6-1. INTRODUCTION

The standard LDH-1 lens for general purpose studio use is the Schneider 5:1 (25-125mm) f/1.7 zoom lens. It is designed with a long back focal length to match the "1" Plumbicon/Vidicon format. The lens can be supplied with either manual or servo control. In either case, iris operation is controlled from the Local Control module or Remote Control Unit. Refer to Table 1-1, Equipment Complement, for additional lens types that are available.

6-2. LENS OPERATION

A. Zoom

The zoom lenses available with the camera system enable the operator to change the televised image size form a wide-angle to a close-up picture. Zooming changes the focal length of the lens. A wide-angle image is derived from a short focal length and a close-up image is the result of a long focal length. To ensure a centered object throughout the zoom range, the camera should be positioned with a close-up picture.

B. Focus

The front assembly of the lens is moved in and out to focus the televised image. The lenses used with this camera system are capable of focusing from infinity down to approximately five feet. The most accurate focusing is attained when the lens is zoomed to the close-up position and the iris is fully open. With the lens in these positions, the depth of field of sharp focus is at a minimum. Conversely, when the lens is zoomed to the wide-angle position, the depth of field of focus is greatest. A depth of field scale is engraved on the focus ring.

NOTE

Depth of field is the distance from the nearest point of sharp focus to the farthest point of sharp focus.

C. Iris

The iris is the adjustable opening which admits light through the lens. The speed of the lens is the maximum iris or aperture setting calibrated in f/numbers. The f/numbers are engraved on the iris adjustment ring and are calculated as follows:

$$f = \frac{\text{FOCAL LENGTH}}{\text{IRIS OPENING}}$$

6-2. LENS OPERATION (Continued)

The higher the f/stop, the smaller the lens opening becomes, and conversely, the lower the f/stop, the wider the lens opening becomes. Closing the iris one full f/stop halves the amount of light entering the lens. Opening the iris one full f/stop doubles the amount of light entering the lens. Standard full f/stop numbers are listed below:

2 2.8 4 5.6 8 11 16

Closing the iris, consistent with available lighting, provides a greater depth of field.

6-3. CARE OF LENSES

The front surfaces of most modern lenses are coated with a microscopically thin film for color correction or light reflection which is easily scratched or damaged when not properly cleaned. To clean this surface, proceed as follows:

1. Remove any accumulation of dust with a camel hair brush.

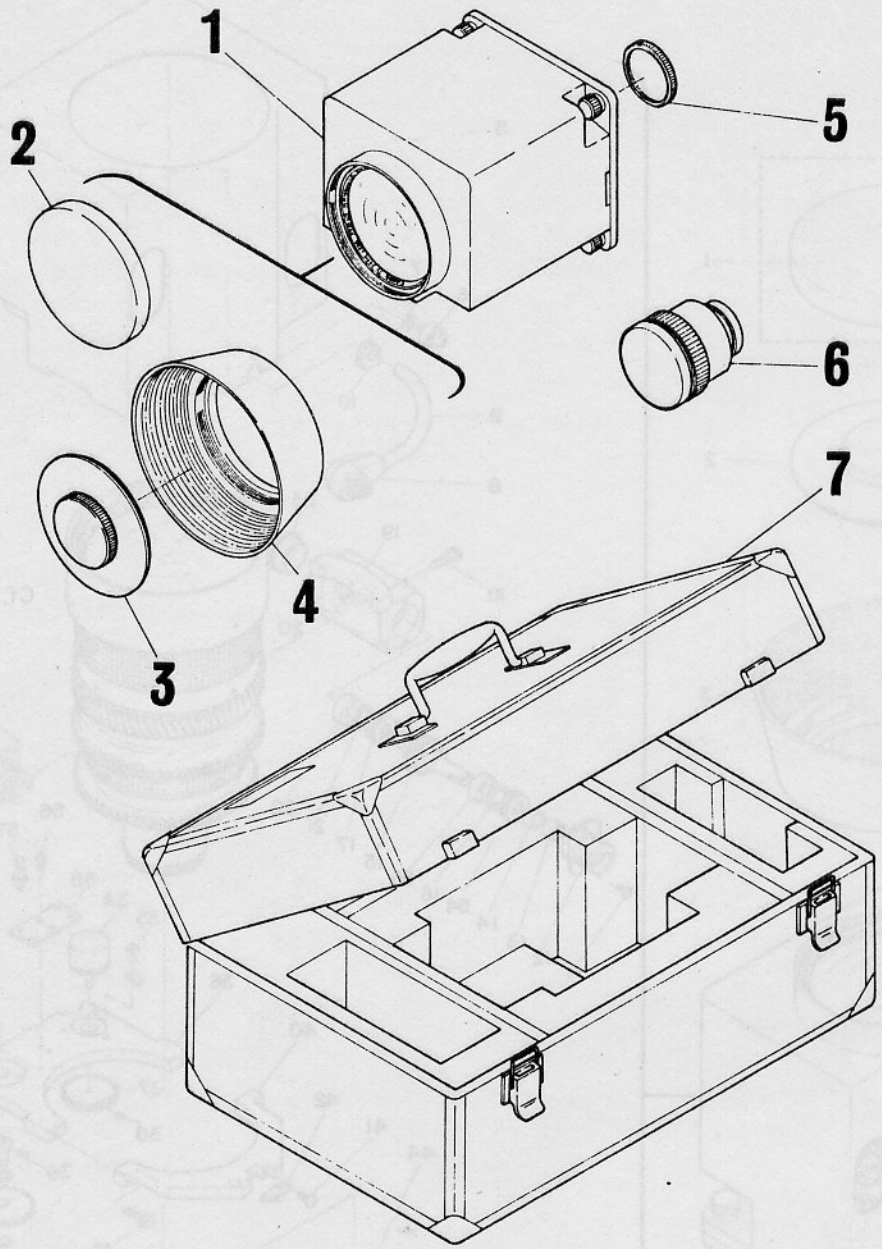
2. Remove smudges such as fingerprints with lens cleaning tissue moistened with isopropyl alcohol or Eastman Kodak Lens Cleaner.

