SERVICE MANUAL

Kodak Shutters

Shutters

FEBRUARY 1947 PARTS LIST No. 1-486

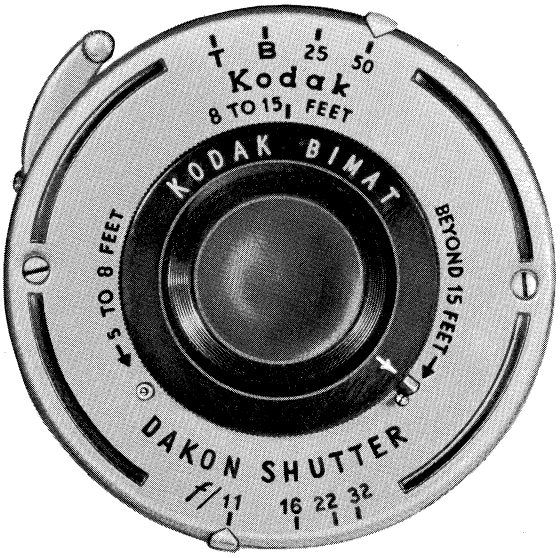
KODAK DAKON SHUTTER

(2 and 3 SPEED)

This parts list covers the Kodak Dakon Shutter (2 speed) with Bimat Lens for the Kodak Vigilant Junior Six-20 (page 2); the Kodak Dakon Shutter (3 speed) with Kodak Anastigmat f/6.3, 105-mm Lens (page 3) and the Kodak Dakon Shutter (3 speed) with Kodak Anastigmat f/8.8, 100-mm Lens (page 3).

The numerical list for these shutters is on page 4.

The dagger (†) indicates parts which are seldom replaced and should be ordered only when needed.



EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

FIG.	PART NUMBER	PART NAME	No. REQD.
	99595	Shutter Assembly, Feet	1
1,3	81799	Case Assembly	1
1	18000	Bushing - Cable release	1
1	55329	Screw - Cable release opening	1
3	81793	Blade Controller Assembly	1
	77976†	Stud - Blade controller	1
3	80324	Blade	3
3	77962	Plate - Diaphragm retainer	1
3	81800	Diaphragm Pointer Assembly	1
3	77966	Wing - Diaphragm	5
3	77968	Pointer - Speed	1
2,3	81794	Mechanism Plate Assembly	1
2	96894	Trigger	1
2	40268	Stud - Trigger	1
2	77970	Lever - Retarding	1
2	77974	Stud - Retarding lever	1
2	81797	Retarding Weight Assembly	1
2	77975	Stud - Retarding weight	1
2	40320†	Stud - Time and bulb lever	1
2	77972†	Stud - Opening lever	1
3	102968	Screw - Mechanism plate	4
5	42797	Lever - Bulb	1
5	60347	Lever - Time	1
5	102949	Screw - Time and bulb lever	1
4,5	77979	Spring - Time and bulb lever	1
5	77969	Lever - Opening	1
5	102949	Screw - Opening	1
4,5	77977	Spring - Opening lever	1
4,5	88934	Spring - Trigger	1
4,5	77978	Spring - Retarding lever	1
6	99594	Speed and Diaphragm Index Plate Complete	1
7	99593	Speed and Diaphragm Index Plate Assembly	1
7	66507†	Stud - Speed and diaphragm index plate	2
7	81542	Front Lens Mounted	1
7	85465	Ring - Front lens retaining	1
6	102965	Screw - Speed and diaphragm index plate	2
		FOR SHUTTERS WITH METRIC SPEED AND DIAPHRAGM PLATE OMIT THE FOLLOWING PARTS:	
	99595	Shutter Assembly	1
	99594	Speed and Diaphragm Index Plate Complete	1
	99593	Speed and Diaphragm Index Plate Assembly	1
		ADD THE FOLLOWING PARTS:	
	104285	Shutter Assembly, Meters	1
6	104284	Speed and Diaphragm Index Plate Complete	1
7	104283	Speed and Diaphragm Index Plate Assembly	1

FIG. | PART NUMBER | PART NAME | No. REQD.

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
	102369	Shutter Assembly							1
8,10	85124		Case Assembly						1
8	18000			Bushing - Cable release					1
8	55329		Screw - Cable release opening						1
10	81793		Blade Controller Assembly						1
	77976†			Stud - Blade controller					1
10	80324		Blade						3
10	77962		Plate - Diaphragm retainer						1
10	102370		Diaphragm Pointer Assembly						1
10	77966			Wing - Diaphragm					5
10	81807		Speed Pointer Assembly						1
9,10	102862		Mechanism Plate Assembly						1
9	96894			Trigger					1
9	40268			Stud - Trigger					1
9	77970			Lever - Retarding					1
9	77974			Stud - Retarding lever					1
9	81797			Retarding Weight Assembly					1
9	77975			Stud - Retarding weight					1
9	40320†			Stud - Time and bulb lever					1
9	77997†			Stud - Opening lever					1
10	102968		Screw - Mechanism plate						4
12	42797		Lever - Bulb						1
12	60347		Lever - Time						1
12	102949		Screw - Time and bulb lever						1
12	77979		Spring - Time and bulb lever						1
12	77995		Lever - Speed control						1
12	77998		Washer - Speed control lever						1
12	77994		Lever - Opening						1
12	77977		Spring - Opening lever						1
12	102949		Screw - Opening lever						1
12	88934		Spring - Trigger						1
12	77978		Spring - Retarding lever						1
13	77985		Cover						1
13	102966		Screw - Cover						3
13	102357		Plate - Speed and diaphragm index						1
13	77988		Stud - Focusing mount stop						1
13	76107		Screw - Diaphragm pointer stop						1
12	104361		Strap - Trigger						1
12	104362		Stud - Trigger strap						1
		FOR SHUTTERS WITH KODAK ANASTIGMAT f 8.8, 100-MM LENS OMIT THE FOLLOWING PARTS:							
	102369	Shutter Assembly							1
13	102357		Plate - Speed and diaphragm index						1
		ADD THE FOLLOWING PARTS:							
	102371	Shutter Assembly f/8.8 Feet							1
	102356		Plate - Speed and diaphragm index						1
		FOR SHUTTERS WITH KODAK ANASTIGMAT f/8.8, 100-MM LENS WITH METRIC SPEED AND DIAPHRAGM PLATE OMIT THE FOLLOWING PARTS:							
	102369	Shutter Assembly							1
13	102357		Plate - Speed and diaphragm index						1
		ADD THE FOLLOWING PARTS:							
	102392	Shutter Assembly f/8.8 Meters							1
13	102875		Plate - Speed and diaphragm index						1

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FEBRUARY 1947

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
18000	2,3	1,8	77979	2,3	4,5,12	99594	2	6
40268	2,3	2,9	77985	3	13	99595	2	
40320	2,3	2,9	77988	3	13	102356	3	
42797	2,3	5,12	77994	3	12	102357	3	13
55329	2,3	1,8	77995	3	12	102369	3	
60347	2,3	5,12	77997	3	9	102370	3	10
66507	2	7	77998	3	12	102371	3	
76107	3	13	80324	2,3	3,10	102392	3	
77962	2,3	3,10	81542	2	7	102862	3	9,10
77966	2,3	3,10	81793	2,3	3,10	102875	3	13
77968	2	3	81794	2	2,3	102949	2,3	5,12
77969	2	5	81797	2,3	2,9	102965	2	6
77970	2,3	2,9	81799	2	1,3	102966	3	13
77972	2	2	81800	2	3	102968	2,3	3,10
77974	2,3	2,9	81807	3	10	104203	2	7
77975	2,3	2,9	85124	3	8,10	104284	2	6
77976	2,3		85465	2	7	104285	2	
77977	2,3	4,5,12	88934	2,3	4,5,12	104361	3	12
77978	2,3	4,5,12	96894	2,3	2,9	104362	3	12
			99593	2	7			

Figure 1

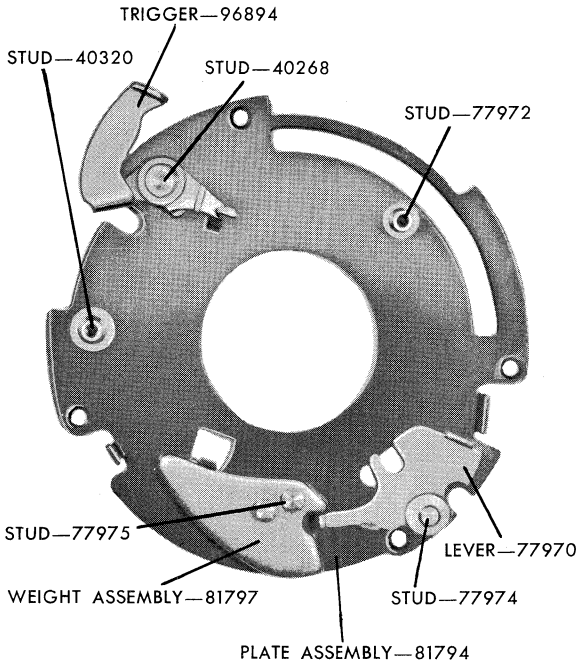


Figure 2

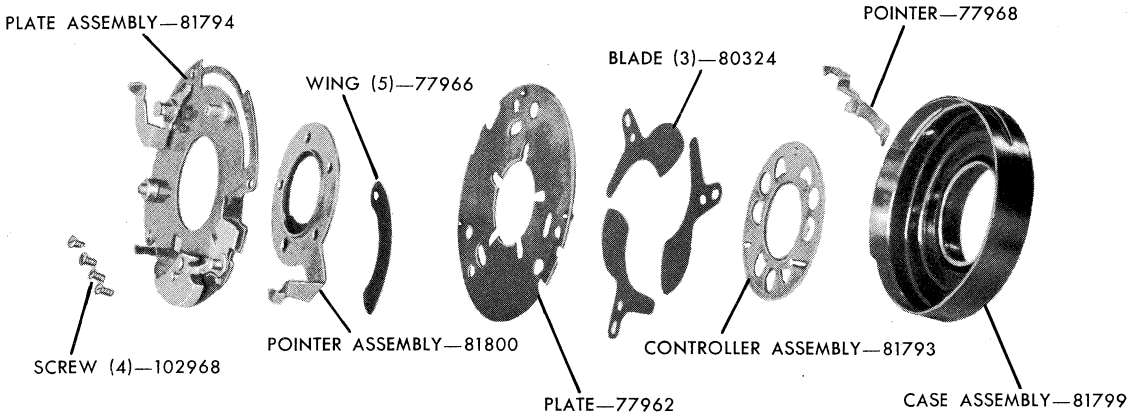


Figure 3

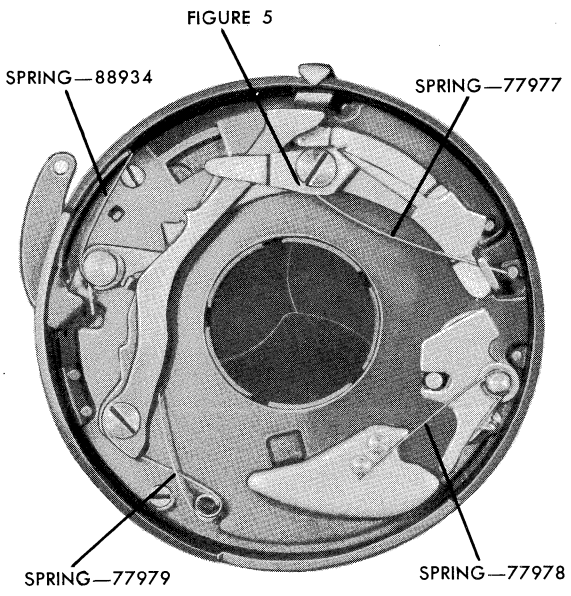


Figure 4

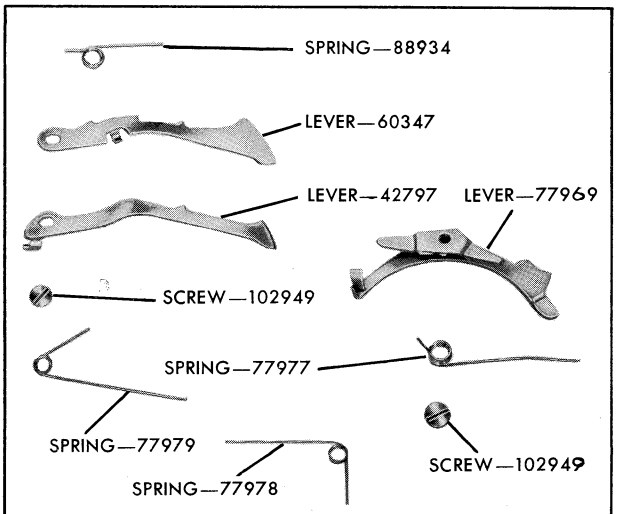


Figure 5

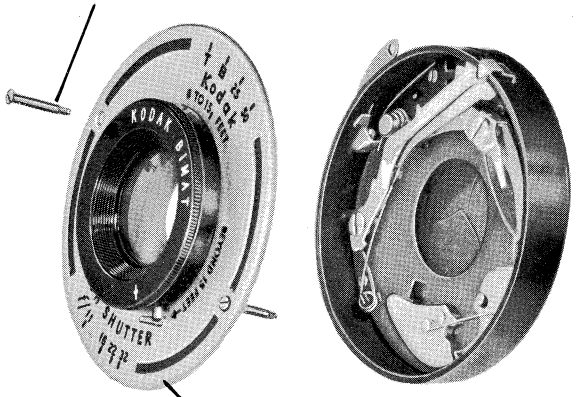


Figure 6

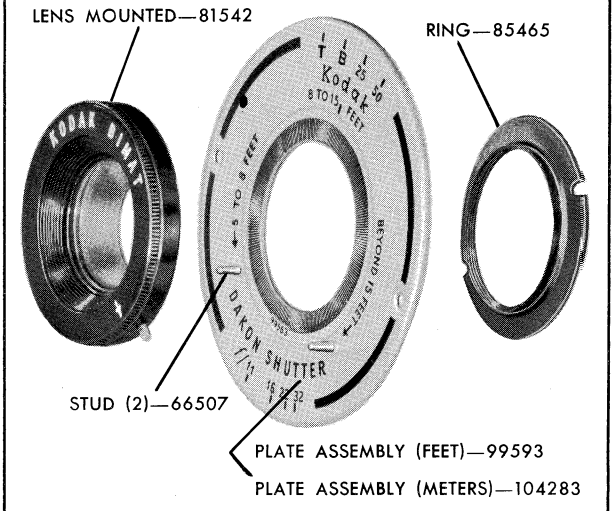


Figure 7

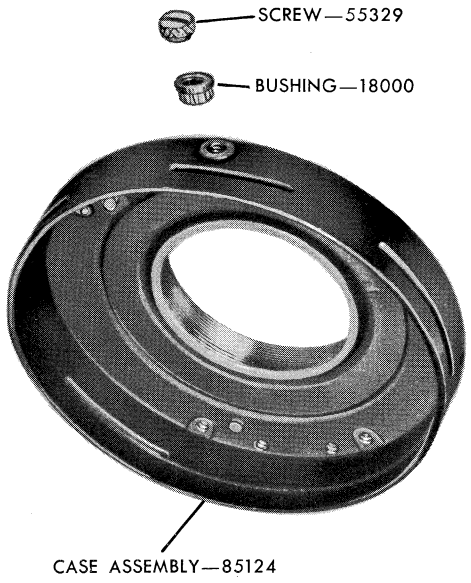


Figure 8

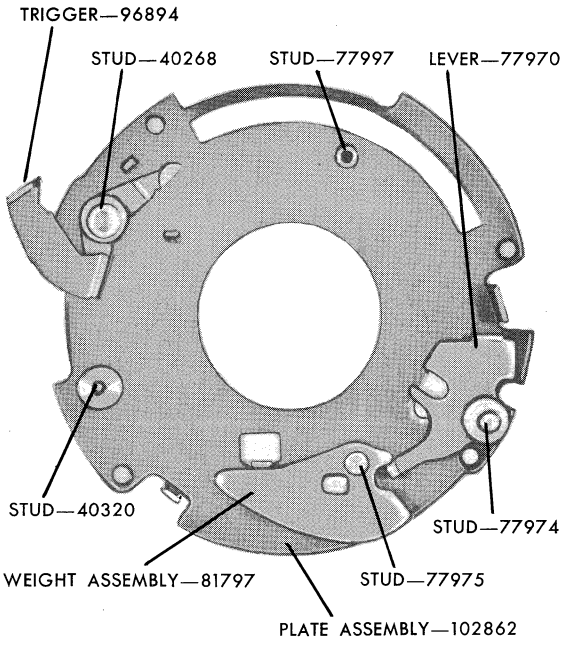


Figure 9

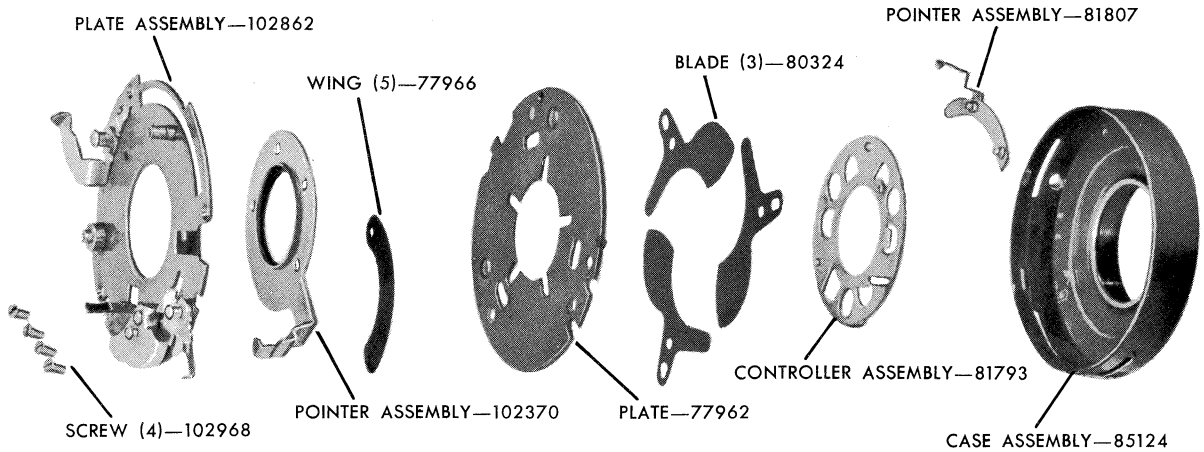


Figure 10

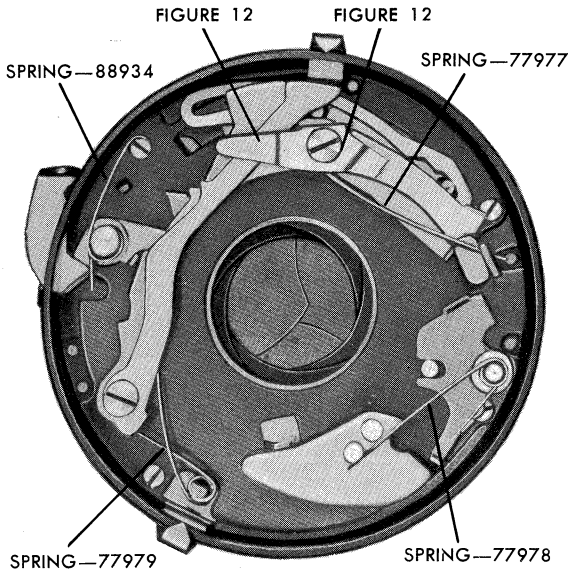


Figure 11

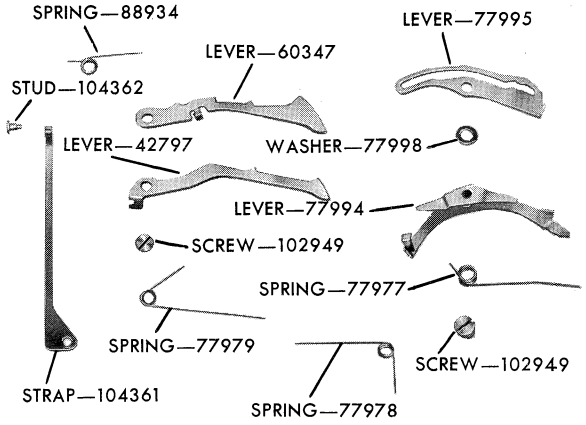


Figure 12

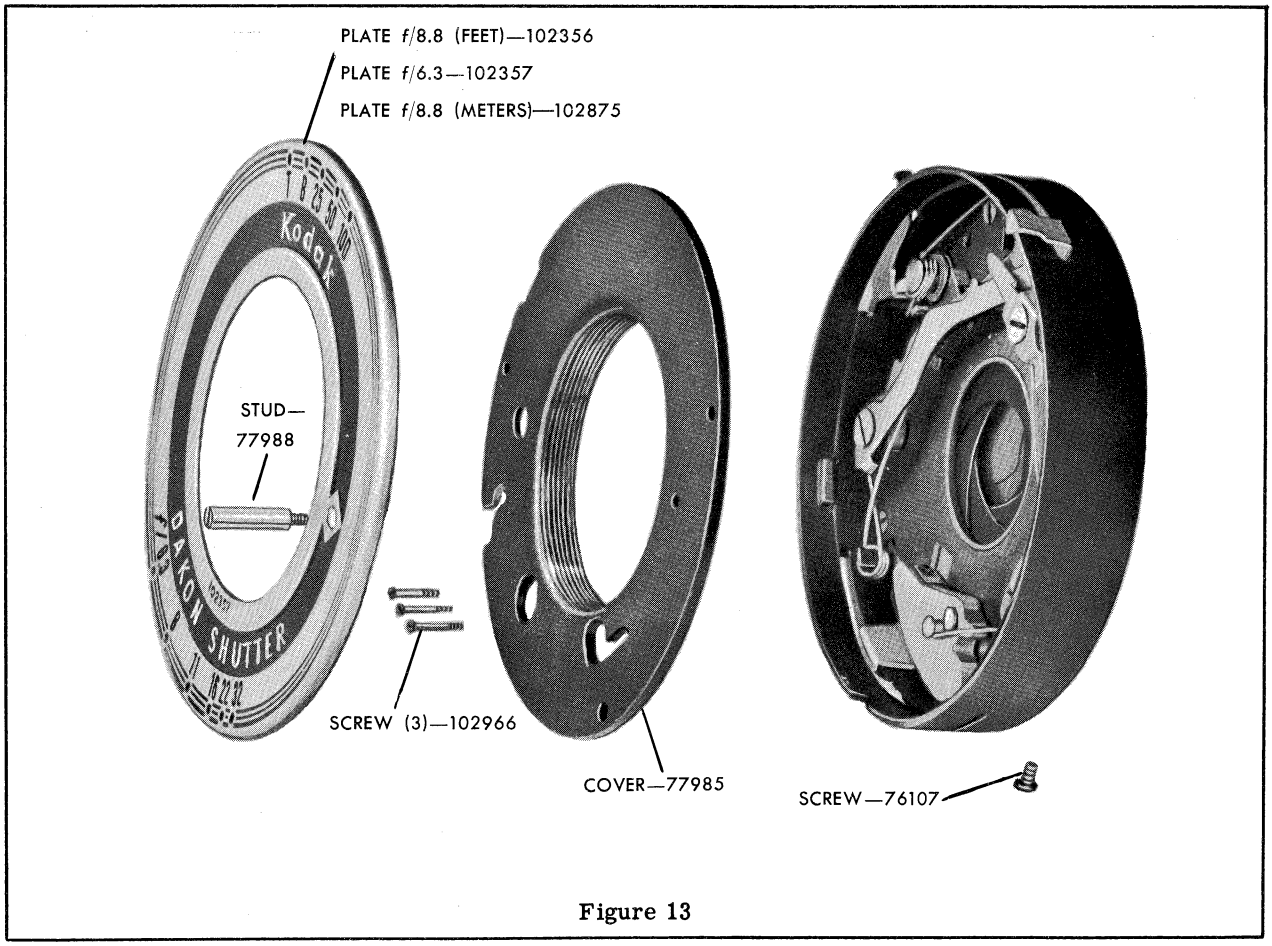


Figure 13

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

APRIL 1949 PARTS LIST No. 1-1480A

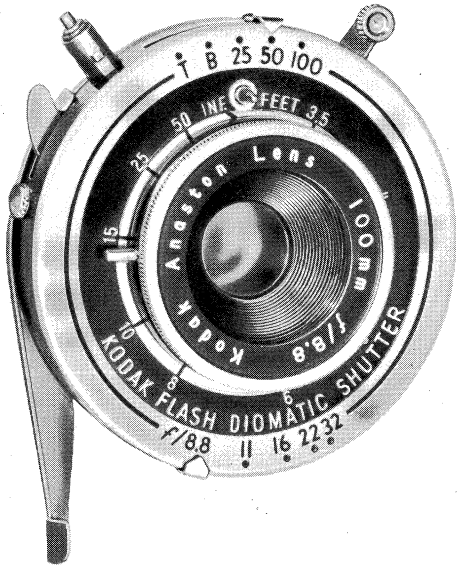
Kodak Flash Diomatic Shutter

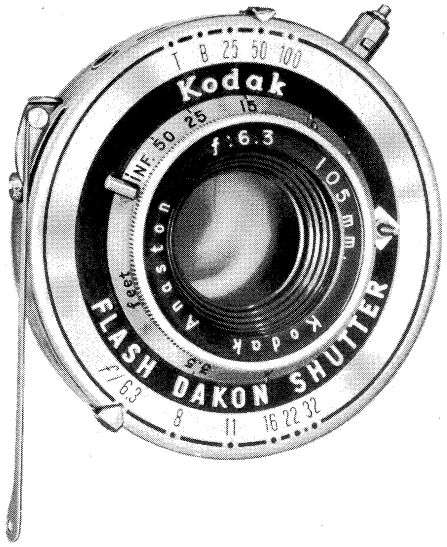
WITH f/6.3 OR f/8.8 LENS FOR KODAK TOURIST CAMERA

Kodak Flash Dakon Shutter

WITH f/6.3 OR f/8.8 LENS FOR KODAK VIGILANT SIX-20 CAMERA

Parts which are identical on both shutters are identified on the illustrations by the part number and name only. Parts which are not common to both shutters are identified by the symbol "A" for the Kodak Flash Diomatic Shutter and the symbol "B" for the Kodak Flash Dakon Shutter. Illustrations and parts list are in the sequence of disassembly so that individual parts can be located quickly.





EASTMAN KODAK COMPANY • ROCHESTER 4, N.Y.

PARTS LIST CORRECTIONS

PARTS LIST NO. 1-1480A - KODAK FLASH DIOMATIC AND DAKON SHUTTERS

Page	Figure	Part No.	Corrections
3	4	117924	Change to 94313
3	4A	117924	Change to 94313
5	Parts List	117924	Change to 94313
5	Numerical List	117924	Change to 94313

PARTS LIST NO. 1-1490C - KODAK FLASH SUPERMATIC SHUTTER

Page	Figure	Part No.	Corrections
3	8	117924	Change to 94313
6	Parts List	117924	Change to 94313
7	Numerical List	117924	Change to 94313

EASTMAN KODAK COMPANY, Rochester,4, N.Y.

1-50-GL-B

T.M. Reg. U.S. Pat. Off.

PARTS LIST CHANGES

PARTS LIST NO. 1-1480A – KODAK FLASH DIOMATIC SHUTTER

Page	Figure	Part No.	Changes
1	2	107534	Change to 103982
4	Parts List	107534	Change to 103982
5	Numerical List	107534	Change to 103982

T.M. Reg. U.S. Pat. Off.

EASTMAN KODAK COMPANY · Rochester 4, N.Y.

5-51-GLP-B

Lithographed in the United States of America

KODAK FLASH DIOMATIC SHUTTER
KODAK FLASH DAKON SHUTTER

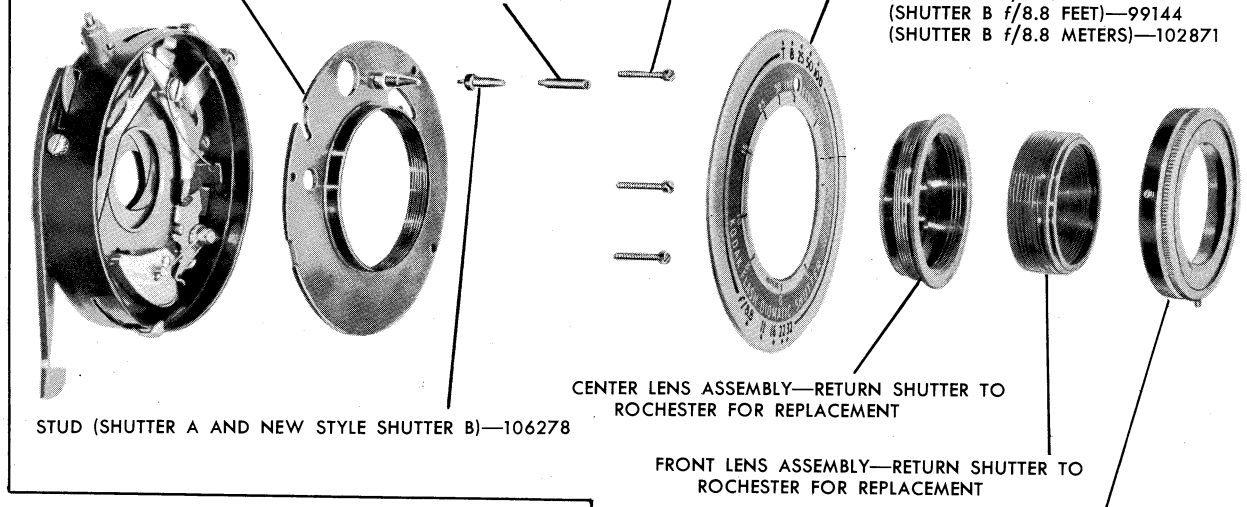


Figure 1

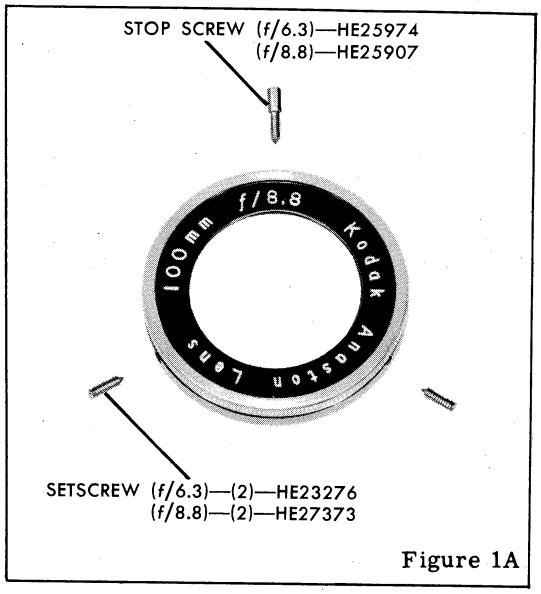


Figure 1A

SHUTTER A

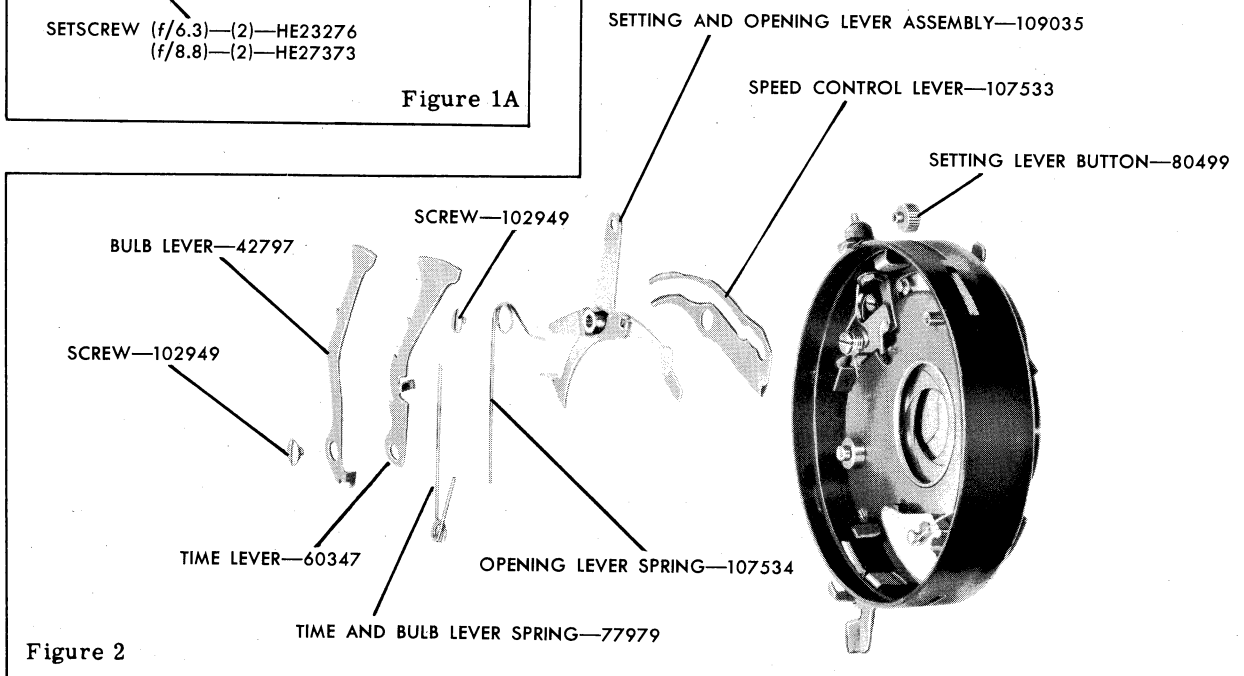


Figure 2

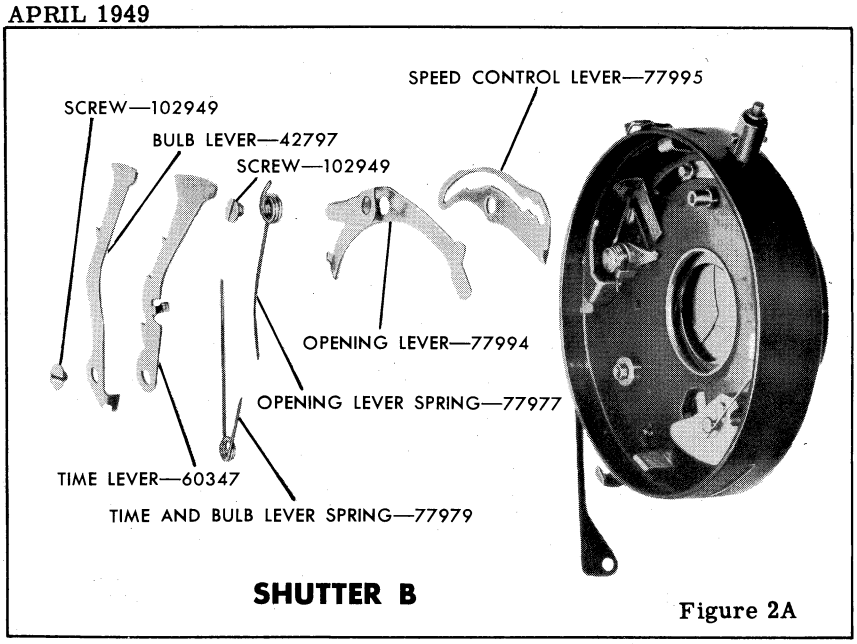


Figure 2A

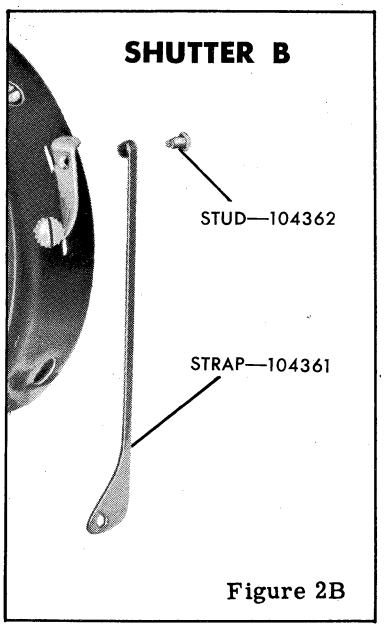


Figure 2B

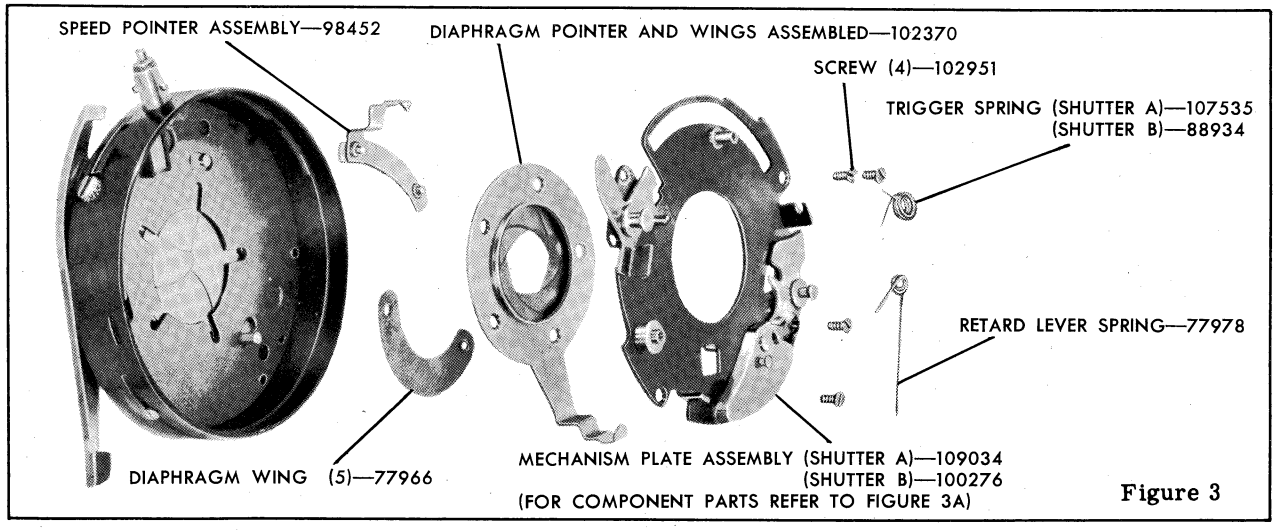


Figure 3

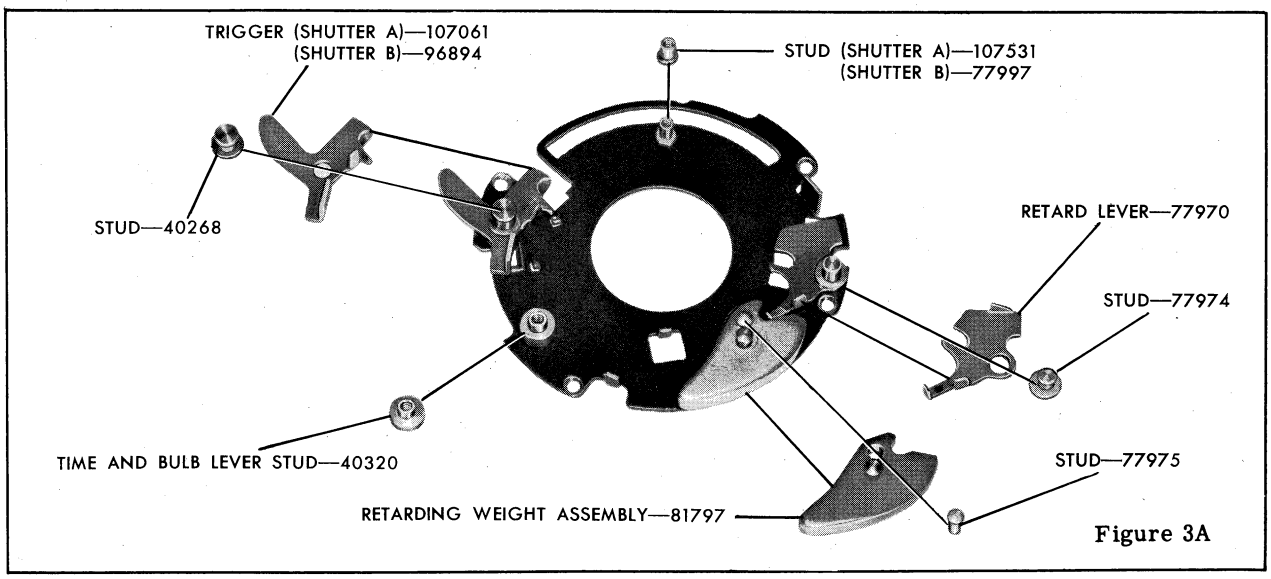
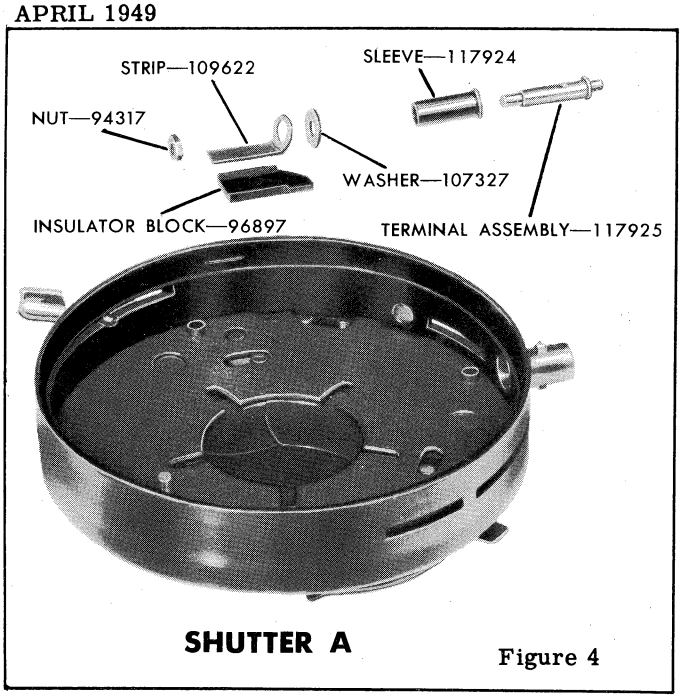


Figure 3A



SHUTTER A

Figure 4

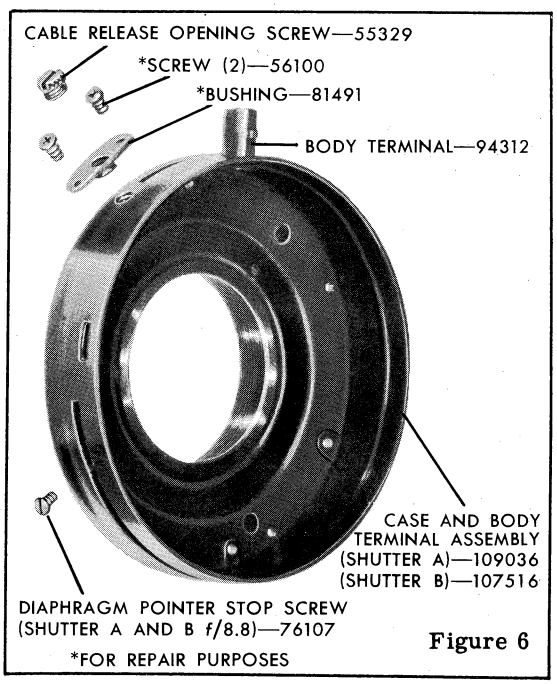
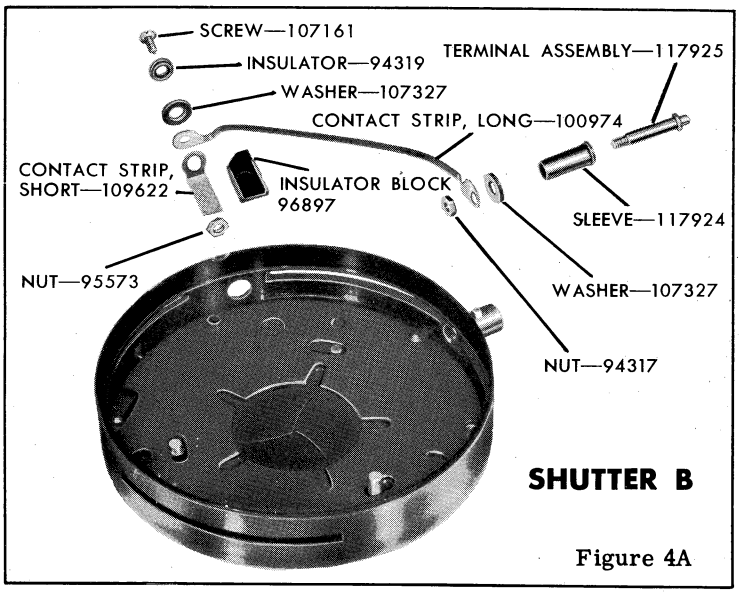


Figure 6



SHUTTER B

Figure 4A

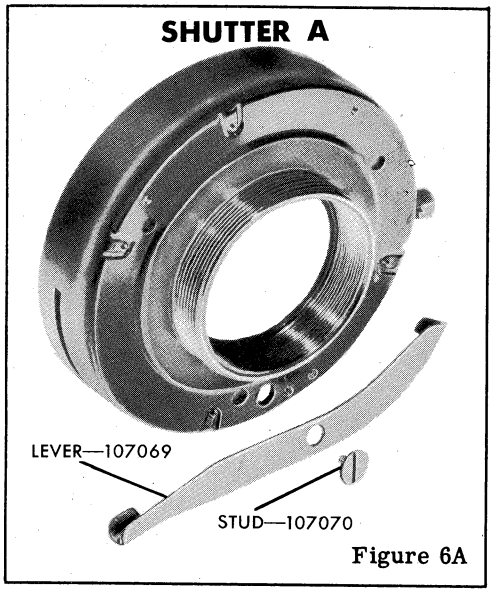


Figure 6A

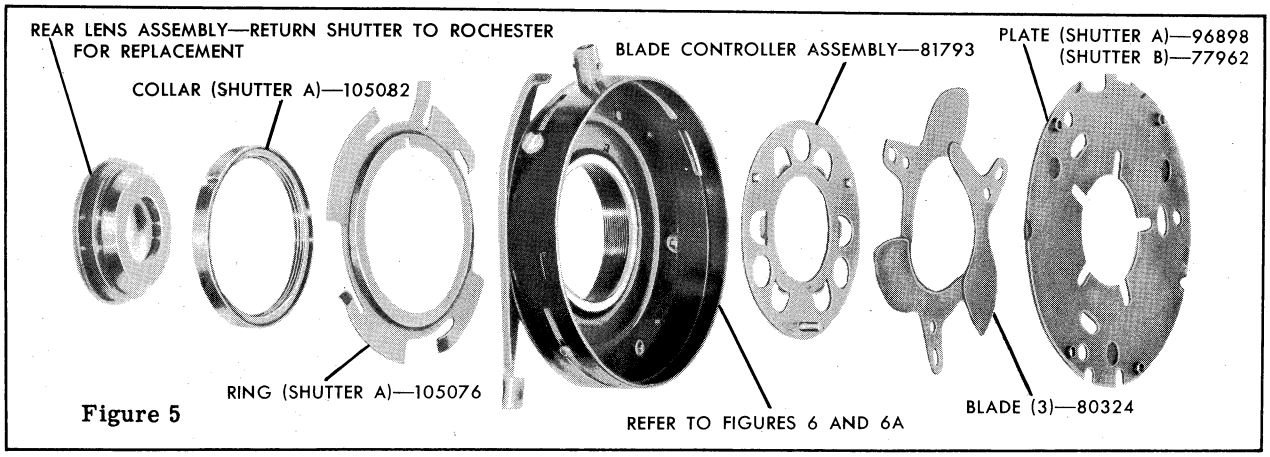


Figure 5

FIG.	PART NUMBER	Shutter A	Shutter B	PART NAME	No. REQD.
1	HE25917	X		Focusing Cap Assembly (f/8.8)	1
1	HE36027	X		Focusing Cap Assembly (f/6.3, Feet)	1
1	HE36031	X		Focusing Cap Assembly (f/6.3, Meters)	1
1	HE25936		X	Focusing Cap Assembly (f/8.8)	1
1	HE31607		X	Focusing Cap Assembly (f/6.3, Feet)	1
1	HE31608		X	Focusing Cap Assembly (f/6.3, Meters)	1
1		X	X	Front Lens Assembly (Return shutter to Rochester for replacement)	1
1		X	X	Center Lens Assembly (Return shutter to Rochester for replacement)	1
1	107540	X		Plate - Speed and diaphragm index (f/6.3)	1
1	107538	X		Plate - Speed and diaphragm index (f/8.8, Feet)	1
1	109123	X		Plate - Speed and diaphragm index (f/8.8, Meters)	1
1	102871		X	Plate - Speed and diaphragm index (f/8.8, Meters)	1
1	99144		X	Plate - Speed and diaphragm index (f/8.8, Feet)	1
1	98604		X	Plate - Speed and diaphragm index (f/6.3)	1
1	107537	X		Screw - Cover	3
1	102995		X	Screw - Cover	3
1	77988		X	Stud - Focusing mount stop (old style)	1
1	106278	X	X	Stud - Focusing mount stop (Shutter A and new style shutter B)	1
1	107180		X	Cover with Stud Assembly	1
1	109037	X		Cover with Stud Assembly	1
1A	HE25903	X	X	Screw - Stop (f/8.8)	1
1A	HE25974	X	X	Screw - Stop (f/6.3)	1
1A	HE27373	X	X	Setscrew (f/8.8)	2
1A	HE23276	X	X	Setscrew (f/6.3)	2
2,2A	102949	X	X	Screw - Opening lever (1), Time and bulb lever (1)	2
2,2A	42797	X	X	Lever - Bulb	1
2,2A	60347	X	X	Lever - Time	1
2,2A	77979	X	X	Spring - Time and bulb lever	1
2	107534	X		Spring - Opening lever	1
2A	77977		X	Spring - Opening lever	1
2	80499	X		Button - Setting lever	1
2	109035	X		Setting and Opening Lever Assembly	1
2A	77994		X	Lever - Opening	1
2	107533	X		Lever - Speed control	1
2A	77995		X	Lever - Speed control	1
2B	104362		X	Stud - Trigger strap	1
2B	104361		X	Strap - Trigger	1
3	107535	X		Spring - Trigger	1
3	88934		X	Spring - Trigger	1
3	77978	X	X	Spring - Retard lever	1
3	102951	X	X	Screw - Plate	4
3	109034	X		Mechanism Plate Assembly	1
3	100276		X	Mechanism Plate Assembly	1
3	102370	X	X	Diaphragm Pointer and Wings Assembled	1
3	77966	X	X	Wing - Diaphragm	5
3	98452	X	X	Speed Pointer Assembly	1
3A	107531	X		Stud - Opening lever	1
3A	77997		X	Stud - Opening lever	1
3A	77970	X	X	Lever - Retard	1
3A	77974	X	X	Stud - Retard lever	1
3A	81797	X	X	Retarding Weight and Stud Assembly	1
3A	77975	X	X	Stud - Retarding weight	1
3A	40320	X	X	Stud - Time and bulb lever	1
3A	107061	X		Trigger	1
3A	96894		X	Trigger	1
3A	40268	X	X	Stud - Trigger	1
4,4A	94317	X	X	Nut - Terminal	1
4,4A	109622	X	X	Strip - Contact	1
4,4A	96897	X	X	Block - Insulator	1

| FIG. | PART NUMBER | Shutter | PART NAME | No. REQD. |

The shutter in which the part is used is indicated by the X. For key to shutter symbols, see front cover.

APRIL 1949

List in Sequence of Disassembly

FIG.	PART NUMBER	Shutter A	Shutter B	PART NAME	No. REQD.
4,4A	107327	X	X	Washer - Insulating, Shutter A (1) Shutter B (2)	3AR
4,4A	117924	X	X	Sleeve - Insulating	1
4,4A	117925	X	X	Inner Terminal Assembly	1
4A	95573		X	Nut - Contact strip screw	1
4A	100974		X	Strip - Contact, long	1
4A	94319		X	Insulator	1
4A	107161		X	Screw - Contact strip	1
5	96898	X		Plate - Diaphragm retainer	1
5	77962		X	Plate - Diaphragm retainer	1
5	80324	X	X	Blade	3
5	81793	X	X	Blade Controller Assembly	1
5	105076	X		Ring - Shutter lock	1
5	105082	X		Collar - Shutter retaining	1
5		X	X	Rear Lens Assembly (Return shutter to Rochester for replacement)	1
6	109036	X		Case and Body Terminal Assembly	1
6	107516		X	Case and Body Terminal Assembly	1
6	94312	X	X	Terminal - Body	1
6	76107	X	X	Screw - Diaphragm pointer stop, Shutter A f/8.8 (1) Shutter B f/8.8 (1)	2AR
6	55329	X	X	Screw - Cable release opening	1
6	*56100	X	X	Screw - Cable release bushing	2
6	*81491	X	X	Bushing - Cable release	1
6A	107070	X		Stud - Shutter trip lever	1
6A	107069	X		Lever - Shutter trip	1
				*For repair purposes	

FIG.	PART NUMBER	PART NAME	No. REQD.

The shutter in which the part is used is indicated by the X. For key to shutter symbols, use front cover.

NUMERICAL LIST

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
			77994	4	2A	104362	4	2B
HE23276	4	1A	77995	4	2A	105076	5	5
HE25903	4	1A	77997	4	3A	105082	5	5
HE25917	4	1	80324	5	5	106278	4	1
HE25936	4	1	80499	4	2	107061	4	3A
HE25974	4	1A	81491	5	6	107069	5	6A
HE27373	4	1A	81793	5	5	107070	5	6A
HE31607	4	1	81797	4	3A	107161	5	4A
HE31608	4	1	88934	4	3	107180	4	1
HE36027	4	1	94312	5	6	107327	5	4,4A
HE36031	4	1	94317	4	4,4A	107516	5	6
40268	4	3A	94319	5	4A	107531	4	3A
40320	4	3A	95573	5	4A	107533	4	2
42797	4	2,2A	96894	4	3A	107534	4	2
55329	5	6	96897	5	4,4A	107535	4	3
56100	5	6	96898	5	5	107537	4	1
60347	4	2,2A	98452	4	3	107538	4	1
76107	5	6	98604	4	1	107540	4	1
77962	5	5	99144	4	1	109034	4	3
77966	4	3	100276	4	3	109035	4	2
77970	4	3A	100974	5	4A	109036	5	6
77974	4	3A	102370	4	3	109037	4	1
77975	4	3A	102871	4	1	109123	4	1
77977	4	2A	102949	4	2,2A	109622	4	4,4A
77978	4	3	102951	4	3	117924	5	4,4A
77979	4	2,2A	102995	4	1	117925	5	4,4A
77988	4	1	104361	4	2B			

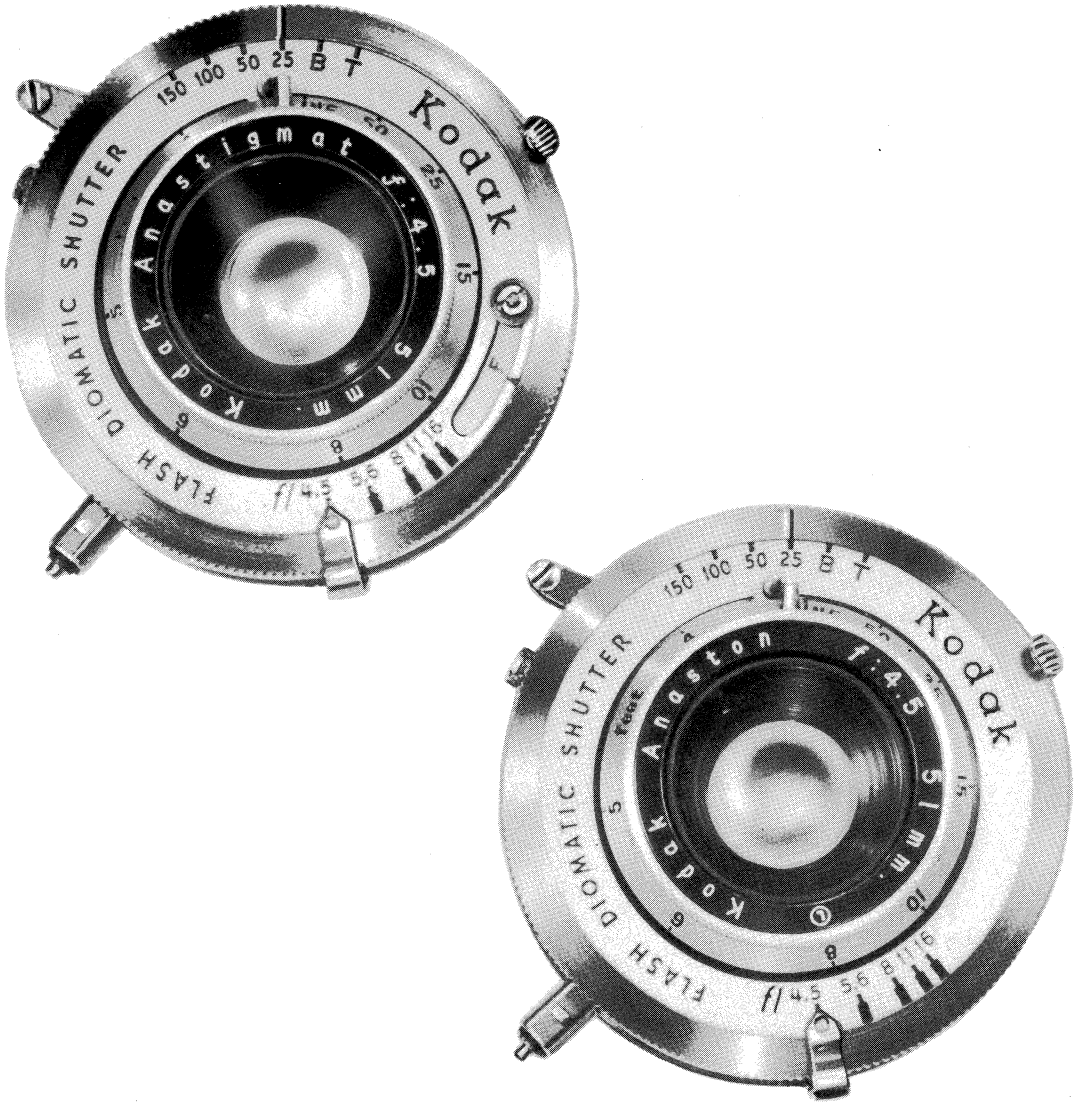
DECEMBER 1949 PARTS LIST No. 1-1480B

KODAK FLASH DIOMATIC SHUTTER

FOR

KODAK 35 CAMERA WITH f/4.5 KODAK ANASTIGMAT OR ANASTON LENS

This revised parts list supersedes Repair Parts List No. 1-1480



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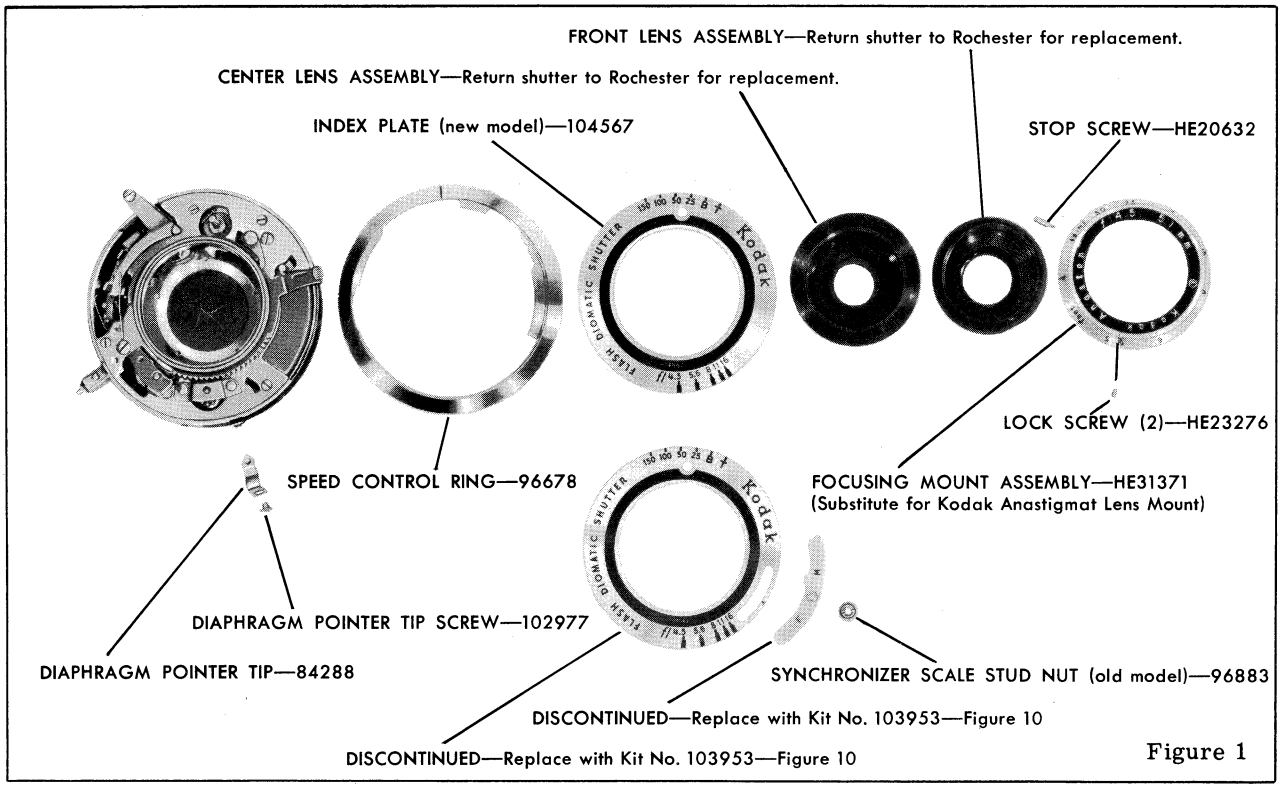


Figure 1

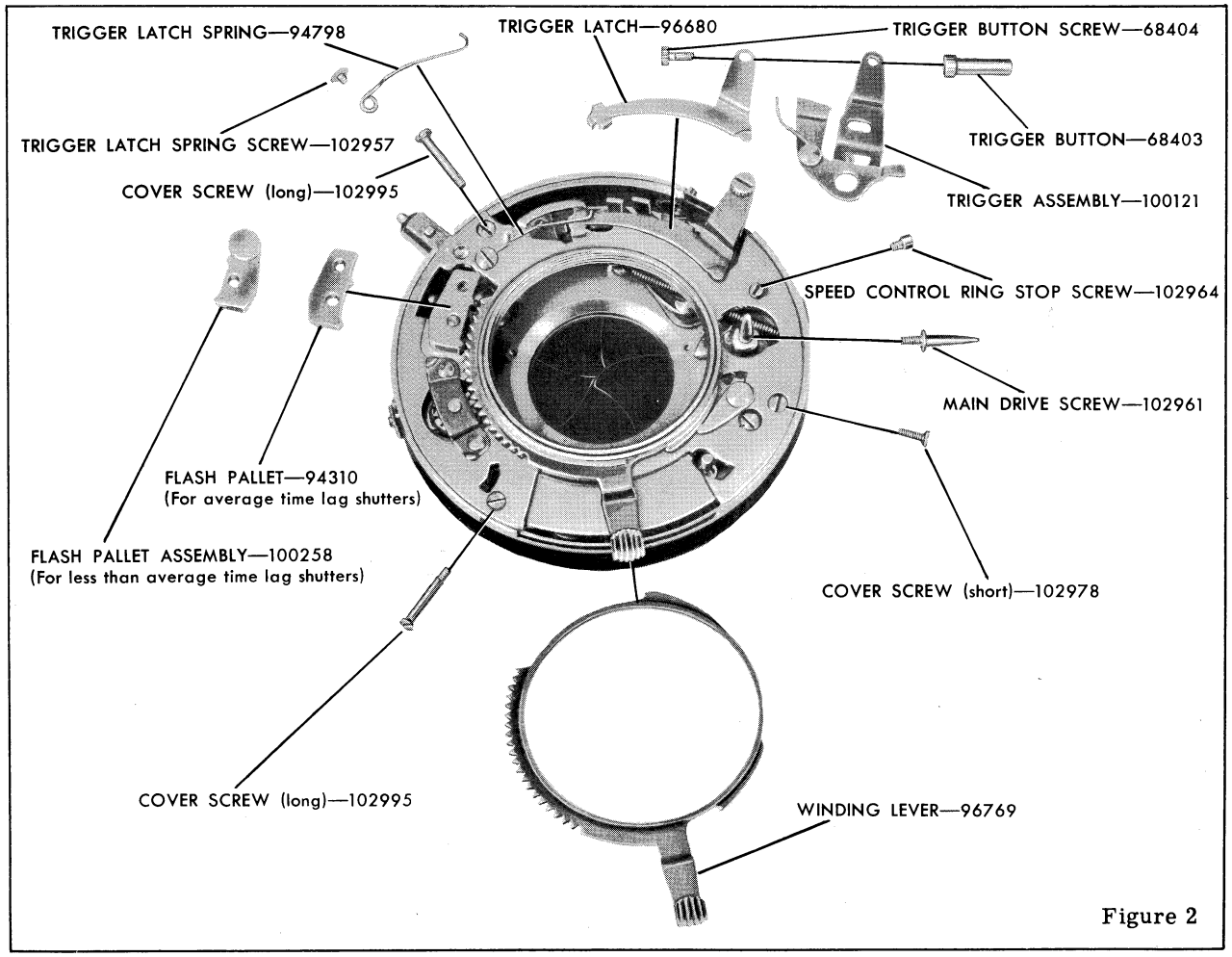


Figure 2

Always give PART NUMBER and NAME when ordering parts

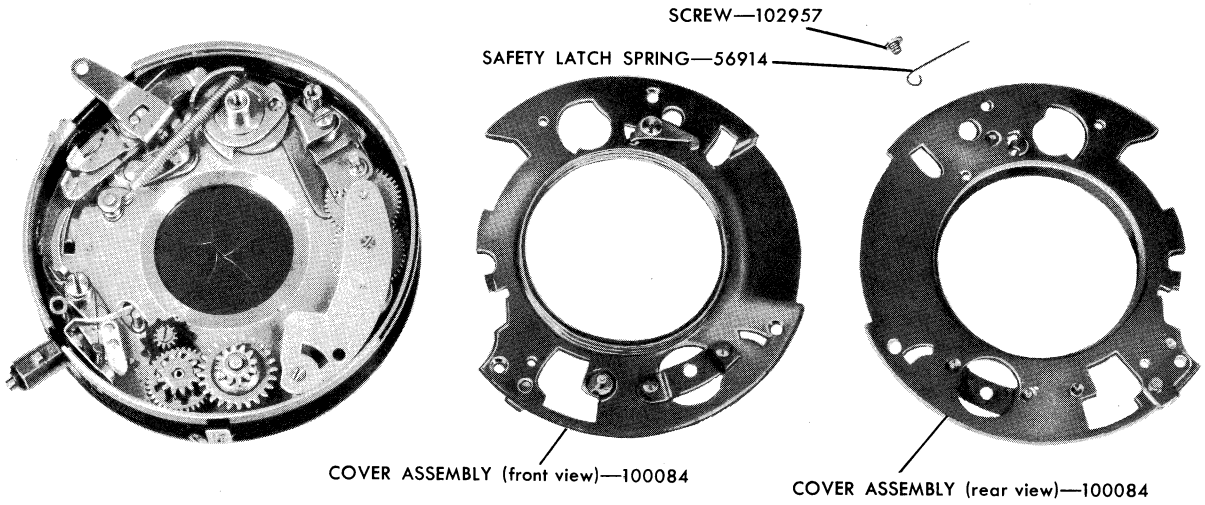


Figure 3

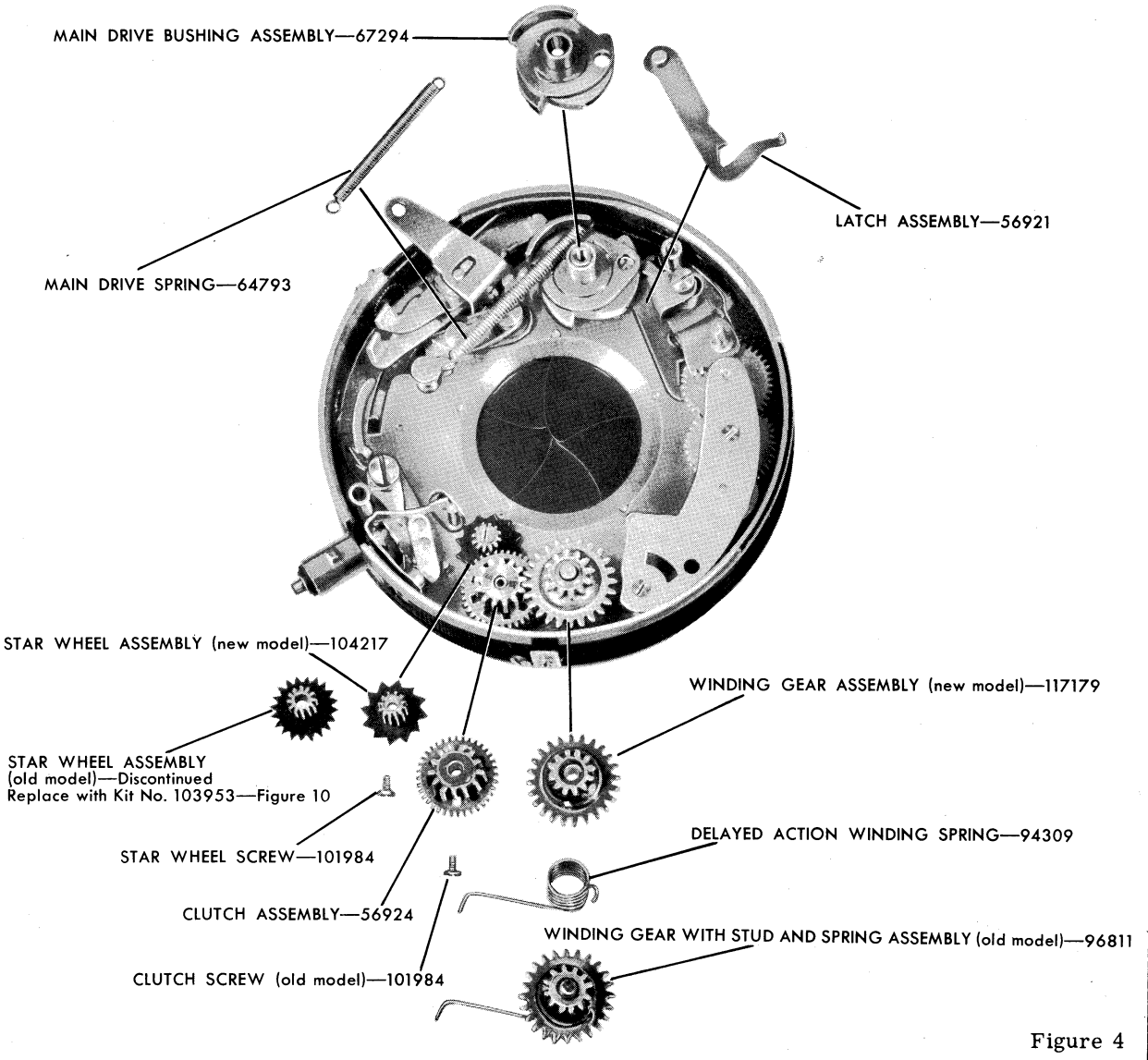


Figure 4

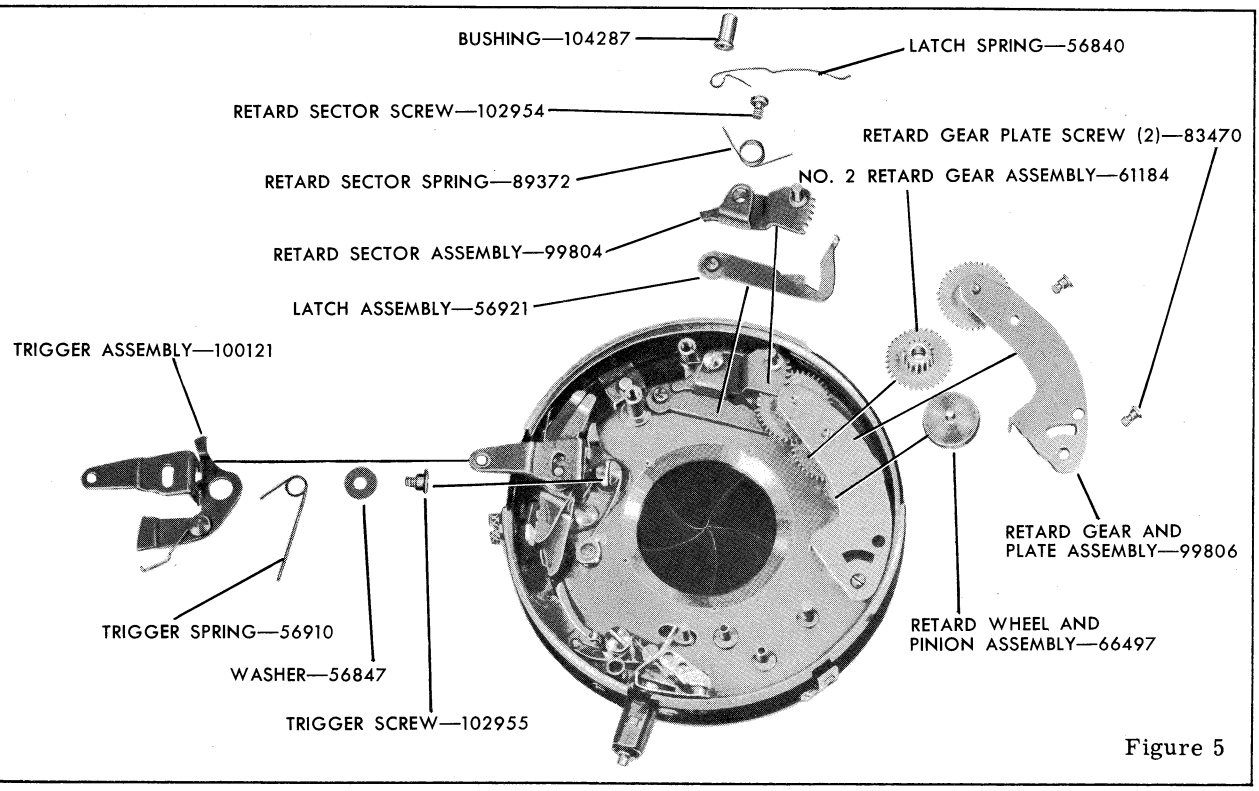


Figure 5

NEW MODEL SHUTTER

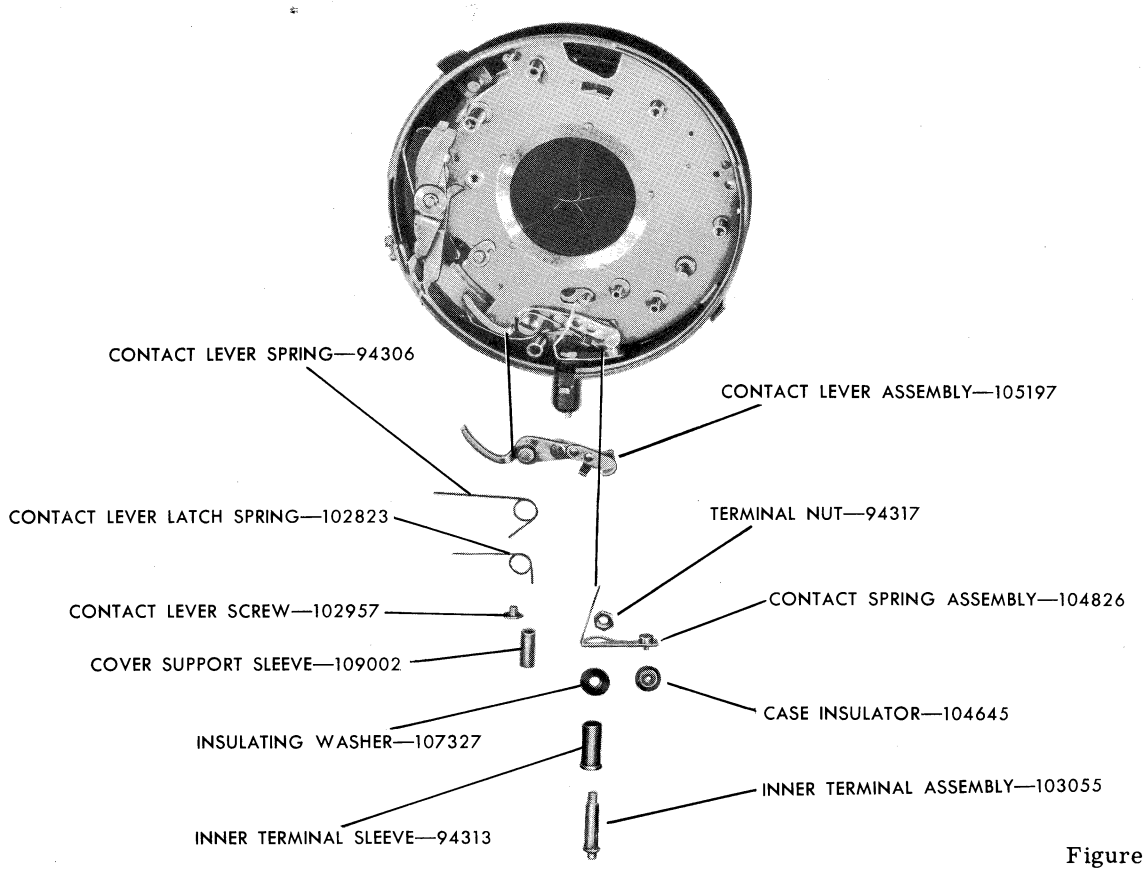
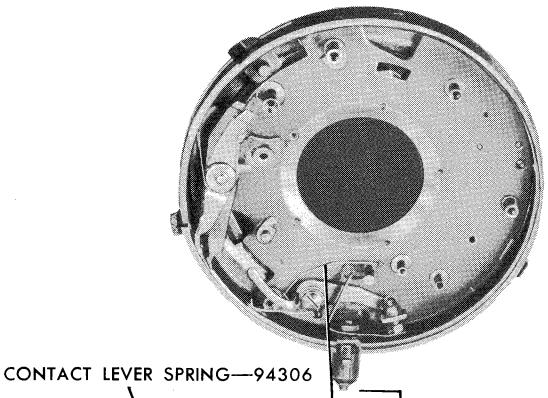


Figure 6

OLD MODEL SHUTTER



CONTACT LEVER SPRING—94306

DISCONTINUED—Replace with Kit No. 103953—Figure 10

TERMINAL NUT—94317

CONTACT SPRING SCREW—102337

CONTACT SPRING—96484

INSULATOR WASHER (2)—94318

CONTACT LEVER SCREW—102957

CASE INSULATOR—94319

INNER TERMINAL SLEEVE—94313

CONTACT SPRING SCREW NUT—94322

INNER TERMINAL ASSEMBLY—103055

CONTACT LEVER LATCH SPRING—102823

Figure 6A

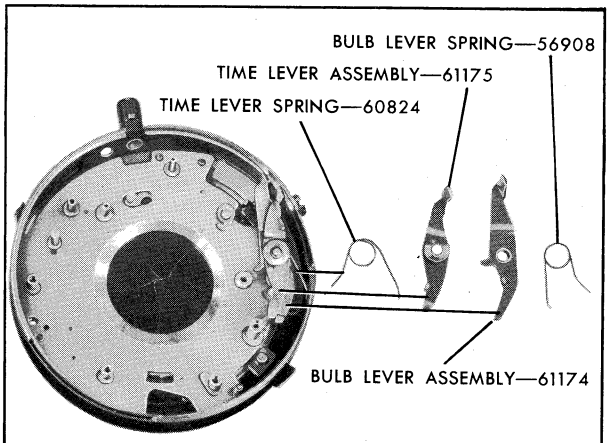


Figure 7

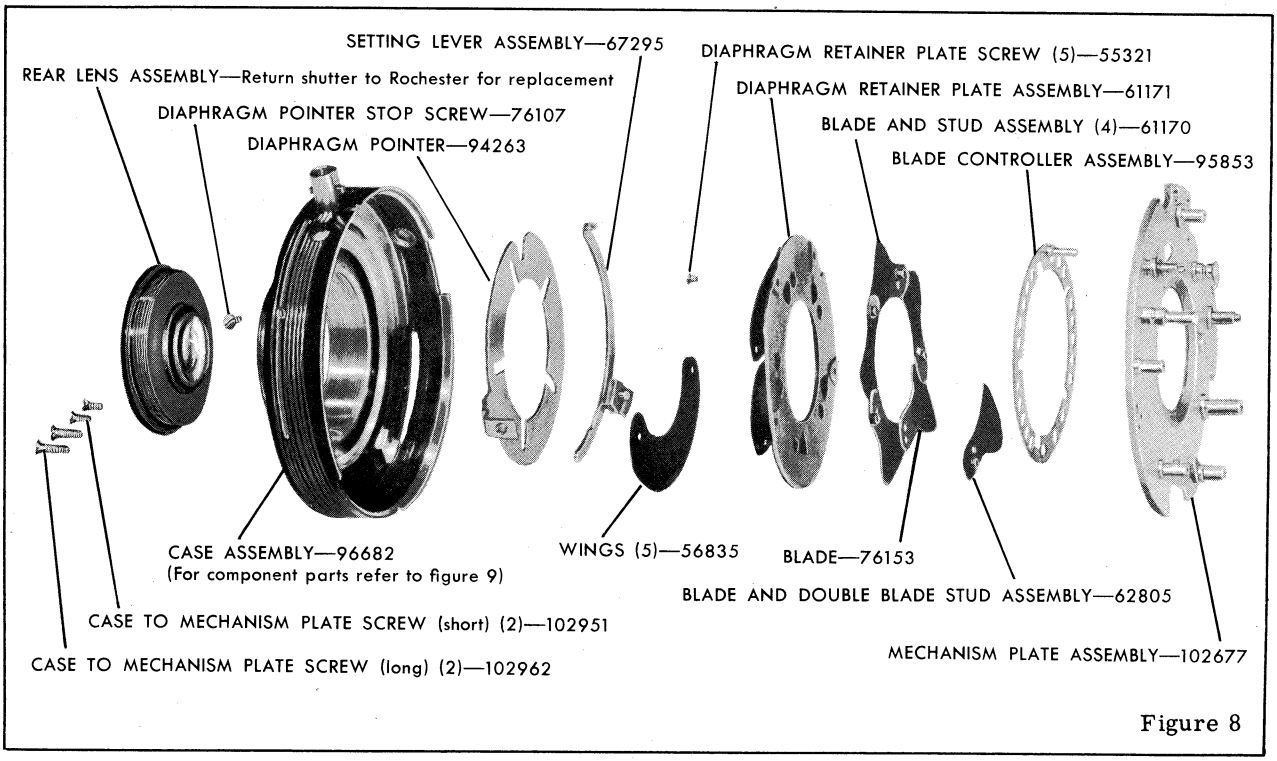


Figure 8

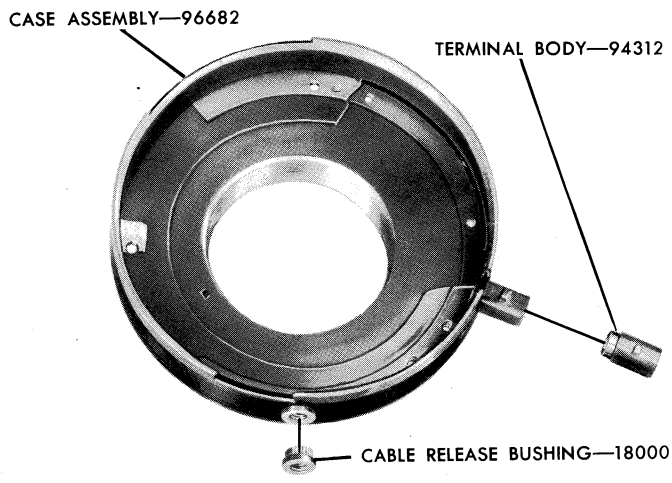


Figure 9

KIT NO. 103953
FOR REPLACING OLD STYLE CONTACTS

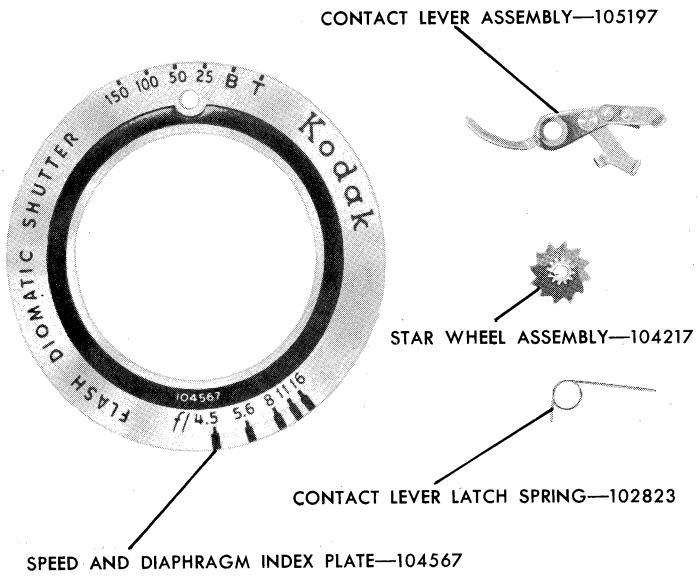


Figure 10

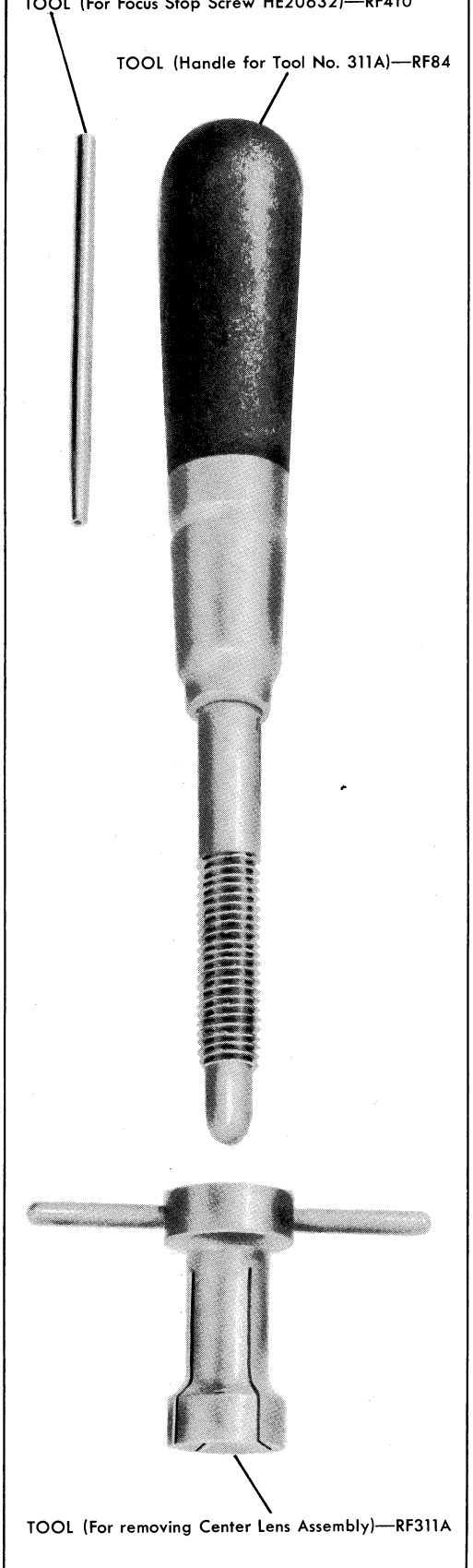


Figure 11

FIG.	PART NUMBER	PART NAME	No. REQD.
11	RF84	Tool - (Handle for Tool No. 311A)	1
11	RF311A	Tool - (For removing center Lens Assembly)	1
11	RF410	Tool - (For focus stop screw HE20632)	1
9	18000	Bushing - Cable release	1
1	HE20632	Screw - Stop	1
1	HE23276	Screw - Lock	2
1	HE31371	Focusing Mount Assembly, Kodak Anaston Lens (Substitute for Kodak Anastigmat Lens)	1
8	55321	Screw - Diaphragm Retainer plate to mechanism plate	5
9	55329	Screw - Cable release opening	1
9	56100	Screw - Cable release bushing (Designed to facilitate repairing-Drill two holes in shutter case with No. 56 drill.)	2
8	56835	Wing - Diaphragm	5
5	56840	Spring - Blade controller latch	1
5	56847	Washer - Trigger	1
7	56908	Spring - Bulb lever	1
5	56910	Spring - Trigger	1
3	56914	Spring - Delayed action safety latch	1
4,5	56921	Blade Controller Latch and Stud Assembly	1
4	56924	Clutch Assembly	1
7	60824	Spring - Time lever	1
8	61170	Blade and Stud Assembly	4
8	61171	Diaphragm Retainer Plate and Wings Assembly	1
7	61174	Bulb Lever Assembly	1
7	61175	Time Lever Assembly	1
5	61184	No. 2 Retard Gear and Pinion Assembly	1
8	62805	Blade and Double Blade Stud Assembly	1
4	64793	Spring - Main drive	1
5	66497	Retard Wheel and Pinion Assembly	1
4	67294	Main Drive Bushing and Disc Assembly	1
8	67295	Setting Lever and Stud Assembly	1
2	68403	Button - Trigger	1
2	68404	Screw - Trigger button	1
8	76107	Screw - Diaphragm pointer stop	1
8	76153	Blade	1
9	81491	Bushing - Cable release (Designed to facilitate repairing-Drill two holes in shutter case with No. 56 drill.)	1
5	83470	Screw - Retard gear plate	2
1	84288	Tip - Diaphragm pointer	1
5	89372	Spring - Retard sector	1
8	94263	Pointer - Diaphragm	1
6,6A	94306	Spring - Contact lever	1
4	94309	Spring - Delayed action winding	1
2	94310	Pallet - Flash (For average time lag shutters)	AR
9	94312	Body - Terminal	1
6,6A	94313	Sleeve - Inner terminal	1
6,6A	94317	Nut - Terminal	1
6A	94318	Washer - Case insulator, old model	2
6A	94319	Insulator - Case, old model	1
6A	94322	Nut - Contact spring screw, old model	1
2	94798	Spring - Trigger latch	1
8	95853	Blade Controller Assembly	1
6A	96484	Spring - Contact, old model	1
1	96678	Ring - Speed control	1
2	96680	Latch - Trigger	1
8,9	96682	Case Assembly	1
2	96769	Lever - Winding	1
4	96811	Winding Gear with Stud and Spring Assembly, old model	1
1	96883	Nut - Synchronizer scale stud, old model	1
5	99804	Retard Sector and Stud Assembly	1
5	99806	Retard Gear and Plate Assembly	1
3	100084	Cover Assembly	1
FIG.	PART NUMBER	PART NAME	No. REQD.

Parts List No. 1-1480B

KODAK FLASH DIOMATIC SHUTTER FOR KODAK 35 CAMERA
WITH *f*/4.5 KODAK ANASTIGMAT OR ANASTON LENS

DECEMBER 1949

FIG.	PART NUMBER	PART NAME	No. REQD.
2,5	100121	Trigger Assembly	1
2	100258	Flash Pallet Assembly (For less than average time lag shutters)	AR
4	101984	Screw - Clutch, old model-(1), Star wheel-(1)	AR
6A	102337	Screw - Contact spring, old model	1
8	102677	Mechanism Plate and Studs Assembled	1
6,6A,10	102823	Spring - Contact lever latch	1
8	102951	Screw - Mechanism plate to case (long)	2
5	102954	Screw - Retard sector	1
5	102955	Screw - Trigger	1
2,6A, 3,6	102957	Screw - Trigger latch spring-(1), Delayed action safety latch spring-(1), Contact lever-(1)	3
2	102961	Screw - Main drive	1
8	102962	Screw - Mechanism plate to case (long)	2
2	102964	Screw - Speed control ring stop	1
1	102977	Screw - Diaphragm pointer tip	1
2	102978	Screw - Cover, short	1
2	102995	Screw - Cover, long	2
6,6A	103055	Inner Terminal Assembly	1
10	103953	Kit for replacing old style contacts	1
4,10	104217	Star Wheel Assembly, new model	1
5	104287	Bushing - Blade controller latch spring	1
1,10	104567	Plate - Speed and diaphragm index, new model	1
6	104645	Insulator - Case, new model	1
6	104826	Contact Spring Assembly, new model	1
6,10	105197	Contact Lever Assembly, new model	1
6	107327	Washer - Insulating, new model	1
6	109002	Sleeve - Cover support, new model	1
4	117179	Winding Gear Assembly, new model	1
		Front Lens Assembly (Return Shutter to Rochester for replacement)	1
		Center Lens Assembly (Return Shutter to Rochester for replacement)	1
		Rear Lens Assembly (Return Shutter to Rochester for replacement)	1

FIG.	PART NUMBER	PART NAME	No. REQD.

2-50-G L P-B

Lithographed in the United States of America

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

JUNE 1953 PARTS LIST No. 6200

KODAK FLASH 200 SHUTTER

with

Kodak Anaston Lens, 105mm *f*/6.3 for Kodak Tourist II Camera

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

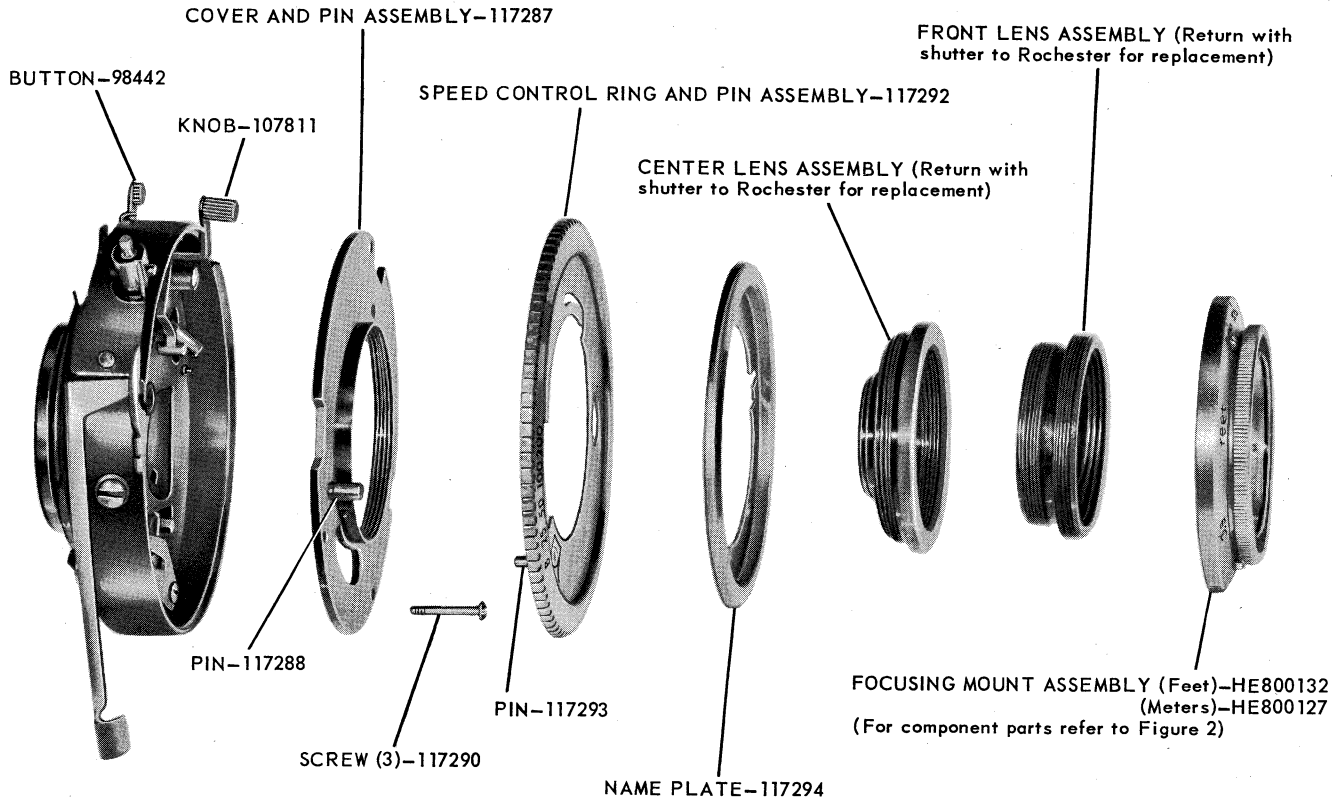


Figure 1

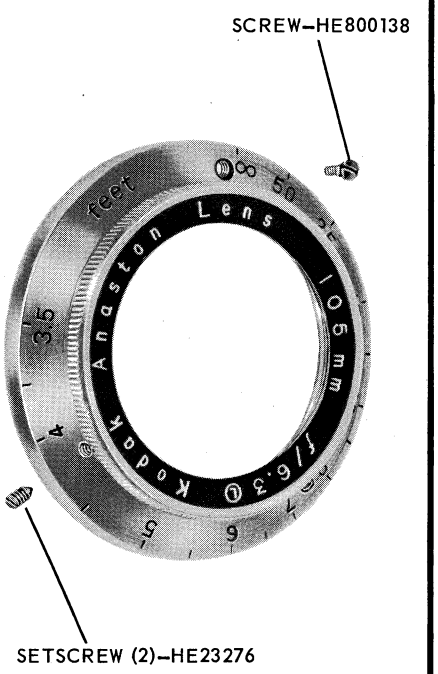


Figure 2

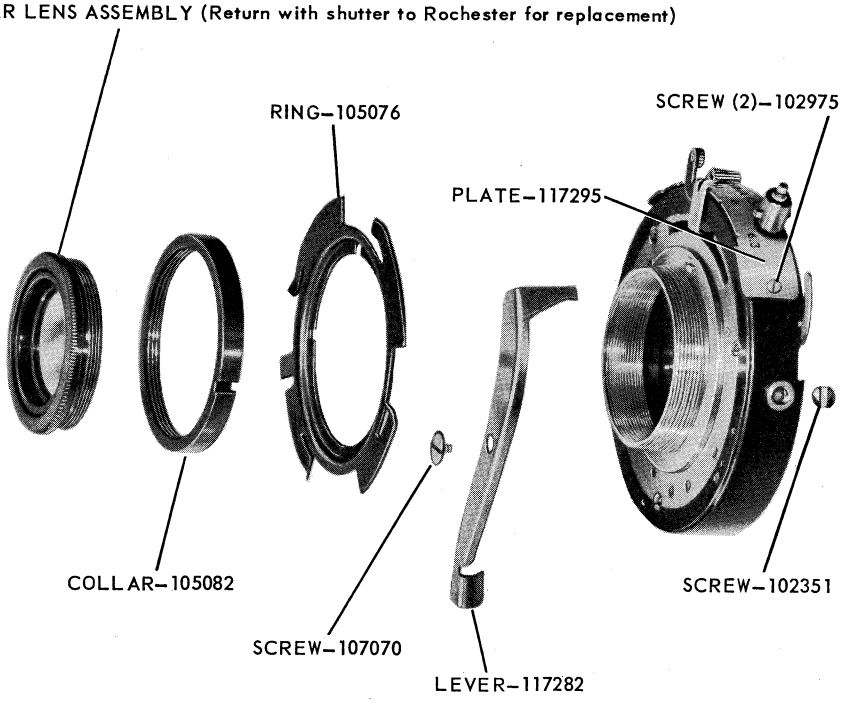


Figure 3

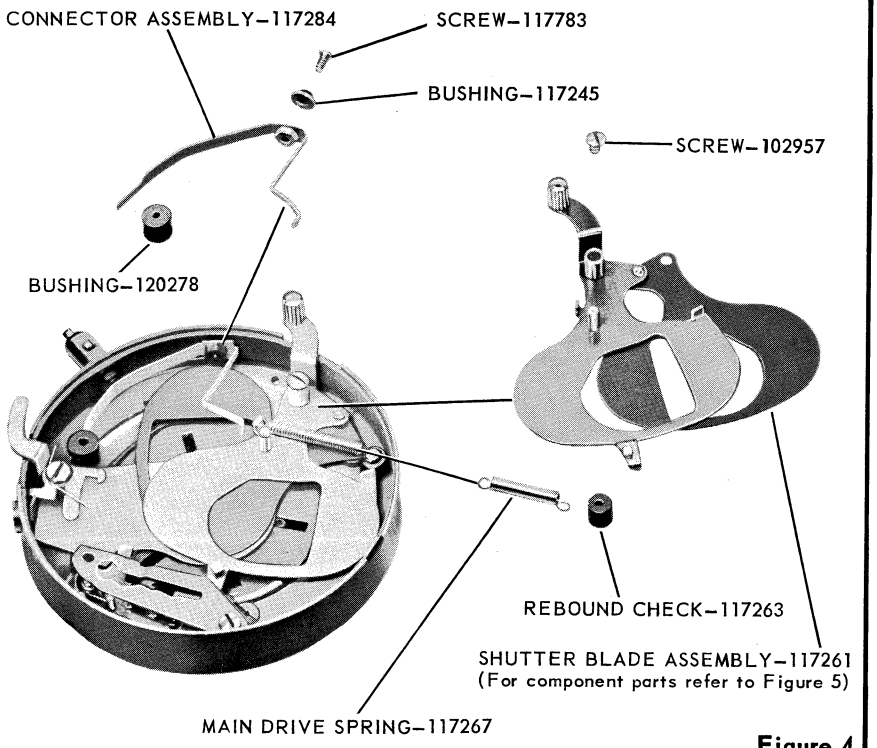


Figure 4

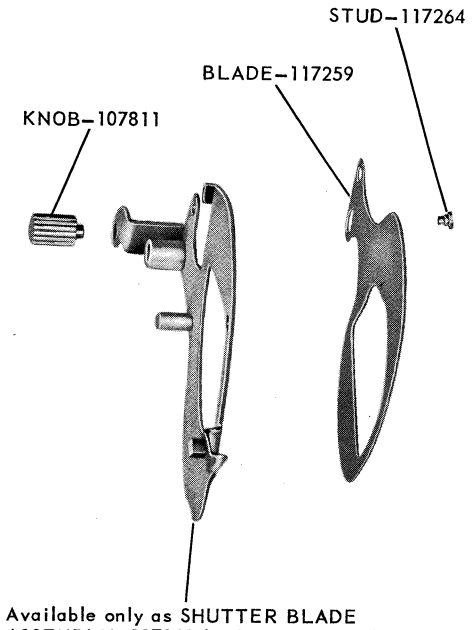


Figure 5

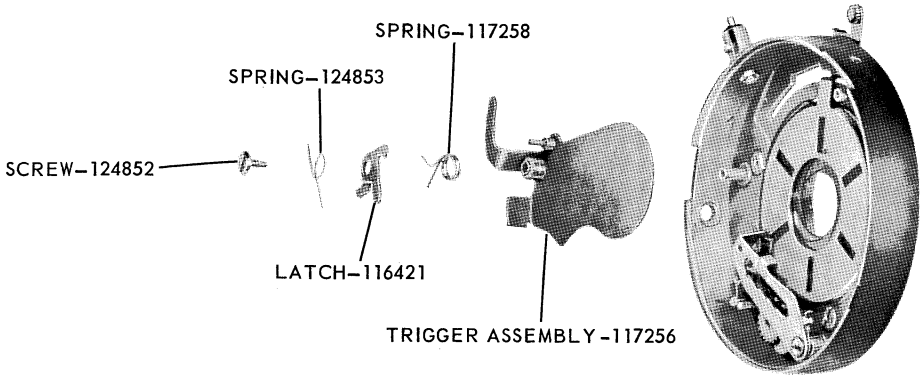


Figure 6

OLD STYLE PARTS

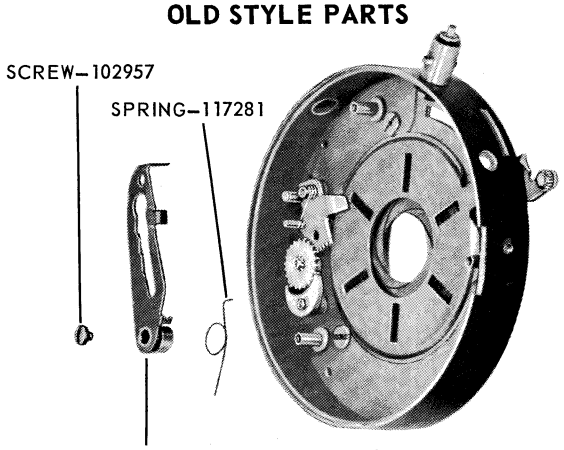


Figure 7

NEW STYLE PARTS

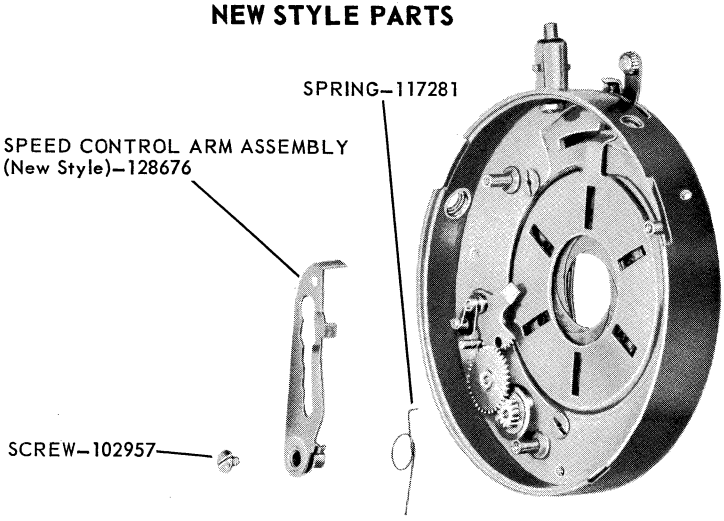


Figure 8

KIT NO. K-295

RETARD GEAR TRAIN KIT

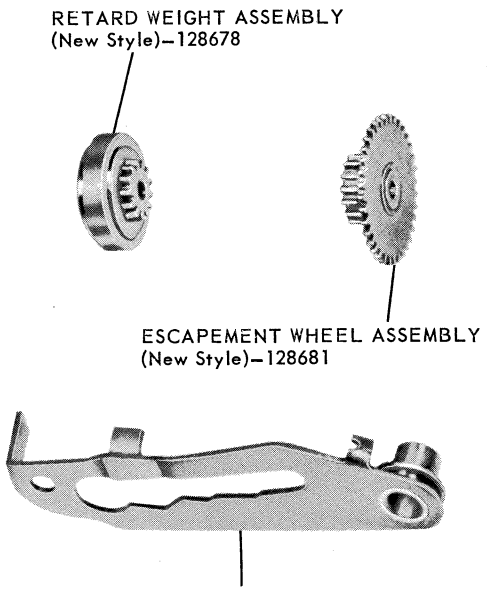


Figure 9

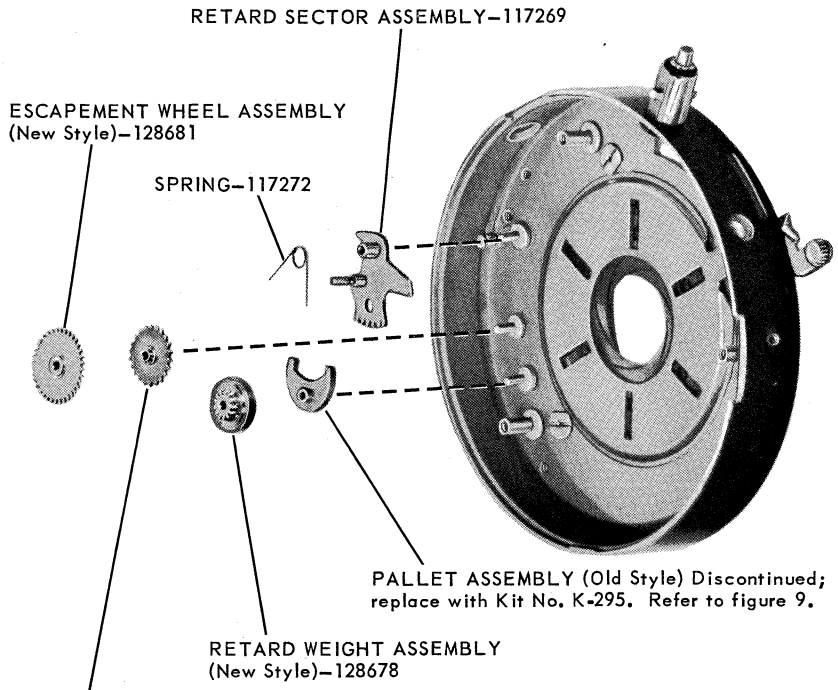


Figure 10

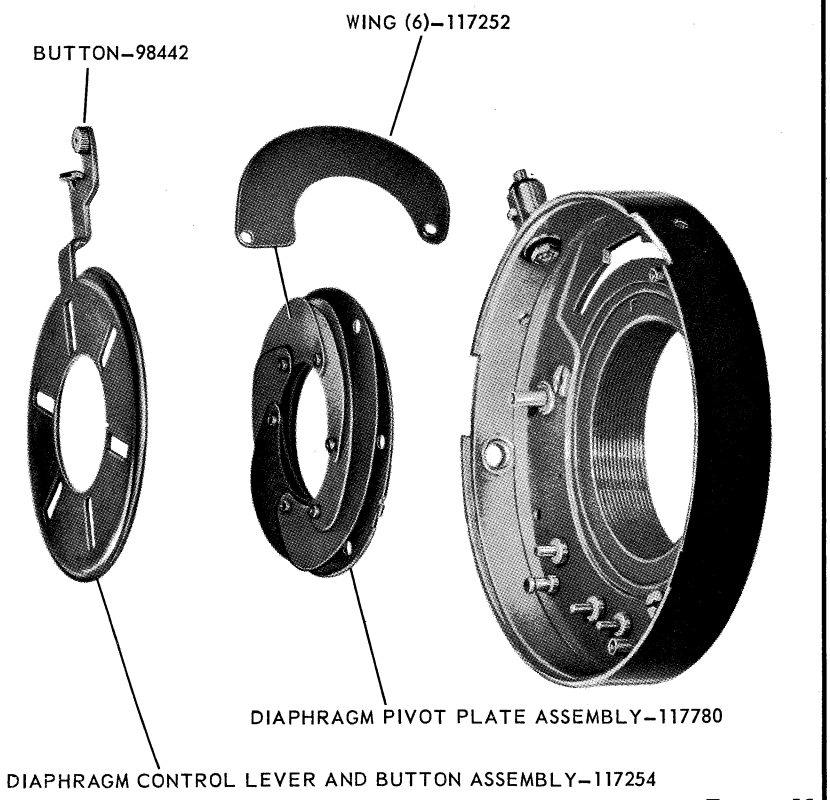


Figure 11

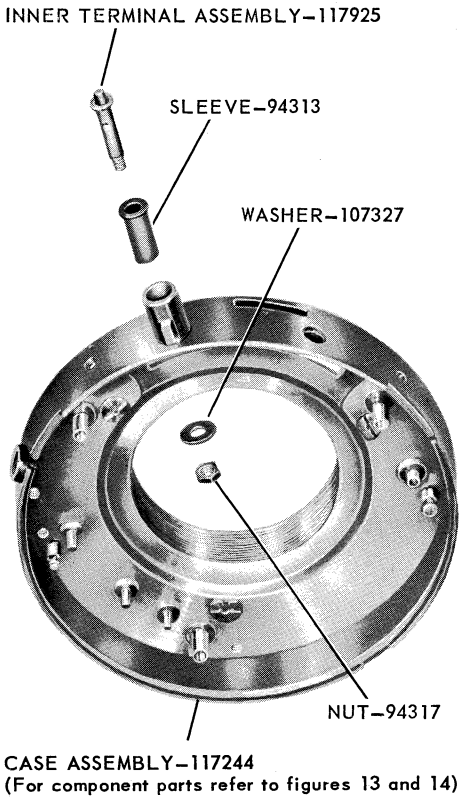
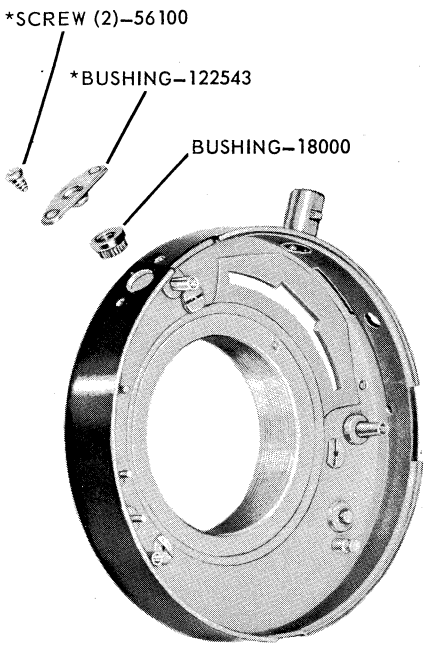


Figure 12



*Designed to facilitate repairing. Use No. 56 (.0465) drill for self tapping screws part No. 56100.

