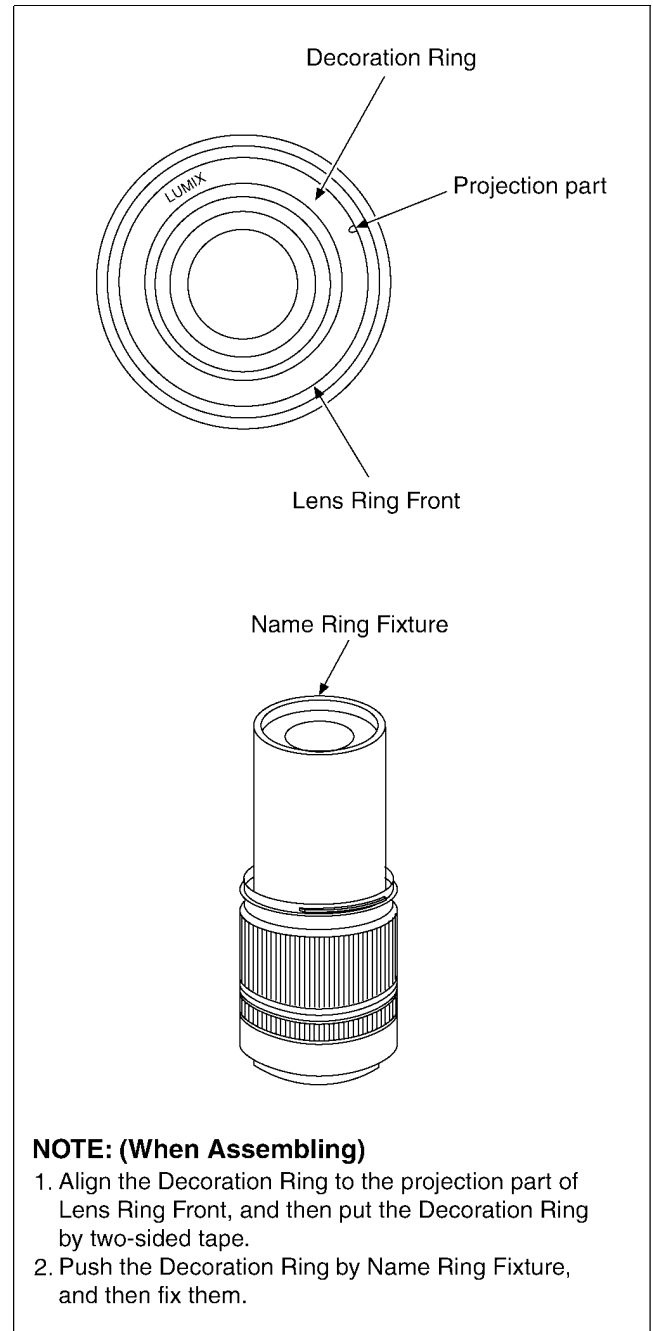
4.2. Removal of the Decoration Ring

NOTE:

Be careful not touch the lens surface with Tweezers when removing the Decoration Ring.



4.3. Phase alignment of the Decoration Ring



5 Maintenance

5.1. CLEANING OF THE LENS SURFACE

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.

DUST/DIRT ON THE LENS GLASSES

Define the location of the dust/dirt first, whether it is outside lens surface or not.

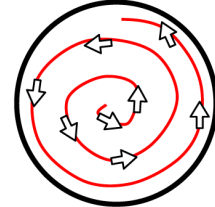
[1]. When it is outside surface of the lens:

1. When the dust and/or dirt gets on the outer side surface of the Lens glasses, order the following procedures.
 - (1). Blow off the dust on the Lens glass surface with the Blower, gently.
(Do not Blow too 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.)

[2]. When it is inside of the lens:

1. It is not allowed to disassemble the Lens other than described in service manual.
In case of the dust/dirt is inside of the "LENS MAIN BLOCK UNIT", contact to the service department of sales company.