3. Do not subject lens to extreme heat. The lens is constructed of compound elements cemented together with an adhesive which could be adversely affected by heat.

6-4. CANON 15-150mm f/2.0 ZOOM LENS

The Canon 15-150mm f/2.0 Zoom Lens is designed to be used with the LDH-1/COS Camera System. When plug (R) on the lens assembly is inserted into connector (R) on the camera front, the servo-controlled iris may be adjusted with the IRIS control on the control panel. Zoom and focus functions are controlled manually using cables connected to the zoom and focus drives on the underside of the lens assembly. Refer to the following figures and their associated parts lists for detailed lens information.

Figure	Title
6-1	Canon Zoom Lens with Carrying Case
6-2	Canon Lens Housing Exploded View
6-3	Canon Aperture and Relay Lens Group
6-4	Canon Focus and Zoom Optical System
6-5	Canon Iris Servo Drive Schematic Diagram



KEY NO.	DESCRIPTION	PART NO.
1	PV10 x 15B LDH-1 15-150mm 1:20	S2-0299
2	Lens Cap	29-5493
3	Hood Cap	24-9194
4	Hood	24-8532
5	Dust Cap	24-8547
6	Extender 2.0X	S2-5289
7	Carrying Case	4-76271

FIGURE 6-1
CANON ZOOM LENS WITH CARRYING CASE