Figure 13

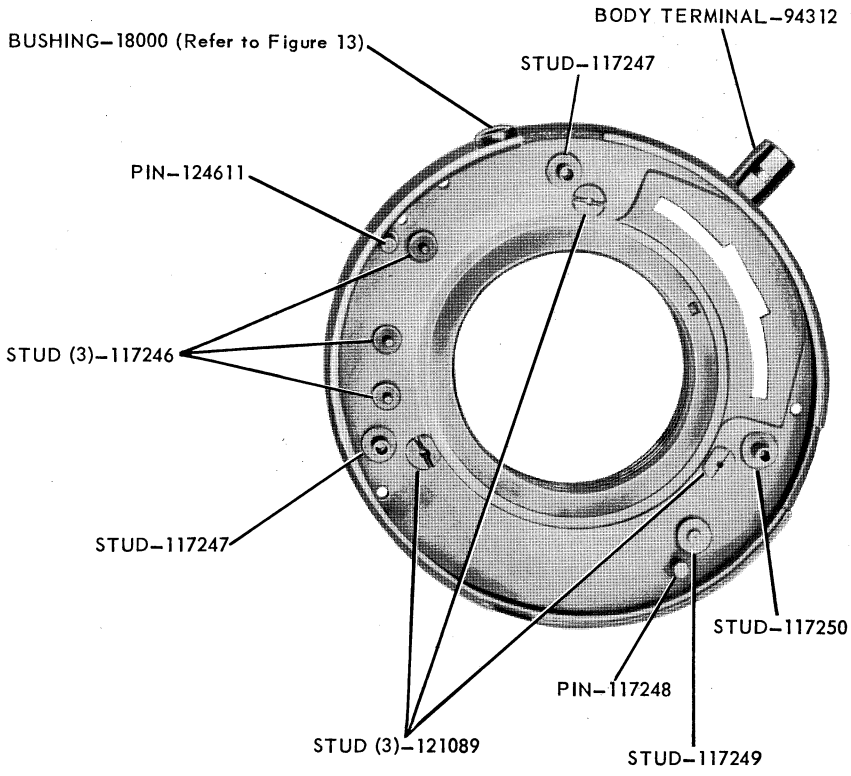


Figure 14

FIG.	PART NO.	PART NAME	REQD.
1		Front Lens Assembly (Return with shutter to Rochester for replacement)	1
1		Center Lens Assembly (Return with shutter to Rochester for replacement)	1
3		Rear Lens Assembly (Return with shutter to Rochester for replacement)	1
9	Kit No. K-295	Retard Gear Train Kit	1
13,14	18000	Bushing - Cable release	1
2	HE23276	Setscrew - Focusing lens mount	2
13	56100	Screw - Cable release bushing (to facilitate repairing)	2
14	94312	Body - Terminal	1
12	94313	Sleeve - Inner terminal insulating	1
12	94317	Nut - Terminal	1
1,11	98442	Button - Diaphragm control lever	1
3	102351	Screw - Cable release bushing	1
4,7,8	102957	Screw - Speed control arm (1), Shutter blade assembly (1)	2
3	102975	Screw - Indicator plate	2
3	105076	Ring - Shutter lock	1
3	105082	Collar - Shutter retaining	1
3	107070	Screw - Shutter trip lever	1
12	107327	Washer - Insulating	1
1,5	107811	Knob - Setting	1
6	116421	Latch - Trigger	1
12	117244	Case Assembly	1
4	117245	Bushing - Connector	1
14	117246	Stud - Pallet (1), Retard sector (1), Escapement wheel (1)	3
14	117247	Stud - Trigger (1), Retard sector arm (1)	2
14	117248	Pin - Main spring	1

Always give PART NUMBER and NAME when ordering parts

FIG.	PART NO.	PART NAME	REQD.
14	117249	Stud - Shutter blade, short	1
14	117250	Stud - Shutter blade, long	1
11	117252	Wing - Diaphragm	6
11	117254	Diaphragm Control Lever and Button Assembly	1
6	117256	Trigger Assembly	1
6	117258	Spring - Trigger	1
5	117259	Blade - Shutter blade, thin	1
4	117261	Shutter Blade Assembly	1
4	117263	Check - Rebound	1
5	117264	Stud - Shutter blade drive	1
4	117267	Spring - Main drive	1
10	117269	Retard Sector Assembly	1
10	117272	Spring - Retard sector	1
7,8	117281	Spring - Speed control arm	1
3	117282	Lever - Shutter trip	1
4	117284	Connector Assembly	1
1	117287	Cover and Pin Assembly	1
1	117288	Pin - Stop	1
1	117290	Screw - Cover	3
1	117292	Speed Control Ring and Pin Assembly	1
1	117293	Pin - Speed control	1
1	117294	Plate - Name	1
3	117295	Plate - Indicator	1
11	117780	Diaphragm Pivot Plate Assembly	1
4	117783	Screw - Connector mounting	1
12	117925	Inner Terminal Assembly	1
4	120278	Bushing - Insulator	1
14	121089	Stud - Diaphragm lever, hold down	3
13	122543	Bushing - Cable release (to facilitate repairing)	1
14	124611	Pin - Retard sector stop	1
6	124852	Screw - Trigger	1
6	124853	Spring - Trigger latch	1
8,9	128676	Speed Control Arm Assembly (new style)	1
9,10	128678	Retard Weight Assembly (new style)	1
9,10	128681	Escapement Wheel and Gear Assembly (new style)	1
1	HE800127	Focusing Mount Assembly (meters)	1
1	HE800132	Focusing Mount Assembly (feet)	1
2	HE800138	Screw - Focusing lens mount stop	1

Always give PART NUMBER and NAME when ordering parts

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

Lithographed in the United States of America

APRIL 1950 PARTS LIST No. 1-5251

FLASH KODON SHUTTER

WITH KODET LENS FOR KODAK TOURIST CAMERA *f*/12.5

The parts illustrated are in the sequence of disassembly.

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

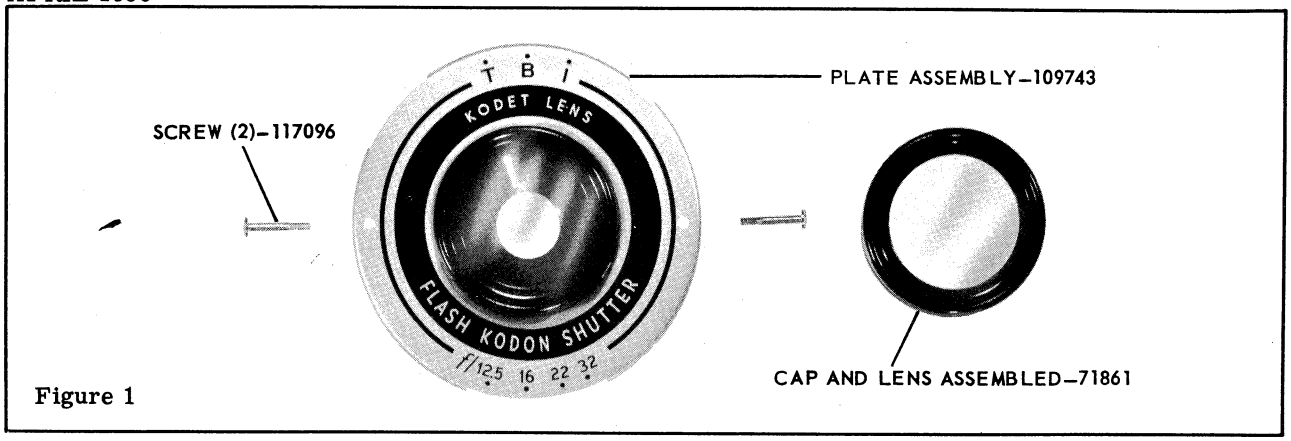


Figure 1

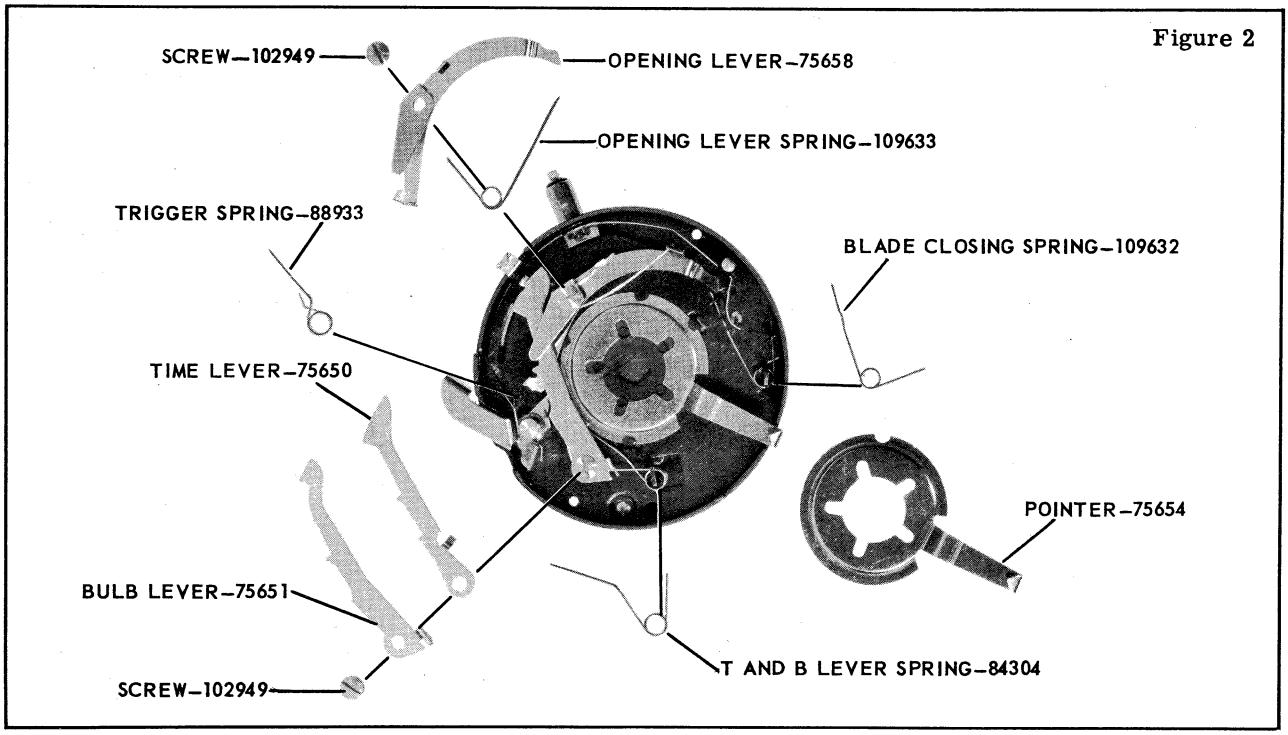


Figure 2

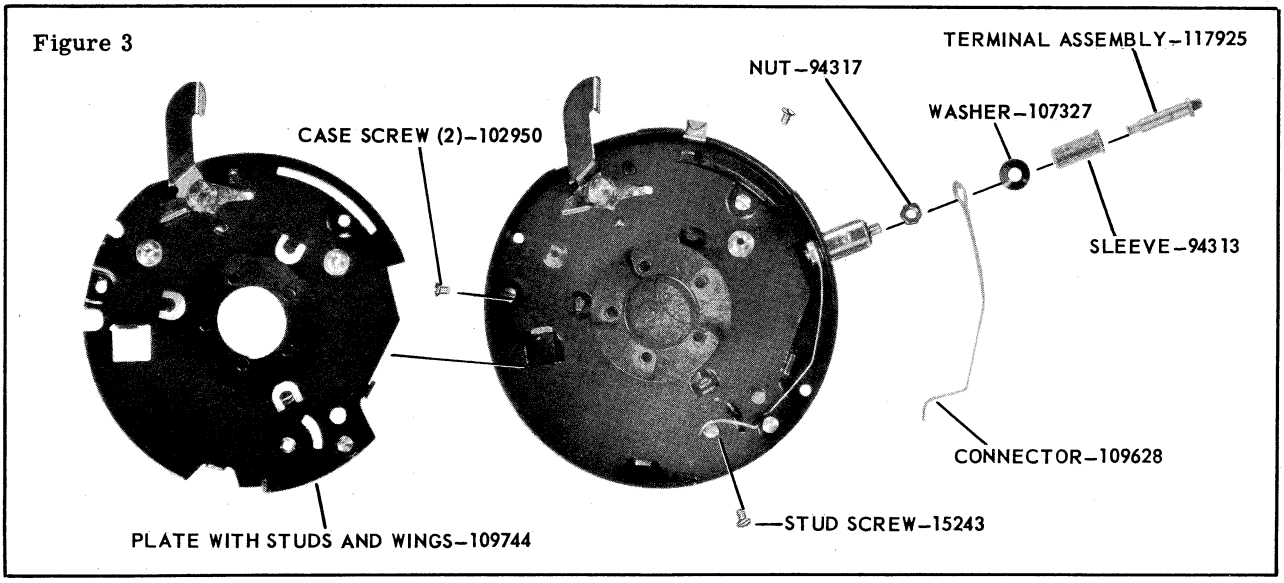


Figure 3

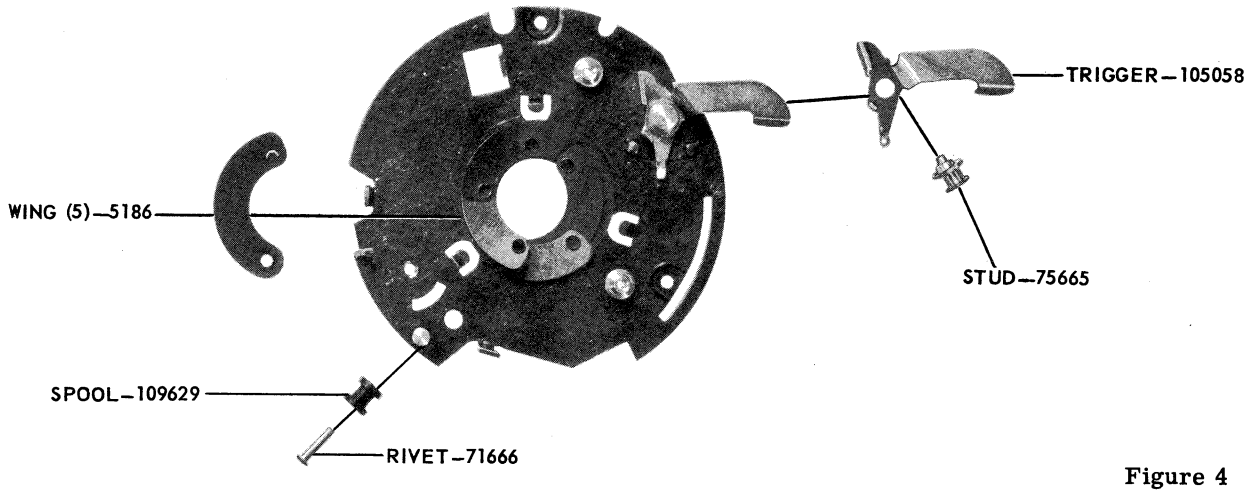


Figure 4

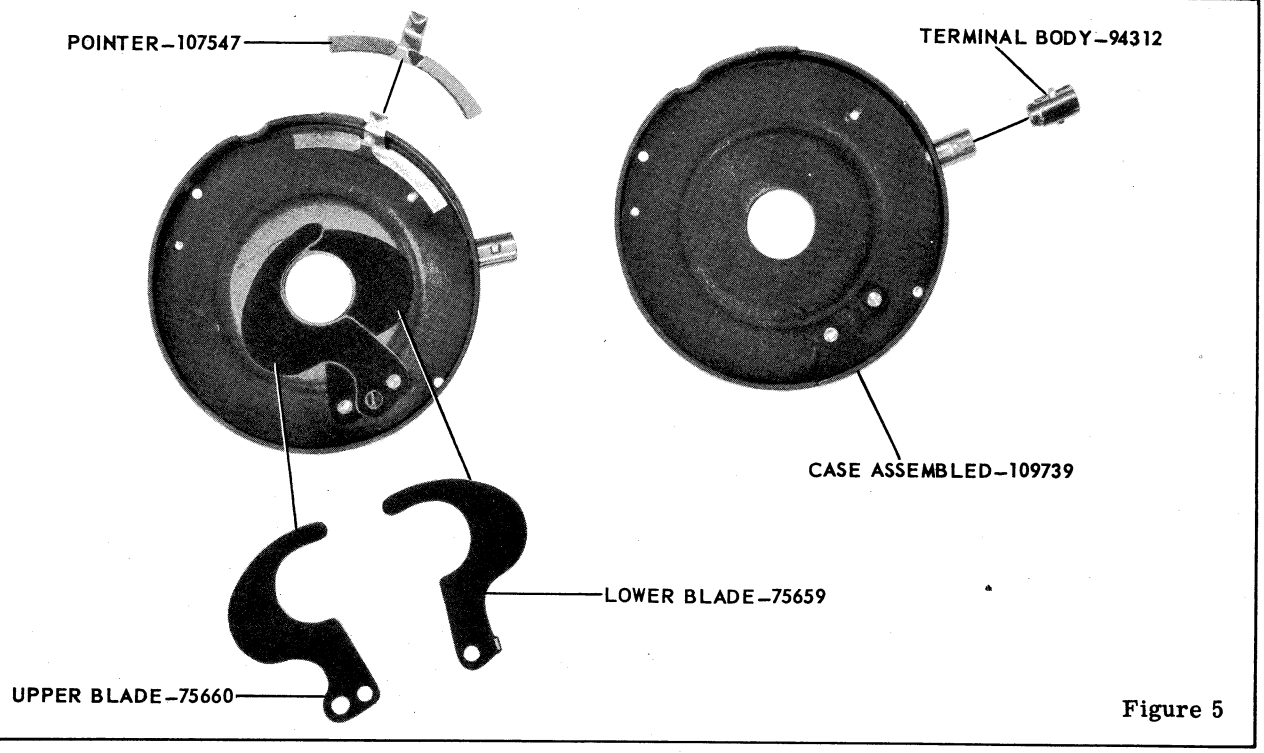


Figure 5

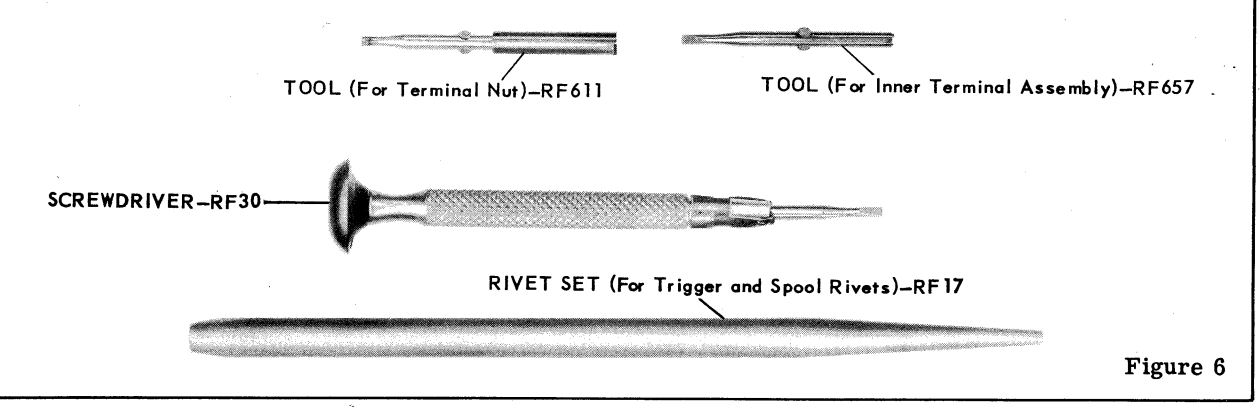


Figure 6

APRIL 1950

FIG.	PART NUMBER	PART NAME	No. REQD.
4	5186	Wing - Diaphragm	5
3	15243	Screw - Plate to blade stud	1
4	71666	Rivet - Insulator spool	1
1	71861	Hood Cap and Lens Assembled	1
2	75650	Lever - Time	1
2	75651	Lever - Bulb	1
2	75654	Pointer - Diaphragm	1
2	75658	Lever - Opening	1
5	75659	Blade - Lower	1
5	75660	Blade - Upper	1
4	75665	Stud - Trigger	1
2	84304	Spring - Time and bulb lever	1
2	88933	Spring - Trigger	1
5	94312	Body - Terminal	1
3	94313	Sleeve - Insulating	1
3	94317	Nut - Terminal	1
2	102949	Screw - T and B lever - 1, Opening lever - 1	2
3	102950	Screw - Plate to case	2
4	105058	Trigger	1
3	107327	Washer - Insulating	1
5	107547	Pointer - Speed	1
3	109628	Connector	1
4	109629	Spool - Insulator	1
2	109632	Spring - Blade closing	1
2	109633	Spring - Opening lever	1
5	109739	Case Assembled	1
1	109743	Speed and Diaphragm Index Plate Assembly	1
3	109744	Mechanism Plate with Studs and Diaphragm Wings	1
1	117096	Screw - Shutter to adapter	2
3	117925	Inner Terminal Assembly	1
6	RF17	Rivet Set (for trigger and spool rivets)	1
6	RF30	Screwdriver - Jewelers'	1
6	RF611	Tool (for terminal nut)	1
6	RF657	Tool (for inner terminal assembly)	1
FIG.	PART NUMBER	PART NAME	No. REQD.

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

Lithographed in the United States of America

Service Instructions

September 1957 No. 1-5251-A

SERVICE HINTS

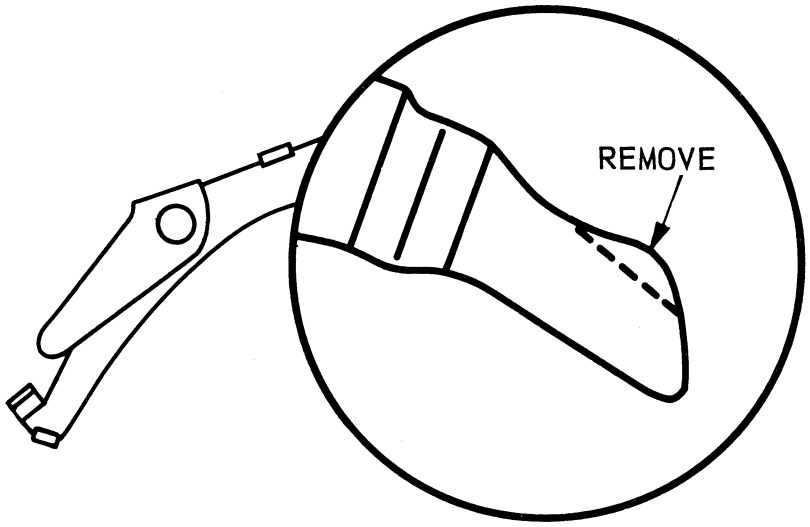
FLASH KODON SHUTTERS FOR KODAK TOURIST CAMERAS

In the course of normal maintenance of these shutters, you may encounter some which tend to bind or stick, a situation apparently brought about mainly by certain climatic conditions which affect the finish of one or two parts. For shutters affected this way we suggest the following remedies.

CASE–Cameras with serial numbers above No. 434,000 were generally equipped with shutter cases having an improved colloidal graphite finish (dark gray color). Where case finish is believed to be a contributing cause of trouble, a new Case Assembly part No. 109739 may be ordered.

BLADES–Climatic conditions occasionally cause the blade finish to soften and build up slightly at the edges, making the blades stick together. Cleaning the blades often corrects this situation. New blades may be ordered as Blade (lower)–75659, Blade (upper)–75660.

OPENING LEVER–The direct cause of sticking was opening lever design, not case finish. The cam action of the hump on the lever was sometimes erratic until slight forming and polishing improvements were made. If sticking occurs at this point, it is suggested that the opening lever be removed and modified as sketched. Buff and polish the edges to remove any roughness that might cause the mechanism to "hang up" during the release cycle. New opening levers may be ordered as part No. 75658.



EASTMAN KODAK COMPANY • ROCHESTER 4, NEW YORK

9-57-IPS-A

Printed in the United States of America

OCTOBER 1948 PARTS LIST No. 1-1470A

FLASH KODAMATIC SHUTTER

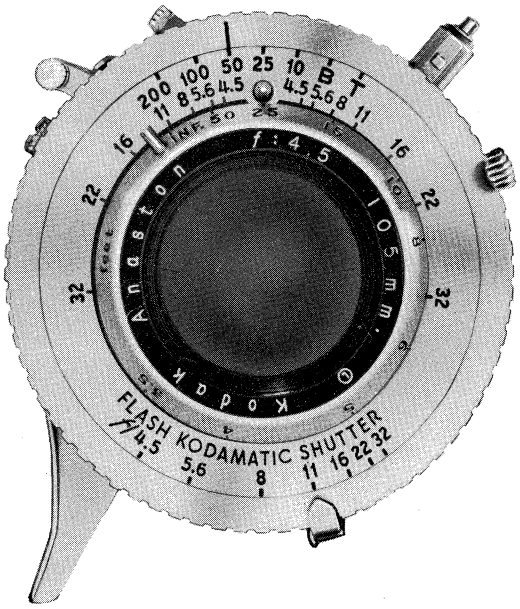
WITHOUT SYNCHRONIZER SCALE

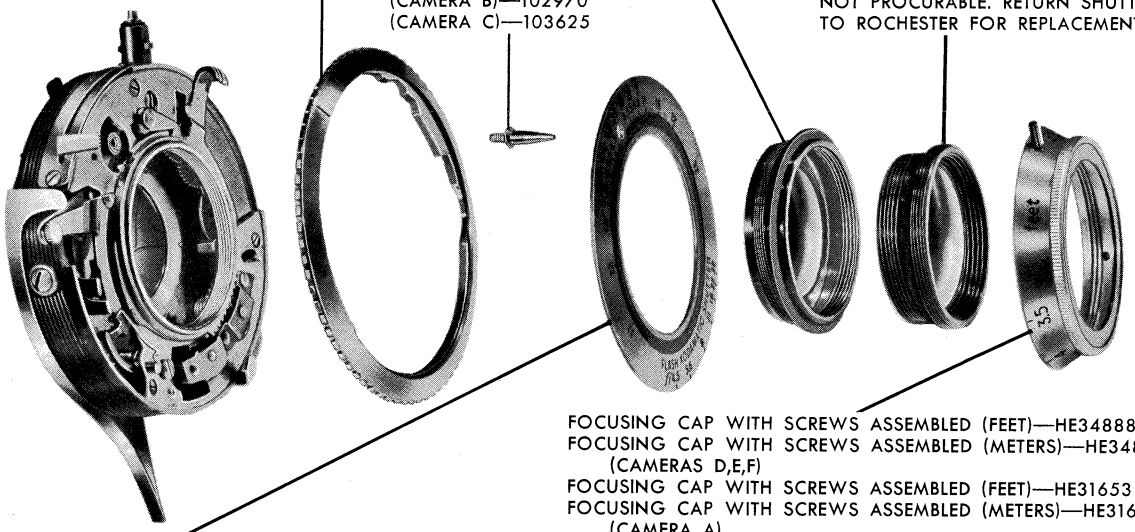
The Flash Kodamatic Shutter without Synchronizer Scale is standard equipment on the following cameras:

SYMBOL	CAMERA	SYMBOL	CAMERA
A	Kodak 35 f/3.5	D	Kodak Vigilant f/4.5
B	Kodak 35 f/3.5 with Range Finder	E	Kodak Monitor f/4.5
C	Kodak Reflex f/3.5	F	Kodak Tourist f/4.5

Parts which are identical on all models are identified only by part number and name. Parts which are not common to all models are identified by the symbol for the individual camera.

Illustrations are arranged in sequence of disassembly so that individual parts can be located quickly.





SPEED CONTROL RING
(CAMERAS A,B)—96485
(CAMERA C, 200 SPEED)—95562
(CAMERA C, 300 SPEED)—109248
(CAMERAS D,E,F)—96770

SCREW
(CAMERAS A,D,E,F)—102961
(CAMERA B)—102970
(CAMERA C)—103625

CENTER LENS ASSEMBLY
NOT PROCURABLE. RETURN SHUTTER TO ROCHESTER FOR REPLACEMENT

FRONT LENS ASSEMBLY
NOT PROCURABLE. RETURN SHUTTER TO ROCHESTER FOR REPLACEMENT.

FOCUSING CAP WITH SCREWS ASSEMBLED (FEET)—HE34888
FOCUSING CAP WITH SCREWS ASSEMBLED (METERS)—HE34897
(CAMERAS D,E,F)
FOCUSING CAP WITH SCREWS ASSEMBLED (FEET)—HE31653
FOCUSING CAP WITH SCREWS ASSEMBLED (METERS)—HE31656
(CAMERA A)
(FOR COMPONENT PARTS REFER TO FIGURE 1A)
(FOR CAMERA B PARTS REFER TO FIGURE 1B)
(FOR CAMERA C PARTS REFER TO FIGURE 1C)

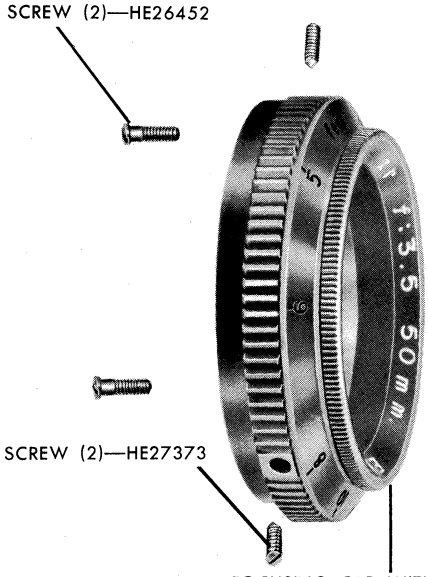
INDEX PLATE
(CAMERA A)—104621
(CAMERA B)—107471
(CAMERA D)—104564
(CAMERA E)—104565
(CAMERA F)—105075
(CAMERA C)—REFER TO FIGURE 1C

Figure 1

STOP SCREW—HE20632
(CAMERAS A,D,E,F)

LOCKING SCREW (2)—HE23276
(CAMERAS A,D,E,F)

Figure 1A



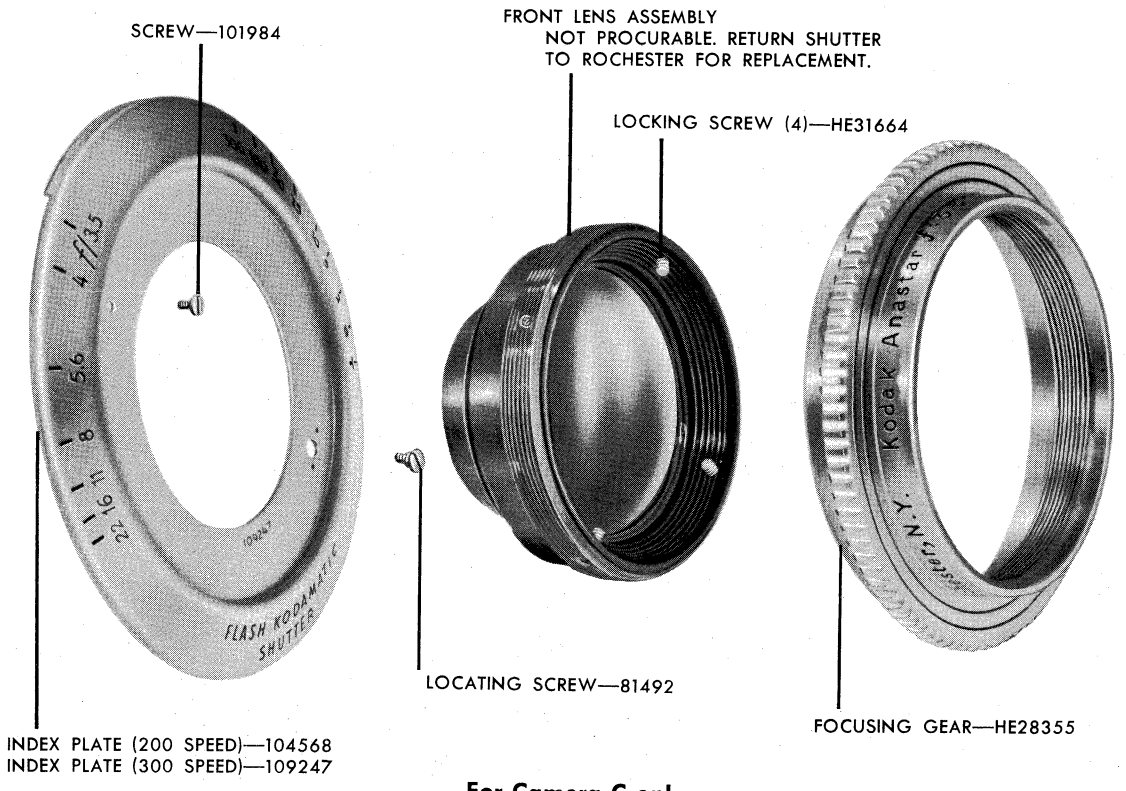
SCREW (2)—HE26452

SCREW (2)—HE27373

FOCUSING CAP WITH SCREWS ASSEMBLED (FEET)—HE27366
FOCUSING CAP WITH SCREWS ASSEMBLED (METERS)—HE27371

For Camera B only

Figure 1B



For Camera C only

Figure 1C

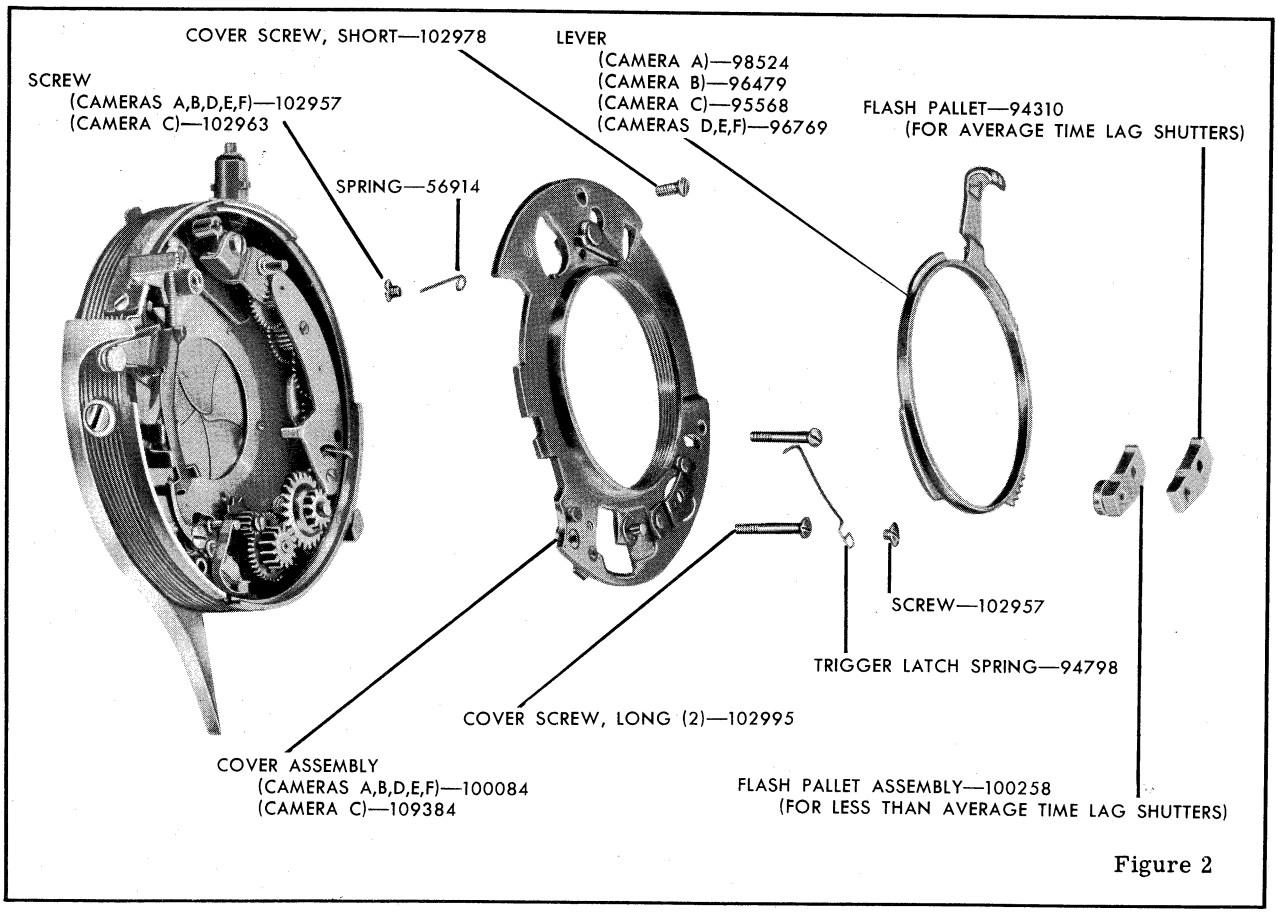


Figure 2

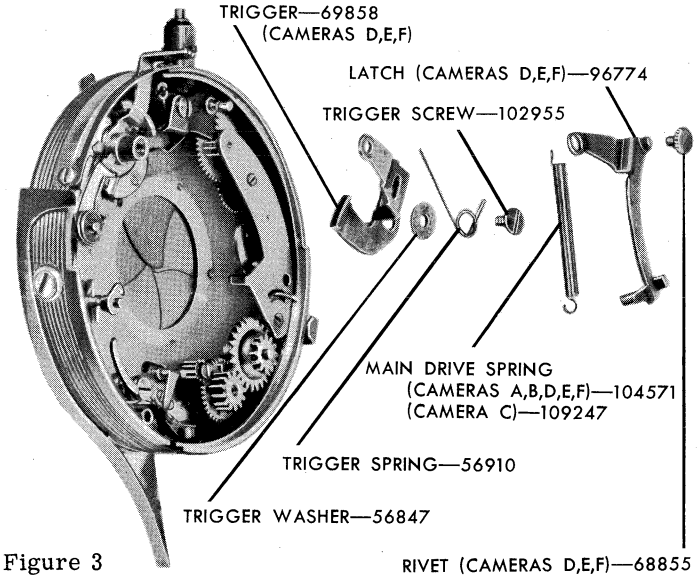


Figure 3

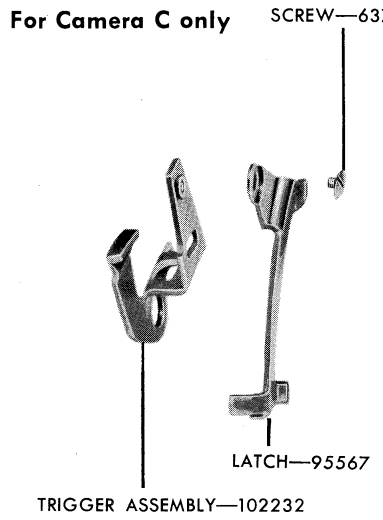


Figure 3B

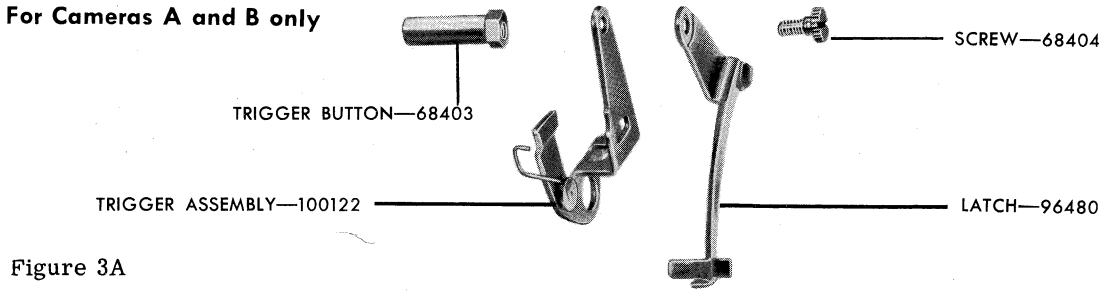


Figure 3A

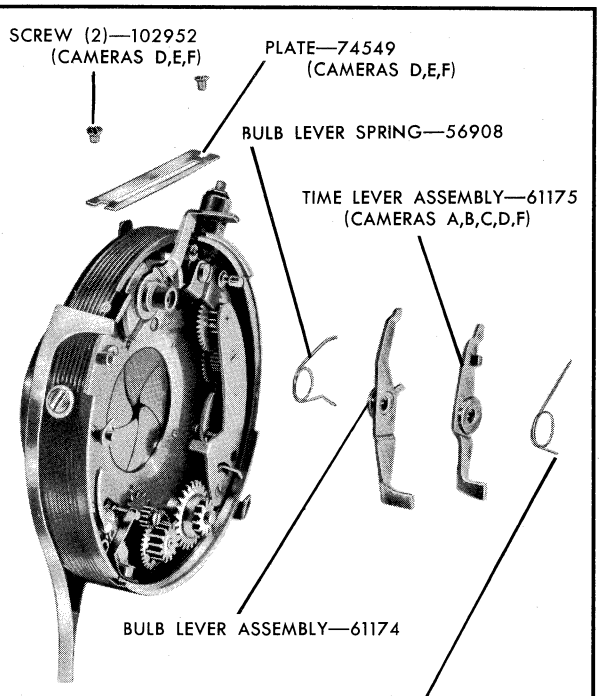


Figure 4

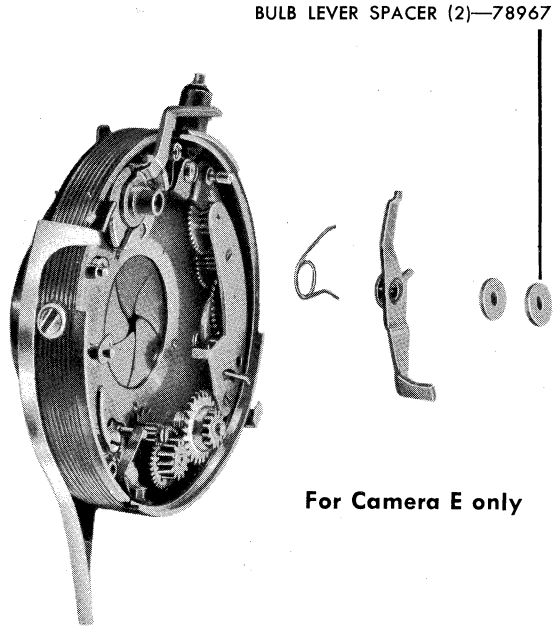


Figure 4A

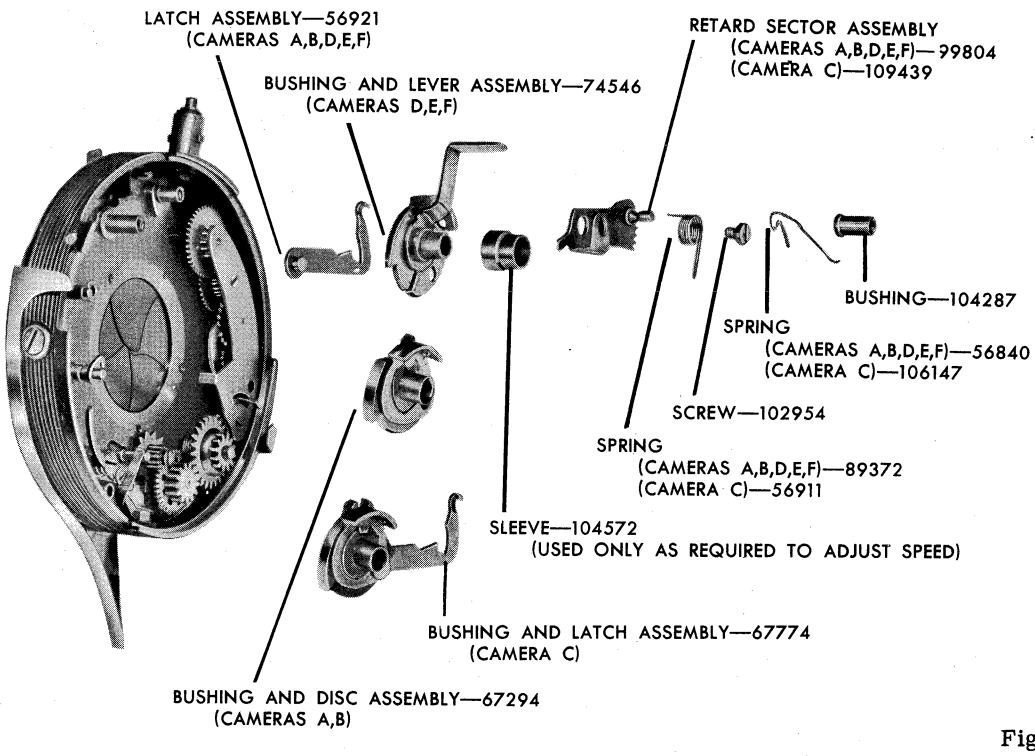


Figure 5

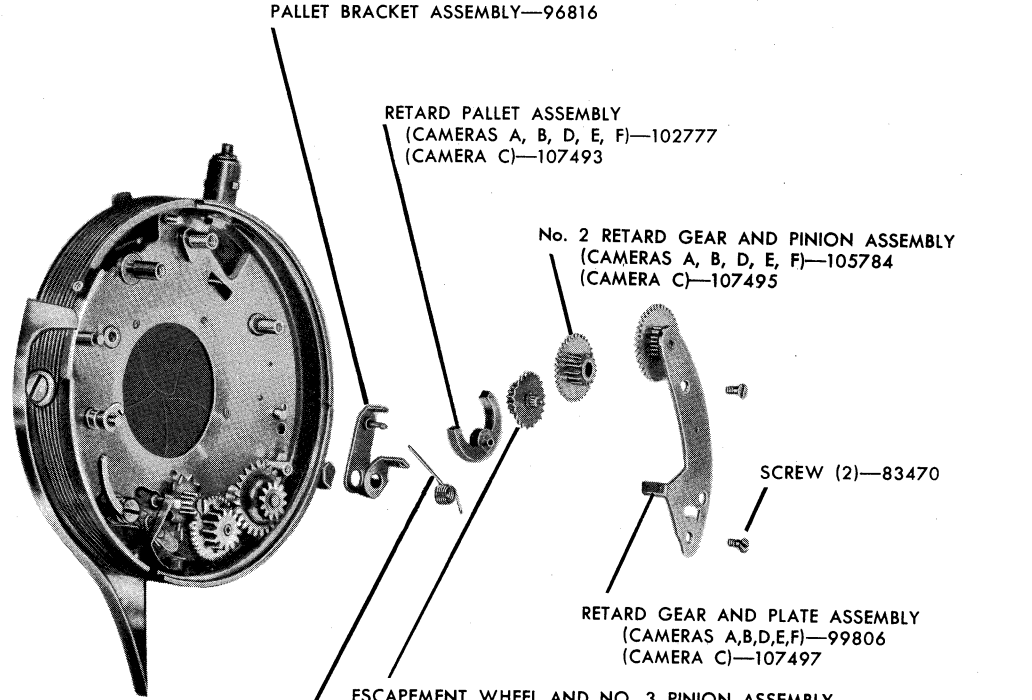


Figure 6

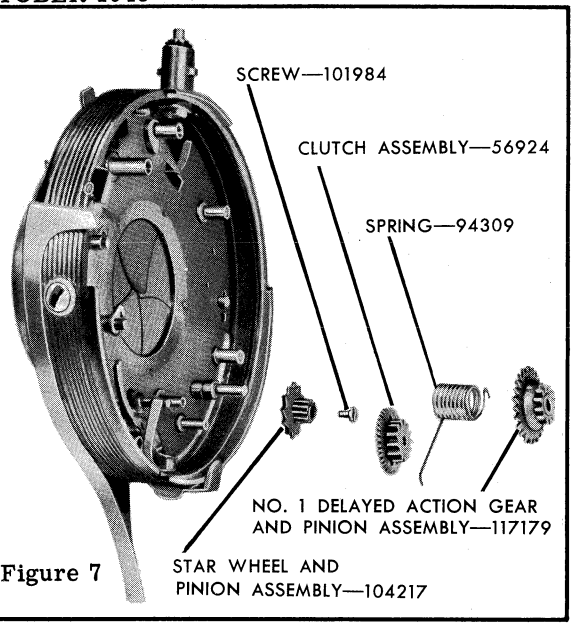


Figure 7

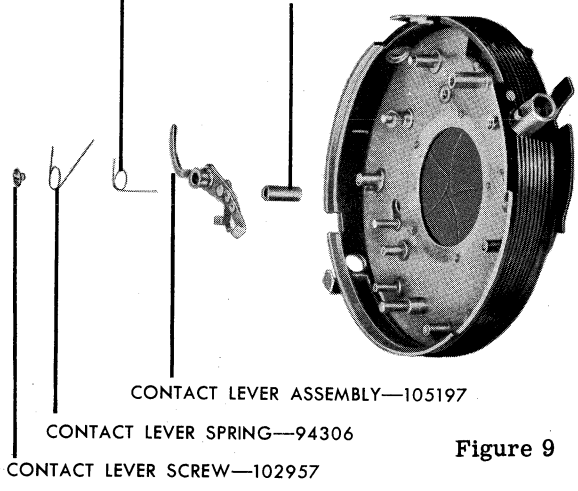


Figure 9

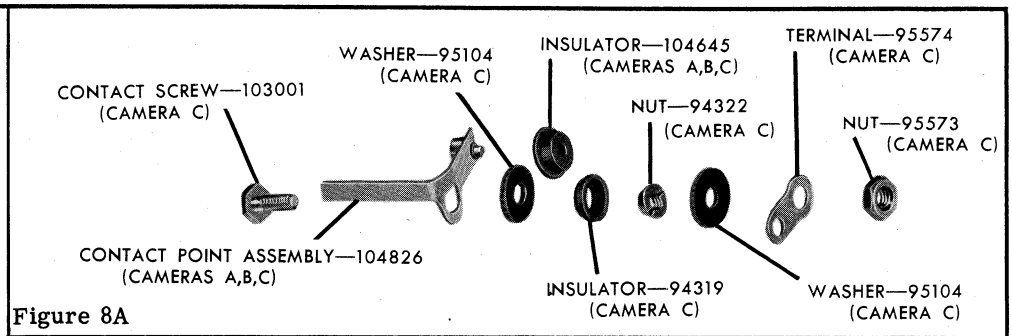


Figure 8A

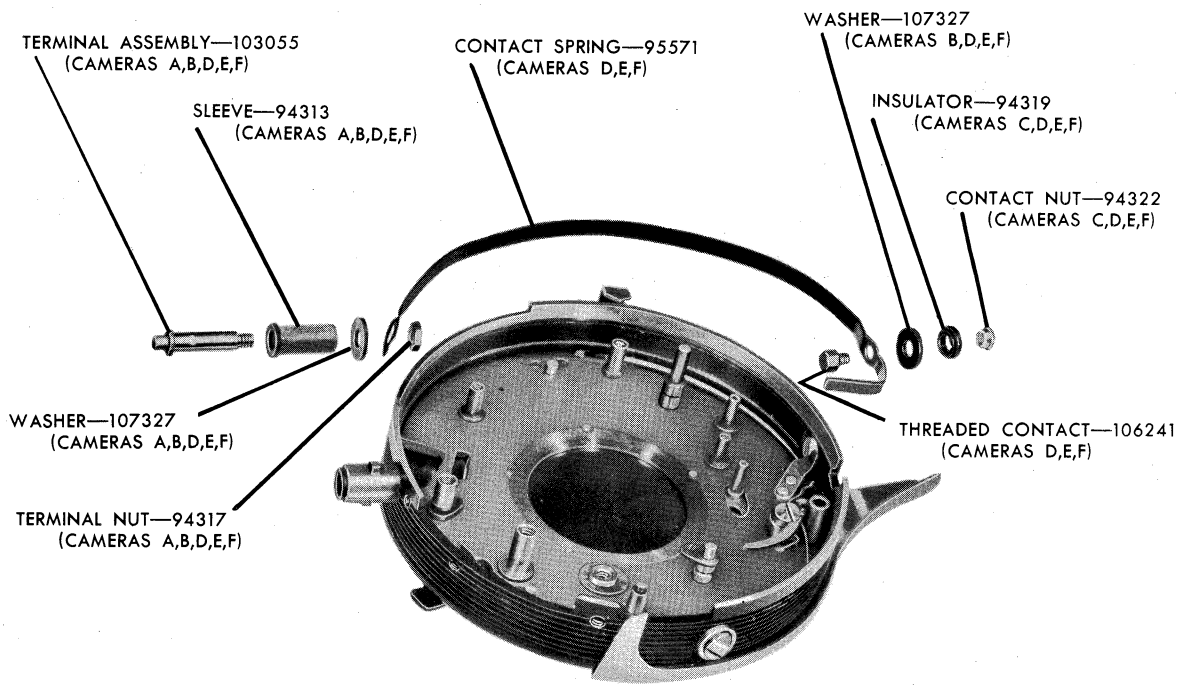


Figure 8

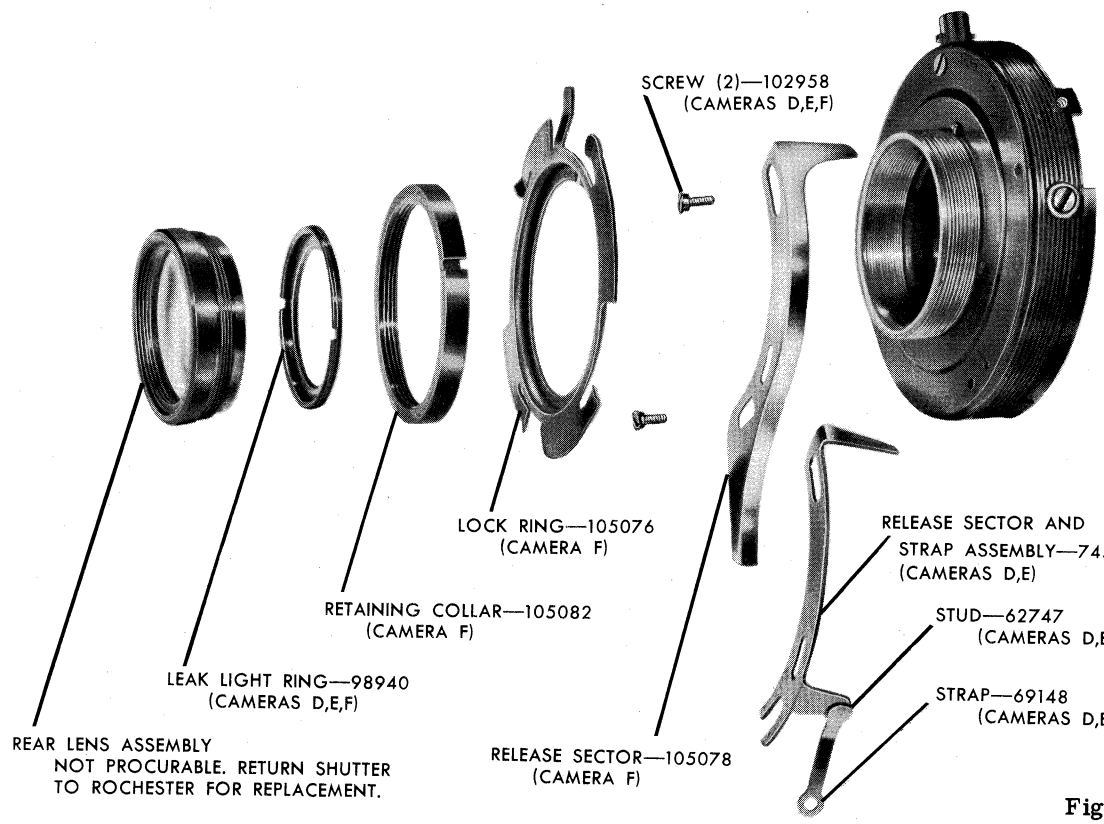


Figure 10

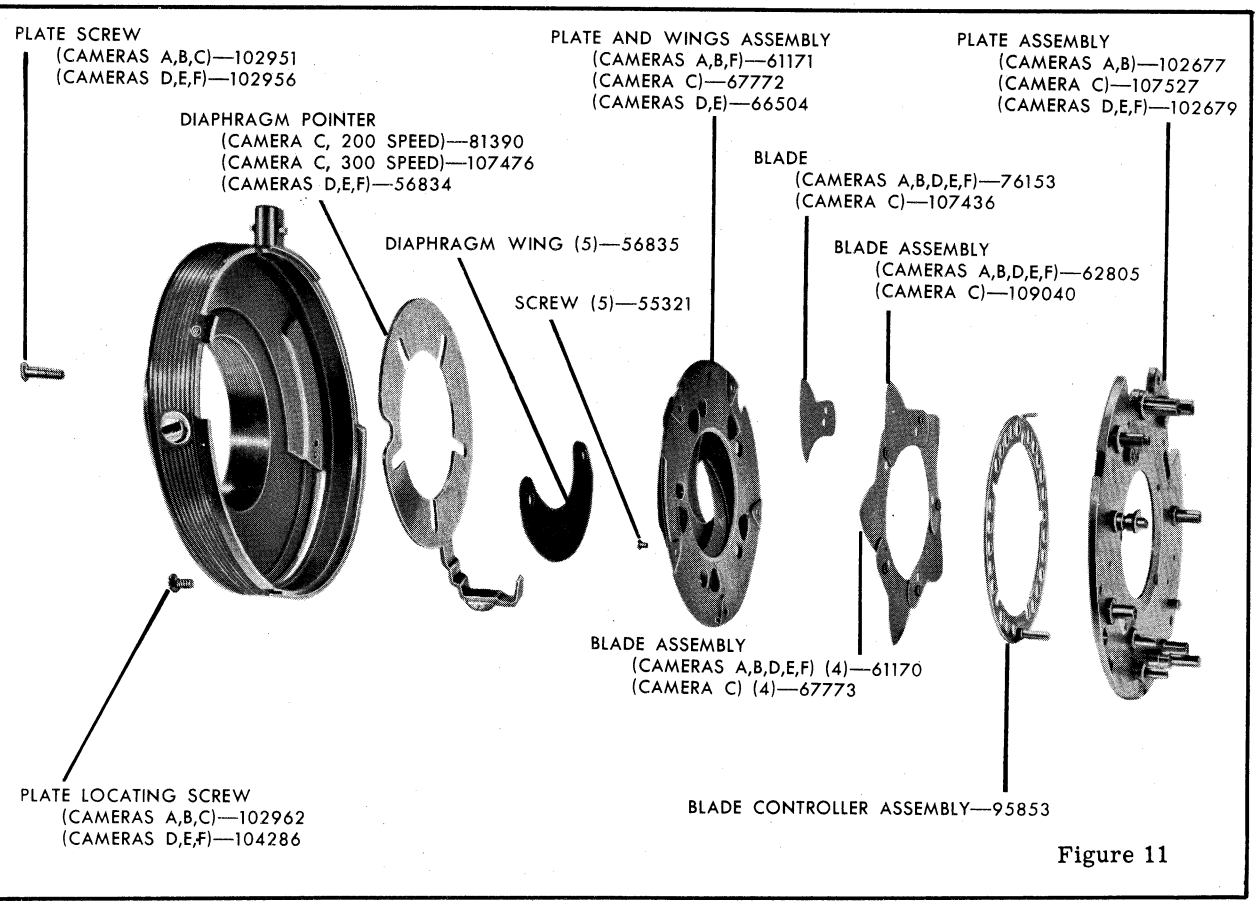


Figure 11

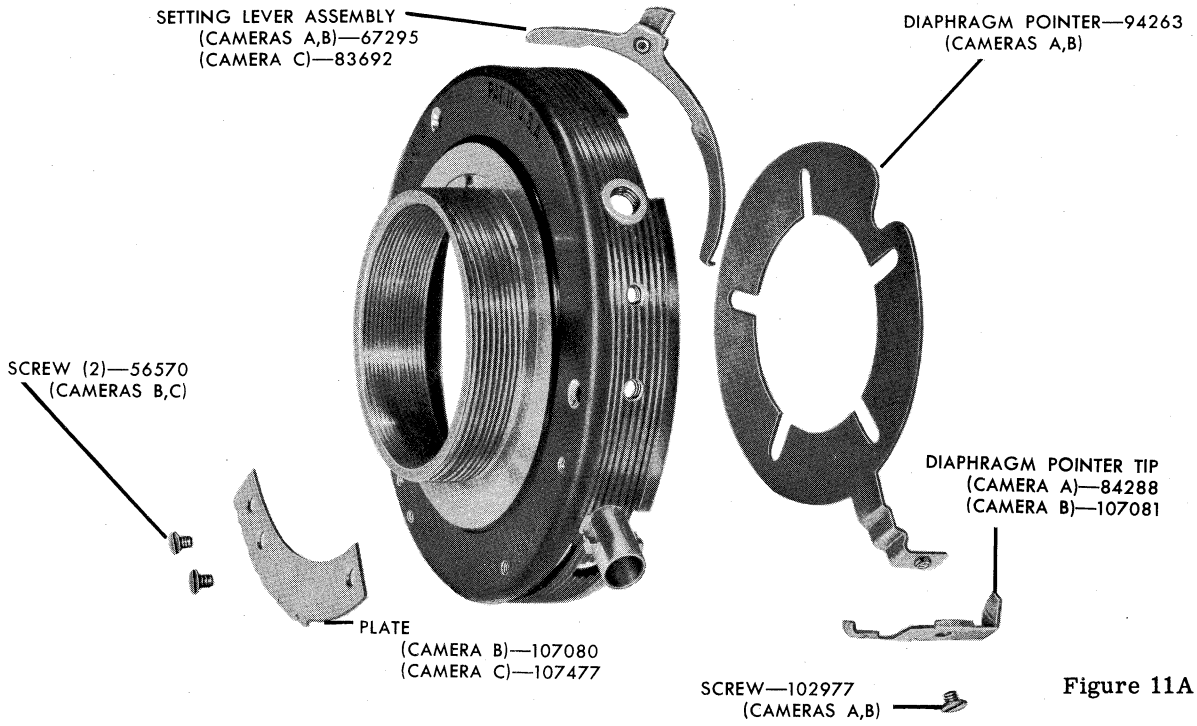


Figure 11A

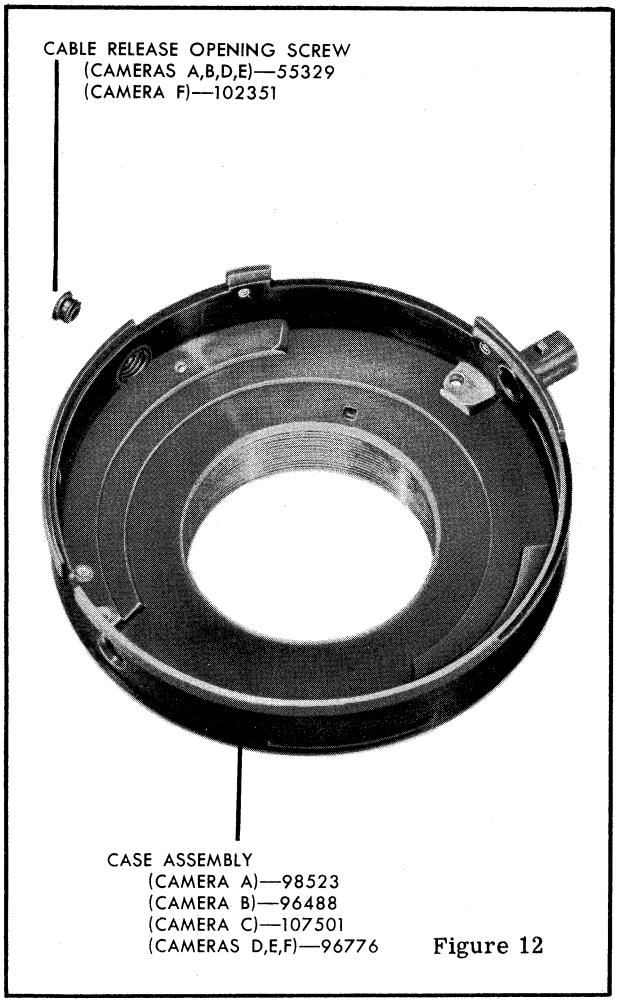


Figure 12

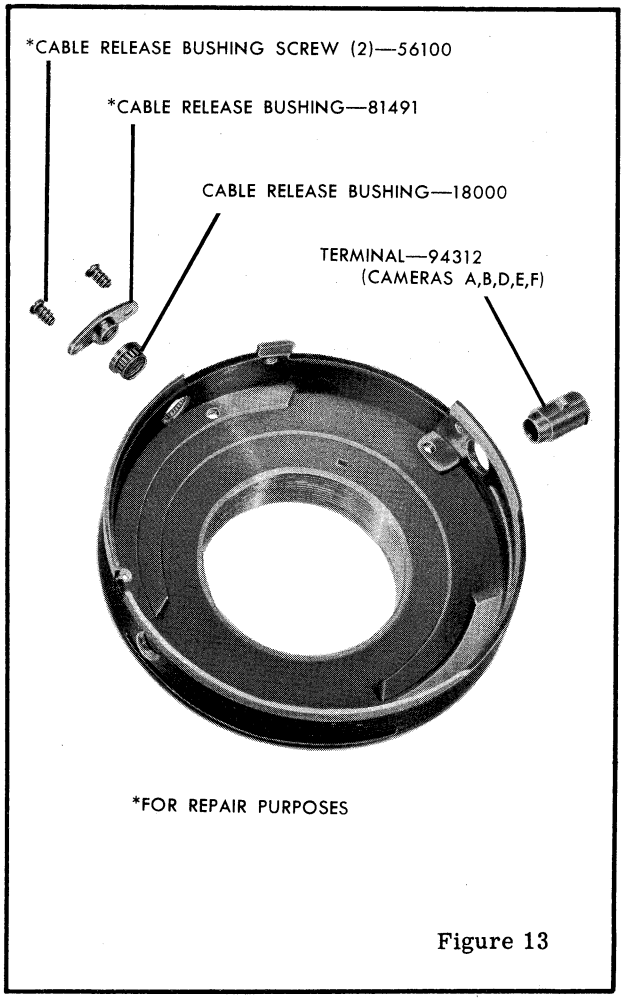


Figure 13

OCTOBER 1948 List in Sequence of Disassembly.

FIG.	PART NUMBER	Camera						PART NAME	No. REQD.
		A	B	C	D	E	F		
1	HE 34888				x	x	x	Focusing Cap with Screws Assembled (Feet)	1
1	HE 34897				x	x	x	Focusing Cap with Screws Assembled (Meters)	1
1	HE 31653	x						Focusing Cap with Screws Assembled (Feet)	1
1	HE 31656	x						Focusing Cap with Screws Assembled (Meters)	1
1B	HE 27366		x					Focusing Cap with Screws Assembled (Feet)	1
1B	HE 27371		x					Focusing Cap with Screws Assembled (Meters)	1
1C	HE 28355			x				Gear - Focusing	1
1A	HE 23276	x			x	x	x	Screw - Locking	2
1B	HE 27373		x					Screw	2
1B	HE 26452		x					Screw	2
1C	HE 31664			x				Screw - Locking	4
1A	HE 20632	x			x	x	x	Screw - Stop	1
1C	81492			x				Screw - Index plate locating	1
1C	101984			x				Screw - Shutter cap	1
1	105075						x	Plate - Speed and diaphragm index	1
1	107471		x					Plate - Speed and diaphragm index	1
1C	109247			x				Plate - Speed and diaphragm index, 300 speed	1
1C	104568			x				Plate - Speed and diaphragm index, 200 speed	1
1	104564				x			Plate - Speed and diaphragm index	1
1	104621	x						Plate - Speed and diaphragm index	1
1	104565					x		Plate - Speed and diaphragm index	1
1	109248			x				Ring - Speed control, 300 speed	1
1	95562			x				Ring - Speed control, 200 speed	1
1	96770				x	x	x	Ring - Speed control	1
1	96485	x	x					Ring - Speed control	1
1	102961	x			x	x	x	Screw - Main drive	1
1	102970		x					Screw - Main drive	1
1	103625			x				Screw - Main drive	1
2	100258	x	x	x	x	x	x	Flash Pallet Assembly (for shutters with less than average time lag)	AR
2	94310	x	x	x	x	x	x	Pallet - Flash (for shutters with average time lag)	AR
2	96769				x	x	x	Lever - Delayed action winding	1
2	95568			x				Lever - Delayed action winding	1
2	96479		x					Lever - Delayed action winding	1
2	98524	x						Lever - Delayed action winding	1
2	102957	x	x	x	x	x	x	Screw - Trigger latch spring	1
2	94798	x	x	x	x	x	x	Spring - Trigger latch	1
2	102995	x	x	x	x	x	x	Screw - Cover, long	2
2	102978	x	x	x	x	x	x	Screw - Cover, short	1
2	100084	x	x		x	x	x	Cover Assembly	1
2	109384			x				Cover Assembly	1
2	102957	x	x		x	x	x	Screw - Delayed action safety spring	1
2	102963			x				Screw - Delayed action safety spring	1
2	56914	x	x	x	x	x	x	Spring - Delayed action safety	1
3	68855				x	x	x	Rivet - Delayed action trigger button	1
3A	68404	x	x					Screw - Trigger button	1
3B	63783			x				Screw - Delayed action trigger latch	1
3	96774				x	x	x	Latch - Delayed action trigger	1
3A	96480	x	x					Latch - Delayed action trigger	1
3B	95567			x				Latch - Delayed action trigger	1
3A	68403	x	x					Button - Trigger	1
3	104571	x	x		x	x	x	Spring - Main drive	1
3	109247			x				Spring - Main drive	1
3	102955	x	x	x	x	x	x	Screw - Trigger	1
3	56910	x	x	x	x	x	x	Spring - Trigger	1
3	56847	x	x	x	x	x	x	Washer - Trigger	1
3	69858				x	x	x	Trigger	1
3A	100122	x	x					Trigger Assembly	1
3B	102232			x				Trigger Assembly	1
4	60824	x	x	x	x		x	Spring - Time lever	1
4	61175	x	x	x	x		x	Time Lever Assembly	1
4A	78967					x		Spacer - Bulb lever	2
FIG.	PART NUMBER	Camera						PART NAME	No. REQD.

The camera upon which the part is used is indicated by the X. For key to camera symbols, see front cover.

OCTOBER 1948 List in Sequence of Disassembly.

FIG.	PART NUMBER	Camera A	B	C	D	E	F	PART NAME	No. REQD.
4	61174	x	x	x	x	x	x	Bulb Lever Assembly	1
4	56908	x	x	x	x	x	x	Spring - Bulb lever	1
4	102952				x	x	x	Screw - Setting lever cover plate	2
4	74549				x	x	x	Plate - Setting lever cover	1
5	104572	x	x	x	x	x	x	Sleeve - Main drive spring (used only as necessary to adjust shutter speed)	AR
5	67774			x				Main Drive Bushing and Latch Assembly	1
5	74546				x	x	x	Main Drive Bushing and Setting Assembly	1
5	67294	x	x					Main Drive Bushing and Disc Assembly	1
5	56921	x	x		x	x	x	Latch Assembly	1
5	102954	x	x	x	x	x	x	Screw - Retarding sector	1
5	89372	x	x		x	x	x	Spring - Retarding sector	1
5	56911			x				Spring - Retarding sector	1
5	99804	x	x		x	x	x	Retard Sector Assembly	1
5	109439			x				Retard Sector Assembly	1
5	104287	x	x	x	x	x	x	Bushing - Latch spring	1
5	56840	x	x		x	x	x	Spring - Blade controller latch	1
5	106147			x				Spring - Blade controller latch	1
6	83470	x	x	x	x	x	x	Screw - Gear plate	2
6	99806	x	x		x	x	x	Retard Gear and Plate Assembly	1
6	107497			x				Retard Gear and Plate Assembly	1
6	105784	x	x		x	x	x	No. 2 Retard Gear and Pinion Assembly	1
6	107495			x				No. 2 Retard Gear and Pinion Assembly	1
6	61183	x	x		x	x	x	Escapement Wheel and No. 3 Pinion Assembly	1
6	107494			x				Escapement Wheel and No. 3 Pinion Assembly	1
6	102777	x	x		x	x	x	Retard Pallet Assembly	1
6	107493			x				Retard Pallet Assembly	1
6	96816	x	x	x	x	x	x	Pallet Bracket Assembly	1
6	102647				x	x	x	Spring - Pallet bracket	1
6	56909	x	x	x				Spring - Pallet bracket	1
7	117179	x	x	x	x	x	x	No. 1 Delayed Action Gear and Pinion Assembly	1
7	94309	x	x	x	x	x	x	Spring - Delayed action winding	1
7	56924	x	x	x	x	x	x	Clutch Assembly	1
7	101984	x	x	x	x	x	x	Screw - Star wheel and pinion assembly	1
7	104217	x	x	x	x	x	x	Star Wheel and Pinion Assembly	1
8	106241				x	x	x	Contact - Threaded	1
8	95571				x	x	x	Spring - Contact	1
8	107327		x		x	x	x	Washer - Insulating	1
8A	95573			x				Nut- Contact terminal	1
8A	95574			x				Terminal - Contact	1
8A	95104			x				Washer - Insulating	1
8,8A	94319			x	x	x	x	Insulator - Case	1
8,8A	94322			x	x	x	x	Nut - Contact Screw	1
8A	95104			x				Washer - Insulating	1
8	94317	x	x		x	x	x	Nut - Terminal	1
8A	103001			x				Screw - Contact point	1
8A	104826	x	x	x				Contact Point Assembly	1
8A	104645	x	x	x				Insulator - Case	1
8	107327	x	x		x	x	x	Washer - Insulating	1
8	103055	x	x		x	x	x	Inner Terminal Assembly	1
8	94313	x	x		x	x	x	Sleeve - Insulating	1
9	102957	x	x	x	x	x	x	Screw - Contact lever	1
9	94306	x	x	x	x	x	x	Spring - Contact lever	1
9	102823	x	x	x	x	x	x	Spring - Contact lever latch	1
9	105197	x	x	x	x	x	x	Contact Lever Assembly	1
9	109002	x	x	x	x	x	x	Sleeve - Cover support	1
10	98940				x	x	x	Ring - Leak light	1
10	105082						x	Collar - Retaining	1
10	105076						x	Ring - Lock	1
10	102958				x	x	x	Screw - Shutter release sector	2
10	105078						x	Sector - Shutter release	1
10	74540				x	x		Shutter Release Sector and Strap Assembly	1
10	69148				x	x		Strap - Shutter release	1

FIG.	PART NUMBER	Camera	PART NAME	No. REQD.

 The camera upon which the part is used is indicated by the X. For key to camera symbols, see front cover.

OCTOBER 1948 List in Sequence of Disassembly.

FIG.	PART NUMBER	Camera A	B	C	D	E	F	PART NAME	No. REQD.
10	62747				x	x		Stud - Shutter release strap	1
11A	56570		x	x				Screw - Click stop plate	2
11A	107080		x					Plate - Click stop	1
11A	107477			x				Plate - Click stop	1
11A	102977	x	x					Screw - Diaphragm Pointer Tip	1
11A	107081		x					Tip - Diaphragm Pointer	1
11A	84288	x						Tip - Diaphragm Pointer	1
11	104286				x	x	x	Screw - Plate locating	1
11	102962	x	x	x				Screw - Plate locating	1
11	102956				x	x	x	Screw - Plate	1
11	102951	x	x	x				Screw - Plate	1
11	55321	x	x	x	x	x	x	Screw - Retaining plate	5
11	66504				x	x		Retaining Plate with Diaphragm Wings Assembled	1
11	61171	x	x				x	Retaining Plate with Diaphragm Wings Assembled	1
11	67772			x				Retaining Plate with Diaphragm Wings Assembled	1
11	56835	x	x	x	x	x	x	Wings - Diaphragm	5
11	102679				x	x	x	Mechanism Plate Assembly	1
11	102677	x	x					Mechanism Plate Assembly	1
11	107527			x				Mechanism Plate Assembly	1
11	95853	x	x	x	x	x	x	Blade Controller Assembly	1
11	61170	x	x		x	x	x	Blade with Stud Assembly	4
11	67773			x				Blade with Stud Assembly	4
11	62805	x	x		x	x	x	Blade with Double Stud Assembly	1
11	109040			x				Blade with Double Stud Assembly	1
11	76153	x	x		x	x	x	Blade	1
11	107436			x				Blade	1
11	56834				x	x	x	Pointer - Diaphragm	1
11A	94263	x	x					Pointer - Diaphragm	1
11	107476			x				Pointer - Diaphragm, 300 speed	1
11	81390			x				Pointer - Diaphragm, 200 speed	1
11A	67295	x	x					Setting Lever Assembly	1
11A	83692			x				Setting Lever Assembly	1
12	102351						x	Screw - Cable release opening	1
12	55329	x	x		x	x		Screw - Cable release opening	1
12	96776				x	x	x	Case Assembly	1
12	96488		x					Case Assembly	1
12	98523	x						Case Assembly	1
12	107501			x				Case Assembly	1
13	94312	x	x		x	x	x	Terminal - Body	1
13	18000	x	x	x	x	x	x	Bushing - Cable release	1
13	*81491	x	x	x	x	x	x	Bushing - Cable release	1
13	*56100	x	x	x	x	x	x	Screw - Cable release bushing	2

* for repair purposes

FIG.	PART NUMBER	Camera	PART NAME	No. REQD.

The camera upon which the part is used is indicated by the X. For key to camera symbols, see front cover.

OCTOBER 1948 Numerical List

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
18000	8	13	94306	6	9	104286	7	11
HE20632	2	1A	94309	6	7	104287	5	5
HE23276	2	1A	94310	3	2	104564	2	1
HE26452	2	1B	94312	8	13	104565	2	1
HE27366	2	1B	94313	6	8	104568	3	1C
HE27371	2	1B	94317	6	8	104571	4	3
HE27373	2	1B	94319	6	8,8A	104572	5	5
HE28355	3	1C	94322	6	8,8A	104621	2	1
HE31653	2	1	94798	3	2	104645	6	8A
HE31656	2	1	95104	6	8A	104826	6	8A
HE31664	3	1C	95562	2	1	105075	2	1
HE34888	2	1	95567	4	3B	105076	7	10
HE34897	2	1	95568	3	2	105078	7	10
55321	7	11	95571	6	8	105082	7	10
55329	8	12	95573	6	8A	105197	6	9
56100	8	13	95574	6	8A	105784	5	6
56570	8	11A	95853	7	11	106147	5	5
56834	7	11	96479	3	2	106241	6	8
56835	7	11	96480	4	3A	107080	8	11A
56840	5	5	96485	2	1	107081	8	11A
56847	4	3	96488	8	12	107327	6	8
56908	4	4	96769	3	2	107436	7	11
56909	5	6	96770	2	1	107471	2	1
56910	4	3	96774	4	3	107476	7	11
56911	5	5	96776	8	12	107477	8	11A
56914	3	2	96816	5	6	107493	5	6
56921	5	5	98523	8	12	107494	5	6
56924	6	7	98524	3	2	107495	5	6
60824	4	4	98940	7	10	107497	5	6
61170	7	11	99804	5	5	107501	8	12
61171	7	11	99806	5	6	107527	7	11
61174	4	4	100084	3	2	109002	6	9
61175	4	4	100122	4	3A	109040	7	11
61183	5	6	100258	3	2	109247	3,4	1C,3
62747	7	10	101984	3,6	1C,7	109248	2	1
62805	7	11	102232	4	3B	109384	3	2
63783	4	3B	102351	3	12	109439	5	5
66504	7	11	102647	5	6	117179	6	7
67294	5	5	102677	7	11			
67295	8	11A	102679	7	11			
67772	7	11	102777	5	6			
67773	7	11	102823	6	9			
67774	5	5	102951	7	11			
68403	4	3A	102952	4	4			
68404	4	3A	102954	5	5			
68555	4	3	102955	4	3			
69148	7	10	102956	7	11			
69858	4	3	102957	3	2			
74540	7	10	102947	3,6	2,9			
74546	5	5	102958	7	10			
74549	4	4	102961	2	1			
76153	7	11	102962	7	11			
78967	4	4A	102963	3	2			
81390	7	11	102970	2	1			
81491	8	13	102977	8	11A			
81492	3	1C	102978	3	2			
83470	5	6	102995	3	2			
83692	8	11A	103001	6	8A			
84288	8	11A	103055	6	8			
89372	5	5	103625	2	1			
94263	8	11A	104217	6	7			

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How to repair...

FLASH KODAMATIC SHUTTERS

- For Kodak Reflex Cameras I and II
- For Kodak 35 Cameras
- For Kodak Monitor and Kodak Vigilant Six-20 Cameras

Eastman Kodak Company • Rochester 4, N. Y.

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Flash Kodamatic Shutter for the Kodak Monitor and Kodak Vigilant Six-20 Cameras

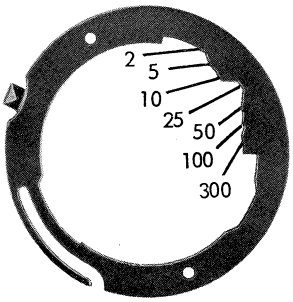
Capitalized words in the text indicate nomenclature which appears on illustrations. Such nomenclature, when not followed by a direct figure reference, will be found on the figure indicated in the last preceding figure reference.

FLASH KODAMATIC SHUTTER

FOR THE KODAK REFLEX CAMERAS I AND II

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Shutter does not trip easily	Possible burr on TRIGGER ASSEMBLY, figure 5.	Burnish the trigger and collar assembly at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 7, when in a set position.
Shutter blades remain open on high speeds	Split shutter blades.	Replace the shutter blades.
	Loose studs on the shutter blades.	Replace the shutter blades.
	Studs loose or missing on mechanism plate.	Replace or restake the studs carefully to avoid swelling the tops of the studs.
Shutter does not set	The TRIGGER LATCH, figure 5, is not returning to its proper position after the shutter has been released.	The trigger latch is bent and binding on the speed index plate or cover. It may be necessary to reduce the tension on the TRIGGER LATCH SPRING, figure 3.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear.	Replace the pinion gear assembly.
	The CLUTCH ASSEMBLY, figure 4, is slipping.	Replace the clutch assembly.
	The latch point on the CONTACT LEVER COMPLETE, figure 8, is damaged.	Replace the contact lever complete.
Shutter speeds slow	Retard gears dirty.	Remove and clean the retard gears.
	The MAIN DRIVE SPRING, figure 7, is weak.	Replace the main drive spring.
	Shutter blades binding.	Remove and clean or replace the shutter blades.
	Excessive retard sector travel.	Swedge the speed control RING, figure 2, at the area controlling the slow speed. (See figure 1.)
Shutter speeds fast	Insufficient retard sector travel.	File the speed ring at the area controlling the fast speed. (See figure 1.)
	Insufficient pallet engagement (on speeds 1/10 second or slower).	Remove material on the speed control ring in the area of contact with the pallet bracket stud.

TROUBLE	CAUSE	REMEDY
Shutter speeds fast (cont'd)		Check for bind of the PALLET BRACKET, figure 6, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle, singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 12.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the tops of the studs.
	BLADE CONTROLLER with contact stud, figure 13, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub of the mechanism plate.	Replace the blade controller. If it is still too loose or too tight, replace the mechanism plate.
	Too much play between the mechanism plate and the diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 13, due to retainer plate being bowed.	Replace the diaphragm retainer plate with wings assembled.
 Figure 1	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.
	Blades opening too far.	File and burnish the blade controller LATCH at point "A." (See figure 7.)
	Blades closing too far.	Swedge the mechanism plate at point "B." (See figure 14.)
	No clearance between the blade controller latch and the BLADE CONTROLLER LUG, figure 14, when the shutter is in the tripped position.	Swedge the mechanism plate at point "C," figure 14, such that this point acts as a stop for the SETTING LEVER with stop stud, figure 12.
	Shutter blades too loose.	Replace the blades.
Winding lever does not hold	The latch point on the CONTACT LEVER COMPLETE, figure 8, is broken off.	Replace the contact lever.

TROUBLE	CAUSE	REMEDY
Shutter operates instantaneously on B (Bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.
The flash setting is below the millisecond tolerance (fast)	The tension is too great on the WINDING GEAR SPRING, figure 4.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on the flash setting.
	The FLASH RETARD PALLET, figure 3, is not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh more firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the binding point. Re-form the plate at this point to allow clearance for the pallet.
The flash setting is above the millisecond tolerance (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover.	Try lubricant or replace the winding lever.
Constant flash short	The contact spring may be bent and touching either the contact lever or the cover.	Re-form the contact spring.
The flash setting is extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.
	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly toward the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter. 2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.
Speed control ring too loose or too tight	Speed ring tension finger not formed properly.	Re-form the speed ring tension finger to increase or decrease the speed ring tension.

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:

1. Front lens mount, using Tool No. 503N.
2. Speed and diaphragm INDEX PLATE, figure 2.
3. Speed control RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be readjusted.

The sequence of reassembly is as follows:

1. Speed control ring.
2. Speed and diaphragm index plate.
3. Set the DIAPHRAGM RING, figure 12, at f/22, and the speed control ring pointer between 1/2- and 1/5-second speeds.
4. Push the speed control ring and the index plate to the left as far as they will go, guiding them under the diaphragm pointer. Place a slight downward pressure on the ring and the index plate and push them toward the right until a click is heard and the screw holes are centered. Push the speed ring pointer to T (Time). Secure the index plate.
5. Front lens mount.

WINDING LEVER

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, above.
2. Winding lever.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.

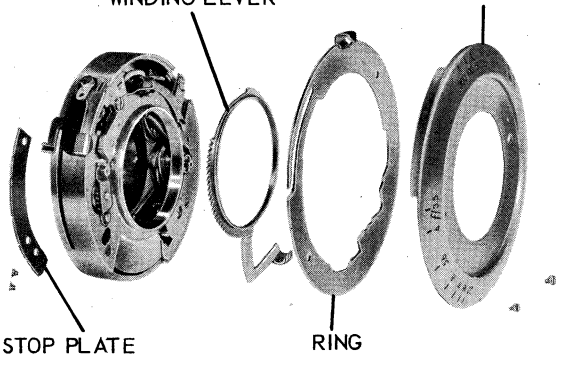


Figure 2

2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 4. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 5, as it may release the winding gear spring tension.

4. Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension on the TRIGGER LATCH SPRING, figure 3. Check for a bind between the trigger latch and the TRIGGER ASSEMBLY, figure 5, at the point of attachment. The winding lever should contact the trigger latch, push the latch out of the slot in the cover, and open the shutter blades. After the shutter has been tripped, the latch should return to the position where it was resting on the ledge just above the small slot in the cover.

After the trigger is depressed, allow it to return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.

5. Speed control ring, paragraphs 1-5, above.

COVER COMPLETE

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, above.
2. Winding lever, paragraph 2, above.
3. TRIGGER LATCH SPRING, figure 3.
4. TRIGGER LATCH, figure 5.
5. SPEED BUSHING, figure 7. Be sure to note whether the large or small diameter is resting on the MAIN DRIVE ASSEMBLY. It must be reassembled in the same position.
6. FLASH RETARD PALLET, figure 3.
7. COVER COMPLETE and the cover SUPPORT SLEEVE.

The sequence of reassembly is as follows:

1. Cover support sleeve and the cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the CONTACT LEVER COMPLETE, figure 8. Be sure the latch does not bind.

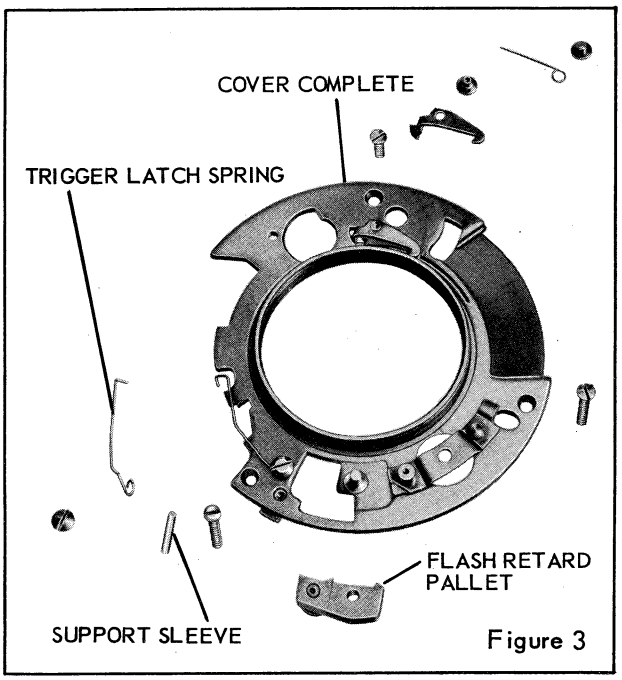


Figure 3

4. Trigger latch spring; do not fasten it securely. Lift the loose end of the spring over the trigger latch until it is at a point halfway between the latch and the central collar; then secure the spring. Place the spring against the outside edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.
5. Winding lever, paragraphs 1-4, page 6.
6. Flash retard pallet on the eccentric stud. Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.

NOTE: Be sure the eccentric stud on the cover is tight. Anchor the stud securely after any adjustment is made.

7. With the shutter in the tripped position, replace the speed bushing, making sure that the same end of the bushing is resting on the main drive assembly as when it was disassembled.
8. Winding lever, paragraph 5, page 6.

WINDING GEAR, CLUTCH ASSEMBLY, and STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, page 6.
2. Winding lever, paragraph 2, page 6.
3. Cover complete, paragraphs 3-7, page 6.
4. WINDING GEAR, figure 4, and the WINDING GEAR SPRING.
5. CLUTCH ASSEMBLY.
6. STAR WHEEL ASSEMBLY.

The sequence of reassembly is as follows:
1. Star wheel assembly.
2. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear on the clutch assembly should turn freely only in a clockwise direction.
3. Winding gear and winding gear spring.
4. Cover complete, paragraphs 1-8, page 6.

TRIGGER ASSEMBLY, TIME LEVER ASSEMBLY, and BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, page 6.
2. Winding lever, paragraph 2, page 6.
3. Cover complete, paragraphs 3-7, page 6.
4. Unhook the MAIN DRIVE SPRING, figure 7, from the MAIN DRIVE SPRING STUD, figure 14.

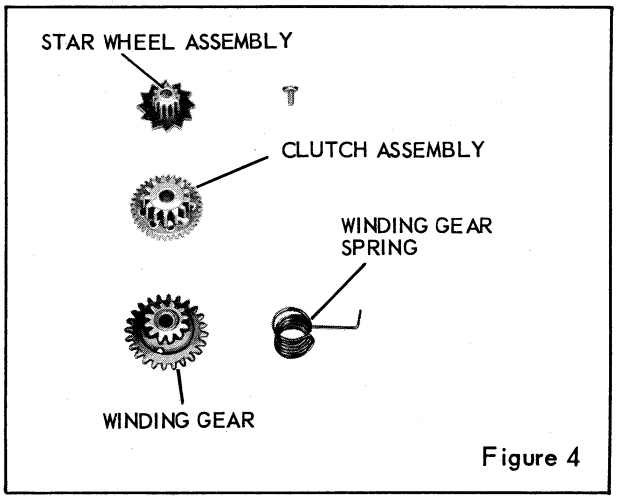


Figure 4

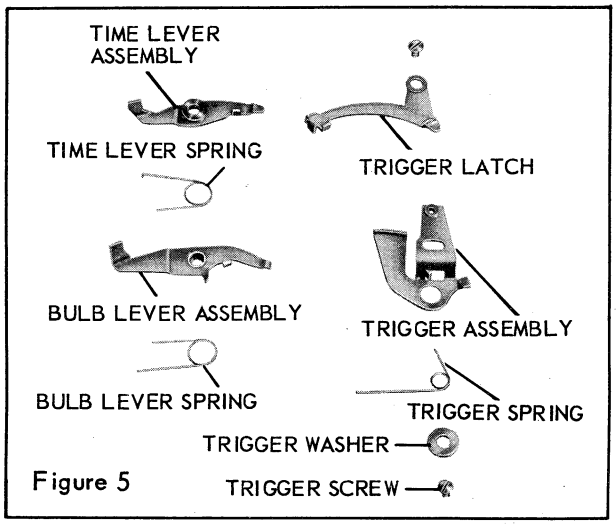


Figure 5

5. TRIGGER SCREW, figure 5, TRIGGER SPRING, and TRIGGER WASHER.

6. TRIGGER ASSEMBLY, TIME LEVER ASSEMBLY, TIME LEVER SPRING, BULB LEVER ASSEMBLY, BULB LEVER SPRING.

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger with the oval hole up and insert the bulb lever assembly in the opening on the trigger. Place the time lever assembly and the time lever spring between the top of the trigger and the top of the bulb lever assembly, with the spring facing up. Grasp all three parts by inserting one prong of a pair of tweezers down through the center of the holes.

With the longer ends of the time and bulb lever springs turned in a clockwise direction and the shorter ends of the springs resting against the lugs on the levers, guide the parts down over the TIME AND BULB LEVER STUD, figure 14. The long ends of the springs should rest against the case.

2. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the MAIN DRIVE SPRING STUD and rest it against the stud.

3. Hook the loose end of the main drive spring onto the main drive spring stud.

4. Cover complete, paragraphs 1-8, page 6.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 6.
2. Winding lever, paragraph 2, page 6.
3. Cover complete, paragraphs 3-7, page 6.
4. Retard gear PLATE COMPLETE, figure 6.
5. Retard GEAR WITH NO. 2 PINION assembly.
6. Retard GEAR WITH NO. 3 PINION and escapement wheel assembled.
7. PALLET.
8. PALLET BRACKET with stud assembly and the PALLET BRACKET SPRING.

NOTE: On earlier models the escapement wheel is a separate gear. It should be removed after the gear with No. 3 pinion. If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and all the parts of the gear train thoroughly.

9. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
10. Set the shutter.
11. Retarding SECTOR WITH STUD and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the retarding sector spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 7.
4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET SPRING STUD, figure 14. The long end of the spring should rest against the case.
5. Retard pallet.
6. Retard gear with No. 3 pinion and escapement wheel assembled.
7. Retard gear with No. 2 pinion assembly.
8. Retard gear plate complete, with the teeth of the gear facing the shutter blades.
9. Retard GEAR PLATE SCREW, figure 6, near the pallet bracket with stud assembly.
10. Lift up the gear end of the gear plate until the teeth of the retarding sector with stud can pass freely under the gear. Place the retarding sector with stud so that when the gear teeth are meshed the outer edge of the sector will be approximately 1/8 inch from the shutter case; then replace the remaining retard gear plate screw.

Figure 6

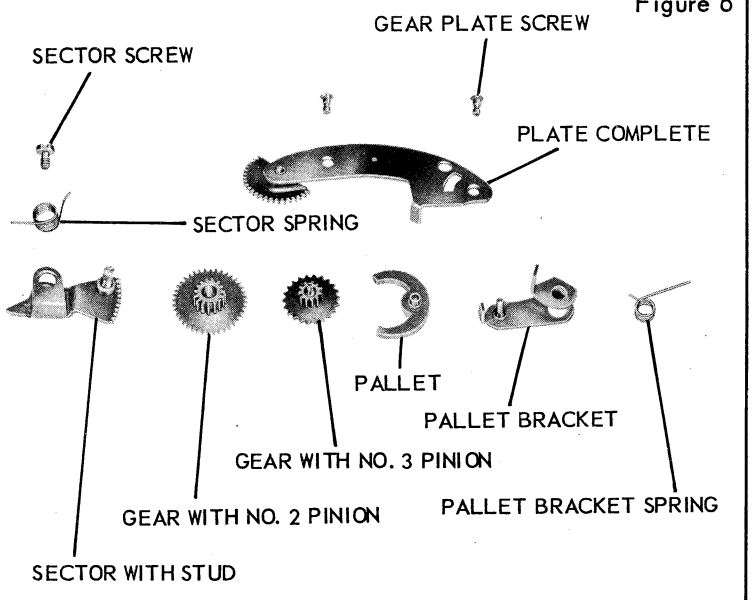
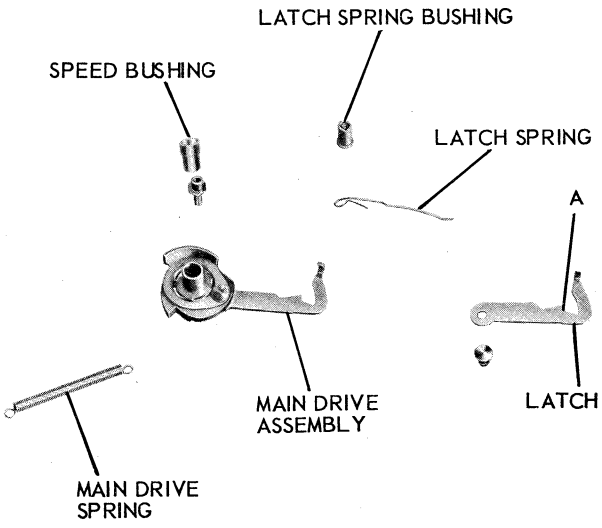


Figure 7



Put the pallet bracket spring in tension by placing the long end of the spring against the inside of the lug on the retard gear plate complete.

11. Cover complete, paragraphs 1-8, page 6.

MAIN DRIVE ASSEMBLY

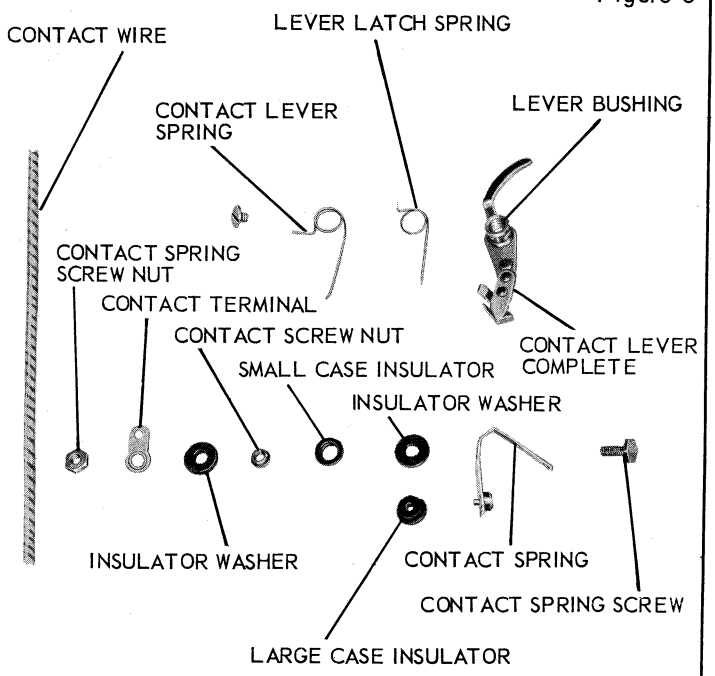
The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 6.
2. Winding lever, paragraph 2, page 6.
3. Cover complete, paragraphs 3-7, page 6.
4. Unhook the LATCH SPRING, figure 7, from the main drive LATCH.
5. Unhook the MAIN DRIVE SPRING from the MAIN DRIVE SPRING STUD, figure 14.
6. Set the shutter.
7. MAIN DRIVE ASSEMBLY, figure 7, to which is attached the main drive spring.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 12; to the MAIN DRIVE STUD, figure 14; to the LATCH, figure 7, at the point of contact with the LATCH SPRING; and to the latch where it contacts the RETARDING SECTOR STUD, figure 14. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud in the assembly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG. The cutout part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the tip of the latch. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-8, page 6.

Figure 8



FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 6.
2. Winding lever, paragraph 2, page 6.
3. Cover complete, paragraphs 3-7, page 6.
4. CONTACT SPRING SCREW NUT, figure 8.
5. CONTACT TERMINAL, to which is fastened the CONTACT WIRE.
6. Case INSULATOR WASHER.
7. Holding the CONTACT SPRING SCREW with Tool No. 181, remove the CONTACT SCREW NUT with Tool No. 503L.
8. Contact spring screw, the CONTACT SPRING, the case INSULATOR WASHER, and the SMALL CASE INSULATOR.
9. CONTACT LEVER COMPLETE.
10. LARGE CASE INSULATOR.

The sequence of reassembly is as follows:

1. If a new contact lever is to be used, place the contact LEVER LATCH SPRING, figure 8, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail; then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.
2. Contact lever complete on the CONTACT LEVER STUD, figure 14. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

CAUTION: The contact lever tail is burnished and must remain in that condition.

3. On the inside of the shutter case replace the large case insulator in the opening above the diaphragm pointer slot, with the collar end of the insulator facing toward the shutter blades.
4. Small case insulator in the opening in the shutter case near the contact lever, with the collar end of the insulator facing out.
5. Case insulator washer over the opening on the inside of the case.
6. Contact spring against the washer, with the small end of the contact point fitted in the large case insulator.
7. Contact spring screw in the hole in the contact spring. Hold the screw in position with

Tool No. 181 and secure it with the contact screw nut, using Tool No. 503L.

8. Case insulator washer on the protruding end of the contact spring screw.

9. Contact terminal, contact wire, and the contact spring screw nut. Secure the nut, using Tool No. 181.

10. Release the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 12. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 14, makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.

11. Cover complete, paragraphs 1-8, page 6.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always trip the shutter blades when the trigger is released very slowly. Set the shutter and the winding lever. Release the shutter very slowly. The winding lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the Trouble Chart– "The flash setting is extremely fast"; see page 5.

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, the winding lever must return fully and become locked in the unwound position.

The flash setting on the shutter should be timed with reliable shutter testing equipment. The tolerance of the delayed action in the shutter for synchronization with the M type flash lamp is 12 — 16 milliseconds.*

*From instant of contact until the shutter blades first begin to show light.

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutter has been achieved by a change in the design of the flash contact parts. The old-style parts which are to be discarded are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No. 121354 – Supplement to Parts List No. 1-1470.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. CONTACT TERMINAL NUT, figure 9.
2. CONTACT TERMINAL, to which is fastened the CONTACT WIRE.
3. Case INSULATOR WASHER.

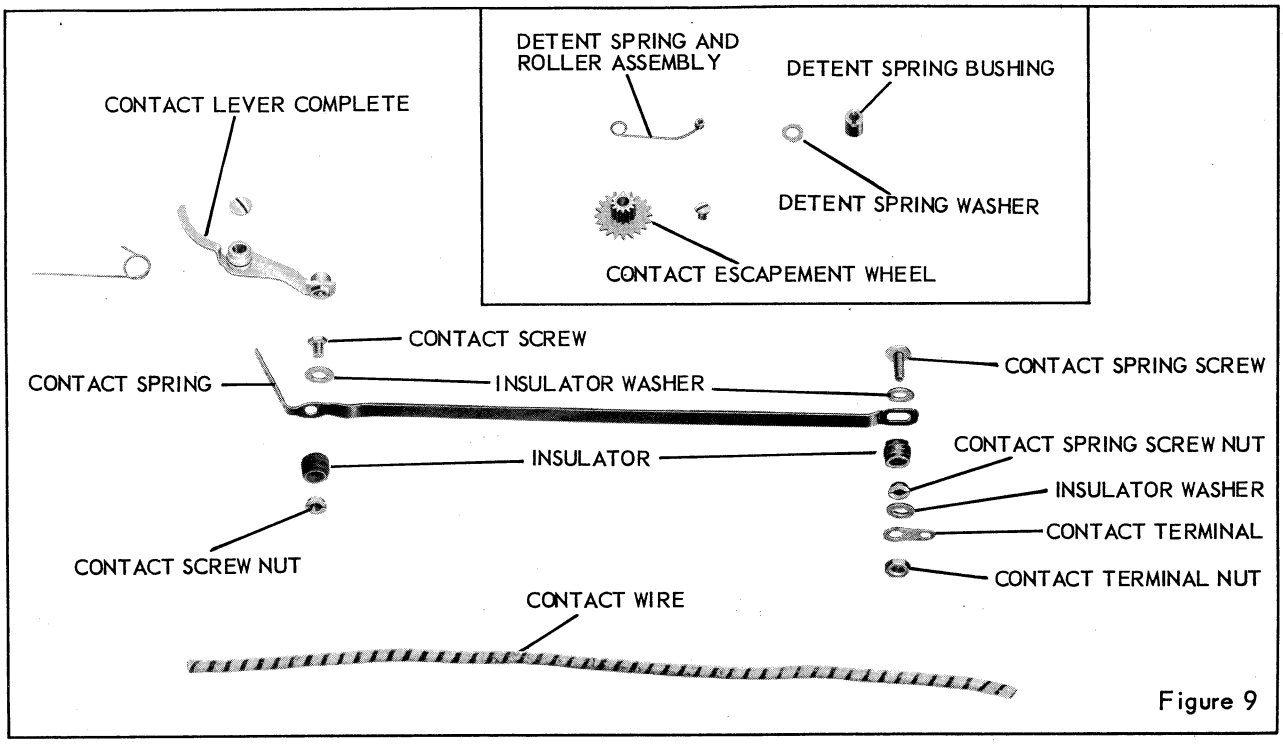


Figure 9

4. Holding the CONTACT SPRING SCREW with Tool No. 181, remove the CONTACT SPRING SCREW NUT with Tool No. 503L.

5. Contact spring screw, the case INSULATOR WASHER and the case INSULATOR.

6. On the contact end of the CONTACT SPRING, hold the CONTACT SCREW with Tool No. 503L and remove the CONTACT SCREW NUT, using Tool No. 181.