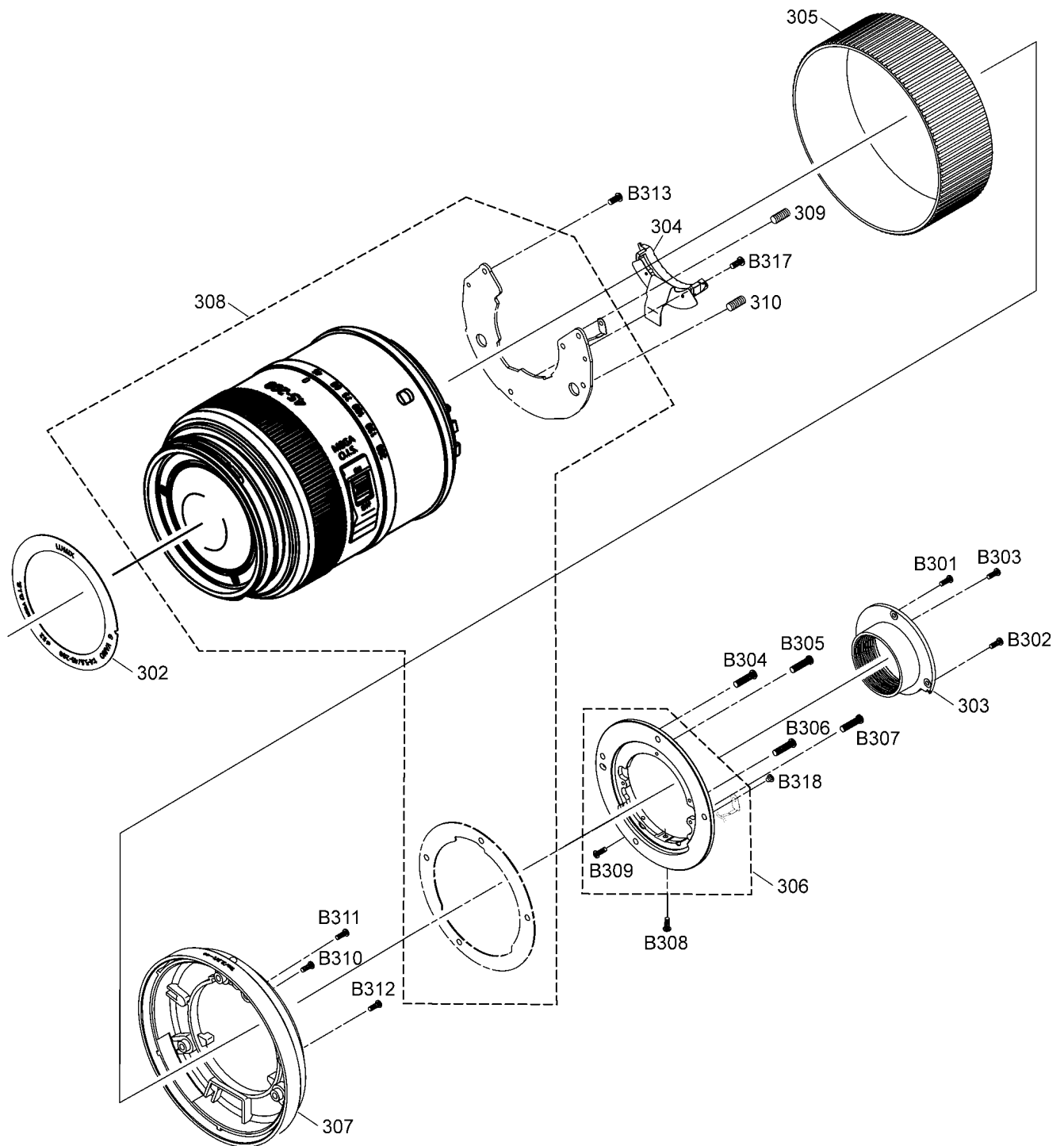
[Cleaning Instructions]