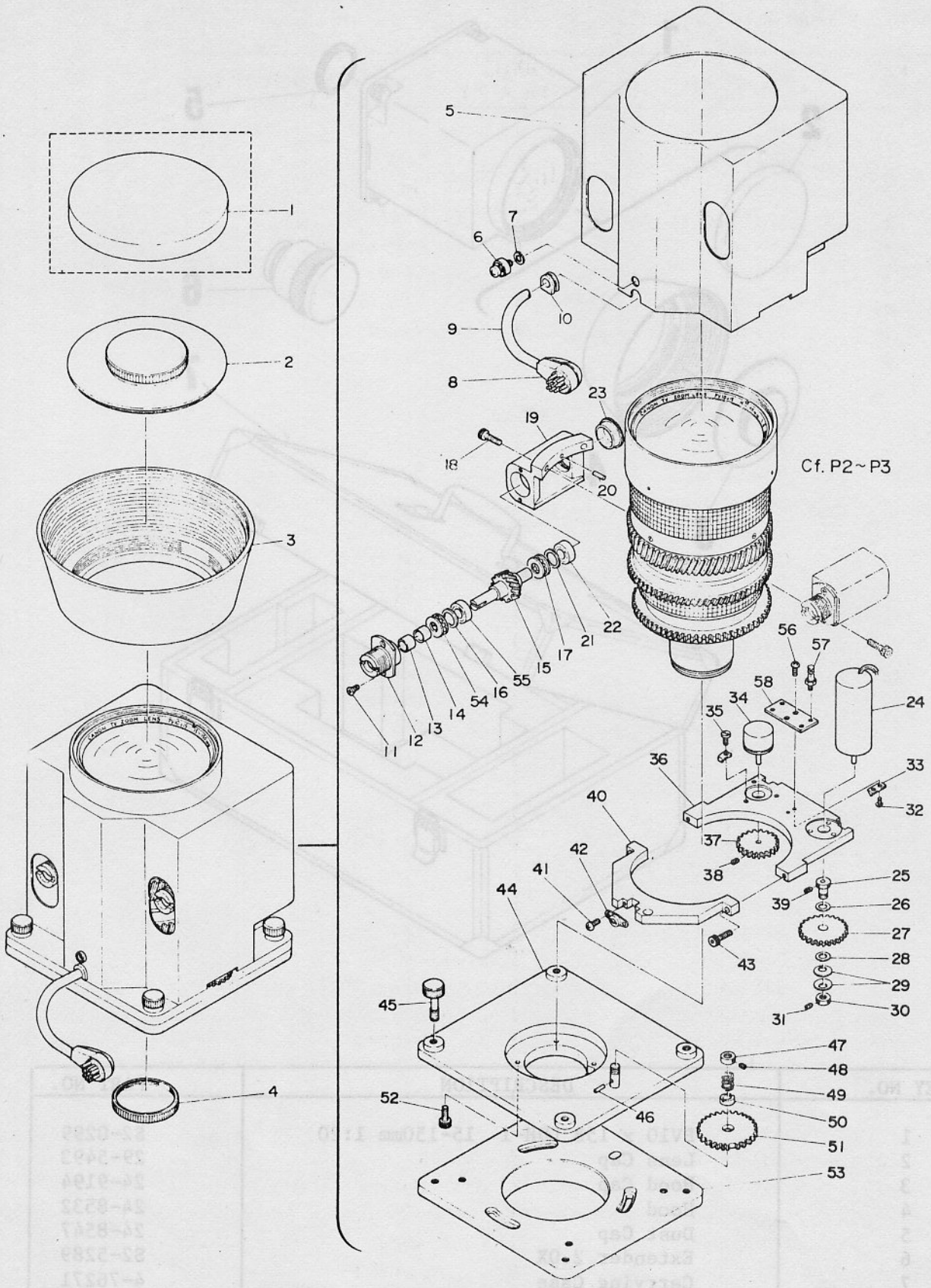


FIGURE 6-2
CANON LENS HOUSING EXPLODED VIEW

CANON LENS HOUSING PARTS LIST

KEY NO.	PART NO.	UNITS PER ASS'Y	DESCRIPTION
1	29-5493-02	1	Lens Cap
2	24-9194-01	1	Hood Cap
3	24-8532-06	1	Hood
4	24-8547-02	1	Dust Cap
5	24-8534-03	1	Cover
6	X71-9258-01	3	Cam Lock
7	X71-9259-01	3	Washer
8	X62-5848-01	1	10p Connecter (for PHILIPS)
9	Y50-0705-01	400mm	Cord
10	24-8594-01	1	Cord Clip
11	X48-300802	4	Screw
12	24-8565-01	2	Outlets Joint
13	24-8806-01	2	Spacer
14	24-7715-01	2	Spacer
15	Y50-0683-01	2	Outlets Gear
16	24-7563-01	2	Spacer
17	X71-0165-01	2	Bearing
18	X31-514129	4	Bolt
19	24-8564-03	2	Outlets Holder
20	24-8570-01	2	Straight Pin
21	24-7563-01	2	Spacer
22	X71-0510-01	2	Bearing
23	24-8568-01	2	Holder Cap
24	X62-2402-04	1	AC Motor (AC 24V)
25	24-8807-01	1	Motor Shaft
26	24-8571-01	1	Washer
27	24-8556-01	1	Gear
28	24-8571-01	1	Washer
29	24-8808-01	2	Spring Washer
30	24-8562-01	1	Lock Collar
31	X10-200308	1	Setscrew
32	X16-200406	2	Screw
33	24-8559-01	1	Index
34	X64-4317-01	1	Potentiometer (1 KΩ)
35	X11-260407	3	Screw
36	24-8553-05	1	Assembly Plate
37	24-8557-03	1	Gear
38	X10-200308	2	Setscrew
39	X10-200308	2	Setscrew