7. Contact screw, case INSULATOR WASHER, case INSULATOR and the contact spring.

8. CONTACT LEVER COMPLETE.

9. DETENT SPRING BUSHING, DETENT SPRING WASHER, and the DETENT SPRING AND ROLLER ASSEMBLY.

10. CONTACT ESCAPEMENT WHEEL.

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Place the contact LEVER LATCH SPRING, figure 10, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail; then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the contact lever spring clockwise at least 15 degrees.

2. Contact lever complete on the contact lever stud. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

> CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Case insulator in the opening in the case near the end of the contact lever complete. The collar end of the insulator should face out.

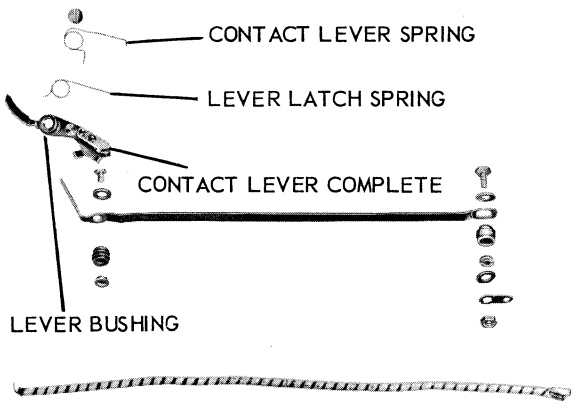


Figure 10

4. Case insulator washer over the opening on the inside of the case.

5. Contact end of the contact spring against the washer. Insert the contact screw in the opening in the spring and the washer.

6. Contact screw nut, using Tool No. 503L, while holding the contact screw with Tool No. 262.

7. Case insulator in the opening in the case near the RETARDING SECTOR STUD, figure 14. The collar end of the insulator should face out.

8. Case insulator washer over the opening on the inside of the case.

9. Contact spring against the washer and insert the contact spring screw in the hole in the spring and the washer.

10. Contact spring screw nut, using Tool No. 503L, while holding the contact spring screw with Tool No. 181.

11. Case insulator washer on the protruding end of the contact spring screw.

12. Contact terminal and contact wire.

13. Contact terminal nut.

14. Cock the shutter. Release the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 12. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 14, makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening, bend the end of the spring toward or away from the stud.

15. STAR WHEEL ASSEMBLY, figure 4.

16. Replace the cover complete and the winding lever.

17. Cock the shutter and press the trigger to release the shutter. At the same time, hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the spring is desirable. There must be approximately .005 inch clearance between the contact lever tail and that part of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance or if there is excessive clearance, the spacing may be controlled by bending the contact lever tail in or out.

Allow the winding lever to go to the at rest position. Depress the trigger and watch to see that the flash contact points do not close. If they close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical portion of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

With the shutter tripped, there must be approximately .005 inch clearance between the contact

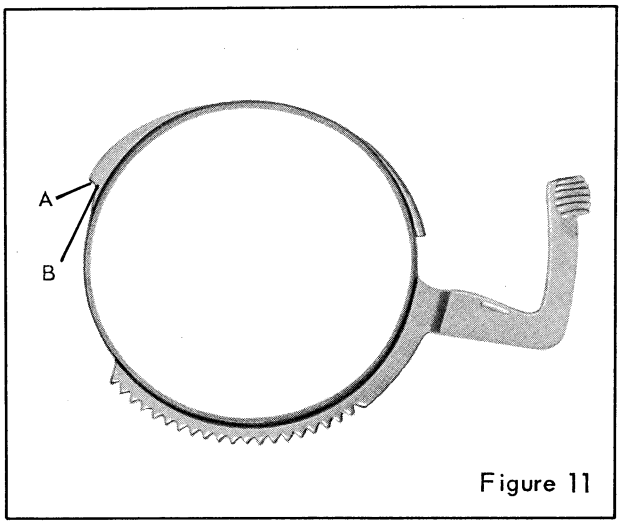


Figure 11

lever latch spring lug and the side of the contact lever. This is to assure full pressure of the contact lever latch into the star wheel assembly.

While pressing the trigger down fully, watch the contacts to make sure that they do not close at any time. If they close, the contact lever tail has been bent too far and should be moved back slightly. If necessary, the winding lever should be stoned at point "A," figure 11. Corner "B" must be square.

18. Be sure to use the new-style speed and diaphragm index plate.

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 6.
2. Winding lever, paragraph 2, page 6.
3. Cover complete, paragraphs 3-7, page 6.
4. Winding gear, clutch assembly, and star wheel assembly, paragraphs 4-6, page 7.
5. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 4-6, page 7.
6. Retard gear train, paragraphs 4-11, page 8.
7. Main drive assembly, paragraphs 4-7, page 9.
8. Flash contact parts, paragraphs 4-10, page 9.
9. Click STOP PLATE, figure 2.
10. Rear lens mount.
11. Blade controller LATCH SPRING BUSHING, figure 7, and the LATCH SPRING.
12. MECHANISM PLATE, figure 12.
13. Diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 13.
14. Shutter blades.
15. BLADE CONTROLLER.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid bending and clean their surfaces with a soft cloth. Fingerprints on the blades will cause corrosion.
2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING and stud, figure 13, with the hole in the blade over the stud near the MAIN DRIVE STUD, figure 14, on the mechanism plate. Refer to figure 15 for positioning of the shutter blade.
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 13, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. BLADE over the blade with double blade bushing and stud. The back of the mechanism plate should appear as shown in figure 16.
6. Diaphragm retainer plate with wings assembled, with the cutout slot in the outer edge of the retainer plate over the opening in the mechanism plate for the PALLET BRACKET with stud assembly, figure 6. After the diaphragm retainer plate is secured, the shutter blades should operate freely.

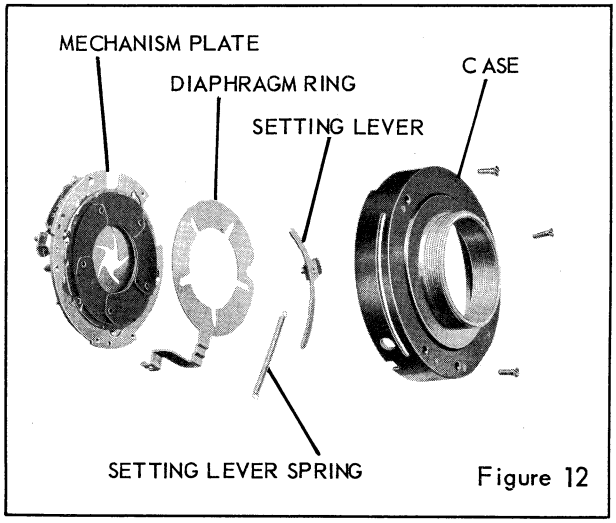


Figure 12

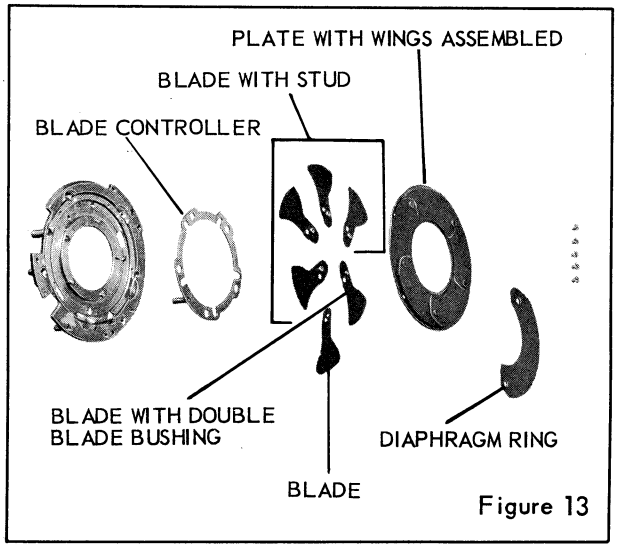


Figure 13

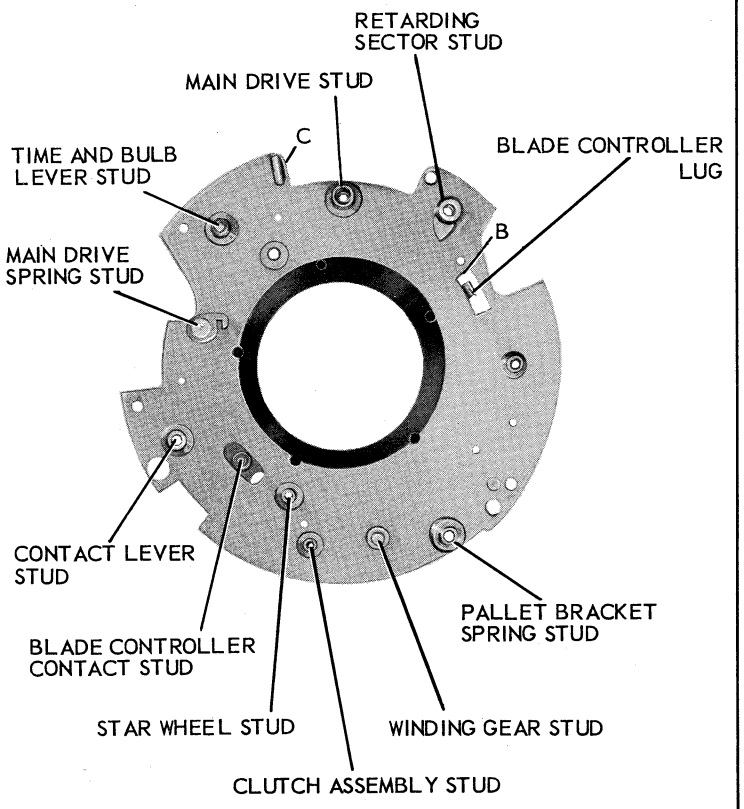


Figure 14

7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around in the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.

8. The shutter CASE, figure 12, DIAPHRAGM RING and the SETTING LEVER with stop stud should be thoroughly cleaned. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the recess in the case occupied by the setting lever; then wipe this area lightly with a clean cloth.

9. Diaphragm ring. Turn the ring until the projecting arm is near the cable release socket.

10. Setting lever with stop stud, with the SETTING LEVER SPRING extending out through the small slot in the case.

11. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slot in the diaphragm ring. After the plate is secured, the diaphragm ring, the setting lever, and the shutter blades should operate freely. Attach the loose end of the setting lever spring to the case stud.

12. Blade controller latch spring bushing and the latch spring.

13. Click stop plate.

14. Flash contact parts, paragraphs 1-10, page 9.

15. Main drive assembly, paragraphs 1-3, page 9.

16. Retard gear train, paragraphs 1-10, page 8.

17. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 1-3, page 7.

18. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-3, page 7.

19. Cover complete, paragraphs 1-8, page 6.

20. Rear lens mount.

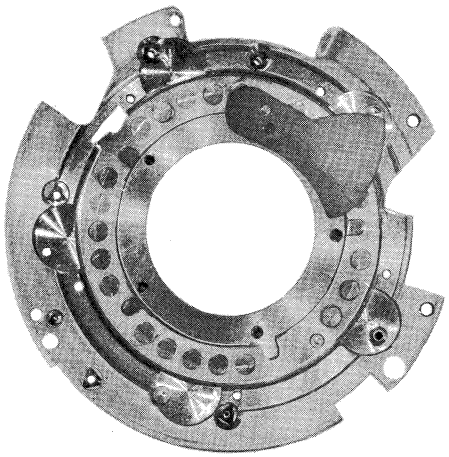


Figure 15

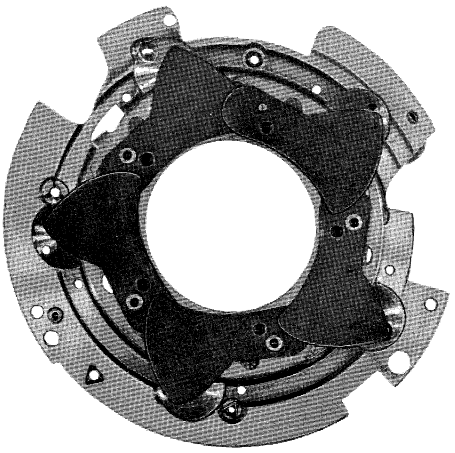


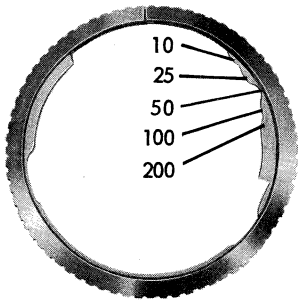
Figure 16

FLASH KODAMATIC SHUTTER

FOR THE KODAK 35 CAMERAS

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Shutter does not trip easily	Possible burr on TRIGGER ASSEMBLY, figure 19.	Burnish the trigger and collar assembly at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 7, when in a set position.
Shutter blades remain open on high speeds	Split shutter blades.	Replace the shutter blades.
	Loose studs on the shutter blades.	Replace the shutter blades.
	Plate blade studs loose or missing on mechanism plate.	Replace or restake the studs carefully to avoid swelling the tops of the studs.
Shutter does not set	The TRIGGER LATCH, figure 19, is not returning to its proper position after the shutter has been released.	The trigger latch is bent and binding on the speed index plate or cover.
		It may be necessary to reduce the tension on the trigger LATCH SPRING, figure 7.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear.	Replace the pinion gear assembly.
	The CLUTCH ASSEMBLY, figure 4, is slipping.	Replace the clutch assembly.
	The latch point on the CONTACT LEVER COMPLETE, figure 21, is damaged.	Replace the contact lever complete.
Shutter speeds slow	Retard gears dirty.	Remove and clean the retard gears.
	The MAIN DRIVE SPRING, figure 7, is weak.	Replace the main drive spring.
	Shutter blades binding.	Remove and clean or replace the shutter blades.
	Excessive retard sector travel.	Swedge the SPEED CONTROL RING, figure 18, at the area controlling the slow speed. (See figure 17.)
	Insufficient retard sector travel.	File the speed ring at the area controlling the fast speed. (See figure 17.)
Shutter speeds fast	Insufficient pallet engagement (on speeds 1/10 second or slower).	Remove material on the speed control ring in the area of contact with the pallet bracket stud.

TROUBLE	CAUSE	REMEDY
Shutter speeds fast (cont'd)		Check for bind of the PALLET BRACKET, figure 20, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle, singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 23.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the tops of the studs.
	BLADE CONTROLLER with contact stud, figure 13, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub of the mechanism plate.	Replace the blade controller. If still too loose or too tight, replace the mechanism plate.
	Too much play between the mechanism plate and the diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 23, due to retainer plate being bowed.	Replace the diaphragm retainer plate with wings assembled.
 Figure 17	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.
	Blades opening too far.	File and burnish the blade controller LATCH at point "A." (See figure 7.)
	Blades closing too far.	Swedge the mechanism plate at point "B." (See figure 24.)
	No clearance between the blade controller latch and the BLADE CONTROLLER LUG, figure 24, when the shutter is in the tripped position.	Swedge the mechanism plate at point "C," figure 24, such that this point acts as a stop for the SETTING LEVER with stop stud, figure 23.
	Shutter blades too loose.	Replace the blades.
Winding lever does not hold	The latch point on the CONTACT LEVER COMPLETE, figure 21, is broken off.	Replace the contact lever.

TROUBLE	CAUSE	REMEDY
Shutter operates instantaneously on B (Bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.
The flash setting is below the millisecond tolerance (fast)	The tension is too great on the WINDING GEAR SPRING, figure 4.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on the flash setting.
	The FLASH RETARD PALLET, figure 3, is not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh more firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the binding point. Re-form the plate at this point to allow clearance for the pallet.
The flash setting is above the millisecond tolerance (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover.	Try lubricant or replace the winding lever.
Constant flash short	The contact spring may be bent and touching either the contact lever or the cover.	Re-form the contact spring.
	Terminal body loose.	Restake the terminal body.
The flash setting is extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.
	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly toward the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter. 2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.
Speed control ring too loose or too tight	Speed and diaphragm index plate not formed properly.	Re-form the speed and diaphragm index plate. Bow the index plate up to place more tension on the speed control ring.

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:
1. Front lens mount.
2. Diaphragm pointer TIP, figure 18.
3. Speed and diaphragm INDEX PLATE.
4. SPEED CONTROL RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be readjusted.

The sequence of reassembly is as follows:
1. Speed control ring.
2. Speed and diaphragm index plate.
3. Diaphragm pointer tip.
4. Front lens mount.

WINDING LEVER

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-4, above.
2. Winding lever.

The sequence of reassembly is as follows:
1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.
2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 4. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 19, as it may release the winding gear spring tension.

4. Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension on the trigger LATCH SPRING, figure 7. Check for a bind between the trigger latch and the TRIGGER ASSEMBLY, figure 19, at the point of attachment. The winding lever should contact the trigger latch, push the latch out of the slot in the cover, and open the shutter blades. After the shutter has been tripped, the latch should return to the position where it was resting on the ledge just above the small slot in the cover.

After the trigger is depressed, allow it to return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.

5. Speed control ring, paragraphs 1-4, above.

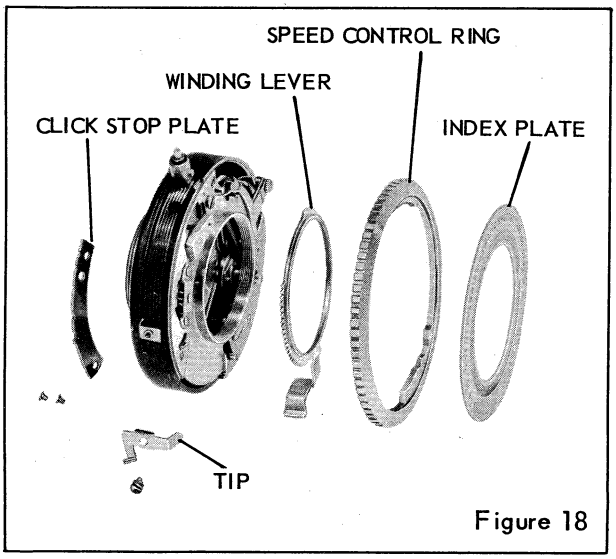


Figure 18

COVER COMPLETE

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-4, above.
2. Winding lever, paragraph 2, above.
3. Trigger LATCH SPRING, figure 7.
4. TRIGGER LATCH, figure 19.
5. SPEED BUSHING, figure 7. Be sure to note whether the large or small diameter is resting on the MAIN DRIVE ASSEMBLY. It must be reassembled in the same position.
6. FLASH RETARD PALLET, figure 3.
7. COVER COMPLETE and the cover SUPPORT SLEEVE.

The sequence of reassembly is as follows:
1. Cover support sleeve and the cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the CONTACT LEVER COMPLETE, figure 21. Be sure the latch does not bind.
4. Trigger latch spring, do not fasten it securely. Lift the loose end of the spring over the trigger latch until it is at a point halfway between the latch and the central collar: then secure the spring. Place the spring against the outside

edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.

5. Winding lever, paragraphs 1-4, page 17.

6. Flash retard pallet on the eccentric stud. Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.

NOTE: Be sure the eccentric stud on the cover is tight. Anchor the stud securely after any adjustment is made.

7. With the shutter in the tripped position, replace the speed bushing, making sure that the same end of the bushing is resting on the main drive assembly as when it was disassembled.

8. Winding lever, paragraph 5, page 17.

WINDING GEAR, CLUTCH ASSEMBLY, and STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 17.
2. Winding lever, paragraph 2, page 17.
3. Cover complete, paragraphs 3-7, page 17.
4. WINDING GEAR, figure 4, and the WINDING GEAR SPRING.
5. CLUTCH ASSEMBLY.
6. STAR WHEEL ASSEMBLY.

The sequence of reassembly is as follows:

1. Star wheel assembly.
2. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear on the clutch assembly should turn freely only in a clockwise direction.
3. Winding gear and winding gear spring.
4. Cover complete, paragraphs 1-8, page 17.

TRIGGER ASSEMBLY, TIME LEVER ASSEMBLY, and BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 17.
2. Winding lever, paragraph 2, page 17.
3. Cover complete, paragraphs 3-7, page 17.
4. Unhook the MAIN DRIVE SPRING, figure 7, from the MAIN DRIVE SPRING STUD, figure 24.
5. TRIGGER SCREW, figure 19, TRIGGER SPRING, and TRIGGER WASHER.
6. TRIGGER ASSEMBLY, TIME LEVER ASSEMBLY, TIME LEVER SPRING, BULB LEVER ASSEMBLY, BULB LEVER SPRING.

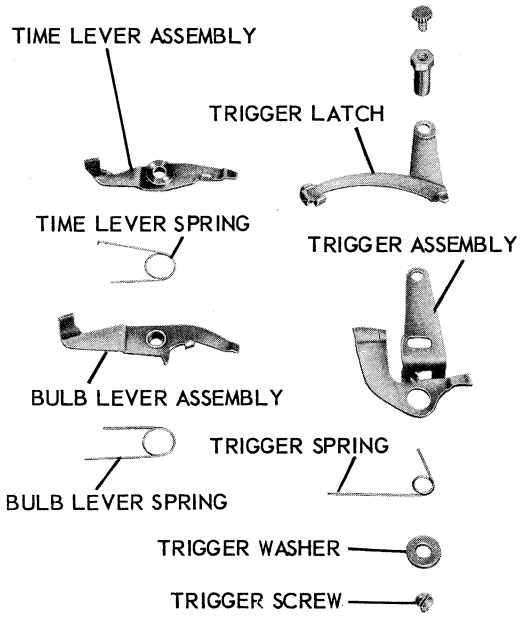


Figure 19

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger with the oval hole up and insert the bulb lever assembly in the opening on the trigger. Place the time lever assembly and the time lever spring between the top of the trigger and the top of the bulb lever assembly, with the spring facing up. Grasp all three parts by inserting one prong of a pair of tweezers down through the center of the holes.

With the longer ends of the time and bulb lever springs turned in a clockwise direction and the shorter ends of the springs resting against the lugs on the levers, guide the parts down over the TIME AND BULB LEVER STUD, figure 24. The long ends of the springs should rest against the case.

2. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the MAIN DRIVE SPRING STUD and rest it against the stud.

3. Hook the loose end of the main drive spring onto the main drive spring stud.

4. Cover complete, paragraphs 1-8, page 17.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 17.
2. Winding lever, paragraph 2, page 17.
3. Cover complete, paragraphs 3-7, page 17.
4. Retard gear PLATE COMPLETE, figure 20.

5. Retard GEAR WITH NO. 2 PINION assembly.

6. Retard gear with No. 3 pinion and ESCAPEMENT WHEEL assembled.

7. Retard PALLET.

8. PALLET BRACKET with stud assembly and the PALLET BRACKET SPRING.

NOTE: If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and all the parts of the gear train thoroughly.

9. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.

10. Set the shutter.

11. Retarding SECTOR WITH STUD and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.

2. Retarding sector screw.

3. Place the long end of the retarding sector spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 7.

4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET SPRING STUD, figure 24. The long end of the spring should rest against the case.

5. Retard pallet.

6. Retard gear with No. 2 pinion assembly.

7. Retard gear with No. 3 pinion and escapement wheel assembled.

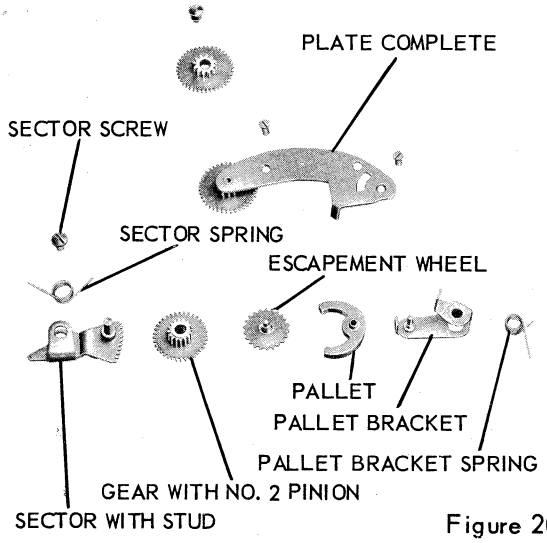


Figure 20

8. Retard gear plate complete. Mesh the teeth of the retarding sector with the teeth on the gear plate complete.

9. Put the pallet bracket spring in tension by placing the long end of the spring against the inside of the lug on the retard gear plate complete.

10. Cover complete, paragraphs 1-8, page 17.

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 17.
2. Winding lever, paragraph 2, page 17.
3. Cover complete, paragraphs 3-7, page 17.
4. Unhook the LATCH SPRING, figure 7, from the main drive LATCH.
5. Unhook the MAIN DRIVE SPRING from the MAIN DRIVE SPRING STUD, figure 24.
6. Set the shutter.
7. MAIN DRIVE ASSEMBLY, figure 7, to which is attached the main drive spring.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 23; on the MAIN DRIVE STUD, figure 24; on the LATCH, figure 7, at the point of contact with the LATCH SPRING; and on the latch where it contacts the RETARDING SECTOR STUD, figure 24. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud in the assmebly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG. The cutout part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the tip of the latch. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-8, page 17.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 17.
2. Winding lever, paragraph 2, page 17.
3. Cover complete, paragraphs 3-7, page 17.
4. TERMINAL NUT, figure 21, using Tool No. 503J.
5. Case INSULATOR WASHER.
6. PLUNGER ASSEMBLY and the terminal body insulating SLEEVE.
7. CONTACT SPRING.
8. Case INSULATOR.
9. CONTACT LEVER COMPLETE.

The sequence of reassembly is as follows:

1. If a new contact lever is to be used,

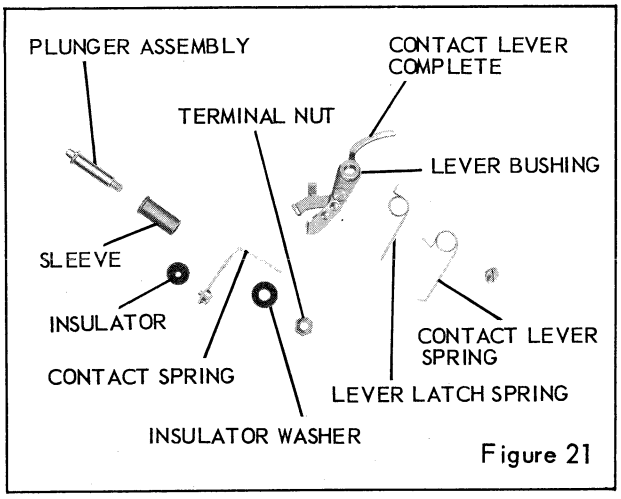


Figure 21

place the contact LEVER LATCH SPRING, figure 21, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail; then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the 1/8 inch of the long end of the spring clockwise at least 15 degrees.

2. Contact lever complete on the CONTACT LEVER STUD, figure 24. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

> CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Terminal body insulating sleeve and the plunger assembly.

4. Case insulator on the inside of the shutter case and in the opening above the diaphragm pointer slot. The collar end of the insulator should face toward the shutter blades.

5. Case insulator washer on the threaded end of the plunger assembly.

6. Contact spring with the threaded end of the plunger assembly extending through the opening in the spring and the contact point inserted in the case insulator.

7. Terminal nut.

8. Cock and release the shutter and at the same time retard its opening action by placing one finder against the shutter SETTING LEVER, figure 23. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 24, makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.

9. Cover complete, paragraphs 1-8, page 17.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always trip the shutter blades when the trigger is released very slowly. Set the shutter and the winding lever. Release the winding lever slowly. The winding lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the Trouble Chart- "The flash setting is extremely fast"; see page 16.

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, the winding lever must return fully and become locked in the unwound position.

The flash settings on the shutter should be timed with reliable shutter testing equipment. The tolerance of the delayed action in the shutter for synchronization with the flash bulbs is as follows:

M (long stroke) * 12 - 16 milliseconds

*From instant of contact until the shutter blades first begin to show light.

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutter has been achieved by a change in the design of the flash contact parts. The old-style parts which are to be discarded are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No. 121355 - Supplement to Parts List No. 1-1470.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. TERMINAL NUT, figure 22, using Tool No. 503J.

2. Case INSULATOR WASHER, PLUNGER ASSEMBLY, and the terminal body insulating SLEEVE.

3. CONTACT SCREW NUT, using Tool No. 503L.

4. CONTACT SCREW, case INSULATOR

WASHER, the CONTACT SPRING, and the case INSULATOR.

5. CONTACT LEVER COMPLETE.

6. DETENT SPRING BUSHING, figure 9, DETENT SPRING WASHER, and DETENT SPRING AND ROLLER ASSEMBLY.

7. CONTACT ESCAPEMENT WHEEL.

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Place the contact LEVER LATCH SPRING, figure 21, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail; then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the contact lever spring clockwise at least 15 degrees.

2. Contact lever complete on the contact lever stud. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Terminal body insulating sleeve and the plunger assembly.

4. Case insulator washer on the threaded end of the plunger assembly.

5. Contact spring with the threaded end of the plunger assembly extending through the opening in the spring near the contact end.

6. Terminal nut.

7. Case insulator, with the collar end of the insulator facing out.

8. Case insulator washer over the opening on the inside of the shutter case. Position the contact spring so that the opening in the spring and the opening in the washer are lined up with the opening in the case. The washer should be next to the case.

9. Insert the contact screw in the opening in the spring and the washer.

10. Contact screw nut, using Tool No. 503L, while holding the contact screw with Tool No. 262.

11. Cock and release the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 23. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 24, makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.

12. STAR WHEEL ASSEMBLY, figure 4.

13. Replace the cover complete and the winding lever.

14. Cock the shutter. Press the trigger to release the shutter, and at the same time hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the spring is desirable. There must be approximately .005 inch clearance between the contact lever tail and that part of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance, or if there is excessive clearance, the spacing may be controlled by bending the contact lever tail in or out.

Allow the winding lever to go to the at rest position. Depress the trigger and watch to see that the flash contact points do not close. If they close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical part of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

With the shutter tripped, there must be approximately .005 inch clearance between the contact lever latch spring lug and the side of the contact lever. This is to assure full pressure of the contact lever latch into the star wheel assembly.

While pressing the trigger down fully, watch the contacts to make sure that they do not close at any time. If they close, the contact lever tail has been bent too far and should be moved back slightly. If necessary, the winding lever should be stoned at point "A" figure 11. Corner "B" smut be square.

15. Be sure to use the new-style speed and diaphragm INDEX PLATE, figure 18.

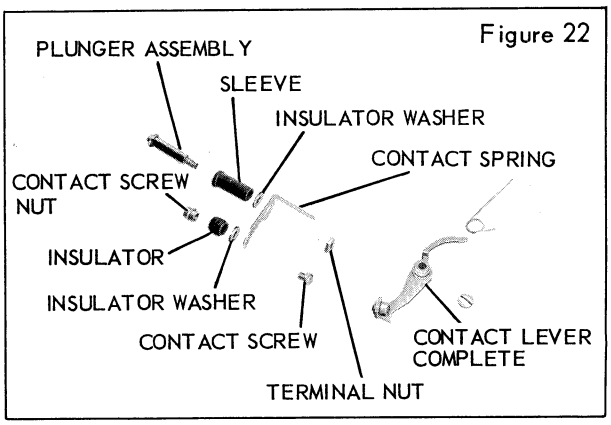


Figure 22

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 17.
2. Winding lever, paragraph 2, page 17.
3. Cover complete, paragraphs 3-7, page 17.
4. Winding gear, clutch assembly, and star wheel assembly, paragraphs 4-6, page 18.
5. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 4-6, page 18.
6. Retard gear train, paragraphs 4-11, page 18.
7. Main drive assembly, paragraphs 4-7, page 19.
8. Flash contact parts, paragraphs 4-9, page 19.
9. CLICK STOP PLATE, figure 18.
10. Rear lens mount.
11. Blade controller LATCH SPRING BUSHING, figure 7, and the LATCH SPRING.
12. MECHANISM PLATE, figure 23.
13. Diaphragm retainer PLATE WITH WINGS ASSEMBLED.
14. BLADE CONTROLLER , figure 13.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid bending and clean their surfaces with a soft cloth.
2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING, and stud, figure 13, with the hole in the blade over the stud near the MAIN DRIVE STUD, figure 24, on the mechanism plate. Refer to figure 15 for positioning of the shutter blade.
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 13, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. BLADE over the blade with double blade bushing and stud. The back of the mechanism plate should appear as shown in figure 16.
6. Diaphragm retainer plate with wings assembled, with long embossing on the back of the plate opposite the MAIN DRIVE STUD, figure 24. After the diaphragm retainer is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.
8. The shutter CASE, figure 23, DIAPHRAGM POINTER, and the SETTING LEVER with stop stud should be thoroughly cleaned. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the recess in the case occupied by the setting lever. Then wipe this area lightly with a clean cloth.
9. Diaphragm pointer. Turn the pointer until the projecting arm is near the cable release socket.
10. Setting lever with stop stud.
11. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the diaphragm ring. After the plate is secured, the diaphragm ring, the setting lever, and the shutter blades should operate freely.
12. Blade controller latch spring bushing and the latch spring.
13. Click stop plate.
14. Flash contact parts, paragraphs 1-8, page 19.
15. Main drive assembly, paragraphs 1-3, page 19.
16. Retard gear train, paragraphs 1-9, page 18.
17. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 1-3, page 18.
18. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-3, page 18.
19. Cover complete, paragraphs 1-8, page 17.
20. Rear lens mount.

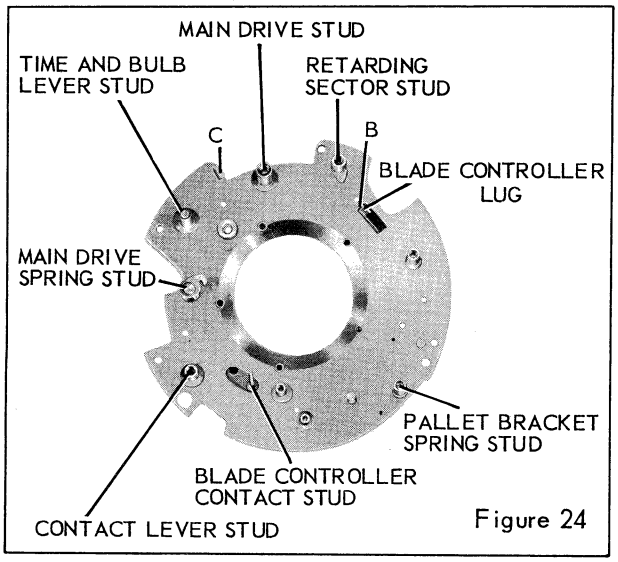


Figure 24

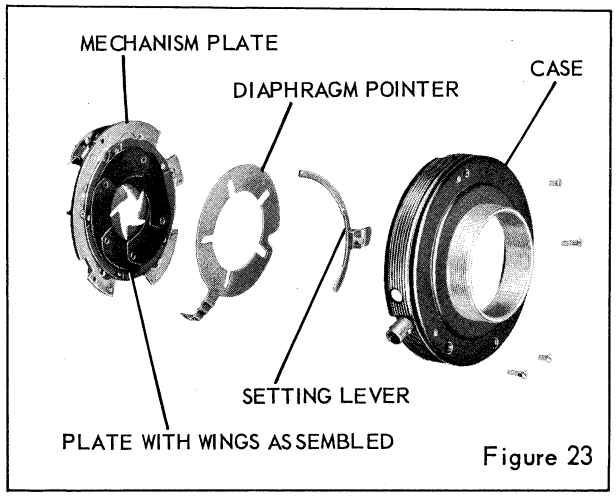


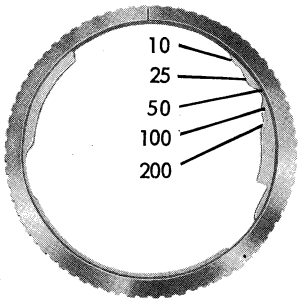
Figure 23

FLASH KODAMATIC SHUTTER

FOR THE KODAK MONITOR AND KODAK VIGILANT SIX-20 CAMERAS

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Shutter does not trip easily	Possible burr on TRIGGER ASSEMBLY, figure 28.	Burnish the trigger and collar assembly at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 27, when in a set position.
Shutter blades remain open on high speeds	Split shutter blades.	Replace the shutter blades.
	Loose studs on the shutter blades.	Replace the shutter blades.
	Plate blade studs missing on mechanism plate.	Replace or restake the studs carefully to avoid swelling the tops of the studs.
Shutter does not set	The TRIGGER LATCH, figure 28, is not returning to its proper position after the shutter has been released.	The trigger latch may be bent and is binding on the speed index plate or cover. It may be necessary to reduce the tension on the trigger LATCH SPRING, figure 7.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear.	Replace the pinion gear assembly.
	The CLUTCH ASSEMBLY, figure 4, is slipping.	Replace the clutch assembly.
	The latch point on the CONTACT LEVER COMPLETE, figure 29, is damaged.	Replace the contact lever complete.
Shutter speeds slow	Retard gears dirty.	Remove and clean the retard gears.
	The MAIN DRIVE SPRING, figure 27, is weak.	Replace the main drive spring.
	Shutter blades binding.	Remove and clean or replace the shutter blades.
	Excessive retard sector travel.	Swedge the speed control RING, figure 26, at the area controlling the slow speed. (See figure 25.)
Shutter speeds fast	Insufficient retard sector travel.	File the speed control ring at the area controlling the fast speed. (See figure 25.)
	Insufficient pallet engagement (on speeds 1/10 second or slower).	Remove material on the speed control ring in the area of contact with the pallet bracket stud.

TROUBLE	CAUSE	REMEDY
		Check for bind of the PALLET BRACKET, figure 20, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle, singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 31.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the tops of the studs.
	BLADE CONTROLLER with contact stud, figure 13, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub of the mechanism plate.	Replace the blade controller. If it is still too loose or too tight, replace the mechanism plate.
 Figure 25	Too much play between the mechanism plate and the diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 31, due to retainer plate's being bowed.	Replace the diaphragm retainer plate with wings assembled.
	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.
	Blades opening too far.	File and burnish the blade controller LATCH at point "A." (See figure 27.)
	Blades closing too far.	Swedge the mechanism plate at point "B." (See figure 32.)
	Shutter blades too loose.	Replace the blades.
Winding lever does not hold	The latch point on the CONTACT LEVER COMPLETE, figure 29, is broken off.	Replace the contact lever.
Shutter operates instantaneously on B (Bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.

TROUBLE	CAUSE	REMEDY
The flash setting is below the millisecond tolerance (fast)	The tension is too great on the WINDING GEAR SPRING, figure 4.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on the flash setting.
	The FLASH RETARD PALLET, figure 26, is not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh more firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the binding point. Re-form the plate at this point to allow clearance for the pallet.
The flash setting is above the millisecond tolerance (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover.	Try lubricant or replace the winding lever.
Constant flash short	The contact spring may be bent and touching either the contact lever or the cover.	Re-form the contact spring.
	Terminal body loose.	Restake the terminal body.
The flash setting is extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.
	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly toward the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter. 2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.
Speed control ring too loose or too tight	Speed and diaphragm index plate not formed properly.	Re-form the speed and diaphragm index plate. Bow the index plate up to place more tension on the speed control ring.

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:
1. Front lens mount.
2. Speed and diaphragm INDEX PLATE, figure 26.
3. Speed control RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be readjusted.

The sequence of reassembly is as follows:
1. Speed control ring.
2. Speed and diaphragm index plate.
3. Front lens mount.

WINDING LEVER

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, above.
2. Winding lever.

The sequence of reassembly is as follows:
1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.
2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 4. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 28, as it may release the winding gear spring tension.

4. Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension on the trigger LATCH SPRING, figure 27. Check for a bind between the trigger latch and the TRIGGER ASSEMBLY, figure 28, at the point of attachment. The winding lever should contact the trigger latch, push the latch out of the slot in the cover, and open the shutter blades. After the shutter has been tripped, the latch should return to the position where it was resting on the ledge just above the small slot in the cover.

After the trigger is depressed, allow it to return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.

5. Speed control ring, paragraphs 1-3, above.

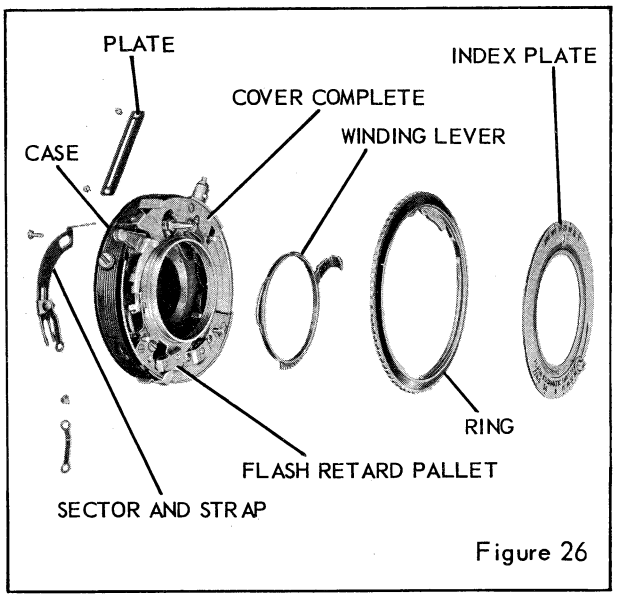


Figure 26

COVER COMPLETE

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, above.
2. Winding lever, paragraph 2, above.
3. Trigger LATCH SPRING, figure 27.
4. Lift up the loose end of the TRIGGER LATCH, figure 28, sufficiently to clear the COVER COMPLETE, figure 26. Move the loose end of the latch until it is clear of the CASE.
5. SPEED BUSHING, figure 27. Be sure to note whether the large or small diameter is resting on the main drive assembly. It must be reassembled in the same position.
6. FLASH RETARD PALLET, figure 26.
7. Cover complete.

The sequence of reassembly is as follows:
1. Cover support sleeve and cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the CONTACT LEVER COMPLETE, figure 29. Be sure the latch does not bind.
4. Trigger latch spring; do not fasten it securely. Lift the loose end of the spring over the trigger latch until it is at a point halfway be-

tween the latch and the central collar; then secure the spring. Place the spring against the outside edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.

5. Winding lever, paragraphs 1-4, page 26.

6. Flash retard pallet on the eccentric stud. Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.

NOTE: Be sure the eccentric stud on the cover is tight. Anchor the stud securely after any adjustment is made.

7. With the shutter in the tripped position, replace the speed bushing, making sure that the same end of the bushing is resting on the main drive assembly as when it was disassembled.

8. Winding lever, paragraph 5, page 26.

WINDING GEAR, CLUTCH ASSEMBLY, AND STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 26.
2. Winding lever, paragraph 2, page 26.
3. Cover complete, paragraphs 3-7, page 26.
4. WINDING GEAR, figure 4, and the WINDING GEAR SPRING.
5. CLUTCH ASSEMBLY.
6. STAR WHEEL ASSEMBLY.

The sequence of reassembly is as follows:

1. Star wheel assembly.
2. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear on the clutch assembly should turn freely only in a clockwise direction.
3. Winding gear and winding gear spring.
4. Cover complete, paragraphs 1-8, page 26.

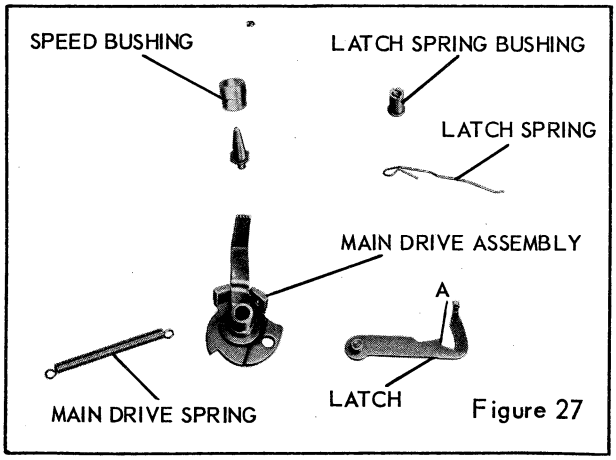


Figure 27

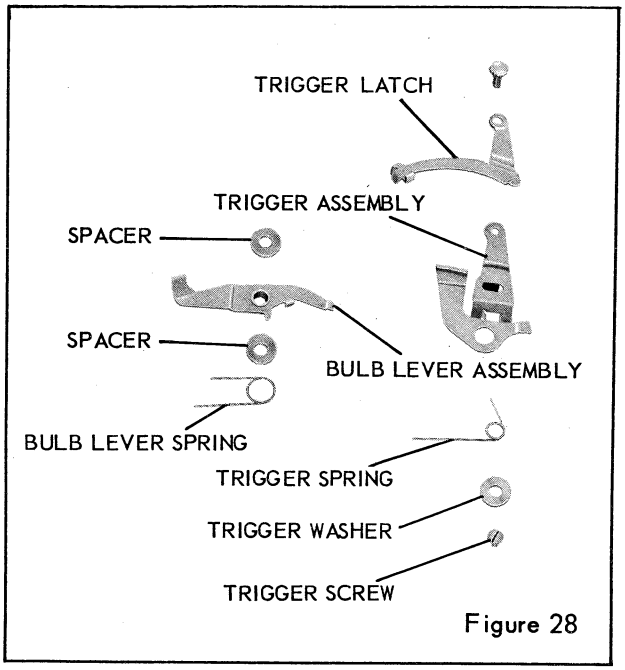


Figure 28

TRIGGER ASSEMBLY AND BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 26.
2. Winding lever, paragraph 2, page 26.
3. Cover complete, paragraphs 3-7, page 26.
4. Unhook the MAIN DRIVE SPRING, figure 27, from the MAIN DRIVE SPRING STUD, figure 32.
5. TRIGGER SCREW, figure 28, TRIGGER SPRING, and TRIGGER WASHER.
6. TRIGGER ASSEMBLY, bulb lever SPACERS, BULB LEVER ASSEMBLY, and BULB LEVER SPRING.

NOTE: In the Flash Kodamatic Shutter for the Kodak Vigilant Six-20 Camera a time lever assembly is used in place of the bulb lever spacers.

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger assembly with the oval hole up, and insert the bulb lever assembly in the opening on the trigger. Place one bulb lever spacer on the BULB LEVER STUD, figure 32, and the remaining spacer on the top of the bulb lever assembly. Grasp the three parts by inserting one prong of a pair of tweezers down through the center of the holes.

With the long end of the bulb lever spring turned in a clockwise direction and the short end resting against the lug on the bulb lever assembly, guide the parts down over the bulb lever stud. The long end of the spring should rest against the case.

NOTE: In the Flash Kodamatic Shutter for the Kodak Vigilant Six-20 Camera, after the bulb lever assembly is in place on the trigger assembly, place the time lever assembly and the time lever spring between the top of the trigger and the top of the bulb lever assembly with the spring facing up. Then, with the springs turned in a clockwise direction, guide the parts down over the time and bulb lever stud. The ends of the springs should rest against the case.

2. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the main drive spring stud and rest it against the stud.
3. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-8, page 26.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, page 26.
2. Winding lever, paragraph 2, page 26.
3. Cover complete, paragraphs 3-7, page 26.
4. Retard gear PLATE COMPLETE, figure 20.
5. Retard GEAR WITH NO. 2 PINION assembly.
6. Retard gear with No. 3 pinion and ESCAPEMENT WHEEL assembled.
7. PALLET.
8. PALLET BRACKET with stud assembly and the PALLET BRACKET SPRING.

NOTE: If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and the parts of the gear train thoroughly.

9. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
10. Set the shutter.
11. Retarding SECTOR WITH STUD and the retarding sector spring.

The sequence of reassembly is as follows:
1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the retarding sector spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 27.
4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out, toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET SPRING STUD, figure 32. The long end of the spring should rest against the case.
5. Retard pallet.
6. Retard gear with No. 2 pinion assembly,
7. Retard gear with No. 3 pinion and escapement wheel assembled.
8. Retard gear plate complete. Mesh the teeth of the retarding sector with the teeth on the gear plate complete.
9. Put the pallet bracket spring in tension by placing the long end of the spring against the inside of the lug on the retard gear plate complete.
10. Cover complete, paragraphs 1-8, page 26.

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, page 26.
2. Winding lever, paragraph 2, page 26.
3. Cover complete, paragraphs 3-7, page 26.
4. Setting lever cover PLATE, figure 26.
5. Unhook the LATCH SPRING, figure 27, from the main drive latch.
6. Unhook the MAIN DRIVE SPRING from the MAIN DRIVE SPRING STUD, figure 32.
7. Set the shutter.
8. MAIN DRIVE ASSEMBLY, figure 27, to which is attached the main drive spring.

The sequence of reassembly is as follows:
1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the MAIN DRIVE STUD, figure 32, to the latch at the point of contact with the latch spring, and to the latch where it contacts the RETARDING SECTOR STUD. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG. The cut-out part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the tip of the latch. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-8, page 26.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-3, page 26.
2. Winding lever, paragraph 2, page 26.

3. Cover complete, paragraphs 3-7, page 26.
4. TERMINAL NUT, figure 29.
5. Case INSULATOR WASHER, PLUNGER ASSEMBLY, and terminal body insulating SLEEVE.
6. On the contact end of the CONTACT SPRING remove the CONTACT SCREW NUT, using Tool No. 503L.
7. CONTACT SPRING SCREW, case INSULATOR, and contact spring.
8. CONTACT LEVER COMPLETE.

The sequence of reassembly is as follows:

1. If a new contact lever is to be used, place the contact LEVER LATCH SPRING, figure 29, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.

2. Contact lever complete on the CONTACT LEVER STUD, figure 32. The end of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

CAUTION: The contact lever tail is burnished and must remain in that condition.

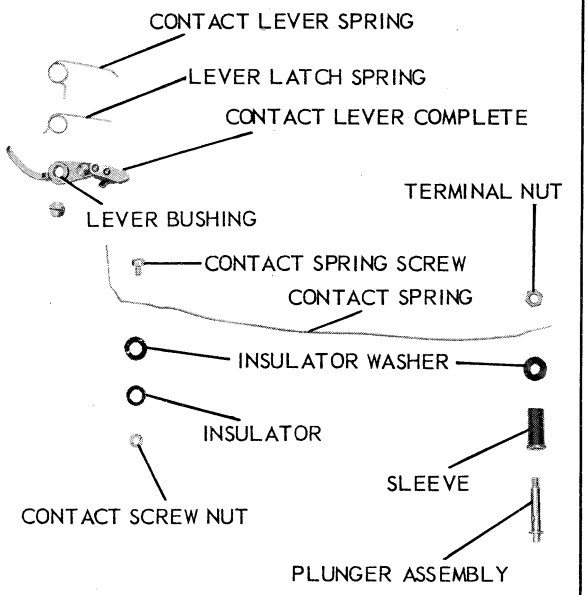


Figure 29

3. Terminal body insulating sleeve and the plunger assembly.
4. Case insulator washer on the threaded end of the plunger assembly.
5. Contact spring, with the threaded end of the plunger assembly extending through the opening in the spring.
6. Terminal nut.
7. Case insulator, with the collar end of the insulator facing out.
8. Case insulator washer over the opening on the inside of the case.
9. Contact end of the contact spring against the washer. Insert the contact spring screw in the opening in the spring and the washer.
10. Contact screw nut, using Tool No. 503L. Hold the screw in position with Tool No. 262.
11. Cock and release the shutter and at the same time retard its opening action by placing one finger against the lever on the main drive assembly. Observe whether the BLADE CONTROLLER CONTACT STUD makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.
12. Cover complete, paragraphs 1-8, page 26.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always trip the shutter blades when the winding lever is released very slowly. Set the shutter and the winding lever. Release the winding lever very slowly. The winding lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the Trouble Chart—"The flash setting is extremely fast"; see page 25.

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, the winding lever must return fully and become locked in the unwound position.

The flash settings on the shutter should be timed with reliable shutter testing equipment. The tolerance of the delayed action in the shutter for synchronization with the flash bulbs is as follows:

M (long stroke)* 12 – 16 milliseconds

*From instant of contact until the shutter blades first begin to show light.

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutters has been achieved by a change in the design of the flash contact parts. The old-style parts which are to be discarded are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No. 121356 – Supplement to Parts List No. 1-1470.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. TERMINAL NUT, figure 30.
2. Case INSULATOR WASHER, PLUNGER ASSEMBLY, and terminal body insulating SLEEVE.
3. On the contact end of the CONTACT SPRING remove the CONTACT SCREW NUT, using Tool No. 503L.
4. CONTACT SPRING SCREW, case INSULATOR WASHER, case INSULATOR, and contact spring.
5. CONTACT LEVER COMPLETE.
6. DETENT SPRING BUSHING, figure 9, DETENT SPRING WASHER, and DETENT SPRING AND ROLLER ASSEMBLY.
7. CONTACT ESCAPEMENT WHEEL.

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Place the contact LEVER LATCH SPRING, figure 29, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.

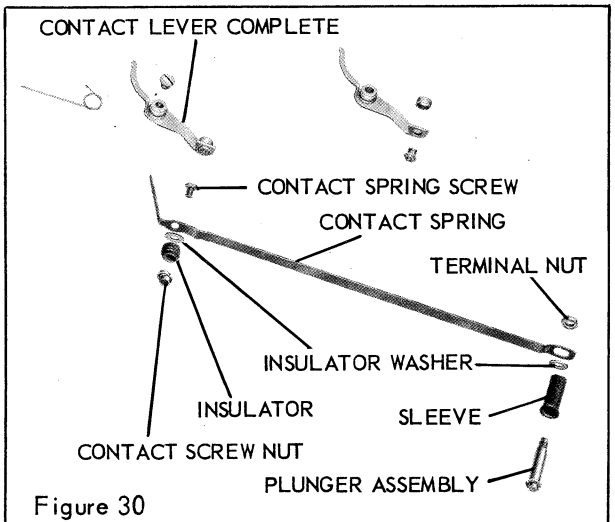


Figure 30

2. Contact lever complete on the CONTACT LEVER STUD, figure 32. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Terminal body insulating sleeve and the plunger assembly.
4. Case insulator washer on the threaded end of the plunger assembly.
5. Contact spring, with the threaded end of the plunger assembly extending through the opening in the spring.
6. Terminal nut.
7. Case insulator, with the collar end of the insulator facing out.
8. Case insulator washer over the opening on the inside of the case.
9. Contact end of the contact spring against the washer. Insert the contact spring screw in the opening in the spring and the washer.
10. Contact screw nut, using Tool No. 503L. Hold the screw in position with Tool No. 262.
11. Cock and release the shutter and at the same time retard its opening action by placing one finger against the lever on the main drive assembly. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 32, makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.
12. STAR WHEEL ASSEMBLY, figure 4.
13. Replace the cover complete and the winding lever.
14. Cock the shutter. Press the trigger to release the shutter and at the same time hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the spring is desirable. There must be approximately .005 inch clearance between the contact lever tail and the part of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance, or if there is excessive clearance, the spacing may be controlled by bending the contact lever tail in or out.

Allow the winding lever to go to the at rest position. Depress the trigger and watch to see that the flash contact points do not close. If they

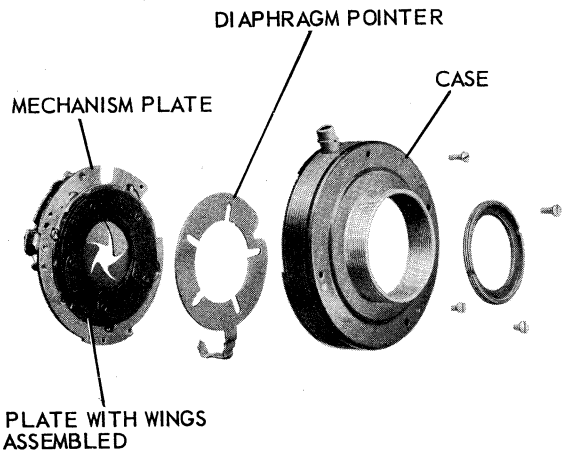


Figure 31

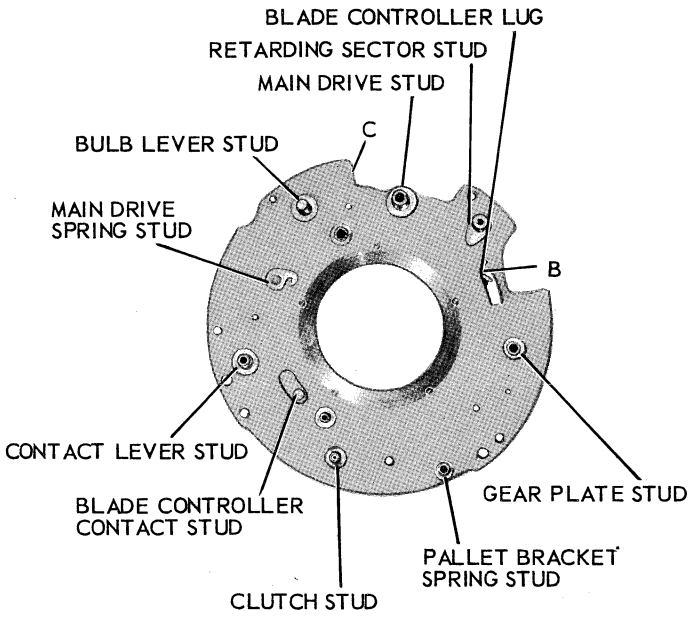


Figure 32

close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical part of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

While pressing the trigger down fully, watch the contacts to make sure they do not close at any time. If they close, the contact lever tail has been bent too far and should be moved back slightly. If necessary, the winding lever should be stoned at point "A," figure 11. Corner "B" must be square.

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-3, page 26.
2. Winding lever, paragraph 2, page 26.
3. Cover complete, paragraphs 3-7, page 26.
4. Winding gear, clutch assembly, and star wheel assembly, paragraphs 4-6, page 27.
5. Trigger assembly and bulb lever assembly, paragraphs 4-6, page 27.
6. Retard gear train, paragraphs 4-11, page 28.
7. Main drive assembly, paragraphs 4-8, page 28.
8. Flash contact parts, paragraphs 4-8, page 28.
9. Shutter release SECTOR AND STRAP assembly, figure 26.
10. Rear lens mount.
11. Blade controller LATCH SPRING BUSHING, figure 27, and the LATCH SPRING.
12. MECHANISM PLATE, figure 31.
13. Diaphragm retainer PLATE WITH WINGS ASSEMBLED.
14. Shutter blades.
15. BLADE CONTROLLER, figure 13.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid bending them and clean their surfaces with a soft cloth.
2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING and stud, figure 13, with the hole in the blade over the stud near the MAIN DRIVE STUD, figure 32, on the mechanism plate. Refer to figure 15 for positioning of the shutter blade.
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 13, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. BLADE over the blade with double blade bushing and stud. The back of the mechanism plate should appear as shown in figure 16.
6. Diaphragm retainer plate with wings assembled, with the long embossing on the back of the plate opposite the MAIN DRIVE STUD, figure 32. After the diaphragm retainer plate is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.
8. The shutter CASE, figure 31, and the DIAPHRAGM POINTER should be thoroughly cleaned.
9. Diaphragm pointer. Turn the pointer until the projecting arm is near the cable release socket.
10. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the diaphragm ring. After the plate is secured, the diaphragm ring and the shutter blades should operate freely.
11. Blade controller latch spring bushing and latch spring.
12. Shutter release sector and strap assembly.
13. Flash contact parts, paragraphs 1-11, page 28.
14. Main drive assembly, paragraphs 1-3, page 28.
15. Retard gear train, paragraphs 1-9, page 28.
16. Trigger assembly and bulb lever assembly, paragraphs 1-3, page 27.
17. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-3, page 27.
18. Cover complete, paragraphs 1-8, page 26.
19. Rear lens mount.

Lithographed in the United States of America

JUNE 1946 PARTS LIST No. 1-1470

FLASH KODAMATIC SHUTTER

This parts list covers the Flash Kodamatic Shutter for the Kodak 35 with Kodak Anastigmat Special f/3.5 lens; the shutter for the Kodak 35 (Range Finder) with Kodak Anastigmat Special f/3.5 lens; the shutter for the Kodak Monitor Six-20 with Kodak Anastigmat f/4.5 lens; the shutter for the Kodak Vigilant Six-20 with Kodak Anastigmat f/4.5 lens; and the shutter for the Kodak Reflex with Kodak Anastigmat f/3.5 lens.

The first section contains the assembly list of procurable parts and a numerical list with cross references to figure and parts list page number. Listed parts are illustrated.

The dagger (†) indicates parts which are seldom replaced and should be ordered only when needed.

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About Repairing

While the information supplied in this parts list is comprehensive, it must be remembered that the services and special tools of a skilled mechanic or serviceman will be necessary for much of the repair work. If satisfactory repair facilities are not available locally, send your equipment to the nearest factory repair shop.

FLASH KODAMATIC SHUTTER FOR KODAK 35 WITH KODAK ANASTIGMAT SPECIAL f/3.5 LENS

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
	99642	Shutter Assembly							1
1	98523		Case Assembly						1
2	18000			Bushing - Cable release					1
				Note: To avoid disassembly of the case, order the replacement bushing and screws below:					
2	81491			Bushing - Cable release					1
2	56100			Screw - Cable release bushing					2
2	94312			Body - Terminal					1
2	55329			Screw - Cable release opening					1
3	67295			Setting Lever with Stop Stud Assembly					1
3	94263			Pointer - Diaphragm					1
4	96813			Mechanism Plate with Studs					1
	56886†			Stud - Clutch					1
	94307†			Stud - Escapement wheel					1
	94305†			Stud - Contact lever					1
	92692†			Stud - Main drive spring					1
	56857†			Stud - Time and bulb lever					1
	56853†			Stud - Main drive					1
	56851†			Stud - Retarding sector					1
	56880†			Stud - Gear plate					2
	56870†			Stud - Gear with No. 2 pinion					1
	56860†			Stud - Plate blade					5
4	95853			Blade Controller with Contact Stud					1
	94323†			Stud - Blade controller contact					1
4	61170			Blade with Stud Assembly					4
4	62805			Blade with Double Blade Stud Assembly					1
4	76153			Blade					1
4	61171			Diaphragm Retainer Plate with Wings Assembly					1
4	56835			Wing - Diaphragm					5
4	55321			Screw - Diaphragm retainer plate					5
3	29925			Screw - Mechanism plate					2
3	66922			Screw - Mechanism plate					2
6	96484			Spring - Contact					1
6	94319			Insulator - Case					1
6	94318			Washer - Case insulator					2
6	94320			Screw - Contact					1
6	94322			Nut - Contact screw					1
6	94313			Sleeve - Terminal body insulating					1
6	94327			Plunger Assembly					1
6	94317			Nut - Terminal					1
6	99843			Contact Lever Complete					1
6	96716			Contact Lever with Bushing Assembly					1
6	99092			Contact Point Assembly					1
6	100282			Nut - Contact point					1
6	94306			Spring - Contact lever					1
6	61189			Screw - Contact lever					1
8	94332			Contact Escapement Wheel and Pinion Assembly					1
8	101984			Screw - Contact escapement wheel					1
8	101090			Detent Spring and Roller Assembly					1
8	64908			Washer - Detent spring					1
8	100963			Bushing - Detent spring					1
8	56924			Clutch Assembly					1
8	101984			Screw - Clutch					1
8	96811			Winding Gear with Pinion and Spring Assembly					1
8	56913			Spring - Winding gear					1
7	61184			Retard Gear with No. 2 Pinion Assembly					1
7	61183			Escapement Wheel with No. 3 Pinion Assembly					1
7	96816			Pallet Bracket Assembly					1
7	56909			Spring - Pallet bracket					1
7	61185			Pallet Assembly					1
7	99806			Retard Gear Plate with Retard Gear and No. 1 Pinion Assembly					1
7	99805			Retard Gear with No. 1 Pinion Assembly					1
7	64786			Stud - Retard gear with No. 1 pinion					1
FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
7	83470							Screw - Retard gear plate	2
7	99804							Retarding Sector with Stud Assembly	1
7	89372							Spring - Retarding sector	1
7	56850							Screw - Retarding sector	1
9	61174							Bulb Lever Assembly	1
9	56908							Spring - Bulb lever	1
9	61175							Time Lever Assembly	1
9	60824							Spring - Time lever	1
9	100122							Trigger Assembly	1
	99887†							Spring - Setting lever release	1
	99886†							Rivet - Setting lever release spring	1
9	56910							Spring - Trigger	1
9	56847							Washer - Trigger	1
9	56865							Screw - Trigger	1
9	96480							Latch - Trigger	1
9	68403							Button - Trigger latch	1
9	68404							Screw - Trigger latch button	1
10	67294							Main Drive Bushing and Disk Assembly	1
10	56921							Blade Controller Latch with Stud Assembly	1
10	64793							Spring - Main drive	1
10	66257							Screw - Main drive	1
10	56840							Spring - Blade controller latch	1
10	56891							Bushing - Blade controller latch spring	1
11	100084							Cover Complete	1
11	56900							Latch - Winding lever safety	1
11	56901							Stud - Winding lever safety latch	1
11	56914							Spring - Winding lever safety latch	1
11	61189							Screw - Winding lever safety latch spring	1
11	94798							Spring - Trigger latch	1
11	61189							Screw - Trigger latch spring	1
11	87170							Screw - Cover, short	1
11	89255							Screw - Cover, long	2
11	100258							Flash Retard Pallet Assembly	1
12	98524							Lever - Winding	1
12	99257							Speed and Diaphragm Index Plate with Synchronizer Scale	1
13	99154							Plate - Speed and diaphragm index	1
13	96714							Synchronizer Scale with Stud Assembly	1
13	96883							Nut - Synchronizer scale stud	1
12	96485							Ring - Speed control	1
12	76107							Screw - Diaphragm pointer stop	1
12	84288							Tip - Diaphragm pointer	1
12	86144							Screw - Diaphragm pointer tip	1

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

Always give PART NUMBER and NAME when ordering parts

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
								The parts for the Flash Kodamatic Shutter for the Kodak 35 with Range Finder are the same as those for the Flash Kodamatic Shutter for the Kodak 35 with Kodak Anastigmat Special f/3.5 Lens except omit the following parts:	
	99642							Shutter Assembly	1
1	98523							Case Assembly	1
10	66257							Screw - Main drive	1
12	98524							Lever - Winding	1
12	99257							Speed and Diaphragm Index Plate with Synchronizer Scale	1
13	99154							Plate - Speed and diaphragm index	1
								ADD THE FOLLOWING PARTS:	
	100107							Shutter Assembly	1
14	96488							Case Assembly	1
15	80504							Screw - Main drive	1
16	96479							Lever - Winding	1
16	100849							Speed and Diaphragm Index Plate with Synchronizer Scale	1
13	100094							Plate - Speed and diaphragm index	1

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
	99846	Shutter Assembly							1
17	96776		Case Assembly						1
18	18000			Bushing - Cable release					1
				Note: To avoid disassembly of the case, order the replacement bushing and screws below:					
18	81491			Bushing - Cable release					1
18	56100			Screw - Cable release bushing					2
18	94312			Body - Terminal					1
18	55329		Screw - Cable release opening						1
19	56834		Pointer - Diaphragm						1
20	96822		Mechanism Plate with Studs						1
	56886†			Stud - Clutch					1
	94307†			Stud - Escapement wheel					1
	94305†			Stud - Contact lever					1
	92692†			Stud - Main drive spring					1
	56857†			Stud - Time and bulb lever					1
	56853†			Stud - Main drive					1
	56851†			Stud - Retarding sector					1
	56880†			Stud - Gear plate					2
	56870†			Stud - Gear with No. 2 pinion					1
	56860†			Stud - Plate blade					5
20	95853		Blade Controller with Contact Stud						1
	94323†			Stud - Blade controller contact					1
20	61170		Blade with Stud Assembly						4
20	62805		Blade with Double Blade Stud Assembly						1
20	76153		Blade						1
20	66504		Diaphragm Retainer Plate with Wings Assembly						1
20	56835			Wing - Diaphragm					5
20	55321		Screw - Diaphragm retainer plate						5
19	56915		Screw - Mechanism plate						2
19	56916		Screw - Mechanism plate						1
19	62742		Screw - Mechanism plate						1
19	99884		Ring - Leak light						1
22	95571		Spring - Contact						1
22	94319		Insulator - Case						1
22	94318		Washer - Case insulator						2
22	94320		Screw - Contact						1
22	94322		Nut - Contact screw						1
22	94313		Sleeve - Terminal body insulating						1
22	94327		Plunger Assembly						1
22	94317		Nut - Terminal						1
22	99843		Contact Lever Complete						1
22	96716			Contact Lever with Bushing Assembly					1
22	99092			Contact Point Assembly					1
22	100282		Nut - Contact point						1
22	94306		Spring - Contact lever						1
22	61189		Screw - Contact lever						1
23	94332		Contact Escapement Wheel and Pinion Assembly						1
23	101984		Screw - Contact escapement wheel						1
23	101086		Detent Spring and Roller Assembly						1
23	64908		Washer - Detent spring						1
23	100963		Bushing - Detent spring						1
23	56924		Clutch Assembly						1
23	101984		Screw - Clutch						1
23	96811		Winding Gear with Pinion and Spring Assembly						1
23	56913			Spring - Winding gear					1
7	61184		Retard Gear with No. 2 Pinion Assembly						1
7	61183		Escapement Wheel with No. 3 Pinion Assembly						1
7	96816		Pallet Bracket Assembly						1
7	56909		Spring - Pallet bracket						1
7	61185		Pallet Assembly						1

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
7	99806							Retard Gear Plate with Retard Gear and No. 1 Pinion Assembly	1
7	99805							Retard Gear with No. 1 Pinion Assembly	1
7	64786							Stud - Retard gear with No. 1 pinion	1
7	83470							Screw - Gear plate	2
7	99804							Retarding Sector with Stud Assembly	1
7	89372							Spring - Retarding sector	1
7	56850							Screw - Retarding sector	1
24	61174							Bulb Lever Assembly	1
24	56908							Spring - Bulb lever	1
24	61175							Time Lever Assembly	1
24	60824							Spring - Time lever	1
24	69858							Trigger	1
24	56910							Spring - Trigger	1
24	56847							Washer - Trigger	1
24	56865							Screw - Trigger	1
24	96774							Latch - Trigger	1
24	68855							Button - Trigger latch	1
25	74546							Main Drive Bushing and Disk Assembly	1
25	56921							Blade Controller Latch with Stud Assembly	1
25	64793							Spring - Main drive	1
25	66257							Screw - Main drive	1
25	56840							Spring - Blade controller latch	1
25	56891							Bushing - Blade controller latch spring	1
26	100084							Cover Complete	1
26	56900							Latch - Winding lever safety	1
26	56901							Stud - Winding lever safety latch	1
26	56914							Spring - Winding lever safety latch	1
26	61189							Screw - Winding lever safety latch spring	1
26	94798							Spring - Trigger latch	1
26	61189							Screw - Trigger latch spring	1
26	75431							Screw - Speed control ring stop	1
26	87170							Screw - Cover, short	1
26	89255							Screw - Cover, long	2
26	100258							Flash Retard Pallet Assembly	1
27	96769							Lever - Winding	1
27	99262							Speed and Diaphragm Index Plate with Synchronizer Scale	1
28	99158							Plate - Speed and diaphragm index	1
28	96714							Synchronizer Scale with Stud Assembly	1
28	96883							Nut - Synchronizer scale stud	1
27	96770							Ring - Speed control	1
27	76107							Screw - Diaphragm pointer stop	1
27	74540							Shutter Release Sector and Strap Assembly	1
27	69148							Strap - Shutter release	1
27	62747							Stud - Shutter release strap	1
27	62741							Screw - Shutter release sector	1
27	74549							Plate - Setting lever cover	1
27	40804							Screw - Setting lever cover plate	2

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FLASH KODAMATIC SHUTTER FOR KODAK VIGILANT SIX-20 WITH KODAK ANASTIGMAT f/4.5 LENS

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
								The parts for the Flash Kodamatic Shutter for the Kodak Vigilant Six-20 with Kodak Anastigmat f/4.5 Lens are the same as those for the Flash Kodamatic Shutter for the Kodak Monitor Six-20 with Kodak Anastigmat f/4.5 Lens except omit the following parts:	
	99846							Shutter Assembly	1
27	99262							Speed and Diaphragm Index Plate with Synchronizer Scale	1
28	99158							Plate - Speed and diaphragm index	1
								ADD THE FOLLOWING PARTS:	
	99649							Shutter Assembly	1
27	99260							Speed and Diaphragm Index Plate with Synchronizer Scale	1
28	99157							Plate - Speed and diaphragm index	1

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
	100877	Shutter Assembly							1
29	95581		Case Assembly						1
30	18000			Bushing - Cable release					1
				Note: To avoid disassembly of the case, order the replacement bushing and screws below:					
30	81491			Bushing - Cable release					1
30	56100			Screw - Cable release bushing					2
30	60831			Stud - Setting lever spring					1
31	83692		Setting Lever with Stop Stud Assembly						1
31	67767		Spring - Setting lever						1
31	81390		Pointer - Diaphragm						1
32	95613		Mechanism Plate with Studs						1
	56886†			Stud - Clutch					1
	94307†			Stud - Escapement wheel					1
	94305†			Stud - Contact lever					1
	92692†			Stud - Main drive spring					1
	56857†			Stud - Time and bulb lever					1
	56853†			Stud - Main drive					1
	56851†			Stud - Retarding sector					1
	56880†			Stud - Gear plate					2
	64788†			Stud - Gear plate					1
	78981†			Stud - Pallet bracket spring					1
	67769†			Stud - Plate blade					1
32	95853		Blade Controller with Contact Stud						1
	94323†			Stud - Blade controller contact					1
32	67773		Blade with Stud Assembly						4
32	85984		Blade with Double Blade Stud Assembly						1
32	67768		Blade						1
32	67772		Diaphragm Retainer Plate with Wings Assembly						1
32	56835			Wing - Diaphragm					5
32	55321		Screw - Diaphragm retainer plate						5
31	29925		Screw - Mechanism plate						2
31	66922		Screw - Mechanism plate						2
34	95571		Spring - Contact						1
34	94319		Insulator - Case						1
34	94318		Washer - Case insulator						2
34	94320		Screw - Contact						1
34	94322		Nut - Contact screw						1
34	95574		Terminal - Contact						1
34	95572		Screw - Contact spring						1
34	95573		Nut - Contact spring screw						1
34	95579		Connector - Wire						1
34	99633		Contact Lever Complete						1
34	95848			Contact Lever with Bushing Assembly					1
34	99092			Contact Point Assembly					1
34	100282		Nut - Contact point						1
34	94306		Spring - Contact lever						1
34	61189		Screw - Contact lever						1
35	94332		Contact Escapement Wheel and Pinion Assembly						1
35	101984		Screw - Contact escapement wheel						1
35	101086		Detent Spring and Roller Assembly						1
35	64908		Washer - Detent spring						1
35	100963		Bushing - Detent spring						1
35	56924		Clutch Assembly						1
35	101984		Screw - Clutch						1
35	95849		Winding Gear with Pinion and Spring Assembly						1
35	94309			Spring - Winding gear					1
36	95379		Retard Gear with No. 2 Pinion Assembly						1
36	95380		Retard Gear with No. 3 Pinion Assembly						1
36	95381		Escapement Wheel with No. 4 Pinion Assembly						1
36	100870		Pallet Bracket Assembly						1
36	95564		Spring - Pallet bracket						1

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.

FIG.	PART NUMBER	1	2	3	4	5	6	PART NAME	No. REQD.
36	67763		Pallet						1
36	68617		Retard Gear Plate with Retard Gear and No. 1 Pinion Assembly						1
36	95378			Retard Gear with No. 1 Pinion Assembly					1
36	64786			Stud - Retard gear with No. 1 pinion					1
36	83470		Screw - Retard gear plate						2
36	95850		Retarding Sector with Stud Assembly						1
36	56911		Spring - Retarding sector						1
36	56850		Screw - Retarding sector						1
37	61174		Bulb Lever Assembly						1
37	56908		Spring - Bulb lever						1
37	61175		Time Lever Assembly						1
37	60824		Spring - Time lever						1
37	102232		Trigger Assembly						1
	95575†			Bushing - Trigger latch					1
37	56910		Spring - Trigger						1
37	56847		Washer - Trigger						1
37	56865		Screw - Trigger						1
37	95567		Latch - Trigger						1
37	63783		Screw - Trigger latch						1
38	67774		Main Drive Bushing and Disk with Blade Controller Latch Assembly						1
38	56842			Latch - Blade controller					1
38	67762			Stud - Blade controller latch					1
38	64793		Spring - Main drive						1
38	82206		Screw - Main drive						1
38	56840		Spring - Blade controller latch						1
38	56891		Bushing - Blade controller latch						1
39	100025		Cover Complete						1
	82155†			Stud - Pinion bracket					1
39	64796			Latch - Winding lever safety					1
39	66163			Stud - Winding lever safety latch					1
39	56914		Spring - Winding lever safety latch						1
39	61189		Screw - Winding lever safety latch spring						1
39	94798		Spring - Trigger latch						1
39	61189		Screw - Trigger latch spring						1
39	87170		Screw - Cover, short						1
39	89255		Screw - Cover, long						2
39	100258		Flash Retard Pallet Assembly						1
40	95568		Lever - Winding						1
40	95562		Ring - Speed control						1
40	95847		Speed and Diaphragm Index Plate with Synchronizer Scale						1
41	95563			Plate - Speed and diaphragm index					1
41	95621			Synchronizer Scale with Stud Assembly					1
41	96883			Nut - Synchronizer scale stud					1
40	101984		Screw - Speed and diaphragm index plate, bottom						1
40	81492		Screw - Speed and diaphragm index plate, top						1
40	76107		Screw - Diaphragm pointer stop						1

FIG. | PART NUMBER | 1 | 2 | 3 | 4 | 5 | 6 | PART NAME | No. REQD.

Always give PART NUMBER and NAME when ordering parts

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PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
18000	1,4,7	2,18,30
29925	1,7	3,31
40804	5	27
55321	1,4,7	4,20,32
55329	1,4	2,18
56100	1,4,7	2,18,30
56834	4	19
56835	1,4,7	4,20,32
56840	2,5,8	10,25, 38
56842	8	38
56847	2,5,8	9,24,37
56850	2,5,8	7,36
56851	1,4,7	
56853	1,4,7	
56857	1,4,7	
56860	1,4	
56865	2,5,8	9,24,37
56870	1,4	
56880	1,4,7	
56886	1,4,7	
56891	2,5,8	10,25, 38
56900	2,5	11,26
56901	2,5	11,26
56908	2,5,8	9,24,37
56909	1,4	7
56910	2,5,8	9,24,37
56911	8	36
56913	1,4	8,23
56914	2,5,8	11,26, 39
56915	4	19
56916	4	19
56921	2,5	10,25
56924	1,4,7	8,23,35
60824	2,5,8	9,24,37
60831	7	30
61170	1,4	4,20
61171	1	4
61174	2,5,8	9,24,37
61175	2,5,8	9,24,37
61183	1,4	7
61184	1,4	7
61185	1,4	7
61189	1,2,4,5,7,8	6,11,22, 26,34, 39
62741	5	27
62742	4	19
62747	5	27
62805	1,4	4,20
63783	8	37
64786	1,5,8	7,36
64788	7	
64793	2,5,8	10,25, 38
64796	8	39
64908	1,4,7	8,23,35
66163	8	39
66257	2,5	10,25
66504	4	20
66922	1,7	3,31
67294	2	10
67295	1	3
67762	8	38
67763	8	36
67767	7	31
67768	7	32
67769	7	
67772	7	32
67773	7	32
67774	8	38
68403	2	9
68404	2	9
68617	8	36
68855	5	24
69148	5	27
69858	5	24
74540	5	27
74546	5	25
74549	5	27
75431	5	26
76107	2,5,8	12,27, 40
76153	1,4	4,20
78981	7	
80504	3	15
81390	7	31
81491	1,4,7	2,18,30
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82155	8	
82206	8	38
83470	2,5,8	7,36
83692	7	31
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85984	7	32
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87170	2,5,8	11,26, 39
89255	2,5,8	11,26, 39
89372	2,5	7
92692	1,4,7	
94263	1	3
94305	1,4,7	
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94307	1,4,7	
94309	7	35
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94320	1,4,7	6,22,34
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94323	1,4,7	
94327	1,4	6,22
94332	1,4,7	8,23,35
94798	2,5,8	11,26, 39
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95380	7	36
95381	7	36
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95563	8	41
95564	7	36
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95572	7	34
95573	7	34
95574	7	34
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95579	7	34
95581	7	29
95613	7	32
95621	8	41
95847	8	40
95848	7	34
95849	7	35
95850	8	36
95853	1,4,7	4,20,32
96479	3	16
96480	2	9
96484	1	6
96485	2	12
96488	3	14
96714	2,5	13,28
96716	1,4	6,22
96769	5	27
96770	5	27
96774	5	24
96776	4	17
96811	1,4	8,23
96813	1	4
96816	1,4	7
96822	4	20
96883	2,5,8	13,28, 41
98523	1	1
98524	2	12
99092	1,4,7	6,22,34
99154	2	13
99157	6	28
99158	5	28
99257	2	12
99260	6	27
99262	5	27
99633	7	34
99642	1	
99649	6	
99804	2,5	7
99805	1,5	7
99806	1,5	7
99843	1,4	6,22
99846	4	
99884	4	19
99886	2	
99887	2	
100025	8	39
100084	2,5	11,26
100094	3	13
100107	3	
100122	2	9

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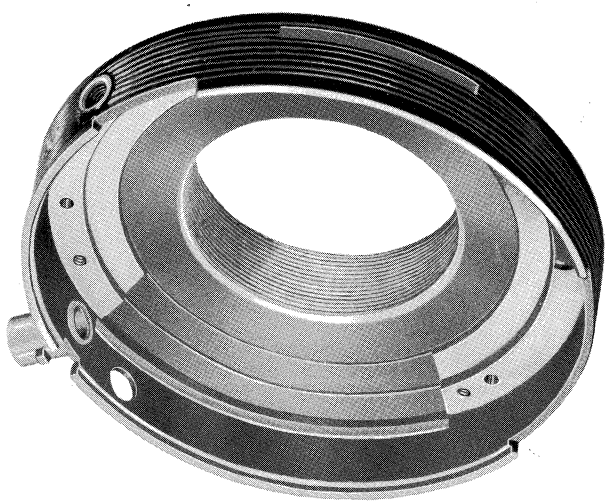
PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
100258	2,5,8	11,26, 39	100870	7	36	101090	1	8
			100877	7		101984	1,4,7,8	8,23,
100282	1,4,7	6,22,34	100963	1,4,7	8,23,35			35,40
100849	3	16	101086	4,7	23,35	102232	8	37



98523—CASE ASSEMBLY

Figure 1

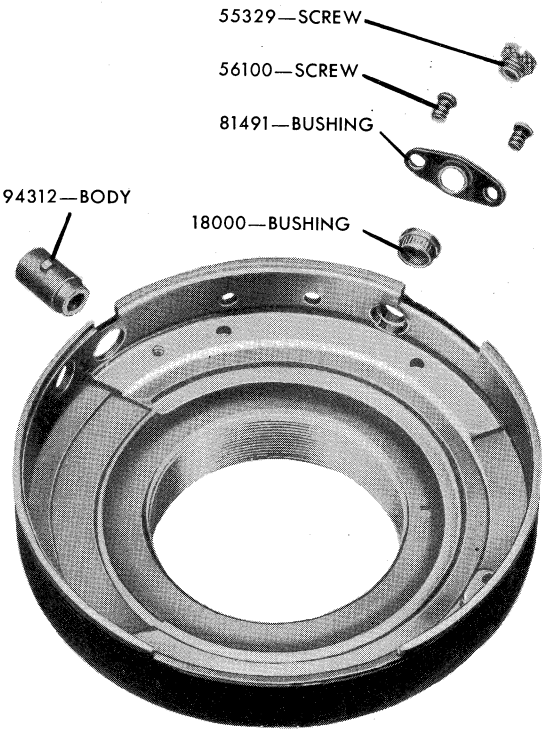


Figure 2

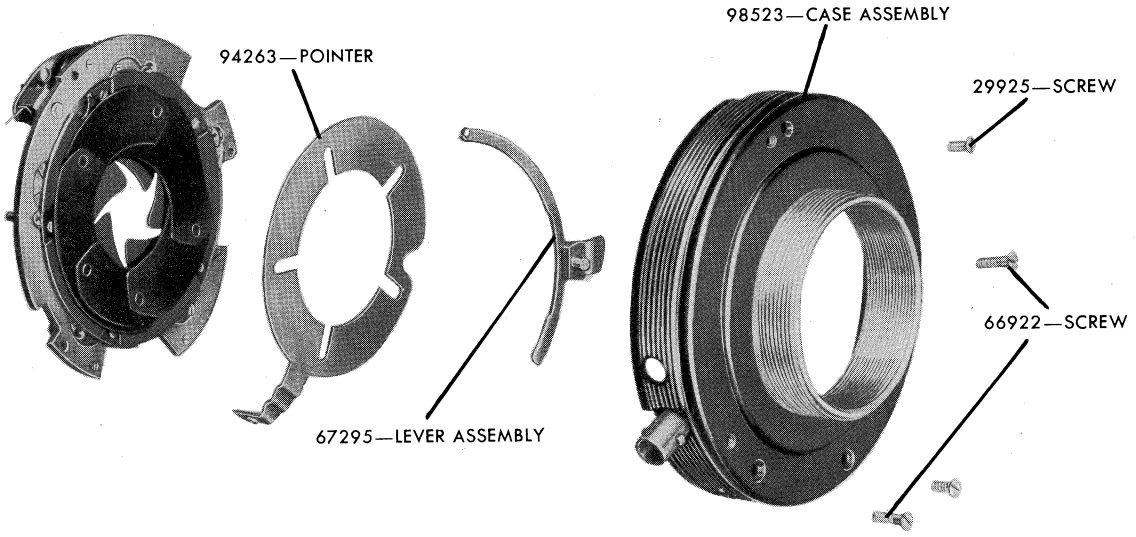


Figure 3

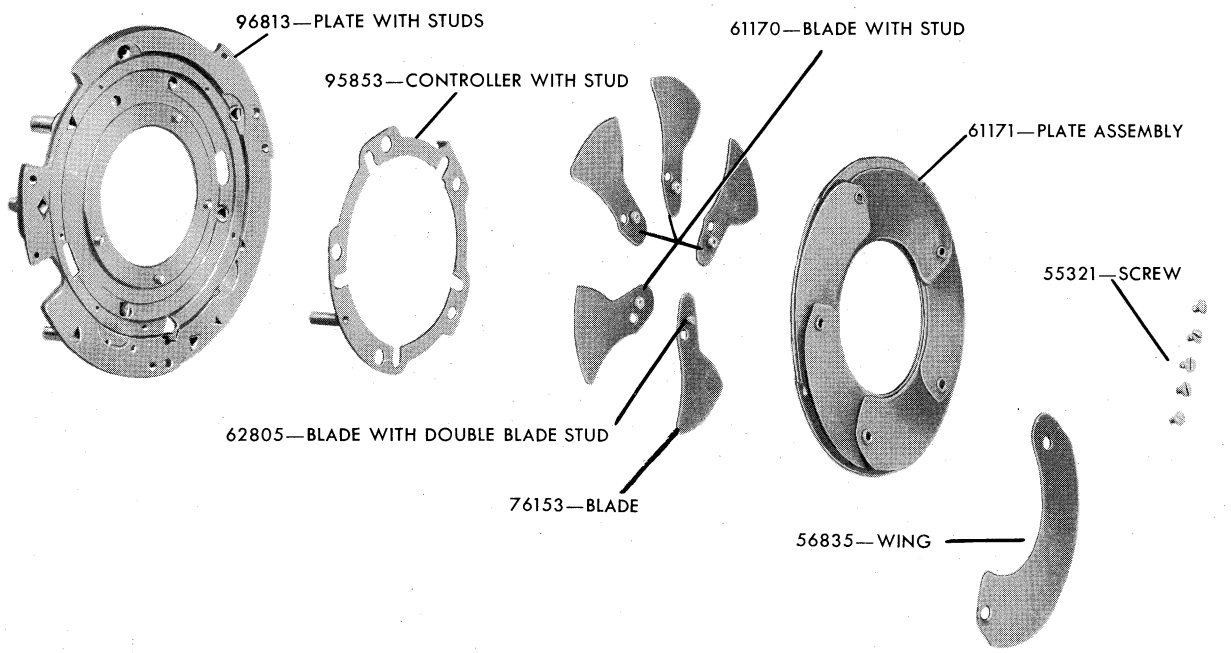


Figure 4

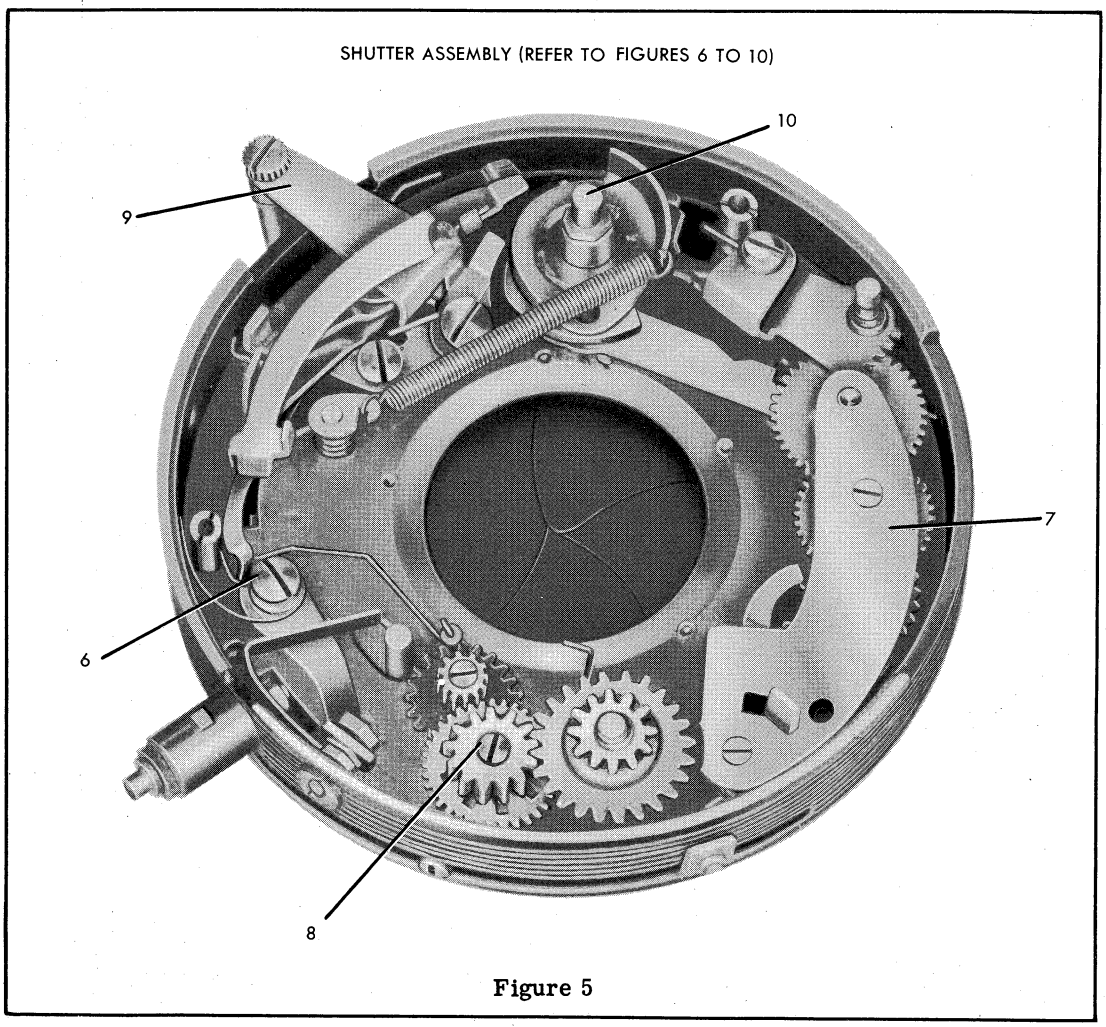


Figure 5

Figure 6

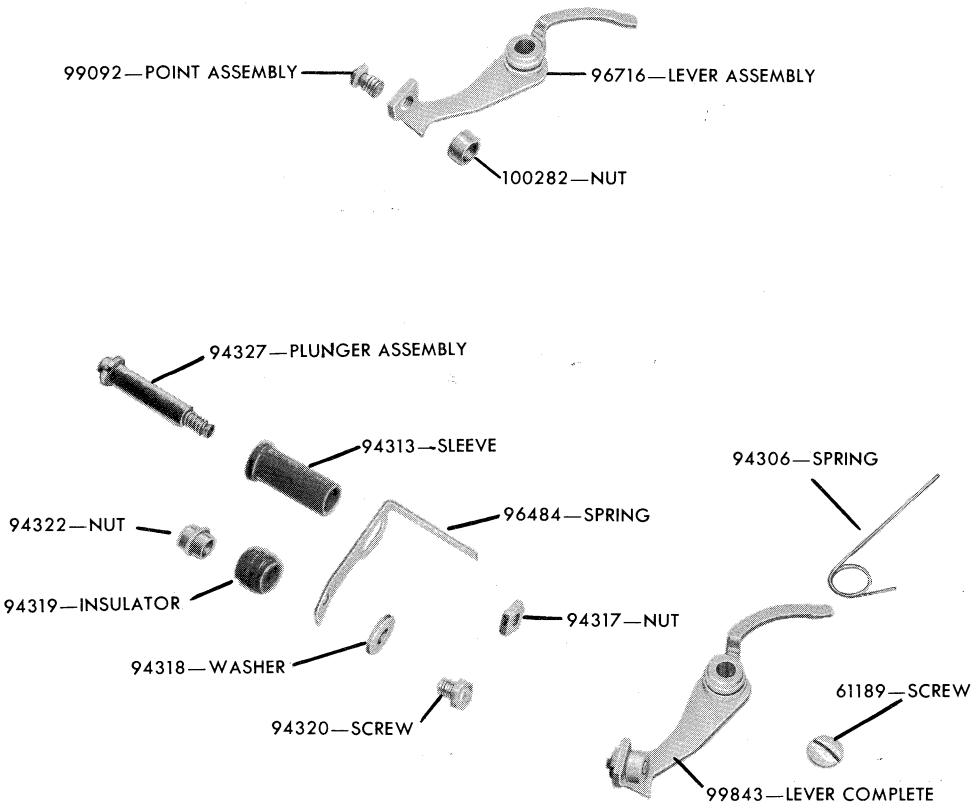
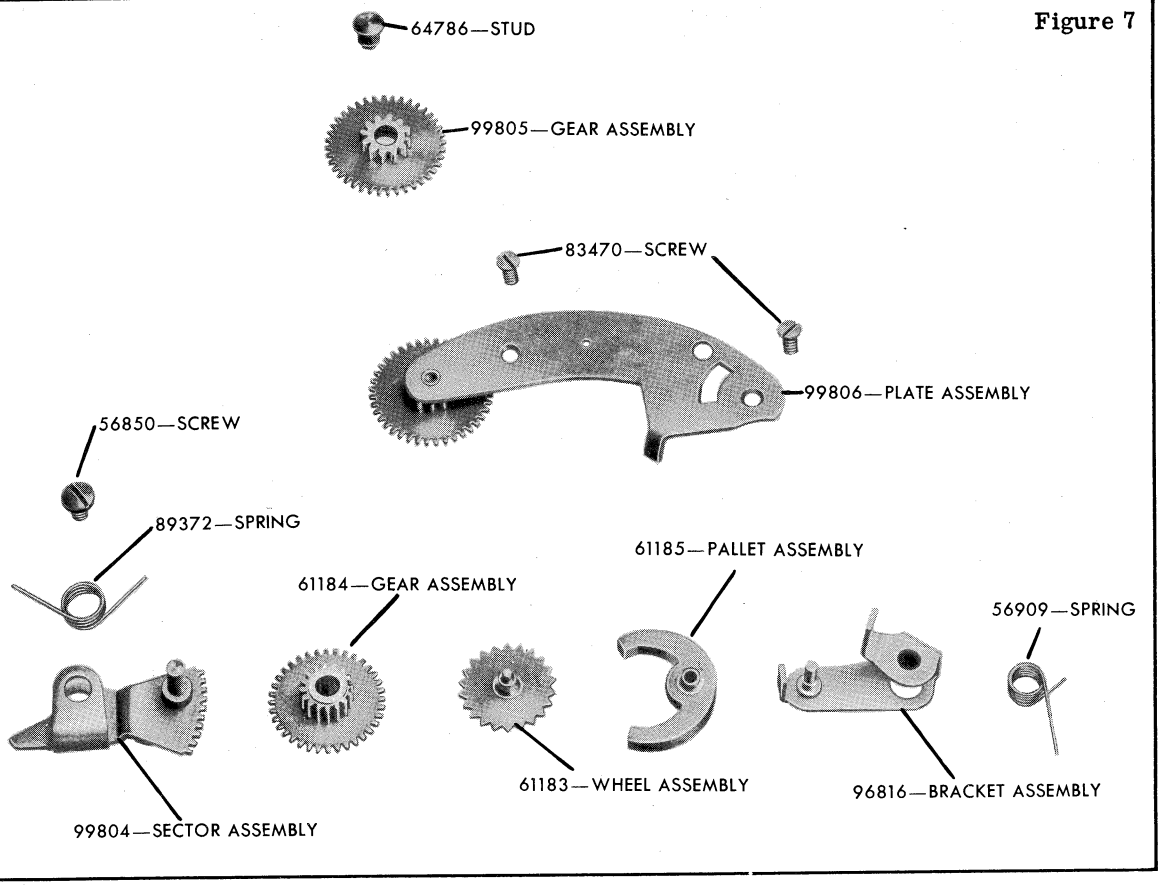


Figure 7



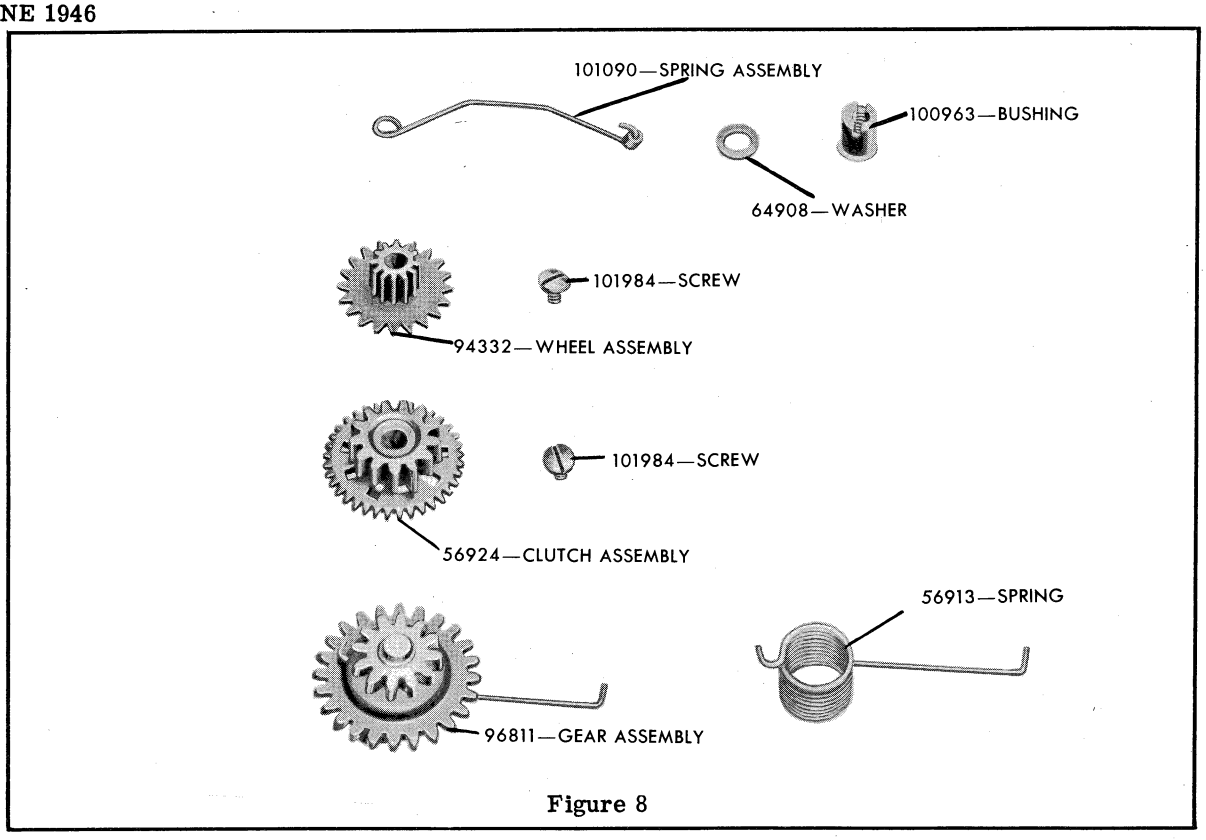
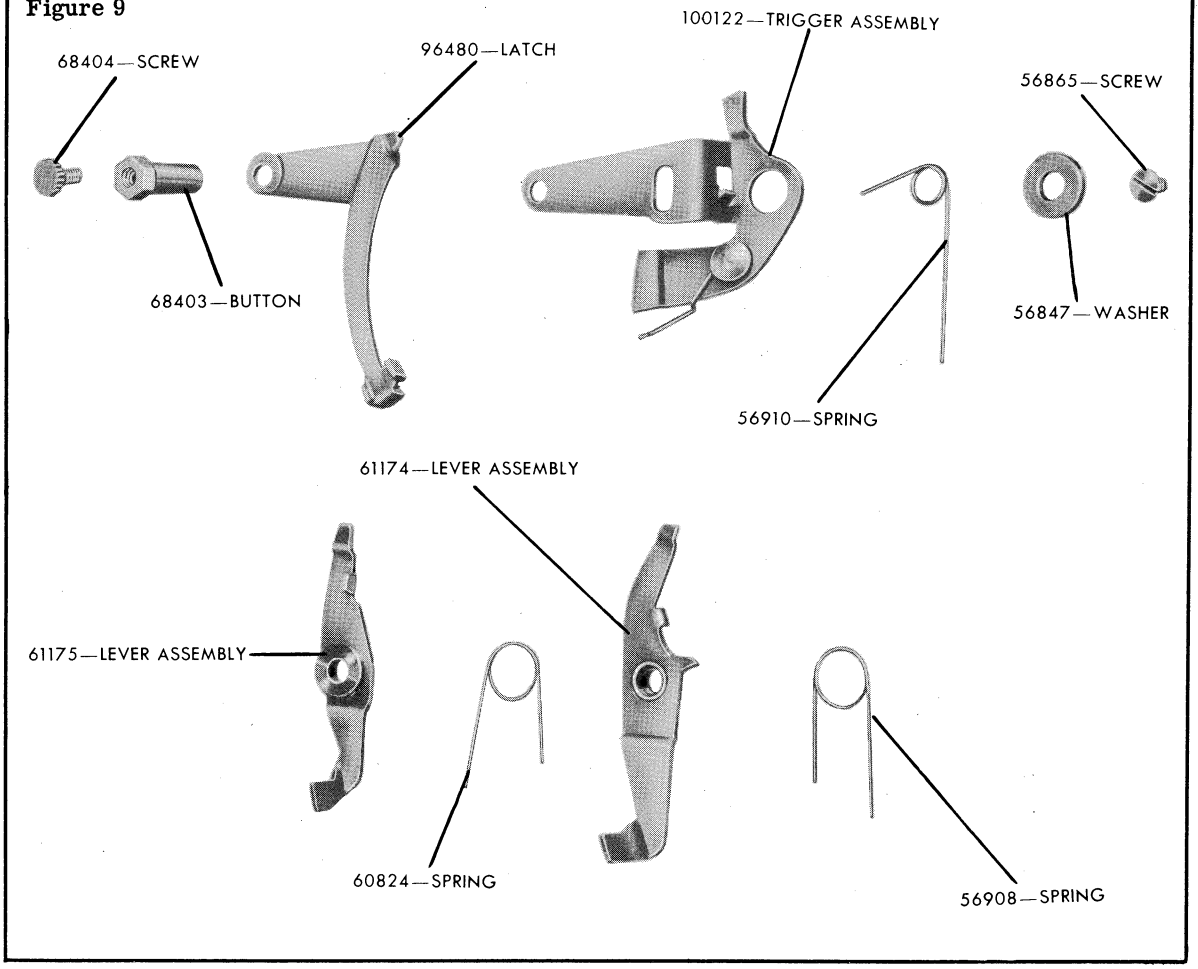


Figure 8

Figure 9



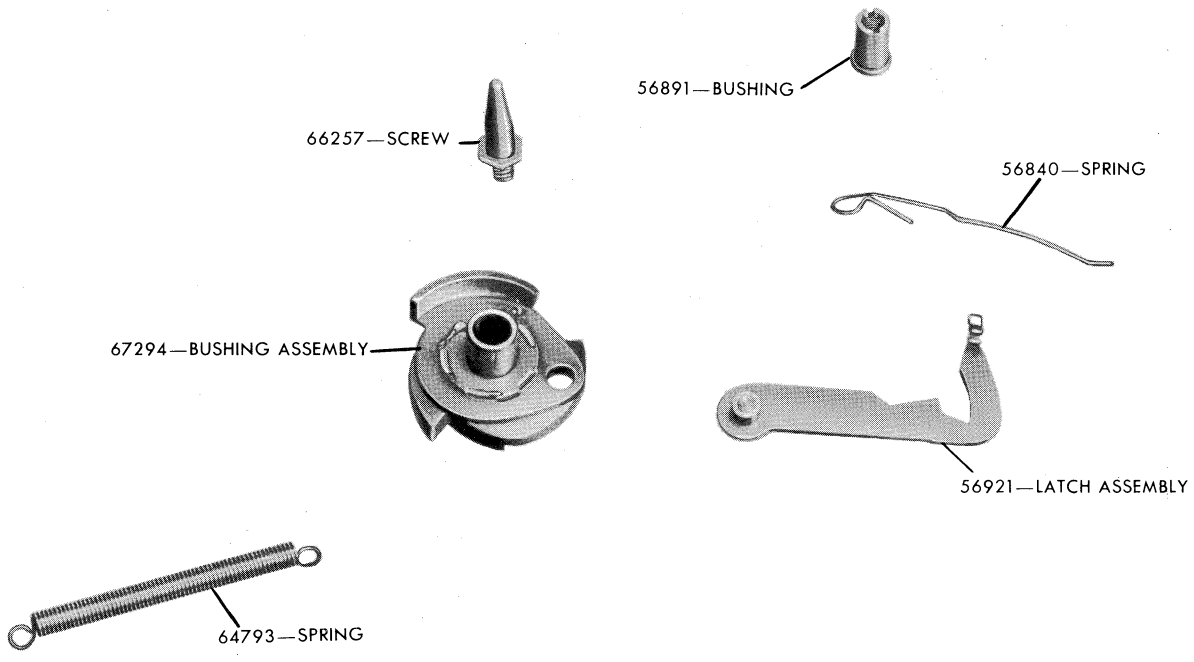
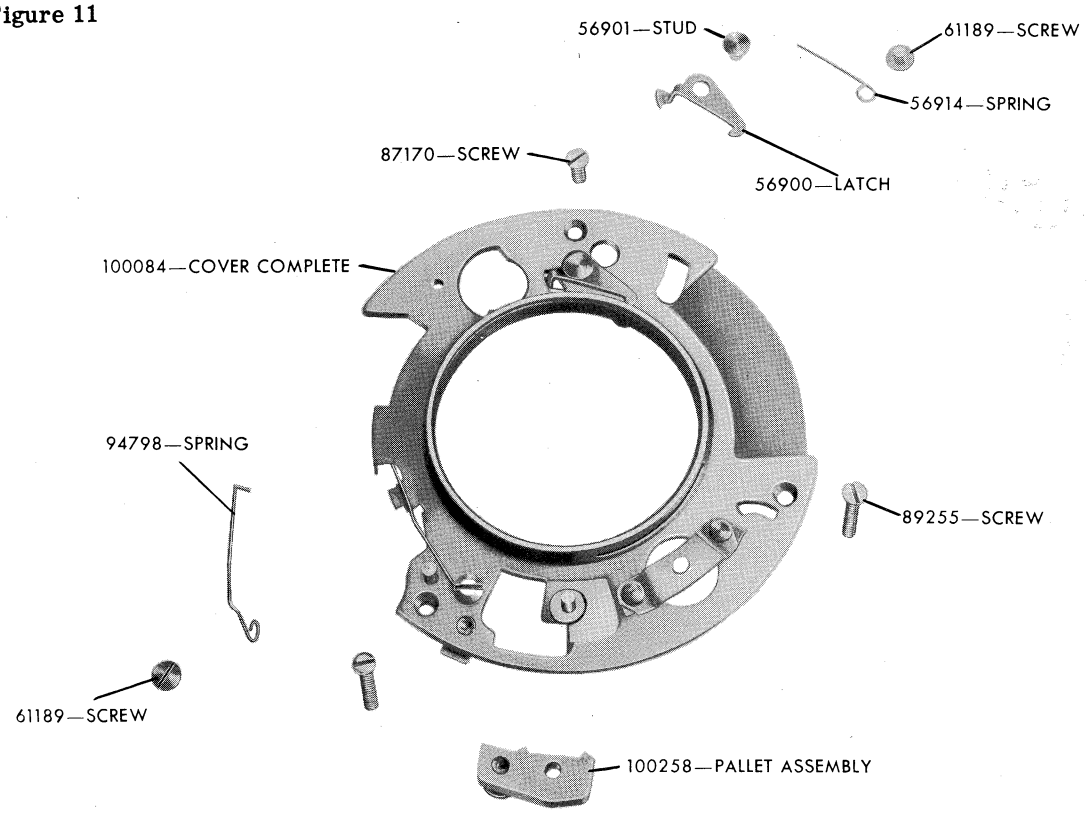