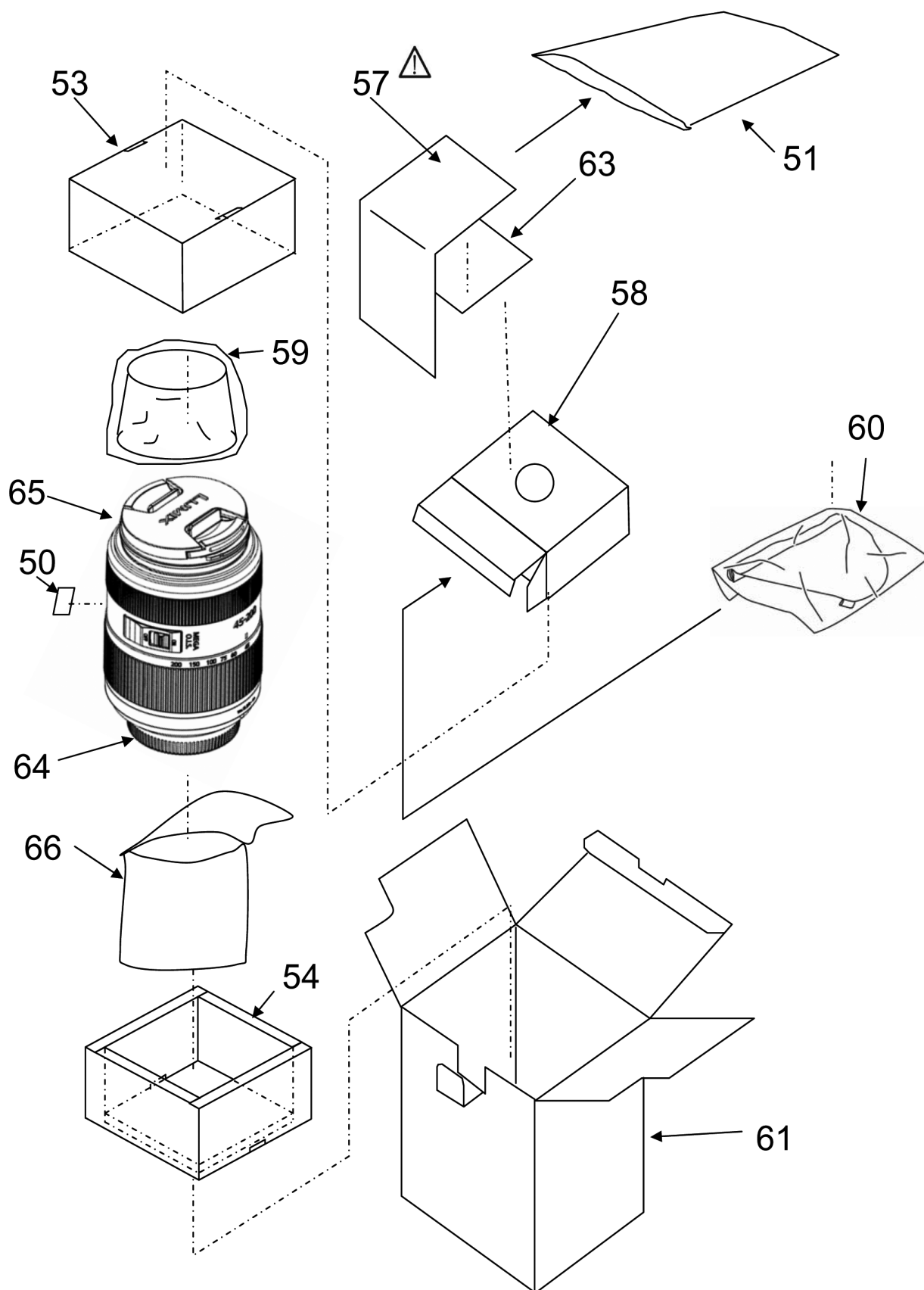
Wipe the lens surface with cleaning sheet starting from centre towards to outside in a circular motion.

6 EXPLODED VIEWS

6.1. FRAME & CASING SECTION



6.2. PACKING PARTS & ACCESSORIES SECTION



7 REPLACEMENT PARTS LIST

7.1. MECHANICAL REPLACEMENT PARTS LIST

Note: 1.* Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark Δ 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.

7.1.1. FRAME & CASING SECTION PARTS LIST

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
50	VQL1V24	WEEE LABEL	1	E
51	VPF1230	POLY BAG	1	E/PP
53	VPN6763	CUSHION B	1	
54	VPN6762	CUSHION A	1	
57	VQT1U89	OPERATING INSTRUCTIONS (EN/GE/FR/SP/IT/CO/RU)	1	E Δ
57	VQT1U88	OPERATING INSTRUCTIONS (EN/CF/SP)	1	PP Δ
57	VQT1U90	OPERATING INSTRUCTIONS (CN)	1	GK Δ
58	VPN6764	ACCESSORY BOX	1	
59	VYC0986	LENS-HOOD-U	1	
60	VFC4358	LENS BAG(L)	1	
61	VPK3661	INNER CARTON	1	E
61	VPK3661B-KIT	INNER CARTON	1	PP
61	VPK3662	INNER CARTON	1	GK
63	VQL1M13	OPERATING LABEL	1	E/PP
64	VFC4315	LENS CAP REAR	1	
65	VYF3201	LENS CAP FRONT	1	
66	VPF1262	POLY BAG	1	

7.1.2. PACKING PARTS & ACCESSORIES SECTION PARTS LIST

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
300	VXW0971	LENS UNIT	1	
302	P04F310	DECORATION RING	1	
303	9630020	SHADING FRAME	1	
304	P0479H0	MOUNT CONTACT UNIT	1	
305	P04F900	ZOOM RUBBER RING	1	
306	P048H50	L MOUNT UNIT	1	
307	-----	REAR TUBE UNIT	1	Not supplied
308	-----	LENS MAIN BLOCK U	1	Not supplied
309	P04F370	FLOWTING RUBBER	1	
310	P04F370	FLOWTING RUBBER	1	
B301	0HE4025	SCREW	1	
B302	0HE4025	SCREW	1	
B303	0HE4025	SCREW	1	
B304	0242050	SCREW	1	
B305	0242050	SCREW	1	
B306	0242050	SCREW	1	
B307	0242050	SCREW	1	
B308	0B44025	SCREW	1	
B309	9580270	SCREW	1	
B310	0247070	SCREW	1	
B311	0247070	SCREW	1	
B312	0247070	SCREW	1	
B313	0257030	SCREW	1	
B317	0257030	SCREW	1	
B318	0554012	SCREW	1	