CANON LENS HOUSING PARTS LIST (Cont'd)

KEY NO.	PART NO.	UNITS PER ASS'Y	DESCRIPTION
40	24-8554-02	1	Assembly Plate
41	X16-200406	6	Screw
42	X71-9260-01	3	Cam Lock
43	X31-524169	2	Bolt
44	29-5495-03	1	Mount Base
45	Y50-0682-01	4	Lens Lock Knob
46	X33-312102	1	Spring Pin
47	24-8562-01	1	Lock Collar
48	X10-200208	1	Setscrew
49	24-6651-02	1	Spring
50	24-8563-01	1	Collar
51	24-8555-01	1	Gear
52	X31-523089	4	Bolt
53	24-8535-02	1	Mount Base
54	X71-0510-01	2	Bearing
55	X71-0165-01	2	Bearing
56	X16-201008	2	Screw
57	X62-6627-01	4	Terminal
58	24-9332-02	1	Terminal Board

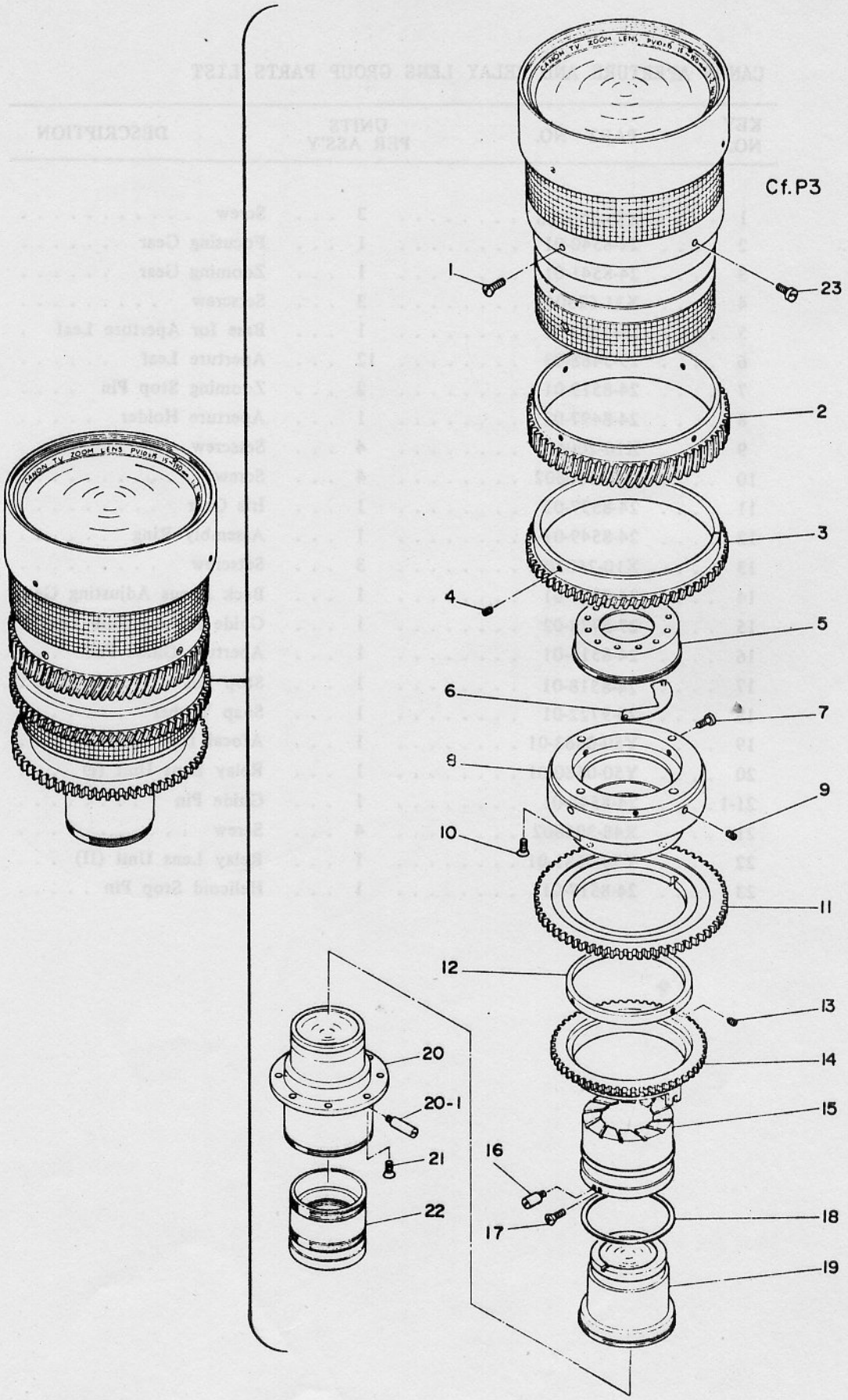


FIGURE 6-3
CANON APERTURE AND RELAY LENS GROUP

CANON APERTURE AND RELAY LENS GROUP PARTS LIST

KEY NO.	PART NO.	UNITS PER ASS'Y	DESCRIPTION
1	X19-200406	3	Screw
2	24-8540-01	1	Focusing Gear
3	24-8541-01	1	Zooming Gear
4	X31-623049	3	Setscrew
5	27-4727-01	1	Base for Aperture Leaf
6	29-5488-03	12	Aperture Leaf
7	24-8519-01	2	Zooming Stop Pin
8	24-8497-02	1	Aperture Holder
9	X10-200608	4	Setscrew
10	X46-300802	4	Screw
11	24-8537-02	1	Iris Gear
12	24-8549-01	1	Assembly Ring
13	X10-260308	3	Setscrew
14	24-8539-01	1	Back Focus Adjusting Gear
15	27-5728-02	1	Guide for Aperture Leaf
16	24-8515-01	1	Aperture Guide Pin
17	24-8518-01	1	Stop Pin
18	26-9722-01	1	Snap Washer
19	Y50-0663-01	1	Afocal Lens Unit
20	Y50-0680-01	1	Relay Lens Unit (I)
21-1	24-8548-01	1	Guide Pin
21	X48-300802	4	Screw
22	Y50-0681-01	1	Relay Lens Unit (II)
23	24-8517-01	1	Helicoid Stop Pin