Figure 10

Figure 11



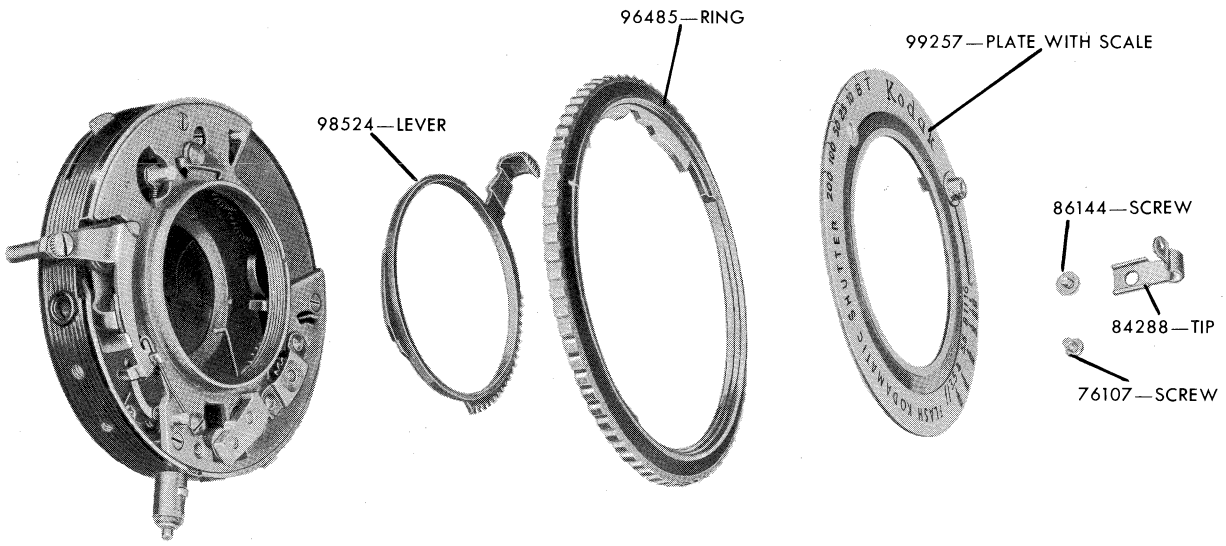


Figure 12

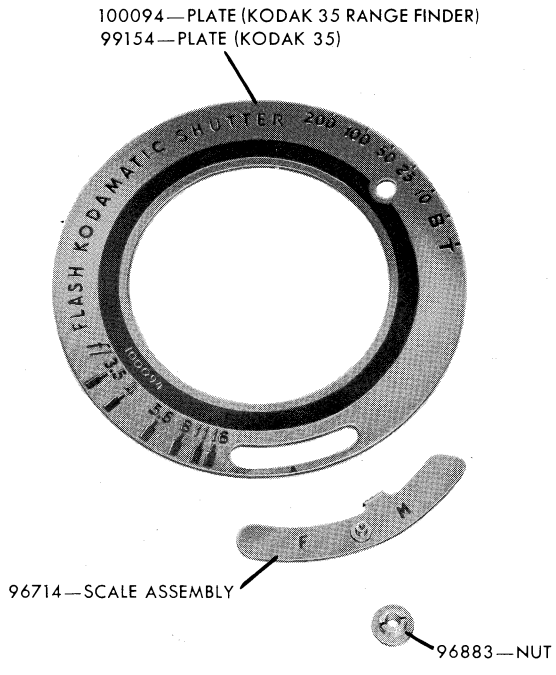


Figure 13

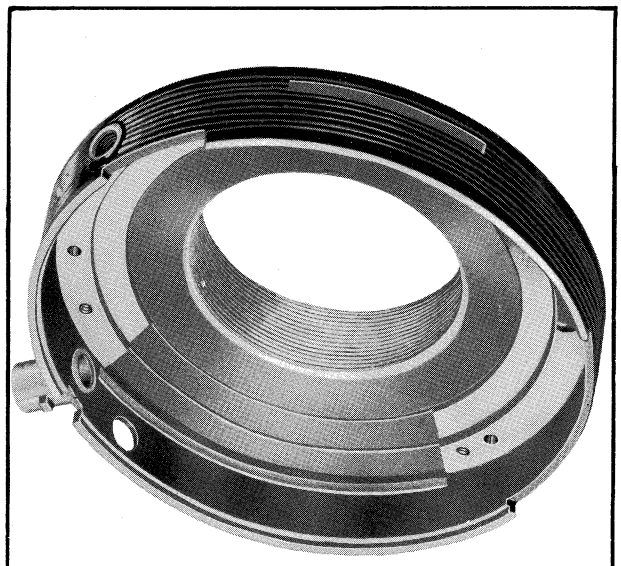


Figure 14

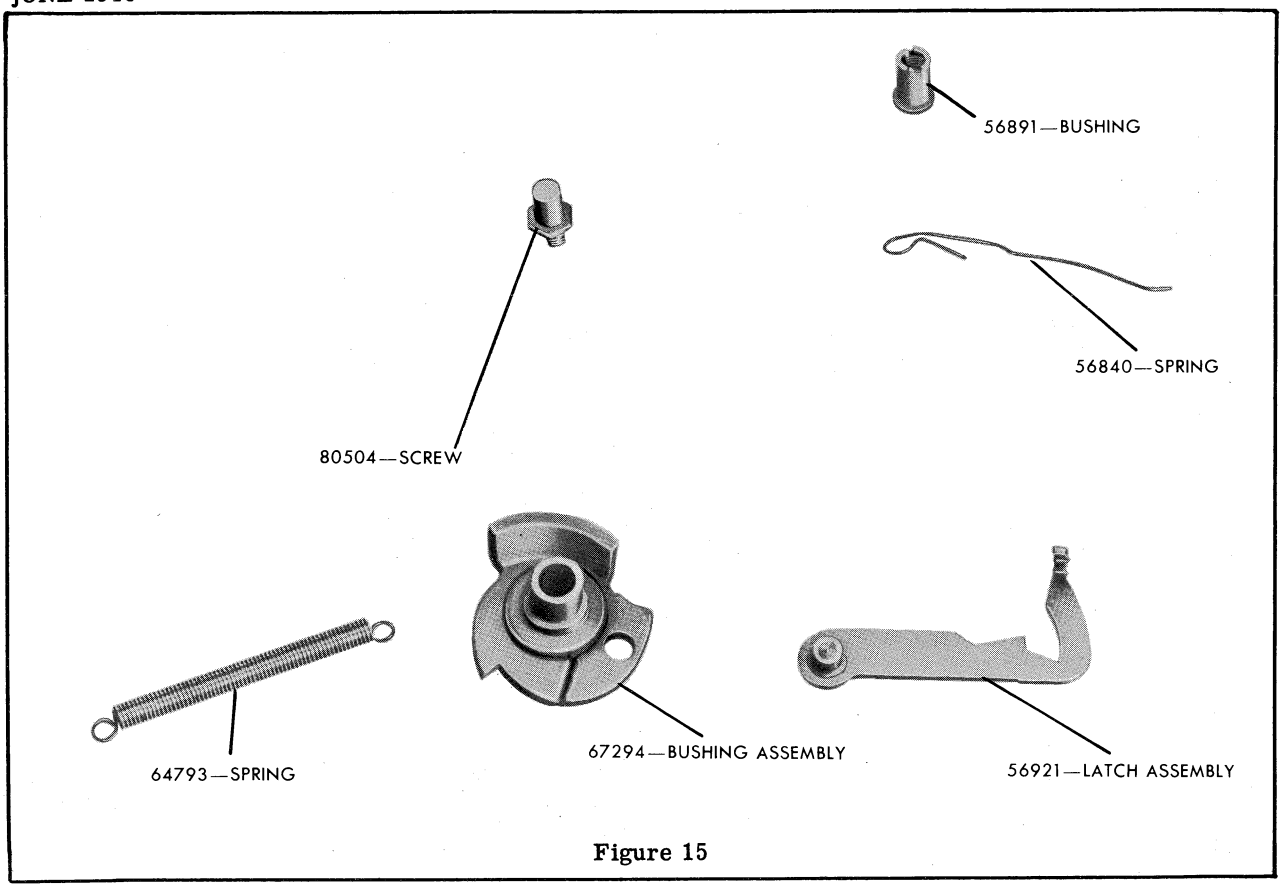


Figure 15

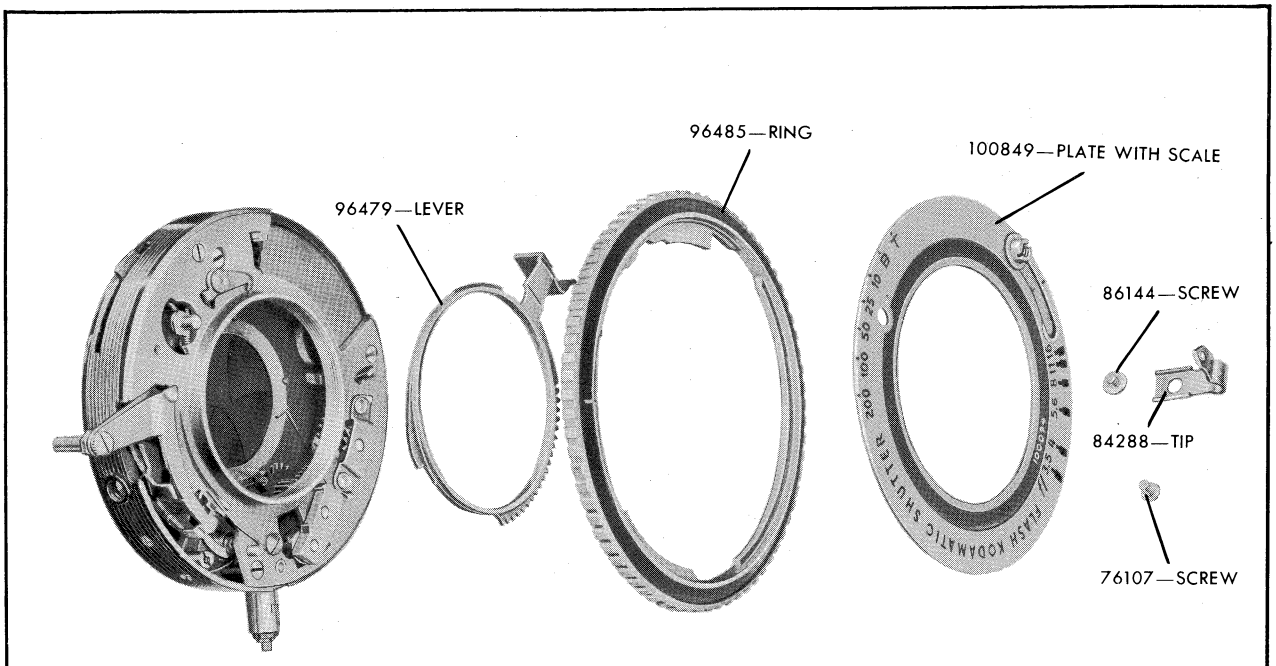


Figure 16

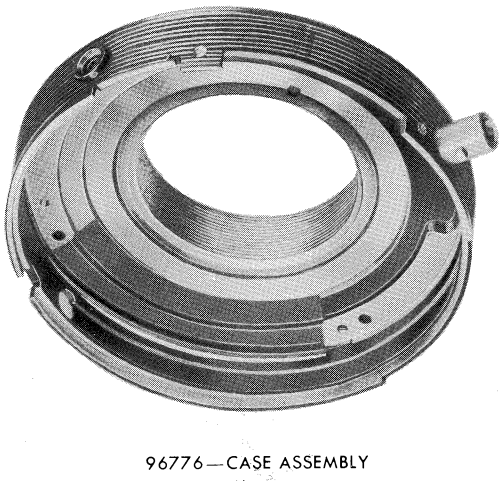


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Figure 17

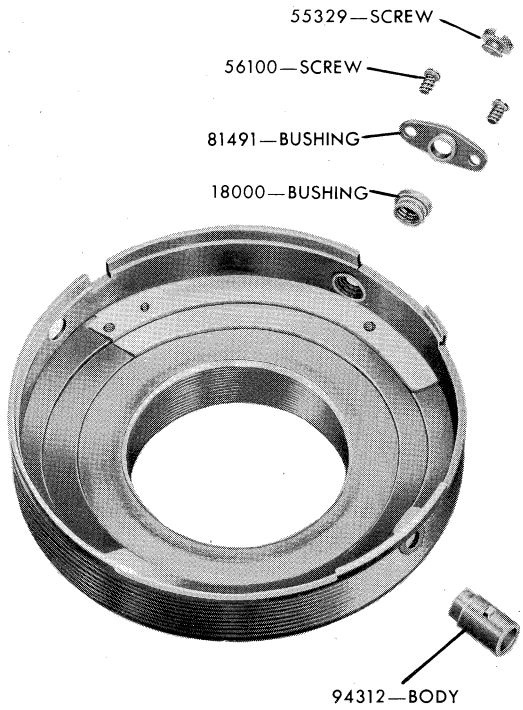


Figure 18

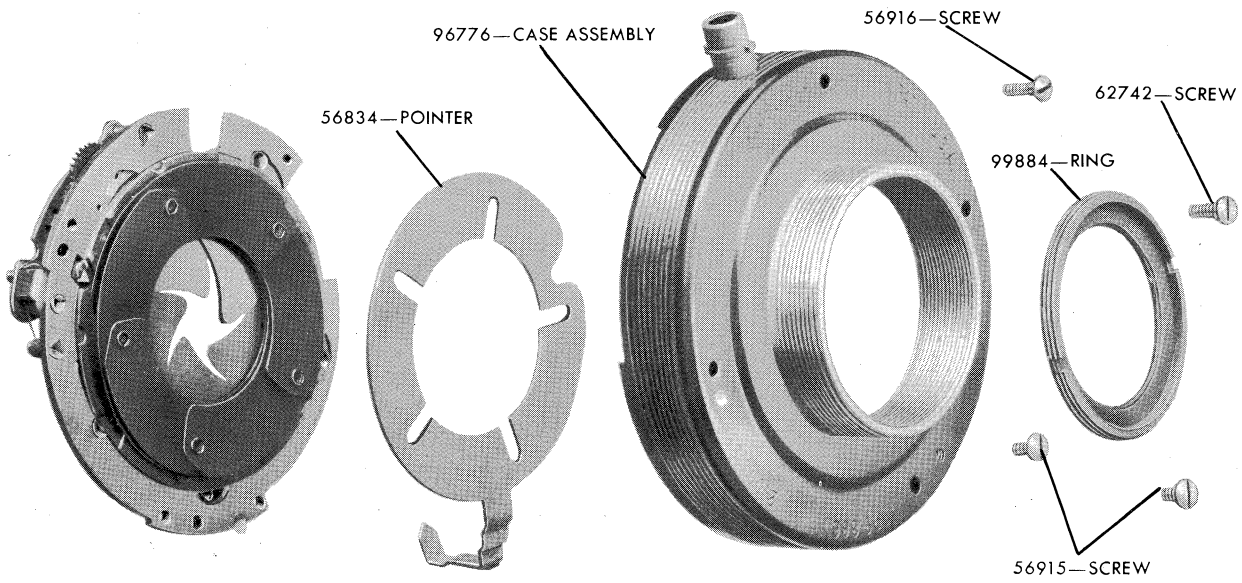


Figure 19

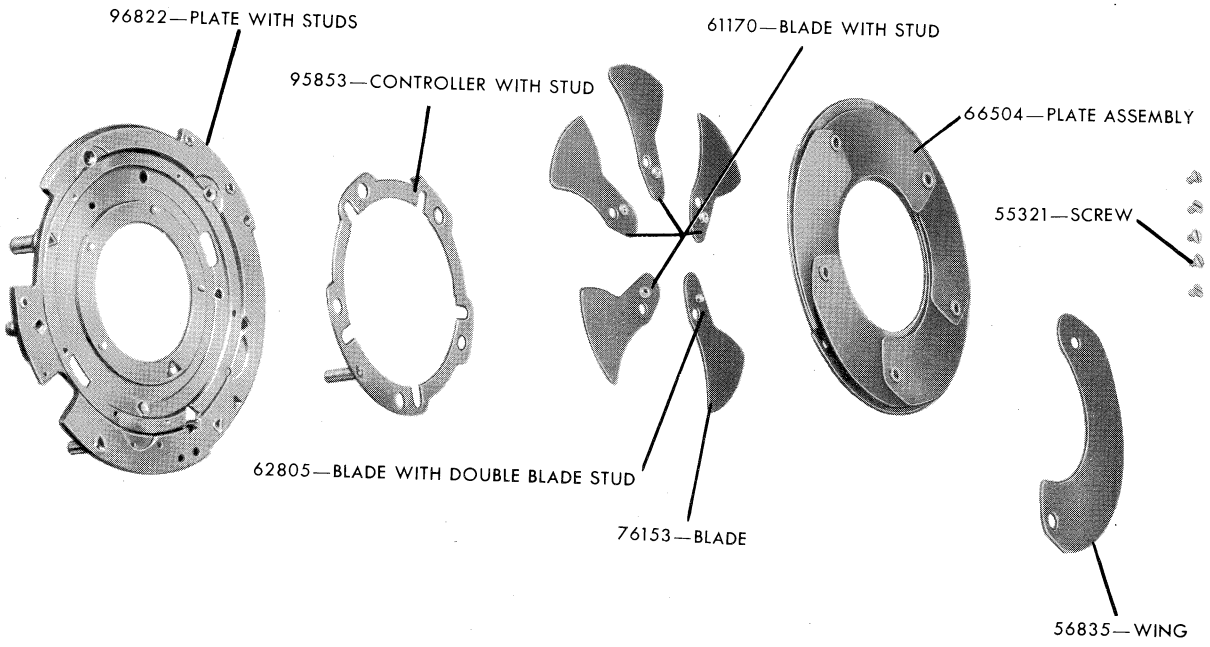
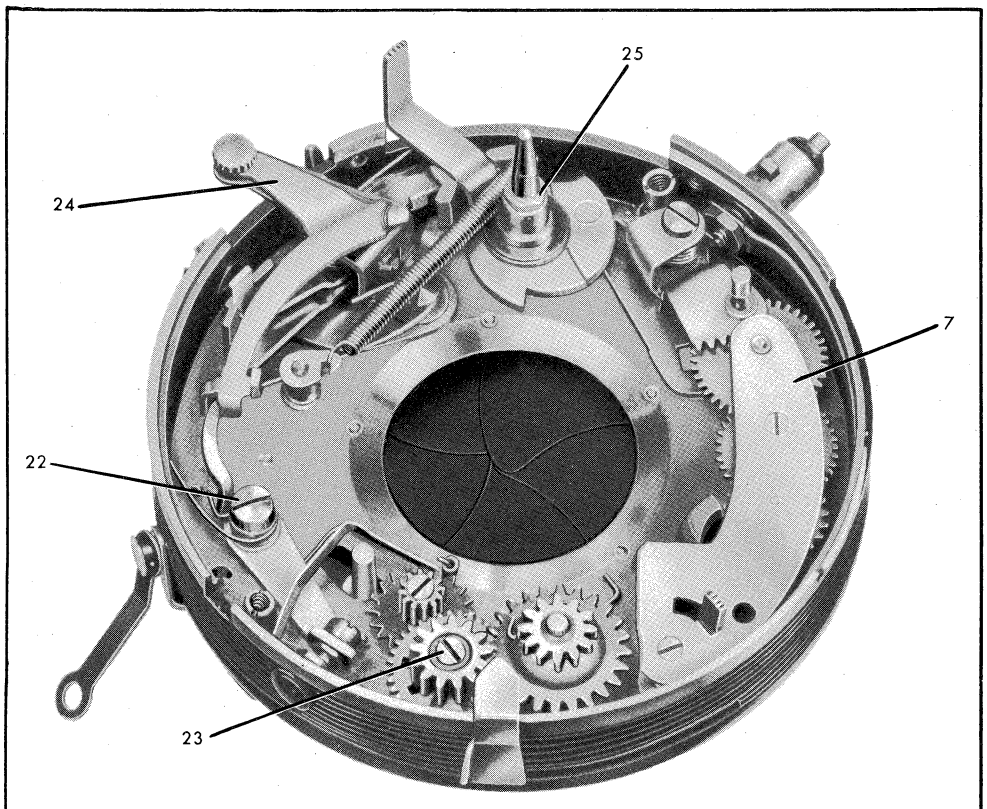


Figure 20



SHUTTER ASSEMBLY REFER TO FIGURES 7 AND 22 TO 25

Figure 21

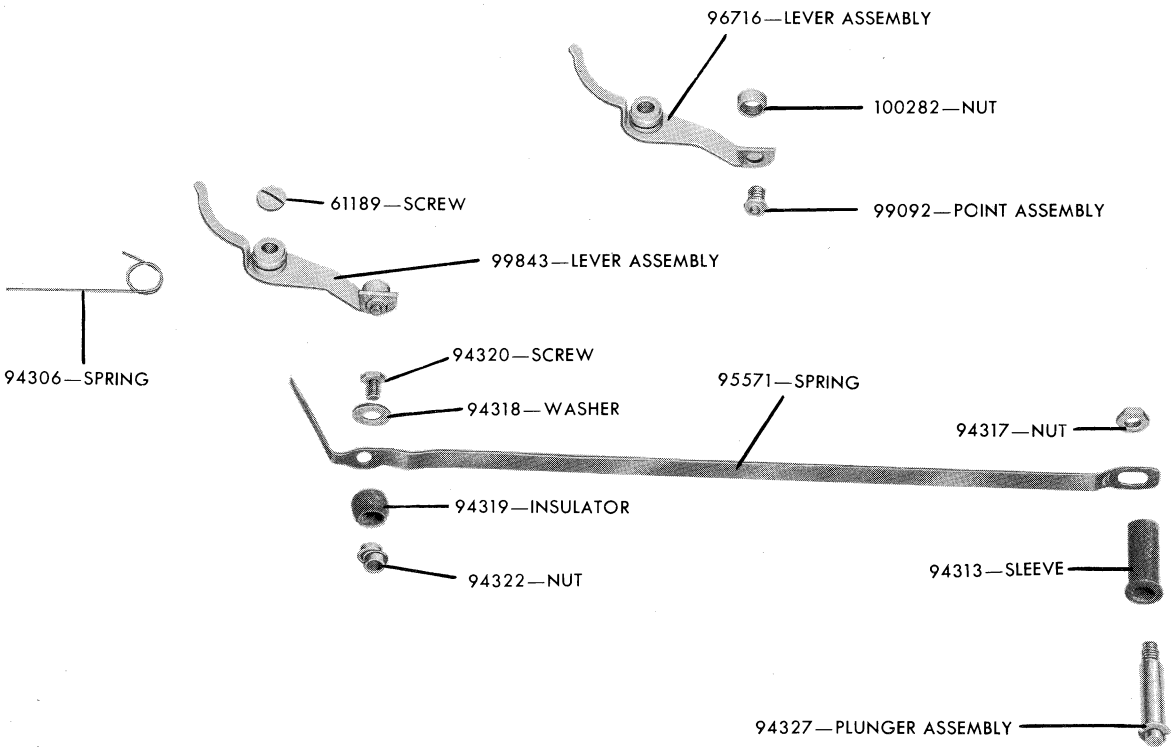


Figure 22

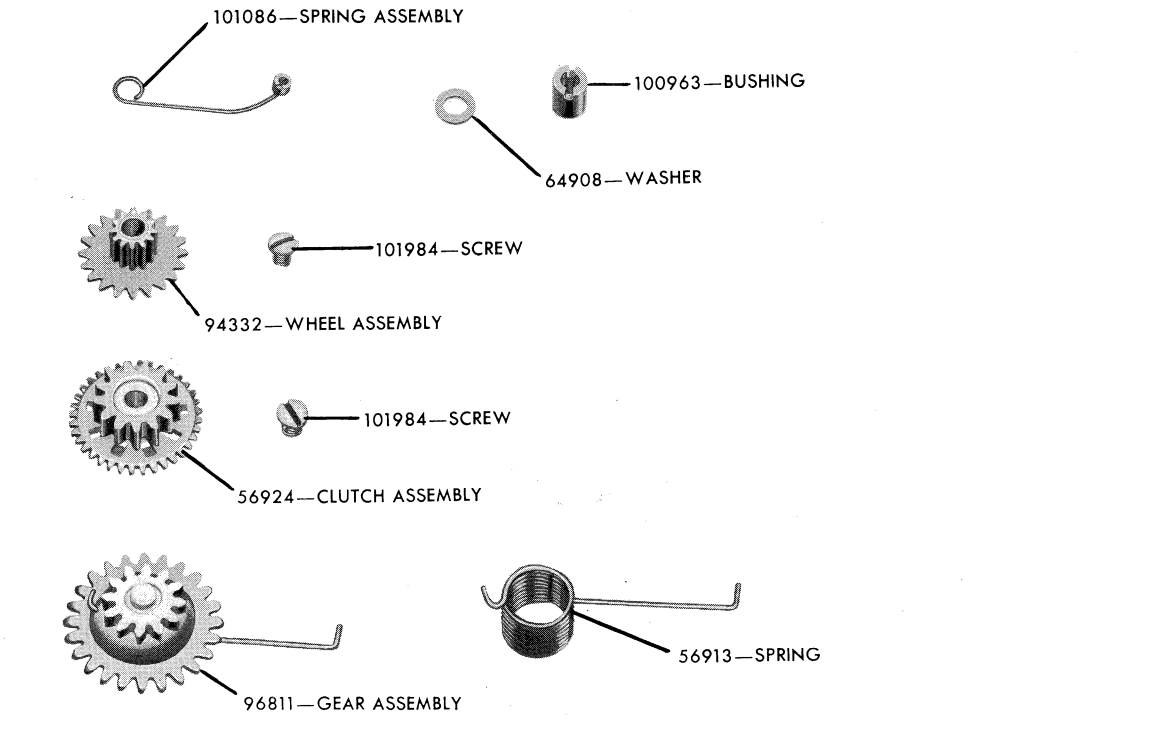


Figure 23

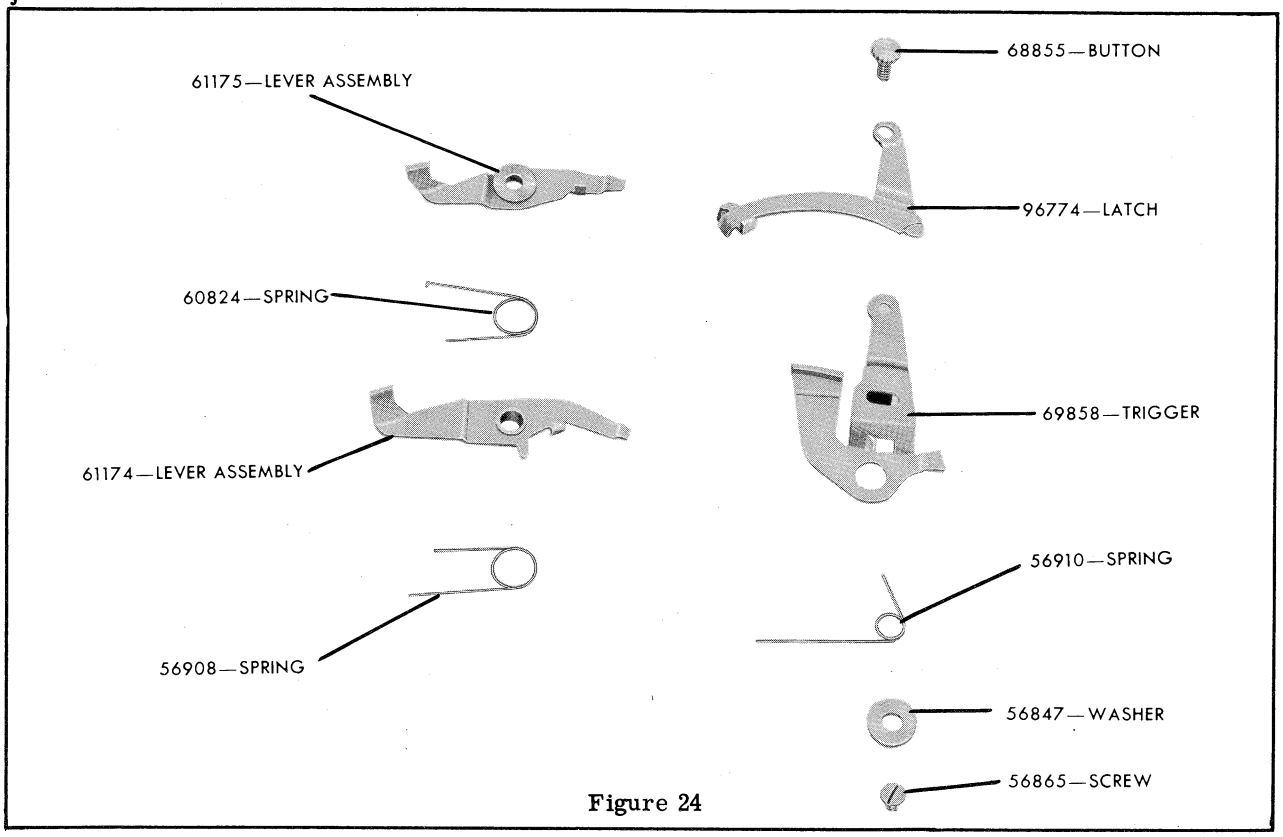
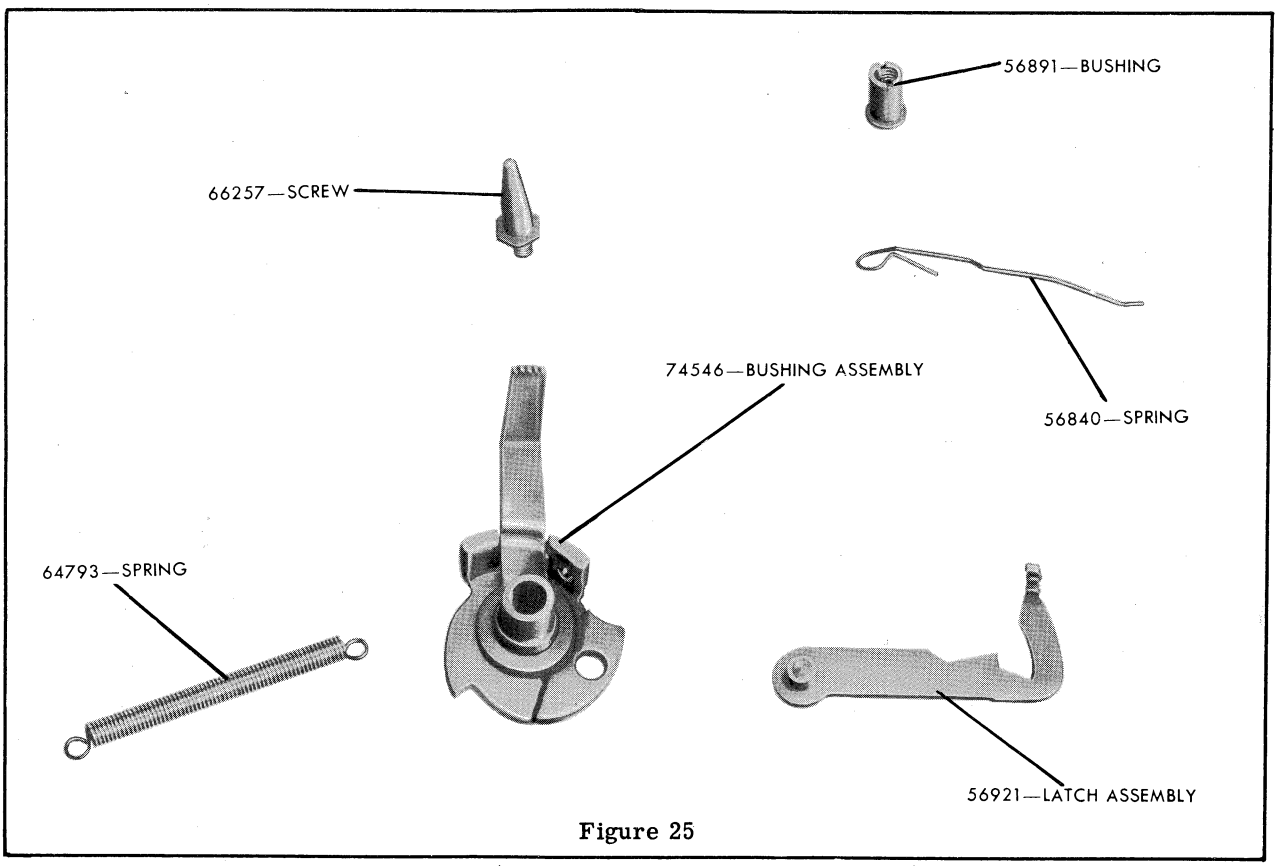


Figure 24



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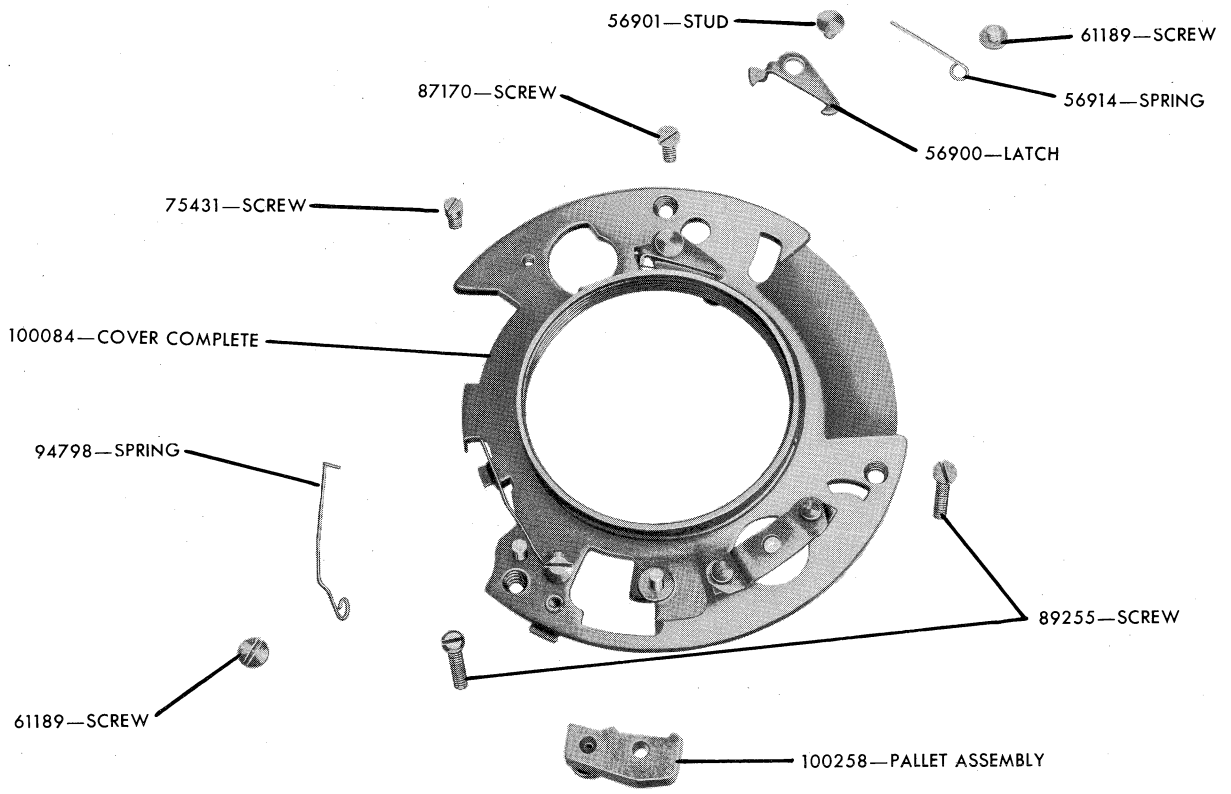

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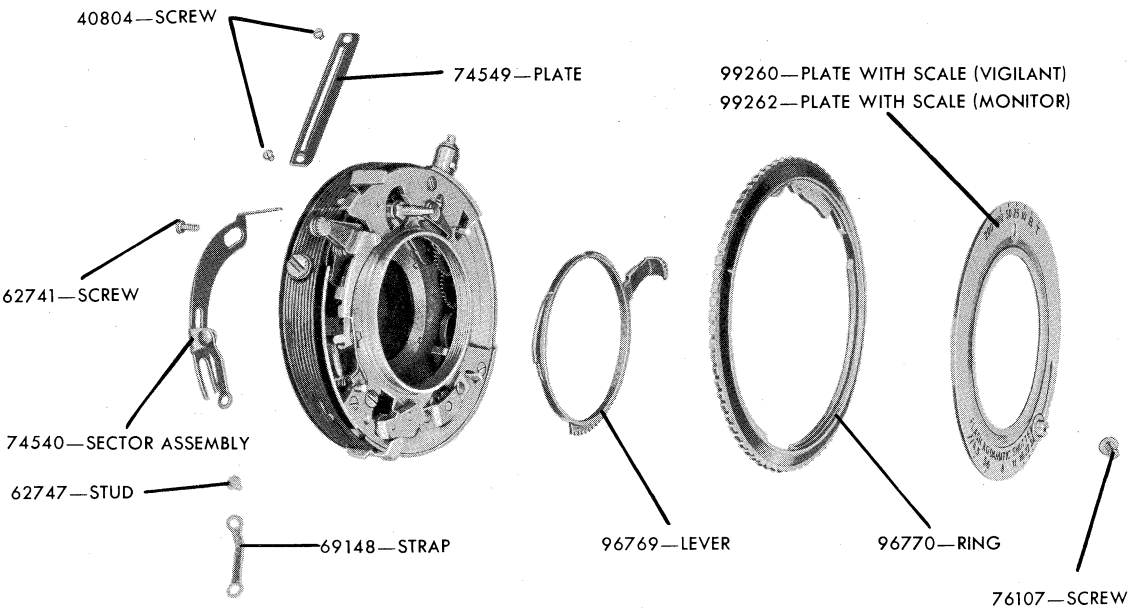

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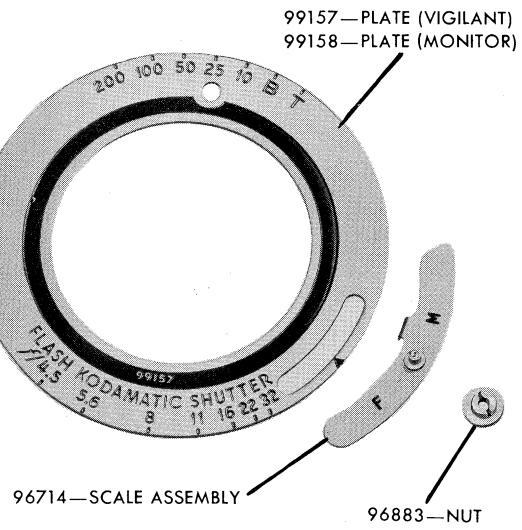
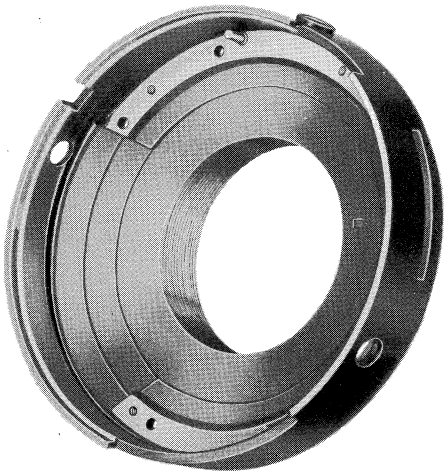


Figure 28



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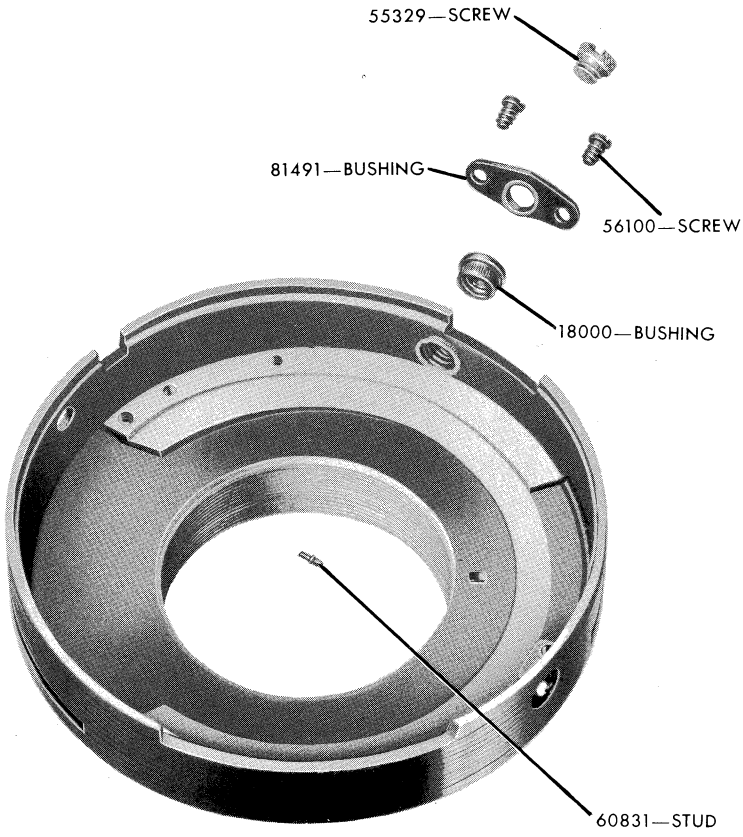


Figure 30

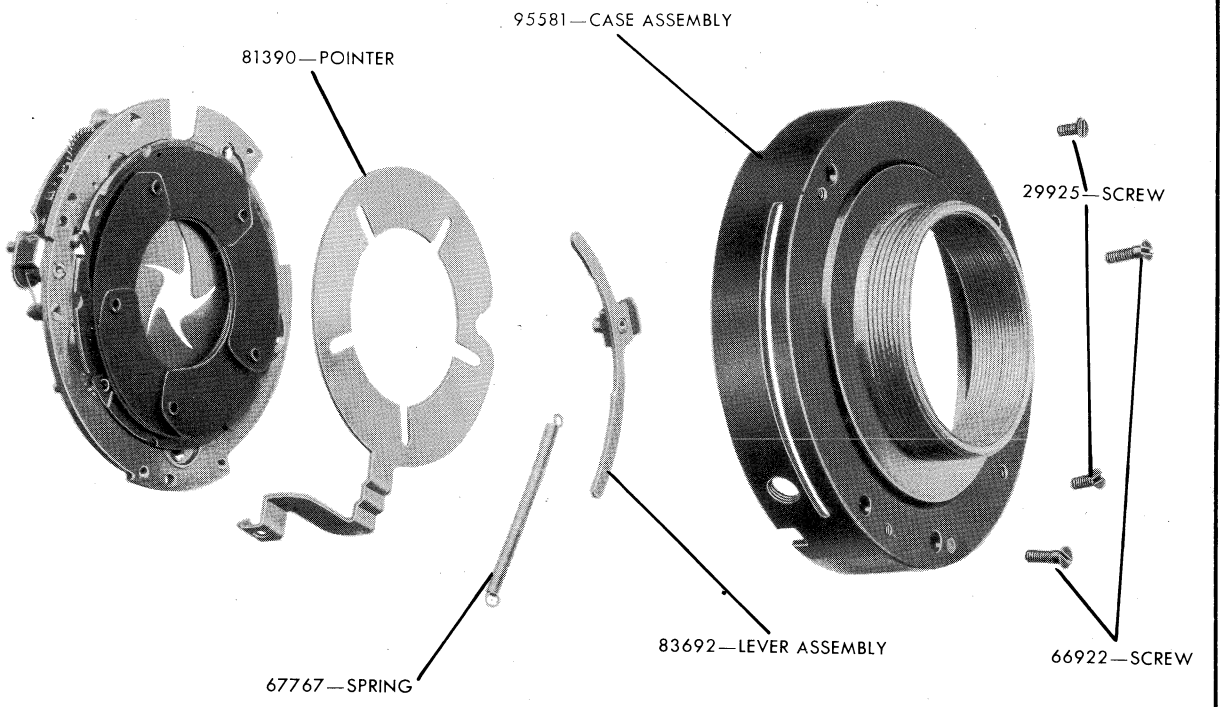


Figure 31

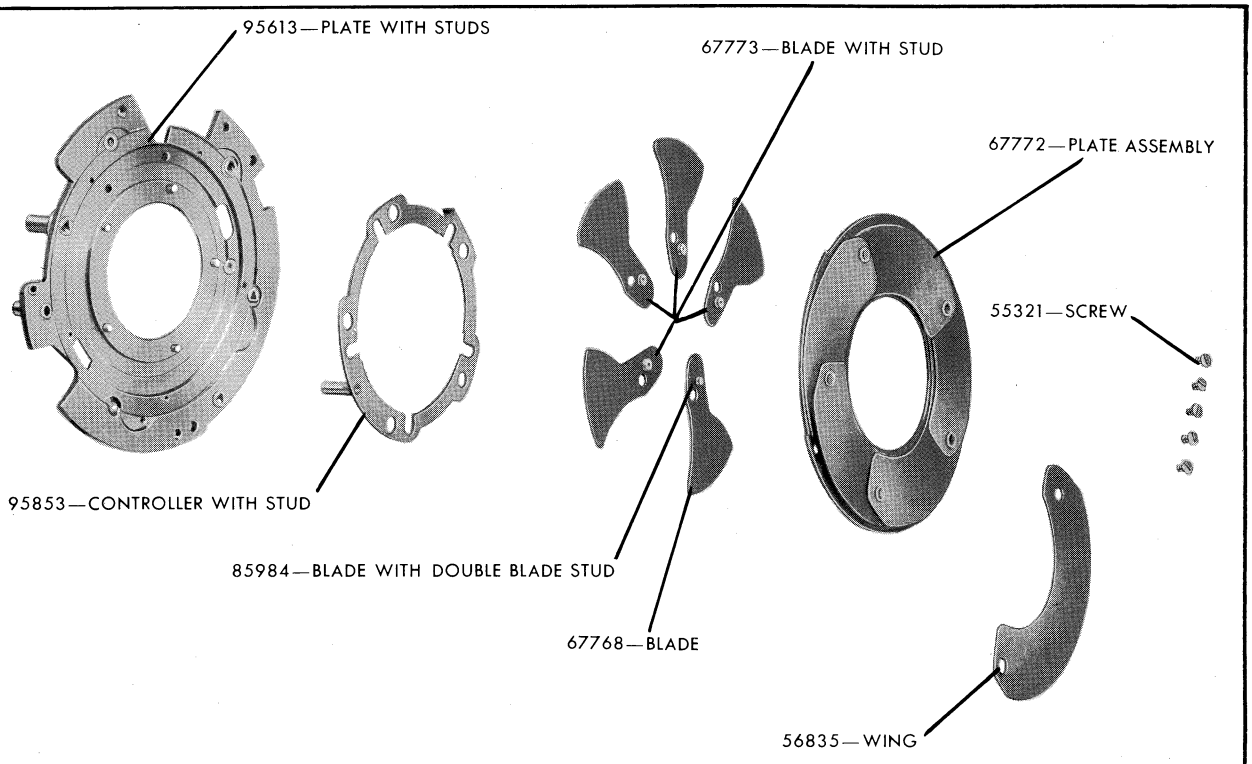


Figure 32

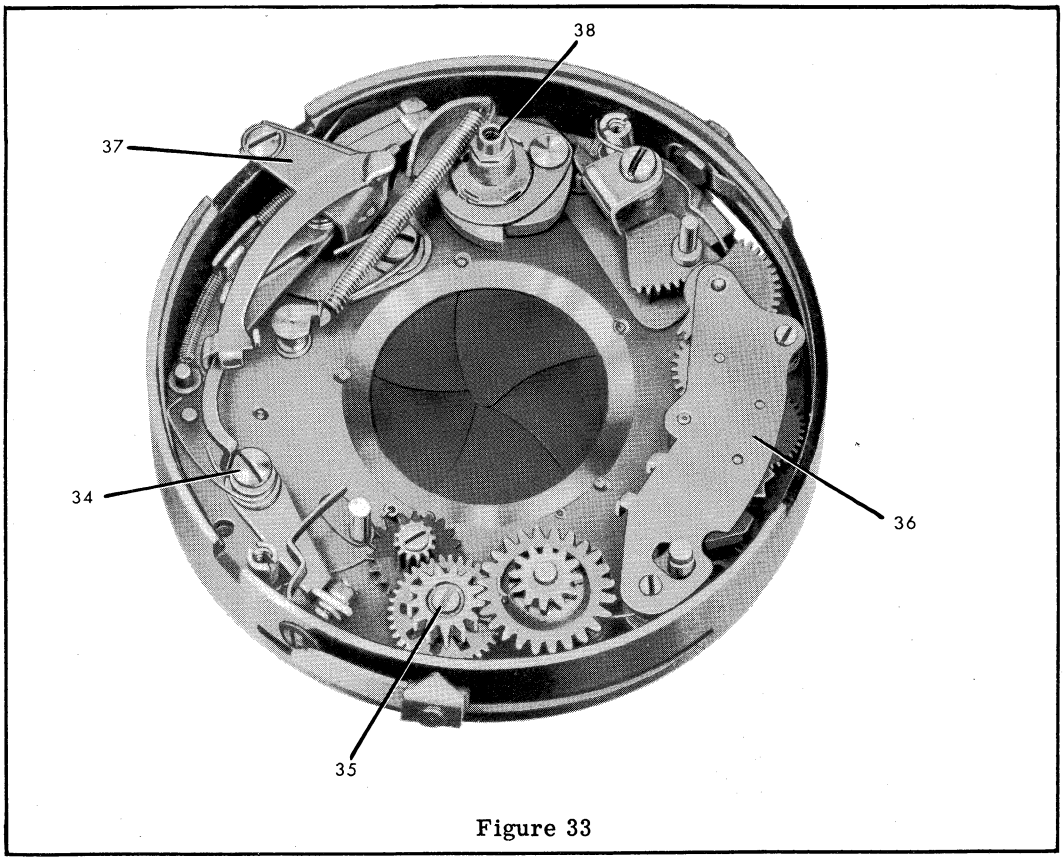
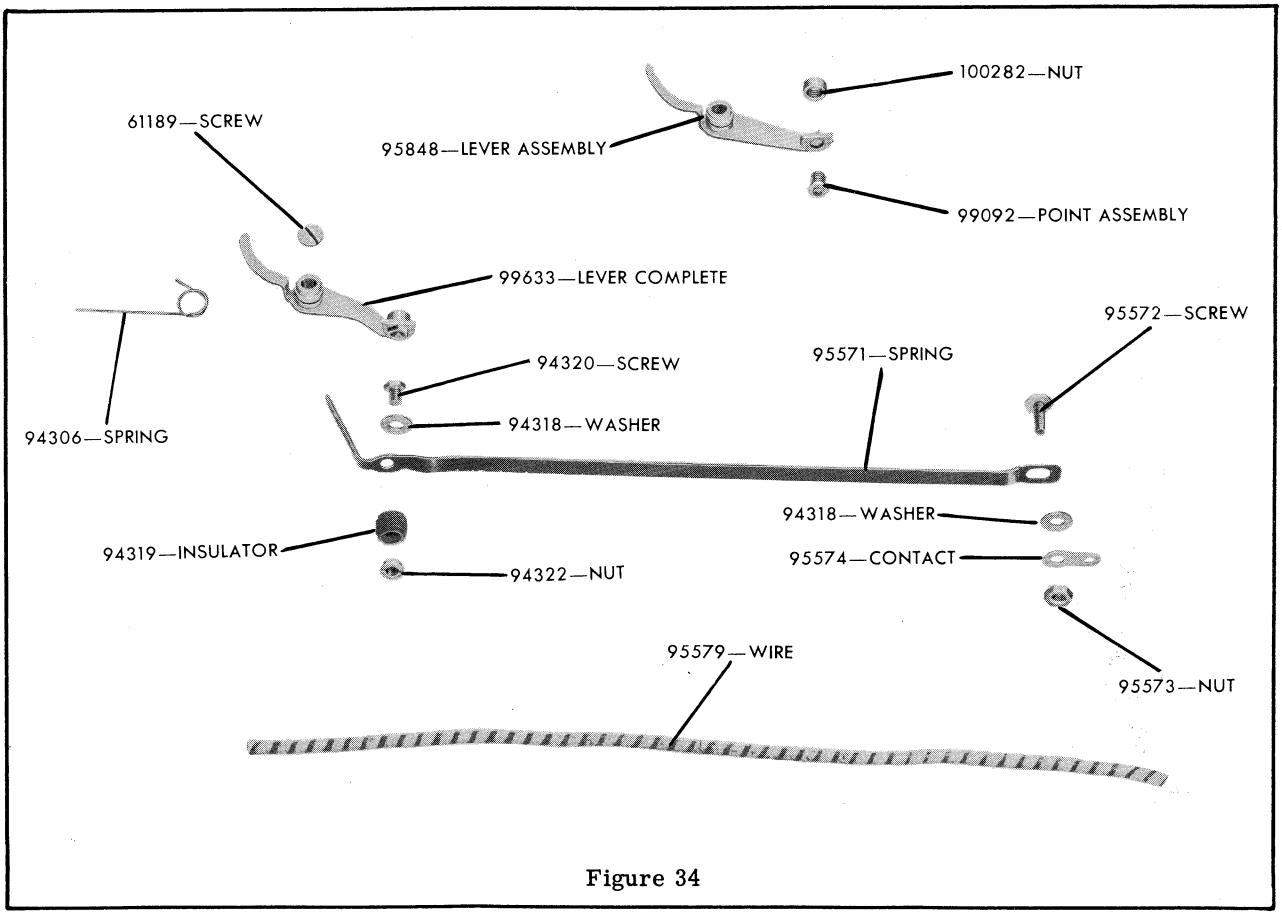


Figure 33



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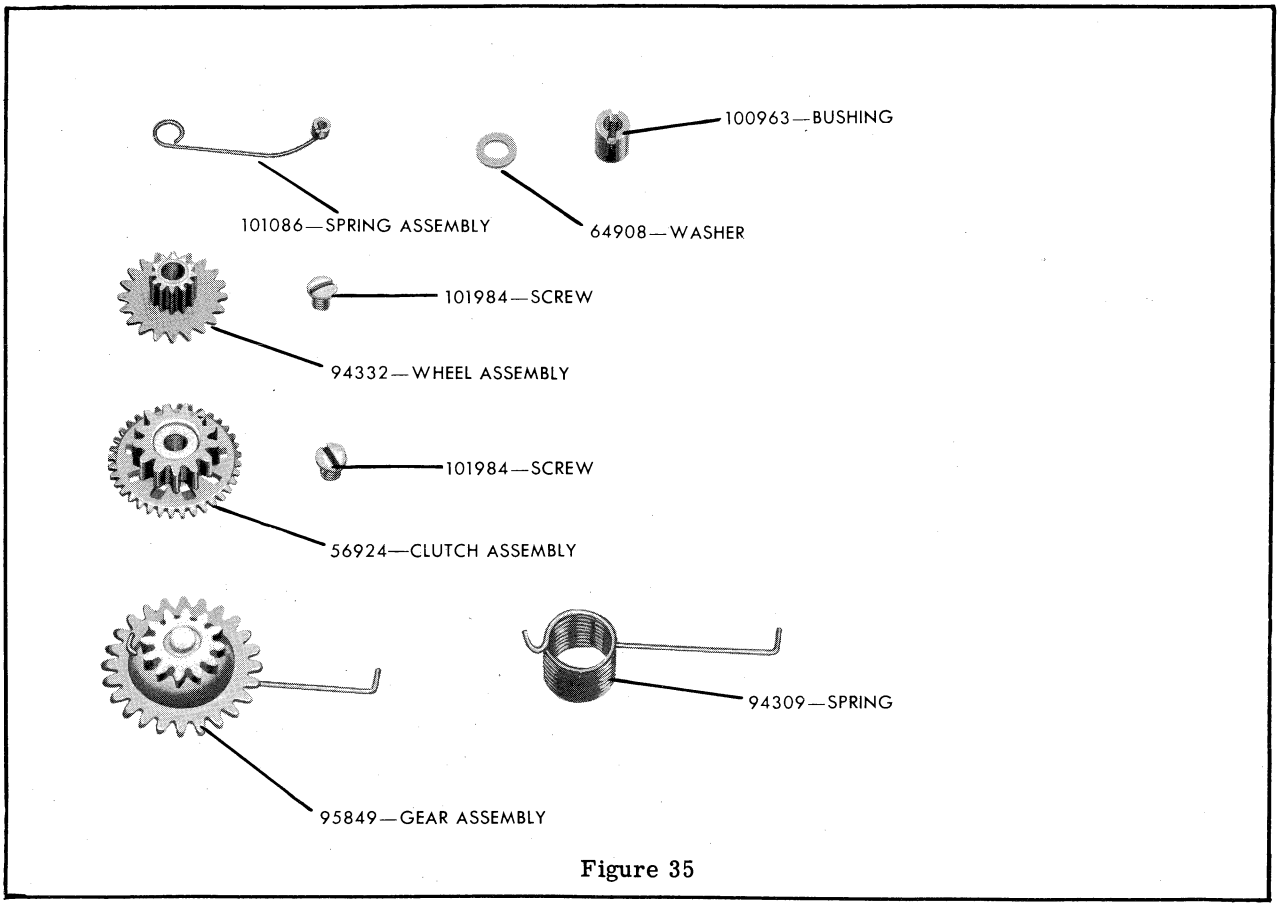

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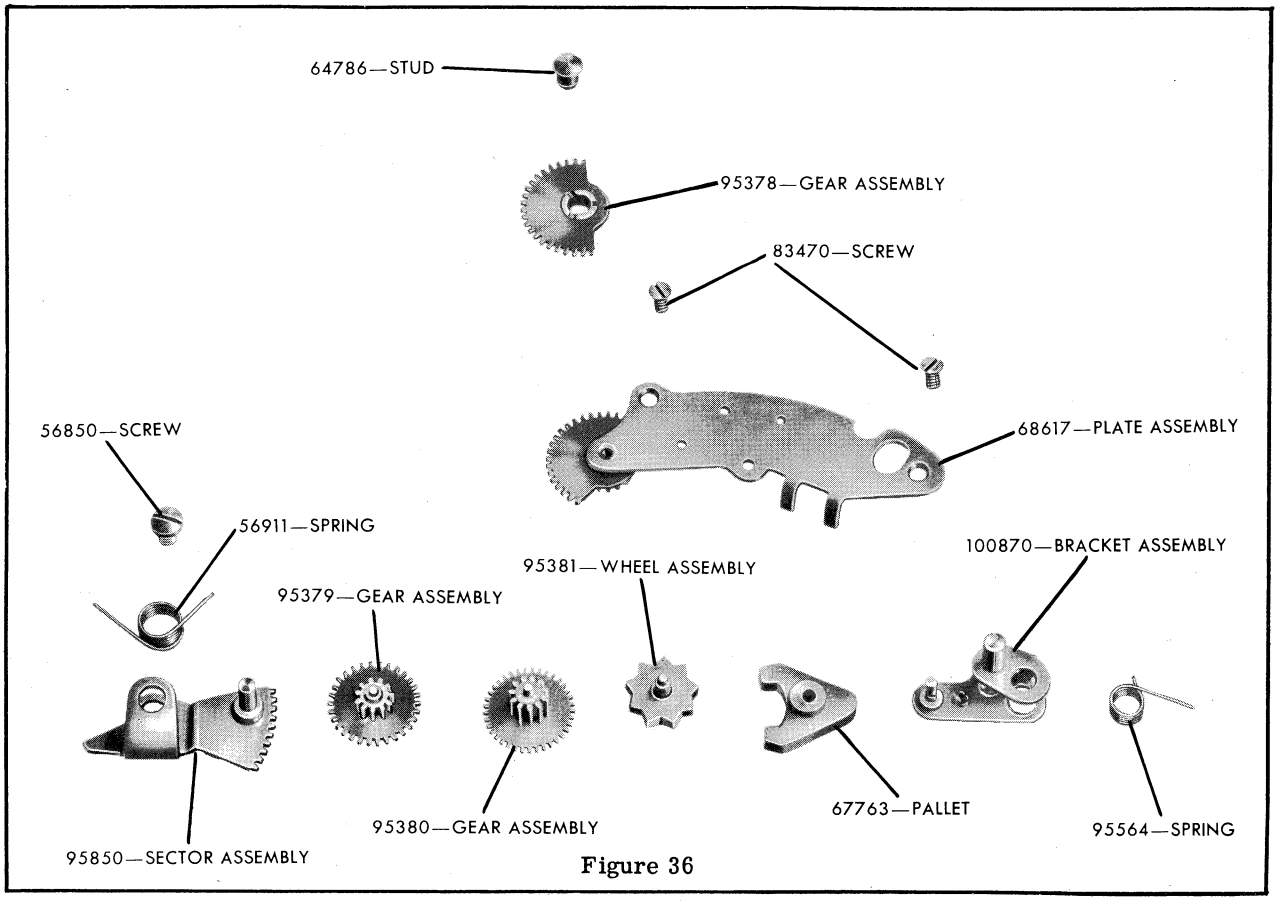
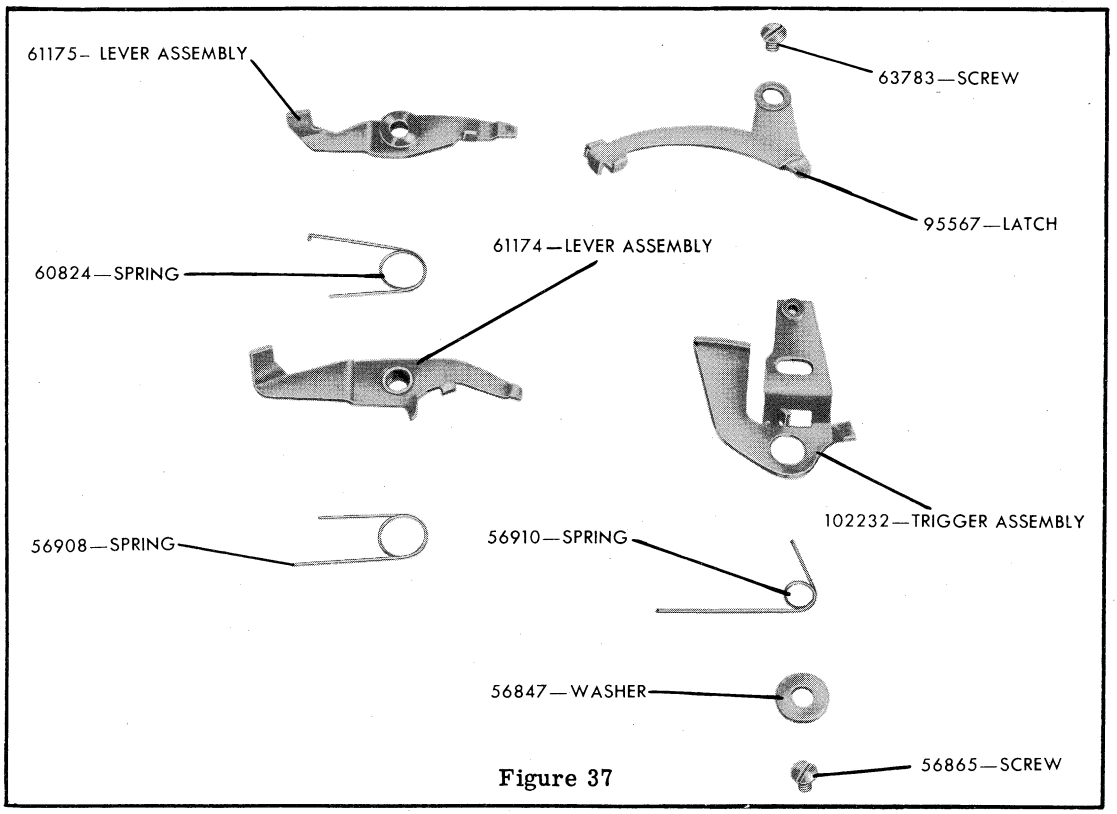


Figure 36



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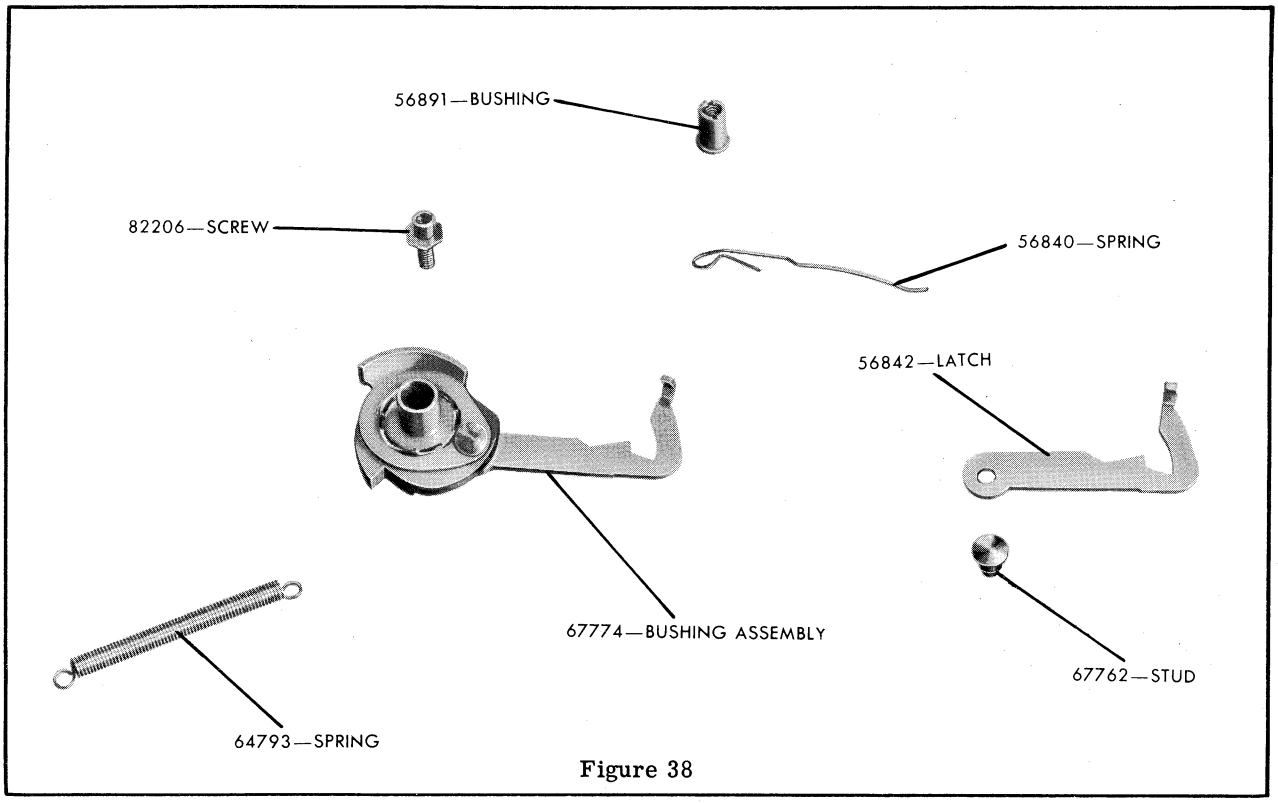


Figure 38

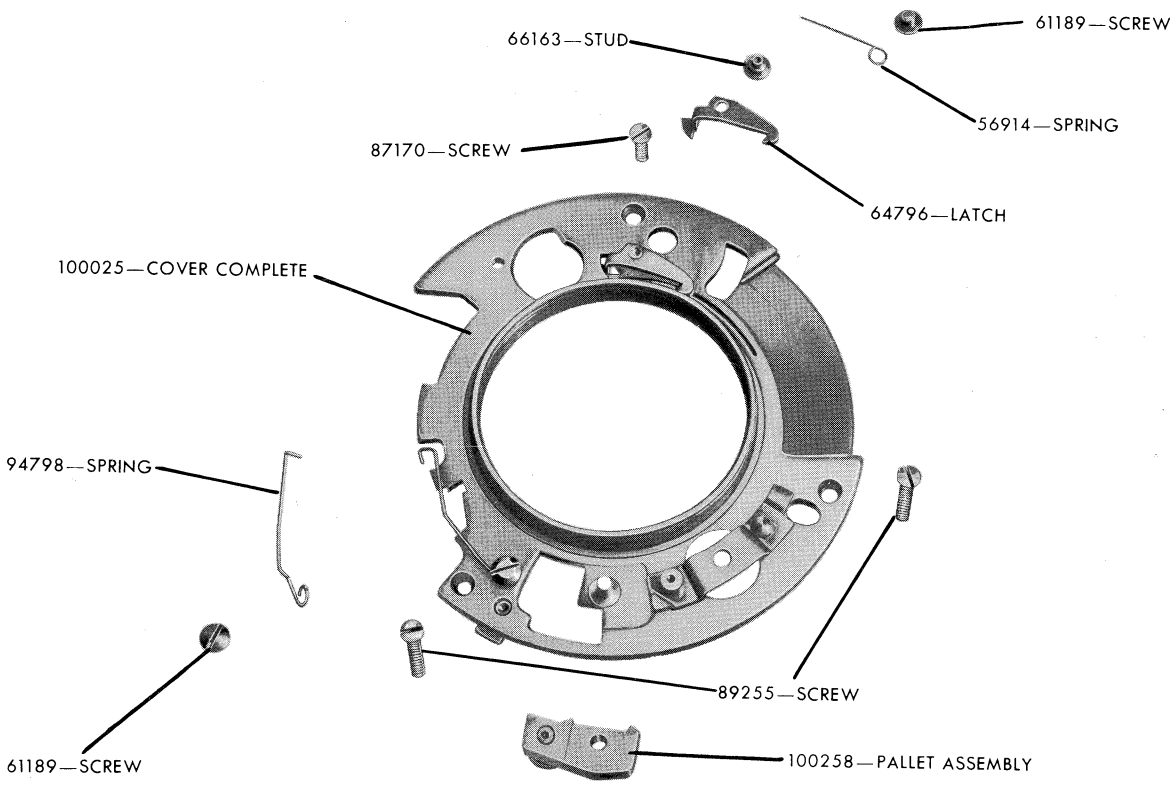


Figure 39

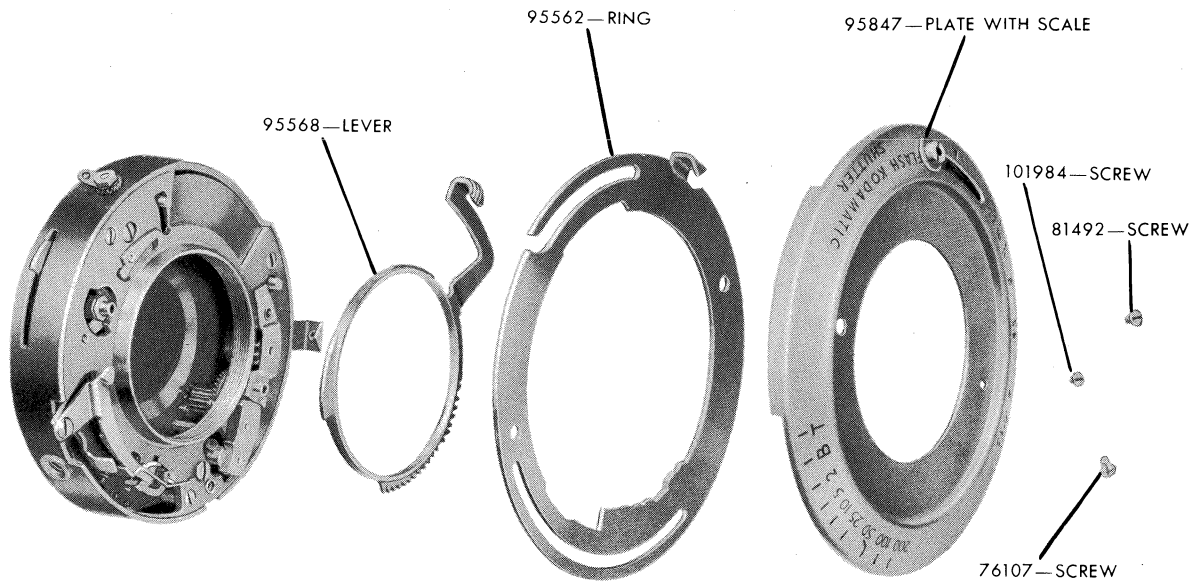


Figure 40


95563—PLATE
200 100 50 25 10 5 2 B T
f/3.5 4 5.6 8 11 16 22
95563
FLASH KODAMATIC SHUTTER
F M
95621—SCALE ASSEMBLY
96883—NUT

Figure 41

August 1949 Supplement to Parts List No. 1-1470

Flash Shutter Contact Conversion Kits

These kits contain the necessary parts for replacing the old-style contacts in the shutters covered by Parts List No. 1-1470. Instructions for installation are contained in Repair Service Manual No. 1470.

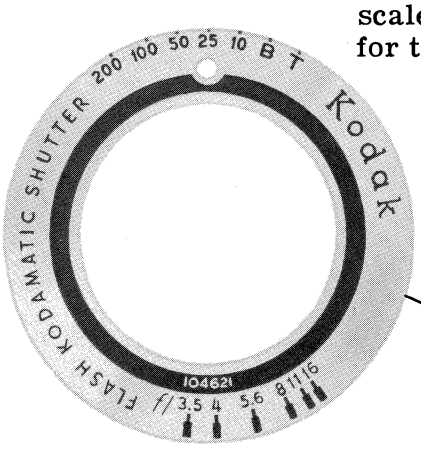
Individual parts included in each kit are illustrated below and may be procured separately for servicing shutters equipped with the newly designed parts.

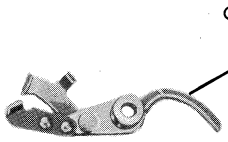
The old-style contact parts listed on the back of this sheet are no longer available and should be deleted from Parts List No. 1-1470.

Always specify kit number when ordering kits.

KIT NO. 121353

For the Kodak Flash Kodamatic Shutter, with synchronizer scale, and the Kodak Anastigmat Special f/3.5 50mm Lens for the Kodak 35 Camera.





CONTACT LEVER ASSEMBLY—105197

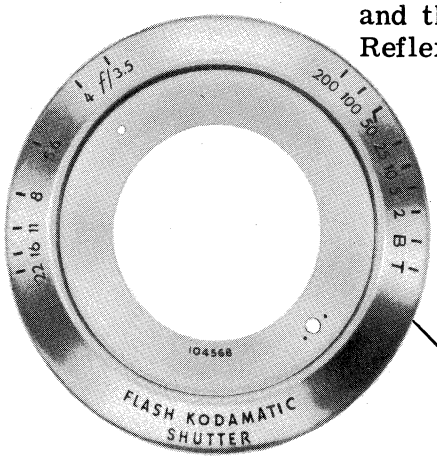
STAR WHEEL ASSEMBLY—104217

SPEED AND DIAPHRAGM INDEX PLATE—104621

CONTACT LEVER LATCH SPRING—102823

KIT NO. 121354

For the Flash Kodamatic Shutter, with synchronizer scale, and the Kodak Anastigmat f/3.5 80mm Lens for the Kodak Reflex Camera.



CONTACT LEVER ASSEMBLY—105197

STAR WHEEL ASSEMBLY—104217

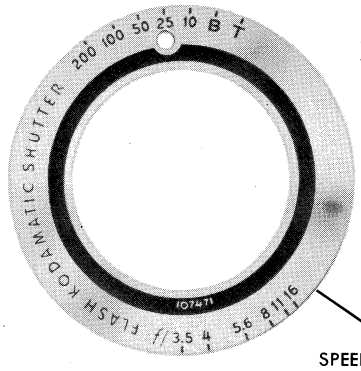
CONTACT LEVER LATCH SPRING—102823

SPEED AND DIAPHRAGM INDEX PLATE—104568

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

KIT NO. 121355

For the Flash Kodamatic Shutter, with synchronizer scale, and the Kodak Anastigmat Special ƒ/3.5 50mm Lens for the Kodak 35 Camera with Range Finder.



CONTACT LEVER ASSEMBLY—105197

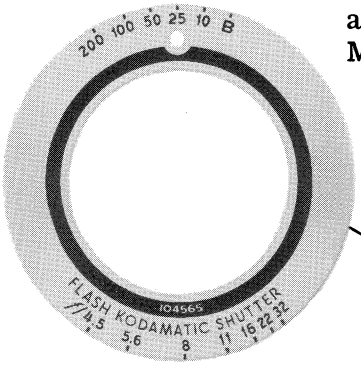
STAR WHEEL ASSEMBLY—104217

CONTACT LEVER LATCH SPRING—102823

SPEED AND DIAPHRAGM INDEX PLATE—107471

KIT NO. 121356

For the Flash Kodamatic Shutter, with synchronizer scale, and the Kodak Anastigmat ƒ/4.5 105mm Lens for the Kodak Monitor Six-20 Camera.



CONTACT LEVER ASSEMBLY—105197

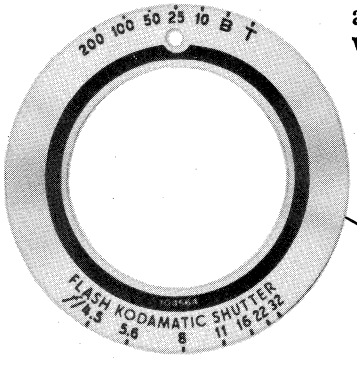
STAR WHEEL ASSEMBLY—104217

SPEED AND DIAPHRAGM INDEX PLATE—104565

CONTACT LEVER LATCH SPRING—102823

KIT NO. 121357

For the Flash Kodamatic Shutter, with synchronizer scale, and the Kodak Anastigmat ƒ/4.5 105mm Lens for the Kodak Vigilant Six-20 Camera.



CONTACT LEVER ASSEMBLY—105197

STAR WHEEL ASSEMBLY—104217

SPEED AND DIAPHRAGM INDEX PLATE—104564

CONTACT LEVER LATCH SPRING—102823

Delete from Parts List No. 1-1470

64908	95621	96714	99154	99257	99633	100282	101086
94332	95847	96716	99157	99260	99843	100849	101090
95563	95848	99092	99158	99262	100094	100963	

10-49-G L P -B

Lithographed in the United States of America

July 1949 Supplement to Parts List No. 1-1490-A

Flash Shutter Contact Conversion Kits

These kits contain the necessary parts for replacing the old-style contacts in the shutters covered by Parts List No. 1-1490A. Instructions for installation are contained in Service Manual No. 1-1490A.

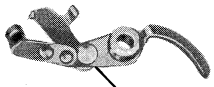
Individual parts included in each kit are illustrated below and may be procured separately for servicing shutters equipped with the newly designed parts.

The old-style contact parts listed below are no longer available and should be deleted from Parts List No. 1-1490A.

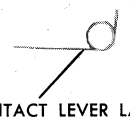
Always specify kit number when ordering kits.

KIT NO. 121349
For Flash Supermatic Shutters with 101mm f/4.5 Kodak Ektar Lens

CONNECTOR BLOCK—109535



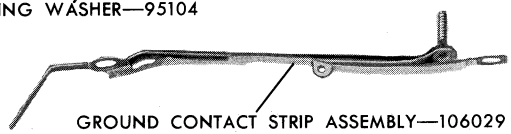
CONTACT LEVER ASSEMBLY—106042



CONTACT LEVER LATCH SPRING—102823

STAR WHEEL ASSEMBLY—104217

INSULATING WASHER—95104



GROUND CONTACT STRIP ASSEMBLY—106029

KIT NO. 121350
For Kodak Flash Supermatic Shutter with Kodak Anastigmat Special 101mm f/4.5 Lens for Kodak Monitor Six-20 Camera

SPEED AND DIAPHRAGM INDEX PLATE—104566

CONTACT LEVER ASSEMBLY—105197

CONTACT LEVER LATCH SPRING—102823

STAR WHEEL ASSEMBLY—104217

Delete the following parts from Parts List No. 1-1490A

64908	96714	99082	99159	100282	102304	102879	102945
93835	96716	99092	99277	100963	102821	102880	102984
94332	99081	99155	99843	101086	102822	102944	

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.
9-49-G L P -B
Lithographed in the United States of America

MAY 1950

S. M. No. 1-1490 A

Servicing the

Kodak . . . . FLASH SUPERMATIC SHUTTERS

- *WITH KODAK EKTAR f/4.5 101mm LENS*
- *AND KODAK MONITOR SIX-20 CAMERA*

Eastman Kodak Company • Rochester 4, N. Y.

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Kodak Flash Supermatic Shutter with
Kodak Ektar f/4.5 101mm Lens

Kodak Flash Supermatic Shutter for
Kodak Monitor Six-20 Camera

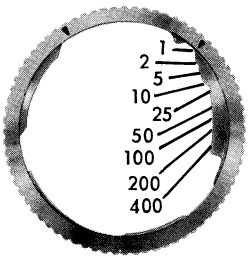
Capitalized words in the text indicate nomenclature which appears on illustrations. Such nomenclature, when not followed by a direct figure reference, will be found on the figure indicated in the last preceding figure references.

KODAK FLASH SUPERMATIC SHUTTER

WITH KODAK EKTAR f/4.5 101mm LENS

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Solenoid will not work flash shutter	Shutter is not designed for use with a solenoid.	
Synchronizer scale does not operate	Scale rivet pulled out.	Fit new rivet and readjust the scale.
Shutter does not trip easily	Possible burr on TRIGGER, figure 5.	Burnish the trigger at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 7, when in a set position.
No Kodatron contact	The BLADE CONTROLLER CONTACT STUD, figure 16, is not touching the CONTACT SPRING, figure 8.	Adjust the contact spring so that it touches the contact stud on the blade controller when the blades are almost fully opened. It is possible to make the adjustment after removing the front lens mount. There must be no contact when the blades are held open with the blade arrestor.
Shutter blades remain open on high speeds	Plate blade studs loose or missing on mechanism plate. Split shutter blades. Loose studs on the shutter blades.	Replace or restake the studs carefully to avoid swelling the tops of the studs. Replace the shutter blades. Replace the shutter blades.
Shutter does not set	The TRIGGER LATCH, figure 5, is not returning to its proper position after the shutter has been released.	The trigger latch is bent and binding on the speed index plate or cover. It may be necessary to reduce the tension on the TRIGGER LATCH SPRING, figure 3.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear. The CLUTCH ASSEMBLY, figure 4, is slipping. The latch point on the CONTACT LEVER COMPLETE, figure 8, is damaged.	Replace the pinion gear assembly. Replace the clutch assembly. Replace the contact lever complete.
Shutter speeds slow	Retard gears dirty. The MAIN DRIVE SPRING, figure 7, is weak.	Remove and clean the retard gears. Replace the main drive spring.

TROUBLE	CAUSE	REMEDY
Shutter speeds slow (cont'd)	Shutter blades binding.	Remove and clean the shutter blades. If necessary, replace the blades.
	Excessive retard sector travel.	Swedge the speed control RING, figure 2, at the area controlling the slow speed (see figure 1).
	Blade controller binding.	Reform the diaphragm retainer plate to allow more clearance between the plate and the mechanism plate.
		Be sure the blade controller is flat.
Shutter speeds fast	Insufficient retard sector travel.	File the speed control ring at the area controlling the fast speed (see figure 1).
 Figure 1	Insufficient pallet engagement (on speeds 1/10 second or slower).	Remove material on the speed control ring in the area of contact with the pallet bracket stud.
		Check for bind of the PALLET BRACKET, figure 6, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 13.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the tops of the studs.
	BLADE CONTROLLER with contact stud, figure 14, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub of the mechanism plate.	Replace the blade controller.
	Too much play between the mechanism plate and the diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 14, due to retainer plate being bowed.	Replace the diaphragm retainer plate with wings assembled.
	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.

TROUBLE	CAUSE	REMEDY
Shutter blades buckle (cont'd)	Blades opening too far.	File and burnish the LATCH at point "A" (see figure 7).
	Blades closing too far.	Swedge the mechanism plate at point "B" (see figure 16).
	No clearance between the blade controller latch and the BLADE CONTROLLER LUG, figure 16, when the shutter is in the tripped position.	Swedge the mechanism plate at point "C," figure 16, such that this point acts as a stop for the SETTING LEVER, with stop stud, figure 13.
	Shutter blades too loose.	Replace the blades.
Shutter operates instantaneously on B (bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.
Both flash settings are below the millisecond tolerances	The tension is too great on the WINDING GEAR SPRING, figure 4.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on both the F and M flash settings.
Both flash settings are above the millisecond tolerances (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover or on the speed INDEX PLATE, figure 2.	Replace the WINDING LEVER, figure 2. Try lubricant.
The F (short stroke) is within the millisecond tolerances but the M (long stroke) is fast	The FLASH RETARD PALLET assembly, figure 3, is not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh more firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the binding point Re-form the plate at this point to allow clearance for the pallet.
Constant flash short	The contact spring is bent and touching either the contact lever or the cover.	Re-form the contact spring.
Both flash settings are extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.

TROUBLE	CAUSE	REMEDY
Both flash settings are extremely fast (cont'd)	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly toward the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter. 2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.
Shutter will not flash lamps when all metal flasholder is in contact with camera, but will, when flasholder is held away from camera	Breakdown in insulation in ground strip.	There should be a resistance of 10,000 ohms between the connector pin nearest the blade arrestor button and any other spot on the shutter case. If not, replace the ground strip.

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:

1. Front lens mount, using Tool No. 501-0.
2. Diaphragm pointer TIP, figure 2.
3. Set the synchronizer scale at "M."
4. Speed and diaphragm INDEX PLATE by turning the plate counterclockwise until the three projections in the center of the plate fit into the three cutouts on the outside edge of the central collar.
5. Speed control RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be adjusted.

The sequence of reassembly is as follows:

1. Speed control ring, with shutter in tripped position. Be sure the projecting lug on the BULB LEVER ASSEMBLY, figure 5, the studs on the retarding SECTOR WITH STUD, figure 6, and the PALLET BRACKET with stud assembly are resting against the inside edge of the speed control ring and are not underneath the ring.
2. Speed and diaphragm index plate by lining up the three projections in the center of the plate with the three cutouts on the outside of the central collar. Turn the plate clockwise until it is properly positioned.
3. Diaphragm pointer tip.
4. Front lens mount.

WINDING LEVER

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, above.
2. Winding lever.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.

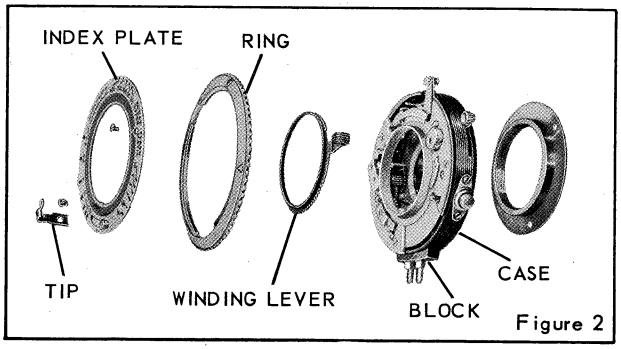


Figure 2

2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 4. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 5, as it may release the winding gear spring tension.

Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension on the TRIGGER LATCH SPRING, figure 3. Check for a bind between the trigger latch and the TRIGGER, figure 5, at the point of attachment. The winding lever should contact the trigger latch, push the latch out of the slot in the cover, and open the shutter blades. After the shutter has been tripped, the latch should return to a position where it is resting on the ledge just above the small slot in the cover.

After the trigger is depressed, allow it to return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.

4. Speed control ring, paragraphs 1-4, above.

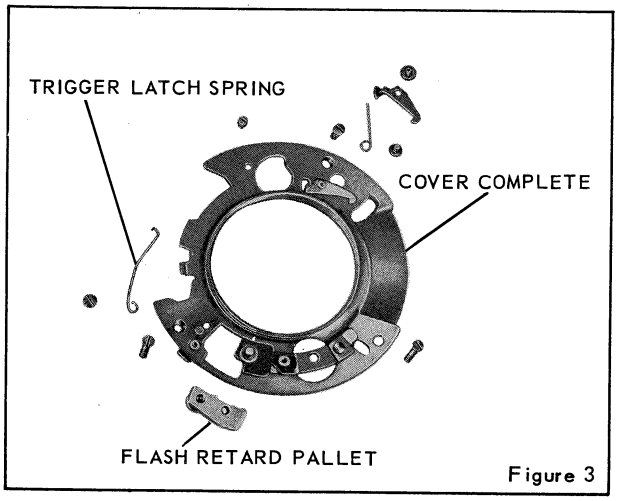


Figure 3

COVER COMPLETE

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. TRIGGER LATCH SPRING, figure 3.
4. Lift up the loose end of the TRIGGER LATCH, figure 5, sufficiently to clear the COVER COMPLETE, figure 3. Move the loose end of the latch until it is clear of the CASE, figure 2.
5. High speed spring CAM, figure 7, and the HIGH SPEED SPRING.
6. FLASH RETARD PALLET assembly, figure 3.
7. Cover complete.

The sequence of reassembly is as follows:

1. Cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the CONTACT LEVER COMPLETE, figure 8. Be sure the latch does not bind.
4. Trigger latch spring; do not fasten it securely. Lift the loose end of the spring over the trigger latch until it is at a point half way between the latch and the central collar. Then secure the spring. Place the spring against the outside edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.
5. Winding lever, paragraphs 1-3, page 7.
6. Flash retard pallet assembly on the eccentric stud. Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.

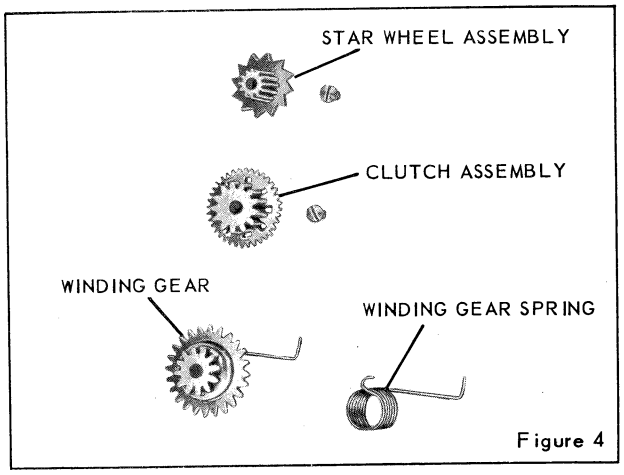


Figure 4

NOTE: Be sure the eccentric stud is tight on the cover. Anchor the stud securely if any adjustment is made.

7. High speed spring and high speed spring cam.
8. Winding lever, paragraph 4, page 7.

WINDING GEAR, CLUTCH ASSEMBLY, AND STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. Cover complete, paragraphs 3-7, above.
4. WINDING GEAR, figure 4, and WINDING GEAR SPRING.
5. CLUTCH ASSEMBLY.
6. STAR WHEEL ASSEMBLY.

The sequence of reassembly is as follows:

1. Winding gear and winding gear spring on the WINDING GEAR STUD, figure 16.
2. Star wheel assembly.
3. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear of the clutch assembly should turn freely only in a clockwise direction when the lower gear of the clutch assembly is held tightly.
4. Cover complete, paragraphs 1-8, above.

TRIGGER, TIME LEVER ASSEMBLY, and BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. Cover complete, paragraphs 3-7, above.
4. Unhook the MAIN DRIVE SPRING, figure 7, from the MAIN DRIVE SPRING STUD, figure 16.
5. TRIGGER SCREW, figure 5, TRIGGER SPRING, and TRIGGER WASHER.

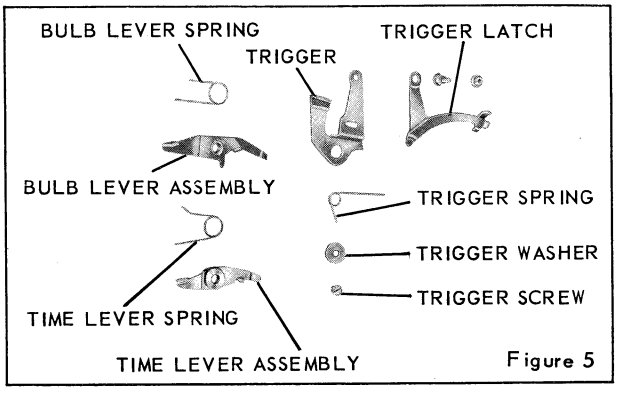


Figure 5

6. TRIGGER, TIME LEVER ASSEMBLY, TIME LEVER SPRING, BULB LEVER ASSEMBLY, and BULB LEVER SPRING.

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger with the oval hole up and insert the bulb lever assembly in the opening on the trigger. Place the time lever assembly and the time lever spring between the top of the trigger and the top of the bulb lever assembly, with the spring facing up. Grasp all three parts by inserting one prong of a pair of tweezers down through the center of the holes. With the long ends of the time and bulb lever springs turned in a clockwise direction and the short ends resting against the lugs on the levers, guide the parts down over the TIME AND BULB LEVER STUD, figure 16. The long ends of the springs should rest against the case.
2. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the main drive spring stud, and rest it against the stud.
3. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-8, page 8.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. Cover complete, paragraphs, 3-7, page 8.
4. Unhook the retard PALLET BRACKET SPRING, figure 6.
5. Retard GEAR PLATE SCREWS.
6. Retard gear PLATE COMPLETE.
7. Retard GEAR WITH NO. 2 PINION assembly.
8. Retard GEAR WITH NO. 3 PINION assembly.
9. ESCAPEMENT WHEEL with No. 3 pinion assembly.
10. Retard PALLET.
11. PALLET BRACKET with stud assembly and the pallet bracket spring.

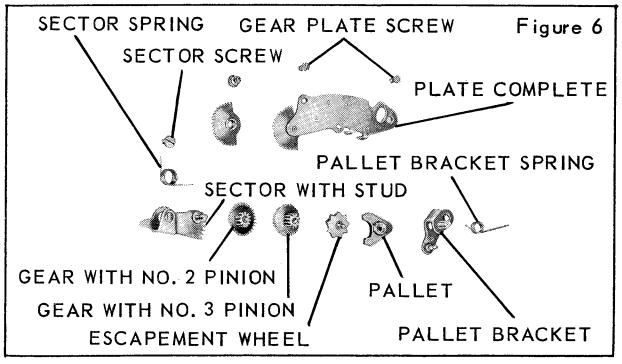


Figure 6

NOTE: If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and all the parts of the gear train thoroughly.

12. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
13. Set the shutter.
14. Retarding sector with stud and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 7.
4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out, toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET SPRING STUD, figure 16. The long end of the spring should rest against the case.
5. Retard pallet.
6. Escapement wheel with No. 4 pinion assembly.
7. Retard gear with No. 3 pinion assembly.
8. Retard gear with No. 2 pinion assembly.
9. Retard gear plate complete, with the teeth of the gear facing the shutter blades.
10. Retard gear plate screw near the pallet bracket.
11. Lift up the gear end of the gear plate until the teeth of the retarding sector with stud pass freely under the gear. Place the retarding sector so that when the gear teeth are meshed the outer edge of the sector will be approximately 1/8 inch from the shutter case.
12. Remaining retard gear plate screw.
13. Put the pallet bracket spring in tension by placing the long end of the spring against the inside edge of the lug on the retard gear plate complete.
14. Cover complete, paragraphs 1-8, page 8.

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. Cover complete, paragraphs 3-7, page 8.
4. Unhook the LATCH SPRING, figure 7, from the main drive LATCH.

5. Unhook the MAIN DRIVE SPRING from the MAIN DRIVE SPRING STUD, figure 16.
6. Set the shutter.
7. MAIN DRIVE ASSEMBLY, figure 7, to which is attached the main drive spring.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 13; on the MAIN DRIVE STUD, figure 16; on the LATCH, figure 7, at the point of contact with the LATCH SPRING, and on the latch where it contacts the RETARDING SECTOR STUD, figure 16. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud in the assembly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG. The cutout part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the tip of the latch.
4. Main drive spring.
5. Cover complete, paragraphs 1-8, page 8.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. Cover complete, paragraphs 3-7, page 8.
4. Retard gear train, paragraphs 4-11, page 9.
5. Winding gear and clutch assembly, paragraphs 4 and 5, page 8.
6. CONNECTOR PINS, figure 8, using Tool No. 635.
7. Connector BLOCK, figure 2.
8. Ground CONTACT STRIP CONNECTOR SCREW, figure 8.
9. Disengage the RESISTOR from the mechanism plate.

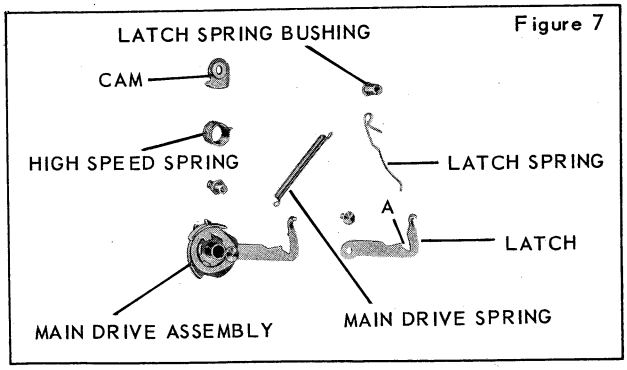


Figure 7

10. Holding the CONTACT SCREW with Tool No. 262, remove the CONTACT SCREW NUT, using Tool No. 503L. Remove the contact screw.
11. CONTACT SPRING, to which is fastened the GROUND CONTACT STRIP and the resistor. Remove the case INSULATOR WASHER and the case INSULATOR.
12. CONTACT LEVER COMPLETE.
13. Shutters of the flash receptacle type are disassembled as follows: Using Tool No. 503J, remove the TERMINAL NUT, figure 9, on the end of the PLUNGER ASSEMBLY. Remove the case INSULATOR WASHER, the plunger assembly, and the terminal body insulating SLEEVE. Remove the CONTACT SPRING and the case INSULATOR. Remove the CONTACT LEVER COMPLETE.

The sequence of reassembly is as follows:

1. If a new contact lever is to be used, place the contact LEVER LATCH SPRING, figure 8, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.
2. Contact lever complete on the CONTACT LEVER STUD, figure 16. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case.

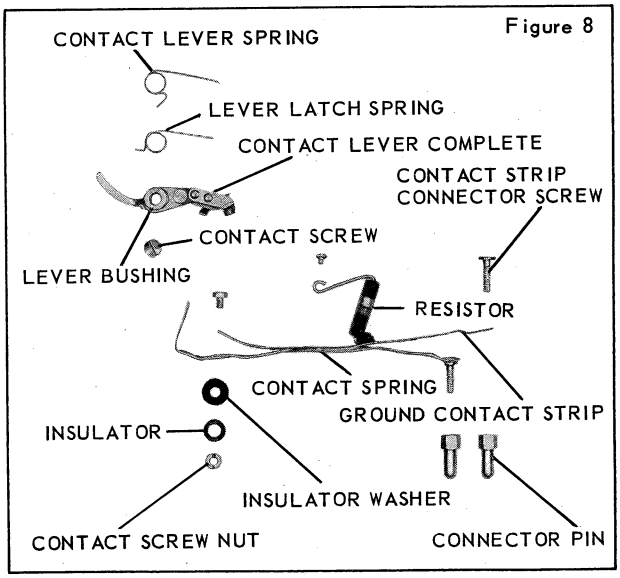


Figure 8

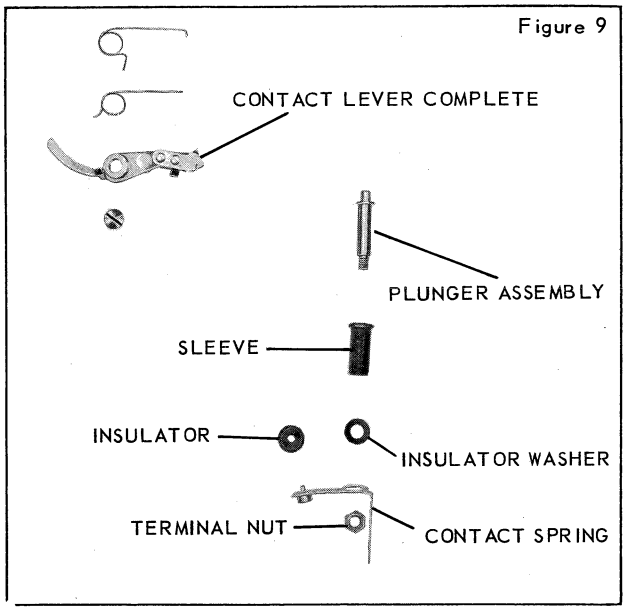


Figure 9

Form the short end of the spring around the vertical part of the contact lever tail.

CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Contact spring. Place the case insulator washer between the shutter case and the contact end of the contact spring and insert the contact screw. Secure the spring by replacing the case insulator and the contact screw nut. To tighten the nut, hold the contact screw with Tool No. 262 and turn the nut with Tool No. 503L.
4. Ground contact strip connector screw.
5. Connector block.
6. Connector pins.
7. Secure the resistor.
8. Winding gear and clutch assembly, paragraphs 1 and 3, page 8.
9. Retard gear train, paragraphs 4-13, page 9.
10. If the shutter is of the flash receptacle plunger type, insert the threaded end of the plunger assembly in the collar end of the terminal body insulating sleeve. Then insert the assembled parts in the body terminal. Place the case insulator washer on the end of the plunger assembly. Replace the case insulator. Position the end of the contact spring over the opening in the shutter base and push the threaded end of the plunger assembly through the opening in the spring. Fasten the plunger with the terminal nut.
11. Trip the shutter and at the same time retard its opening action by placing one finder against the shutter SETTING LEVER, figure 13. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 16, makes slight contact with the contact spring just before the blades are fully open. If the spring does not touch the stud, bend the end of the spring toward the stud.
12. Cover complete, paragraphs 1-8, page 8.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always trip the shutter blades when the trigger is released very slowly. Set the shutter and the winding lever. Release the winding lever very slowly. The lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and the winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the "Trouble Chart—Both flash settings extremely fast;" see page 5.

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, it must return fully and become locked in the unwound position.

The flash settings on the shutter should be timed with reliable shutter testing equipment. The tolerances of the delayed action in the shutter for synchronization with the flash bulbs are as follows:

F (short stroke)*	$3\frac{1}{2}$ — $5\frac{1}{2}$ milliseconds
M (long stroke)*	12 — 16 milliseconds

*From instant of contact until the shutter blades first begin to show light.

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutter has been achieved by a change in the design of the flash contact parts. The old-style parts which are to be discarded are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No. 121349 - Supplement to Parts List No. 1-1490A.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Retard gear train, paragraphs 4-11, page 9.
2. Winding gear and clutch assembly, paragraphs 4 and 5, page 8.
3. CONNECTOR PINS, figure 10, using Tool No. 635.

4. Disengage the RESISTOR from the mechanism plate.
5. CONTACT LEVER COMPLETE.
6. Connector BLOCK, figure 2.
7. Ground CONTACT STRIP CONNECTOR SCREW, figure 8.
8. Holding the CONTACT SCREW, figure 10, with Tool No. 262, remove the CONTACT SCREW NUT, using Tool No. 503L. Remove the contact screw, the case insulator WASHER, the CONTACT SPRING, and the case INSULATOR. Remove the resistor from the contact spring.
9. DETENT SPRING AND ROLLER BUSHING, DETENT SPRING AND ROLLER WASHER, and the DETENT SPRING AND ROLLER ASSEMBLY.
10. CONTACT ESCAPEMENT WHEEL.
11. SHUTTERS OF THE FLASH RECEPTACLE TYPE are disassembled as follows: Using Tool No. 503J, remove the TERMINAL NUT, figure 11, on the end of the PLUNGER ASSEMBLY. Remove the case INSULATOR WASHER, the plunger assembly, and the terminal body insulating SLEEVE. On the contact end of the CONTACT SPRING, remove the CONTACT SCREW NUT, using Tool No. 503L. Remove the CONTACT SCREW, contact spring, case INSULATOR WASHER, and the case INSULATOR. Remove the CONTACT LEVER COMPLETE.

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Place the contact LEVER LATCH SPRING, figure 8, on the contact LEVER BUSHING, with the long end of the spring at the bottom and facing the shutter blades. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.
2. Contact lever complete on the CONTACT LEVER STUD, figure 16. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

   CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Contact spring by placing the case insulator washer between the shutter case and the contact end of the contact spring and insert the contact screw.
4. Contact screw nut, using Tool No. 503L. Hold the screw in position with Tool No. 262.
5. Ground contact strip connector screw.
6. New connector block.
7. Connector pins.
8. Secure the looped wire end of the resistor to the mechanism plate. Solder the other end of the resistor to the ground contact strip.
9. Winding gear and clutch assembly, paragraphs 1-3, page 8.
10. Retard gear train, paragraphs 4-13, page 9.
11. SHUTTERS OF THE FLASH RECEPTACLE TYPE are reassembled as follows: Replace the contact lever spring and the contact lever as described in paragraphs 1 and 2 above. Insert the collar end of the terminal body insulating sleeve. Then insert the assembled parts in the terminal body. Replace the case insulator washer on the threaded end of the plunger assembly. Replace the con-

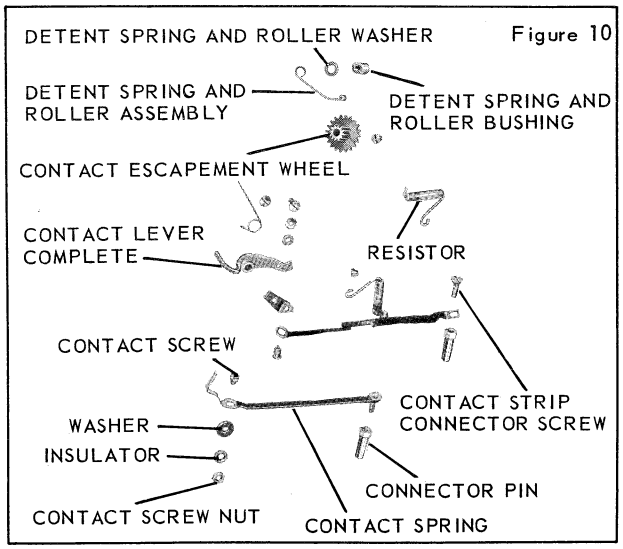


Figure 10

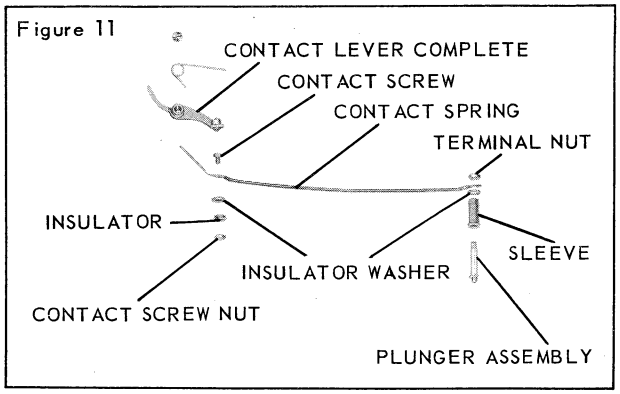


Figure 11

tact spring, with the threaded end of the plunger extending through the opening in the spring. Secure the spring with the terminal nut. On the contact end of the contact spring, replace the case insulator with the collar end facing out. Replace the case insulator washer over the opening on the inside of the case. Place the contact end of the contact spring against the washer and insert the contact screw in the opening in the spring and the washer. Replace the contact screw nut, using Tool No. 503L while holding the screw in position with Tool No. 262.