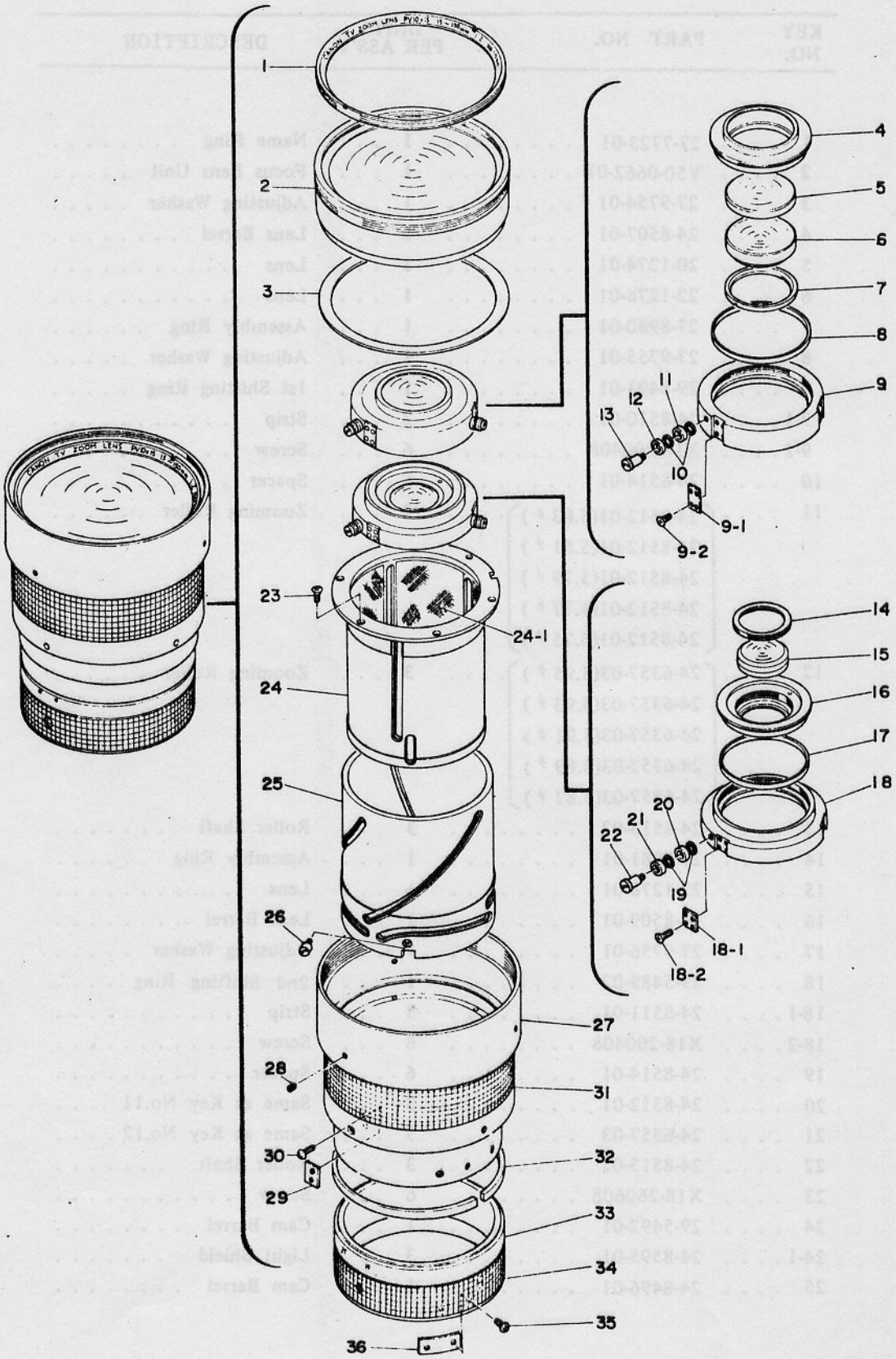


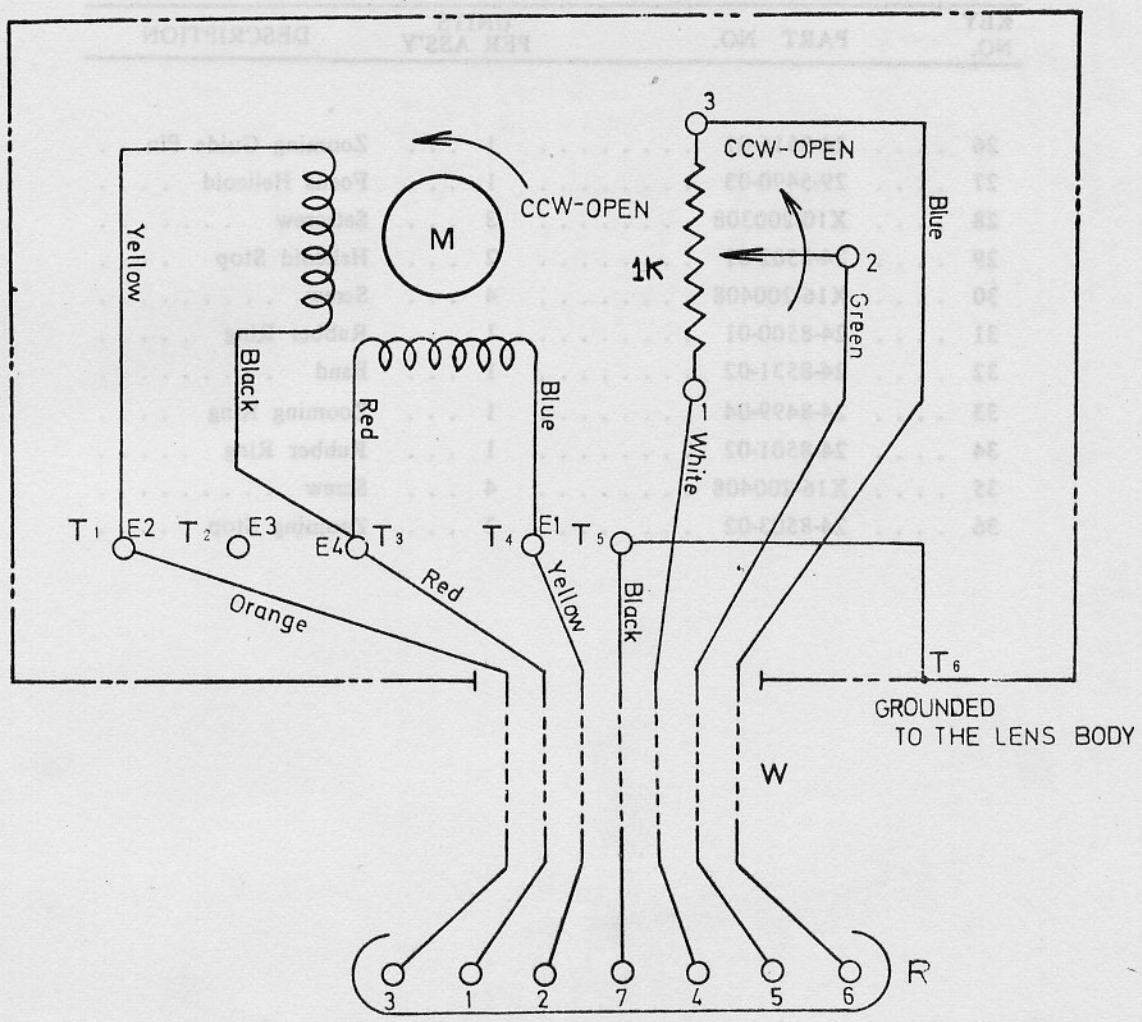
FIGURE 6-4
CANON FOCUS AND ZOOM OPTICAL SYSTEM