12. Trip the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 13. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 16, makes slight contact with the contact spring just before the blades are fully open. If the stud does not touch the spring, bend the end of the spring toward the stud.
13. STAR WHEEL ASSEMBLY, figure 4.
14. Replace the cover complete and the winding lever.
15. Cock the shutter; then press the trigger to release the shutter. At the same time hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the spring is desirable. There must be approximately .005-inch clearance between the contact lever tail and that part of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance or if there is excessive clearance, the spacing may be controlled by bending the contact lever tail in or out.

Allow the winding lever to go to the at rest position. Depress the trigger, and watch to see that the flash contacts do not close. If they close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical portion of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

With the shutter tripped, there must be approximately .005 inch clearance between the contact lever latch spring lug and the side of the contact lever. This is to assure full pressure of the contact lever latch into the star wheel.

While pressing the trigger down fully, watch the contacts to make sure they do not close at any time. If they close, the contact lever tail on the contact lever has been bent too far and should be moved back slightly. If necessary, the winding lever should be stoned at point "A," figure 12. Corner "B" must be square.

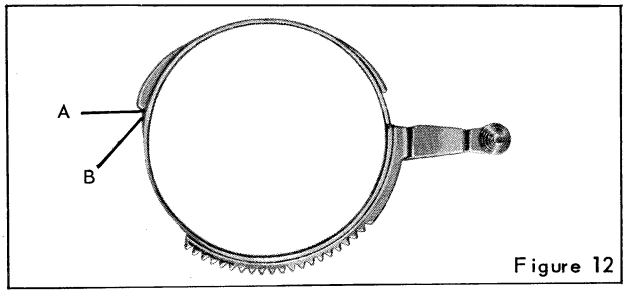


Figure 12

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 7.
2. Winding lever, paragraph 2, page 7.
3. Cover complete, paragraphs 3-7, page 8.
4. Winding gear, clutch assembly, and star wheel assembly, paragraphs 4-6, page 8.
5. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 4-6, page 8.
6. Retard gear train, paragraphs 4-14, page 9.
7. Main drive assembly, paragraphs 4-7, page 9.
8. Flash contact parts, paragraphs 4-13, page 10.
9. Rear lens mount.
10. Blade controller LATCH SPRING BUSHING, figure 7 and the LATCH SPRING.
11. MECHANISM PLATE, figure 13.
12. Diaphragm retainer PLATE WITH WINGS ASSEMBLED.
13. Shutter blades.
14. BLADE CONTROLLER, figure 14.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid

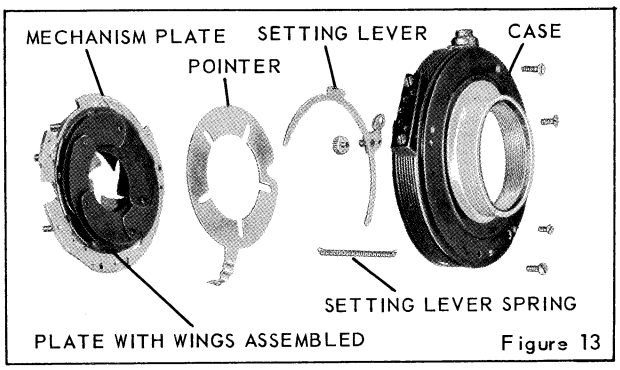


Figure 13

bending them and clean their surfaces with a soft cloth. Fingerprints on the blades will cause corrosion.

2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING and stud, figure 14, with the hole in the blade over the stud near the BLADE CONTROLLER LUG, figure 17, on the mechanism plate.
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 14, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. BLADE over the blade with double blade bushing and stud. The back of the mechanism plate should appear as shown in figure 15.
6. Diaphragm retainer plate with wings assembled, with the cutout slot in the outer edge of the retainer plate over the opening in the mechanism for the PALLET BRACKET with stud assembly, figure 6. After the retainer plate is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings to the maximum aperture.
9. The shutter CASE, figure 13, diaphragm POINTER and setting lever should be thoroughly cleaned. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the recess in the case occupied by the setting lever. Then wipe this area lightly with a clean cloth.
9. Diaphragm pointer. Turn the pointer until the projecting arm is near the cable release socket.
10. Setting lever, with one end of the SETTING LEVER SPRING attached to the lever and the loose end of the spring resting against the side of the shutter case.
11. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the pointer. After the plate is secured, the diaphragm ring, the setting lever, and the shutter blades should operate freely. Secure the loose end of the setting lever spring to the case stud.
12. Blade controller latch and latch spring.
13. Flash contact parts, paragraphs 1-11, page 10.
14. Main drive assembly, paragraphs 1-4, page 9.
15. Retard gear train, paragraphs 1-13, page 9.
16. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 1-3, page 8.
17. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-4, page 8.
18. Rear lens mount.

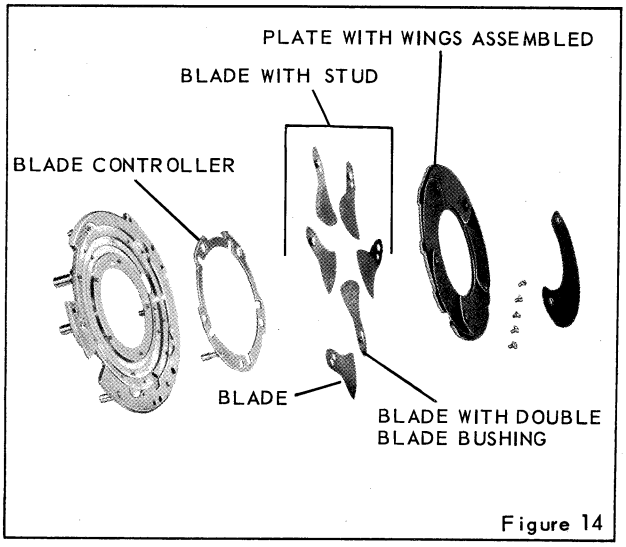


Figure 14

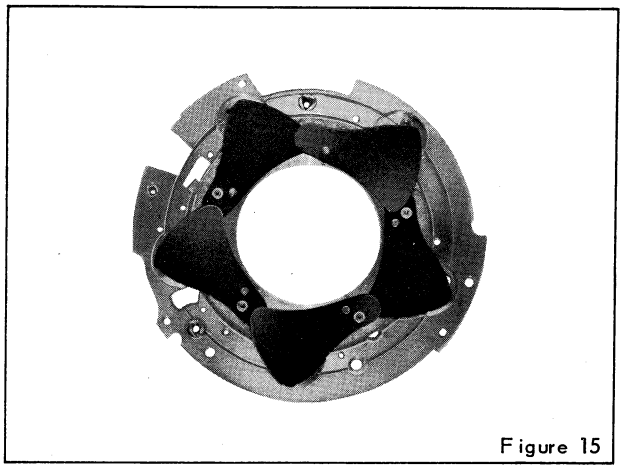


Figure 15

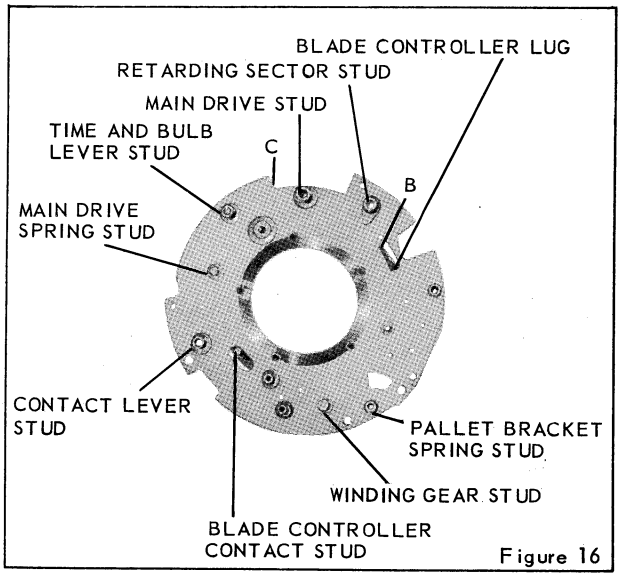
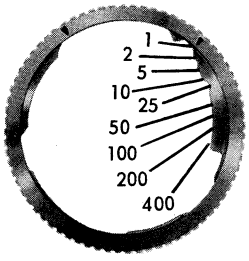


Figure 16

KODAK FLASH SUPERMATIC SHUTTER

FOR KODAK MONITOR SIX-20 CAMERA

TROUBLE CHART

TROUBLE	TROUBLE	REMEDY
Shutter does not trip easily	Possible burr on TRIGGER ASSEMBLY, figure 21.	Burnish the trigger and collar assembly at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 24, when in a set position.
Shutter blades remain open on high speeds	Split shutter blades.	Replace the shutter blades.
	Loose studs on the shutter blades.	Replace the shutter blades.
	Plate blade studs loose or missing on mechanism plate.	Replace or restake the studs carefully to avoid swelling the top of the studs.
Shutter does not set	The TRIGGER LATCH, figure 21, is not returning to its proper position after the shutter has been released.	The trigger latch is bent and binding on the speed index plate or cover. It may be necessary to reduce the tension on the TRIGGER LATCH SPRING, figure 19.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear.	Replace the pinion gear assembly.
	The CLUTCH ASSEMBLY, figure 20, is slipping.	Replace the clutch assembly.
	The latch point on the CONTACT LEVER COMPLETE, figure 24, is damaged.	Replace the contact lever complete.
Shutter speeds slow  Figure 17	Retard gears dirty.	Remove and clean the retard gears.
	The MAIN DRIVE SPRING, figure 23, is weak.	Replace the main drive spring.
	Shutter blades binding.	Remove and replace the shutter blades.
	Excessive retard sector travel.	Swedge the speed control RING, figure 18, at the area controlling the slow speed. (See figure 17.)
Shutter speeds fast	Insufficient retard sector travel.	File the speed ring at the area controlling the fast speed. (See figure 17.)
	Insufficient pallet engagement (on speeds 1/10 or slower).	Remove material on the speed control ring in the area of contact with the pallet bracket stud.

TROUBLE	CAUSE	REMEDY
Shutter speeds fast (cont'd)		Check for bind of the PALLET BRACKET, figure 22, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle, singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 27.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the tops of the studs.
	BLADE CONTROLLER with contact stud, figure 28, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub or the mechanism plate.	Replace the blade controller. If it is still too loose or too tight, replace the mechanism plate.
	Too much play between the mechanism plate and the diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 27, due to retainer plate's being bowed.	Replace the diaphragm retainer plate with wings assembled.
	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.
	Blades opening too far.	File and burnish the blade controller LATCH at point "A." (See figure 23.)
	Blades closing too far.	Swedge the mechanism plate at point "B." (See figure 29.)
	No clearance between the blade controller latch and the BLADE CONTROLLER LUG, figure 29, when the shutter is in the tripped position.	Swedge the mechanism plate at point "C," figure 29, such that this point acts as a stop for the SETTING LEVER with stop stud, figure 27.
	Shutter blades too loose.	Replace the blades.
Winding lever does not hold	The latch point on the CONTACT LEVER COMPLETE, figure 24, is broken off.	Replace the contact lever.
Shutter operates instantaneously on B (Bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.

TROUBLE	CAUSE	REMEDY
The flash setting is below the millisecond tolerance (fast)	The tension is too great on the WINDING GEAR SPRING, figure 20.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on the flash setting.
	The FLASH RETARD PALLET, figure 19, is not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh more firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the ginding point. File the plate at this point to allow clearance for the pallet.
The flash setting is above the millisecond tolerance (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover or on the speed INDEX PLATE, figure 18.	Replace the winding lever. Try lubricant.
Constant flash short	The contact spring may be bent and touching either the contact lever or the cover.	Re-form the contact spring.
	Insulation breaking down on the contact spring.	Replace the contact spring.
	Terminal body loose.	Restake the terminal body.
The flash setting is extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.
	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly toward the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter. 2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.
Speed control ring too loose or too tight	Speed and diaphragm index plate not formed properly.	Re-form the speed and diaphragm index plate. Bow the index plate up to place more tension on the speed control ring.

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:

1. Front lens mount, using Tool No. 256.
2. Focusing mount STOP SCREW, figure 18.
3. Speed and diaphragm INDEX PLATE by turning the plate counterclockwise until the three projections in the center of the plate fit into the three cutouts on the outside edge of the central collar.
4. Speed control RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be adjusted.

The sequence of reassembly is as follows:

1. Speed control ring, with shutter in tripped position. Be sure the projecting lug on the BULB LEVER ASSEMBLY, figure 21, the studs on the retarding SECTOR WITH STUD, figure 22, and the PALLET BRACKET with stud assembly are resting against the inside edge of the speed control ring and are not underneath the ring.
2. Speed and diaphragm index plate by lining up the three projections in the center of the plate with the three cutouts on the outside edge of the central collar on the COVER COMPLETE, figure 19. Turn the plate clockwise until it is properly positioned.
3. Focusing mount stop screw.
4. Front lens mount.

WINDING LEVER

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, above.
2. Winding lever.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.

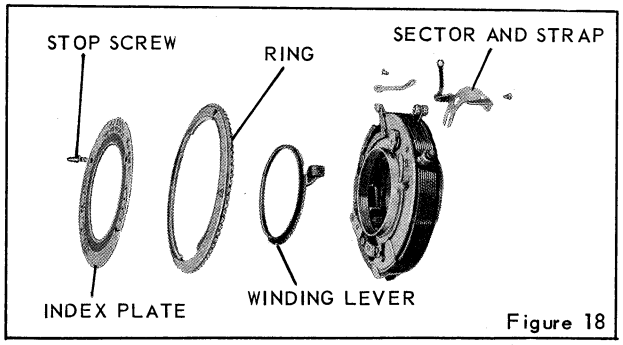


Figure 18

2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 20. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 21, as it may release the winding gear spring tension.

4. Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension to the TRIGGER LATCH SPRING, figure 19. Check for a bind between the trigger latch and the TRIGGER ASSEMBLY, figure 21, at the point of attachment. The winding lever should contact the trigger latch, push the latch out of the slot in the cover, and open the shutter blades. After the shutter has been tripped, the latch should return to rest on the ledge just above the small slot in the cover.

   After the trigger is depressed, allow it to return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.
5. Speed control ring, paragraphs 1-4, above.

COVER COMPLETE

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, above.

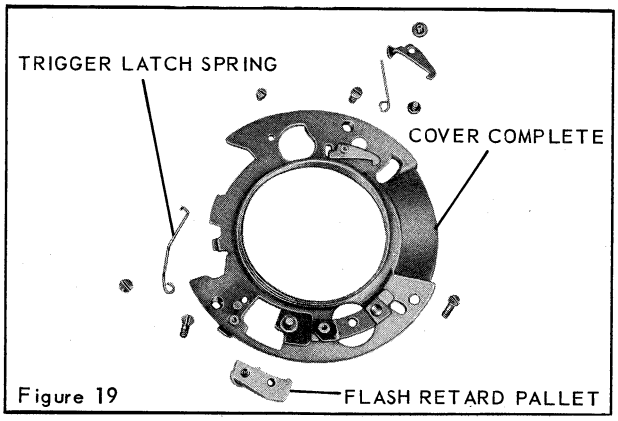


Figure 19

2. Winding lever, paragraph 2, page 18.
3. TRIGGER LATCH SPRING, figure 19.
4. Lift up on the loose end of the TRIGGER LATCH, figure 21, sufficiently to clear the COVER COMPLETE, figure 19. Move the loose end of the latch until it is clear of the CASE, figure 27.
5. FLASH RETARD PALLET, figure 19.
6. Cover complete.

The sequence of reassembly is as follows:

1. Cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the CONTACT LEVER COMPLETE, figure 24. Be sure the latch does not bind.
4. Trigger latch spring; do not fasten it securely. Lift the loose end of the spring over the trigger latch until it is at a point halfway between the latch and the central collar, then secure the spring. Place the spring against the outside edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.
5. Winding lever, paragraphs 1-4, page 18.
6. Flash retard pallet on the eccentric stud. Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.

   NOTE: Be sure the eccentric stud is tight on the cover. Anchor the stud securely after any adjustment is made.

7. Winding lever, paragraphs, page 18.

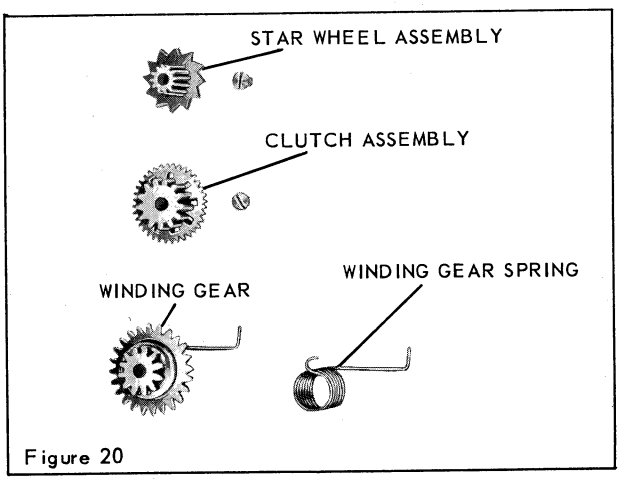


Figure 20

WINDING GEAR, CLUTCH ASSEMBLY, AND STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 18.
2. Winding lever, paragraph 2, page 18.
3. Cover complete, paragraphs 3-6, page 18.
4. WINDING GEAR, figure 20, and the WINDING GEAR SPRING.
5. CLUTCH ASSEMBLY.
6. STAR WHEEL ASSEMBLY.

The sequence of reassembly is as follows:

1. Star wheel assembly.
2. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear on the clutch assembly should turn freely only in a clockwise direction.
3. Winding gear and winding gear spring.
4. Cover complete, paragraphs 1-7, page 18.

TRIGGER ASSEMBLY AND BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 18.
2. Winding lever, paragraph 2, page 18.
3. Cover complete, paragraphs 3-6, page 18.
4. Unhook the MAIN DRIVE SPRING, figure 23, from the MAIN DRIVE SPRING STUD, figure 29.
5. TRIGGER SCREW, figure 21, TRIGGER SPRING, and TRIGGER WASHER.
6. TRIGGER ASSEMBLY, bulb lever SPACERS, BULB LEVER ASSEMBLY, and BULB LEVER SPRING.

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger assembly with the oval hole up and insert the bulb lever assembly in the opening on the trigger. Place the two bulb lever spacers on the top of the bulb lever assembly. Grasp all four parts by inserting one prong of a pair of tweezers down through the center of the holes.

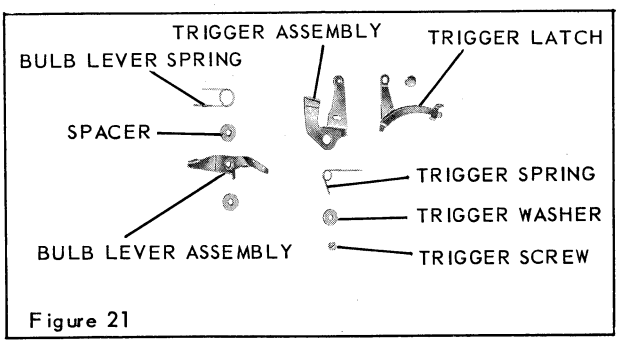


Figure 21

With the long end of the bulb lever spring turned in a clockwise direction and the short end resting against the lug on the bulb lever assembly, guide the parts down over the BULB LEVER STUD, figure 29. The long end of the spring should rest against the case.

2. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the main drive spring stud and rest it against the stud.
3. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-7, page 18.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 18.
2. Winding lever, paragraph 2, page 18.
3. Cover complete, paragraphs 3-6, page 18.
4. Retard gear PLATE COMPLETE, figure 22.
5. Retard GEAR WITH NO. 2 PINION assembly.
6. Retard GEAR WITH NO. 3 PINION assembly.
7. ESCAPEMENT WHEEL with No. 4 pinion assembly.
8. Retard PALLET.
9. PALLET BRACKET with stud assembly and the PALLET BRACKET SPRING.

NOTE: If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and all the parts of the gear train thoroughly.

10. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
11. Set the shutter.
12. Retarding SECTOR WITH STUD and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 23.
4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out, toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET STUD, figure 29. The long end of the spring should rest against the case.
5. Retard pallet.
6. Escapement wheel with No. 4 pinion assembly.
7. Retard gear with No. 3 pinion assembly.
8. Retard gear with No. 2 pinion assembly.
9. Retard gear plate complete, with the teeth of the gear facing the shutter blades.
10. Retard gear plate screw, near the pallet bracket.
11. Lift up the gear end of the gear plate until the teeth of the retarding sector with stud pass freely under the gear. Place the retarding sector so that when the gear teeth are meshed the outer edge of the sector will be approximately 1/8 inch from the shutter case.
12. Remaining retard gear plate screw.
13. Put the pallet bracket spring in tension by placing the long end of the spring against the inside edge of the lug on the retard gear plate complete.
14. Cover complete, paragraphs 1-7, page 18.

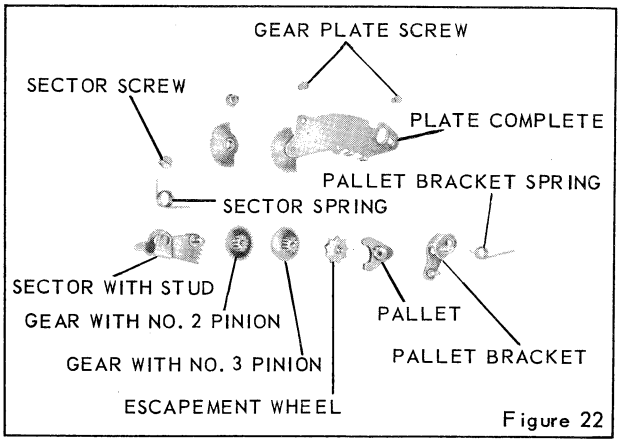


Figure 22

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 18.
2. Winding lever, paragraph 2, page 18.
3. Cover complete, paragraphs 3-6, page 18.
4. Unhook the LATCH SPRING, figure 23, from the main drive LATCH.
5. Unhook the MAIN DRIVE SPRING from the MAIN DRIVE SPRING STUD, figure 29.
6. Set the shutter.

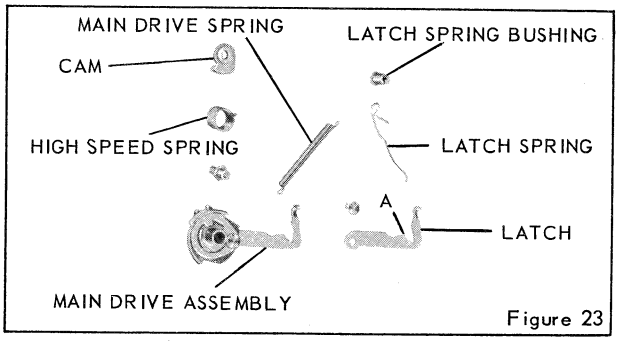


Figure 23

7. MAIN DRIVE ASSEMBLY, figure 23, to which is attached the main drive spring.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 27; on the MAIN DRIVE STUD, figure 29; on the LATCH, figure 23, at the point of contact with the LATCH SPRING, and on the latch where it contacts the RETARDING SECTOR STUD, figure 29. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud into the assembly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG. The cutout part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the top of the latch.
4. Main drive spring.
5. Cover complete, paragraphs 1-7, page 18.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 18.
2. Winding lever, paragraph 2, page 18.
3. Cover complete, paragraphs 3-6, page 18.
4. TERMINAL NUT, figure 24.
5. Case INSULATOR WASHER, PLUNGER ASSEMBLY, and terminal body insulating SLEEVE.
6. On the contact end of the CONTACT SPRING, remove the CONTACT SCREW NUT, using Tool No. 503L.
7. CONTACT SCREW, contact spring, case INSULATOR WASHER and case INSULATOR.
8. CONTACT LEVER COMPLETE.

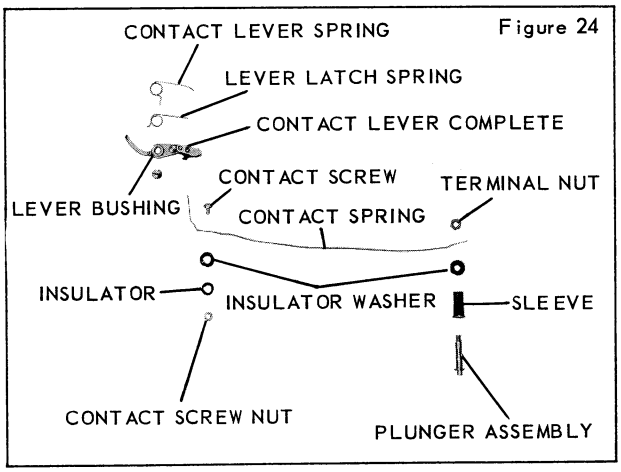


Figure 24

The sequence of reassembly is as follows:

1. If a new contact lever is to be used, place the contact LEVER LATCH SPRING, figure 24, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.
2. Contact lever complete on the CONTACT LEVER STUD, figure 29. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

   CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Terminal body insulating sleeve and the plunger assembly.
4. Case insulator washer on the threaded end of the plunger assembly.
5. Contact spring, with the threaded end of the plunger assembly extending through the opening in the spring.
6. Terminal nut.
7. Case insulator, with the collar end of the insulator facing out.
8. Case insulator washer over the opening on the inside of the case.
9. Contact end of the contact spring against the washer. Insert the contact screw in the opening in the spring and the washer.
10. Contact screw nut, using Tool No. 503L. Hold the screw in position with Tool No. 262.
11. Cock the shutter. Release the shutter and at the same time retard its opening action by placing one finger against the shutter setting lever. Observe whether the BLADE CONTROLLER CONTACT STUD makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.
12. Cover complete, paragraphs 1-7, page 18.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always trip the

shutter blades when the trigger is released very slowly. Set the shutter and the winding lever. Release the winding lever very slowly. The lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the "Trouble Chart"—The flash setting is extremely fast; see page 17.

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, the lever must return fully and become locked in the unwound position.

The flash settings on the shutter should be timed with reliable shutter testing equipment. The tolerance of the delayed action in the shutter for synchronization with the flash bulbs is as follows:

M (long stroke* 12 — 16 milliseconds

*From instant of contact until the shutter blades first begin to show light.

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutter has been achieved by a change in the design of the flash contact parts. The old-style parts which are to be discarded are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No. 121350 - Supplement to Parts List No. 1-1490A.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. TERMINAL NUT, figure 25.
2. Case INSULATOR WASHER, PLUNGER ASSEMBLY, and terminal body insulating SLEEVE.
3. On the contact end of the CONTACT SPRING, remove the CONTACT SCREW NUT, using Tool No. 503L.
4. CONTACT SCREW, contact spring, case INSULATOR WASHER and case INSULATOR.
5. CONTACT LEVER COMPLETE.
6. DETENT SPRING BUSHING, DETENT SPRING WASHER, and DETENT SPRING and ROLLER ASSEMBLY.
7. CONTACT ESCAPEMENT WHEEL.

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Place the contact LEVER LATCH SPRING, figure 24, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then plate the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise at least 15 degrees.
2. Contact lever complete on the CONTACT LEVER STUD, figure 29. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

   CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Terminal body insulating sleeve and the plunger assembly.
4. Case insulator washer on the threaded end of the plunger assembly.
5. Contact spring, with the threaded end of the plunger assembly extending through the opening in the spring.
6. Terminal nut.
7. Case insulator, with the collar end of the insulator facing out.
8. Case insulator washer over the opening on the inside of the case.
9. Contact end of the contact spring against the washer. Insert the contact screw in the opening in the spring and the washer.
10. Contact screw nut, using Tool No. 503L. Hold the screw in position with Tool No. 262.
11. Cock the shutter. Release the shutter and at the same time retard its opening action by

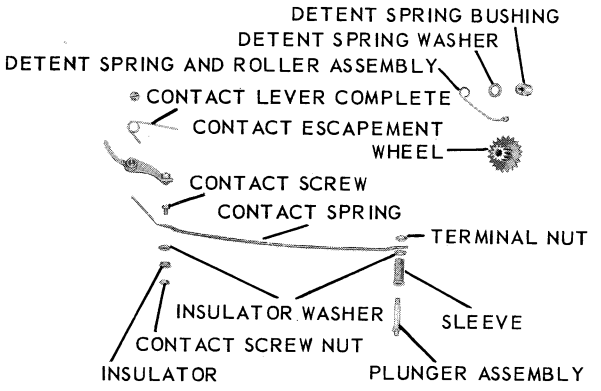


Figure 25

placing one finger against the shutter setting lever. Observe whether the BLADE CONTROLLER CONTACT STUD makes contact with the contact spring when the shutter blade opening approximates the f/16 diaphragm opening. If the stud does not touch the spring at this diaphragm opening, bend the end of the spring toward or away from the stud.

12. STAR WHEEL ASSEMBLY, figure 20.
13. Replace the cover complete and the winding lever.
14. Cock the shutter and press the trigger to release the shutter; at the same time hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the spring is desirable. There must be approximately .005 inch clearance between the contact lever tail and the part of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance, or if there is excessive clearance, the spacing may be controlled by bending the contact lever tail in or out.

    Allow the winding lever to go to the at rest position. Depress the trigger and watch to see that the flash contact points do not close. If they close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical part of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

    With the shutter tripped, there must be approximately .005 inch clearance between the contact lever latch spring lug and the side of the contact lever. This is to assure full pressure of the contact lever latch into the star wheel assembly.

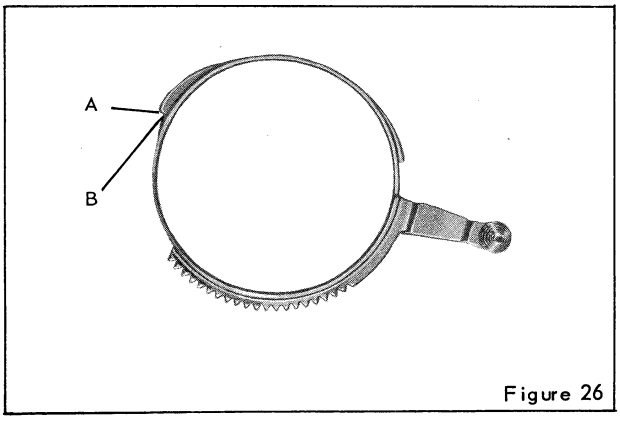


Figure 26

While pressing the trigger down fully, watch the contacts to make sure they do not close at any time. If they close, the contact lever tail has been bent too far and should be moved back slightly. If necessary, the winding lever should be stoned at point "A," figure 26. Corner "B" must be square.

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 18.
2. Winding lever, paragraph 2, page 18.
3. Cover complete, paragraphs 3-6, page 18.
4. Winding gear, clutch assembly, and star wheel assembly, paragraphs 4-6, page 19.
5. Trigger assembly and bulb lever assembly, paragraphs 4-6, page 19.
6. Retard gear train, paragraphs 4-12, page 20.
7. Main drive assembly, paragraphs 4-7, page 20.
8. Flash contact parts, paragraphs 4-8, page 21.
9. Shutter release SECTOR AND STRAP assembly, figure 18.
10. Rear lens mount.
11. Blade controller LATCH SPRING BUSHING, figure 23, and the LATCH SPRING.
12. MECHANISM PLATE, figure 27.
13. Diaphragm retainer PLATE WITH WINGS ASSEMBLED.
14. Shutter blades.
15. BLADE CONTROLLER, figure 28.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid bending them and clean their surfaces with a soft cloth.
2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING and stud, figure 28, with the hole in the blade over the stud near the MAIN DRIVE STUD, figure 29, on the mechanism plate.
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 28, allowing the wide end of each blade to overlap the narrow

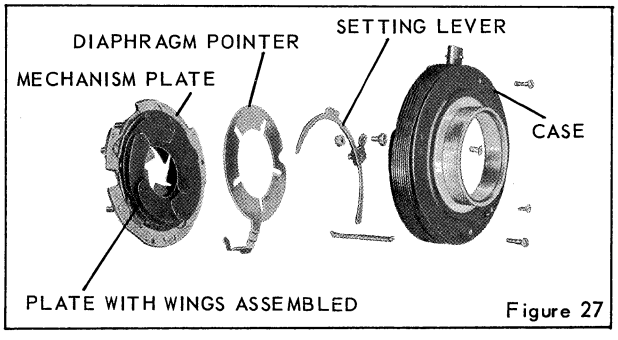


Figure 27

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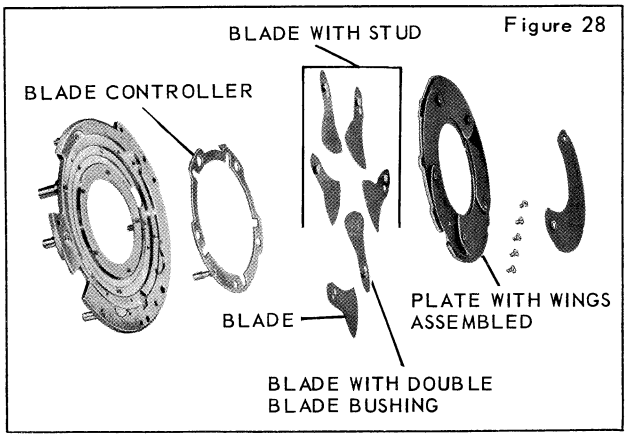


Figure 28

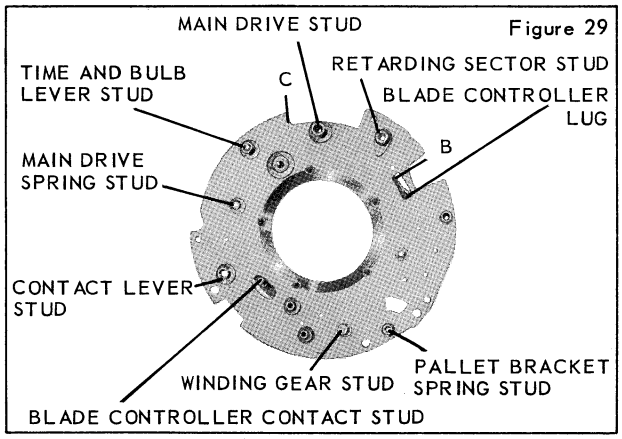


Figure 29

end of the preceding blade.

5. BLADE over the blade with double blade bushing and stud.
6. Diaphragm retainer plate with wings assembled, with the cutout slot in the outer edge of the plate over the opening in the mechanism plate for the PALLET BRACKET with stud assembly, figure 22. After the diaphragm retainer plate is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.
8. The shutter CASE, figure 27, and the DIAPHRAGM POINTER should be cleaned.
9. Diaphragm pointer. Turn the pointer until the projecting arm is near the cable release socket.
10. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the diaphragm ring. After the plate is secured, the diaphragm ring and the shutter blades should operate freely.
11. Blade controller latch spring bushing and latch spring.
12. Shutter release sector and strap assembly.
13. Flash contact parts, paragraphs 1-11, page 21.
14. Main drive assembly, paragraphs 1-4, page 20.
15. Retard gear train, paragraphs 1-13, page 20.
16. Trigger assembly and bulb lever assembly, paragraphs 1-3, page 19.
17. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-3, page 19.
18. Cover complete, paragraphs 1-7, page 18.
19. Rear lens mount.

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

NOVEMBER 1950 PARTS LIST No. 1-1490E

KODAK FLASH SUPERMATIC SHUTTER

WITH TWO PRONG CONNECTORS

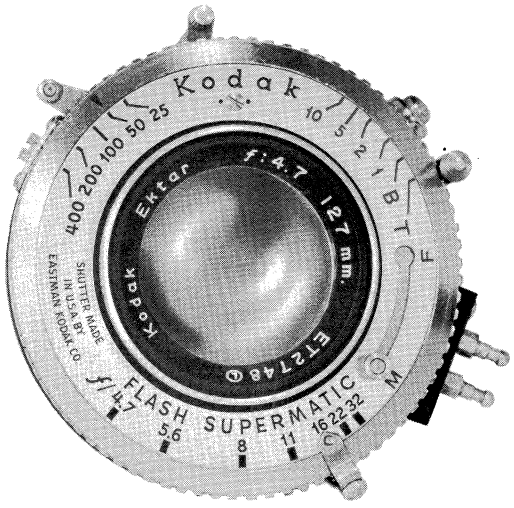
(This list also covers Shutters having Graphic or Busch Index Plates)

This parts list supersedes parts list No. 1-1490, with the exception of the shutter for the Kodak Medalist II Camera.

The shutters covered by this list are identified by symbols A through G. For key to symbols refer to page 9.

Illustrated parts which are common to all shutters are identified by the part name and number only. Parts which are not common are identified by the symbol for the individual shutter.

Illustrations and parts list are in the sequence of disassembly.



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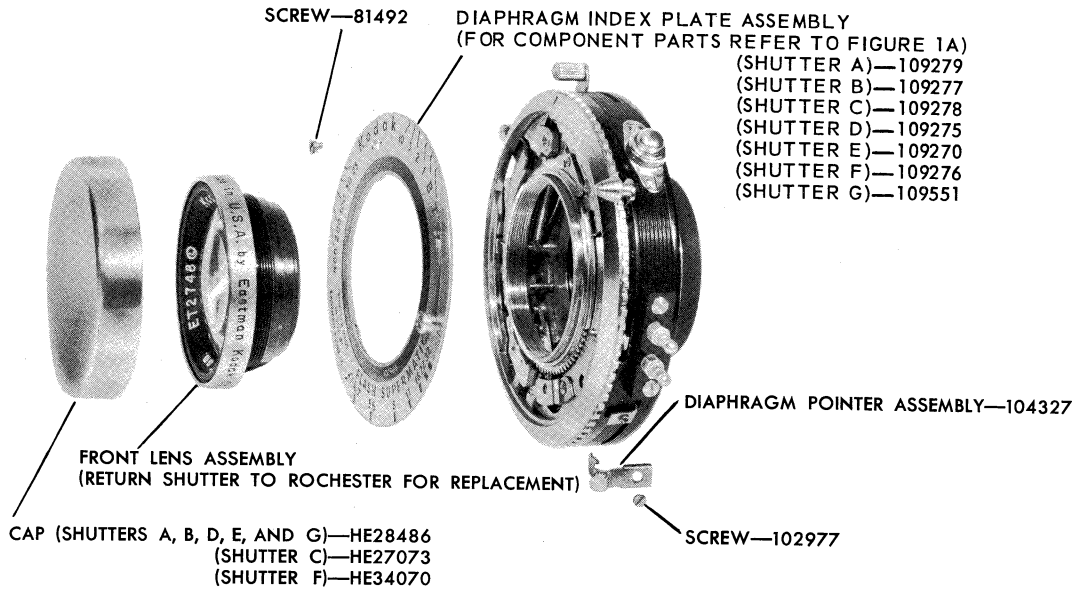


Figure 1

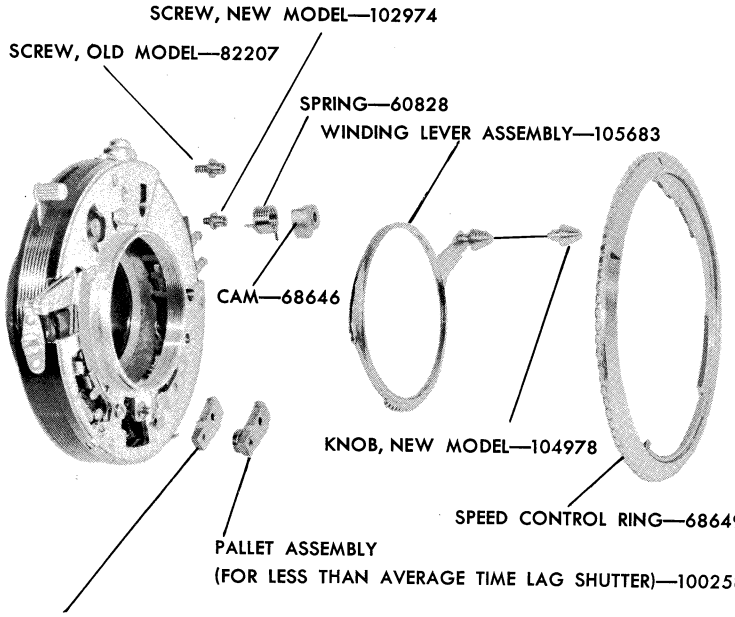


Figure 2

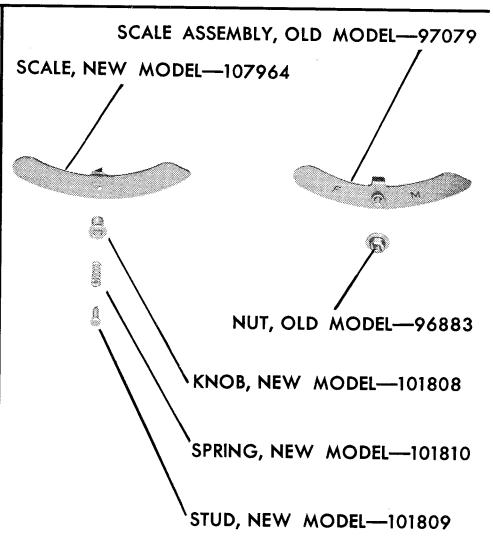


Figure 1A

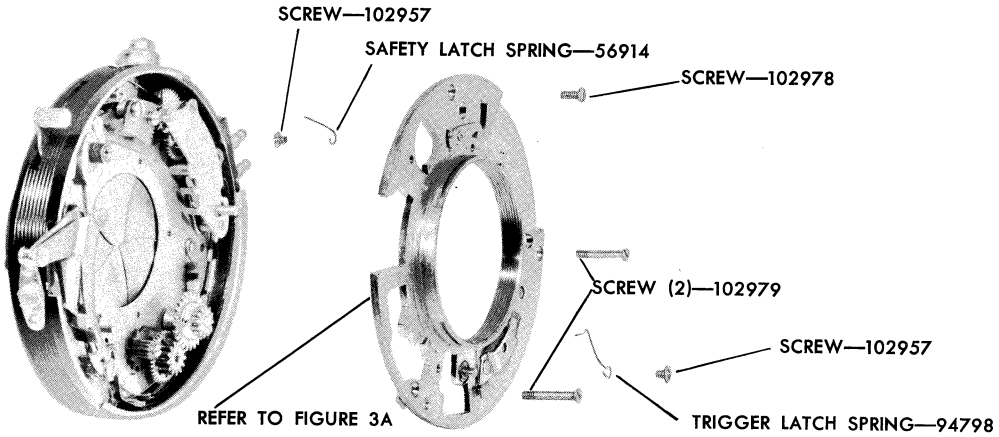


Figure 3

For key to symbols refer to page 9

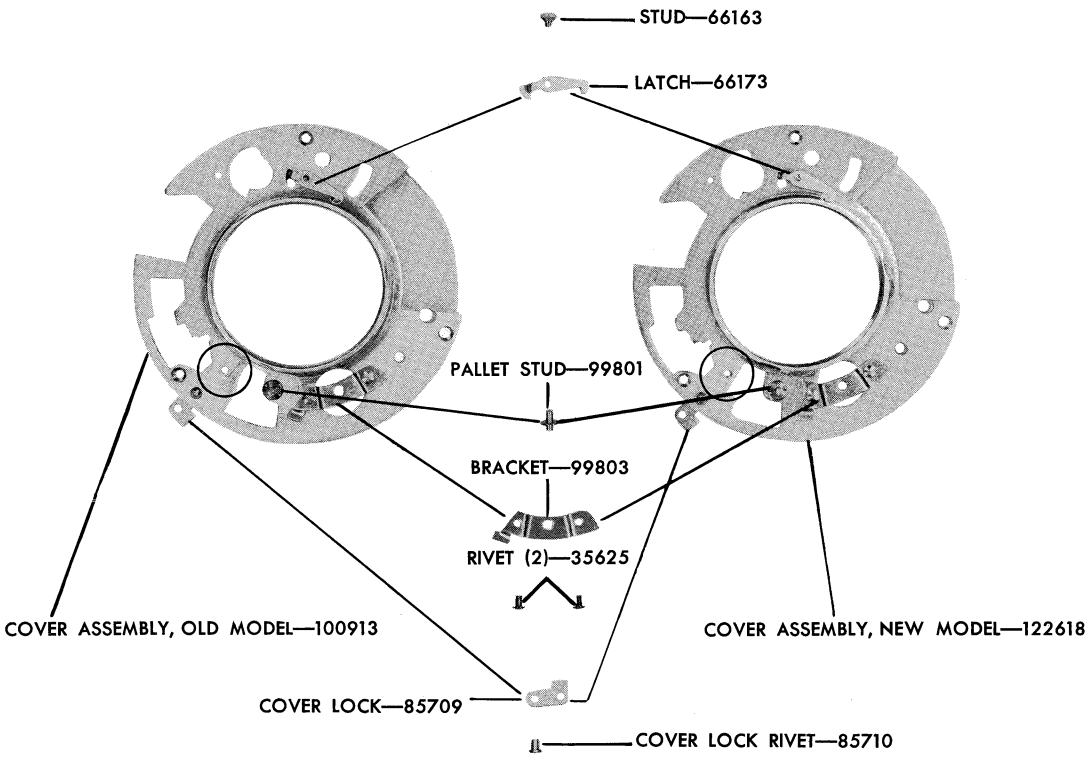


Figure 3A

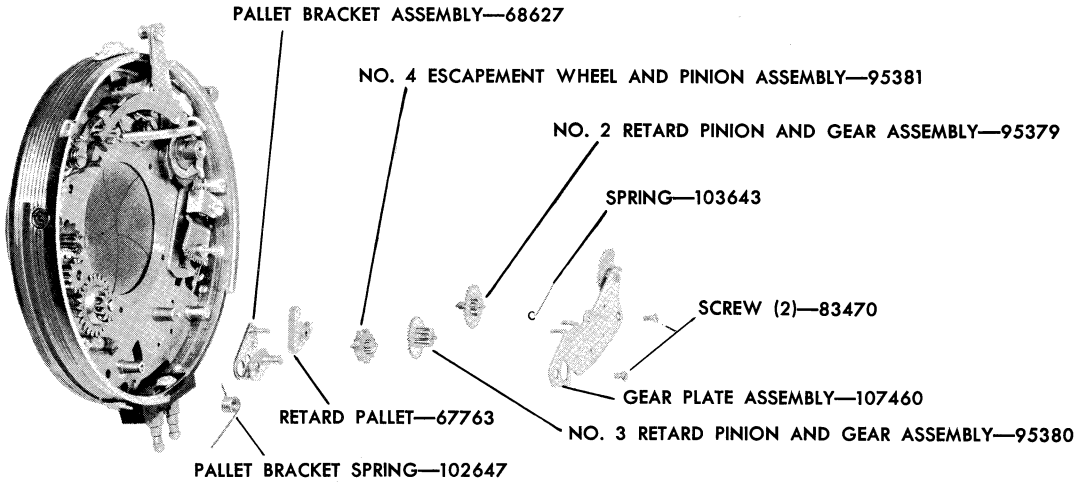


Figure 4

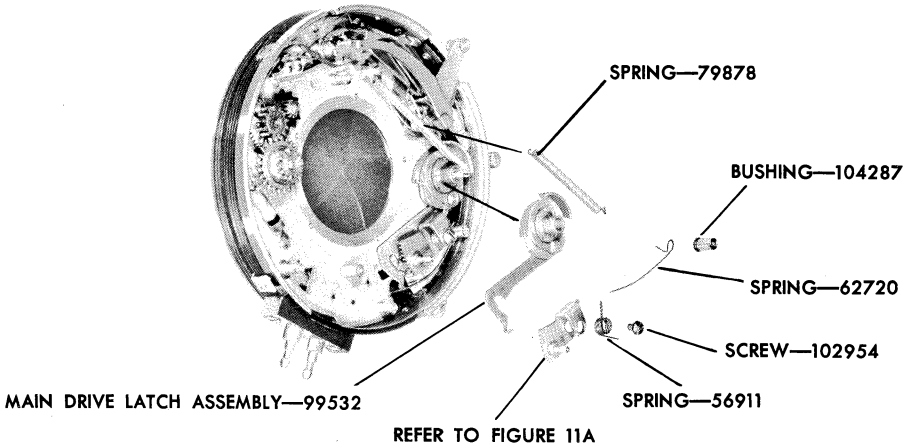


Figure 5

For key to symbols refer to page 9

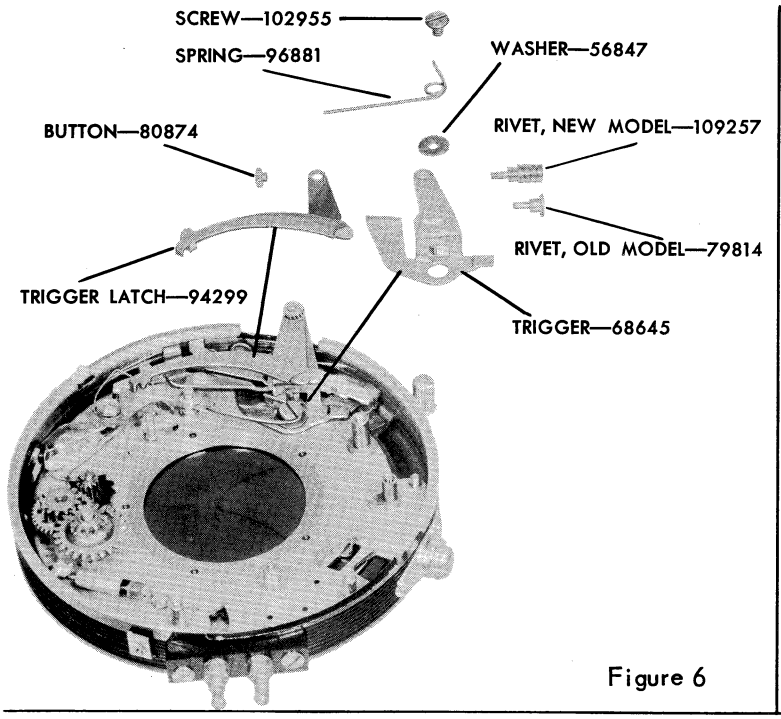


Figure 6

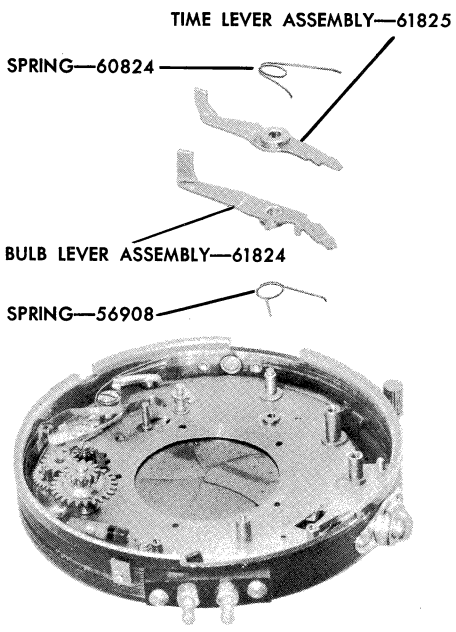
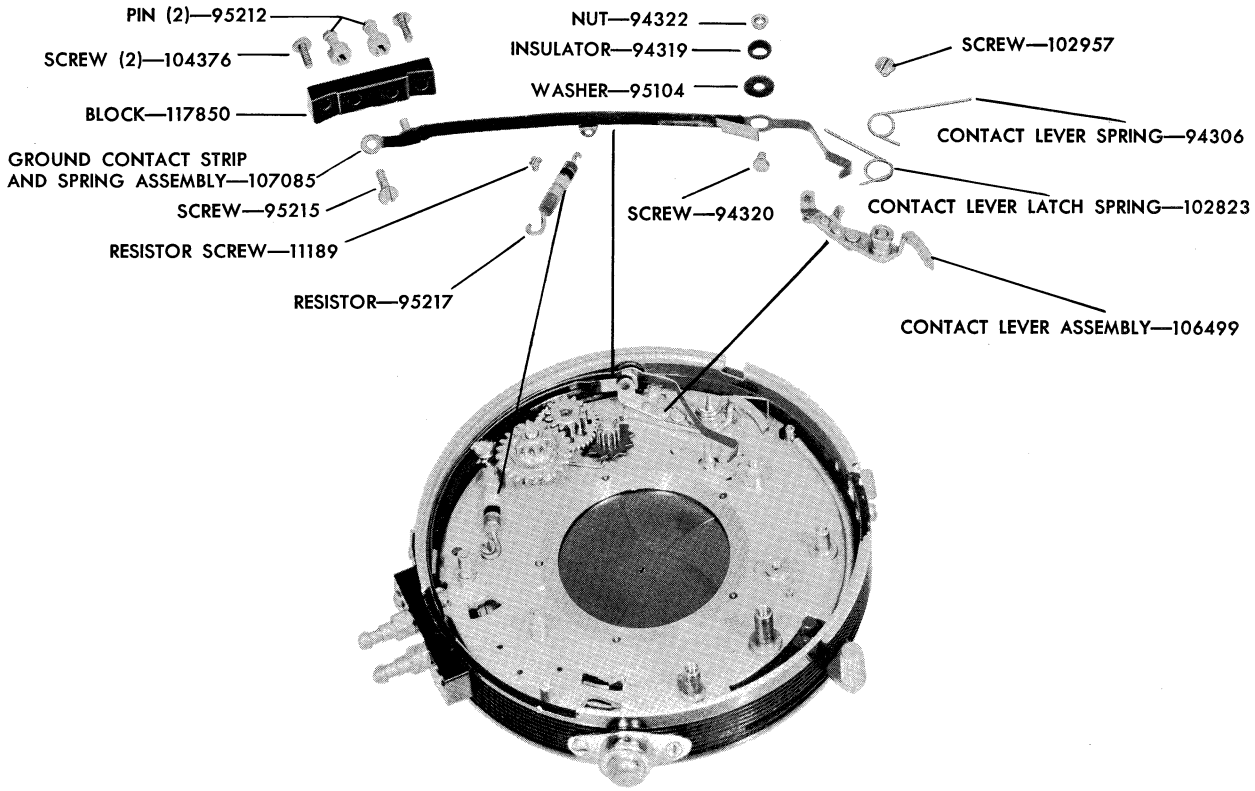


Figure 7

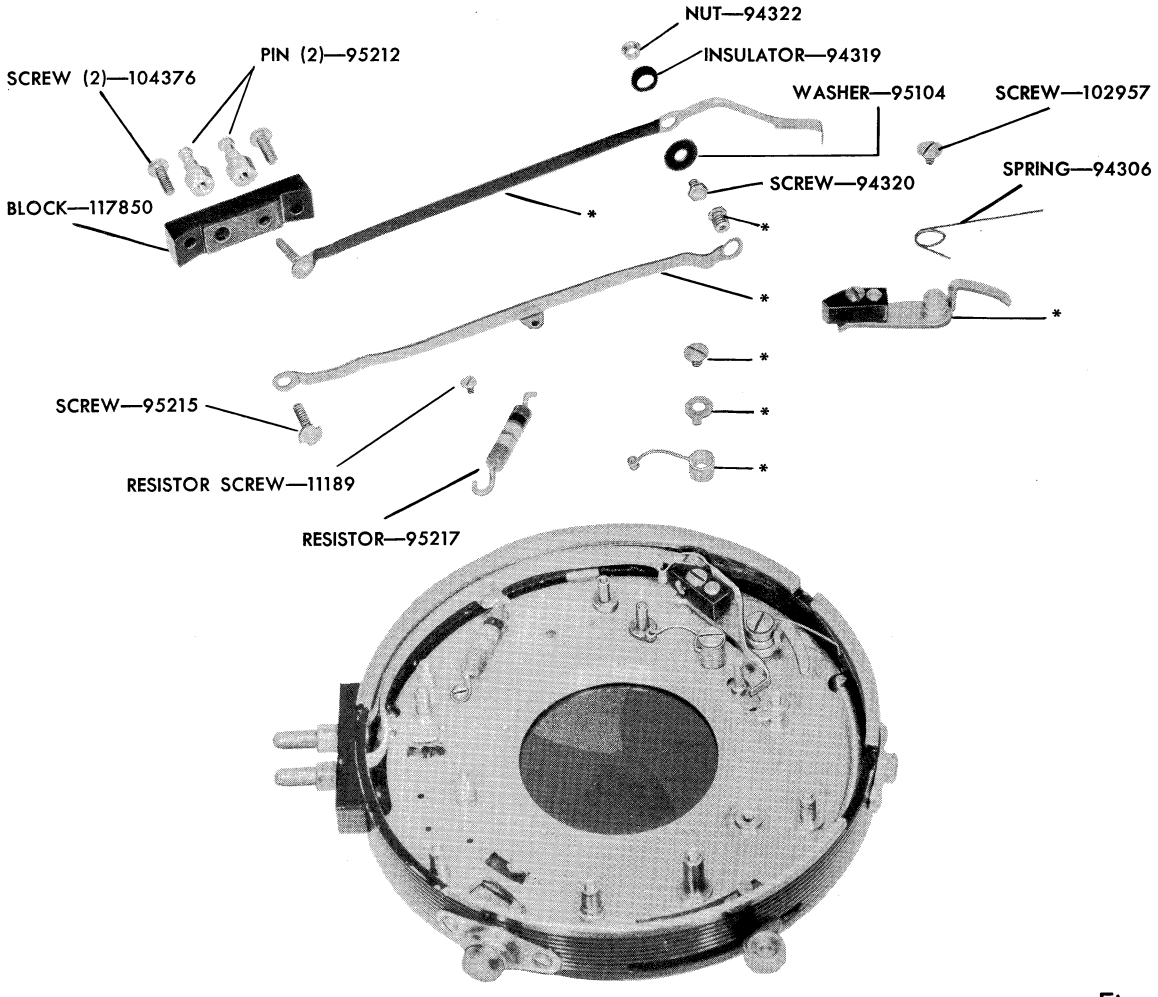


NEW MODEL PARTS

Figure 8

For key to symbols refer to page 9

OLD MODEL PARTS



*DISCONTINUED—REPLACE WITH KIT NO. 121351—REFER TO FIGURE 13

Figure 8A

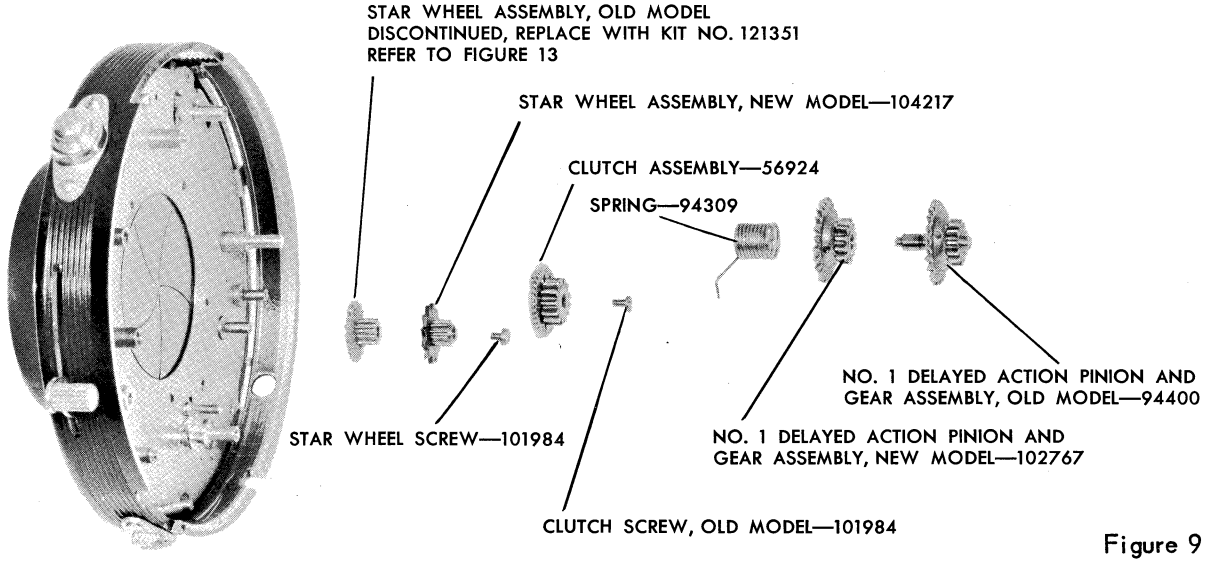


Figure 9

For key to symbols refer to page 9

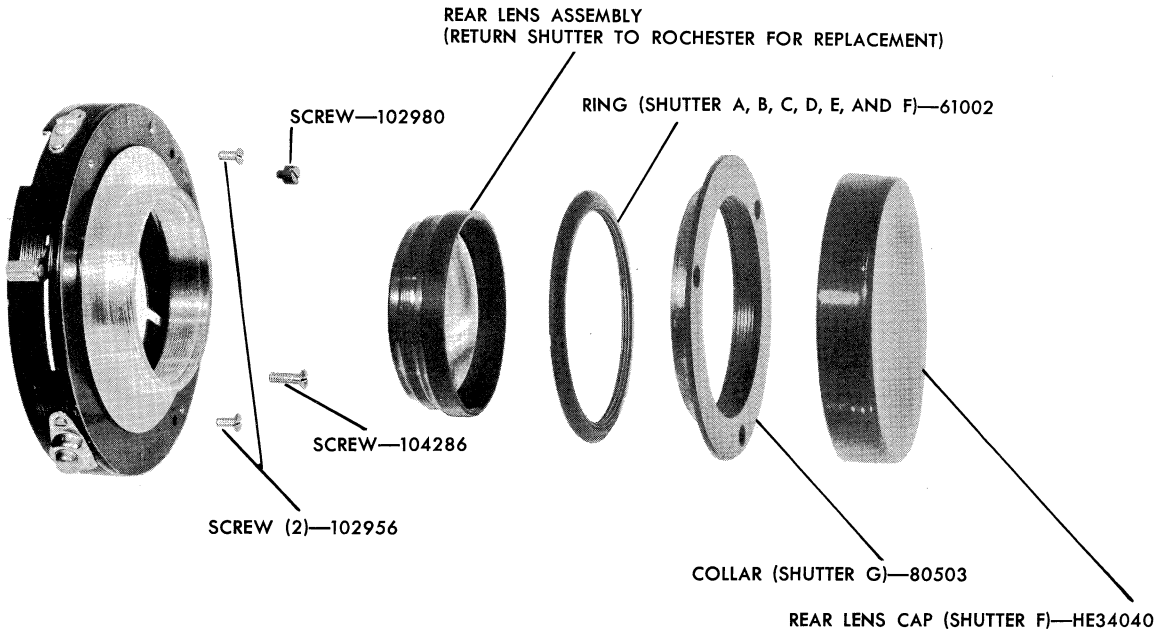


Figure 10

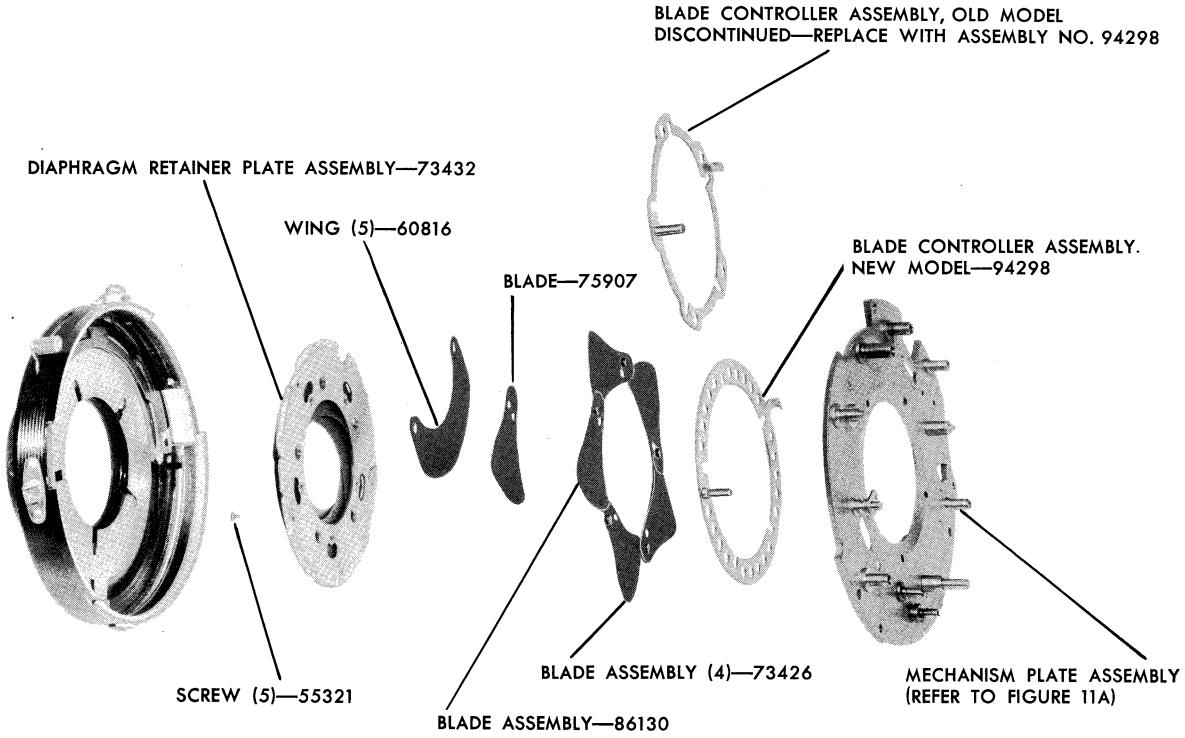


Figure 11

For key to symbols refer to page 9

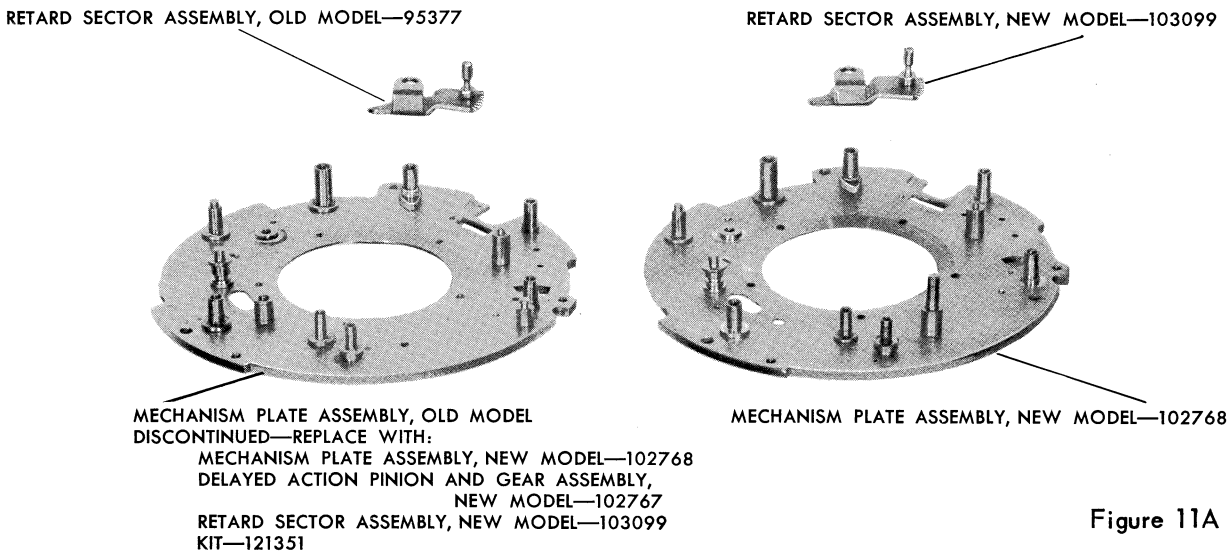


Figure 11A

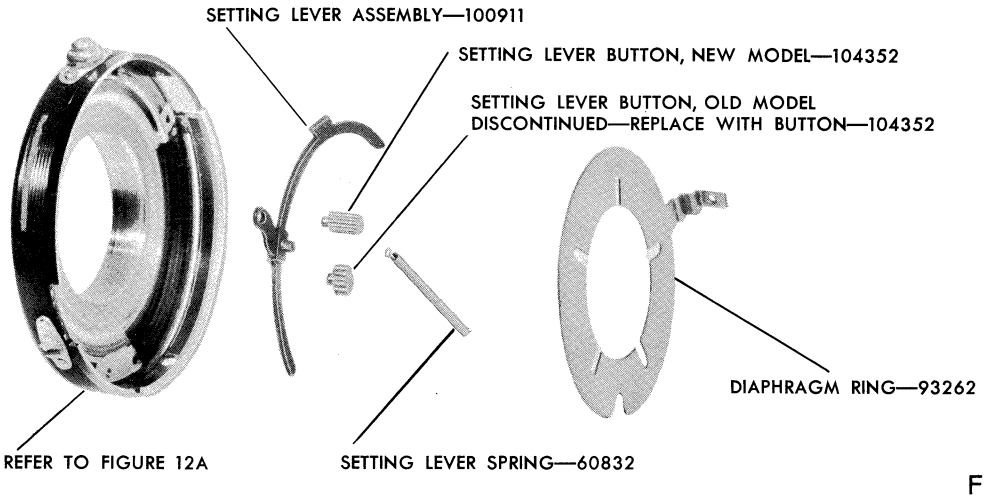


Figure 12

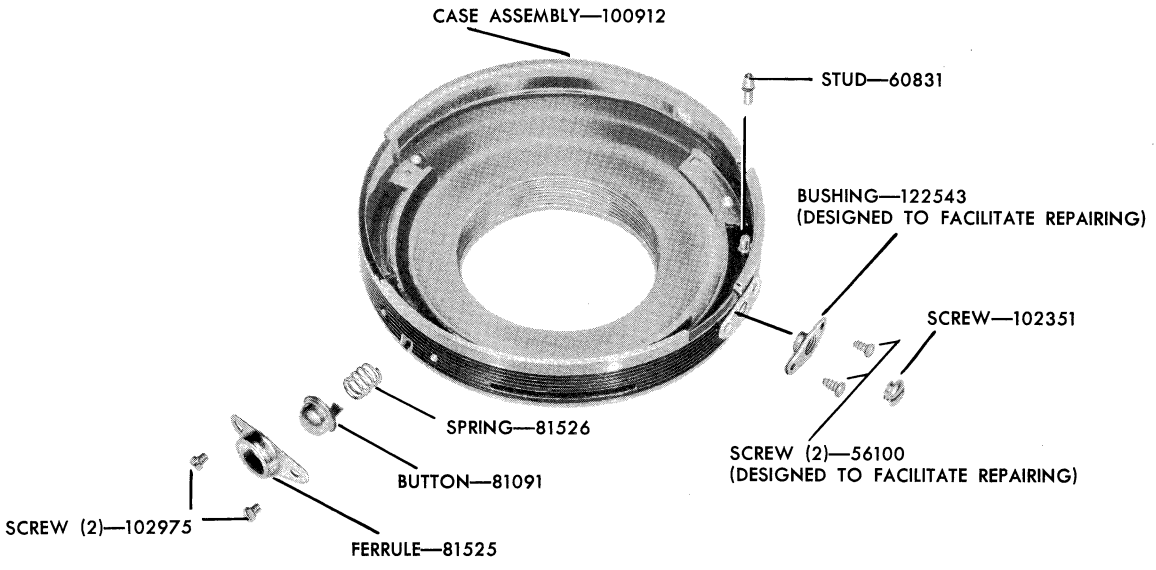


Figure 12A

For key to symbols refer to page 9

Kit No. 121351

This kit contains the necessary parts for replacing the old-model contacts or the old-model star wheel. This kit is also necessary when replacing the old-model mechanism plate.

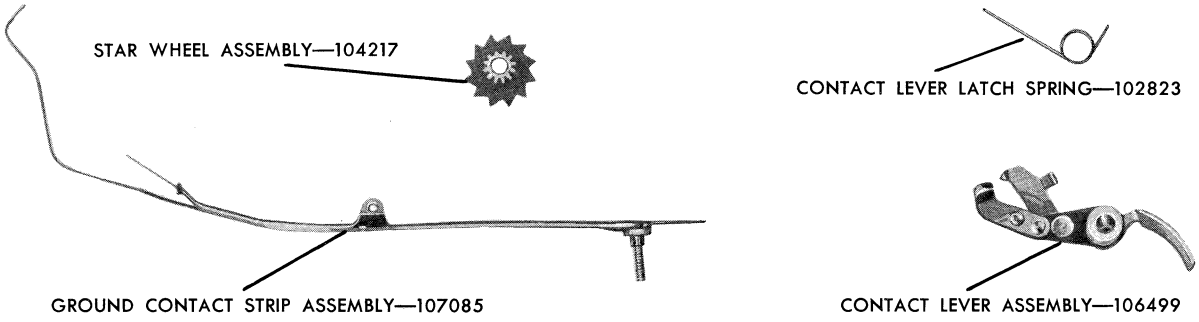


Figure 13

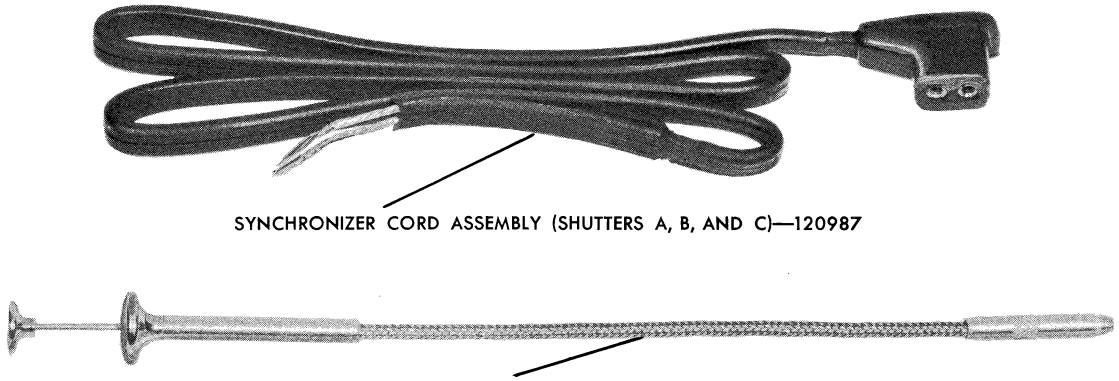


Figure 14

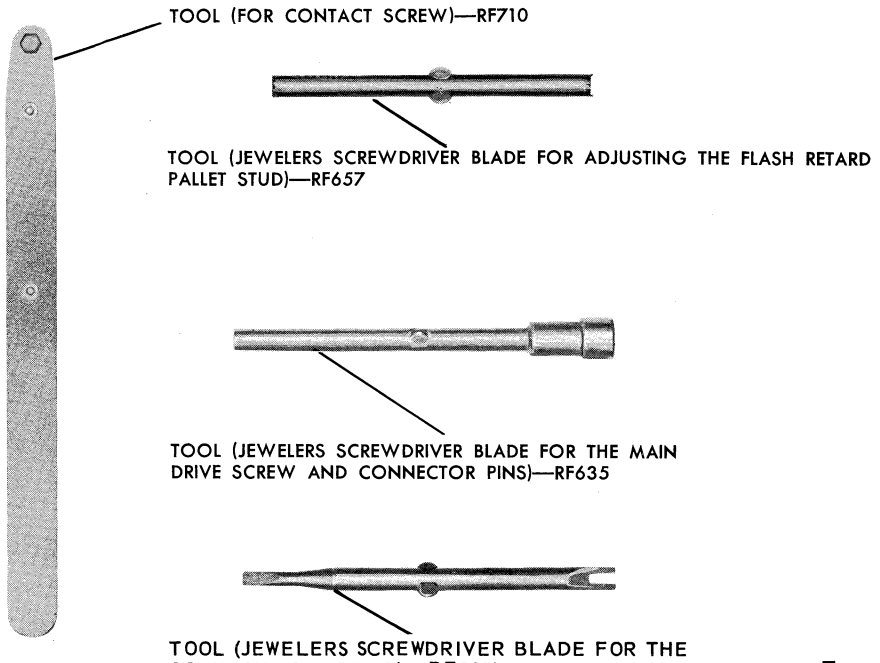


Figure 15

For key to symbols refer to page 9

KEY TO SYMBOLS

Symbol

A	Kodak Flash Supermatic Shutter with Kodak Ektar Lens, 105mm f/3.7
B	Kodak Flash Supermatic Shutter with Kodak Ektar Lens, 127mm f/4.7
C	Kodak Flash Supermatic Shutter with Kodak Ektar Lens, 203mm f/7.7
D	Graphic Flash Supermatic Shutter with Kodak Ektar Lens, 105mm f/3.7
E	Graphic Flash Supermatic Shutter with Kodak Ektar Lens, 127mm f/4.7
F	Graphic Flash Supermatic Shutter with Kodak Ektar Lens, 100mm f/6.3
G	Busch Flash Supermatic Shutter with Kodak Ektar Lens, 127mm f/4.7

FIG.	PART NUMBER	Shutter							PART NAME	No. REQD.
		A	B	C	D	E	F	G		
1	HE28486	x	x		x	x		x	Cap - Front lens	1
1	HE27073			x					Cap - Front lens	1
1	HE34070						x		Cap - Front lens	1
		x	x	x	x	x	x	x	Front Lens Assembly - Return shutter to Rochester for replacement	1
1	102977	x	x	x	x	x	x	x	Screw - Diaphragm pointer	1
1	104327	x	x	x	x	x	x	x	Diaphragm Pointer and Button Assembly	1
1	81492	x	x	x	x	x	x	x	Screw - Speed and diaphragm index plate locating	1
1	109279	x							Diaphragm Index Plate and Synchronizer Scale Assembly	1
1	109277		x						Diaphragm Index Plate and Synchronizer Scale Assembly	1
1	109278			x					Diaphragm Index Plate and Synchronizer Scale Assembly	1
1	109275				x				Diaphragm Index Plate and Synchronizer Scale Assembly	1
1	109270					x			Diaphragm Index Plate and Synchronizer Scale Assembly	1
1	109276						x		Diaphragm Index Plate and Synchronizer Scale Assembly	1
1	109551							x	Diaphragm Index Plate and Synchronizer Scale Assembly	1
1A	97079	x	x	x	x	x	x	x	Synchronizer Scale Assembly, Old Model	1
1A	96883	x	x	x	x	x	x	x	Nut - Synchronizer scale, old model	1
1A	107964	x	x	x	x	x	x	x	Scale - Synchronizer, new model	1
1A	101808	x	x	x	x	x	x	x	Knob - Synchronizer scale operating	1
1A	101810	x	x	x	x	x	x	x	Spring - Synchronizer scale operating knob, new model	1
1A	101809	x	x	x	x	x	x	x	Stud - Synchronizer scale operating knob, new model	1
2	68649	x	x	x	x	x	x	x	Ring - Speed control	1
2	105683	x	x	x	x	x	x	x	Winding Lever and Knob Assembly	1
2	104978	x	x	x	x	x	x	x	Knob - Winding lever, new model	1
2	68646	x	x	x	x	x	x	x	Cam - High speed spring	1
2	60828	x	x	x	x	x	x	x	Spring - High speed	1
2	82207	x	x	x	x	x	x	x	Screw - Main drive, old model	1
2	102974	x	x	x	x	x	x	x	Screw - Main drive, new model	1
2	94310	x	x	x	x	x	x	x	Pallet - Flash retard (For average time lag shutters)	1
2	100258	x	x	x	x	x	x	x	Flash Retard Pallet Assembly (For less than average time lag shutters)	1
3,8,8A	102957	x	x	x	x	x	x	x	Screw - Trigger latch spring (1), Safety latch spring (1) Contact lever (1)	3
3	94798	x	x	x	x	x	x	x	Spring - Trigger latch	1
3	102978	x	x	x	x	x	x	x	Screw - Cover, short	1
3	102979	x	x	x	x	x	x	x	Screw - Cover, long	1
3A	100913	x	x	x	x	x	x	x	Cover Assembly, Old Model	1
3A	122618	x	x	x	x	x	x	x	Cover Assembly, New Model	1
3A	85709	x	x	x	x	x	x	x	Lock - Cover	1
FIG.	PART NUMBER	Shutter							PART NAME	No. REQD.

FIG.	PART NUMBER	Shutter							PART NAME	No. REQD.
		A	B	C	D	E	F	G		
3A	85710	x	x	x	x	x	x	x	Rivet - Cover lock	1
3A	99801	x	x	x	x	x	x	x	Stud - Pallet	1
3A	99803	x	x	x	x	x	x	x	Bracket - Delayed action pinion	1
3A	35625	x	x	x	x	x	x	x	Rivet - Delayed action pinion bracket	2
3A	66173	x	x	x	x	x	x	x	Latch - Delayed action safety	1
3A	66163	x	x	x	x	x	x	x	Stud - Delayed action safety latch	1
3	56914	x	x	x	x	x	x	x	Spring - Safety latch	1
4	83470	x	x	x	x	x	x	x	Screw - Gear plate	2
4	107460	x	x	x	x	x	x	x	Retard Gear Plate and No. 1 Pinion Assembly	1
4	103643	x	x	x	x	x	x	x	Spring - No. 1 Sector	1
4	95379	x	x	x	x	x	x	x	No. 2 Retard Pinion and Gear Assembly	1
4	95380	x	x	x	x	x	x	x	No. 3 Retard Pinion and Gear Assembly	1
4	95381	x	x	x	x	x	x	x	No. 4 Escapement Wheel and Pinion Assembly	1
4	67763	x	x	x	x	x	x	x	Pallet - Retard	1
4	102647	x	x	x	x	x	x	x	Spring - Pallet bracket	1
4	68627	x	x	x	x	x	x	x	Pallet Bracket and Stud Assembly	1
5	79878	x	x	x	x	x	x	x	Spring - Main drive	1
5	99532	x	x	x	x	x	x	x	Main Drive Latch and Bushing Assembly	1
5	102954	x	x	x	x	x	x	x	Screw - Retard sector	1
5	56911	x	x	x	x	x	x	x	Spring - Retard sector	1
11A	95377	x	x	x	x	x	x	x	Retard Sector and Stud Assembly, Old Model	1
11A	103099	x	x	x	x	x	x	x	Retard Sector and Stud Assembly, New Model	1
5	104287	x	x	x	x	x	x	x	Bushing - Blade controller latch spring	1
5	62720	x	x	x	x	x	x	x	Spring - Blade controller latch	1
6	102955	x	x	x	x	x	x	x	Screw - Trigger	1
6	96881	x	x	x	x	x	x	x	Spring - Trigger	1
6	56847	x	x	x	x	x	x	x	Washer - Trigger	1
6	80874	x	x	x	x	x	x	x	Button - Trigger	1
6	79814	x	x	x	x	x	x	x	Rivet - Trigger button, old model	1
6	109257	x	x	x	x	x	x	x	Rivet - Trigger button, new model	1
6	94299	x	x	x	x	x	x	x	Latch - Trigger	
6	68645	x	x	x	x	x	x	x	Trigger	1
7	60824	x	x	x	x	x	x	x	Spring - Time lever	1
7	61825	x	x	x	x	x	x	x	Time Lever Assembly	1
7	61824	x	x	x	x	x	x	x	Bulb Lever Assembly	1
7	56908	x	x	x	x	x	x	x	Spring - Bulb lever	1
8,8A	94306	x	x	x	x	x	x	x	Spring - Contact lever	1
8,13	102823	x	x	x	x	x	x	x	Spring - Contact lever latch	1
8,13	106499	x	x	x	x	x	x	x	Contact Lever Assembly	1
8,8A	94320	x	x	x	x	x	x	x	Screw - Contact	1
8,8A	94322	x	x	x	x	x	x	x	Nut - Contact screw	1
8,8A	11189	x	x	x	x	x	x	x	Screw - Resistor	1
8,8A	95217	x	x	x	x	x	x	x	Resistor	1
8,8A	95104	x	x	x	x	x	x	x	Washer - Insulating	1
8,8A	94319	x	x	x	x	x	x	x	Insulator - Case	1
8,8A	95215	x	x	x	x	x	x	x	Screw - Ground connector	1
8,13	107085	x	x	x	x	x	x	x	Ground Contact Strip and Spring Assembly	1
8,8A	95212	x	x	x	x	x	x	x	Pin - Connector	2
8,8A	117850	x	x	x	x	x	x	x	Block - Connector	1
8,8A	104376	x	x	x	x	x	x	x	Screw - Connector block	2
9	94400	x	x	x	x	x	x	x	No. 1 Delayed Action Pinion and Gear Assembly, Old Model	1
9	102767	x	x	x	x	x	x	x	No. 1 Delayed Action Pinion and Gear Assembly, New Model	1
9	94309	x	x	x	x	x	x	x	Spring - Delayed action winding	1
9	101984	x	x	x	x	x	x	x	Screw - Clutch, old model (1), Star Wheel Assembly (1)	2
9	56924	x	x	x	x	x	x	x	Clutch Assembly	1
9,13	104217	x	x	x	x	x	x	x	Star Wheel Assembly, New Model	1
10	HE34040						x		Cap - Rear lens	1
10	61002	x	x	x	x	x	x		Collar - Shutter retaining	1
10	80503							x	Ring - Shutter retaining	1
10		x	x	x	x	x	x	x	Rear Lens Assembly (Return shutter to Rochester for replacement)	1
10	102980	x	x	x	x	x	x	x	Screw - Shutter locating	1
		A	B	C	D	E	F	G		
FIG.	PART NUMBER	Shutter							PART NAME	No. REQD.

FIG.	PART NUMBER	Shutter							PART NAME	No. REQD.
		A	B	C	D	E	F	G		
10	104286	x	x	x	x	x	x	x	Screw - Mechanism plate to case, short	2
10	102956	x	x	x	x	x	x	x	Screw - Mechanism plate to case, long	1
11A		x	x	x	x	x	x	x	Mechanism Plate Assembly, Old Model, Discontinued - Replace with: New Model Mechanism Plate Assembly -102768 New Model Retard Sector Assembly - 103099 New Model Delayed Action Pinion and Gear Assembly -102767 Kit Assembly - 121351	
11A	102768	x	x	x	x	x	x	x	Mechanism Plate Assembly, New Model	1
11		x	x	x	x	x	x	x	Blade Controller Assembly, Old Model Discontinued - Replace with new model Blade Controller Assembly - 94898	1
11	94298	x	x	x	x	x	x	x	Blade Controller Assembly, New Model	1
11	73426	x	x	x	x	x	x	x	Blade with Stud Assembly	4
11	86130	x	x	x	x	x	x	x	Blade with Double Blade Bushing and Stud Assembly	1
11	75907	x	x	x	x	x	x	x	Blade	1
11	73432	x	x	x	x	x	x	x	Diaphragm Retainer Plate Assembly	1
11	60816	x	x	x	x	x	x	x	Wing - Diaphragm	5
11	55321	x	x	x	x	x	x	x	Screw - Diaphragm retainer plate to mechanism plate	5
12	93262	x	x	x	x	x	x	x	Ring - Diaphragm	1
12	104352	x	x	x	x	x	x	x	Button - Setting lever, new model	1
12		x	x	x	x	x	x	x	Button - Setting lever, old model discontinued - Replace with New Model Button - 104352	1
12	60832	x	x	x	x	x	x	x	Spring, Setting lever	1
12	100911	x	x	x	x	x	x	x	Setting Lever Assembly	1
12A	102975	x	x	x	x	x	x	x	Screw - Blade arrestor ferrule	2
12A	81525	x	x	x	x	x	x	x	Ferrule - Blade arrestor	1
12A	81091	x	x	x	x	x	x	x	Button - Blade arrestor	1
12A	81526	x	x	x	x	x	x	x	Spring - Blade arrestor	1
12A	102351	x	x	x	x	x	x	x	Screw - Cable release opening	1
12A	100912	x	x	x	x	x	x	x	Case Assembly	1
12A	56100	x	x	x	x	x	x	x	Screw - Cable release bushing (Designed to facilitate repairing)	2
12A	122543	x	x	x	x	x	x	x	Bushing - Cable release (Designed to facilitate repairing)	1
12A	60831	x	x	x	x	x	x	x	Stud - Setting lever spring	1
13	121351	x	x	x	x	x	x	x	Kit (For replacing the Old Model Flash Contact Parts, the Old Model Star Wheel, and the Old Model Mechanism Plate.)	1
14	120987	x	x	x					Synchronizer Cord Assembly	1
14		x	x	x					7-inch No. 5 Kodak Metal Cable Release	1
15	RF503-L	x	x	x	x	x	x	x	Tool (Jewelers screwdriver blade for contact screw nut)	1
15	RF657	x	x	x	x	x	x	x	Tool (Jewelers screwdriver blade for adjusting the Flash Retard Pallet Stud)	1
15	RF635	x	x	x	x	x	x	x	Tool (Jewelers screwdriver blade for the Main Drive Screw and Connector Pins)	1
15	RF710	x	x	x	x	x	x	x	Tool (For Contact Screw)	1
		A	B	C	D	E	F	G		
FIG.	PART NUMBER	Shutter							PART NAME	No. REQD.

Lithographed in the United States of America

Numerical List

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
RF503-L	11	15	81525	11	12A	102647	10	4
RF635	11	15	81526	11	12A	102767	10	9
RF657	11	15	82207	9	2	102768	11	11A
RF710	11	15	83470	10	4	102823	10	8,13
11189	10	8,8A	85709	9	3A	102954	10	5
HE27073	9	1	85710	10	3A	102955	10	6
HE28486	9	1	86130	11	11	102956	11	10
HE34040	10	10	93262	11	12	102957	9,10	3,8,8A
HE34070	9	1	94298	11	11	102974	9	2
35625	10	3A	94299	10	6	102975	11	12A
55321	11	11	94306	10	8,8A	102977	9	1
56100	11	12A	94309	10	9	102978	9	3
56847	10	6	94310	9	2	102979	9	3
56908	10	7	94319	10	8,8A	102980	10	10
56911	10	5	94320	10	8,8A	103099	10	11A
56914	10	3	94322	10	8,8A	103643	10	4
56924	10	9	94400	10	9	104217	10	9,13
60816	11	11	94798	9	3	104286	11	10
60824	10	7	95104	10	8,8A	104287	10	5
60828	9	2	95212	10	8,8A	104327	9	1
60831	11	12A	95215	10	8,8A	104352	11	12
60832	11	12	95217	10	8,8A	104376	10	8,8A
61002	10	10	95377	10	11A	104978	9	2
61824	10	7	95379	10	4	105683	9	2
61825	10	7	95380	10	4	106499	10	8,13
62720	10	5	95381	10	4	107085	10	8,13
66163	10	3A	96881	10	6	107460	10	4
66173	10	3A	96883	9	1A	107964	9	1A
67763	10	4	97079	9	1A	109257	10	6
68627	10	4	99532	10	5	109270	9	1
68645	10	6	99801	10	3A	109275	9	1
68646	9	2	99803	10	3A	109276	9	1
68649	9	2	100258	9	2	109277	9	1
73426	11	11	100911	11	12	109278	9	1
73432	11	11	100912	11	12A	109279	9	1
75907	11	11	100913	9	3A	109551	9	1
79814	10	6	101808	9	1A	117850	10	8,8A
79878	10	5	101809	9	1A	120987	11	14
80503	10	10	101810	9	1A	121351	11	13
80874	10	6	101984	10	9	122543	11	12A
81091	11	12A	102351	11	12A	122618	9	3A
81492	9	1						

EASTMAN KODAK COMPANY

ROCHESTER 4, N. Y.

DECEMBER 1949 S. M. No. 1-1490

How to repair ...

Kodak

FLASH SUPERMATIC SHUTTERS

- For Kodak Medalist II Camera
- With Kodak Ektar f/4.7 127mm., f/3.7 105mm., and f/7.7 203mm. Lenses

Eastman Kodak Company · Rochester 4, N.Y.

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Kodak Flash Supermatic Shutter for Kodak Medalist II Camera

Kodak Flash Supermatic Shutter with Kodak Ektar f/4.7 127mm, f/3.7 105mm, and f/7.7 203mm Lenses

• *Capitalized words in the text indicate nomenclature which appears on illustrations. Such nomenclature, when not followed by a direct figure reference, will be found on the figure indicated in the last preceding figure reference.*

KODAK FLASH SUPERMATIC SHUTTER

FOR THE KODAK MEDALIST II CAMERA

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Solenoid will not work flash shutter	Shutter not designed for use with a solenoid.	
Synchronizer scale does not operate	Scale rivet pulled out.	Fit new rivet and readjust the scale.
Shutter does not trip easily	Bind in the operating DISK, figure 11, at the bearing NUT.	Clean thoroughly. Use powdered graphite. Blow off excess.
	Possible burr on TRIGGER and collar ASSEMBLY, figure 5.	Burnish the trigger and collar assembly at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 7, when in a set position.
No Kodatron contact	The BLADE CONTROLLER CONTACT STUD, figure 14, is not touching the CONTACT SPRING, figure 8.	Adjust the contact spring so that it touches the contact stud on the blade controller when the blades are almost fully opened. It is possible to make the adjustment after removing the front lens mount.
Shutter blades remain open on high speeds	Plate blade studs missing on mechanism plate.	Replace and restake the studs carefully to avoid swelling the top of the studs.
	Split shutter blades.	Replace the shutter blades.
	Loose studs on the shutter blades.	Replace the shutter blades.
Shutter does not set	The TRIGGER LATCH, figure 5, is not returning to its proper position after the shutter has been released.	The trigger latch may be bent and binding on the speed index plate or cover.
		It may be necessary to reduce the tension on the TRIGGER LATCH SPRING, figure 3.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear.	Replace the pinion gear assembly.
	The CLUTCH ASSEMBLY, figure 4, is slipping.	Replace the clutch assembly.
	The latch point on the contact LEVER COMPLETE, figure 8, is damaged.	Replace the contact lever complete.
Shutter speeds slow	Retard gears dirty.	Remove and clean the retard gears.
	The MAIN DRIVE SPRING, figure 7, is weak.	Replace the main drive spring.

TROUBLE	CAUSE	REMEDY
Shutter speeds slow (cont'd)	Shutter blades binding.	Remove and clean the shutter blades. If necessary, replace the blades.
	Excessive retard sector travel.	Swedge the SPEED CONTROL RING, figure 2, at the area controlling the slow speed. (See figure 1.)
	Blade controller with contact stud binding.	Re-form the diaphragm retainer plate to allow more clearance between the plate and the mechanism plate. Be sure the blade controller is flat.
Shutter speeds fast	Insufficient retard sector travel.	File the speed ring at the area controlling the fast speed. (See figure 1.)
	Insufficient pallet engagement (on speeds 1/10 second or slower).	1. Remove material on the speed control ring in the area of contact with the pallet bracket stud. 2. Check for bind of the PALLET BRACKET, figure 6, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 12.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the top of the studs.
	BLADE CONTROLLER with contact stud, figure 13, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub of the mechanism plate.	Replace the blade controller.
	Too much play between the mechanism plate and the diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 13, due to retainer plate being bowed.	Replace the diaphragm retainer plate with wings assembled.
	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.

TROUBLE	CAUSE	REMEDY
Shutter blades buckle (cont'd)	Blades opening too far.	File and burnish the blade controller LATCH at point "A". (See figure 7.)
	Blades closing too far.	Swedge mechanism plate at "B", figure 14.
	No clearance between the blade controller latch and the BLADE CONTROLLER LUG, figure 14, when the shutter is in the tripped position.	Swedge the mechanism plate at point "C," figure 14, such that this point acts as a stop for the SETTING LEVER with stop stud, figure 12.
Shutter operates instantaneously on B (bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.
Both flash settings are below the millisecond tolerances (fast).	The tension is too great on the WINDING GEAR SPRING, figure 4.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on both the F and M flash settings.
Both flash settings are above the millisecond tolerances (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover or on the speed INDEX PLATE, figure 2.	Try lubricant, or replace the WINDING LEVER, figure 2.
The F (short stroke) is within the millisecond tolerances but the M (long stroke) is fast	THE FLASH RETARD PALLET, figure 3, is not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the binding point. File the plate at this point to allow clearance for the pallet.
Constant flash short	Cracked contact insulating BLOCK, figure 8.	Replace the contact insulating block. The shutter should be checked independently of the camera. If the shutter is working properly, refit it to the camera. If the short persists, check the case insulating bushing NUT, figure 8, to see that it or any part of the contact wire is not touching the focusing tube or light guard.
	The contact spring may be bent and touching either the contact lever or the cover.	Re-form the contact spring.
Both flash settings are extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.

TROUBLE	CAUSE	REMEDY
Both flash settings are extremely fast (cont'd)	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly toward the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter. 2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.

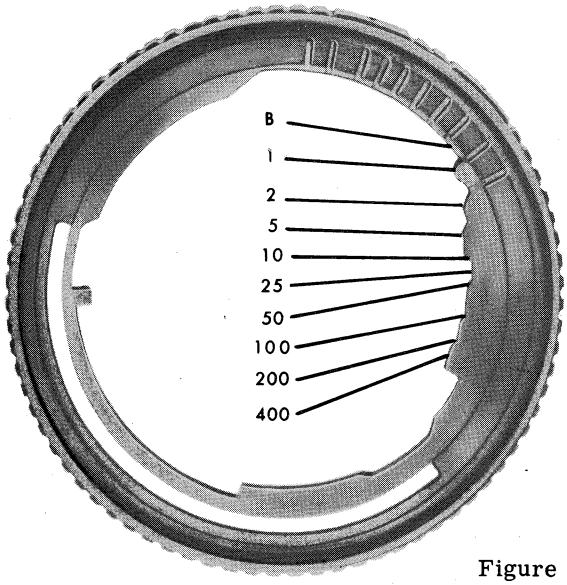

Figure 1

DISASSEMBLY AND REASSEMBLY

DIAPHRAGM CONTROL RING

The sequence of disassembly is as follows:
1. Front lens mount, using Tool No. 501-0.
2. Diaphragm control ring RETAINER WITH SYNCHRO SCALE, figure 2.
3. Diaphragm control RING SPRINGS (one or two).
4. DIAPHRAGM CONTROL RING.

The sequence of reassembly is as follows:
1. Diaphragm control ring, fitting the notch opposite the pointer over the projecting lever on the DIAPHRAGM RING, figure 2.
2. Diaphragm control ring springs (one or two).
3. Diaphragm control ring retainer with synchro scale.
4. Front lens mount, using Tool No. 501-0.

SPEED CONTROL RING

The sequence of disassembly is as follows:
1. Diaphragm control ring, paragraphs 1-4 above.
2. DIAPHRAGM CLICK STOP SPRING, figure 2.
3. Speed and diaphragm INDEX PLATE and the SPEED ring CLICK STOP SPRING.
4. SPEED CONTROL RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be readjusted.

The sequence of reassembly is as follows:
1. Speed control ring with shutter in tripped position. Be sure the projecting lug on the BULB LEVER ASSEMBLY, figure 5, the studs on the retarding SECTOR WITH STUD, figure 6, and the PALLET BRACKET with stud assembly are resting against the inside edge of the speed control ring and are not underneath the ring.
2. Speed ring click stop spring. The crimped side of the spring should face toward the back of the shutter.
3. Speed and diaphragm index plate.
4. Diaphragm click stop spring.
5. Diaphragm control ring, paragraphs 1-4 above.

WINDING LEVER

The sequence of disassembly is as follows:
1. Diaphragm control ring, paragraphs 1-4 above.
2. Speed control ring, paragraphs 2-4, above.
3. WINDING LEVER, figure 2.

The sequence of reassembly is as follows:
1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.
2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 4. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the

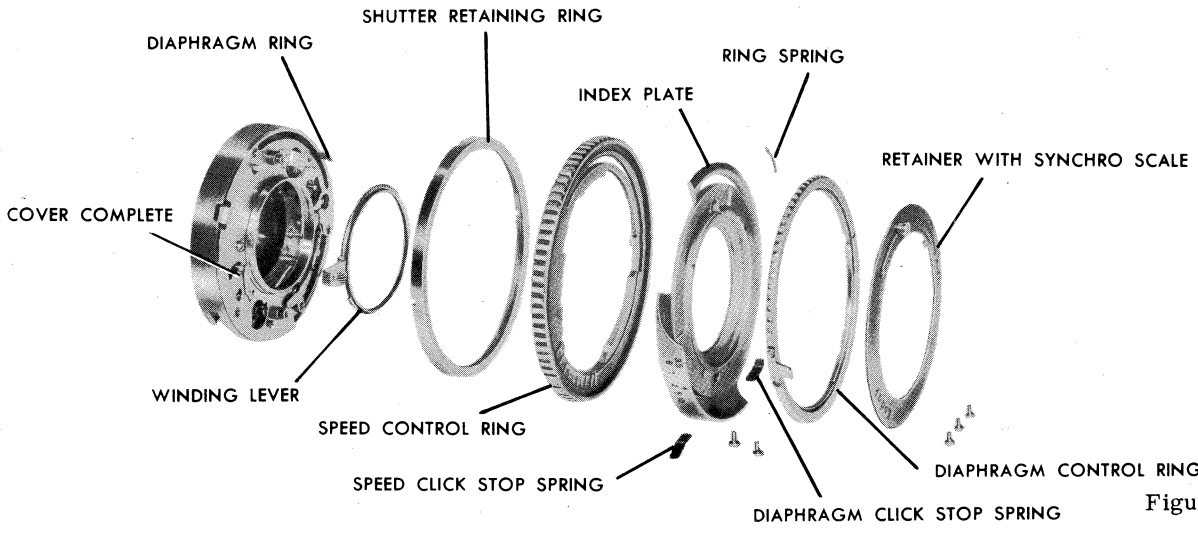

Figure 2

approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 5, as it may release the winding gear spring tension.

Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension on the TRIGGER LATCH SPRING, figure 3. Check for a bind between the trigger latch and the TRIGGER ASSEMBLY, figure 5, at the point of attachment. The winding lever should contact the trigger latch; push the latch out of the slot in the cover and open the shutter blades. After the shutter has been tripped, the latch should return to a position where it is resting on the ledge just above the small slot in the cover.

After the trigger is depressed, allow it to return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.

4. Speed control ring, paragraphs 1-5, page 7.

COVER COMPLETE

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. TRIGGER LATCH SPRING, figure 3.
5. TRIGGER LATCH, figure 5.
6. High speed spring CAM, figure 7, and the HIGH SPEED SPRING.
7. FLASH RETARD PALLET, figure 3.
8. SHUTTER RETAINING RING, figure 2.
9. COVER COMPLETE, figure 3.

The sequence of reassembly is as follows:

1. Cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the contact LEVER COMPLETE, figure 8. Be sure the latch does not bind.
4. Trigger latch spring; do not fasten securely. Lift the loose end of the spring over the trigger latch until it is at a point half way between the latch and the central collar. Then secure the spring. Place the spring against the outside edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.
5. Shutter retaining ring.
6. Winding lever, paragraphs 1-3, page 7.
7. Flash retard pallet, on the eccentric stud. Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.
8. High speed spring and the high speed spring cam.
9. Winding lever, paragraph 4, page 8.

WINDING GEAR, CLUTCH ASSEMBLY, and STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. Cover complete, paragraphs 4-9, page 8.

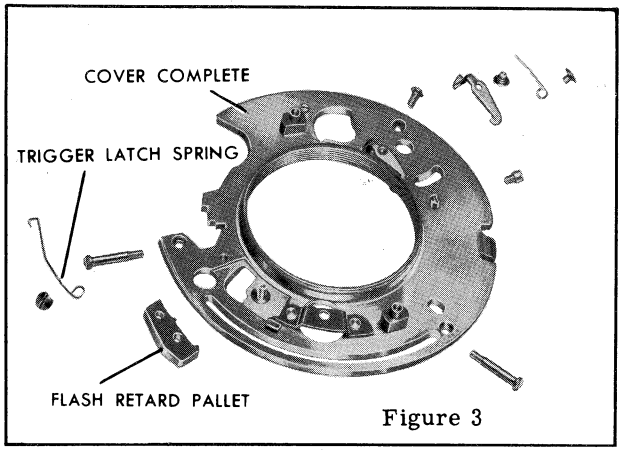

Figure 3

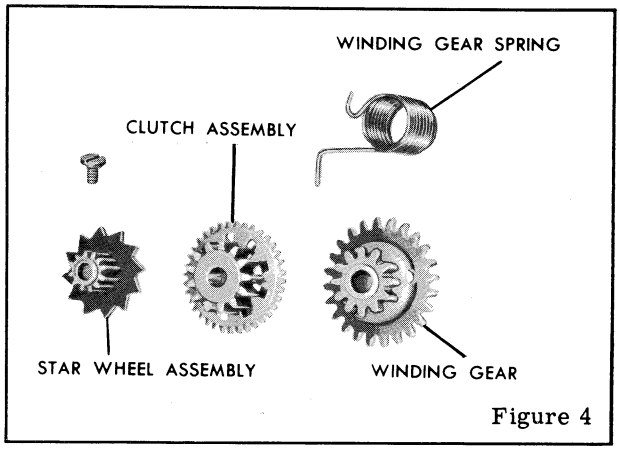

Figure 4

5. WINDING GEAR, figure 4, and the WINDING GEAR SPRING.
6. CLUTCH ASSEMBLY.
7. STAR WHEEL assembly.

The sequence of reassembly is as follows:

1. Winding gear and the winding gear spring on the WINDING GEAR STUD, figure 14.
2. Star wheel assembly.
3. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear on the clutch assembly should turn freely only in a clockwise direction when the lower gear of the clutch assembly is held tight.
4. Cover complete, paragraphs 1-9, page 8.

TRIGGER ASSEMBLY AND BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. Cover complete, paragraphs 4-9, page 8.
5. Unhook the MAIN DRIVE SPRING, figure 7, from the MAIN DRIVE SPRING STUD, figure 14.
6. TRIGGER SCREW, figure 5, TRIGGER SPRING, TRIGGER WASHER.
7. TRIGGER ASSEMBLY, bulb lever SPACERS, BULB LEVER ASSEMBLY, and BULB LEVER SPRING.

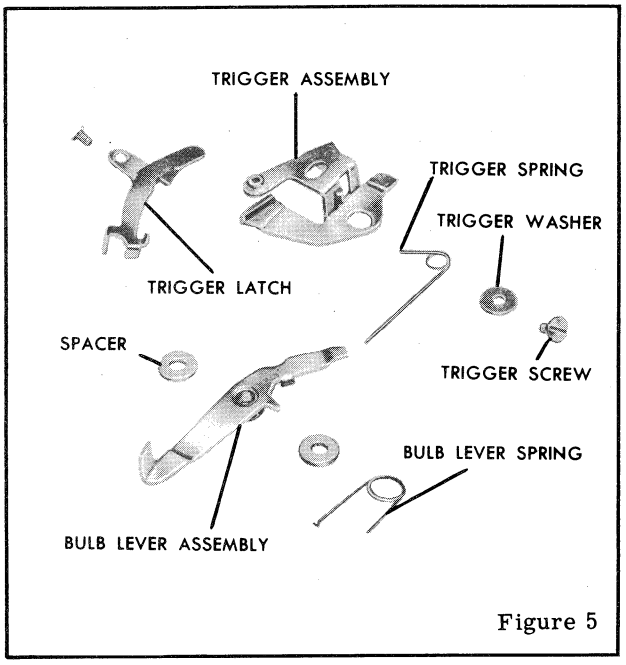

Figure 5

The sequence of reassembly is as follows:

1. One bulb lever spacer on the BULB LEVER STUD, figure 14.
2. With the bulb lever spring underneath, hold the trigger assembly with the oval hole up and insert the bulb lever assembly between that part of the trigger which is operated by the cable release and the upper part of the trigger. Insert the projecting lug on the bulb lever through the rectangular opening on the trigger.
3. Remaining bulb lever spacer between the top of the trigger and the top of the bulb lever assembly.
4. With the hooked end of the bulb lever spring turned in a clockwise direction, guide the parts down over the bulb lever stud. Insert the hooked end of the bulb lever spring into the small hole in the side of the case.
5. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the main drive spring stud, and rest it against the stud.
6. Hook the loose end of the main drive spring onto the main drive spring stud.
7. Cover complete, paragraphs 1-9, page 8.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. Cover complete, paragraphs 4-9, page 8.
5. Retard GEAR PLATE SCREW, figure 6, near the retarding SECTOR WITH STUD.
6. Retard gear plate ANTI-BACKLASH SPRING.

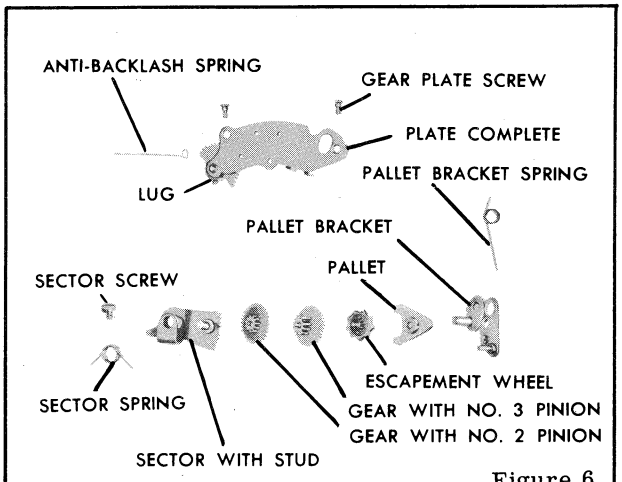

Figure 6

7. Unhook the retard PALLET BRACKET SPRING. Remove the remaining retard gear plate screw.
8. Retard gear PLATE COMPLETE.
9. Retard GEAR WITH NO. 2 PINION assembly.
10. Retard GEAR WITH NO. 3 PINION assembly.
11. ESCAPEMENT WHEEL with No. 4 pinion assembly.
12. Retard PALLET.
13. PALLET BRACKET with stud assembly and the pallet bracket spring.

NOTE: If the retard gears are dirty, clean all the parts of the gear train and the retard gear bearing holes in the mechanism plate thoroughly.

14. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
15. Set the shutter.
16. Retarding sector with stud and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the sector spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 7.
4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET SPRING STUD, figure 14. The long end of the spring should rest against the case.
5. Retard pallet.
6. Escapement wheel with No. 4 pinion assembly.
7. Retard gear with No. 3 pinion assembly.
8. Retard gear with No. 2 pinion assembly.
9. Retard gear plate complete, with the teeth of the gear facing the shutter blades.
10. Retard gear plate screw, near the pallet bracket.
11. Lift up the gear end of the gear plate until the teeth of the retarding sector with stud pass freely under the gear. Place the retarding sector so that when the gear teeth are meshed the outer edge of the sector will be approximately 1/8 inch from the shutter case.
12. Retard gear plate anti-backlash spring, on the RETARD GEAR PLATE STUD, figure 14. Line up the opening in the spring with the hole in the gear plate. Replace but do not tighten the remaining gear plate screw. The spring should be parallel to the shutter case. Holding the spring in this position, tighten the gear plate screw. Hook the end of the anti-backlash spring on the retard plate gear LUG, figure 6.
13. Place the long end of the pallet bracket spring against the inside edge of the lug on the retard gear plate complete.
14. Cover complete, paragraphs 1-9, page 8.

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. Cover complete, paragraphs 4-9, page 8.
5. Unhook the LATCH SPRING, figure 7, from the main drive LATCH.
6. Unhook the MAIN DRIVE SPRING from the main drive spring stud.
7. Set the shutter.
8. MAIN DRIVE ASSEMBLY, to which is attached the main drive spring.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 12; on the MAIN DRIVE STUD, figure 14; on the LATCH, figure 7, at the point of contact with the LATCH SPRING, and on the latch where it contacts the RETARDING SECTOR STUD, figure 14. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud into the assembly.

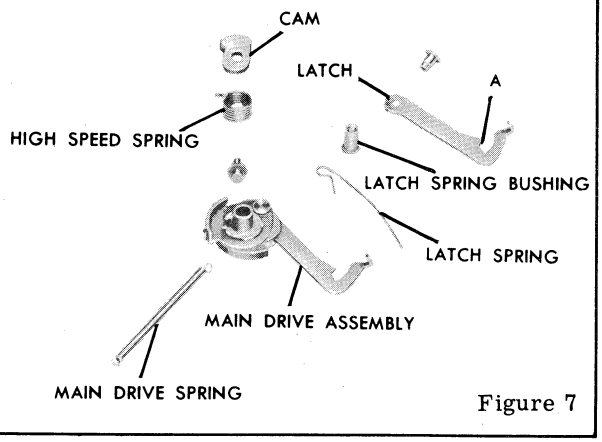

Figure 7

3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG. The cutout portion of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on tip of the latch.
4. Main drive spring.
5. Cover complete, paragraphs 1-9, page 8.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. Cover complete, paragraphs 4-9, page 8.
5. CONTACT WIRE BUSHING, figure 8, the contact WIRE, and the connector screw NUT.
6. CASE INSULATING BUSHING and the CONNECTOR SCREW.
7. CONTACT SPRING.
8. Contact insulating BLOCK.
9. Contact LEVER COMPLETE.

The sequence of reassembly is as follows:

1. Contact insulating block.
2. If a new contact lever is to be used, place the contact LEVER LATCH SPRING, figure 8, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the contact lever spring clockwise, with respect to the bushing, at least 15 degrees.
3. Contact lever complete on the contact lever stud. The ends of the contact lever spring should face in, toward the shutter blades.

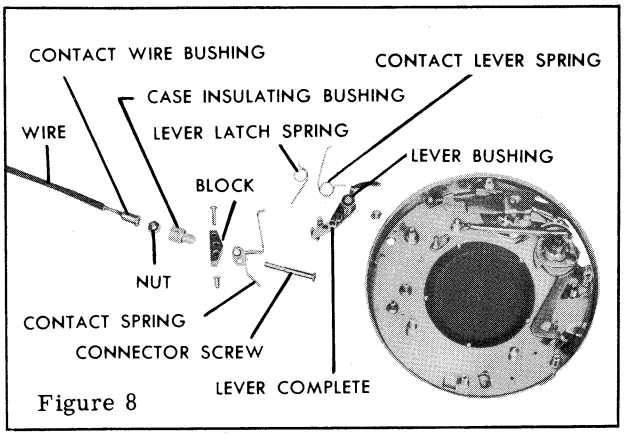

Figure 8

Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

CAUTION: The contact lever tail is burnished and must remain in that condition.

4. Contact spring.
5. Case insulating bushing with the flat side facing the outer rim of the case.
6. Connector screw and connector screw nut.
7. Contact wire bushing and contact wire.
8. Release the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 12. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 14, makes slight contact with the contact spring stud before the blades are fully open. If the spring does not touch the stud, bend the end of the spring toward the stud.
9. Cover complete paragraphs 1-9, page 8.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always trip the shutter blades when the trigger is released very slowly. Set the shutter and the winding lever. Release the shutter, allowing the winding lever to return slowly. The winding lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and the winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the Trouble Chart. (Both flash settings extremely fast; see page 5).

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, the lever must return fully and become locked in the unwound position.

The flash settings on the shutter should be timed with reliable shutter testing equipment. The tolerances of the delayed action in the shutter for synchronization with the flash bulbs are as follows:

F (short stroke)*	3 1/2--5 1/2 milliseconds.
M (long stroke)*	12--16 milliseconds.

*From instant of contact until the shutter blades first begin to show light.

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutter has been achieved by a change in the design of the flash contact parts. The old-style parts, which are to be discarded, are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No.121352 — Supplement to Parts List No. 1-1490.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. CONTACT WIRE BUSHING, figure 9, the contact WIRE, and the connector screw NUT.
2. CASE INSULATING BUSHING and the CONNECTOR SCREW.
3. CONTACT SPRING.
4. CONTACT BRACKET with contact point ASSEMBLY.
5. Contact insulating BLOCK.
6. Contact LEVER COMPLETE.
7. DETENT SPRING AND ROLLER SCREW, DETENT SPRING AND ROLLER WASHER, and DETENT SPRING AND ROLLER ASEMBLY.
8. CONTACT ESCAPEMENT WHEEL.

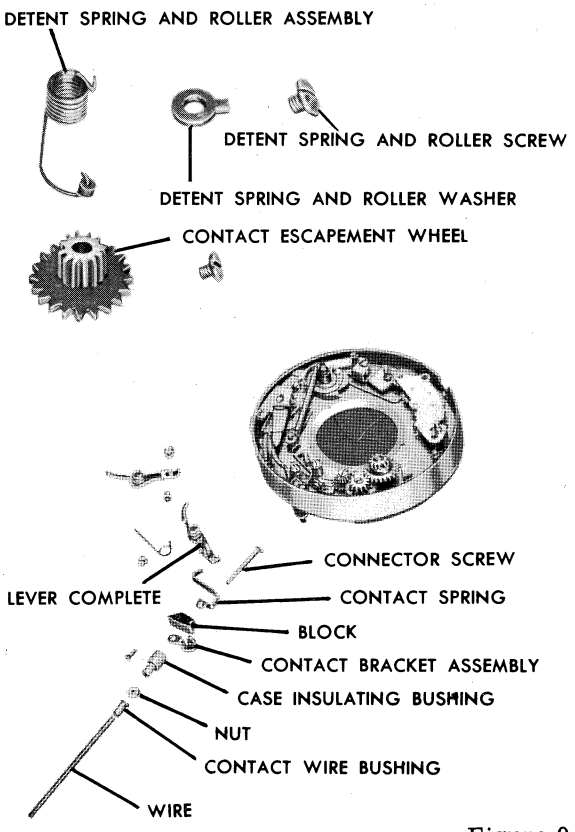

Figure 9

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Contact insulating block.
2. Place the contact LEVER LATCH SPRING, figure 8, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the contact lever spring clockwise, with respect to the bushing, at least 15 degrees.
3. Contact lever complete on the contact lever stud. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

   CAUTION: The contact lever tail is burnished and must remain in that condition.

4. Contact spring.
5. Case insulating bushing with the flat side facing the outer rim of the case.
6. Connector screw and connector screw nut.
7. Contact wire bushing and contact wire.
8. Cock and release the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 12. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 14, makes slight contact with the contact spring when the blades are fully open. If the spring does not touch the stud, bend the end of the spring toward the stud.
9. STAR WHEEL ASSEMBLY, figure 4.
10. Replace the cover complete and the winding lever.
11. Cock the shutter; then press the trigger to release the shutter. At the same time hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the trigger latch spring is desirable. There

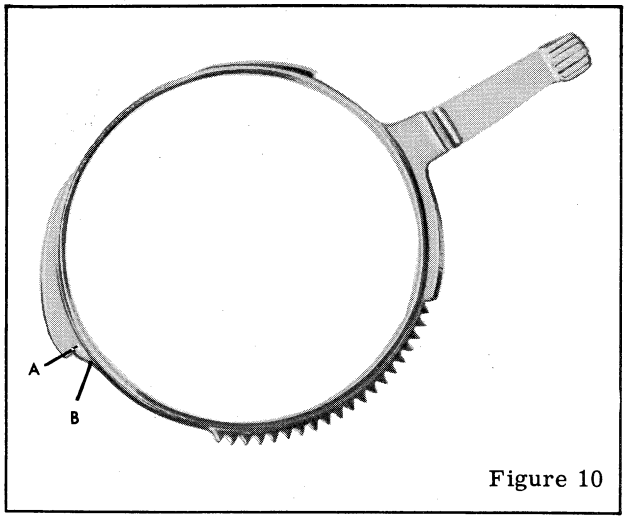

Figure 10

must be approximately .005-inch clearance between the contact lever tail and that portion of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance or if there is excessive clearance the spacing may be controlled by bending the contact lever tail in or out.

Allow the winding lever to go to the "at rest" position. Depress the trigger and watch to see that the flash contacts do not close. If they close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical portion of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

With the shutter tripped there must be approximately .005-inch clearance between the contact latch spring lug and the side of the contact lever. This is to assure full pressure of the contact lever latch into the star wheel.

While pressing the trigger down fully, watch the contacts to make sure that they do not close at any time. If they close, the contact lever tail on the contact lever has been bent too far and it should be moved back slightly. If necessary, the winding lever should be stoned at point "A", figure 10. Corner "B" must be square.

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Diaphragm control ring, paragraphs 1-4, page 7.
2. Speed control ring, paragraphs 2-4, page 7.
3. Winding lever, paragraph 3, page 7.
4. Cover complete, paragraphs 4-9, page 8.
5. Winding gear, clutch assembly, and star wheel assembly, paragraphs 5-7, page 8.
6. Trigger assembly and bulb lever assembly, paragraphs 5-7, page 9.
7. Retard gear train, paragraphs 5-16, page 9.
8. Main drive assembly, paragraphs 5-8, page 10.
9. Flash contact parts, paragraphs 5-9, page 11.
10. Rear lens mount.
11. Shutter operating disk bearing NUT, figure 11.
12. Shutter operating DISK and the shutter operating disk SPACER.
13. Blade controller LATCH SPRING BUSHING, figure 7, and the LATCH SPRING.
14. MECHANISM PLATE, figure 12.
15. Diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 13.
16. Shutter blades.
17. BLADE CONTROLLER.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid bending and clean their surfaces with a soft cloth. Fingerprints on the blades will cause corrosion.
2. Blade controller.

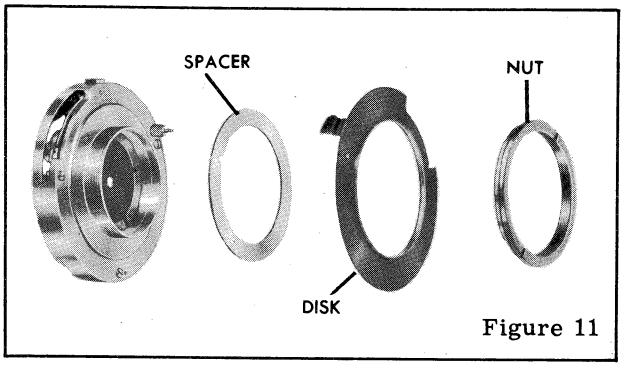

Figure 11

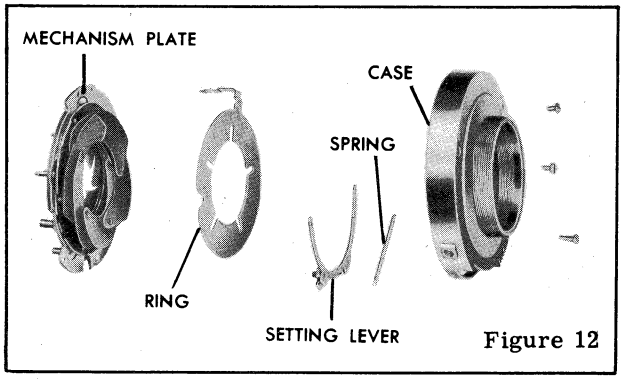

Figure 12

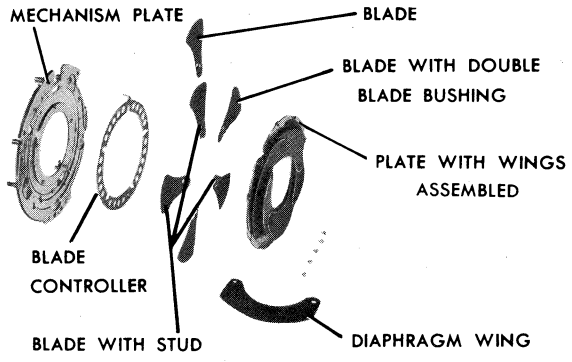

Figure 13

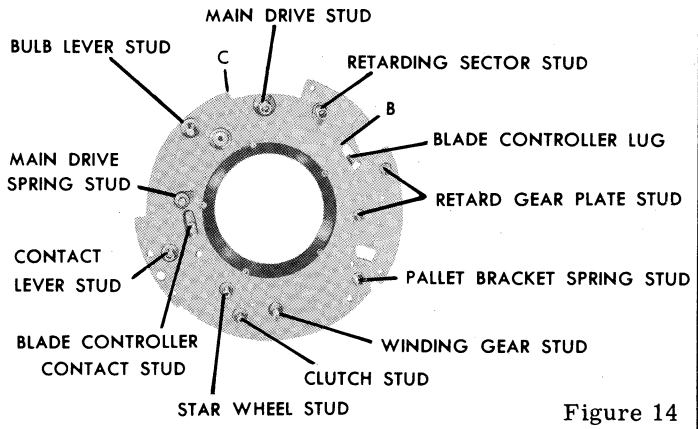

Figure 14

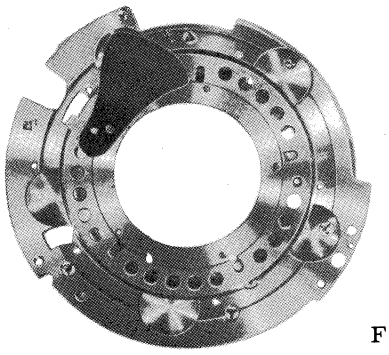

Figure 15

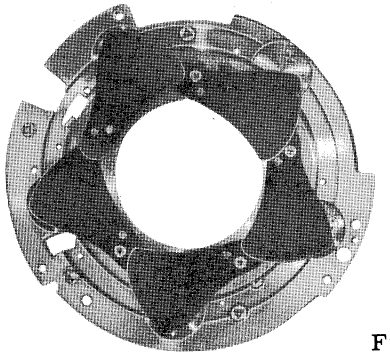

Figure 16

3. BLADE WITH DOUBLE BLADE BUSHING and stud, with the hole in the blade over the stud on the mechanism plate near the BLADE CONTROLLER LUG, figure 14. Refer to figure 15 for positioning of the shutter blade,
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 13, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. BLADE, over the blade with double blade bushing and stud. The back of the mechanism plate should appear as shown in figure 16.
6. Diaphragm retainer plate with wings assembled, with the cutout slot in the outer edge of the retainer plate over the opening in the mechanism plate for the PALLET BRACKET with stud assembly, figure 5. After the diaphragm retainer plate is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.
8. The shutter CASE, figure 12, diaphragm RING, and the SETTING LEVER with stop stud should be thoroughly cleaned. Apply a thin film of grease (Texaco Unitemp-RCX149 Grease) in the recess in the case occupied by the setting lever. Then wipe this area lightly with a clean cloth.
9. Diaphragm ring. Turn the ring until the projecting arm is near the cable release nut.
10. Setting lever with stop stud, with the setting lever SPRING extending through the opening in the case with the stop stud near the cable release nut.
11. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the diaphragm ring. After the plate is secured, the diaphragm ring, the setting lever, and the shutter blades should operate freely. Secure the loose end of the setting lever spring.
12. Blade controller latch spring bushing and latch spring.
13. Shutter operating disk spacer and shutter operating disk.
14. Shutter operating disk bearing nut.
15. Flash contact parts, paragraphs 1-8, page 11.
16. Main drive assembly, paragraphs 1-4, page 10.
17. Retard gear train, paragraphs 1-13, pages 9 and 10.
18. Trigger assembly, and bulb lever assembly, paragraphs 1-6, page 9.
19. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-4, page 9.
20. Rear lens mount.

KODAK FLASH SUPERMATIC SHUTTER

With Kodak Ektar f/4.7 127mm, f/3.7 105mm, and f/7.7 203mm Lenses

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Solenoid will not work flash shutter	Shutter not designed for use with a solenoid.	
Synchronizer scale does not operate	Scale rivet pulled out.	Fit new rivet and readjust the scale.
Shutter does not trip easily	Possible burr on TRIGGER, figure 20.	Burnish the trigger at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 7, when in a set position.
No Kodatron contact	BLADE CONTROLLER CONTACT STUD, figure 20, is not touching the CONTACT SPRING, figure 21.	Adjust the contact spring so that it touches the contact stud on the blade controller when the blades are almost fully opened. It is possible to make the adjustment after removing the front lens mount. There must be no contact when the blades are held open with the blade arrestor.
Shutter blades remain open on high speeds	Plate blade studs missing on mechanism plate. Split shutter blades. Loose studs on shutter blades.	Replace and restake the studs carefully to avoid swelling the top of the studs. Replace the shutter blades. Replace the shutter blades.
Shutter does not set	The TRIGGER LATCH, figure 20, is not returning to its proper position after the shutter has been released.	The trigger latch is bent and binding on the speed index plate or cover. It may be necessary to reduce the tension on the TRIGGER LATCH SPRING, figure 19.
The winding lever does not hold when the shutter is set	The winding gear pinion is loose on the gear. The CLUTCH ASSEMBLY, figure 4, is slipping. The latch point on the contact LEVER COMPLETE, figure 21, is damaged.	Replace the pinion gear assembly. Replace the clutch assembly. Replace the contact lever complete.
Shutter speeds slow	Retard gears dirty. The MAIN DRIVE SPRING, figure 7, is weak.	Remove and clean the retard gears. Replace the main drive spring.

TROUBLE	CAUSE	REMEDY
Shutter speeds slow (cont'd)	Shutter blades binding.	Remove and clean the shutter blades. If necessary, replace the blades.
	Excessive retard sector travel.	Swedge the speed control RING, figure 18, at the area controlling the slow speed (see figure 17).
	Blade controller binding.	Re-form the diaphragm retainer plate to allow more clearance between the plate and the mechanism plate.
		Be sure the blade controller is flat.
Shutter speeds fast	Insufficient retard sector travel.	File the speed control ring at the area controlling the fast speed (see figure 17).
	Insufficient pallet engagement (on shutter speeds 1/10 second or slower).	Remove the material on the speed control ring in the area of contact with the pallet bracket stud.
		Check for bind of the PALLET BRACKET, figure 6, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Clean the gear train thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 23.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the top of the stud.
	BLADE CONTROLLER with contact stud, figure 13, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight on the central hub of the mechanism plate.	Replace the blade controller.
	Too much play between mechanism plate and diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 13, due to retainer plate being bowed.	Replace the diaphragm retainer plate with wings assembled.
	Burr or roughness on diaphragm retainer plate with wings assembled.	Replace the plate.

TROUBLE	CAUSE	REMEDY
Shutter blades buckle (cont'd)	Blades opening too far.	File and burnish the blade controller LATCH at point "A" (see figure 7).
	Blades closing too far.	Swedge the mechanism plate at point "B" (see figure 26).
	No clearance between the blade controller latch and the BLADE CONTROLLER LUG, figure 26, when the shutter is in the tripped position.	Swedge the mechanism plate at point "C", figure 26, such that this point acts as a stop for the SETTING LEVER with stop stud, figure 23.
Shutter operates instantaneously on B (bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.
Both flash settings are below the millisecond tolerances (fast)	The tension is too great on the WINDING GEAR SPRING, figure 4.	Relieve the tension slightly on the winding gear spring. However, there must be enough tension on the spring to permit the winding lever to carry through on both the F and M flash settings.
Both flash settings are above the millisecond tolerances (slow)	There is not enough tension on the winding gear spring.	Place the winding gear spring under slightly greater tension. Care should be taken during this adjustment not to disturb the trigger latch.
	The winding lever may be binding around the central opening of the cover or on the speed INDEX PLATE, figure 18.	Try lubricant or replace the WINDING LEVER, figure 18.
The F (short stroke) is within the millisecond tolerances but the M (long stroke) is fast	FLASH RETARD PALLET assembly, figure 19, not meshing properly with the winding lever.	With special Tool No. 657, turn the eccentric post so that the pallet will mesh more firmly in the teeth of the winding lever. Make certain the post is tight on the cover after making this adjustment.
	The flash retard pallet may be binding on the speed index plate.	The index plate will be marked at the binding point. File the plate at this point to allow clearance for the pallet.
Constant flash short	The contact spring may be bent and touching either the contact lever or the cover.	Re-form the contact spring.
Both flash settings are extremely fast	The trigger latch may not be falling into the slot on the cover. This allows the shutter blades to open too soon.	Add more tension to the trigger latch spring.
	The end of the trigger latch is bent back, toward the trigger. When the latch falls into the slot on the cover, the bent latch will permit the trigger to go down far enough to trip the shutter blades.	Re-form the end of the trigger latch by bending it slightly towards the winding gear. After the shutter has been assembled, it can be checked to see if the shutter blades will open before the winding lever opens them. 1. Set the shutter.

TROUBLE	CAUSE	REMEDY
Both flash settings are extremely fast (cont'd)		2. Set the winding lever. 3. Holding the winding lever down, release the shutter. The shutter blades should not open while the winding lever is down.
Shutter will not flash lamps when all-metal flasholder is in contact with camera, but will, when flasholder is held away from camera	Breakdown in the insulation of ground strap.	There should be a resistance of 10,000 ohms between the connector pin nearest the blade arrestor button and any other spot on the shutter case. If not, replace the ground strap, together with the resistor.

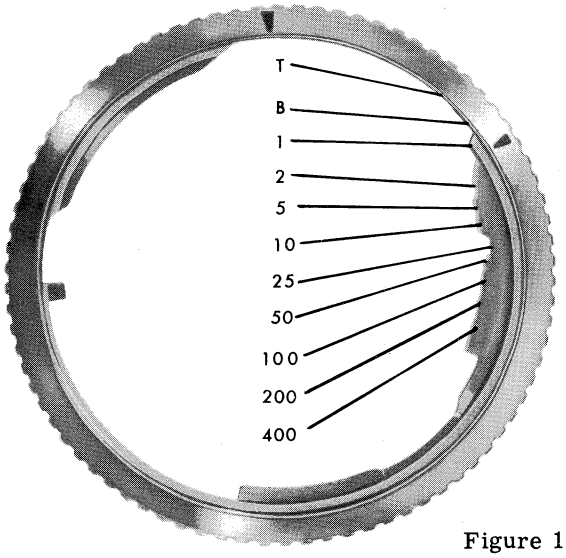

Figure 17

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:

1. Front lens mount, using Tool No. 501-0.
2. Diaphragm pointer TIP, figure 18.
3. Set the synchronizer scale at "M."
4. Speed and diaphragm INDEX PLATE, by turning the plate counterclockwise until the three projections in the center of the plate fit into the three cutouts on the outside edge of the central collar.
5. Speed control RING.

CAUTION: If the WINDING LEVER is disturbed, the flash timing will have to be adjusted.

The sequence of reassembly is as follows:

1. Speed control ring, with shutter in tripped position. Be sure the projecting lug on the BULB LEVER ASSEMBLY, figure 20, the studs on the retarding SECTOR WITH STUD, figure 6, and the PALLET BRACKET with stud assembly are resting against the inside edge of the speed control ring and are not underneath the ring.
2. Speed and diaphragm index plate, by lining up the three projections in the center of the plate with the three cutouts on the outside edge of the central collar. Turn the plate clockwise until it is properly positioned.
3. Diaphragm pointer tip.
4. Front lens mount.

WINDING LEVER

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5 above.
2. WINDING LEVER, figure 18.

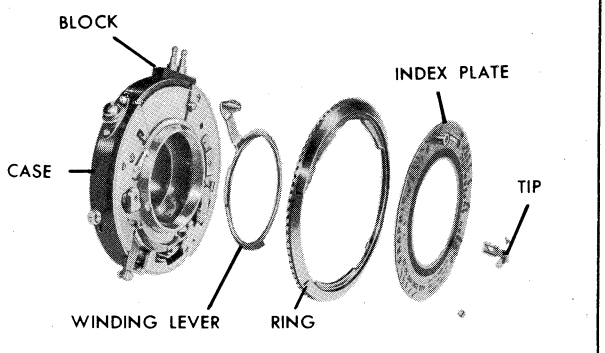

Figure 18

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) to the teeth of the winding lever.
2. Set the shutter.
3. Winding lever, with the sixth or seventh tooth from the left meshed with the WINDING GEAR, figure 4. Place the WINDING GEAR SPRING in tension by giving two and one-quarter strokes to the winding lever, lifting and replacing the lever after the first and second strokes. This should be the approximate setting for the flash synchronization of the shutter.

CAUTION: Do not touch the TRIGGER LATCH, figure 20, as it may release the winding gear spring tension.

Trip the shutter and lightly hold the winding lever down around the central collar on the cover. As the shutter is tripped, the end of the latch should fall into the slot on the cover. If it does not, add more tension on the TRIGGER LATCH SPRING, figure 19. Check for a bind between the trigger latch and the TRIGGER, figure 20, at the point of attachment. The winding lever should contact the trigger latch; push the latch out of the slot in the cover and open the shutter blades. After the shutter has been tripped, the latch should return to a position where it is resting on the ledge just above the small slot in the cover.

After the trigger is depressed, allow it to

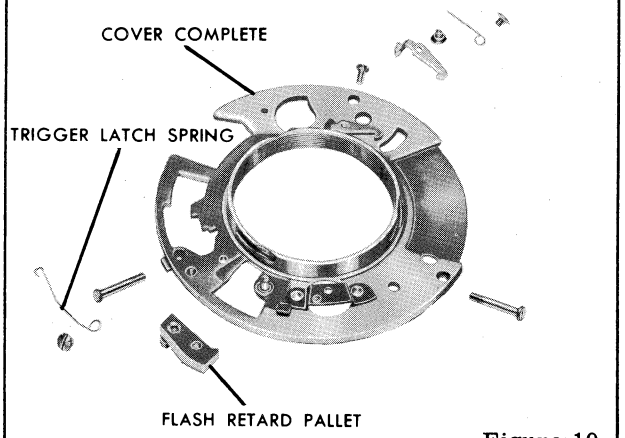

Figure 19

return to its proper position very slowly. If there is too much tension on the trigger latch spring, it will tend to retard the action of the latch and the trigger.

4. Speed control ring, paragraphs 1-4, page 19.

COVER COMPLETE

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. TRIGGER LATCH SPRING, figure 19.
4. Lift up the loose end of the TRIGGER LATCH, figure 20, sufficiently to clear the COVER COMPLETE, figure 19. Move the end of the latch until it is clear of the CASE, figure 18.
5. High speed spring CAM, figure 7, and the HIGH SPEED SPRING.
6. FLASH RETARD PALLET assembly, figure 19.
7. COVER COMPLETE.

The sequence of reassembly is as follows:

1. Cover complete.
2. Set the shutter.
3. Trigger latch, with the long bent end of the latch contacting the inner edge of the contact LEVER COMPLETE, figure 21. Be sure the latch does not bind.
4. Trigger latch spring; do not fasten securely. Lift the loose end of the spring over the trigger latch until it is at a point half way between the latch and the central collar. Then secure the spring. Place the spring against the outside edge of the trigger latch. The latch should be burnished and a thin film of grease (Texaco Unitemp-RCX169 Grease) applied at the point of spring contact.

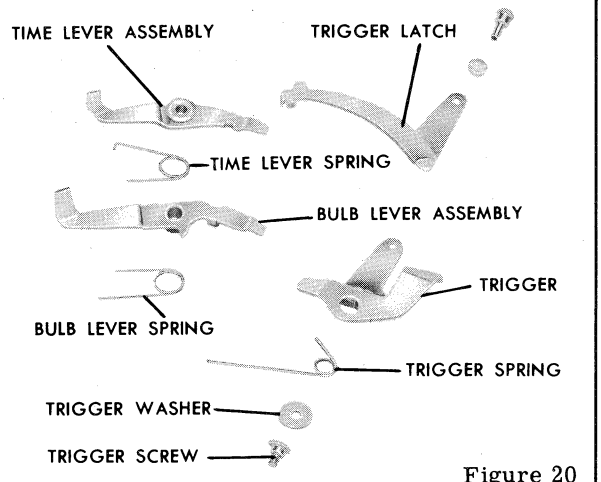

Figure 20

5. Winding lever, paragraphs 1-3, page 19.
6. Flash retard pallet assembly on the eccentric stud.

   Pull down the winding lever slowly and see that the pallet falls into every tooth of the lever. If it does not, turn the eccentric stud until the pallet is closer to the lever, using Tool No. 657. Care should be taken not to get the pallet too close to the lever, as this will cause the action of the lever to be rough.

   NOTE: Be sure the eccentric stud is tight on the cover. If any adjustment is made to the stud, it should be anchored securely in position on the cover complete.

7. High speed spring and the high speed spring cam.
8. Winding lever, paragraph 4, page 19.

WINDING GEAR, CLUTCH ASSEMBLY, AND STAR WHEEL ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. Cover complete, paragraphs 3-7 above.
4. WINDING GEAR, figure 4, and the WINDING GEAR SPRING.
5. CLUTCH ASSEMBLY.
6. STAR WHEEL ASSEMBLY.

The sequence of reassembly is as follows:

1. Winding gear and the winding gear spring on the WINDING GEAR STUD, figure 26.
2. Star wheel assembly.
3. Clutch assembly, with a thin film of grease (Texaco Unitemp-RCX169 Grease) on the underside of the assembly. The top gear of the clutch assembly should turn freely only in a clockwise direction when the lower gear of the clutch assembly is held tight.
4. Cover complete, paragraphs 1-8 above.

TRIGGER, TIME LEVER ASSEMBLY, AND BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. Cover complete, paragraphs 3-7 above.
4. Unhook the MAIN DRIVE SPRING, figure 7, from the MAIN DRIVE SPRING STUD, figure 26.
5. TRIGGER SCREW, figure 20, TRIGGER SPRING, and TRIGGER WASHER.
6. TRIGGER, TIME LEVER ASSEMBLY, TIME LEVER SPRING, BULB LEVER ASSEMBLY, and BULB LEVER SPRING.

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger with the oval hole up and insert the bulb lever assembly in the opening on the trigger. Place the time lever assembly and the time lever spring between the top of the trigger and the top of the bulb lever assembly with the spring facing up. Grasp the three parts by inserting one prong of a pair of tweezers down through the center of the holes. With the longer ends of the time and bulb lever springs turned in a clockwise direction and the shorter ends resting against the lugs on the levers, guide the parts down over the TIME AND BULB LEVER STUD, figure 26. The long ends of the springs should rest against the case.
2. Trigger washer, trigger spring, and trigger screw. Lift the long end of the spring over the end of the MAIN DRIVE SPRING STUD, and rest it against the stud.
3. Hook the loose end of the main drive spring onto the main drive spring stud.
4. Cover complete, paragraphs 1-8, page 20.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. Cover complete, paragraphs 3-7, page 20.
4. Retard GEAR PLATE SCREW, figure 6, near the retarding SECTOR WITH STUD.
5. Retard gear plate ANTI-BACKLASH SPRING.
6. Unhook the retard PALLET BRACKET SPRING. Remove the remaining retard gear plate screw.
7. Retard gear PLATE COMPLETE.
8. Retard GEAR WITH NO. 2 PINION assembly.
9. Retard GEAR WITH NO. 3 PINION assembly.
10. ESCAPEMENT WHEEL with No. 4 pinion assembly.
11. Retard PALLET.
12. PALLET BRACKET with stud assembly and pallet bracket spring.

    NOTE: If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and all the parts of the gear train thoroughly.

13. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
14. Set the shutter.
15. Retarding sector with stud and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and the retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 7.
4. With the short end of the pallet bracket spring down, place the spring inside the pallet bracket with stud assembly. Allow the long end of the spring to extend out toward the case. Place the pallet bracket and the pallet bracket spring on the PALLET BRACKET SPRING STUD, figure 26. The long end of the spring should rest against the inside of the case.
5. Retard pallet.
6. Escapement wheel with No. 4 pinion assembly.
7. Retard gear with No. 3 pinion assembly.
8. Retard gear with No. 2 pinion assembly.
9. Retard gear plate complete, with the teeth of the gear facing the shutter blades.
10. Retard gear plate screw near the pallet bracket.
11. Lift up the gear end of the gear plate until the teeth of the retarding sector with stud pass freely under the gear. Place the retarding sector so that when the gear teeth are meshed the outer edge of the sector will be approximately 1/8 inch from the shutter case.
12. Retard gear plate anti-backlash spring on the RETARD GEAR PLATE STUD, figure 26. Line up the opening in the spring with the hole in the gear plate. Replace, but do not tighten, the remaining gear plate screw. The spring should be parallel to the shutter case. Holding the spring in this position, tighten the gear plate screw. Hook the end of the anti-backlash spring onto the retard plate gear LUG, figure 6.
13. Put the pallet bracket spring in tension by placing the long end of the spring against the inside edge of the lug on the retard gear plate complete.
14. Cover complete, paragraphs 1-8, page 20.

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. Cover complete, paragraphs 3-7, page 20.
4. Unhook the LATCH SPRING, figure 7, from the main drive LATCH.
5. Unhook the MAIN DRIVE SPRING from the MAIN DRIVE SPRING STUD, figure 26.
6. Set the shutter.
7. MAIN DRIVE ASSEMBLY, figure 7, to which is attached the main drive spring.

The sequence of reassembly is as follows:

1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 23; on the MAIN DRIVE STUD, figure 26; on the LATCH, figure 7, at the point of contact with the LATCH SPRING, and on the latch where it contacts the RETARDING SECTOR STUD, figure 26. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud into the assembly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG, figure 26. The cutout part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the tip of the latch.
4. Main drive spring.
5. Cover complete, paragraphs 1-8, page 20.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. Cover complete, paragraphs 3-7, page 20.
4. CONNECTOR PINS, figure 21, using Tool No. 635.
5. Connector BLOCK, figure 18, by removing the two connector block screws.
6. Disengage the RESISTOR from the mechanism plate.
7. CONTACT STRIP CONNECTOR SCREW.
8. Holding the CONTACT SCREW, figure 21, with Tool No. 262, remove the CONTACT SCREW NUT, using Tool No. 503L. Remove the contact screw.
9. CONTACT SPRING, to which is fastened the GROUND CONTACT STRIP and the resistor. Remove the case insulator WASHER and the case INSULATOR.
10. Contact LEVER COMPLETE.
11. Shutters of the flash receptacle type are disassembled as follows: Using Tool No. 503J, remove the TERMINAL NUT, figure 22, on the end of the PLUNGER ASSEMBLY. Remove the case INSULATOR WASHER, the plunger assembly, and the terminal body insulating SLEEVE. On the contact end of the CONTACT SPRING, remove the CONTACT SCREW NUT, using Tool No. 503L. Remove the CONTACT SCREW, the contact spring, the case INSULATOR WASHER, and the case INSULATOR. Then remove the contact LEVER COMPLETE.

The sequence of reassembly is as follows:

1. If a new contact lever is to be used, place the contact LEVER LATCH SPRING, figure 21, on the contact LEVER BUSHING, with the long end of the spring at the bottom. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end

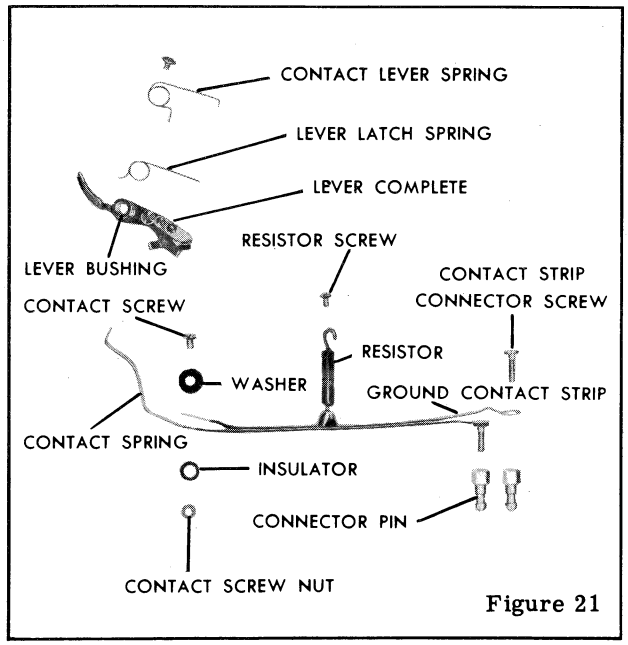

Figure 21

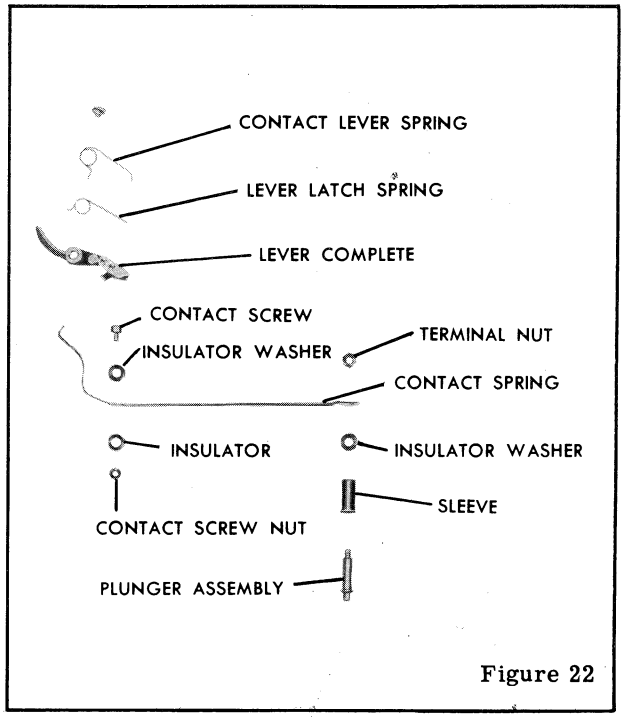

Figure 22

of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise, with respect to the bushing, at least 15 degrees.

2. Contact lever complete on the CONTACT LEVER STUD, figure 26. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

   CAUTION: The contact lever tail is burnished and must remain in that condition.

3. Contact spring. Place the case insulator washer between the shutter case and the contact end of the contact spring and insert the contact screw. Secure the spring by replacing the case insulator and the contact screw nut. Tighten the nut by holding the contact screw with Tool No. 262, and turn the nut with Tool No. 503L.
4. Ground contact strip connector screw.
5. Connector block.
6. Connector pins.
7. Resistor.
8. If the shutter is of the flash receptacle plunger type, insert the threaded end of the plunger assembly in the collar end of the terminal body insulating sleeve. Then insert the assembled parts in the terminal body. Place the case insulator washer on the end of the plunger. Position the end of the contact spring over the opening in the shutter case and push the threaded end of the plunger through the opening in the spring. Fasten the plunger with the terminal nut.

   Insert the case insulator in the hole in the side of the shutter case, near the stud on the blade controller, with the collar end of the insulator facing out. Replace the case insulator washer over the opening on the inside of the shutter case. Position the contact end of the contact spring against the washer and insert the contact screw. Secure the screw with the contact screw nut, using Tool No. 503L, holding the screw with Tool No. 262.
9. Trip the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 23. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 26, makes slight contact with the contact spring just before the blades are fully open. If the spring does not touch the stud, bend the end of the spring toward the stud.
10. Cover complete, paragraphs 1-8, page 20.

FLASH SYNCHRONIZATION

After the shutter is assembled, it must be checked to see if the winding lever will always

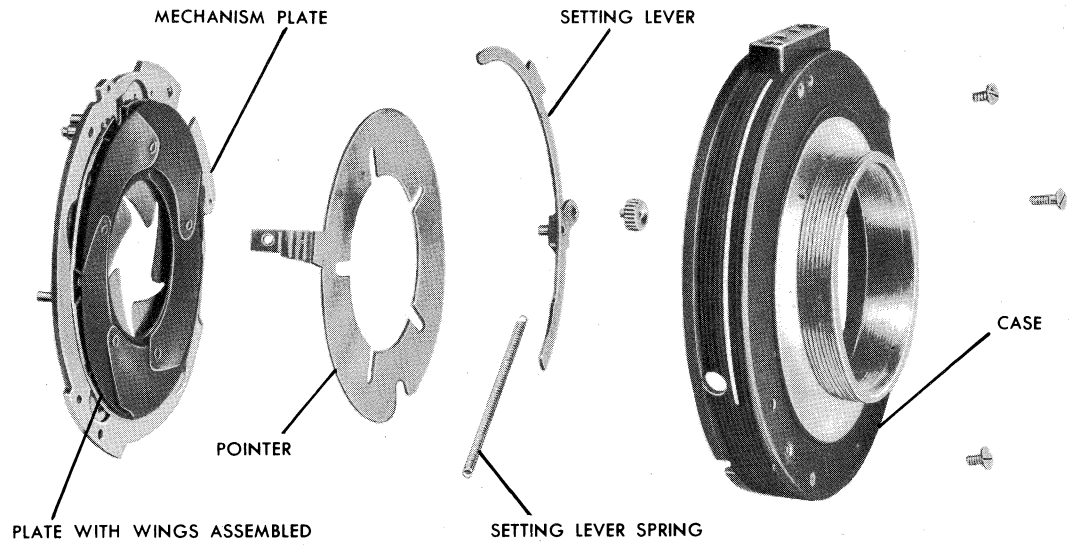

Figure 23

trip the shutter blades when the trigger is released very slowly. Set the shutter and the winding lever. Release the shutter allowing the winding lever to return slowly. The winding lever must trip the shutter blades.

The shutter must be checked to see if the shutter blades will open while the latch is still in the slot in the cover plate. To check for this condition, set the shutter and winding lever. While holding the winding lever in the fully wound position, depress the trigger. The shutter blades should not open while the winding lever is being held down. If they do, refer to the Trouble Chart. (Both flash settings extremely fast, see page 17.)

Check the operation of the winding lever safety latch. When the shutter is not set, the winding lever must be locked in the unwound position. After the shutter has been actuated with the winding lever, the winding lever must return fully and become locked in the unwound position.

The flash settings on the shutter should be timed with reliable shutter testing equipment. The tolerances of the delayed action in the shutter for synchronization with the flash bulbs are as follows:

F (short stroke)*	3 1/2—5 1/2	milliseconds
M (long stroke)*	12—16	milliseconds

*From instant of contact until the shutter blades first begin to show light.

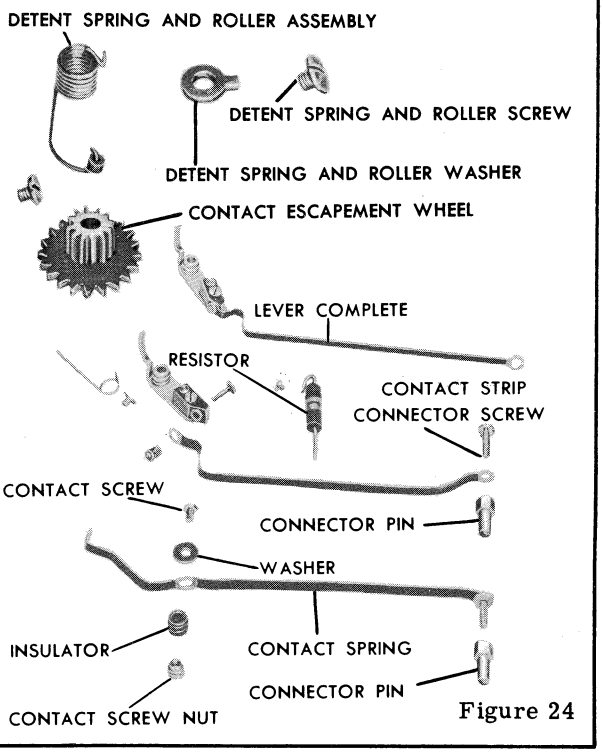

Figure 24

FLASH SHUTTER CONTACT CONVERSION KIT

A more satisfactory operation of the shutter has been achieved by a change in the design of the flash contact parts. The old-style parts, which are to be discarded, are no longer available. They are to be replaced by the parts furnished in the Flash Shutter Contact Conversion Kit No. 121351 — Supplement to Parts List No. 1-1490.

OLD-STYLE FLASH CONTACT PARTS

The sequence of disassembly is as follows:

1. CONNECTOR PINS, figure 24, using Tool No. 635.
2. Connector BLOCK, figure 18.
3. Disengage the RESISTOR from the mechanism plate.
4. Contact LEVER COMPLETE.
5. Ground CONTACT STRIP CONNECTOR SCREW.
6. Holding the CONTACT SCREW, figure 24, with Tool No. 262, remove the CONTACT SCREW NUT, using Tool No. 503L. Remove the contact screw, the case insulator WASHER and the CONTACT SPRING. Remove the resistor from the contact lever complete.
7. DETENT SPRING AND ROLLER SCREW, DETENT SPRING AND ROLLER WASHER and DETENT SPRING AND ROLLER ASSEMBLY.
8. CONTACT ESCAPEMENT WHEEL.
9. Shutters of the flash receptacle type are disassembled as follows: Using Tool No. 503J, remove the TERMINAL NUT, figure 25, on the end of the PLUNGER ASSEMBLY. Remove the case INSULATOR WASHER, the plunger assembly, and the terminal body insulating SLEEVE. On the contact end of the CONTACT SPRING, remove the CONTACT SCREW NUT, using Tool No. 503L.

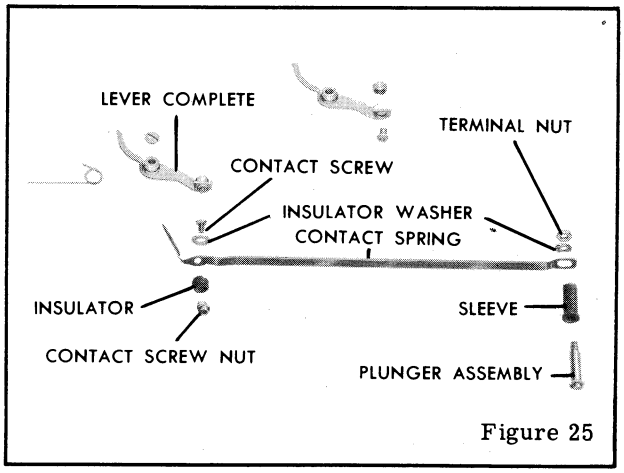

Figure 25

Remove the CONTACT SCREW, the contact spring, the case INSULATOR WASHER, and the case INSULATOR. Remove the contact LEVER COMPLETE.

NEW-STYLE FLASH CONTACT PARTS

The sequence of assembly is as follows:

1. Place the contact LEVER LATCH SPRING, figure 21, on the contact LEVER BUSHING, with the long end of the spring at the bottom and facing the shutter blades. Lift the long end of the spring and rest it against the outside edge of the spring lug on the contact lever latch. Form the short end of the spring around the vertical part of the contact lever tail. Then place the CONTACT LEVER SPRING on the contact lever bushing. Bend the last 1/8 inch of the long end of the spring clockwise, with respect to the bushing, at least 15 degrees.
2. Contact lever complete on the CONTACT LEVER STUD, figure 26. The ends of the contact lever spring should face in, toward the shutter blades. Turn the long end of the spring in a clockwise direction to place it in tension, and rest it in the groove in the case. Form the short end of the spring around the vertical part of the contact lever tail.

   CAUTION: The contact lever tail is burnished and must remain in that condition. If the contact lever touches the bulb lever assembly, approximately .010 inch should be removed from the end of the lever.

3. Contact spring of the connector pin type shutter. Place the case insulator washer between the shutter case and the contact end of the contact spring and insert the contact screw. Secure the spring by replacing the case insulator and the contact screw nut. Tighten the nut by holding the contact screw with Tool No. 262, and turn the nut with Tool No. 503L.
4. Ground contact strip connector screw.
5. Connector block.
6. Connector pins.
7. Secure the looped wire end of the resistor to the mechanism plate. Solder the other end of the resistor to the ground contact strip.
8. If the shutter is of the flash receptacle plunger type, see figure 22. Fit the contact lever spring and the contact lever as described in paragraphs 1 and 2 above. Insert the threaded end of the plunger assembly in the collar end of the terminal body insulating sleeve. Then insert the assembled parts in the terminal body. Place the case insulator washer on the end of the plunger assembly. Position the end of the contact spring over the opening in the shutter case and push the threaded end of the plunger assembly through the opening in the spring. Fasten the plunger with the terminal nut.

   Insert the case insulator in the hole in the inside of the case, near the stud on the blade controller, with the collar end of the insulator facing out. Replace the case insulator washer over the opening in the outside of the shutter case. Position the contact end of the contact spring against the washer and insert the contact screw in the opening in the spring. Fasten the screw with the contact screw nut, using Tool No. 503L, while holding the screw with Tool No. 262.
9. Trip the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 23. Observe whether the BLADE CONTROLLER CONTACT STUD, figure 26, makes slight contact with the contact spring just before the blades are fully open. If the spring does not touch the stud, bend the end of the spring toward the stud.
10. STAR WHEEL ASSEMBLY, figure 4.
11. Replace the cover complete and the winding lever.
12. Cock the shutter; then press the trigger to release the shutter. At the same time hold the winding lever to prevent its return. The trigger latch must drop into the slot on the cover with a distinct snap. If it does not, check for a bind between the trigger and the trigger latch or between the trigger latch and the cover complete. If no bind exists, increase the tension on the trigger latch spring. A slight downward pressure on the spring is desirable. There must be approximately

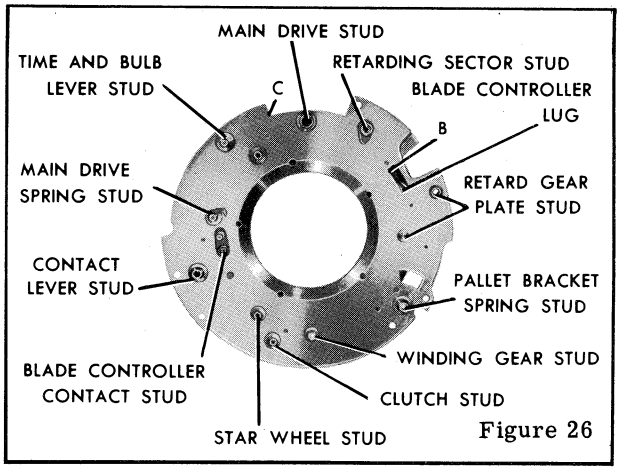

Figure 26

.005 inch clearance between the contact lever tail and that part of the trigger latch which engages the tail. The contact points must be in contact. If there is no clearance or if there is excessive clearance, the spacing may be controlled by bending the contact lever tail in or out.

Allow the winding lever to go to the "at rest" position. Depress the trigger and watch to see that the flash contacts do not close. If they close, hold the end of the contact lever tail toward the shutter case, place a screwdriver blade against the vertical position of the contact lever tail near the contact lever stud, and apply pressure toward the shutter blades at this point.

With the shutter tripped, there must be approximately .005 inch clearance between the contact lever latch spring lug and the side of the contact lever. This is to assure full pressure of the latch into the star wheel.

While pressing the trigger down fully, watch the contacts to make sure they do not close at any time. If they close, the contact lever tail on the contact lever has been bent too far and it should be moved back slightly. If necessary, the winding lever should be stoned at point "A " figure 10. Corner "B" must be square.

SHUTTER BLADES

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-5, page 19.
2. Winding lever, paragraph 2, page 19.
3. Cover complete, paragraphs 3-7, page 20.
4. Winding gear, clutch assembly, and star wheel assembly, paragraphs 4-6, page 20.
5. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 4-6, page 20.
6. Retard gear train, paragraphs 4-5, page 21.
7. Main drive assembly, paragraphs 4-7, page 21.
8. Flash contact parts, paragraphs 4-11, page 22.
9. Rear lens mount.
10. Blade controller LATCH SPRING BUSHING, figure 7, and the LATCH SPRING.
11. MECHANISM PLATE, figure 23.
12. Diaphragm retainer PLATE WITH WINGS ASSEMBLED.
13. Shutter blades.
14. BLADE CONTROLLER, figure 13.

The sequence of reassembly is as follows:

1. If necessary, clean the shutter blades thoroughly. Hold the blades carefully to avoid bending and clean their surfaces with a soft cloth. Fingerprints on the blades will cause corrosion.
2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING and stud, figure 13, with the hole in the blade over the stud on the mechanism plate, near the BLADE CONTROLLER LUG, figure 26. Refer to figure 15 for positioning of the shutter blade.
4. Proceeding counterclockwise, replace four BLADES WITH STUD, figure 13, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. BLADE, over the blade with double blade bushing and stud. The back of the mechanism plate should appear as shown in figure 16.
6. Diaphragm retainer plate with wings assembled, with the cutout slot in the outer edge of the retainer plate over the opening in the mechanism for the PALLET BRACKET with stud assembly, figure 6. After the retainer plate is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.
8. The shutter CASE, figure 23, diaphragm POINTER and the SETTING LEVER should be thoroughly cleaned. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the recess in the case occupied by the setting lever. Then wipe this area lightly with a clean cloth.
9. Diaphragm pointer. Turn the pointer until the projecting arm is near the cable release nut.
10. Setting lever, with one end of the SETTING LEVER SPRING attached to the lever and the loose end of the spring resting against the side of the shutter case.
11. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the pointer. After the plate is secured, the diaphragm ring, the setting lever, and the shutter blades should operate freely. Secure the loose end of the setting lever spring to the case stud.
12. Blade controller latch and latch spring.
13. Flash contact parts, paragraphs 1-9, page 22.
14. Main drive assembly, paragraphs 1-4, page 22.
15. Retard gear train, paragraphs 1-13, page 21.
16. Trigger assembly, time lever assembly and bulb lever assembly, paragraphs 1-3, page 21.
17. Winding gear, clutch assembly, and star wheel assembly, paragraphs 1-4, page 20.
18. Rear lens mount.

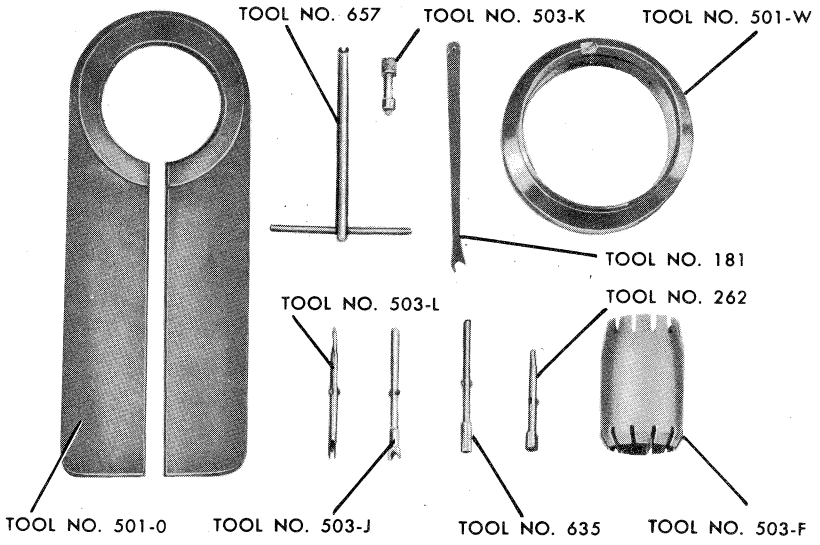

Figure 27

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

Lithographed in the United States of America

NOVEMBER 1950 PARTS LIST No. 1-1490D

KODAK FLASH SUPERMATIC SHUTTER

FOR KODAK MEDALIST II CAMERA

This parts list supersedes the section of parts list No. 1-1490 which covered the shutter for the Kodak Medalist II Camera.

The illustrations and parts list are in the sequence of disassembly.

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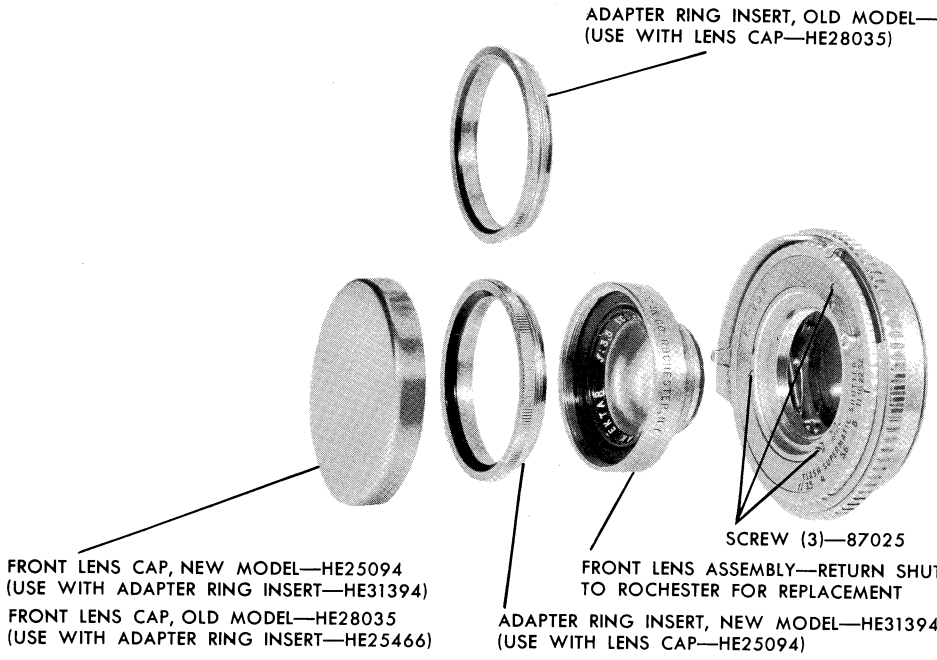


Figure 1

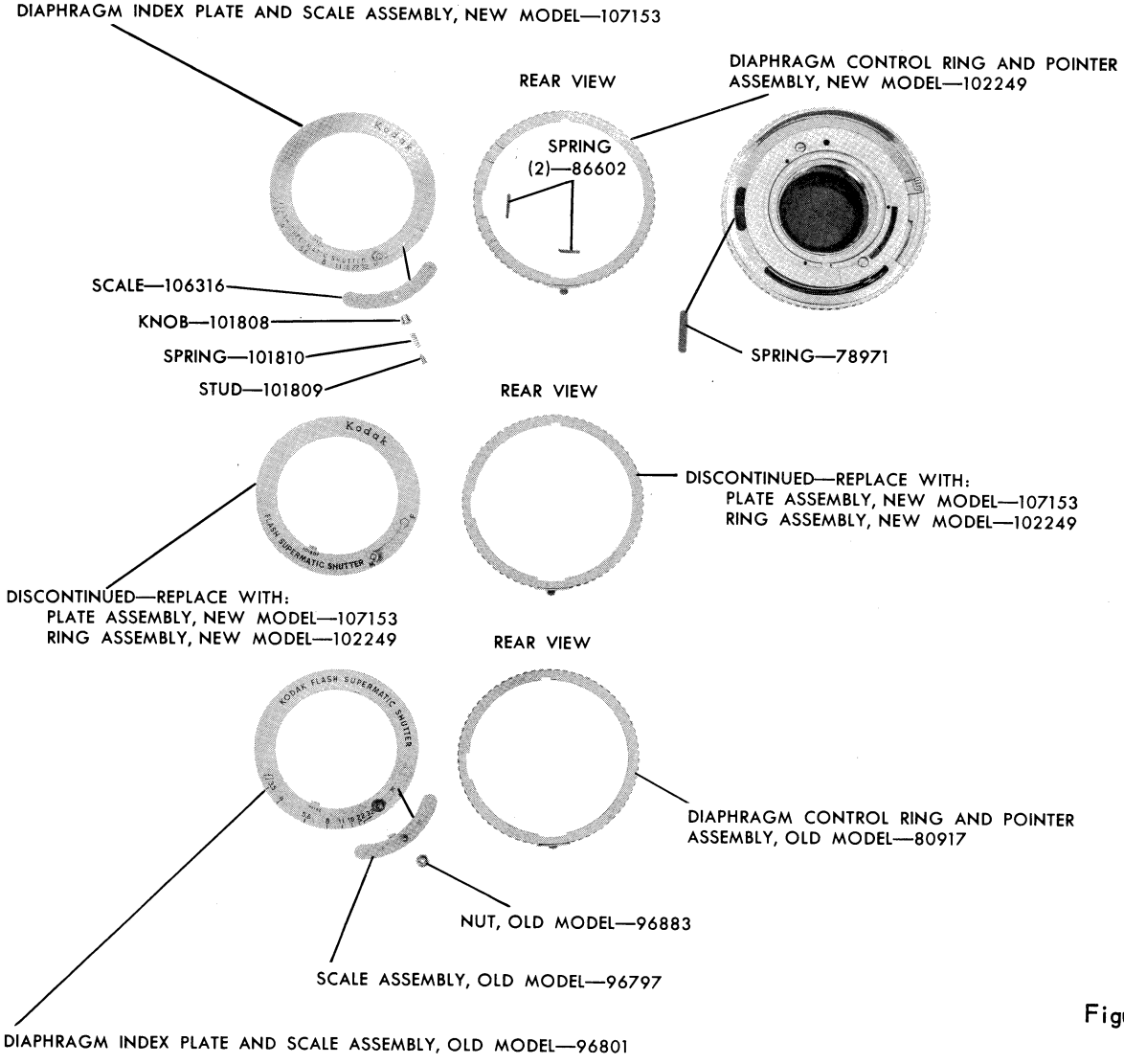


Figure 2

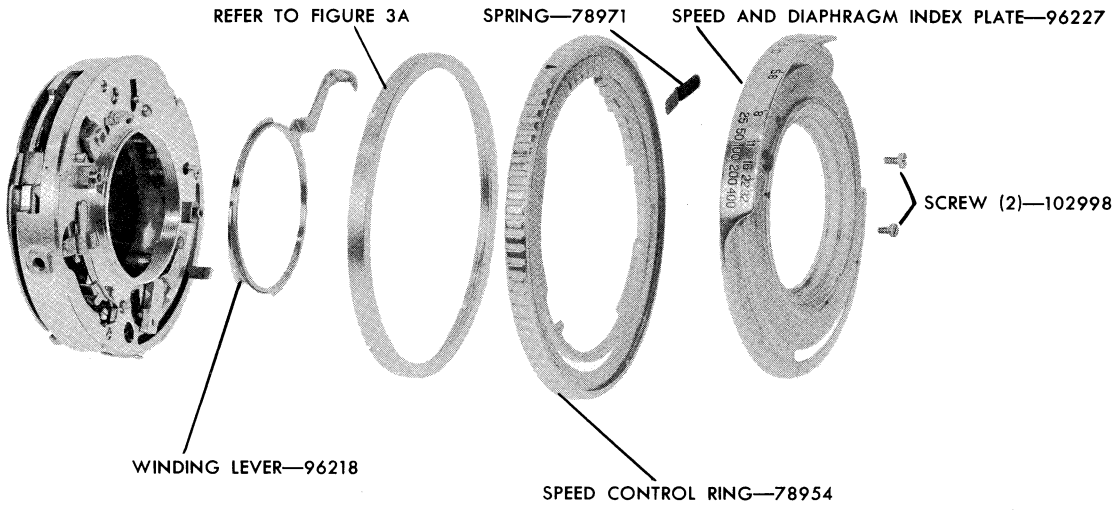


Figure 3

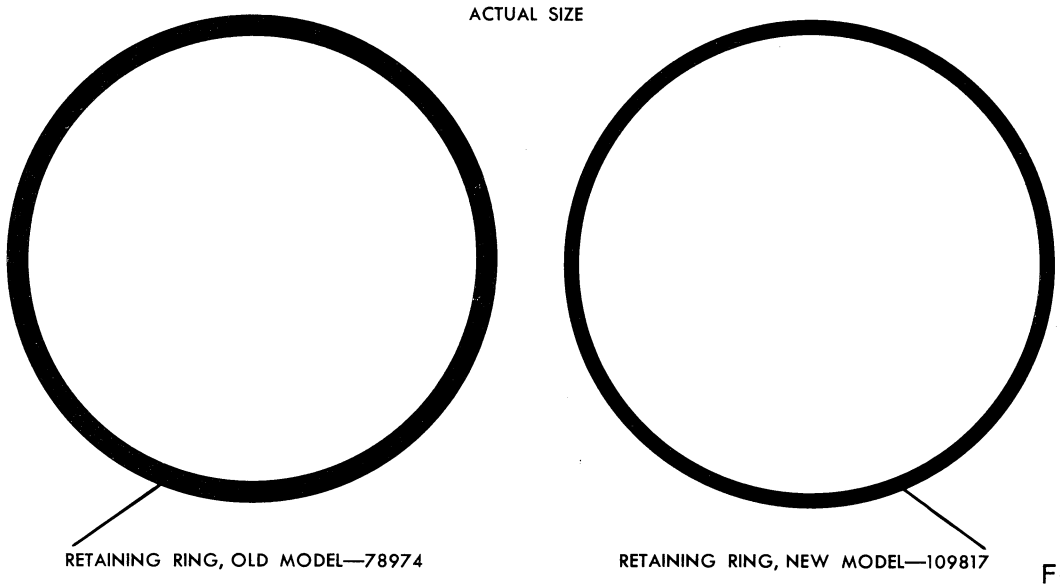


Figure 3A

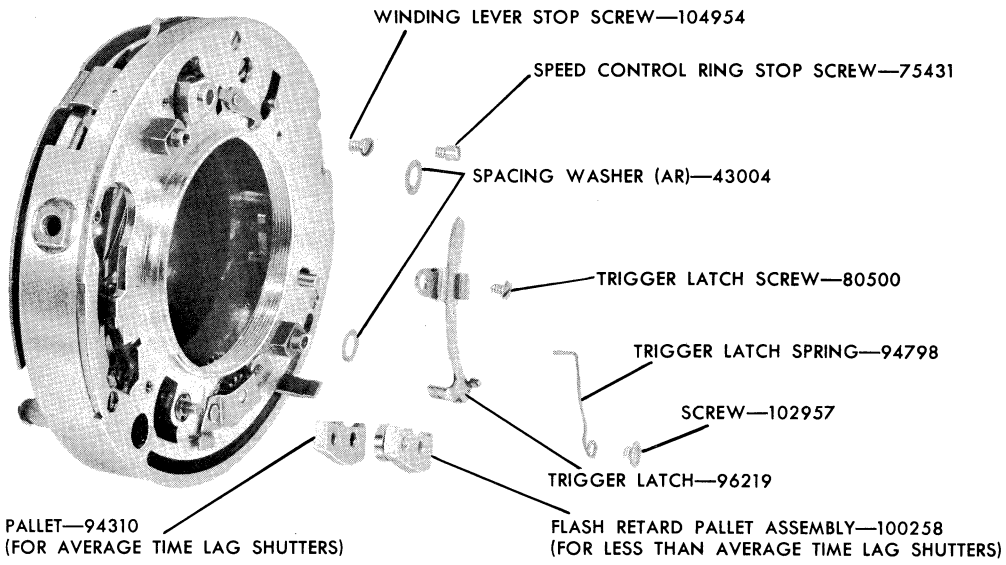


Figure 4

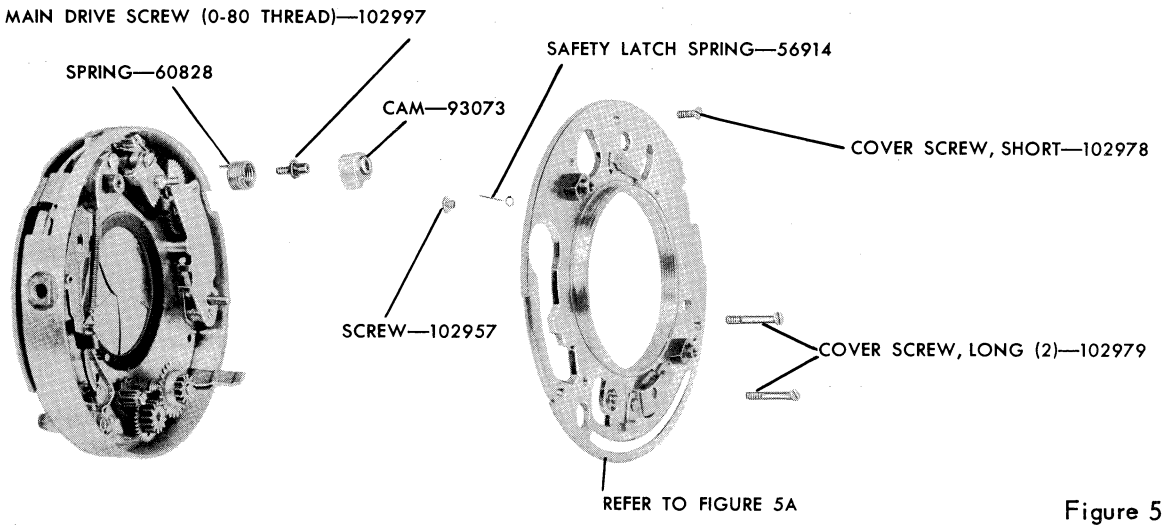


Figure 5

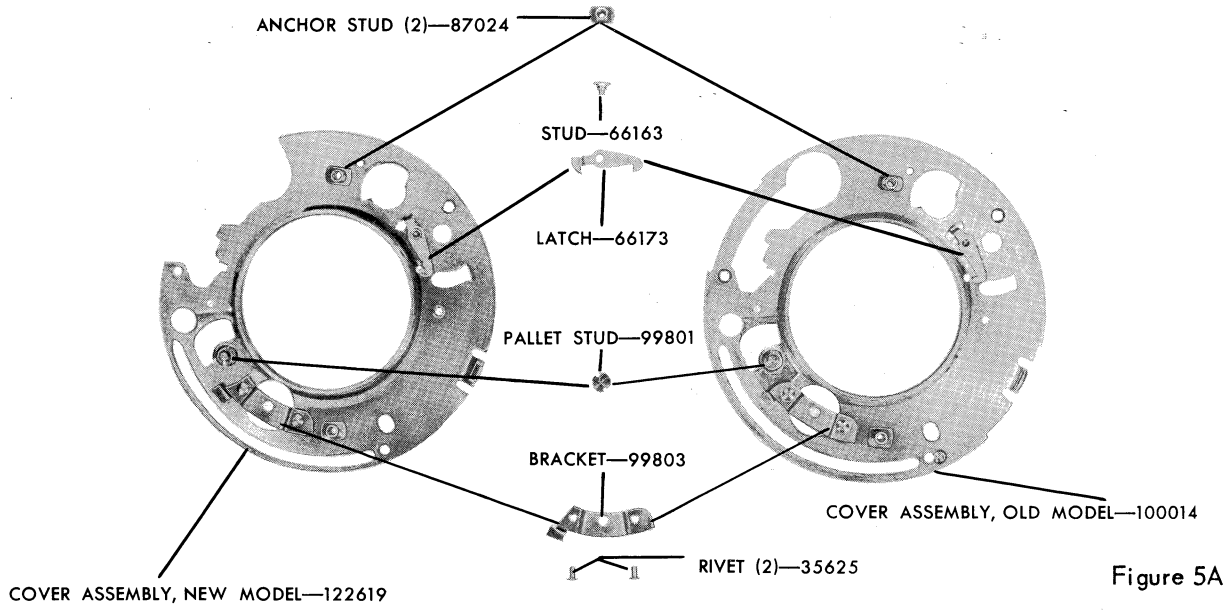


Figure 5A

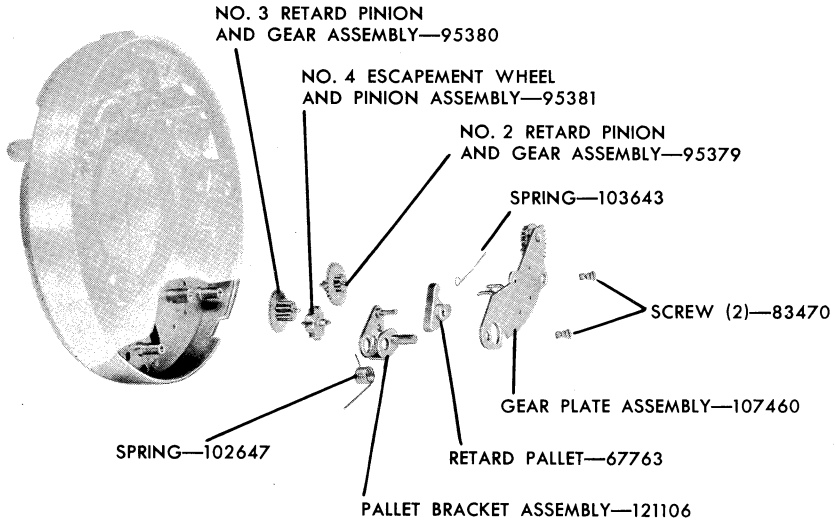


Figure 6

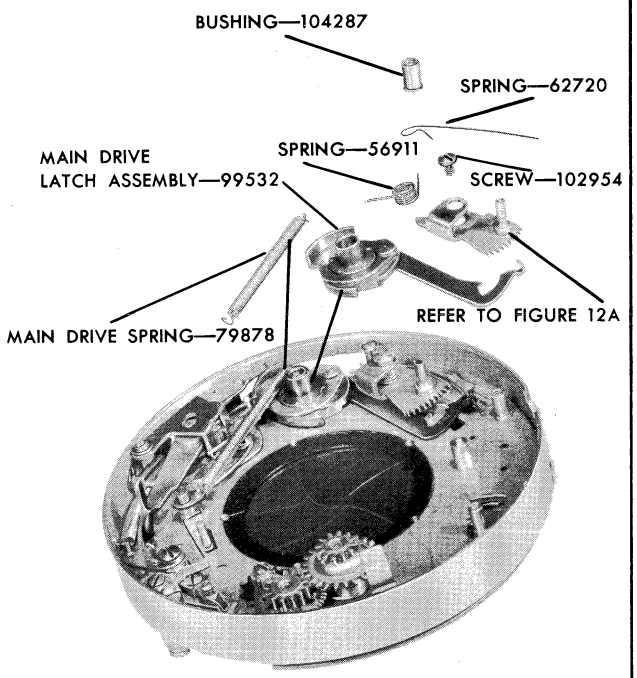


Figure 7

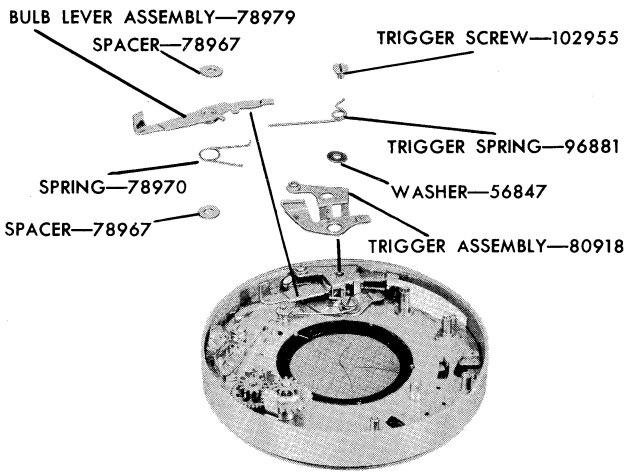
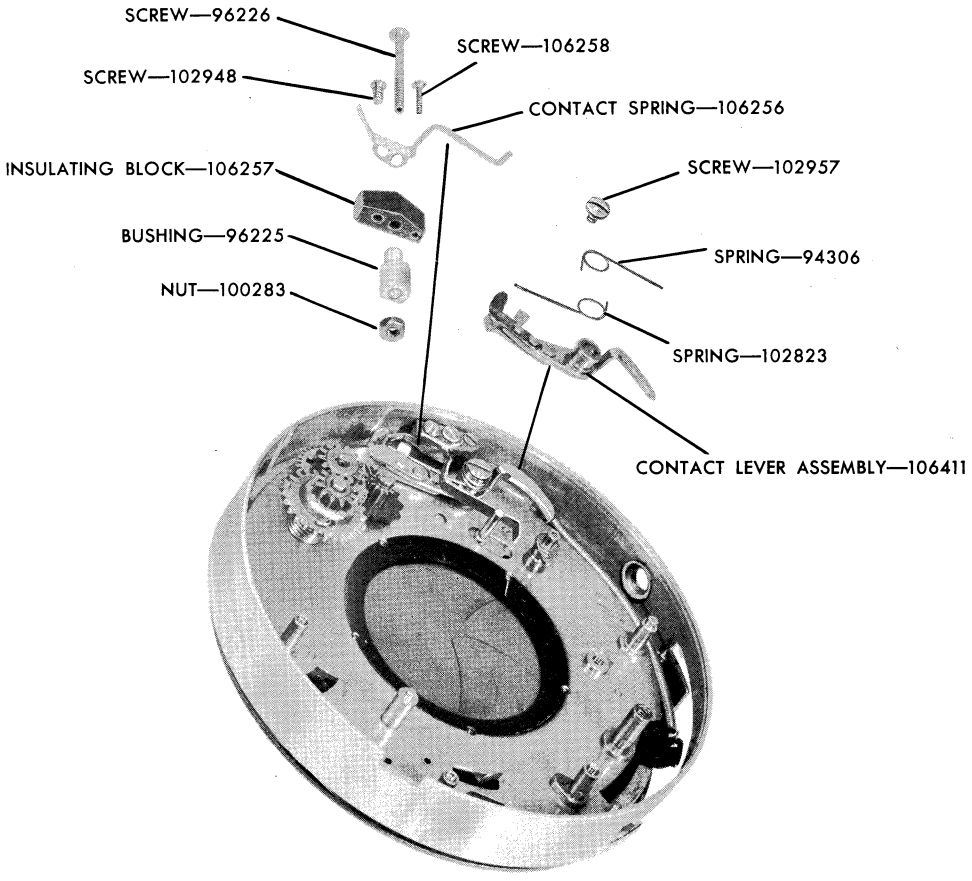


Figure 8



NEW MODEL PARTS

Figure 9

OLD MODEL PARTS

*DISCONTINUED—REPLACE WITH KIT NO. 121352—REFER TO FIGURE 13

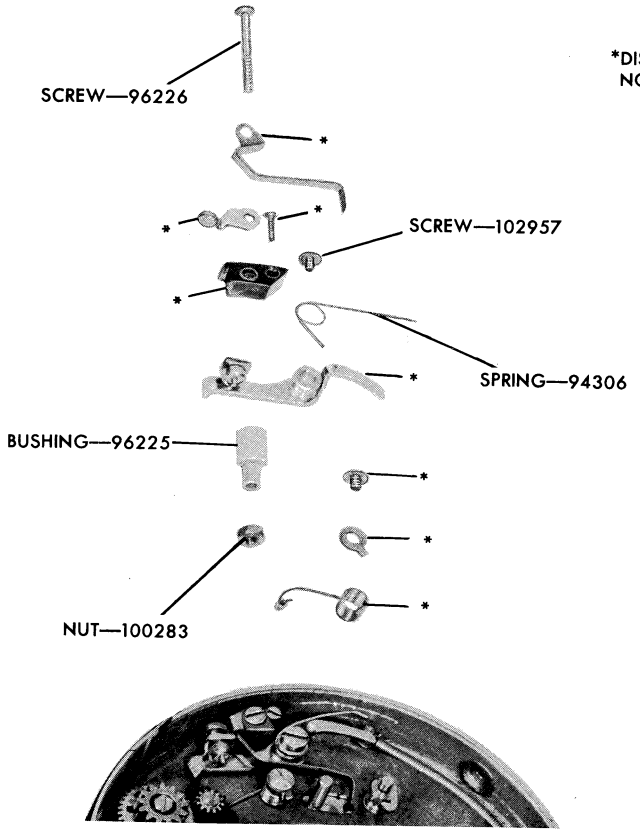


Figure 9A

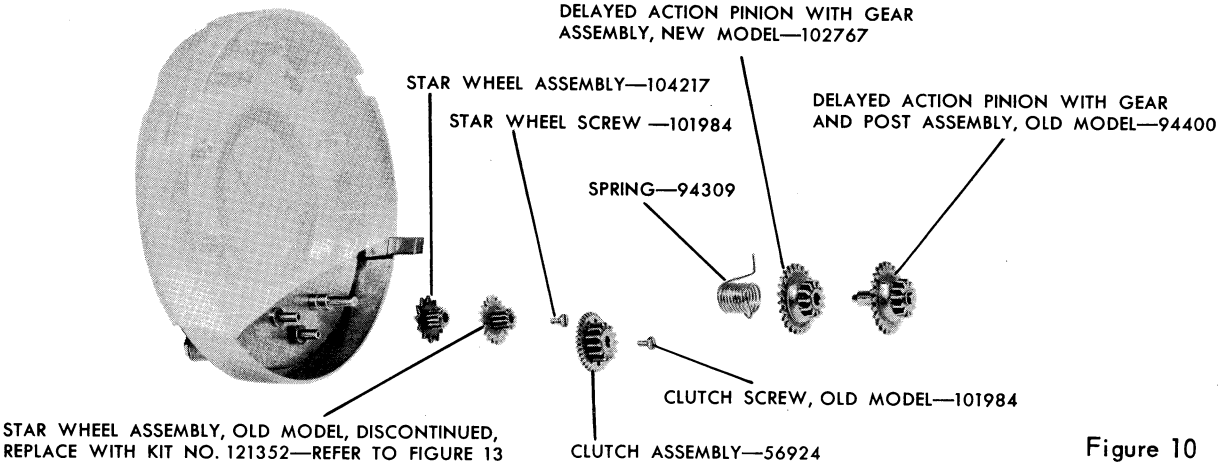


Figure 10

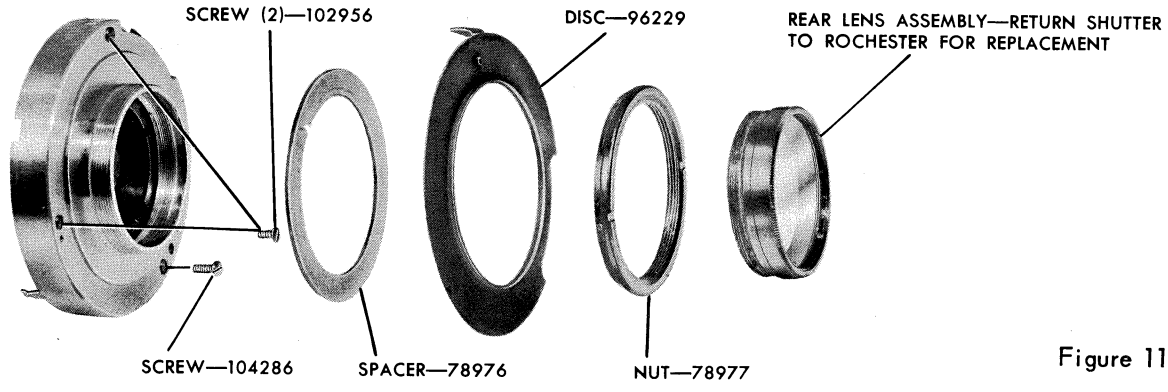


Figure 11

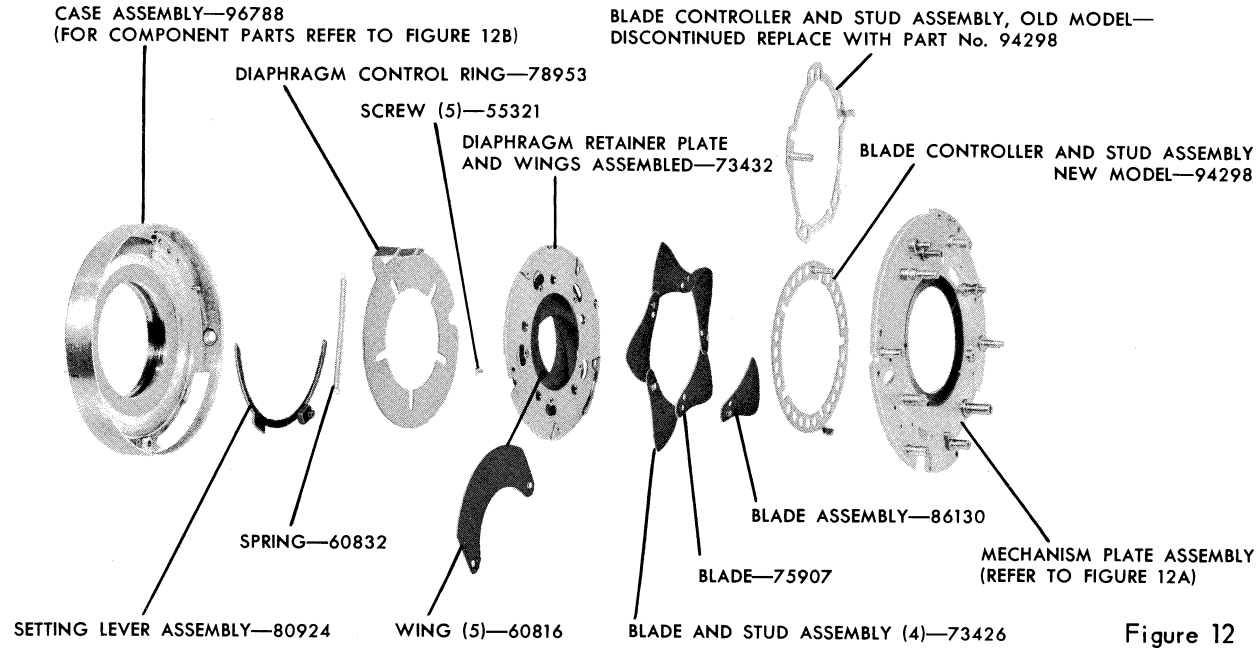


Figure 12

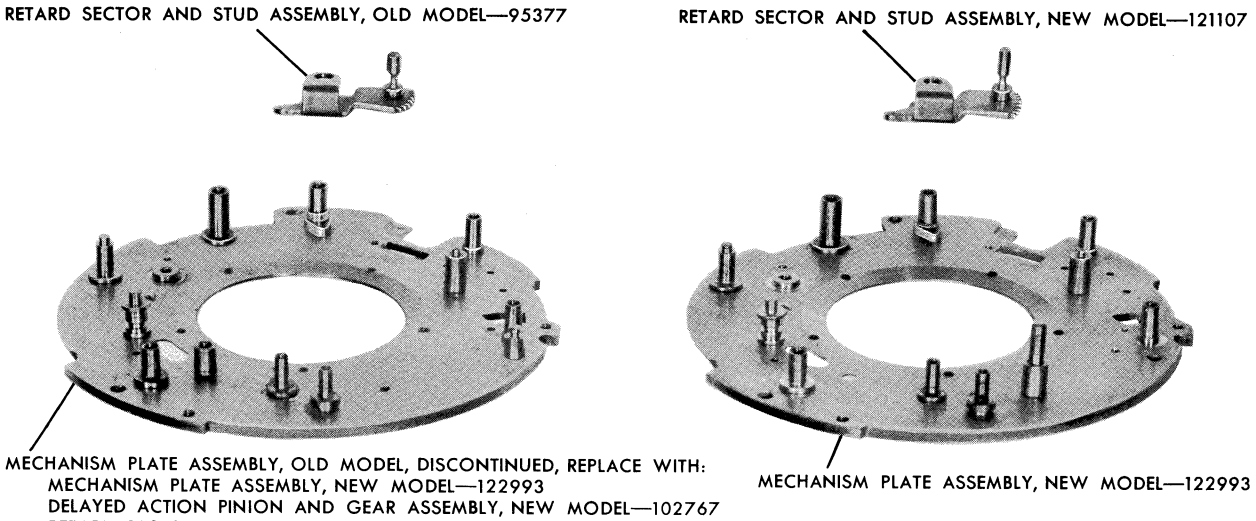


Figure 12A

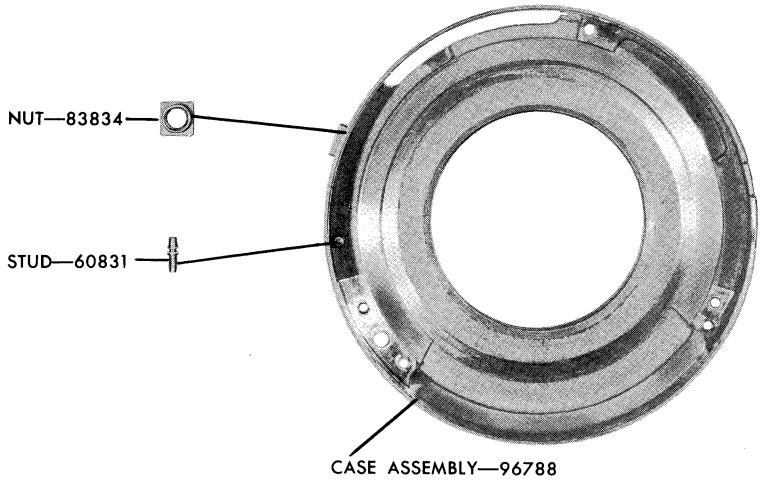


Figure 12B

Kit No. 121352

This kit contains the necessary parts for replacing the old-model contacts or the old-model star wheel. This kit is also necessary when replacing the old-model mechanism plate.

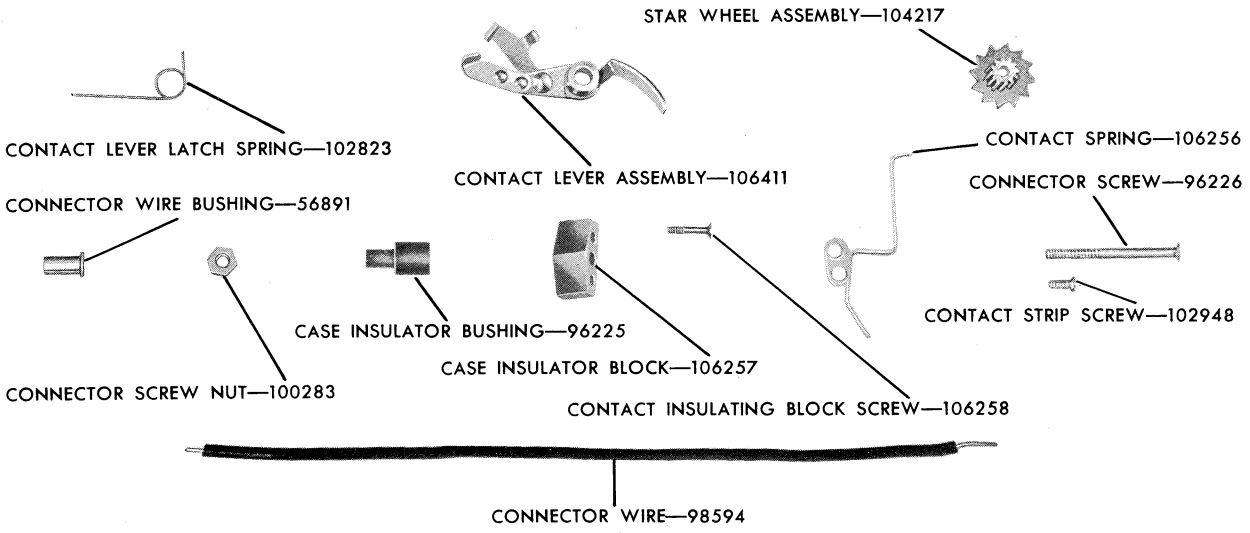


Figure 13

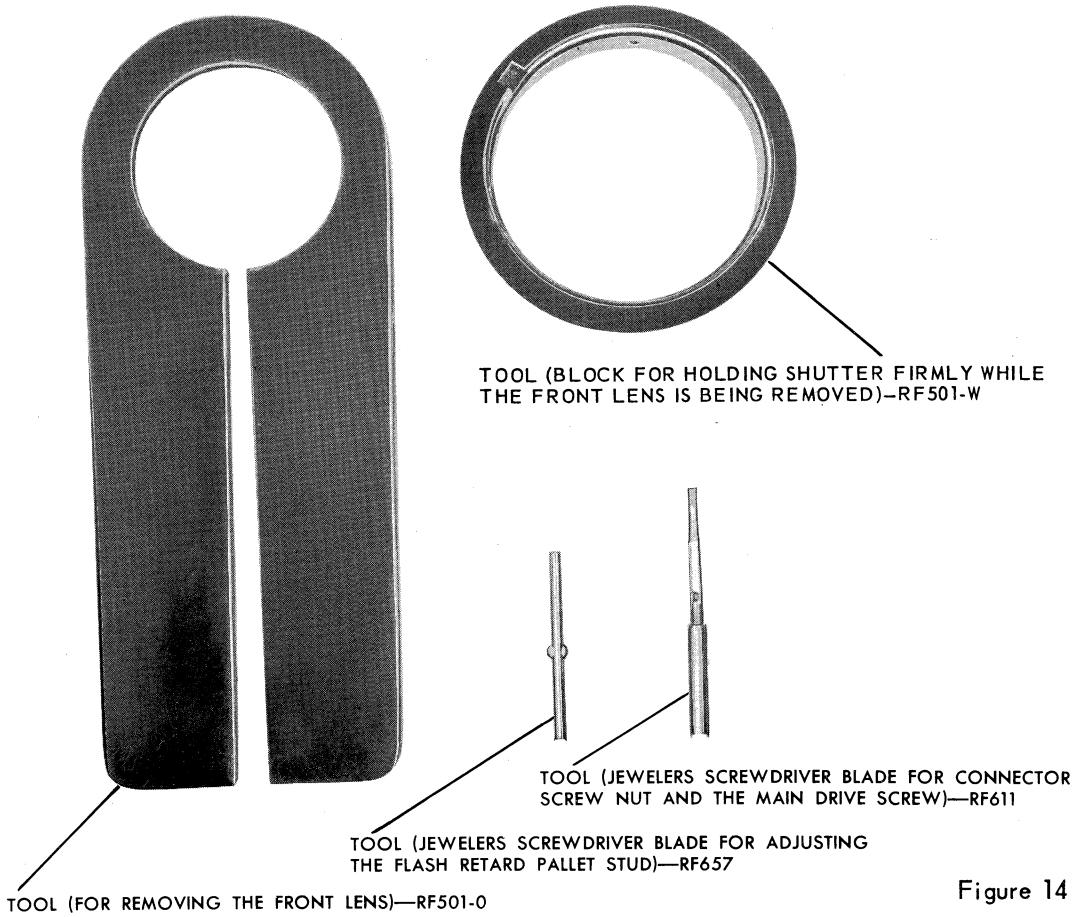


Figure 14

FIG.	PART NUMBER	PART NAME	No. REQD.
1	HE28035	Cap - Front lens, old model	1
1	HE25094	Cap - Front lens, new model	1
1	HE25466	Insert - Adapter ring, old model	1
1	HE31394	Insert - Adapter ring, new model	1
1		Front Lens Assembly - Return shutter to Rochester for replacement	1
1	87025	Screw - Diaphragm index plate	3
2	96801	Diaphragm Index Plate and Synchronizer Scale Assembly, Old Model	1
2	107153	Diaphragm Index Plate and Synchronizer Scale Assembly, New Model	1
2	96797	Synchronizer Scale Assembly, Old Model	1
2	106316	Synchronizer Scale Assembly, New Model	1
2	96883	Nut - Synchronizer scale stud, old model	1
2	101808	Knob - Synchronizer scale operating, new model	1
2	101810	Spring - Synchronizer scale operating knob, new model	1
2	101809	Stud - Synchronizer scale operating knob, new model	1
2	102249	Diaphragm Control Ring and Pointer Assembly, New Model	1
2	86602	Spring - Diaphragm control ring	2
3	102998	Screw - Speed and diaphragm index plate	2
3	96227	Plate - Speed and diaphragm index	1
2,3	78971	Spring - Speed control ring tension	1
3	78954	Ring - Speed control	1
3A	78974	Ring - Shutter retaining, old model	1
3A	109817	Ring - Shutter retaining, new model	1
3	96218	Lever - Winding	1
4	94310	Pallet - Flash retard (For average time lag shutters)	1
4	100258	Flash Retard Pallet Assembly (For less than average time lag shutters)	1
4	43004	Washer - Speed index anchor stud spacing	AR
4	104954	Screw - Winding lever stop	1
4	75431	Screw - Speed control ring stop	1
4,5	102957	Screw - Trigger latch spring-(1), Safety latch spring-(1), Contact lever-(1)	3
4	94798	Spring - Trigger latch	1
4	96219	Latch - Trigger	1
4	80500	Screw - Trigger latch	1
5	102978	Screw - Cover, short	1
5	102979	Screw - Cover, long	2
5	56914	Spring - Safety latch	1
5	93073	Cam - High speed spring	1
5	102997	Screw - Main drive (0-80 Thread)	1
5	60828	Spring - Main drive	1
5A	100014	Cover Assembly, Old Model	1
5A	122619	Cover Assembly, New Model	1
5A	87024	Stud - Speed index plate anchor	2
5A	66163	Stud - Delayed action safety latch	1
5A	66173	Latch - Delayed action safety	1
5A	99801	Stud - Pallet	1
5A	35625	Rivet - Delayed action pinion bracket	2
5A	99803	Bracket - Delayed action pinion	1
6	83470	Screw - Retard gear plate	2
6	107460	Retard Gear Plate and No. 1 Pinion Assembly	1
6	103643	Spring - No. 1 Sector	1
6	67763	Pallet - Retard	1
6	121106	Pallet Bracket and Stud Assembly	1
6	102647	Spring - Pallet bracket	1
6	95379	No. 2 Retard Pinion and Gear Assembly	1
6	95381	No. 4 Escapement Wheel and Pinion Assembly	1
6	95380	No. 3 Retard Pinion and Gear Assembly	1
7	102954	Screw - Retard sector	1
12A	95377	Retard Sector and Stud Assembly, Old Model	
12A	121107	Retard Sector and Stud Assembly, New Model	
7	56911	Spring - Retard sector	1
7	62720	Spring - Blade controller latch	1
7	104287	Bushing - Blade controller latch spring	1
7	99532	Main Drive Latch and Bushing Assembly	1

FIG.	PART NUMBER	PART NAME	No. REQD.

FIG.	PART NUMBER	PART NAME	No. REQD.
7	79878	Spring - Main drive	1
8	102955	Screw - Trigger	1
8	96881	Spring - Trigger	1
8	56847	Washer - Trigger	1
8	80918	Trigger Assembly	1
8	78967	Spacer - Bulb lever	2
8	78979	Bulb Lever Assembly	1
8	78970	Spring - Bulb lever	1
9,9A	102957	Screw - Contact lever	1
9,9A	94306	Spring - Contact lever	1
9,13	102823	Spring - Contact lever latch, new model	1
9,13	106411	Contact Lever Assembly, New Model	1
9,9A,13	96226	Screw - Connector	1
9,13	102948	Screw - Contact strip, new model	1
9,13	106258	Screw - Contact insulating block, new model	1
9,13	106256	Spring - Contact, New Model	1
9,13	106257	Block - Contact insulating, new model	1
9,9A,13	96225	Bushing - Case insulating	1
9,9A,13	100283	Nut - Connector screw	1
10	94400	No. 1 Delayed Action Pinion with Gear and Post Assembly, Old Model	1
10	102767	No. 1 Delayed Action Pinion and Gear Assembly, New Model	1
10	94309	Spring - No. 1 Delayed Action Pinion and Gear Assembly	1
10	101984	Screw - Clutch Assembly, Old Model-(1), Star Wheel Assembly-(1)	2
10	56924	Clutch Assembly	1
10,13	104217	Star Wheel Assembly	1
11		Rear Lens Assembly - Return shutter to Rochester for replacement	1
11	78977	Nut - Shutter operating disc bearing	1
11	96229	Disc - Shutter operating	1
11	78976	Spacer - Shutter operating disc bearing	1
11	102956	Screw - Mechanism plate to case, short	2
11	104286	Screw - Mechanism plate to case, long	1
12A		Mechanism Plate Assembly, Old Model (Discontinued, replace with New Model Mechanism Plate Assembly 122993, New Model Delayed Action Pinion and Gear Assembly, 102767 and Kit No. 121352)	1
12A	122993	Mechanism Plate Assembly, New Model	1
12	94298	Blade Controller and Stud Assembly, New Model	1
12	86130	Blade with Double Blade Bushing and Stud Assembly	1
12	75907	Blade	1
12	73426	Blade and Stud Assembly	4
12	73432	Diaphragm Retainer Plate and Wings Assembly	1
12	60816	Wing - Diaphragm	5
12	55321	Screw - Diaphragm retainer plate to mechanism plate	5
12	78953	Ring - Diaphragm control	1
12	60832	Spring - Setting lever	1
12	80924	Setting Lever Assembly	1
12	96788	Case Assembly	1
12B	83434	Nut - Cable release	1
12B	60831	Stud - Setting lever spring	1
13	56891	Bushing - Connector wire	1
13	98594	Wire - Connector	1
13	121352	Kit - (For replacing Old Model Star Wheel, Old Model Mechanism Plate Assembly, and the Old Model Flash Contact Parts)	1
14	RF501-O	Tool (For removing the Front Lens)	1
14	RF501-W	Tool (Block for holding shutter firmly while the Front Lens is being removed)	1
14	RF611	Tool (Jeweler's Screwdriver blade for Connector Screw Nut and Main Drive Screw)	1
14	RF657	Tool (Jeweler's screwdriver blade for adjusting the Flash Retard Pallet Stud)	1
FIG.	PART NUMBER	PART NAME	No. REQD.

Numerical List

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
RF501-O	10	14	80500	9	4	100283	10	9,9A,13
RF501-W	10	14	80917	9	2	101808	9	2
RF611	10	14	80918	10	8	101809	9	2
RF657	10	14	80924	10	12	101810	9	2
HE25094	9	1	83434	10	12B	101984	10	10
HE25466	9	1	83470	9	6	102249	9	2
HE28035	9	1	86130	10	12	102647	9	6
HE31394	9	1	86602	9	2	102767	10	10
35625	9	5A	87024	9	5A	102823	10	9,13
43004	9	4	87025	9	1	102948	10	9,13
55321	10	12	93073	9	5	102954	9	7
56847	10	8	94298	10	12	102955	10	8
56891	10	13	94306	10	9,9A	102956	10	11
56911	9	7	94309	10	10	102957	9,10	4,5,
56914	9	5	94310	9	4			9,9A
56924	10	10	94400	10	10	102978	9	5
60816	10	12	94798	9	4	102979	9	5
60828	9	5	95377	9	12A	102997	9	5
60831	10	12B	95379	9	6	102998	9	3
60832	10	12	95380	9	6	103643	9	6
62720	9	7	95381	9	6	104217	10	10,13
66163	9	5A	96218	9	3	104286	10	11
66173	9	5A	96219	9	4	104287	9	7
67763	9	6	96225	10	9,9A,13	104954	9	4
73426	10	12	96226	10	9,9A,13	106256	10	9,13
73432	10	12	96227	9	3	106257	10	9,13
75431	9	4	96229	10	11	106258	10	9,13
75907	10	12	96788	10	12	106316	9	2
78953	10	12	96797	9	2	106411	10	9,13
78954	9	3	96801	9	2	107153	9	2
78967	10	8	96881	10	8	107460	9	6
78970	10	8	96883	9	2	109817	9	3A
78971	9	2,3	98594	10	13	121106	9	6
78974	9	3A	99532	9	7	121107	9	12A
78976	10	11	99801	9	5A	121352	10	13
78977	10	11	99803	9	5A	122619	9	5A
78979	10	8	100014	9	5A	122993	10	12A
78978	10	7	100258	9	4			

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

3-51-GL-B

Lithographed in the United States of America

JULY 1949 PARTS LIST No. 1-1490C

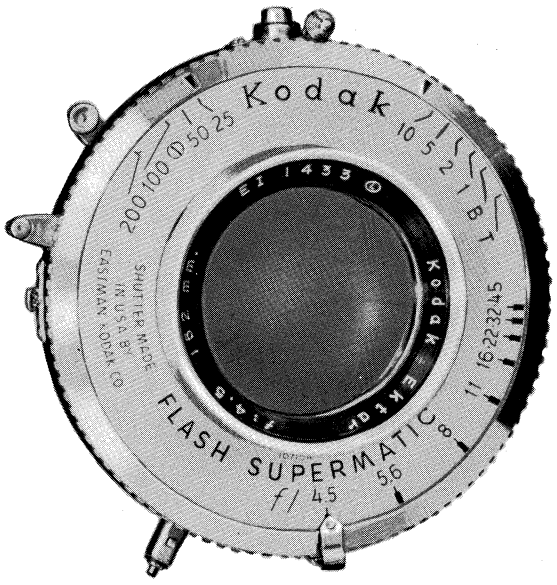
KODAK FLASH SUPERMATIC SHUTTER

with f/6.3 135mm KODAK WIDE FIELD EKTAR LENS

or f/4.5 152mm KODAK EKTAR LENS

Symbol "A" identifies parts for the Kodak Flash Supermatic Shutter with the f/6.3 135mm Kodak Wide Field Ektar Lens, and Symbol "B" identifies parts for the Kodak Flash Supermatic Shutter with the f/4.5 152mm Kodak Ektar Lens.

Illustrations and Parts List are in the sequence of disassembly so that individual parts can be located quickly.



EASTMAN KODAK COMPANY • ROCHESTER 4, N.Y.