CANON FOCUS AND ZOOM OPTICAL SYSTEM PARTS LIST

KEY NO.	PART NO.	UNITS PER ASS'Y	DESCRIPTION
1	27-7723-01	1	Name Ring
2	Y50-0662-01	1	Focus Lens Unit
3	27-9754-01	1	Adjusting Washer
4	24-8507-01	1	Lens Barrel
5	20-1274-01	1	Lens
6	22-1276-01	1	Lens
7	27-8980-01	1	Assembly Ring
8	27-9755-01	1	Adjusting Washer
9	29-5491-01	1	1st Shifting Ring
9-1	24-8510-01	3	Strip
9-2	X18-200408	6	Screw
10	24-8514-01	6	Spacer
11	24-8512-01(5.83 ϕ) 24-8512-01(5.81 ϕ) 24-8512-01(5.79 ϕ) 24-8512-01(5.77 ϕ) 24-8512-01(5.75 ϕ)	3	Zooming Roller
12	24-6357-03(5.95 ϕ) 24-6357-03(5.93 ϕ) 24-6357-03(5.91 ϕ) 24-6357-03(5.89 ϕ) 24-6357-03(5.87 ϕ)	3	Zooming Roller
13	24-8513-02	3	Roller Shaft
14	27-8981-01	1	Assembly Ring
15	22-1278-01	1	Lens
16	24-8509-01	1	Lens Barrel
17	27-9756-01	1	Adjusting Washer
18	29-5489-02	1	2nd Shifting Ring
18-1	24-8511-01	3	Strip
18-2	X18-200408	6	Screw
19	24-8514-01	6	Spacer
20	24-8512-01	3	Same as Key No.11
21	24-6357-03	3	Same as Key No.12
22	24-8513-02	3	Roller Shaft
23	X18-260608	6	Screw
24	29-5492-01	1	Cam Barrel
24-1	24-8595-01	3	Light Shield
25	24-8496-01	1	Cam Barrel

CANON FOCUS AND ZOOM OPTICAL SYSTEM PARTS LIST (Cont'd)

KEY NO.	PART NO.	UNITS PER ASS'Y	DESCRIPTION
26	24-8516-01	1	Zooming Guide Pin
27	29-5490-03	1	Focus Helicoid
28	X10-200308	3	Setscrew
29	24-8502-01	2	Helicoid Stop
30	X16-200408	4	Screw
31	24-8500-01	1	Rubber Ring
32	24-8531-02	1	Band
33	24-8499-04	1	Zooming Ring
34	24-8501-02	1	Rubber Ring
35	X16-200408	4	Screw
36	24-8503-02	2	Zooming Stop



SYMBOL	PARTS NO.	DESCRIPTION	SPECIFICATION
M	X62-2402-04	AC Motor	AC 24V
P	X64-4317-01	Potentiometer	1 K 350°
$T_1 \sim 4$	X62-6627-01	Terminal	
T_5	X62-6610-01	Earth Terminal	
T_6	X62-6759-01	Earth Terminal	
W	Y50-0705-01	Cord	400 mm
K	X62-5848-01	10p Connector	for PHILIPS

FIGURE 6-5
CANON IRIS SERVO DRIVE SCHEMATIC DIAGRAM