"A" Kodak Flash Supermatic Shutter with f/6.3
135mm Kodak Wide Field Ektar Lens
"B" Kodak Flash Supermatic Shutter with f/4.5
152mm Kodak Ektar Lens

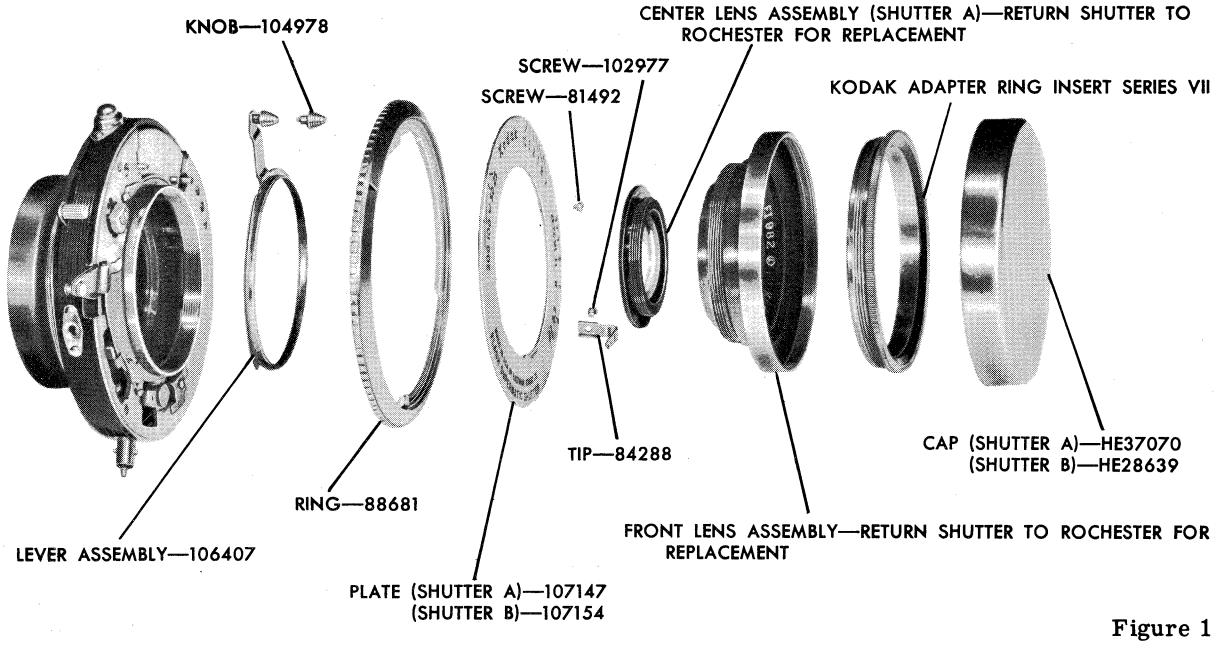


Figure 1

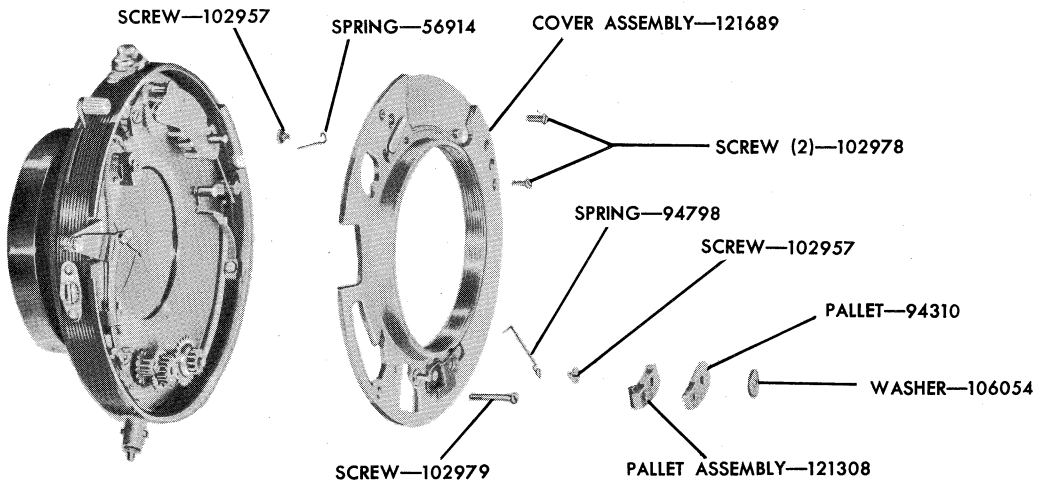


Figure 2

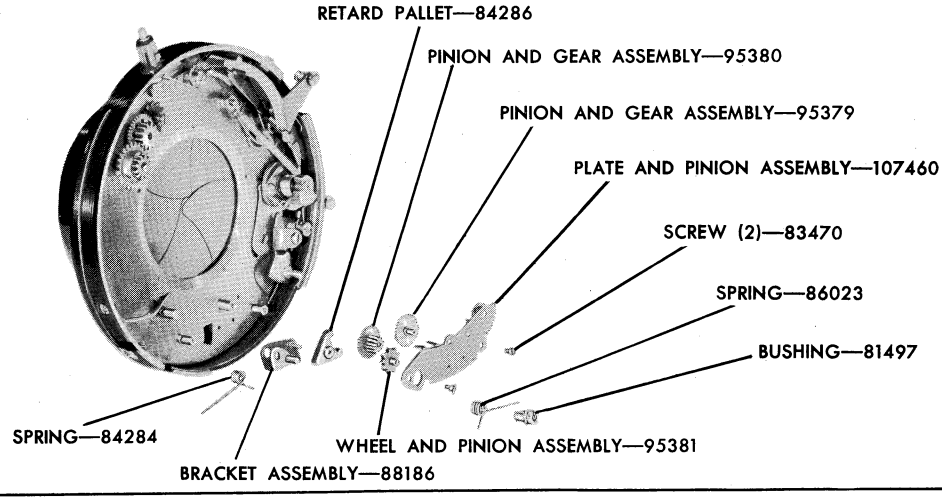


Figure 3

Always give PART NUMBER and NAME when ordering parts.

"A" Kodak Flash Supermatic Shutter with f/6.3
135mm Kodak Wide Field Ektar Lens
"B" Kodak Flash Supermatic Shutter with f/4.5
152mm Kodak Ektar Lens

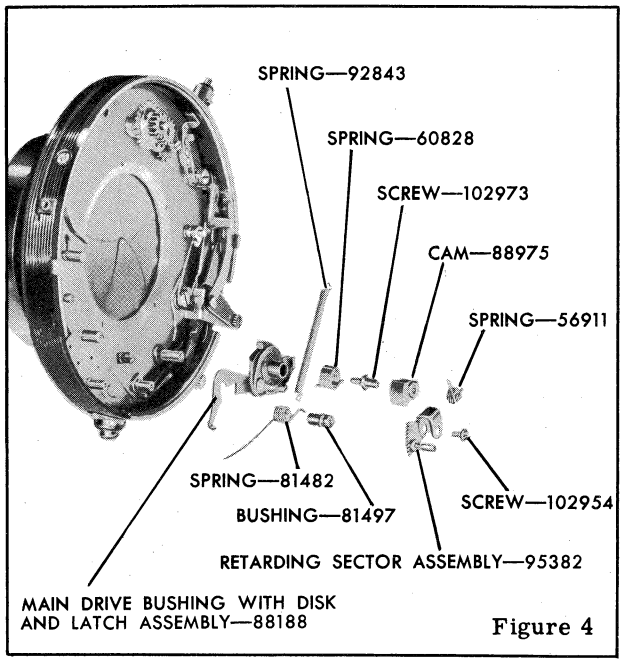


Figure 4

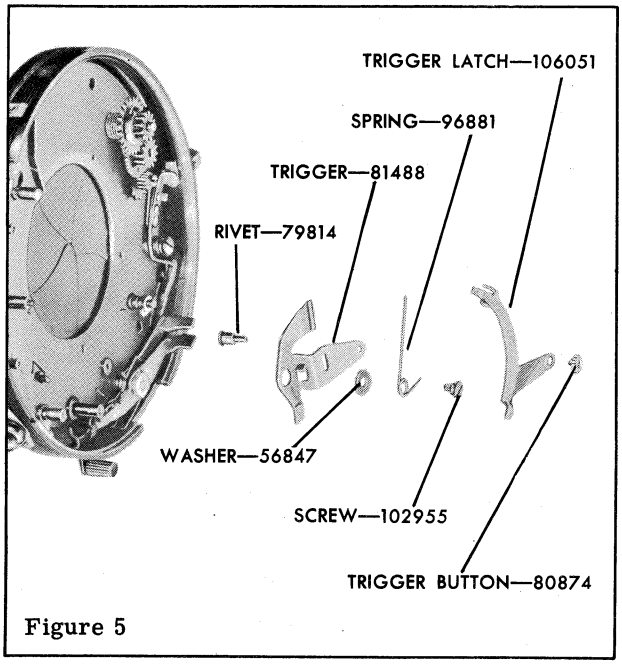


Figure 5

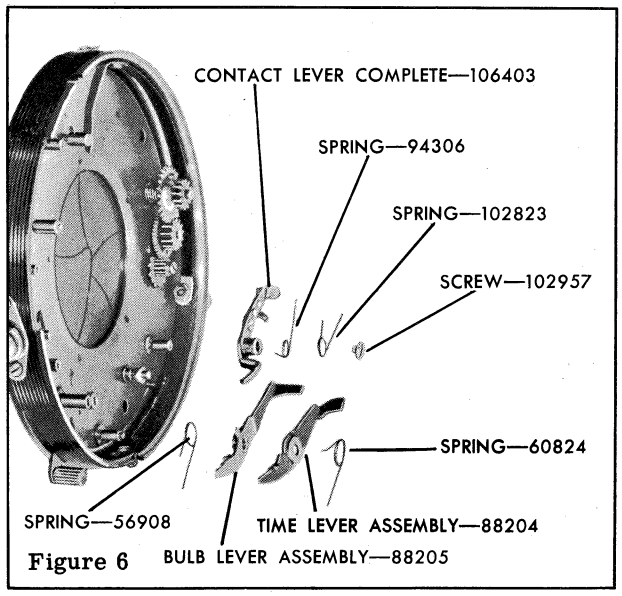


Figure 6

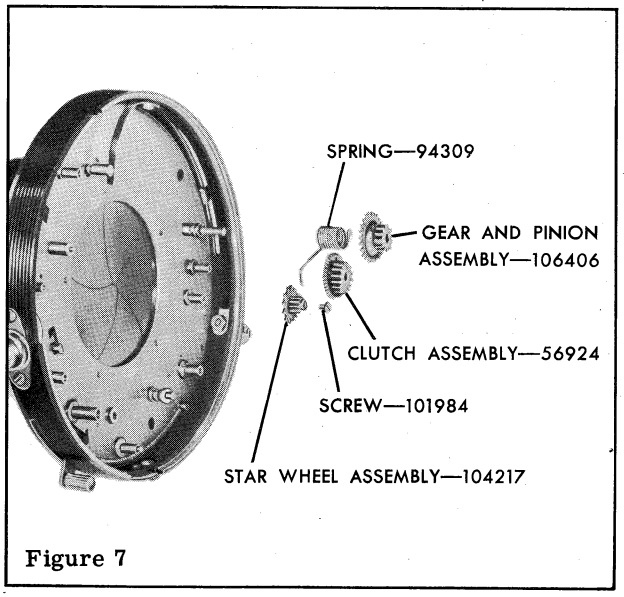


Figure 7

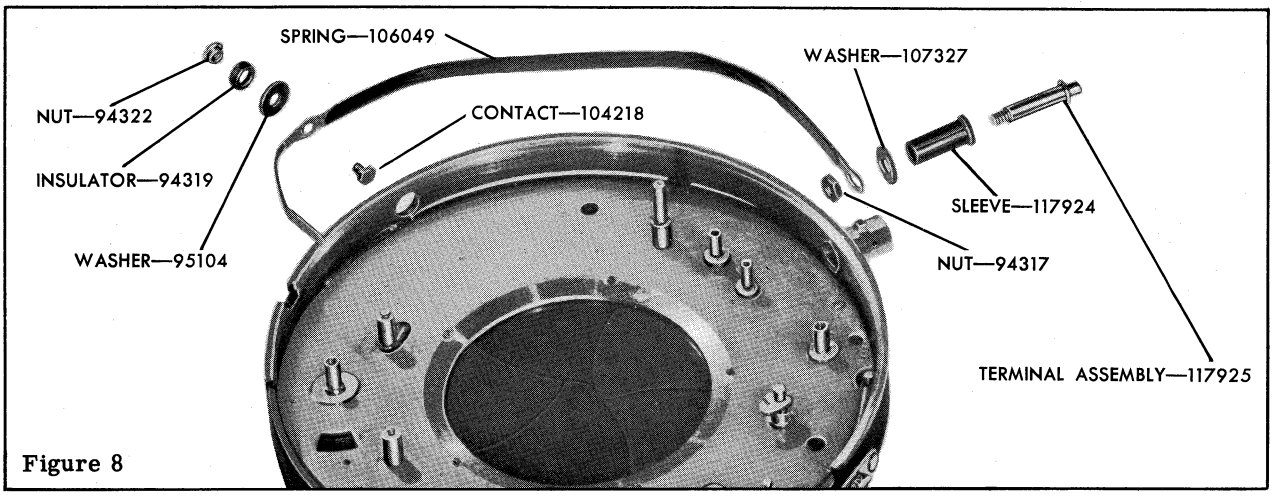


Figure 8

"A" Kodak Flash Supermatic Shutter with f/6.3 135mm Kodak Wide Field Ektar Lens
"B" Kodak Flash Supermatic Shutter with f/4.5 152mm Kodak Ektar Lens

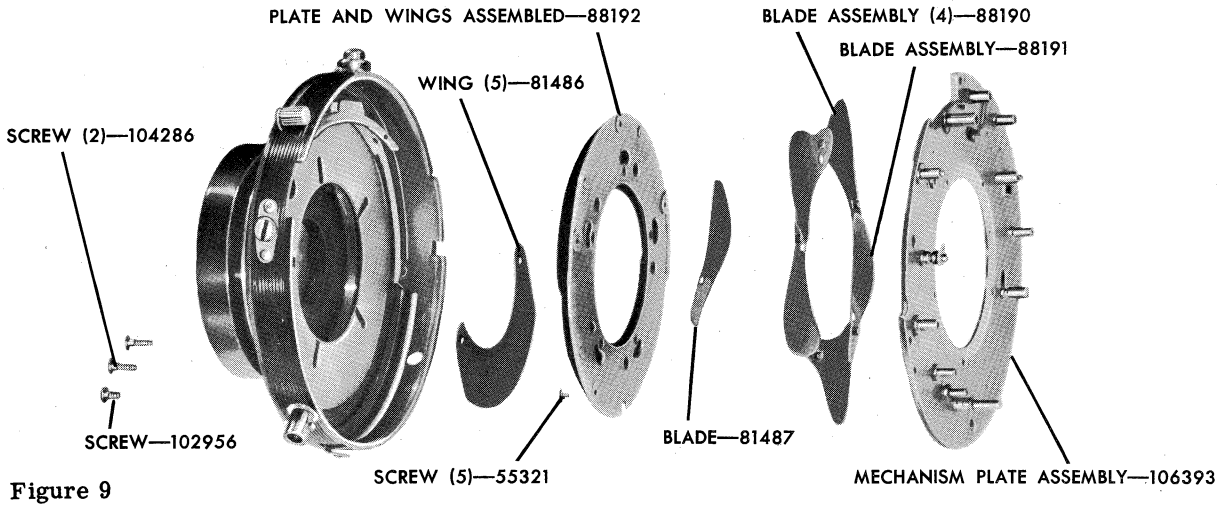


Figure 9

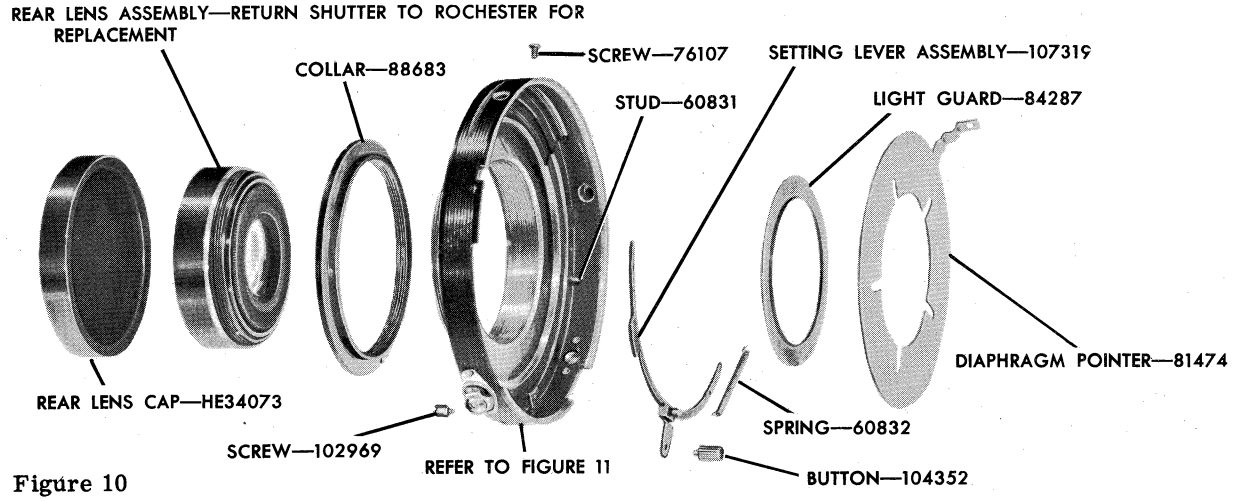


Figure 10

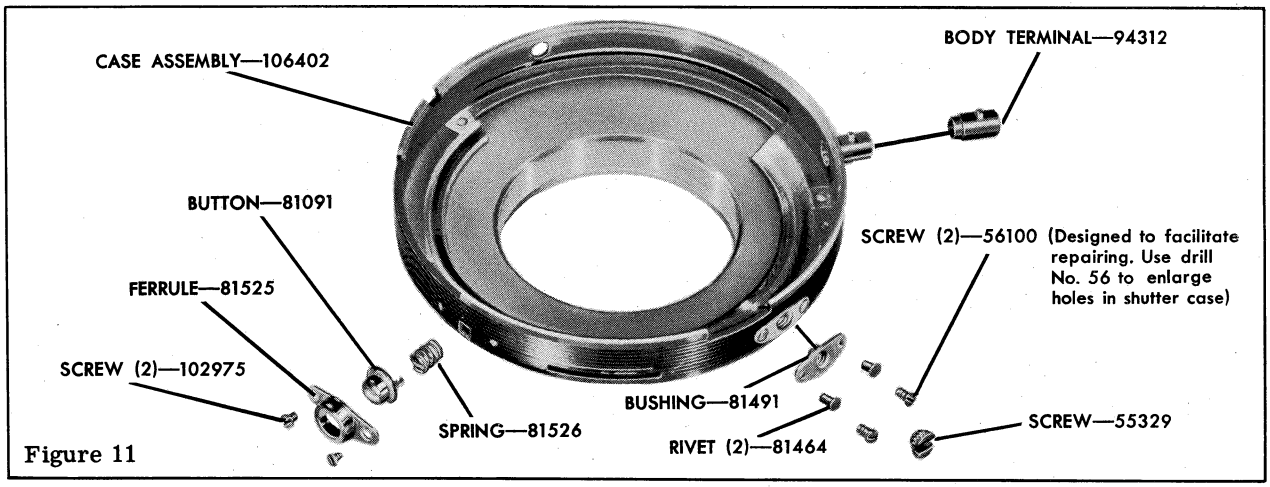


Figure 11

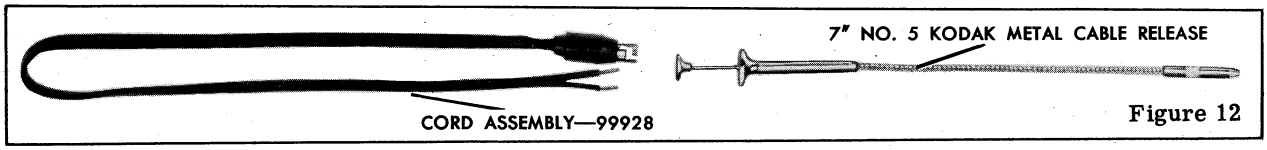


Figure 12

Always give PART NUMBER and NAME when ordering parts.

"A" Kodak Flash Supermatic Shutter with f/6.3
135mm Kodak Wide Field Ektar Lens
"B" Kodak Flash Supermatic Shutter with f/4.5
152mm Kodak Ektar Lens

FIG.	PART NUMBER	Shutter A	Shutter B	PART NAME	No. REQD.
1	HE37070	X		Cap - Front lens	1
1	HE28639		X	Cap - Front lens	1
1		X		Kodak Adapter Ring Insert Series VII	1
1		X	X	Front Lens Assembly - Return shutter to Rochester for replacement	1
1		X		Center Lens Assembly - Return shutter to Rochester for replacement	1
1	84288	X	X	Tip - Diaphragm pointer	1
1	102977	X	X	Screw - Diaphragm pointer tip	1
1	81492	X	X	Screw - Speed and diaphragm index plate	1
1	107147	X		Plate - Speed and diaphragm index	1
1	107154		X	Plate - Speed and diaphragm index	1
1	88681	X	X	Ring - Speed control	1
1	106407	X	X	Winding Lever Assembly	1
1	104978	X	X	Knob - Winding lever	1
2	106054	X	X	Washer - Pallet spacer	1
2	94310	X	X	Pallet - Flash retard (For average time lag shutters)	1
2	121308	X	X	Flash Retard Pallet Assembly (For less than average time lag shutters)	1
2	102978	X	X	Screw - Cover, short	2
2	102979	X	X	Screw - Cover, long	1
2	102957	X	X	Screw - Trigger latch spring-(1), Contact lever-(1), Safety latch spring-(1)	3
2	94798	X	X	Spring - Trigger latch	1
2	121689	X	X	Cover Assembly	1
2	56914	X	X	Spring - Safety latch	1
3	83470	X	X	Screw - Retard gear plate	2
3	107460	X	X	Retard Gear Plate and Pinion Assembly	1
3	95379	X	X	No. 2 Retard Pinion and Gear Assembly	1
3	95381	X	X	No. 4 Escapement Wheel and Pinion Assembly	1
3	95380	X	X	No. 3 Retard Pinion and Gear Assembly	1
3	84286	X	X	Pallet - Retard	1
3	88186	X	X	Pallet Bracket Assembly	1
3	84284	X	X	Spring - Pallet bracket	1
3	86023	X	X	Spring - Closing	1
3,4	81497	X	X	Bushing - Closing spring-(1), Blade controller latch spring-(1)	2
4	102954	X	X	Screw - Retard Sector	1
4	95382	X	X	Retard Sector and Stud Assembly	1
4	56911	X	X	Spring - Retard sector	1
4	88975	X	X	Cam - Spring	1
4	60828	X	X	Spring - High speed	1
4	102973	X	X	Screw - Main drive	1
4	88188	X	X	Main Drive Bushing with Disk and Latch Assembly	1
4	92843	X	X	Spring - Main drive	1
4	81482	X	X	Spring - Blade controller latch	1
5	80874	X	X	Button - Trigger	1
5	106051	X	X	Latch - Trigger	1
5	81488	X	X	Trigger	1
5	79814	X	X	Rivet - Trigger button	1
5	102955	X	X	Screw - Trigger	1
5	96881	X	X	Spring - Trigger	1
5	56847	X	X	Washer - Trigger	1
6	60824	X	X	Spring - Time lever	1
6	88204	X	X	Time Lever Assembly	1
6	88205	X	X	Bulb Lever Assembly	1
6	56908	X	X	Spring - Bulb lever	1
6	102957	X	X	Screw - Contact lever	1
6	106403	X	X	Contact Lever Complete	1
6	94306	X	X	Spring - Contact lever	1
6	102823	X	X	Spring - Contact lever latch	1
7	106406	X	X	No. 1 Delayed Action Gear and Pinion Assembly	1
				The shutter in which the part is used is indicated by the X.	
FIG.	PART NUMBER	Shutter A	Shutter B	PART NAME	No. REQD.

"A" Kodak Flash Supermatic Shutter with f/6.3 135mm Kodak Wide Field Ektar Lens
"B" Kodak Flash Supermatic Shutter with f/4.5 152mm Kodak Ektar Lens

FIG.	PART NUMBER	Shutter A	Shutter B	PART NAME	No. REQD.
7	94309	X	X	Spring - Winding	1
7	56924	X	X	Clutch Assembly	1
7	101984	X	X	Screw - Star wheel assembly	1
7	104217	X	X	Star Wheel and Pinion Assembly	1
8	94317	X	X	Nut - Terminal	1
8	107327	X	X	Washer - Insulating	1
8	117924	X	X	Sleeve - Insulating	1
8	117925	X	X	Inner Terminal Assembly	1
8	106049	X	X	Spring - Contact	1
8	104218	X	X	Contact - Threaded	1
8	95104	X	X	Washer - Threaded contact insulating	1
8	94319	X	X	Insulator - Case	1
8	94322	X	X	Nut - Contact	1
9	104286	X	X	Screw - Plate, long	2
9	102956	X	X	Screw - Plate, short	1
9	55321	X	X	Screw - Diaphragm retainer plate	5
9	88192	X	X	Diaphragm Retainer Plate and Wings Assembled	1
9	81486	X	X	Wing - Diaphragm	5
9	88190	X	X	Blade and Stud Assembly	4
9	88191	X	X	Blade with Double Blade Bushing and Stud Assembly	1
9	81487	X	X	Blade	1
9	106393	X	X	Mechanism Plate with Studs, Blade Controller, and Spacer Assembled	1
10	60832	X	X	Spring - Setting lever	1
10	107319	X	X	Setting Lever Assembly	1
10	104352	X	X	Button - Setting lever	1
10	60831	X	X	Stud - Setting lever spring	1
10	81474	X	X	Pointer - Diaphragm	1
10	84287	X	X	Guard - Diaphragm light	1
10	76107	X		Screw - Diaphragm pointer stop	1
10	88683	X	X	Collar - Shutter mounting	1
10	102969	X	X	Screw - Case locating	1
10		X	X	Rear Lens Assembly - Return shutter to Rochester for replacement	1
10	HE34073	X	X	Cap - Rear lens	1
11	102975	X	X	Screw - Blade arrestor ferrule	2
11	81525	X	X	Ferrule - Blade arrestor	1
11	81091	X	X	Button - Blade arrestor	1
11	81526	X	X	Spring - Blade arrestor	1
11	55329	X	X	Screw - Cable release opening	1
11	81464	X	X	Rivet - Cable release bushing	2
11	56100	X	X	Screw - Cable release bushing (Designed to facilitate repairing. Use drill No. 56 to enlarge holes in shutter case.)	2
11	81491	X	X	Bushing - Cable release	1
11	106402	X	X	Case Assembly	1
11	94312	X	X	Terminal - Body	1
12	99928	X	X	Cord and Connector Assembly	1
12		X	X	7'' No. 5 Kodak Metal Cable Release	1

The shutter in which the part is used is indicated by the X.

FIG.	PART NUMBER	Shutter	PART NAME	No. REQD.

Always give PART NUMBER and NAME when ordering parts.

PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.	PART NUMBER	PARTS LIST PAGE NUMBERS	FIGURE No.
HE28639	5	1	84286	5	3	102954	5	4
HE34073	6	10	84287	6	10	102955	5	5
HE37070	5	1	84288	5	1	102956	6	9
55321	6	9	86023	5	3	102957	5	2,6
55329	6	11	88186	5	3	102969	6	10
56100	6	11	88188	5	4	102973	5	4
56847	5	5	88190	6	9	102975	6	11
56908	5	6	88191	6	9	102977	5	1
56911	5	4	88192	6	9	102978	5	2
56914	5	2	88204	5	6	102979	5	2
56924	6	7	88205	5	6	104217	6	7
60824	5	6	88681	5	1	104218	6	8
60828	5	4	88683	6	10	104286	6	9
60831	6	10	88975	5	4	104352	6	10
60832	6	10	92843	5	4	104978	5	1
76107	5	10	94306	5	6	106049	6	8
79814	5	5	94309	6	7	106051	5	5
80874	5	5	94310	5	2	106054	5	2
81091	6	11	94312	6	11	106393	6	9
81464	6	11	94317	6	8	106402	6	11
81474	6	10	94319	6	8	106403	5	6
81482	5	4	94322	6	8	106406	5	7
81486	6	9	94798	5	2	106407	5	1
81487	6	9	95104	6	8	107147	5	1
81488	5	5	95379	5	3	107154	5	1
81491	6	11	95380	5	3	107319	6	10
81492	5	1	95381	5	3	107327	6	8
81497	5	3,4	95382	5	4	107460	5	3
81525	6	11	96881	5	5	117924	6	8
81526	6	11	99928	6	12	117925	6	8
83470	5	3	101984	6	7	121308	5	2
84284	5	3	102823	5	6	121689	5	2

11-49-G L P -B

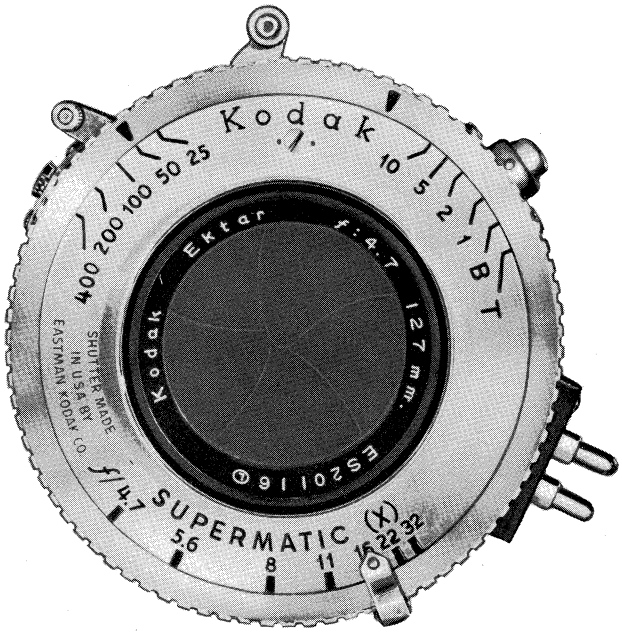
Lithographed in the United States of America

JULY 1948 PARTS LIST No. 1-1490B

KODAK SUPERMATIC (X) SHUTTER

WITH 127mm f/4.7 KODAK EKTAR LENS

This parts list also covers the following:
Kodak Supermatic (X) Shutter with 127mm f/4.7 Kodak Ektar Lens for Busch Cameras
Kodak Supermatic (X) Shutter with 127mm f/4.7 Kodak Ektar Lens for Graphic Cameras
Kodak Supermatic (X) Shutter with 152mm f/4.5 Kodak Ektar Lens for Graphic Cameras
Photographs contained in this list were made from parts for the Kodak Supermatic (X) Shutter with 127mm f/4.7 Kodak Ektar Lens. The parts which are identical on all shutters are identified by part number and name only. To identify the parts that are different in design, the lens identification has been added to the nomenclature. Illustrations are arranged in sequence of disassembly so that individual parts can be located quickly.



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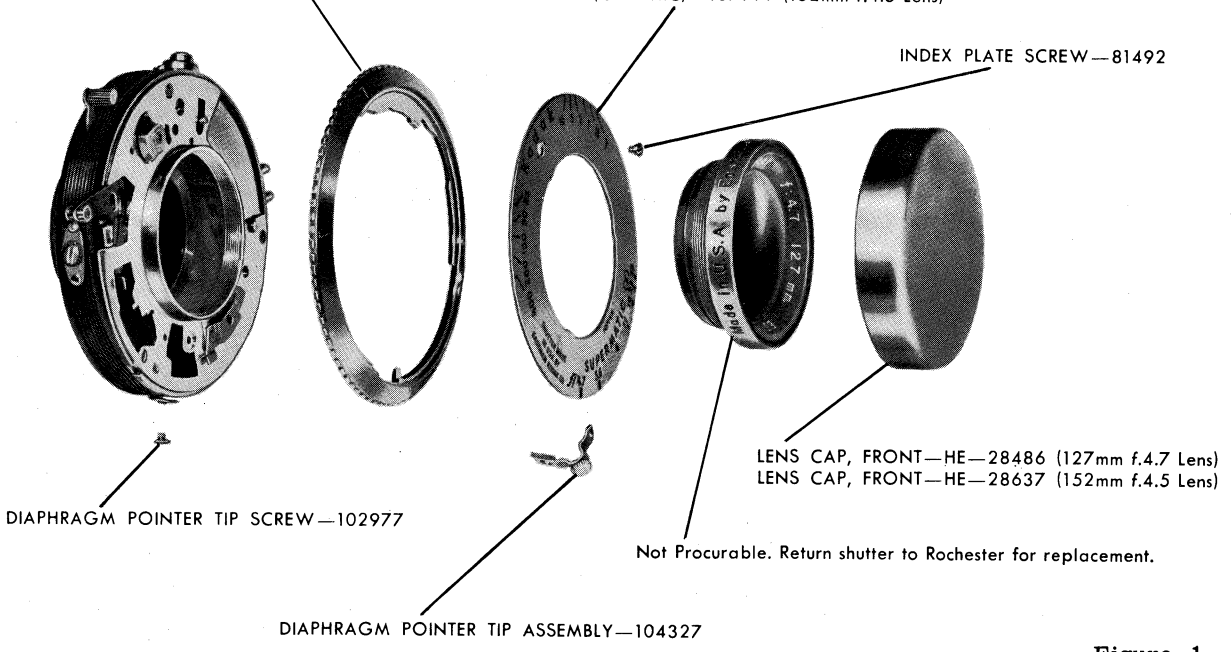

Figure 1

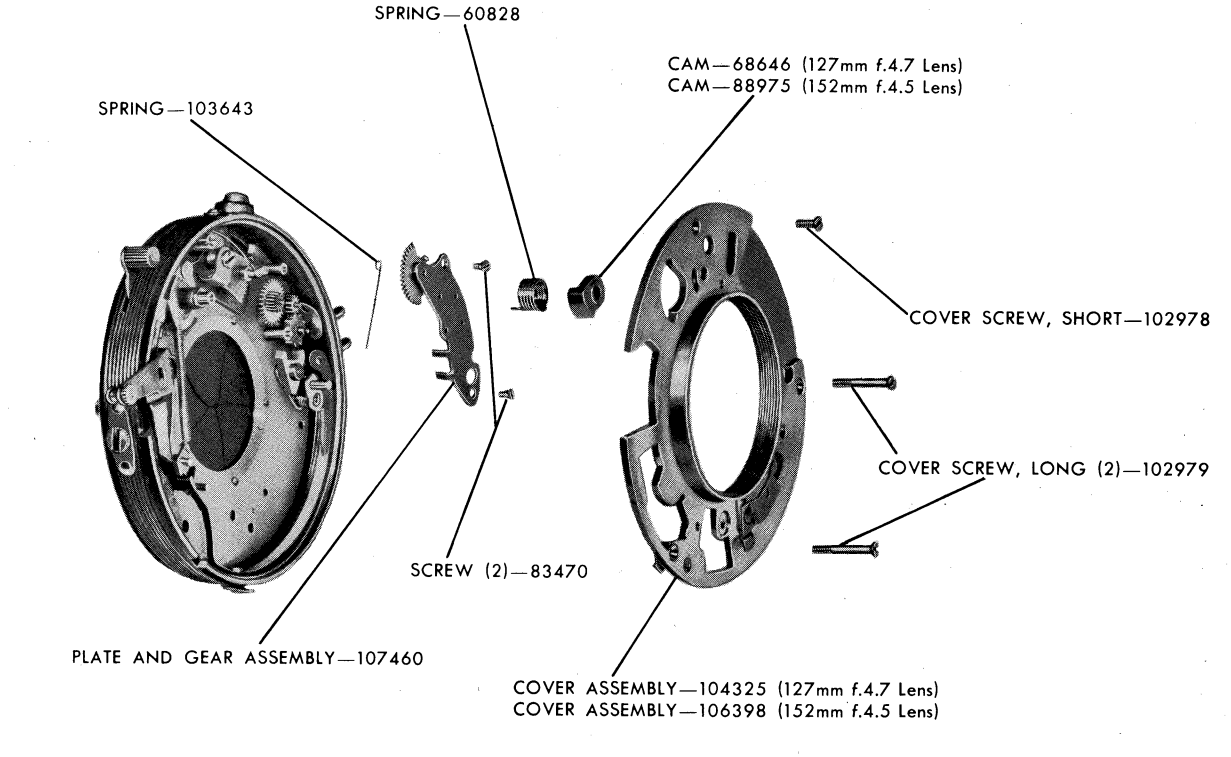

Figure 2

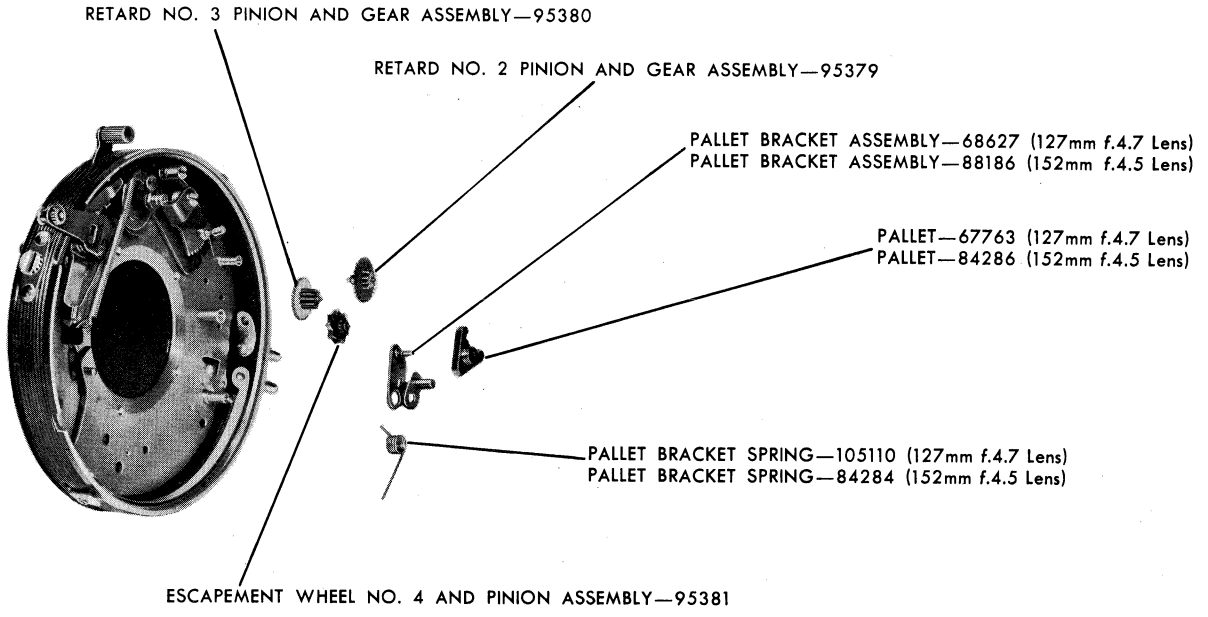

Figure 3

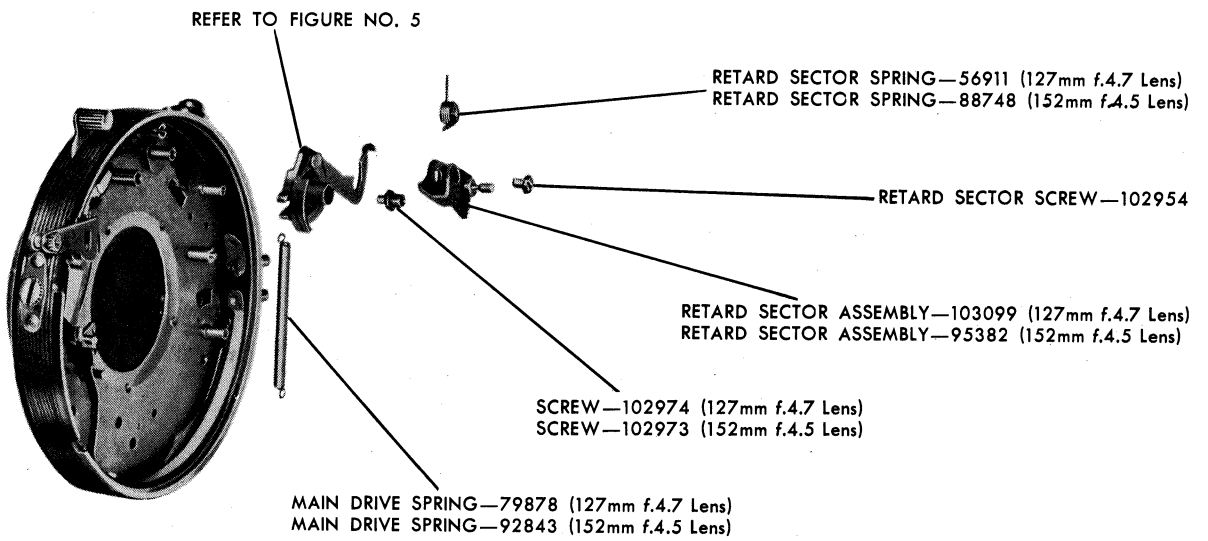

Figure 4

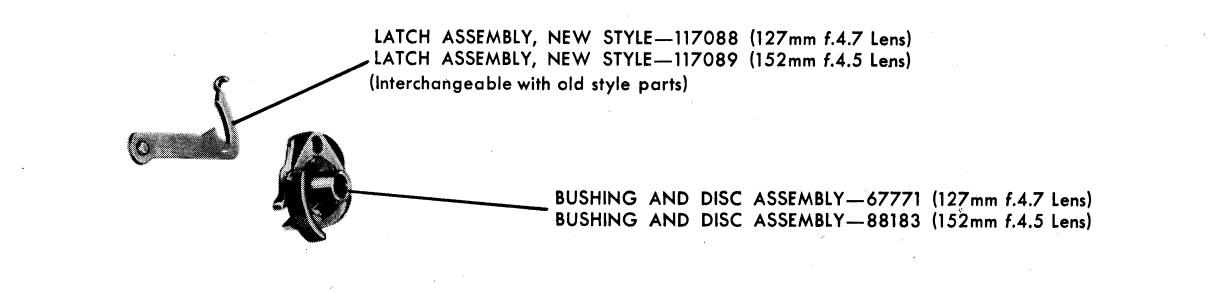

Figure 5

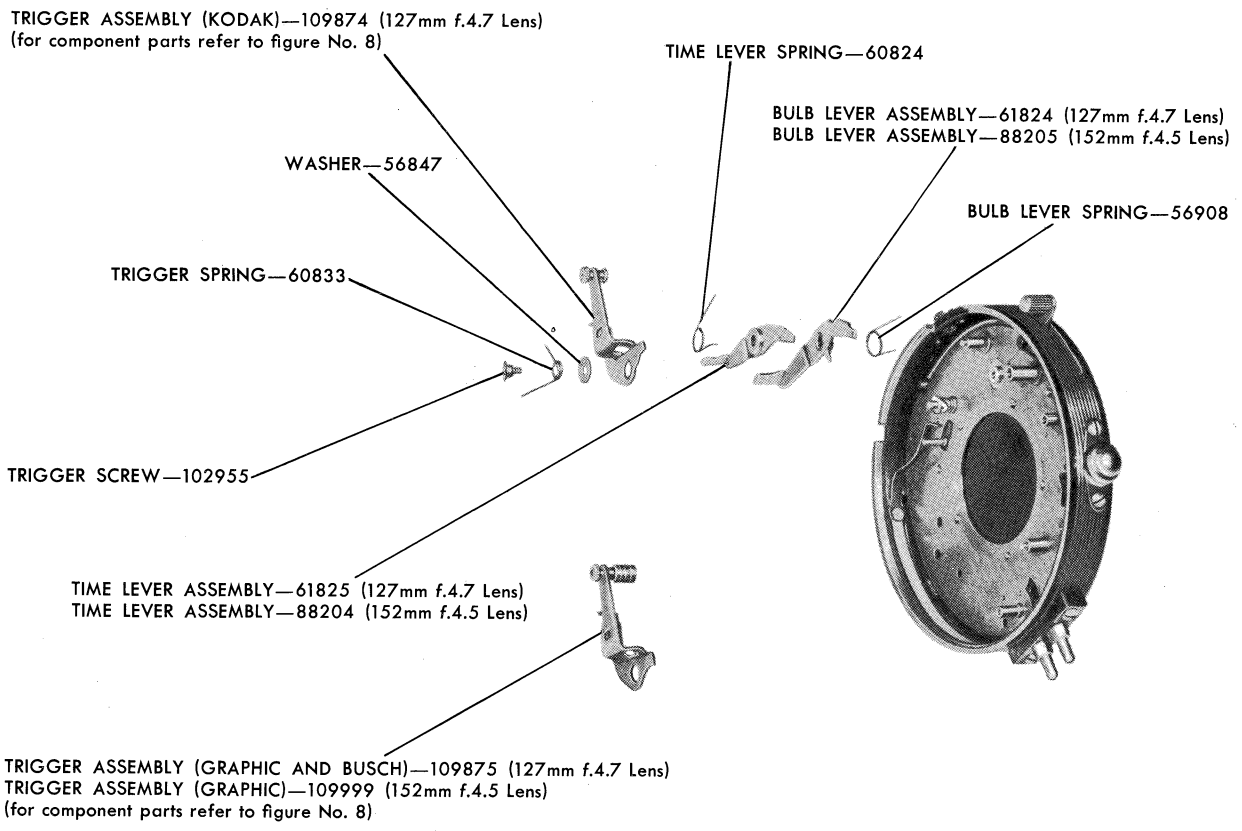

Figure 6

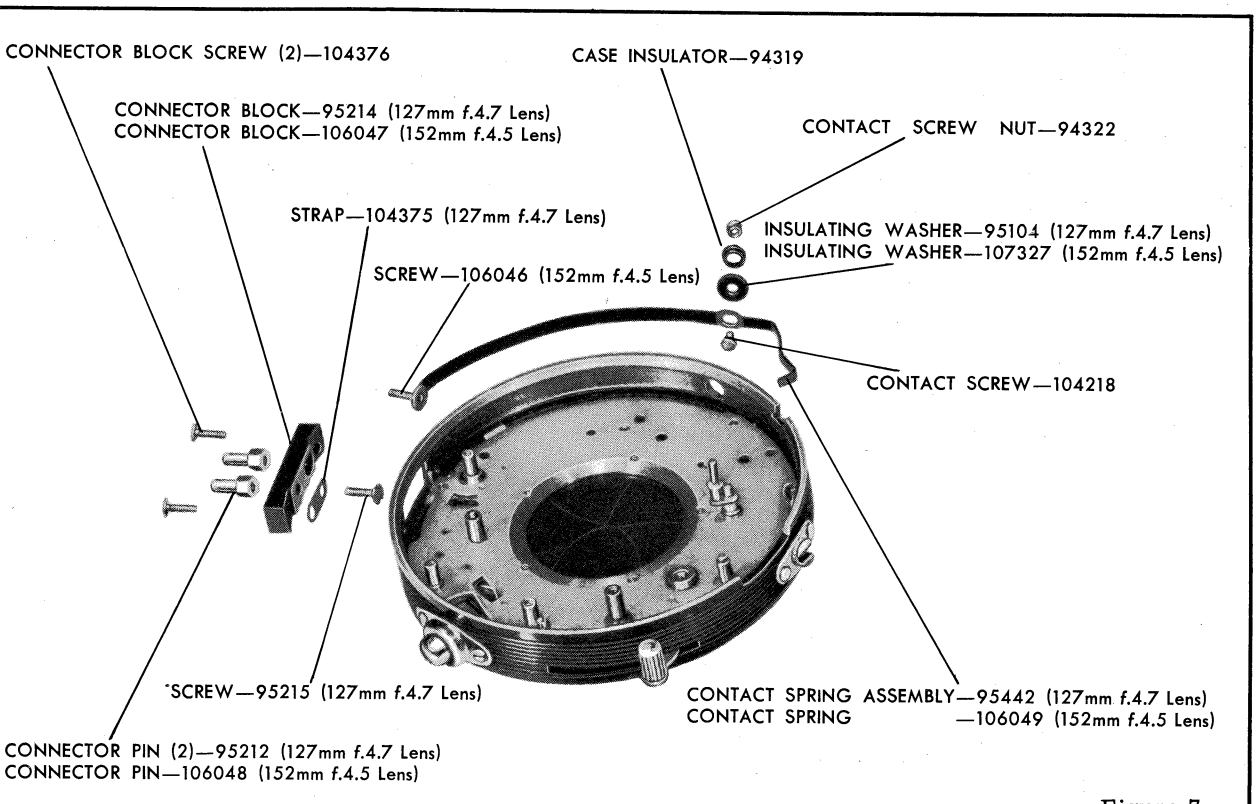

Figure 7

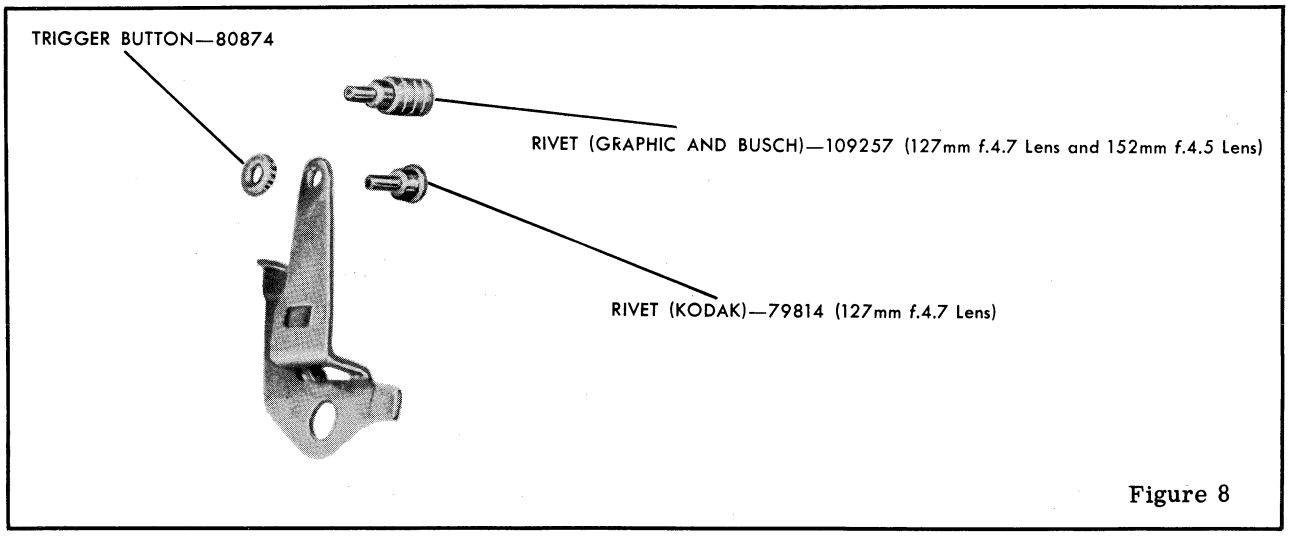

Figure 8

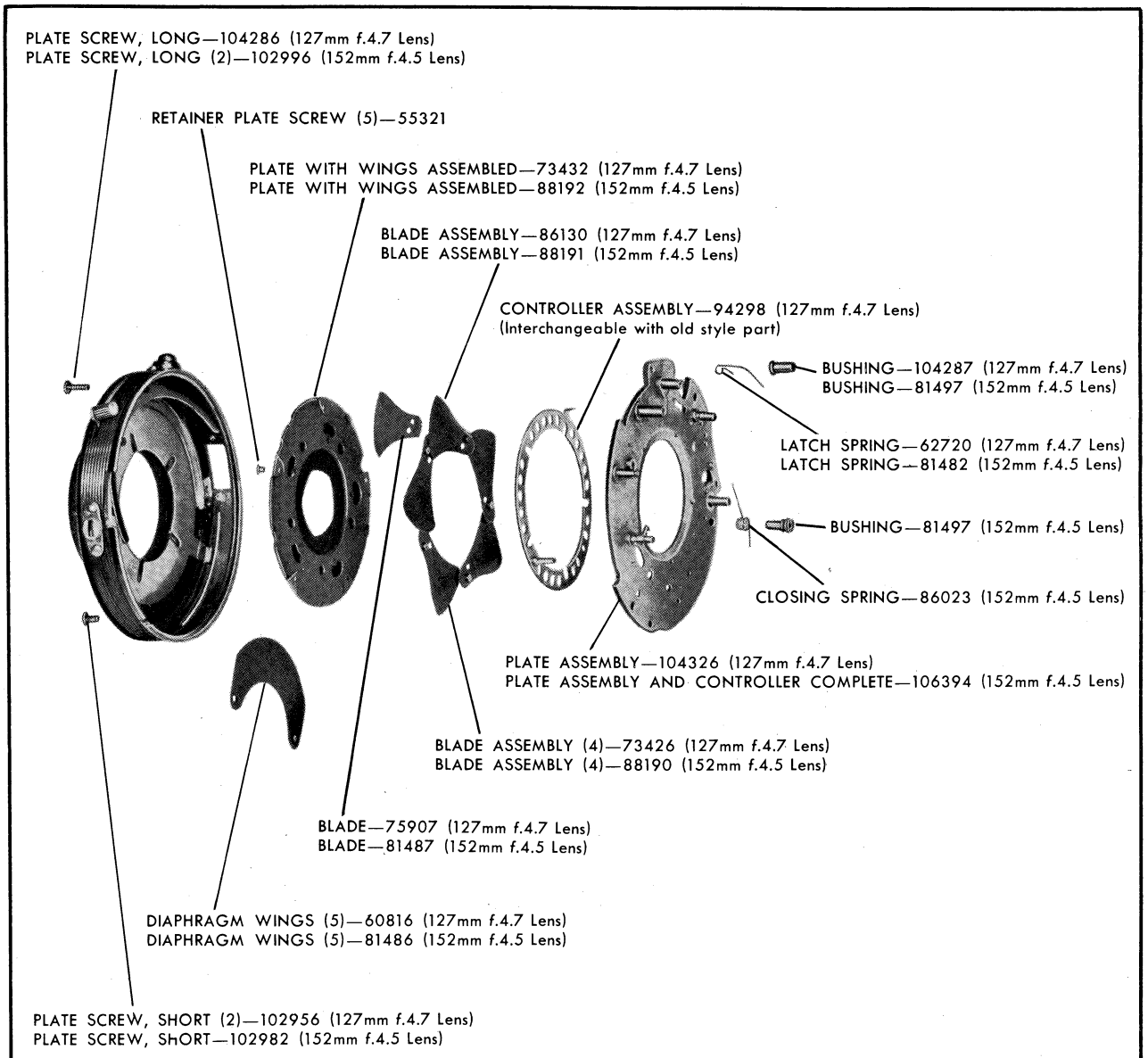

Figure 9

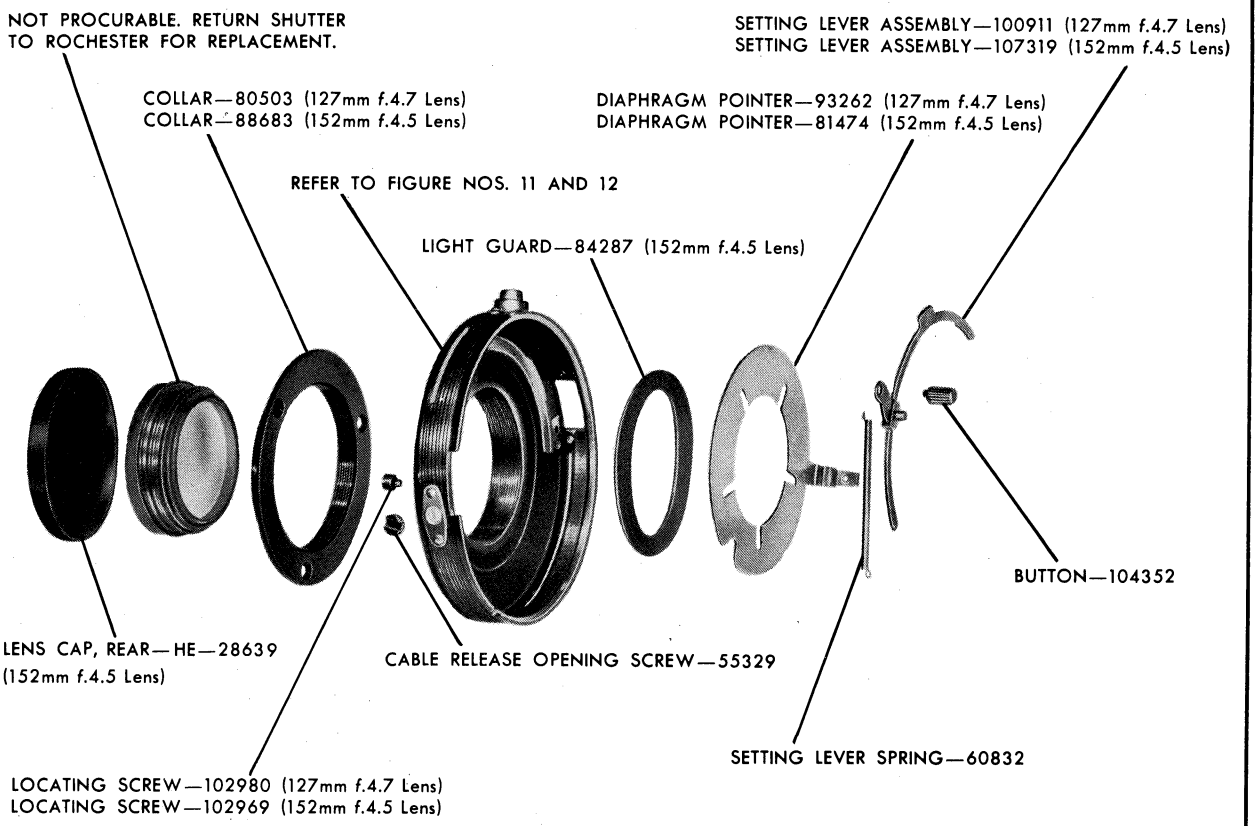

Figure 10

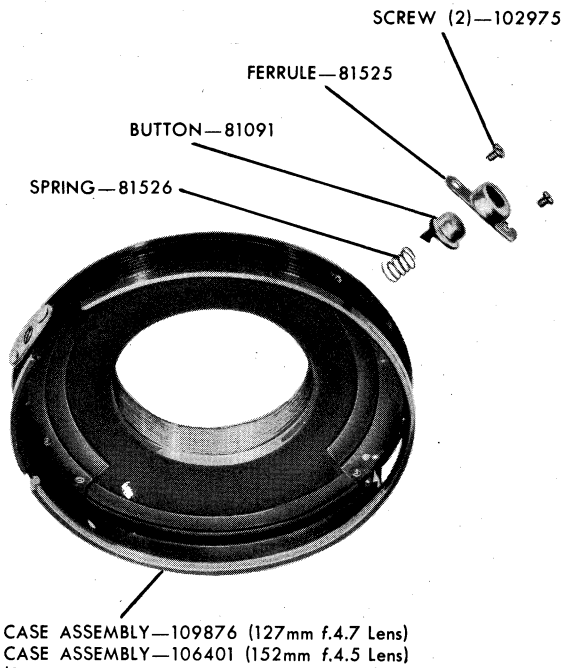

Figure 11

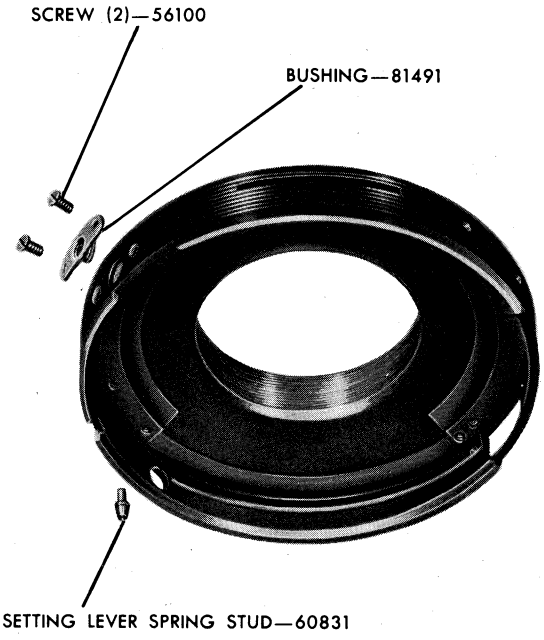

Figure 12

FIG.	PART NUMBER	PART NAME	No. REQD.
1	HE-28486	Cap - Lens, front (127mm f/4.7 Lens)	1
1	HE-28637	Cap - Lens, front (152mm f/4.5 Lens)	1
10	HE-28639	Cap - Lens, rear (152mm f/4.5 Lens)	1
9	55321	Screw - Retainer plate	5
10	55329	Screw - Cable release opening	1
12	56100	Screw - Cable release bushing	2
6	56847	Washer - Trigger	1
6	56908	Spring - Bulb lever	1
4	56911	Spring - Retard sector (127mm f/4.7 Lens)	1
9	60816	Wing - Diaphragm (127mm f/4.7 Lens)	5
6	60824	Spring - Timer lever	1
2	60828	Spring - High speed	1
12	60831	Stud - Setting lever spring	1
10	60832	Spring - Setting lever	1
6	60833	Spring - Trigger	1
6	61824	Bulb Lever Assembly (127mm f/4.7 Lens)	1
6	61825	Time Lever Assembly (127mm f/4.7 Lens)	1
9	62720	Spring - Latch (127mm f/4.7 Lens)	1
5	67762	Stud - Latch (127mm f/4.7 Lens)	1
3	67763	Pallet - Retard (127mm f/4.7 Lens)	1
5	67771	Bushing and Disc Assembly (127mm f/4.7 Lens)	1
3	68627	Pallet Bracket Assembly)(127mm f/4.7 Lens)	1
2	68646	Cam (127mm f/4.7 Lens)	1
1	68649	Ring - Speed control (127mm f/4.7 Lens)	1
9	73426	Blade with Stud Assembly (127mm f/4.7 Lens)	4
9	73432	Diaphragm Retainer Plate and Wings Assembly (127mm f/4.7 Lens)	1
9	75907	Blade (127mm f/4.7 Lens)	1
8	79814	Rivet - Trigger button, Kodak (127mm f/4.7 Lens)	1
4	79878	Spring - Main drive (127mm f/4.7 Lens)	1
10	80503	Collar - Retaining (127mm f/4.7 Lens)	1
8	80874	Button - Trigger	1
11	81091	Button - Blade arrestor	1
10	81474	Pointer - Diaphragm (152mm f/4.5 Lens)	1
9	81482	Spring - Blade controller latch (152mm f/4.5 Lens)	1
9	81486	Wing - Diaphragm (152mm f/4.5 Lens)	5
9	81487	Blade (152mm f/4.5 Lens)	1
12	81491	Bushing - Cable release	1
1	81492	Screw - Speed and diaphragm index plate	1
9	81497	Bushing (152mm f/4.5 Lens)	2
11	81525	Ferrule - Blade arrestor	1
11	81526	Spring - Blade arrestor	1
2	83470	Screw - Gear plate	2
3	84284	Spring - Pallet bracket (152mm f/4.5 Lens)	1
3	84286	Pallet (152mm f/4.5 Lens)	1
10	84287	Guard - Light (152mm f/4.5 Lens)	1
9	86023	Spring - Closing (152mm f/4.5 Lens)	1
9	86130	Blade with Double Blade Bushing and Stud Assembly (127mm f/4.7 Lens)	1
4	88183	Bushing and Disc Assembly (152mm f/4.5 Lens)	1
3	88186	Pallet Bracket Assembly (152mm f/4.5 Lens)	1
9	88190	Blade Assembly (152mm f/4.5 Lens)	4
9	88191	Blade Assembly (152mm f/4.5 Lens)	1
9	88192	Diaphragm Retainer Plate and Wings Assembly (152mm f/4.5 Lens)	1
6	88204	Time Lever Assembly (152mm f/4.5 Lens)	1
6	88205	Bulb Lever Assembly (152mm f/4.5 Lens)	1
1	88681	Ring - Speed control (152mm f/4.5 Lens)	1
10	88683	Collar - Retaining (152mm f/4.5 Lens)	1
4	88748	Spring - Retard sector (152mm f/4.5 Lens)	1
2	88975	Cam (152mm f/4.5 Lens)	1
4	92843	Spring - Main drive (152mm f/4.5 Lens)	1
10	93262	Pointer - Diaphragm (127mm f/4.7 Lens)	1
9	94298	Blade Controller Assembly (127mm f/4.7 Lens)	1

| FIG. | PART NUMBER | PART NAME | No. REQD. |

FIG.	PART NUMBER	PART NAME	No. REQD.
7	94319	Insulator - Case	1
7	94322	Nut - Contact screw	1
7	95104	Washer - Insulating (127mm f/4.7 Lens)	1
7	95212	Pin - Connector (127mm f/4.7 Lens)	2
7	95214	Block - Connector (127mm f/4.7 Lens)	1
7	95215	Screw - Connector, ground (127mm f/4.7 Lens)	1
3	95379	Retard No. 2 Pinion and Gear Assembly	1
3	95380	Retard No. 3 Pinion and Gear Assembly	1
3	95381	Escapement Wheel No. 4 and Pinion Assembly	1
4	95382	Retard Sector Assembly (152mm f/4.5 Lens)	1
7	95442	Contact Spring Assembly (127mm f/4.7 Lens)	1
10	100911	Setting Lever Assembly (127mm f/4.7 Lens)	1
4	102954	Screw - Retard sector	1
6	102955	Screw - Trigger	1
9	102956	Screw - Plate, short (127mm f/4.7 Lens)	2
10	102969	Screw - Locating (152mm f/4.5 Lens)	1
4	102973	Screw - Main drive (152mm f/4.5 Lens)	1
4	102974	Screw - Main drive (127mm f/4.7 Lens)	1
11	102975	Screw - Blade arrestor ferrule	2
1	102977	Screw - Diaphragm pointer tip	1
2	102978	Screw - Cover, short	1
2	102979	Screw - Cover, long	2
10	102980	Screw - Shutter locating	1
9	102982	Screw - Plate, short (152mm f/4.5 Lens)	1
9	102996	Screw - Plate, long (152mm f/4.5 Lens)	2
4	103099	Retard Sector Assembly (127mm f/4.7 Lens)	1
2	103643	Spring - Anti back lash	1
1	104216	Plate - Speed and diaphragm index, Graphic (127mm f/4.7 Lens)	1
7	104218	Contact - Threaded	1
9	104286	Screw - Plate, long (127mm f/4.7 Lens)	1
9	104287	Bushing - Latch spring (127mm f/4.7 Lens)	1
2	104325	Cover Assembly (127mm f/4.7 Lens)	1
9	104326	Mechanism Plate Assembly (127mm f/4.7 Lens)	1
1	104327	Diaphragm Pointer Tip Assembly	1
10	104352	Button - Setting lever	1
7	104375	Strap - Ground (127mm f/4.7 Lens)	1
7	104376	Screw - Connector block	2
3	105110	Spring - Pallet bracket (127mm f/4.7 Lens)	1
7	106046	Screw - Connector (152mm f/4.5 Lens)	1
7	106047	Block - Connector (152mm f/4.5 Lens)	1
7	106048	Pin - Connector (152mm f/4.5 Lens)	1
7	106049	Spring - Contact (152mm f/4.5 Lens)	1
9	106394	Plate Assembly and Controller Complete (152mm f/4.5 Lens)	1
2	106398	Cover Assembly (152mm f/4.5 Lens)	1
11	106401	Case Assembly (152mm f/4.5 Lens)	1
1	107144	Plate - Speed and diaphragm index, Graphic (152mm f/4.5 Lens)	1
1	107148	Plate - Speed and diaphragm index, Kodak (127mm f/4.7 Lens)	1
10	107319	Setting Lever Assembly (152mm f/4.5 Lens)	1
7	107327	Washer - Insulating (152mm f/4.5 Lens)	1
2	107460	Retard Gear Plate and Gear Assembly	1
8	109257	Rivet - Trigger button, Graphic and Busch (127mm f/4.7 and 152mm f/4.5 Lens)	1
1	109456	Plate - Speed and diaphragm index, Busch (127mm f/4.7 Lens)	1
6	109874	Trigger Assembly, Kodak (127mm f/4.7 Lens)	1
6	109875	Trigger Assembly, Graphic and Busch (127mm f/4.7 Lens)	1
11	109876	Case Assembly (127mm f/4.7 Lens)	1
6	109999	Trigger Assembly, Graphic (152mm f/4.5 Lens)	1
5	117088	Latch Assembly (127mm f/4.7 Lens)	1
5	117089	Latch Assembly (152mm f/4.5 Lens)	1

FIG. PART NUMBER PART NAME No. REQD.

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JANUARY 1950 S. M. No. 1-1490 B

How to repair the

KODAK SUPERMATIC (X) SHUTTER

Eastman Kodak Company · Rochester 4, N.Y.

TABLE OF CONTENTS

• *Capitalized words in the text indicate nomenclature which appears on illustrations. Such nomenclature, when not followed by a direct figure reference, will be found on the figure indicated in the last preceding figure reference.*

KODAK SUPERMATIC (X) SHUTTER

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Shutter does not trip easily	Possible burr on TRIGGER ASSEMBLY, figure 4.	Burnish the trigger at the point where it contacts the MAIN DRIVE ASSEMBLY, figure 3, when in a set position.
No Kodatron contact	BLADE CONTROLLER CONTACT STUD, figure 9, is not touching the CONTACT SPRING, figure 6.	Adjust the contact spring so that it touches the contact stud on the blade controller when the blades are almost fully opened. It is possible to make the adjustment after removing the front lens mount. There must be no contact when the blades are held open by the blade arrestor.
Shutter blades remain open on high speeds	Plate blade studs missing on mechanism plate.	Replace and restake the studs carefully to avoid swelling the top of the studs.
	Split shutter blades.	Replace the shutter blades.
	Loose studs on shutter blades.	Replace the shutter blades.
Shutter speeds slow	Retard gears dirty.	Remove the retard gear train and clean all the parts thoroughly.
	The MAIN DRIVE SPRING, figure 3, is weak.	Replace the main drive spring.
	Shutter blades binding.	Remove and replace the shutter blades.
	Excessive retard sector travel.	Swedge the speed control RING, figure 2, at the area controlling the slow speed. (See figure 1.)
Shutter speeds fast	Insufficient retard sector travel.	File the speed ring at the area controlling the fast speed. (See figure 1.)
	Insufficient pallet engagement (on shutter speeds 1/10 second or slower).	Remove material on the speed control ring in the area of contact with the pallet bracket stud.
		Check for bind of the PALLET BRACKET, figure 5, against the retard gear PLATE COMPLETE.
	Gear train dirty.	Remove the retard gear train and clean all the parts thoroughly.
	Too much tension on the main drive spring.	Replace the main drive spring.

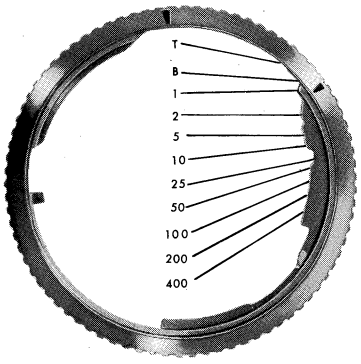


Figure 1

TROUBLE	CAUSE	REMEDY
Shutter blades buckle	NOTE: The following conditions may contribute to blade buckle singly or in combination.	
	Loose studs on shutter blades or MECHANISM PLATE, figure 9.	Replace the shutter blades. Restake the studs on the mechanism plate carefully to avoid swelling the top of the studs.
	BLADE CONTROLLER with contact stud, figure 7, not flat.	Straighten or replace the blade controller.
	Shutter blades not flat.	Replace the blades.
	Mechanism plate not flat.	Replace the mechanism plate.
	Blade controller too loose or too tight.	Replace the blade controller.
	Too much play between mechanism plate and diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 7, due to bowing of retainer plate.	Replace the diaphragm retainer plate with wings assembled.
	Burr on diaphragm plate.	Replace the plate.
	Blades opening too far.	File and burnish the blade controller LATCH at point "A" (see figure 3).
	Blades closing too far.	Swedge the mechanism plate at point "B" (see figure 9).
	No clearance between the blade	Swedge the mechanism plate at point "C", figure 9, such that this point acts as a stop for the SETTING LEVER with stop stud, figure 8.
Shutter operates instantaneously on B (bulb)	The lug on the side of the rectangular opening in the trigger is out of adjustment.	Bend the lug on the trigger in or out until proper adjustment is achieved.
Continuous flashing of Kodatron Speed Lamp	Breakdown in contact spring insulation.	Replace the contact spring.

DISASSEMBLY AND REASSEMBLY

SPEED CONTROL RING

The sequence of disassembly is as follows:

1. Front lens mount.
2. Diaphragm pointer TIP, figure 2.
3. Speed and diaphragm INDEX PLATE by turning the plate counterclockwise until the three projections in the center of the plate fit into the three cutouts on the outside edge of the central collar. Then carefully lift off the the index plate.
4. Speed control RING.

The sequence of reassembly is as follows:

1. Speed control ring, making sure that the projecting lugs on the TIME and BULB LEVER ASSEMBLIES, figure 4, the studs on the retarding SECTOR WITH STUD, figure 5, and the PALLET BRACKET with stud assembly are resting against the inside edge of the speed control ring and are not underneath the ring.
2. Speed and diaphragm index plate, by lining up the three projections in the center of the plate with the three cutouts on the outside edge of the central collar. Turn the plate clockwise until it is properly positioned.
3. Diaphragm pointer tip.
4. Front lens mount.

COVER COMPLETE

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4 above.
2. High speed spring CAM, figure 3, and the HIGH SPEED SPRING.
3. COVER COMPLETE, figure 2.

The sequence of reassembly is as follows:

1. Cover complete.
2. High speed spring and the high speed spring cam.
3. Speed control ring, paragraphs 1-4 above.

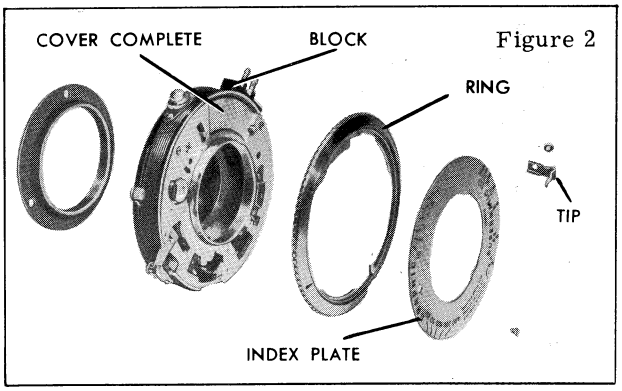


Figure 2

TRIGGER ASSEMBLY, TIME LEVER ASSEMBLY, AND BULB LEVER ASSEMBLY

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4 above.
2. Cover complete, paragraphs 2 and 3 above.
3. Unhook the MAIN DRIVE SPRING, figure 3, from the MAIN DRIVE SPRING STUD, figure 9.
4. TRIGGER SCREW, figure 4, the TRIGGER SPRING, and the TRIGGER WASHER.
5. TRIGGER ASSEMBLY, TIME LEVER ASSEMBLY, TIME LEVER SPRING, BULB LEVER ASSEMBLY and BULB LEVER SPRING.

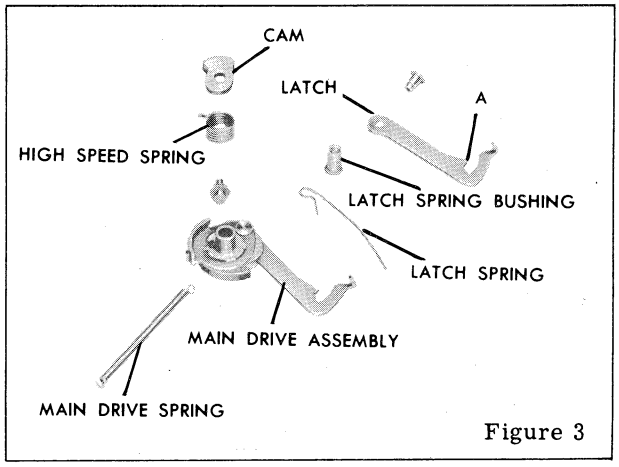


Figure 3

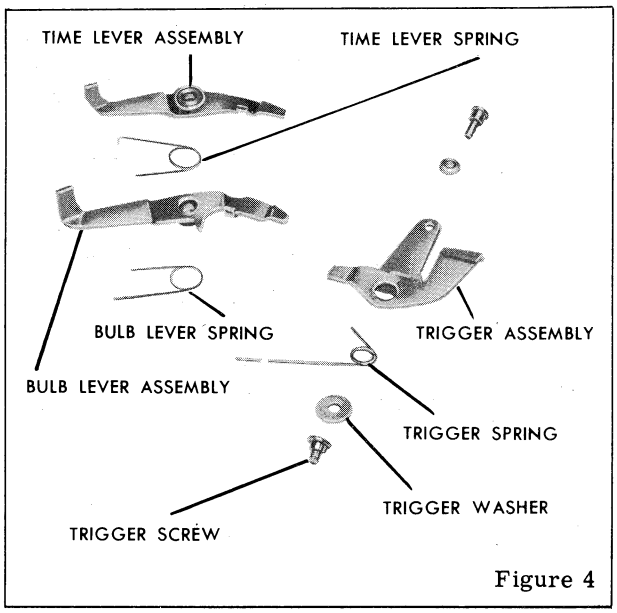


Figure 4

The sequence of reassembly is as follows:

1. With the bulb lever spring underneath, hold the trigger with the oval hole up and insert the bulb lever assembly between that part of the trigger which is operated by the cable release and the upper part of the trigger. Insert the lug on the bulb lever through the rectangular opening in the trigger.
2. Time lever assembly and the time lever spring between the top of the trigger and the top of the bulb lever assembly with the spring facing up. Grasp all three assemblies by inserting one prong of a pair of tweezers down through the center of the holes. With the longer ends of the time and bulb lever spring turned in a clockwise direction and the shorter ends resting against the lugs on the levers, guide the parts down over the TIME AND BULB LEVER STUD, figure 9. The long ends of the spring should rest against the case.
3. Trigger washer over the round hole in the base of the trigger.
4. Trigger spring over the washer with the short end pointing toward the BLADE CONTROLLER CONTACT STUD.
5. Trigger screw. Lift the long end of the trigger spring over the end of the main drive spring stud and rest it against the stud.
6. Main drive spring.
7. Cover complete, paragraphs 1-3, page 5.

RETARD GEAR TRAIN

The sequence of disassembly is as follows:

1. Speed control ring, paragraphs 1-4, page 5.
2. Cover complete, paragraphs 2 and 3, page 5.
3. Retard GEAR PLATE SCREW, figure 5, near the retarding SECTOR WITH STUD.
4. Retard gear plate ANTI-BACKLASH SPRING.
5. Unhook retard PALLET BRACKET SPRING.

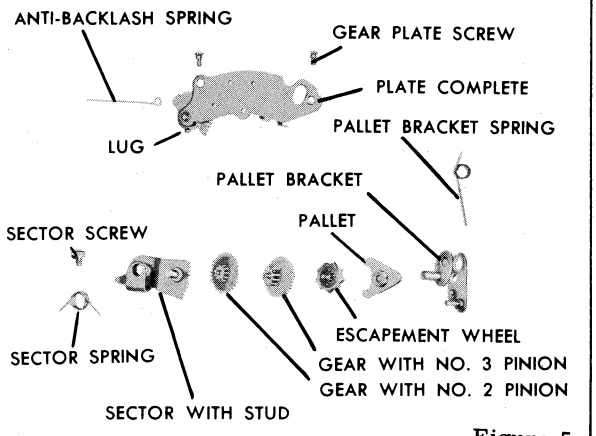


Figure 5

Remove remaining retard gear plate screw.

6. Retard gear PLATE COMPLETE.
7. Retard GEAR WITH NO. 2 PINION assembly.
8. Retard GEAR WITH NO. 3 PINION assembly.
9. ESCAPEMENT WHEEL with No. 4 pinion assembly.
10. Retard PALLET.
11. PALLET BRACKET with stud assembly and the pallet bracket spring.

NOTE: If the retard gears are dirty, clean the retard gear bearing holes in the mechanism plate and all the parts of the gear train thoroughly.

12. Retarding SECTOR SCREW. Unhook the retarding SECTOR SPRING.
13. Set the shutter.
14. Retarding sector with stud and the retarding sector spring.

The sequence of reassembly is as follows:

1. Retarding sector with stud and retarding sector spring, with the long end of the spring at the top.
2. Retarding sector screw.
3. Place the long end of the sector spring against the inner side of the blade controller LATCH SPRING BUSHING, figure 3.
4. Place the short end of the pallet bracket spring so that it faces toward the MECHANISM PLATE, figure 9, and insert the pallet bracket with stud assembly. Allow the long end of the spring to extend out toward the case.
5. Retard pallet.
6. Escapement wheel with No. 4 pinion assembly.
7. Retard gear with No. 3 pinion assembly.
8. Retard gear with No. 2 pinion assembly.
9. Retard gear plate complete, with the teeth of the gear facing the shutter blades.
10. Retard gear plate screw near the pallet bracket.
11. Lift up the gear end of the gear plate until the teeth of the retarding sector with stud pass freely under the gear. Place the retarding sector so that when the gear teeth are meshed the outer edge of the sector will be approximately 1/8 inch from the shutter case.
12. Retard gear plate anti-backlash spring on the retard GEAR PLATE STUD, figure 9. Line up the opening in the spring with the hole in the gear plate. Replace, but do not tighten, the remaining gear plate screw. The spring should be parallel to the case. Holding the spring in this position, tighten the gear plate screw. Hook the end of the anti-backlash spring on to the retard plate gear LUG, figure 5.
13. Place the long end of the pallet bracket spring

against the inside edge of the lug on the retard gear plate complete.
14. Cover complete, paragraphs 1-3, page 5.

MAIN DRIVE ASSEMBLY

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-4, page 5.
2. Cover complete, paragraphs 2 and 3, page 5.
3. Unhook the LATCH SPRING, figure 3, from the main drive LATCH.
4. Unhook the MAIN DRIVE SPRING from the main drive stud.
5. Set the shutter.
6. MAIN DRIVE ASSEMBLY, to which is attached the main drive spring.

The sequence of reassembly is as follows:
1. Apply a thin film of grease (Texaco Unitemp-RCX169 Grease) in the slot on the main drive assembly where it engages the stop stud on the SETTING LEVER, figure 8; on the MAIN DRIVE STUD, figure 9; on the LATCH, figure 3, at the point of contact with the LATCH SPRING and the latch where it contacts the RETARDING SECTOR STUD, figure 9. This area of the latch should be burnished before applying the lubricant.
2. Main drive assembly on the main drive stud, being sure to fit the setting lever stop stud into the assembly.
3. Close the shutter blades. Push the latch toward the BLADE CONTROLLER LUG, figure 9. The cutout part of the latch will come to rest around the lug. Place the loose end of the latch spring against the vertical lug on the tip of the latch.
4. Main drive spring.
5. Cover complete, paragraphs 1-3, page 5.

FLASH CONTACT PARTS

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-4, page 5.
2. Cover complete, paragraphs 2 and 3, page 5.
3. CONNECTOR PIN, figure 6, near the diaphragm POINTER, figure 8.
4. CONTACT SCREW NUT, figure 6, using Tool No. 503L.
5. CONTACT SCREW, the case insulator WASHER, the CONTACT SPRING, and the case INSULATOR.
6. Remaining connector pin, the GROUND STRAP SCREW, and the GROUND STRAP.

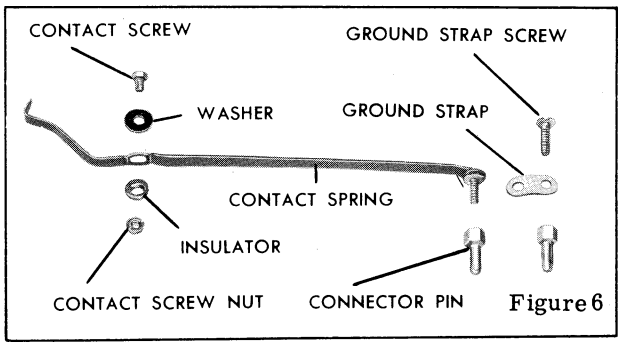


Figure 6

The sequence of reassembly is as follows:
1. Ground strap, the ground strap screw, and the connector pin.
2. Contact spring, with the screw end inserted in the opening in the connector BLOCK figure 2. Secure the end in place with the remaining connector pin.
3. Case insulator washer, the contact screw, the case insulator, and the contact screw nut.
4. Cock and release the shutter and at the same time retard its opening action by placing one finger against the shutter SETTING LEVER, figure 8. Allow the shutter to release slowly, at the same time observing whether the BLADE CONTROLLER CONTACT STUD, figure 9, makes slight contact with the contact spring just before the blades are fully open. If the spring does not touch the stud, bend the end of the spring toward the stud. There should be no contact when the blades are held open with the blade arrestor.
5. Cover complete, paragraphs 1-3, page 5.

SHUTTER BLADES

The sequence of disassembly is as follows:
1. Speed control ring, paragraphs 1-4, page 5.
2. Cover complete, paragraphs 2 and 3, page 5.
3. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 3-5, page 5.
4. Retard gear train, paragraphs 3-14, page 6.
5. Main drive assembly, paragraphs 3-6, page 7.
6. Flash contact parts, paragraphs 3-6, page 7.
7. Rear lens mount.
8. Blade controller LATCH SPRING BUSHING, figure 3 and the LATCH SPRING.
9. MECHANISM PLATE, figure 9.
10. Diaphragm retainer PLATE WITH WINGS ASSEMBLED, figure 7.
11. Shutter blades.
12. BLADE CONTROLLER.

The sequence of reassembly is as follows:
1. If necessary, clean shutter blades thoroughly. Hold the blades carefully to avoid bending them and clean their surfaces with a soft cloth. Fingerprints on the blades will cause corrosion.
2. Blade controller.
3. BLADE WITH DOUBLE BLADE BUSHING and stud, figure 7, with the hole in the blade over

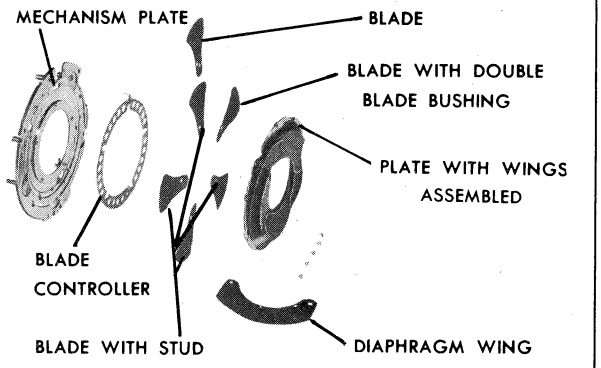


Figure 7

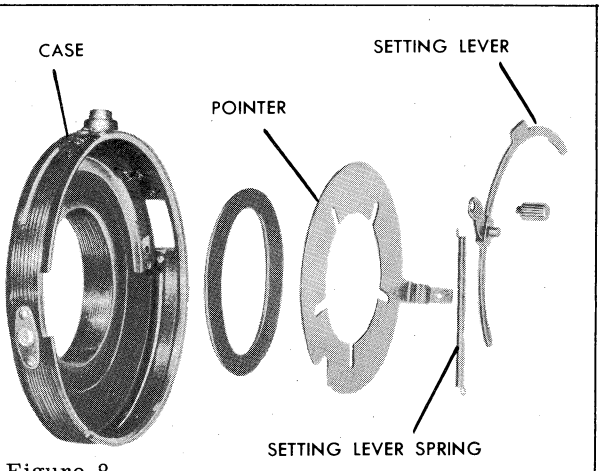


Figure 8

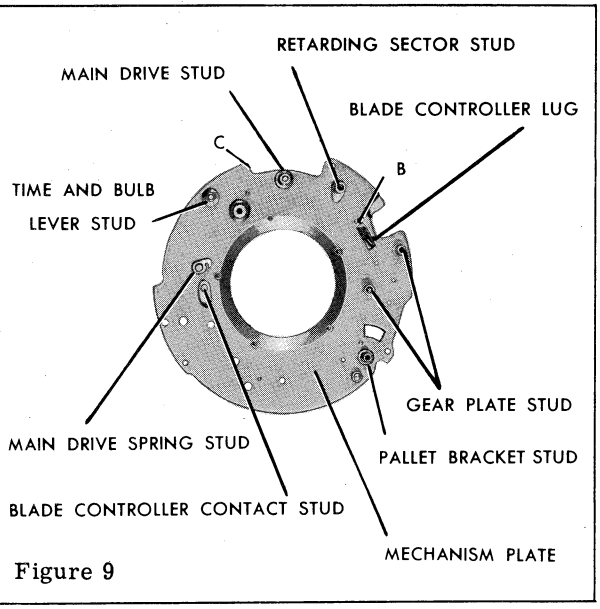


Figure 9

the stud near the BLADE CONTROLLER LUG, figure 9, on the mechanism plate.

4. Proceeding counterclockwise, replace four BLADES WITH STUD, allowing the wide end of each blade to overlap the narrow end of the preceding blade.
5. Blade over the blade with double blade bushing and stud.
6. Diaphragm retainer plate with wings assembled, with the cutout slot in the outer edge of the retainer plate over the opening in the mechanism plate for the PALLET BRACKET with stud assembly, figure 5. After the diaphragm retainer plate is secured, the shutter blades should operate freely.
7. Open the shutter blades. Close the diaphragm wings and run the side of a screwdriver blade around the central opening in the mechanism plate. This will open the diaphragm wings uniformly to the maximum aperture.
8. The shutter CASE, figure 8, diaphragm POINTER, and the SETTING LEVER with stop stud should be thoroughly cleaned.

   Apply a thin film of grease (Texaco Unitemp-RCX169 grease) in the recess in the case occupied by the setting lever. Then wipe this area lightly with a clean cloth.
9. Diaphragm pointer. Turn the pointer clockwise until the projecting arm is at the end of the slot in the case, near the cable release nut.
10. Setting lever with stop stud. Attach one end of the SETTING LEVER SPRING to the lever. Allow the loose end of the spring to rest against the shutter case. The stop stud should be located near the cable release nut.
11. Mechanism plate. See that the circular projections on the ends of the diaphragm wings are in position in the slots in the diaphragm pointer. After the plate is secured, the diaphragm, the shutter blades, and the setting lever should operate freely.
12. Secure the loose end of the setting lever spring to the case stud.
13. Blade controller latch spring bushing and the latch spring.
14. Flash contact parts, paragraphs 1-4, page 7.
15. Main drive assembly, paragraphs 1-4, page 7.
16. Retard gear train, paragraphs, 1-13, page 6.
17. Trigger assembly, time lever assembly, and bulb lever assembly, paragraphs 1-7, pages 5 and 6.
18. Rear lens mount.

EASTMAN KODAK COMPANY • ROCHESTER 4, N.Y.

I-50-G L P-B

Lithographed in the United States of America

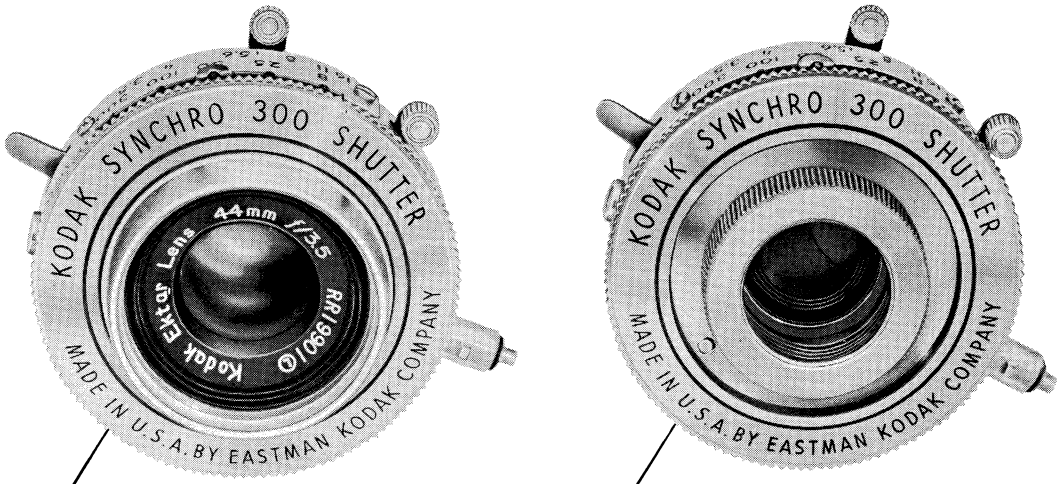
OCTOBER 1955 PARTS LIST No. 5501-B

KODAK SYNCHRO 300 SHUTTER

(Type M-F-X Synchronization)

for

Kodak Signet 35 Cameras



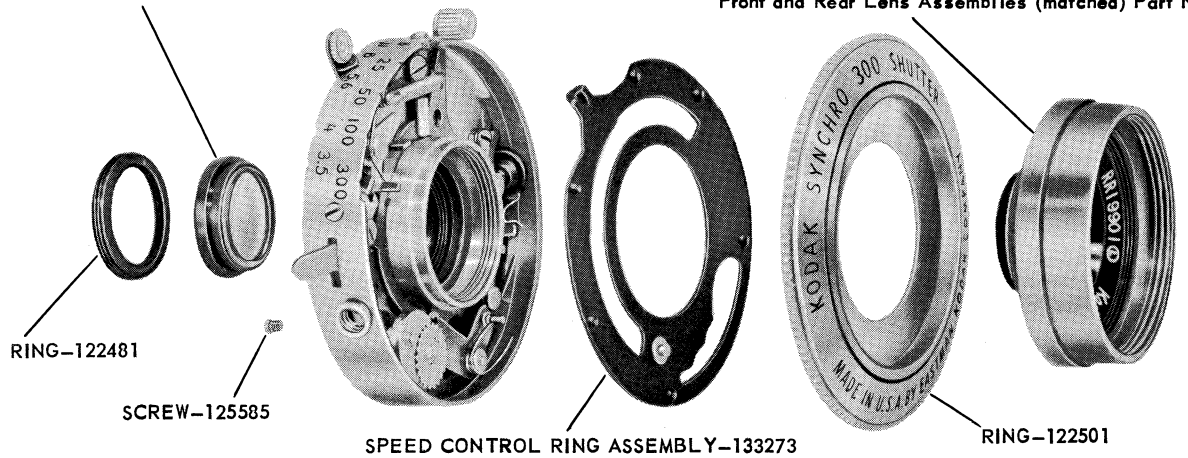
SHUTTER COMPLETE (with lens)–131295

SHUTTER COMPLETE (without lens)–131294

Figure 1

REAR LENS ASSEMBLY–Available only as a set of Front and Rear Lens Assemblies (matched) Part No. 802260

FRONT LENS ASSEMBLY–Available only as a set of Front and Rear Lens Assemblies (matched) Part No. 802260



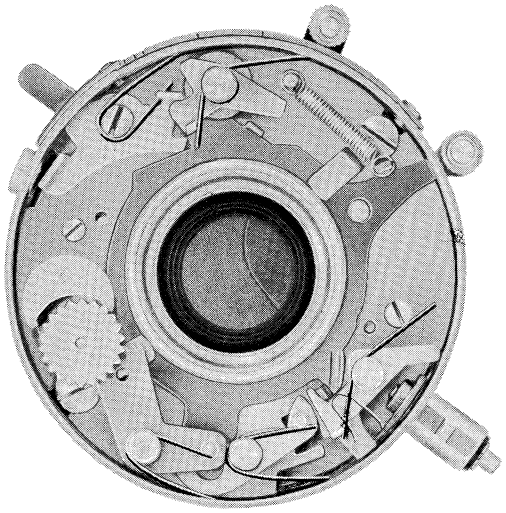
RING–122481

SCREW–125585

SPEED CONTROL RING ASSEMBLY–133273

RING–122501

Figure 2



This illustration shows springs and related parts in position

Figure 3

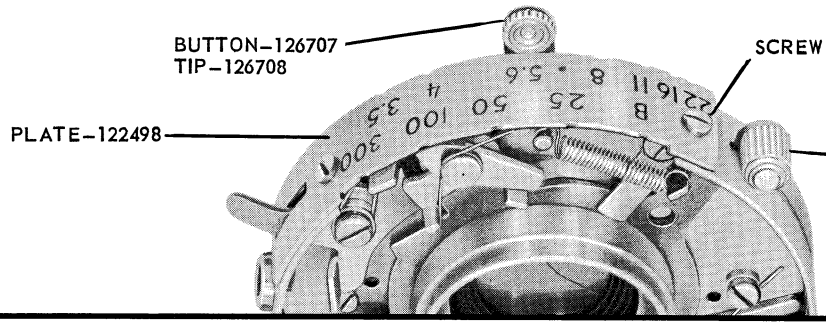


Figure 4

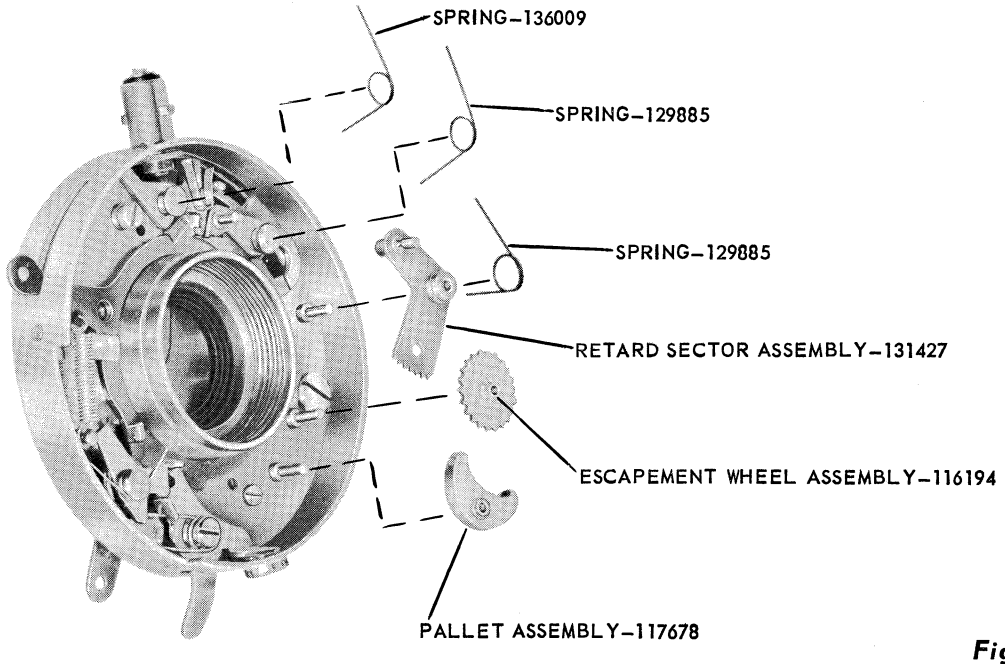


Figure 5

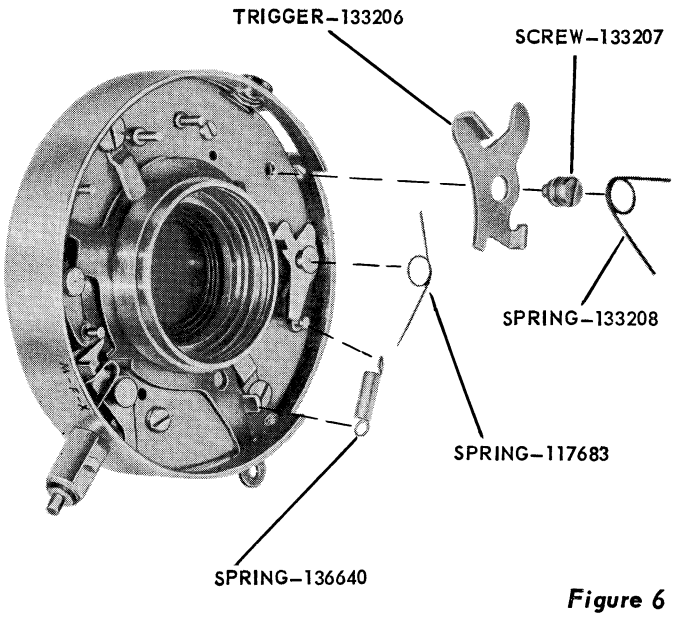


Figure 6

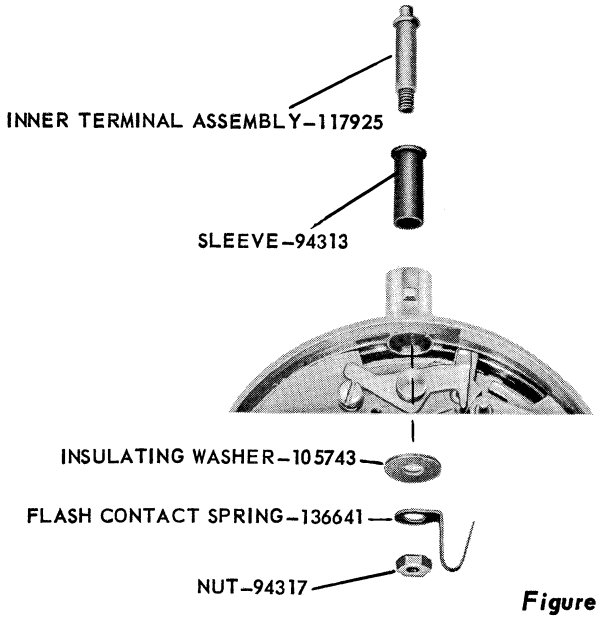


Figure 7

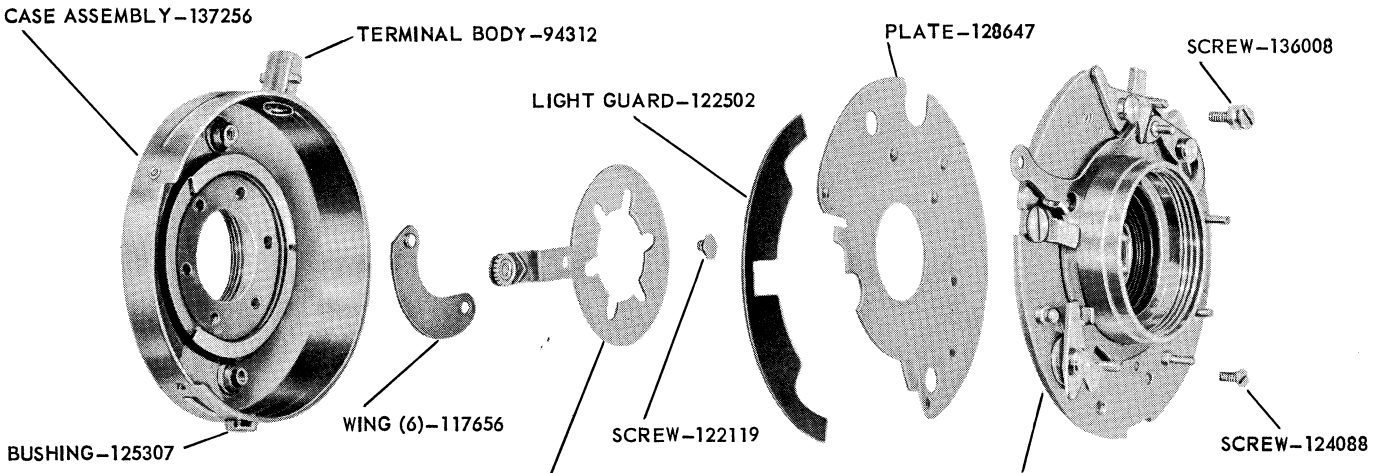


Figure 8

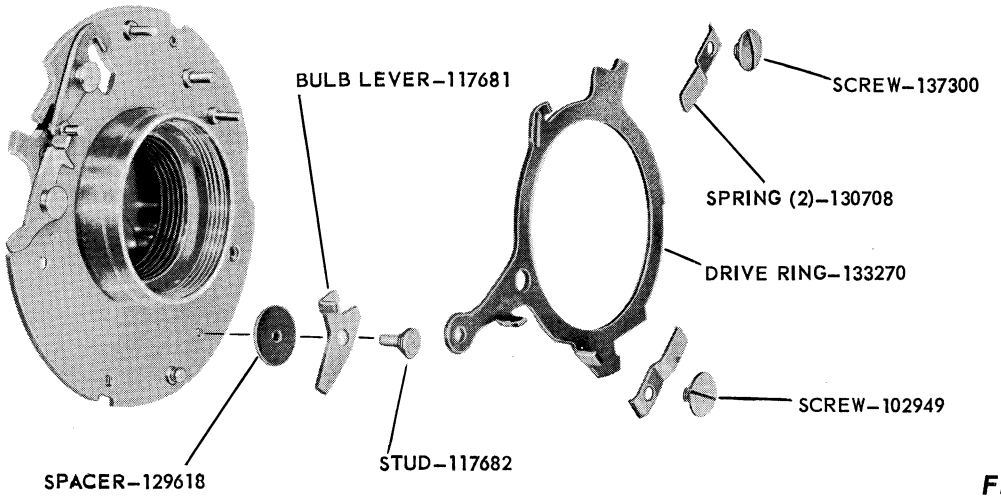


Figure 9

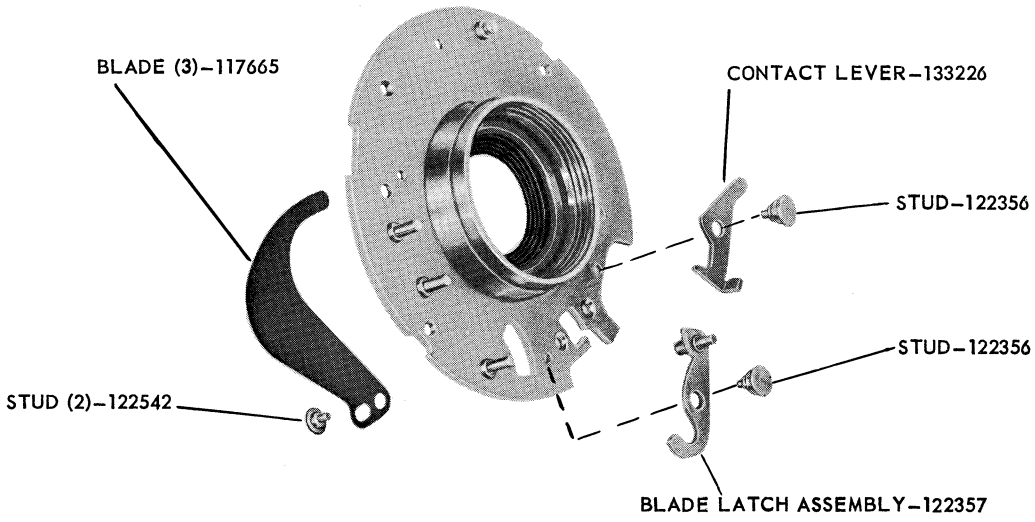


Figure 10

KODAK SYNCHRO 300 SHUTTER (Type M-F-X Synchronization)
for Kodak Signet 35 Cameras

FIG.	PART NO.	PART NAME	REQD.
8	94312	Body - Terminal	1
7	94313	Sleeve - Insulating	1
7	94317	Nut - Terminal	1
9	102949	Screw - Drive ring retaining spring, small head	1
4	102975	Screw - Diaphragm index plate	2
7	105743	Washer - Insulating	1
5	116194	Escapement Wheel Assembly	1
8	117656	Wing - Diaphragm	6
10	117665	Blade - Shutter	3
5	117678	Pallet Assembly	1
9	117681	Lever - Bulb	1
9	117682	Stud - Bulb lever	1
6	117683	Spring - Bulb lever	1
7	117925	Inner Terminal Assembly	1
8	122119	Screw - Diaphragm pointer	1
10	122356	Stud - Blade latch (1), contact lever (1)	2
10	122357	Blade Latch Assembly	1
2	122481	Ring - Rear lens clamping	1
4	122498	Plate - Speed and diaphragm index	1
2	122501	Ring - Speed actuating	1
8	122502	Guard - Diaphragm pointer light	1
10	122542	Stud - Blade pivot	2
4	123110	Button - Setting lever	1
8	124088	Screw - Mechanism plate retaining	1
8	125307	Bushing - Cable release	1
2	125585	Screw - Shutter locating	1
8	126685	Diaphragm Pointer Assembly	1
4	126707	Button - Diaphragm pointer	1
4	126708	Tip - Diaphragm pointer	1
8	128647	Plate - Diaphragm retainer	1
9	129618	Spacer - Bulb lever	1
5	129885	Spring - Retard sector return (1), blade latch (1)	2
9	130708	Spring - Drive ring retaining	2
1	131294	Shutter Complete (without lens)	1
1	131295	Shutter Complete (with lens)	1
5	131427	Retard Sector Assembly	1
6	133206	Trigger	1
6	133207	Screw - Trigger	1
6	133208	Spring - Trigger	1
10	133226	Lever - Contact	1
9	133270	Ring - Drive	1
8	133272	Mechanism Plate Assembly	1
2	133273	Speed Control Ring Assembly	1
8	136008	Screw - Mechanism plate to case	1
5	136009	Spring - Contact lever	1
6	136640	Spring - Main drive	1
7	136641	Spring - Flash contact	1
8	137256	Case Assembly	1
9	137300	Screw - Drive ring retaining spring, large head	1
	802260	Front and Rear Lens Assemblies (matched)	1 set

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

12-55-GLP-B

Lithographed in the United States of America

Repair Bulletin

MODIFYING THE KODAK TBI CABLE RELEASE No. 2 (cloth)
for use on
KODAK SYNCHRO-RAPID 800 and KODAK SYNCHRO 300 SHUTTERS

RF-121

September, 1951

Since neither the Synchro-Rapid 800 or Synchro 300 Shutter has a (time) setting, a TBI cable release is needed to make time exposures. It has been noticed that the Kodak TBI Cable Release No. 2 (Cloth) does not latch properly to hold the shutter blades open, since the trigger assembly has such a short stroke that the cable release just barely reaches the first ratchet tooth before tripping the shutter.

To make sure the cable release will not trip the shutter before reaching at least the third or fourth tooth, shorten the plunger approximately 1/16 inch with cutters or a saw. Be sure to dress the plunger tip afterwards to restore its shape.

EASTMAN KODAK COMPANY
ROCHESTER 4, N. Y.

10-51-GLP-B

Lithographed in the United States of America

APRIL 1955

PARTS LIST No. 6201

KODAK SYNCHRO-RAPID 800 SHUTTER

WITH

Kodak Anastar Lens, 101mm f/4.5 for Kodak Tourist Camera
Kodak Ektar Lens, 78mm f/3.5 for Kodak Chevron Camera
Kodak Ektar Lens, 101mm f/4.5 for Graflex Cameras
Kodak Ektar Lens, 101mm f/4.5-Catalog listed shutter

This revised parts list supersedes parts list No. 1-5250. Shutters covered by this list are identified by symbols A, B, C, and D. For key to symbols refer to page 9. Parts which are common to all shutters are identified by part name and number only. Parts not common to all shutters are identified by the symbol for the individual shutter.

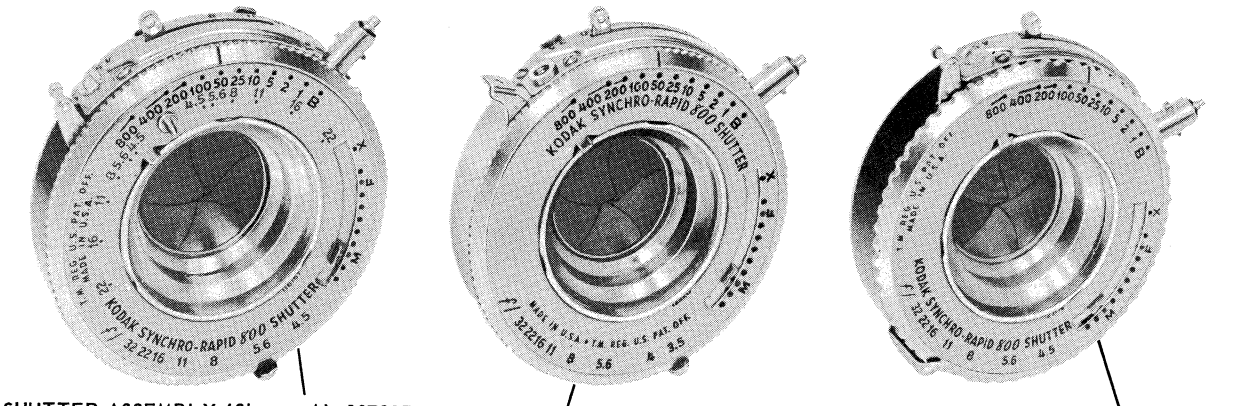
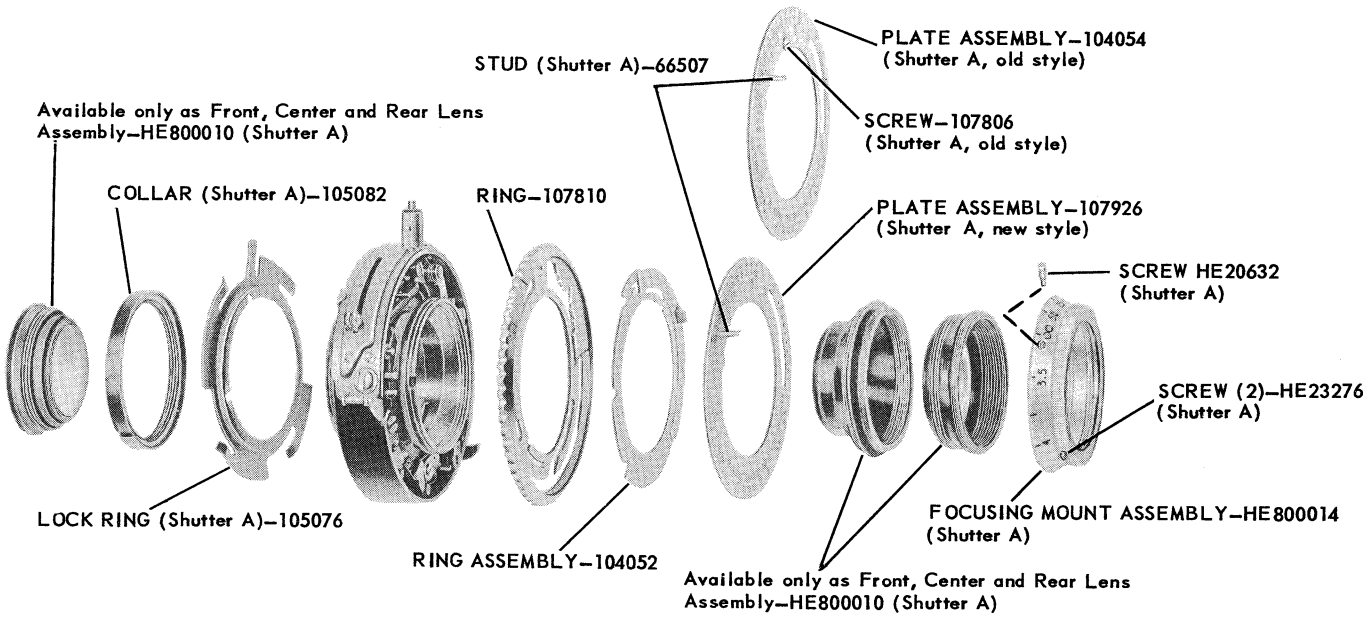
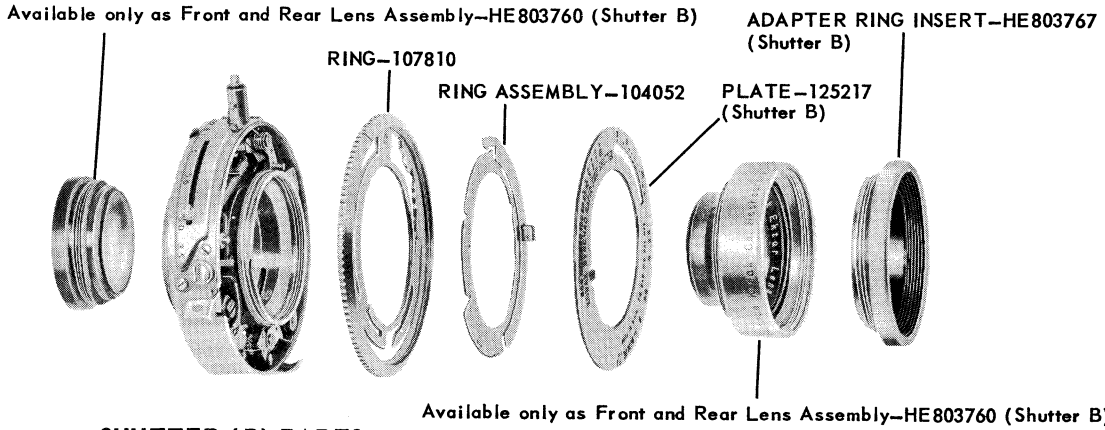


Figure 1



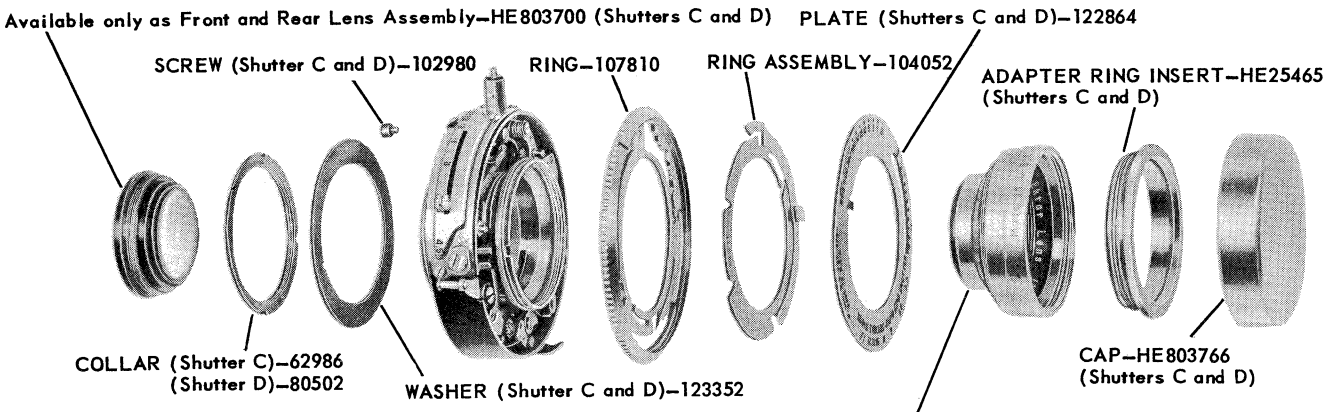
SHUTTER (A) PARTS

Figure 2



SHUTTER (B) PARTS

Figure 3



SHUTTER C and D PARTS

Figure 4

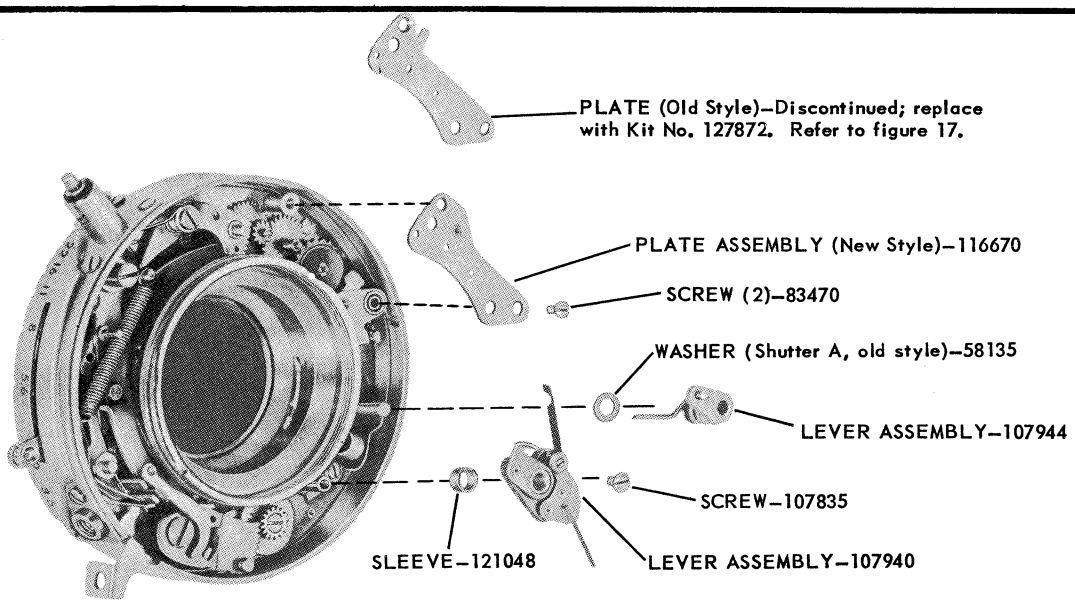


Figure 5

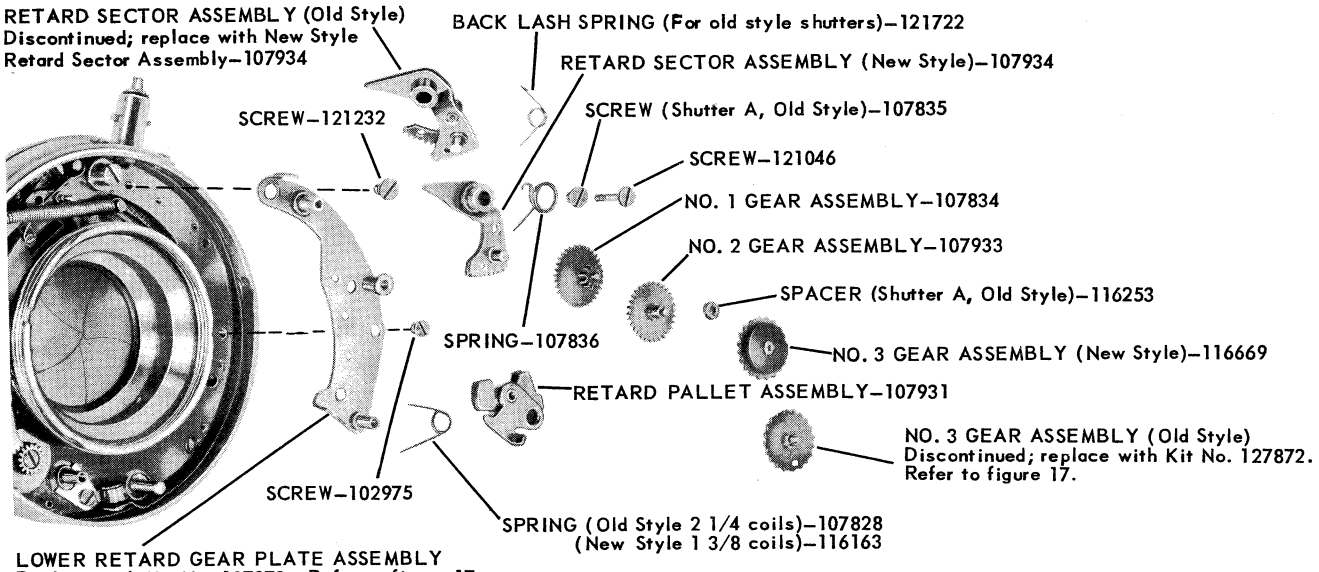


Figure 6

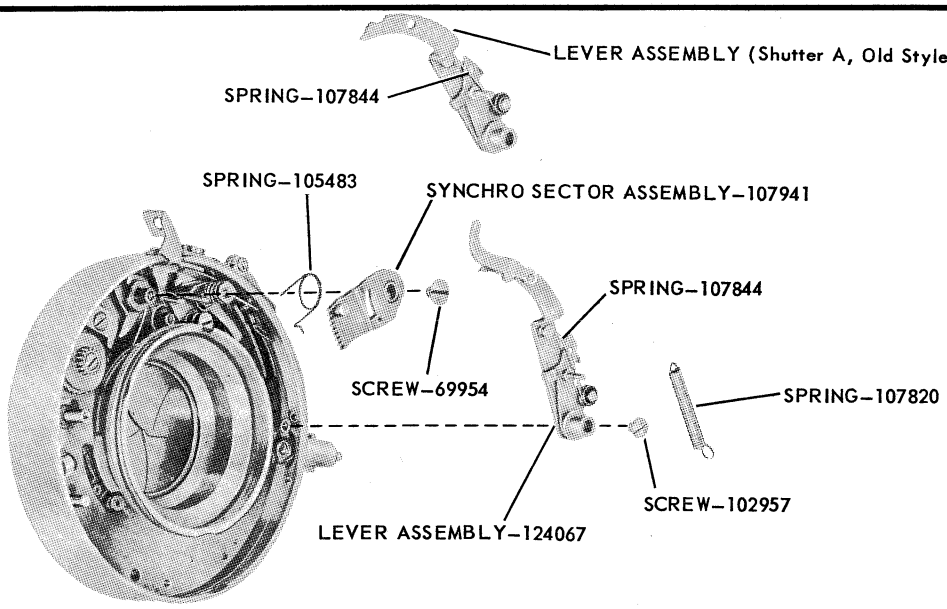


Figure 7

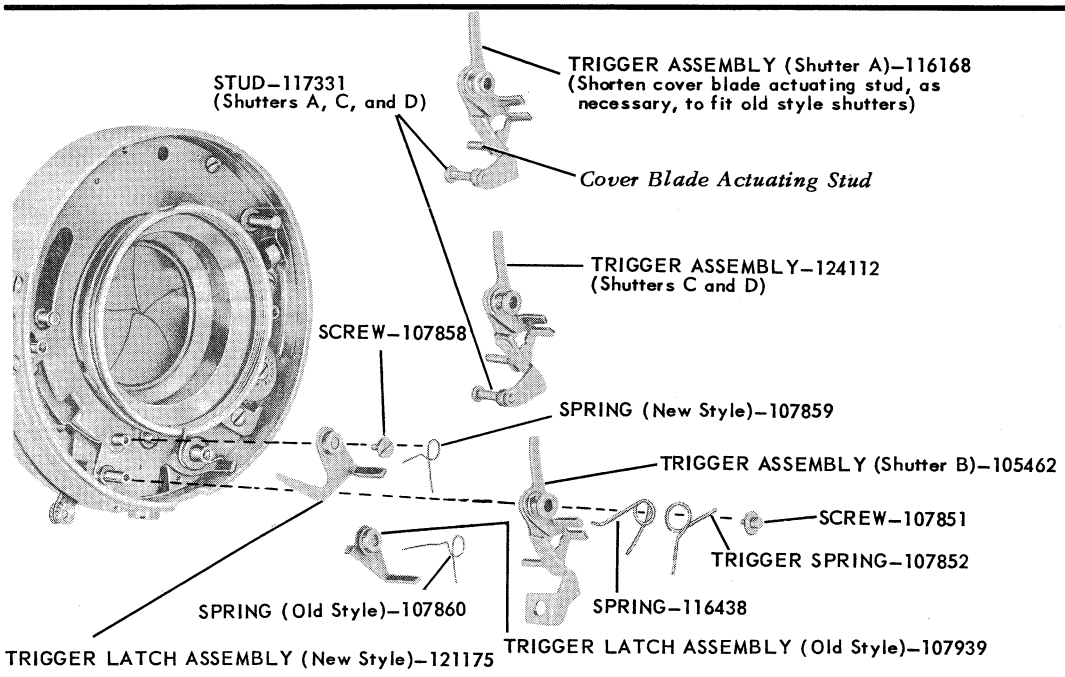


Figure 8

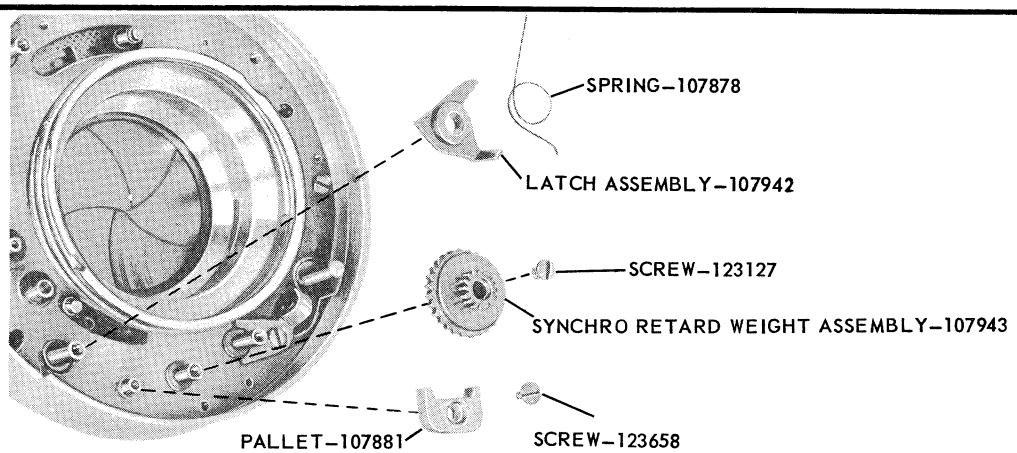


Figure 9

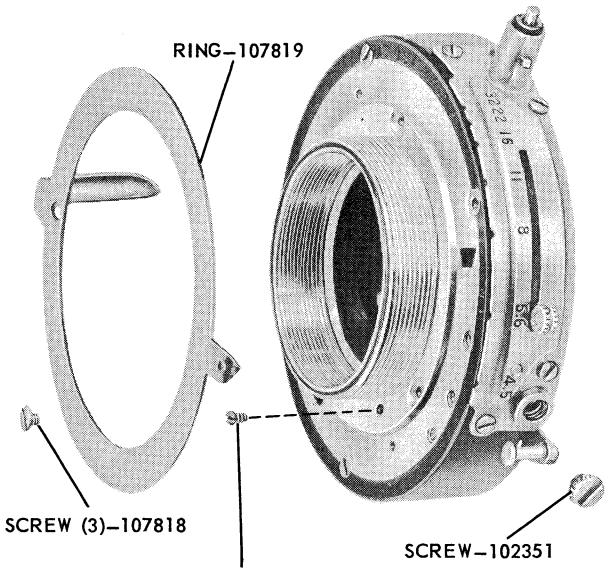


Figure 10

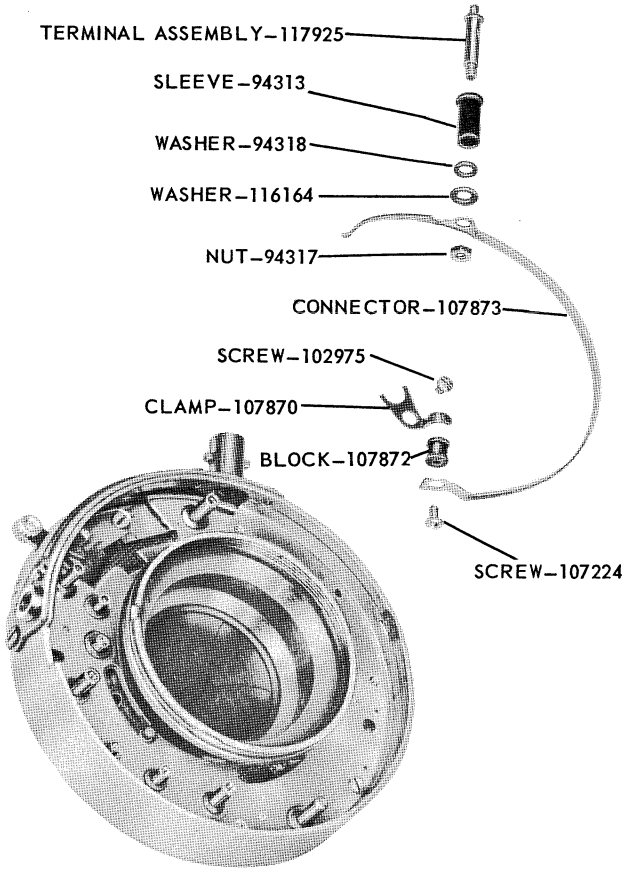


Figure 11

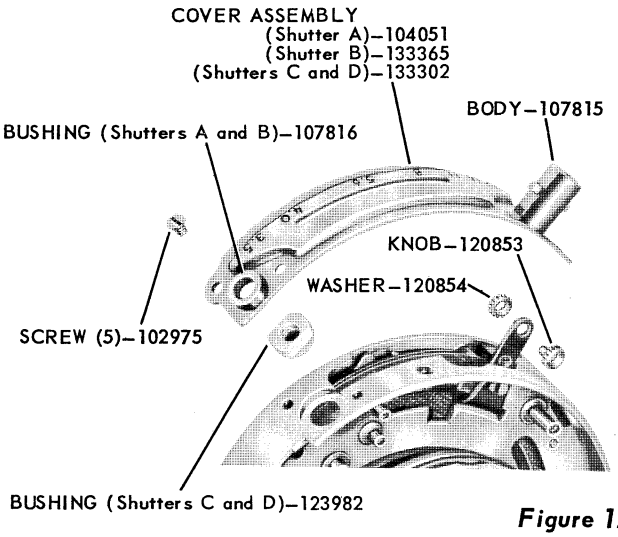


Figure 12

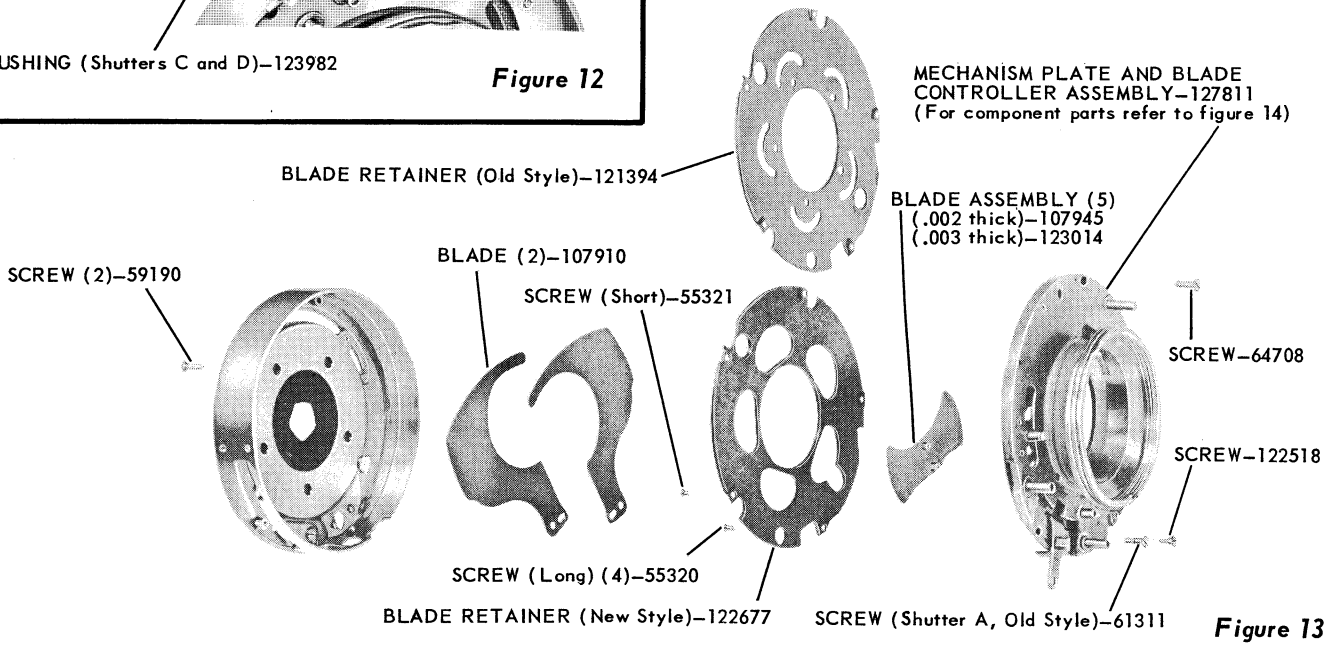


Figure 13

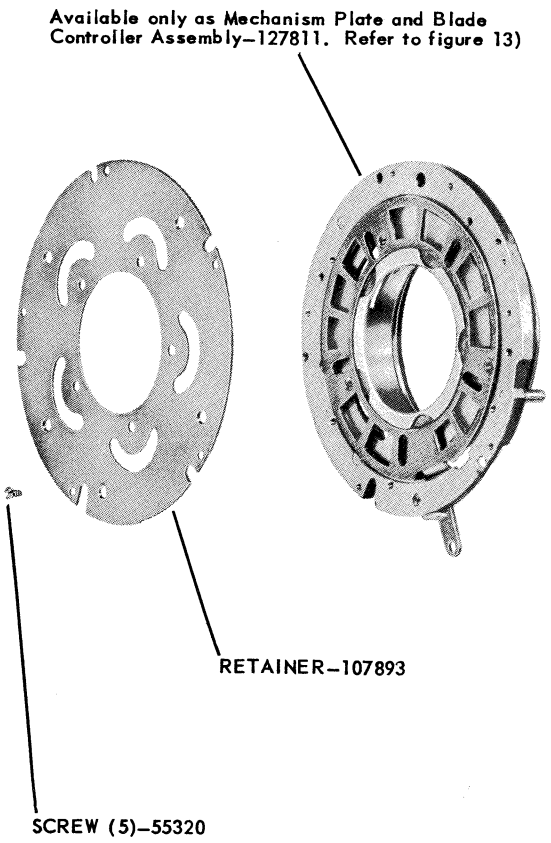


Figure 14

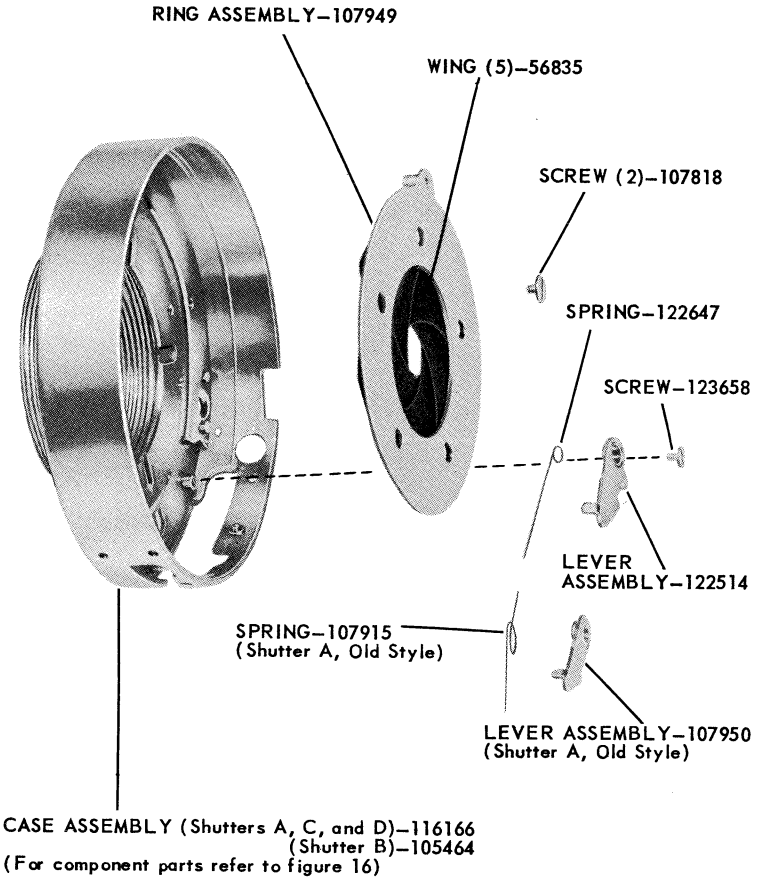


Figure 15

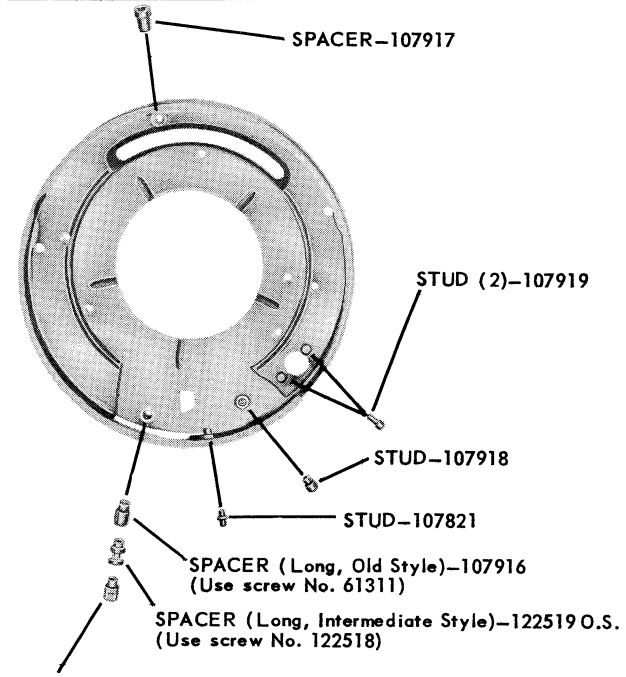


Figure 16

KIT NO. 127872

Necessary parts for replacing Old Style Upper and Lower Retard Gear Plates and Old Style No. 3 Pinion Assembly.

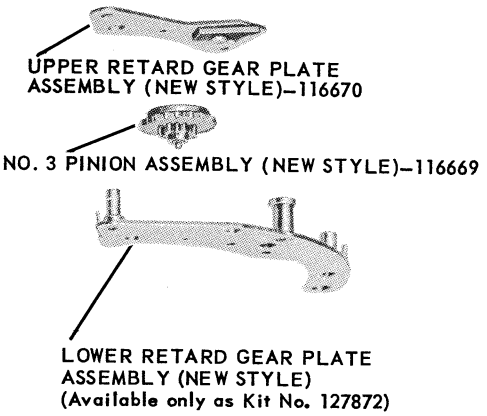


Figure 17

SERVICE TOOLS

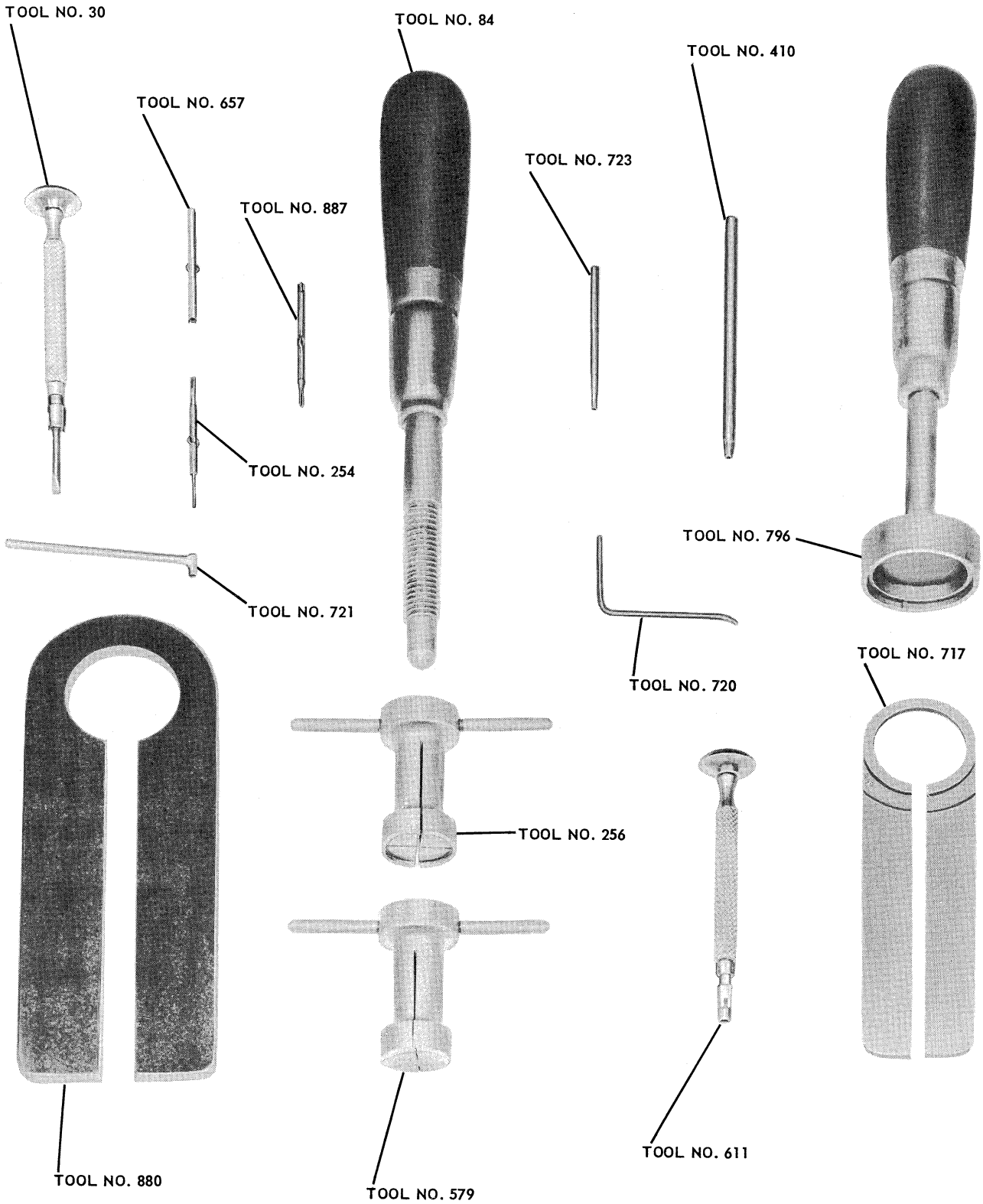


Figure 18

KEY TO SYMBOLS

KODAK SYNCHRO-RAPID 800 SHUTTER
with

A *Kodak Anastar Lens, 101mm f/4.5 for Kodak Tourist Camera*

B *Kodak Ektar Lens, 78mm f/3.5 for Kodak Chevron Camera*

C *Kodak Ektar Lens, 101mm f/4.5 for Graflex Cameras*

D *Kodak Ektar Lens, 101mm f/4.5-Catalog listed shutter*

FIG.	PART NO.	SHUTTERS	PART NAME	REQD
18	30		Jewelers' Screwdriver	1
18	84		Handle (For tools No. 256 and 579)	1
18	254		Blade - Jewelers' screwdriver (For adjusting contact lever assembly, use with tool Nos. 30 and 721)	1
18	256	B	Wrench - Expanding (For removing rear lens from Chevron camera shutter, use with tool No. 84)	1
18	410	A	Wrench - Hexagon socket, 1/16 inch (For focus mount stop screw on Tourist camera shutters)	1
18	579	A C D	Wrench - Expanding (For removing rear lenses from Tourist, Graflex and Catalog listed shutters, use with tool No. 84)	1
18	611		Wrench - Hexagon socket, 1/8 inch (For trigger screw)	
18	657		Blade - Jewelers' screwdriver (For inner terminal assembly, use with tool No. 30)	1
18	717	A	Wrench - Contracting (For removing front lens assembly on Tourist camera shutters)	1
18	720		Tool - Bending (For adjusting release lever latch assembly)	1
18	721		Wrench - Special socket (For adjusting contact lever assembly, use with tool Nos. 30 and 721)	1
18	723		Tool - Bending (For adjusting trigger stud)	1
18	796	A	Wrench - Shutter retaining collar (For Tourist cameras)	1
18	880	B C D	Wrench - Contracting (For removing front lens assemblies from Chevron, Graflex and Catalog listed shutters)	1
18	887		Blade - Jewelers' screwdriver (For small fulcross screws, use with tool No. 30)	1
2	HE20632	A	Screw - Focus mount stop	1
2	HE23276	A	Screw - Focus mount lock	2
4	HE25465	C D	Insert - Adapter ring	1
13,14	55320		Screw - Blade retainer to mechanism plate (long) (4), Blade controller plate to mechanism plate (5)	9
13	55321		Screw - Blade retainer to mechanism plate (short)	1
15	56835		Wing - Diaphragm	5
5	58135	*A	Washer - High speed spring lever assembly spacing	1
13	59190		Screw - Case to mechanism plate	2
13	61311	*A	Screw - Mechanism plate to long spacer	1
4	62986	C	Collar - Shutter retaining	1
13	63708		Screw - Mechanism plate to short spacer	1
2	66507	A	Stud - Focus stop	1
7	69954		Screw - Synchro sector	1
4	80502	D	Collar - Shutter retaining	1
5	83470		Screw - Upper retard gear plate to mechanism plate stud	2
11	94313		Sleeve - Inner terminal insulating	1
11	94317		Nut - Terminal	1
11	94318		Washer - Terminal (small)	1
10	102351		Screw - Cable release opening	1
7	102957		Screw - Release lever	1

*Old Style

FIG.	PART NO.	SHUTTERS	PART NAME	REQD
6,11,12	102975		Screw - Lower retard gear plate to mechanism plate (1), Terminal block clamp (1), Setting lever cover to case (5)	7
4,10	102980	C D	Screw - Shutter locating	1
12	104051	A	Setting Lever Cover Assembly	1
2,3,4	104052		Synchro Flash Control Ring Assembly	1
2	104054	*A	Speed and Diaphragm Index Plate Assembly	1
2	105076	A	Ring - Shutter lock	1
2	105082	A	Collar - Shutter retaining	1
8	105462	B	Trigger Assembly	1
15	105464	B	Case Assembly	1
1	105465	B	Shutter Assembly (without lenses)	1
7	105483		Spring - Synchro sector actuating	1
11	107224		Screw - Terminal block	1
2	107806	*A	Screw - Speed and diaphragm index plate	1
2,3,4	107810		Ring - Speed control	1
12	107815		Body - Terminal	1
12	107816	A B	Bushing - Cable release	1
10,15	107818		Screw - Diaphragm indicator ring (3), Diaphragm actuating ring assembly to case (2)	5
10	107819		Ring - Diaphragm indicator	1
7	107820		Spring - Main	1
16	107821		Stud - Main spring	1
6	107828		Spring - Retard pallet (old style)	1
6	107834		No. 1 Gear Assembly	1
5,6	107835		Screw - Contact lever (1), Retard sector (shutter A, old style) (1)	2
6	107836		Spring - Retard sector	1
7	107844		Spring - Release lever latch	1
8	107851		Screw - Trigger	1
8	107852		Spring - Trigger	1
8	107858		Screw - Trigger latch	1
8	107859		Spring - Release lever (new style)	1
8	107860		Spring - Release lever (old style)	1
11	107870		Clamp - Terminal block	1
11	107872		Block - Terminal	1
11	107873		Connector - Long	1
9	107878		Spring - Synchro sector latch	1
9	107881		Pallet - Synchro retard	1
14	107893		Retainer - Blade-controller	1
13	107910		Blade	2
15	107915	*A	Spring - Snubber lever	1
16	107916	A C D	Spacer - Mechanism plate (long) (old style)	1
16	107917		Spacer - Mechanism plate (short)	1
16	107918		Stud - Snubber lever	1
16	107919		Stud - Cover blade	2
1	107925	A	Shutter Assembly (without lenses)	1
2	107926	†A	Speed and Diaphragm Index Plate Assembly	1
6	107931		Retard Pallet Assembly	1
6	107933		No. 2 Gear Assembly	1
6	107934		Retard Sector Assembly (new style)	1
7	107936	*A	Release Lever Assembly	1
8	107939		Trigger Latch Assembly (old style)	1
5	107940		Contact Lever Assembly	1
7	107941		Synchro Sector Assembly	1
9	107942		Synchro Sector Latch Assembly	1
9	107943		Synchro Retard Weight Assembly	1
5	107944		High Speed Spring Lever Assembly	1
13	107945		Blade Assembly (.002 thick)	5

Always give PART NUMBER and NAME when ordering parts

*Old Style – †New Style

FIG.	PART NO.	SHUTTERS	PART NAME	REQD
15	107949		Diaphragm Actuating Ring Assembly	1
15	107950	*A	Snubber Lever Assembly	1
6	116163		Spring - Retard pallet (new style)	1
11	116164		Washer - Terminal (large)	1
15	116166	A C D	Case Assembly	1
8	116168	A	Trigger Assembly - (Shorten cover blade actuating stud as necessary to fit old style shutter)	1
6	116253	*A	Spacer - No. 2 gear assembly	1
8	116438		Spring - Bulb lever	1
6,17	116669		No. 3 Gear Assembly (new style)	1
5,17	116670		Upper Retard Gear Plate Assembly	1
8	117331	A C D	Stud - Shutter release strap	1
11	117925		Inner Terminal Assembly	1
12	120853		Knob - Setting	1
12	120854		Washer - Setting knob	1
6	121046		Screw - Retard sector	1
5	121048		Sleeve - Contact lever bushing	1
8	121175		Trigger Latch Assembly (new style)	1
6	121232		Screw - Lower retard gear plate to mechanism plate	1
13	121394		Retainer - Blade (old style)	1
6	121722		Spring - Back lash (for old style shutters)	1
15	122514		Snubber Lever Assembly	1
13	122518		Screw - Mechanism plate to long spacer	1
16	122519 O.S.	A C D	Spacer - Mechanism plate (long) (Intermediate style)	1
16	122519 N.S.		Spacer - Mechanism plate (long) (new style)	1
15	122647		Spring - Snubber	1
13	122677		Retainer - Blade (new style)	1
4	122864	C D	Plate - Speed and diaphragm index	1
13	123014		Blade Assembly (.003 thick)	1
1	123043	C D	Shutter Assembly (without lenses)	1
9	123127		Screw - Synchro retard weight assembly	1
4	123352	C D	Washer - Shutter spacing	1
9,15	123658		Screw - Synchro retard pallet (1), Snubber lever (1)	2
12	123982	C D	Bushing - Cable release	1
7	124067		Release Lever Assembly	1
8	124112	A D	Trigger Assembly	1
3	125217	B	Plate - Speed and diaphragm index	1
13	127811		Mechanism Plate and Blade Controller Assembly	1
17	127872		Kit Assembly (for replacing upper and lower retard gear plates and old style No. 3 pinion assembly)	1
10	131821	B	Screw - Shutter locating	1
12	133302	C D	Setting Lever Cover Assembly	1
12	133365	B	Setting Lever Cover Assembly	1
2	HE800010	A	Front, Center and Rear Lens Assembly	1
2	HE800014	A	Focusing Mount Assembly	1
4	HE803700	C D	Front and Rear Lens Assembly	1
3	HE803760	B	Front and Rear Lens Assembly	1
4	HE803766	C D	Cap - Lens	1
3	HE803767	B	Insert - Adapter ring	1

*Old Style

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

6-55-GLP-B

Lithographed in the United States of America

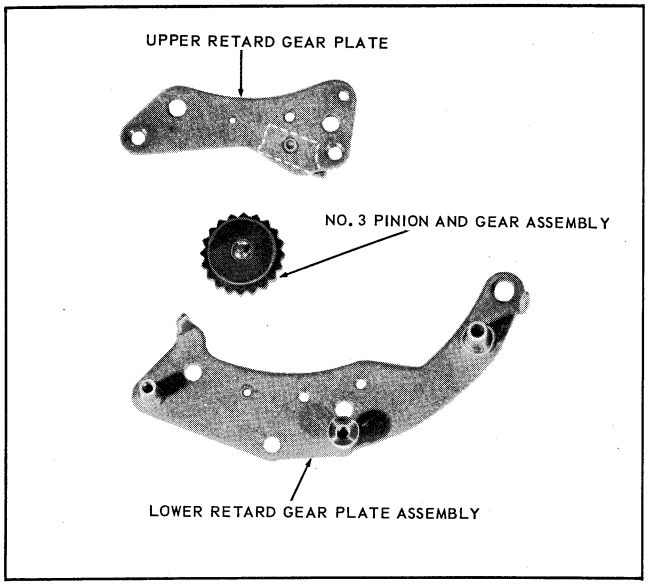
Service Instructions

November 1953 No. 6201-A

KODAK SYNCHRO-RAPID 800 SHUTTER

1. Erratic Speed at 1/200 Second
2. Insulated Cable Release Socket

1. In early shutters, considerable speed variation between repeated actuations at the 1/200 speed may be traceable to backlash in the No. 3 pinion and gear assembly. To reduce this backlash, the No. 3 pinion and gear assembly and the upper retard gear plate have been fitted in production with small permanent magnets. When adjusting shutters which have this improvement, test the 1/200 speed several times. If there is undue variation, changing the relative position of the two magnets may be required. To do this, remove the upper retard gear plate and turn the No. 3 pinion and gear assembly 90 degrees and reassemble the shutter. This will increase the attraction or repulsion of the magnetic fields, taking up the backlash. The direction (clockwise or counterclockwise) in which the backlash is eliminated is unimportant. Earlier shutters which do not have magnets can be modified if necessary by installing Part No. 127872–Replacement Kit for Upper and Lower Retard Gear Plates and the No. 3 Pinion and Gear Assembly. Shutter speeds other than 1/200 second will not be affected.



2. When using this shutter with a metal cable release and a flasholder with a metal battery case, shorting of the batteries can occur when connected in a certain manner, if the cable release touches the battery case. To eliminate this possibility, nylon cable release sockets and nylon bushings for the trigger assembly, at the point contacted by the cable release plunger, were developed to electrically insulate the metal cable release from the shutter. This change is incorporated in current production. To make this change, the following parts are required:

New Part	Replaces	
No. 124112	No. 116168	Trigger Assembly
No. 124113	No. 104051	Setting Lever Cover Assembly
No. 123982	———	Nylon Bushing for Cover Assembly

Bushing, Part No. 123982 (cable release socket) is not staked to cover assembly. It is held in place between the cover and the shutter case.

EASTMAN KODAK COMPANY

Rochester 4, New York

Lithographed in the United States of America

S. M. No. 1-5250

SERVICING INSTRUCTIONS FOR THE

KODAK

SYNCHRO-RAPID

800 SHUTTER

EASTMAN KODAK COMPANY • Rochester, N. Y.

Servicing The

KODAK SYNCHRO-RAPID 800 SHUTTER

The Kodak Synchro-Rapid 800 Shutter is a new-type shutter which utilizes an entirely different blade action from any previous shutter. Since the action is different, a brief outline of the working principles is given here.

When the shutter is cocked, tension is applied to the main spring for operating the shutter blades. Speed is controlled by the amount of retard gear train action as determined by the position of the retard sector. At the 1/400-second speed the gear train has no retarding action and at the 1/800-second speed, a high-speed spring is utilized as an auxiliary source of power.

Cocking the shutter also applies a spring load to the synchro sector which tends to rotate the part counterclockwise. Movement is prevented, however, by the end of the release lever which engages the flat surface of the synchro sector. When the trigger is pressed, the synchro sector is released allowing the sector to make contact with the arm of the contact lever. Blade action, however, does not begin at once since the blade controller is still held by the release lever latch. The synchro sector rotates, maintaining electrical contact, and through a camming action moves the end of the release lever toward the center of the shutter until the release lever latch releases the blade controller and the blade action begins. The length of the interval between the electrical contact and the start of the blade action is the millisecond delay of the shutter. This delay is controlled by the position of the contact lever which can be changed by moving the synchro control ring.

While many of the problems involved in making repairs are common to other shutters, the working tolerances of the "800" shutter are extremely small and adjustment is exceptionally critical. For this reason, repair of the shutter should not be attempted unless adequate testing equipment is available. Such equipment should include a means of checking speeds, synchronization, and flash contact. To make these tests satisfactorily, a checker such as the General Electric Time Interval Meter, the Heiland Synch Checker, or some similar electronic device must be used. Satisfactory repair cannot be made without such testing equipment.

This manual has been prepared as a guide for the experienced shutter repair man. While it includes complete disassembly and reassembly, it is expected that the repair man will dismantle only those parts necessary to make the repair.

For example: To clean or replace cover blades, disassemble in this sequence.

1. Figures 1 through 8.
2. Remove trigger spring shown in figure 63 and the retard sector and spring, figures 13 and 14.
3. Figures 16, 27, 30 through 35.
4. Remove terminal nut (holds long connector to terminal assembly).
5. Lift out the end of the long connector at the terminal assembly. Be careful not to change the forming of the connector.
6. Figure 36.
7. Cock the shutter.
8. Pull gently on the long connector to make it clear the shutter case; then raise the mechanism plate on the side opposite the set lever until the set lever clears the slot in the set lever cover.
9. Clean or replace blades, figure 43.

Too much stress cannot be laid upon the importance of proper lubrication with the correct lubricant. Two lubricants, Molykote grease and Texaco Unitemp grease, are used on the shutter. The Molykote grease is very unstable and must be thoroughly stirred before using. When applying the lubricants, use a very small amount. Too much lubrication will retard shutter action; too little may cause scoring of the working parts.

GENERAL SPECIFICATIONS

Speed Tolerance (Same as ASA Tolerances) –
1 second to 1/200 second ± 20%
1/200 second to 1/800 second ± 30%

Synchro Time Delay –
M setting 14 to 17 milliseconds
F setting 3 to 4½ milliseconds
Maximum (one dot beyond M) 18 to 24 milliseconds
Minimum (one dot beyond F) 2 milliseconds

Contact Efficiency –
75% Minimum
(Contacts must be closed for at least 75% of the time during the first 2½ milliseconds after contacts first touch)

Lubrication –
Two lubricants are used on the shutter and it is very essential that these lubricants be applied to the right

places and in the correct amounts. Molykote lubricant should be applied:

1. On the end of the release lever where it engages the synchro sector
2. On the inside and outside diameters of the blade controller
3. On the latching surface of the release lever latch where it engages the release lever lock stud

Molykote should be thoroughly mixed before using since it tends to separate when standing. Apply sparingly to the points indicated, leaving a very thin film on the surface without a surplus around the edges. If too much lubricant is used, it will transfer to the shutter blades and cause a slowing up of shutter speeds.

Texaco Unitemp grease is used on all other parts of the shutter where lubrication is required. Use only a thin film and wipe off any excess. These points are:

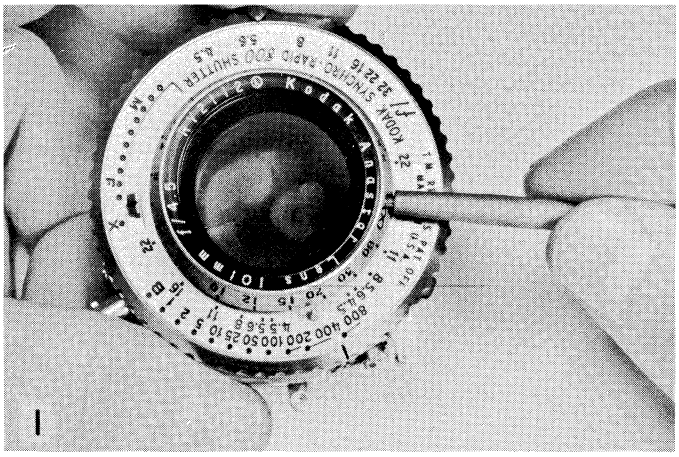
1. Outside diameter of index plate
2. Top of shutter case where speed ring bears
3. Tail of retard sector
4. Inside diameter of speed control ring
5. Inside diameter of synchro control ring
6. Inside diameter of diaphragm control ring
7. Stud on blade controller which engages high speed spring
8. Studs for release lever, synchro sector, synchro escapement wheel, and retard sector
9. Trigger where it engages trigger latch and synchro sector latch
10. Snubber lever where stud on blade controller contacts (old-style snubber only)

SERVICE TROUBLES AND REMEDIES

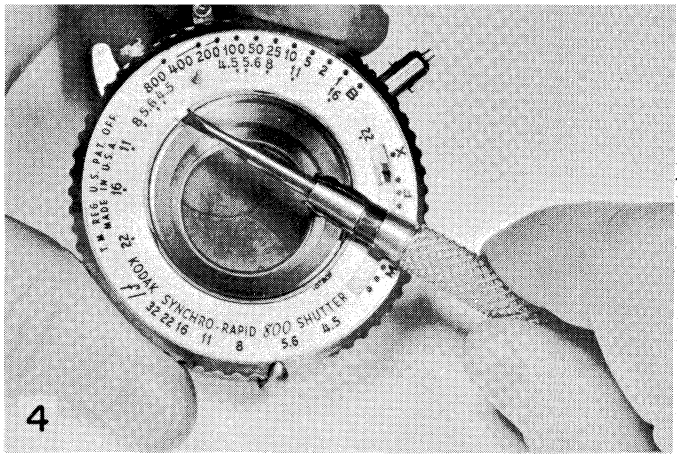
TROUBLE	PROBABLE CAUSE	REMEDY
BLADE ACTION		
Blade action very sluggish. Gummy deposit on blades.	Excessive Molykote has transferred onto blades.	Disassemble the shutter and remove the blades. Clean the mechanism plate and retainer plates. Lubricate the blade controller with a thin film of Molykote. Replace the blades and reassemble the shutter.
Blades buckled (split at tip of one or more blades).	Blades crossed while closing.	Replace the blades. Check each blade for flatness when reassembling and straighten if necessary.
Blades stay open on retard speeds (especially ½, 1 second).	Bind in cover blades.	Check cover blades for nick on edge of back side. Replace if necessary. Due to diaphragm indicator ring disengaged from stud on diaphragm control ring which extends through slot in back of mechanism case. Re-engage stud in hole.
	Mechanism plate bent.	Check for flatness. Replace if necessary.
	Retard pallet adjustment allows too much drag.	Readjust.
	Nickel plating on retard pallet or escapement wheel blistered.	Replace with new pallet assembly and parkerized (black) escapement wheel.
	Scoring of mechanism plate hub by inside diameter of blade controller.	Burnish out roughness on both parts. Use proper amount of Molykote lubricant and reassemble.
Blades do not open or close all the way. Action of blades is free.	Screw for blade controller retainer plate has loosened and backed off. Blade is catching on screw head.	Dismantle and tighten all screws securely.

TROUBLE	PROBABLE CAUSE	REMEDY
Blades bound. One blade out of position (pattern irregular).	Blade stud pulled out of blade.	Replace blade.
	Section of blade broken out around blade rivet.	Replace blade.
Cover blades close before shutter blades on retard speeds.	Lug on trigger latch fractured.	Replace trigger latch (if old-style trigger latch is removed, old-style must be used to replace).
	Trigger latch stud loose.	Replace mechanism plate.
GENERAL ACTION		
Shutter will not hold cocked position.	Handle of blade controller fractured or bent.	Replace blade controller.
	Release lever not returning completely when cocking, due to mechanism plate being bent.	Replace mechanism plate if necessary.
Shutter will not trip when cocked especially on 1/800.	Slots of blade controller peened by blade studs to create hollow spot in slot.	Replace blade controller.
	Sticking or friction between release lever lock stud (on handle of blade controller) and release lever latch.	Stone surfaces smooth and relubricate. Adjust as per instructions. Replace parts if necessary.
1/800 speed checks same as 1/400.	High-speed spring broken.	Replace.
Shutter jammed.	Broken part lodged in mechanism.	Check for broken parts, such as trigger latch, high-speed spring, or mechanism plate stud. Replace as necessary.
All retard speeds fast.	No retard action by gear train due to dirt or parts not working freely.	Correct binds of retard sector or gear train components. Clean parts if necessary.
	Gear and pinion assembly not riveted tightly.	Restake or replace assembly.
	Stud on blade controller which operates retard sector is broken loose.	Replace stud.
Cocking action rough.	Snubber lever roughened by stud on blade.	Replace snubber lever (lubricate as per instructions).
Instantaneous exposure on bulb setting or bulb exposure on instantaneous setting.	Adjustment of bulb lever not correct.	Readjust.
Diaphragm out of round.	One diaphragm wing out of engagement with slot in bottom of shutter case.	Dismantle, replace diaphragm wing and reassemble.

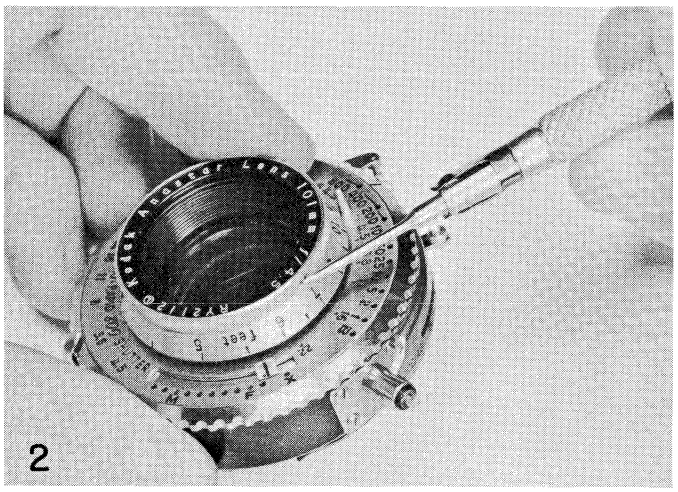
TROUBLE	PROBABLE CAUSE	REMEDY
ELECTRICAL		
Flash bulb fires when loading.	Electrical short.	Check for any foreign matter between the insulated parts of the circuit (i.e. long connector, short connector, contact lever) and make sure none of these parts is in contact with case, mechanism plate or other metal parts. If short occurs when shutter is set for maximum milliseconds (one dot beyond "M" setting), spacing of contact points is probably too close and should be readjusted to increase spacing (see instructions). Be sure that short connector coils do not touch either the case or the contact lever bushing, and that insulating sleeve is used over contact lever bushing. Check for short between body terminal and center plunger of terminal assembly. If short occurs only when setting the shutter, check for end of long connector touching the handle of blade controller.
Shutter will not fire flash bulb.	Contact efficiency not satisfactory (check with proper equipment).	Readjust as per instructions.
	Open circuit where short connector is soldered to adjusting screw of contact lever assembly.	Resolder.
No contact with speed-lamp outfit.	Adjustment of tip of long connector not correct.	Readjust per instructions.



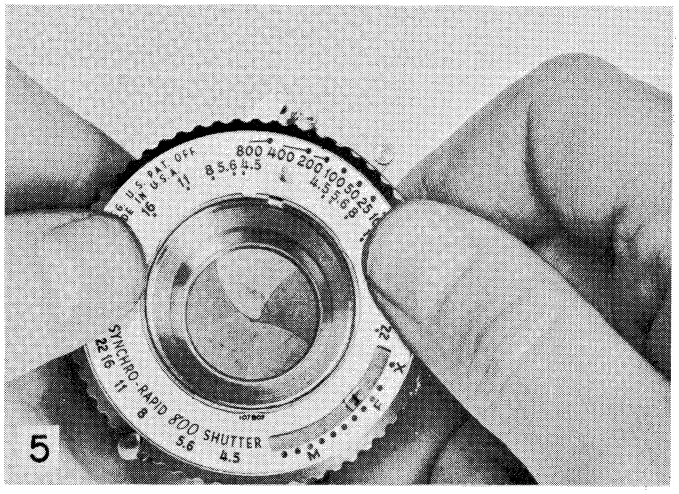
1. Remove the focus mount stop screw with tool No. RF410.



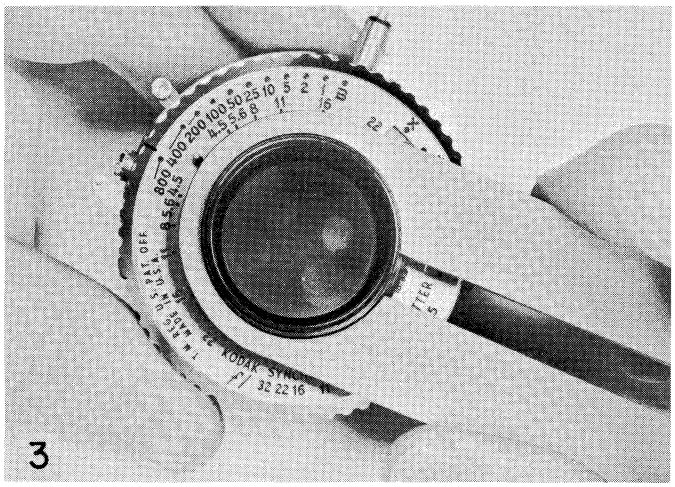
4. Raise the tab on the index plate assembly and twist the screwdriver to the left.



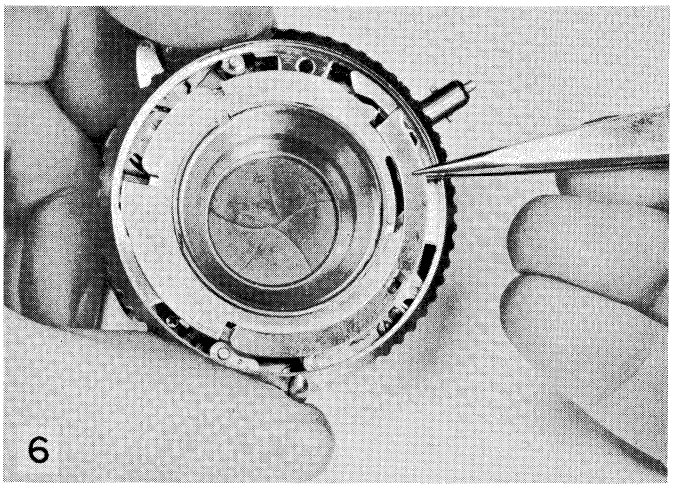
2. Loosen the two focus mount assembly screws and remove the focus mount assembly.



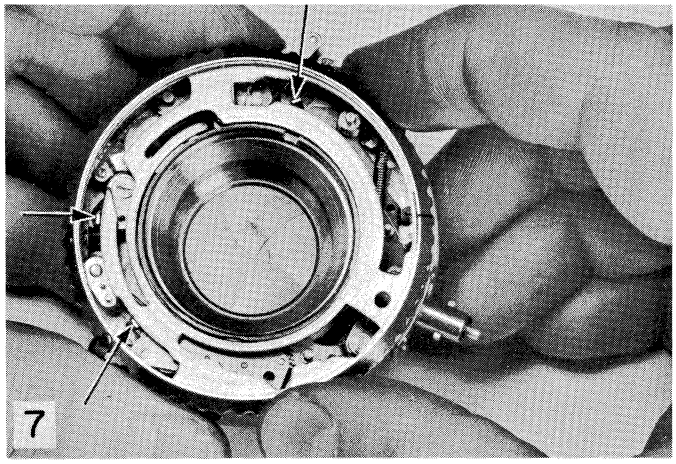
5. Turn the index plate counterclockwise. Shows location of tab when index plate is in position to be removed.



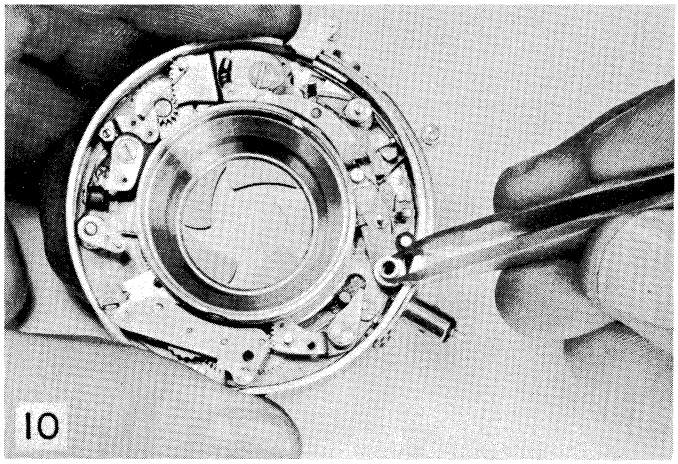
3. Use tool RF717. Remove center and front lens. As a guide for reassembly, if taking front lens from center lens, scribe a mark just as they are separated. Do not separate lens unless necessary for cleaning.



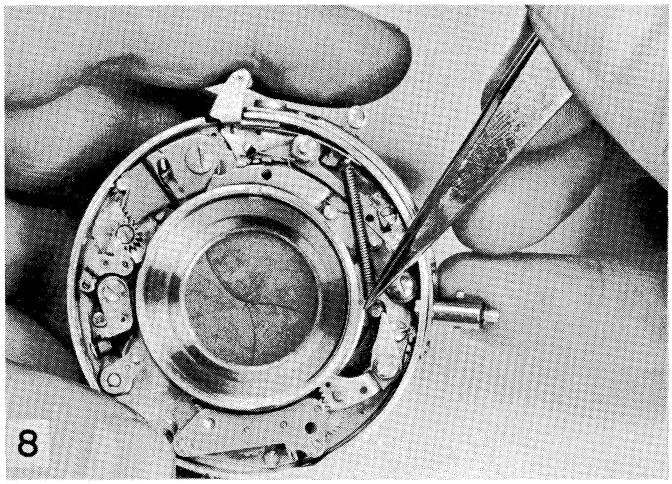
6. Lift off synchro flash control ring.



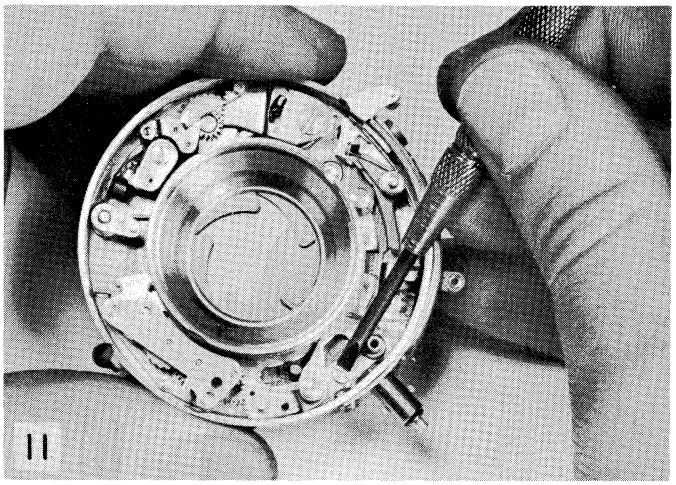
7. Remove the speed control ring. Note position of lugs for reassembly (arrows).



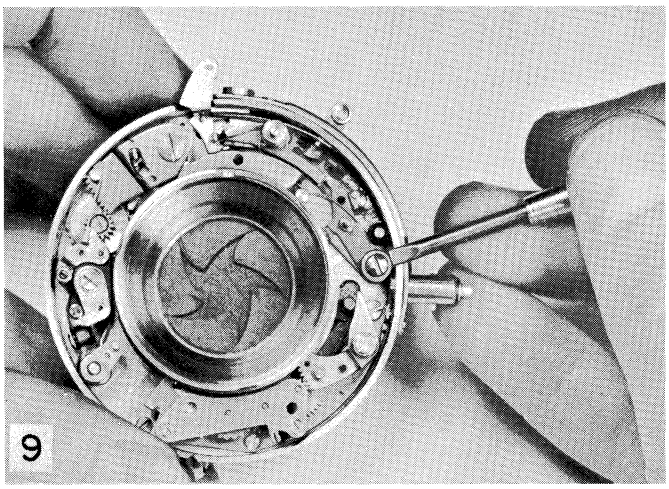
10. Lift out the release lever assembly and the release lever spring.



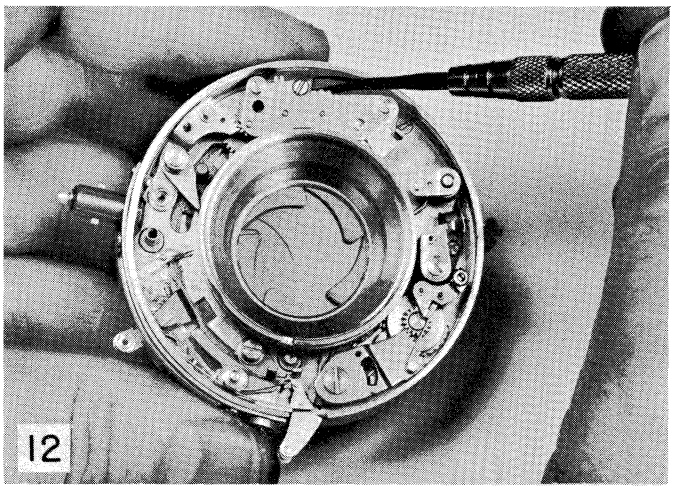
8. Remove the main spring from the two studs.



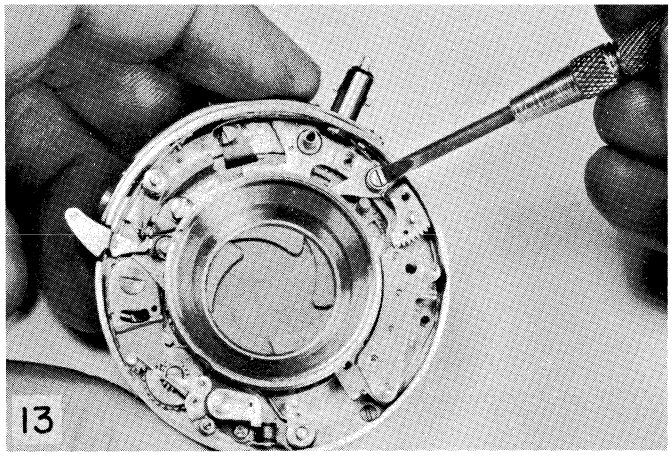
11. Remove the gear plate clamping screw.



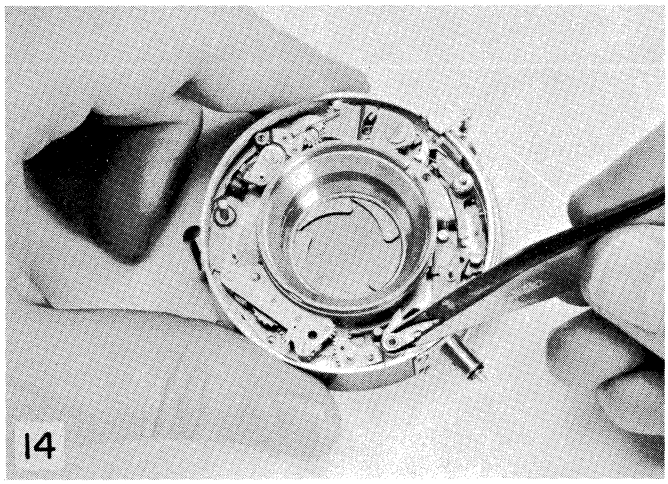
9. Remove the release lever screw.



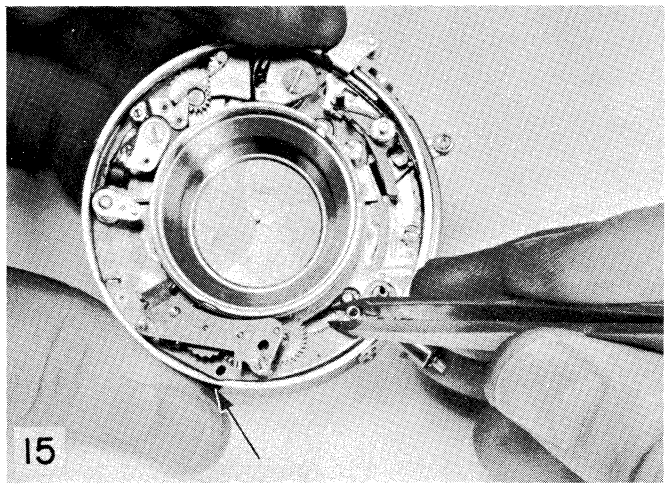
12. Remove the gear plate pivot screw.



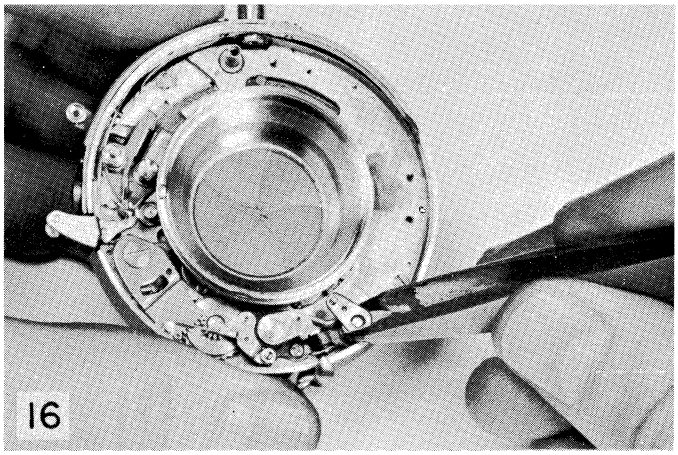
13. Remove the retard sector screw.



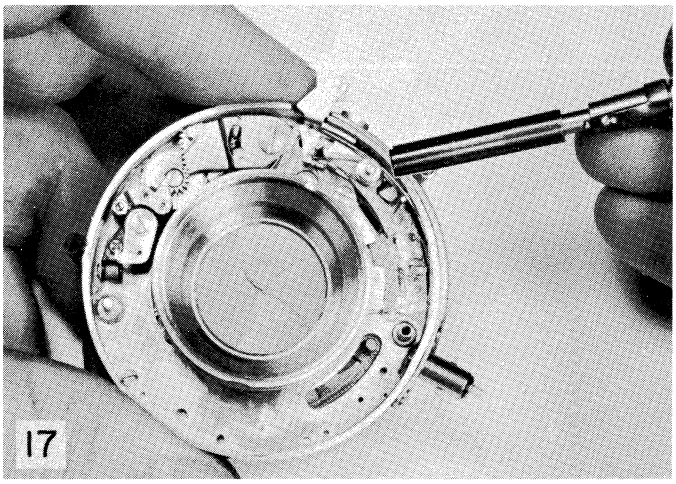
14. Lift out the retard sector and spring.



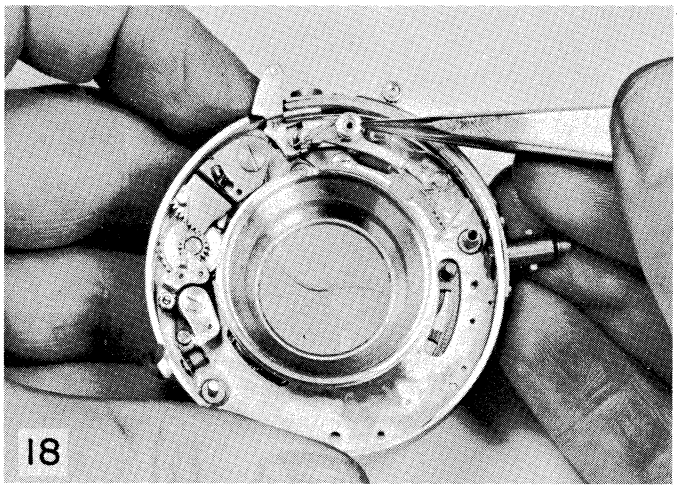
15. Lift out the gear train assembly. Slide counterclockwise until hump on lower plate is opposite cutout (arrow). Realign for reassembly.



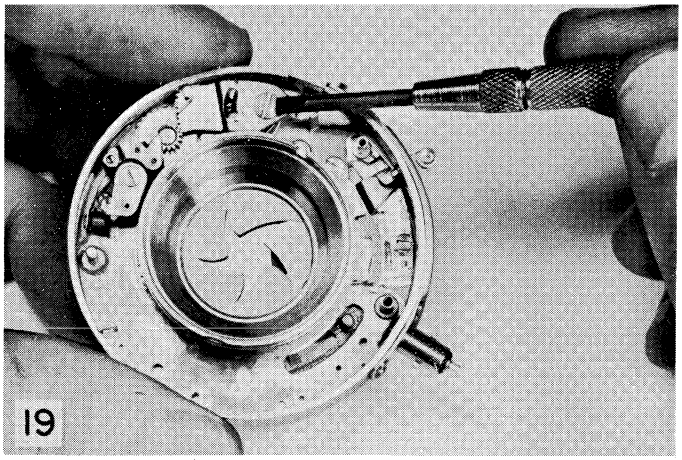
16. Lift out high speed spring lever assembly.



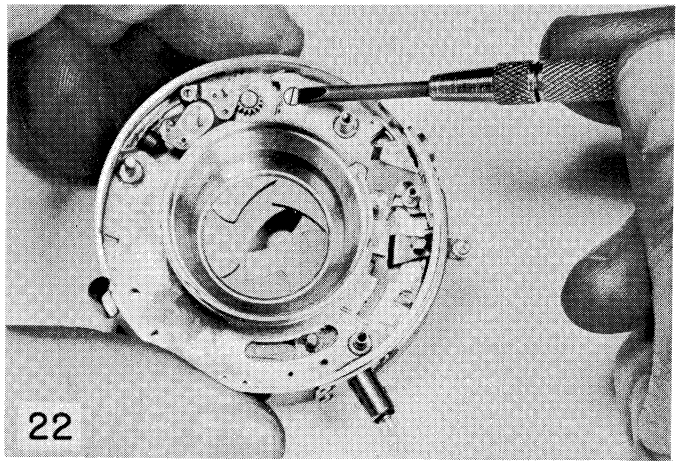
17. Use tool RF611 to remove the trigger screw.



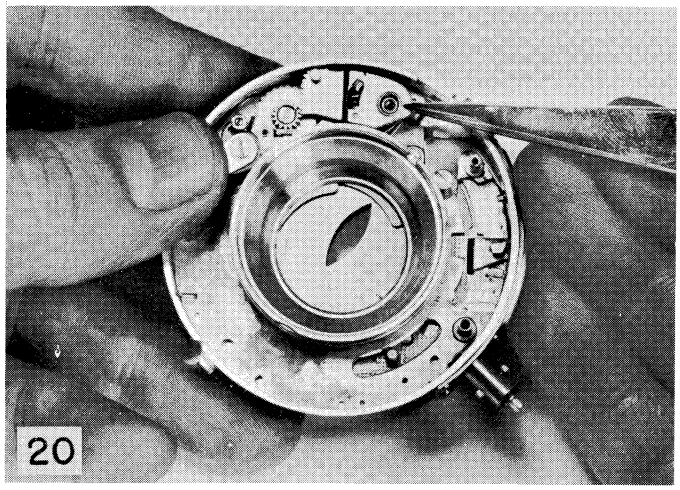
18. Lift out trigger assembly. Includes trigger spring and bulb lever spring.



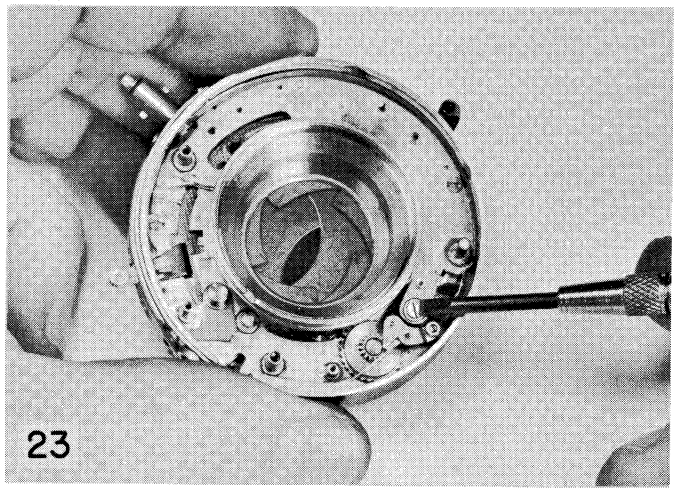
19. Remove screw from synchro sector assembly.



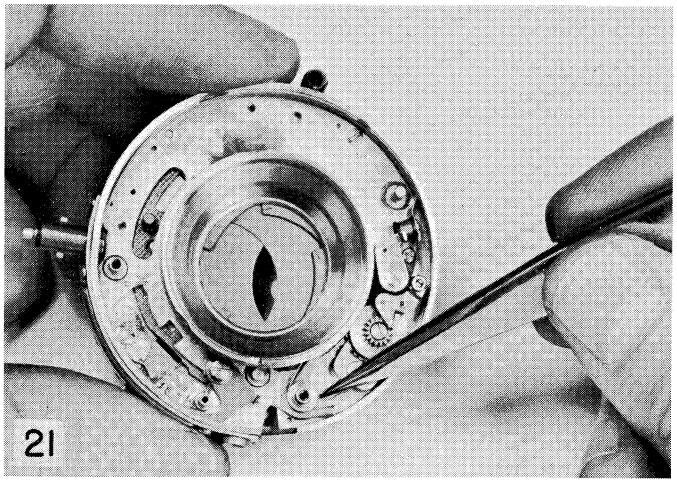
22. Remove synchro retard pallet screw and synchro retard pallet.



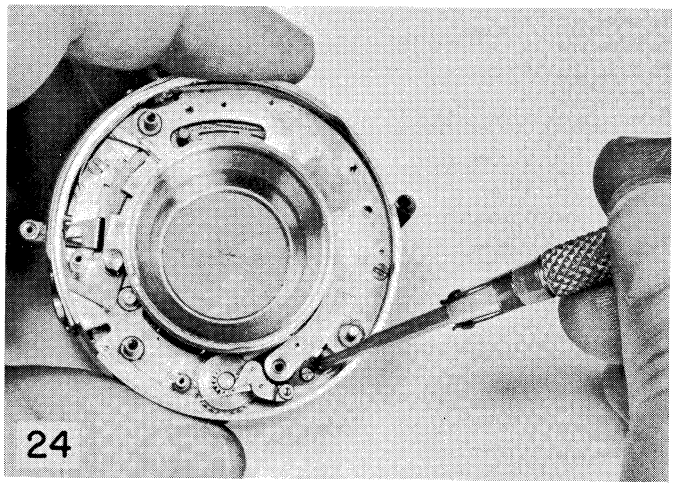
20. Hold the contact lever assembly out of the way and remove synchro sector and spring.



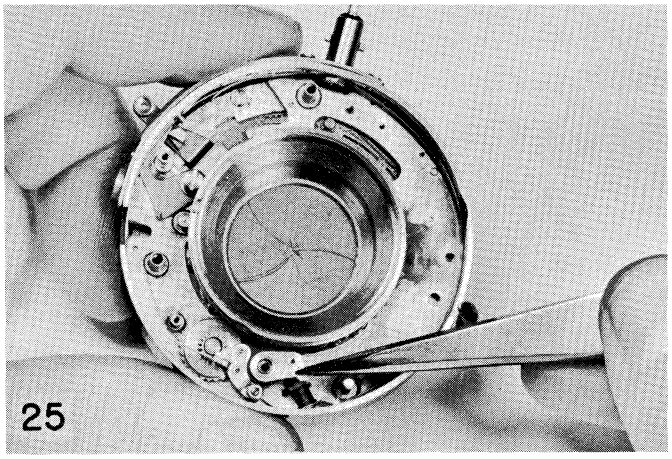
23. Remove contact lever assembly screw.



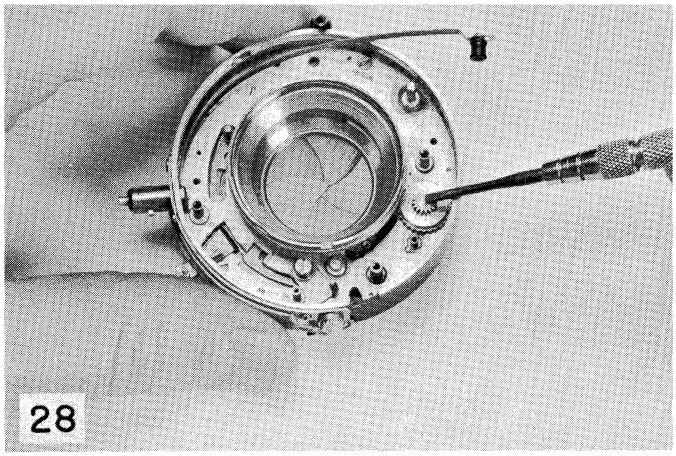
21. Lift out synchro sector latch assembly and spring.



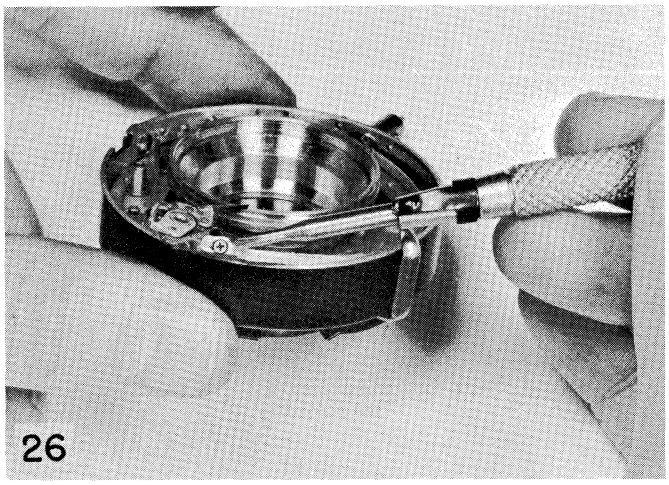
24. Remove clamp screw and clamp. Use tool RF681.



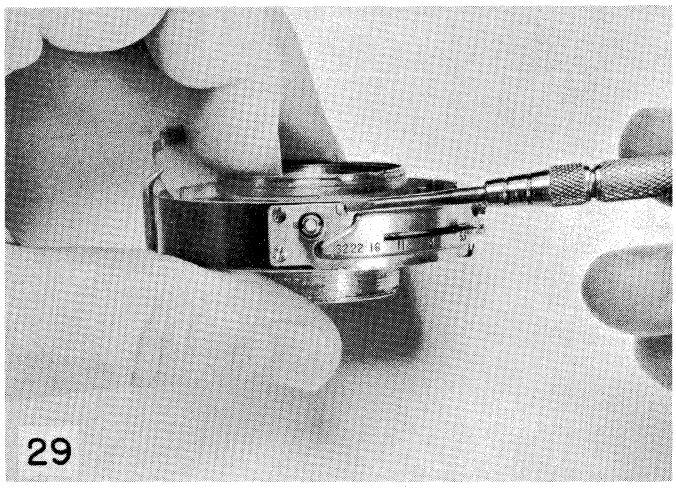
25. Lift out contact lever assembly. (Contact lever is still attached to end of long connector.)



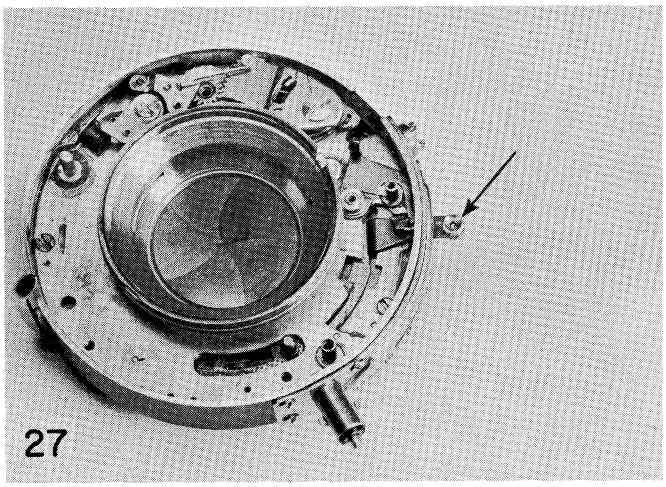
28. Remove screw and synchro retard weight.



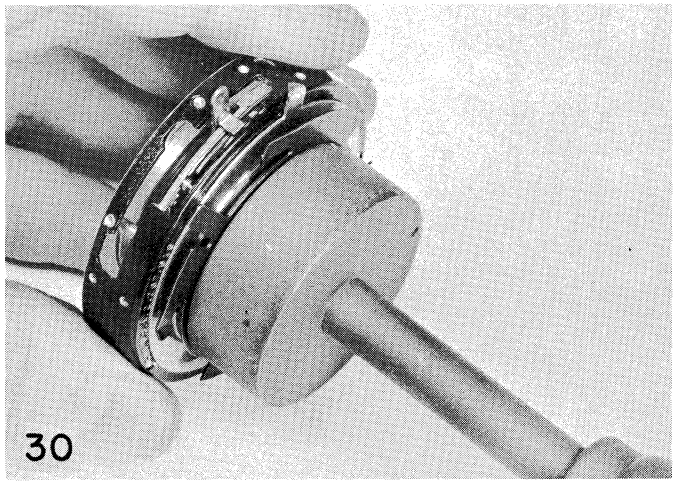
26. Loosen block screw one turn (tool RF681) to remove contact lever assembly from long connector. Short connector will slip from beneath screw.



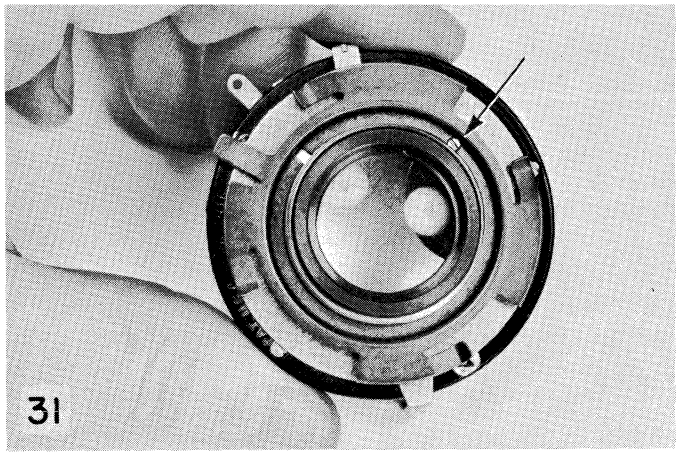
29. Remove five screws from setting lever cover assembly and remove the cover with long connector attached. See figure 4 in parts list for further breakdown.



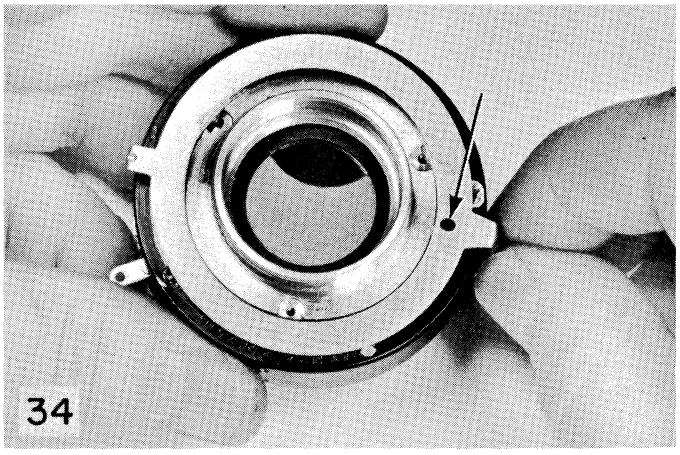
27. Drill to remove knob and washer from handle of blade controller.



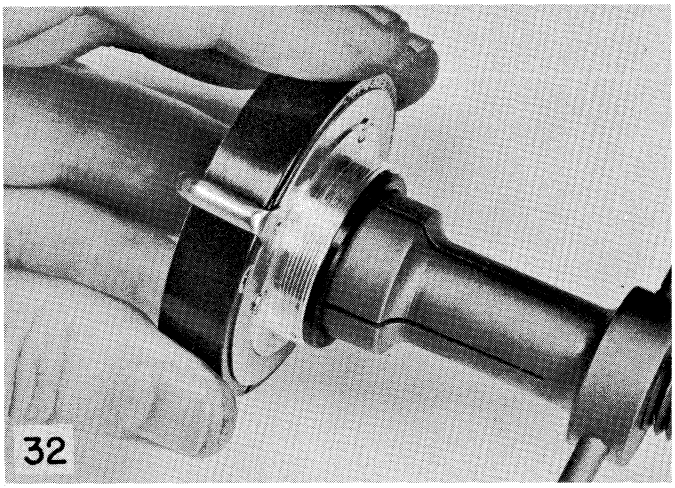
30. Remove the retaining collar with tool RF505A.



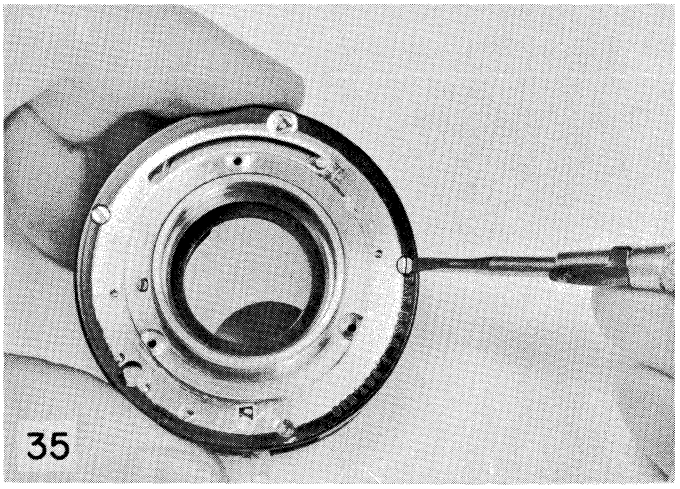
31. Remove the lock ring. Note position of ring in relation to locating screw (arrow) for reassembly.



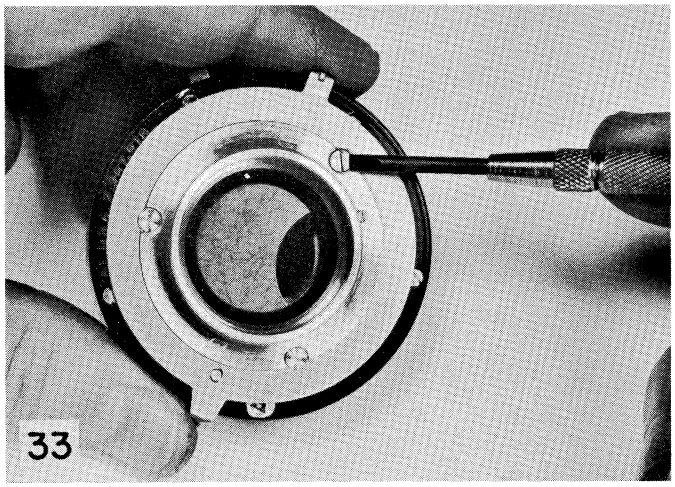
34. Lift off diaphragm indicator ring. When replacing, engage hole (arrow) with stud on diaphragm control ring.



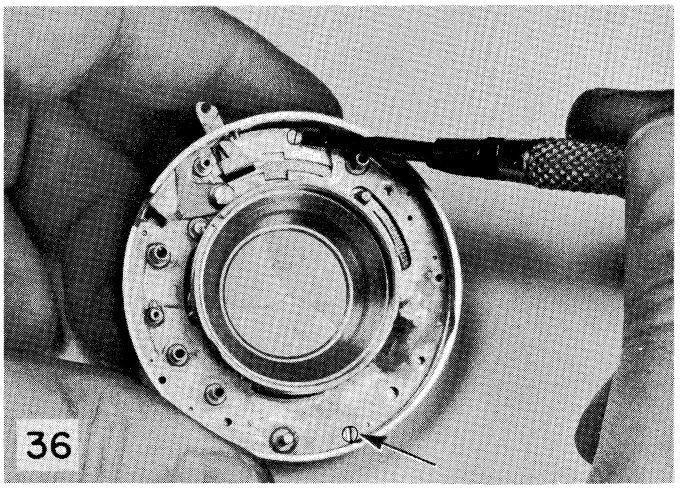
32. With tools RF84 and RF311A remove the rear lens assembly.



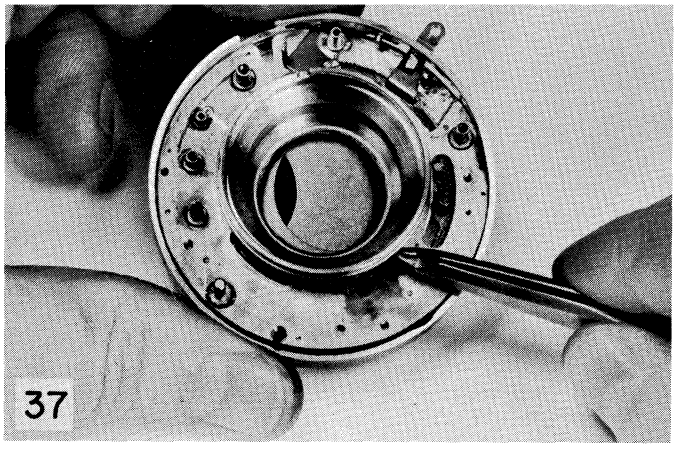
35. Remove two case-to-mechanism plate screws.



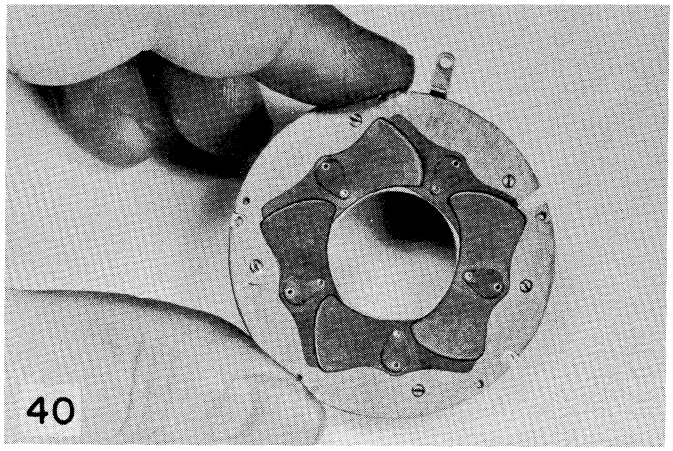
33. Remove three diaphragm indicator ring screws.



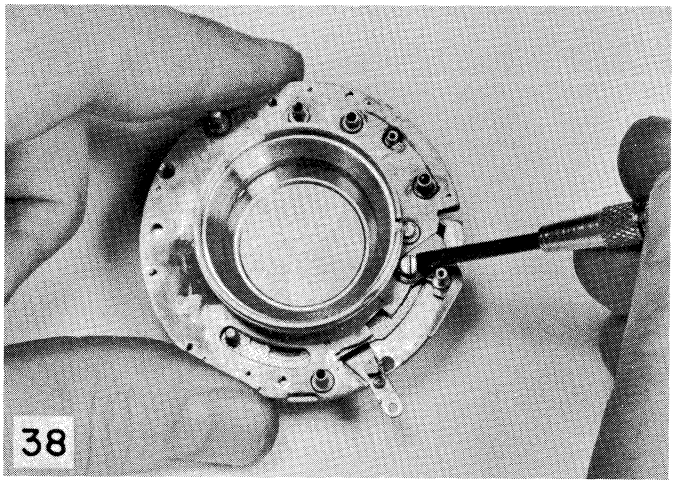
36. Remove screw for short spacer (arrow) and screw for long spacer.



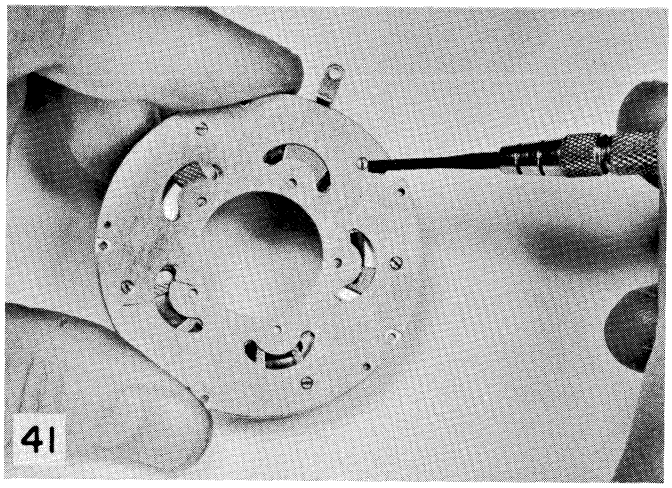
37. Lift out mechanism plate assembly.



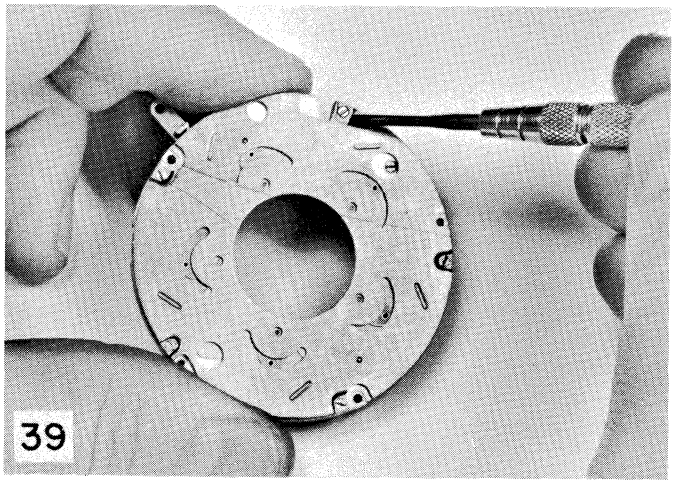
40. Shows blades in position on plate. Before removing blades, number blades and plate so that they can be replaced in the same position. Tip plate upside down to remove.



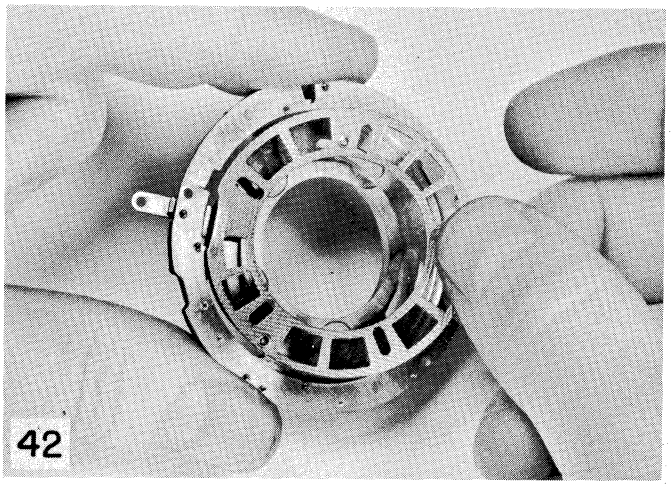
38. Remove screw and trigger latch assembly.



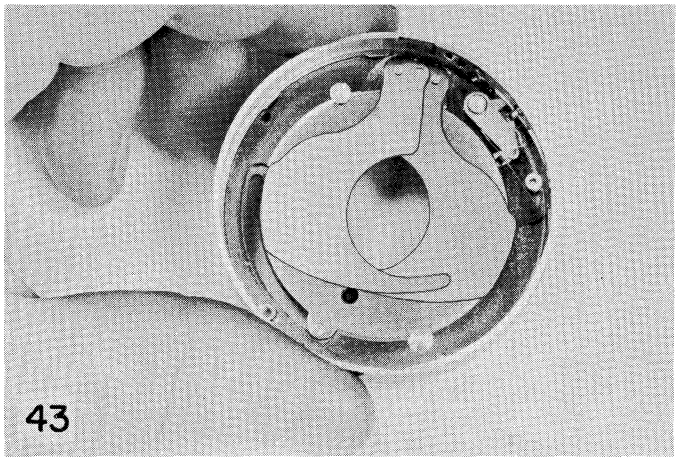
41. Remove five screws and blade controller retainer plate.



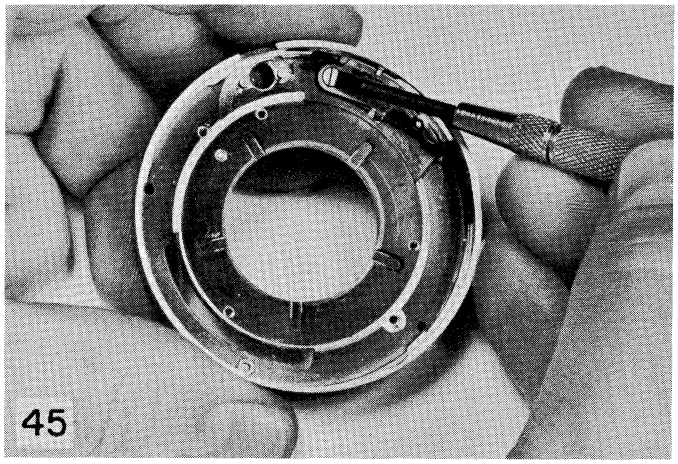
39. Remove five screws and blade retainer plate.



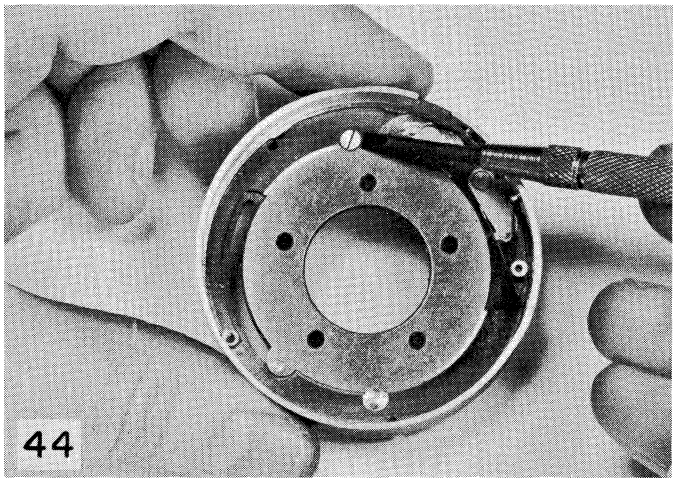
42. Remove blade controller assembly. Withdraw handle through the square hole in the mechanism plate.



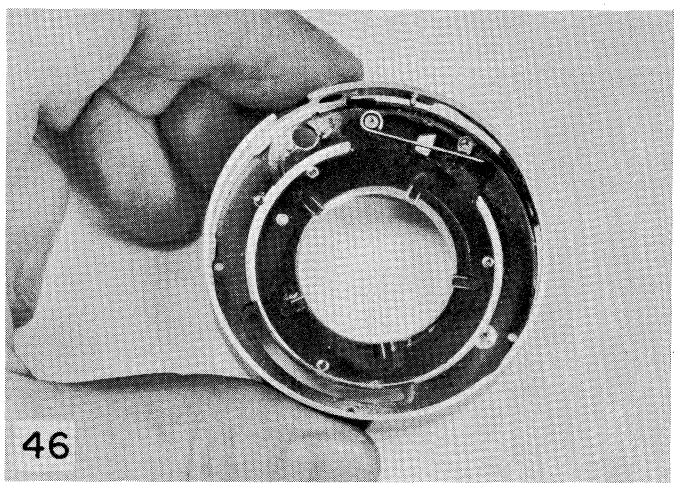
43. Remove two cover blades. Cover blade near snubber to be assembled first.



45. Remove screw and snubber assembly.



44. Remove two screws and diaphragm actuating ring assembly.



46. Shows location of snubber spring.

REASSEMBLY AND ADJUSTMENT

Numbers in parenthesis are picture numbers in the disassembly section

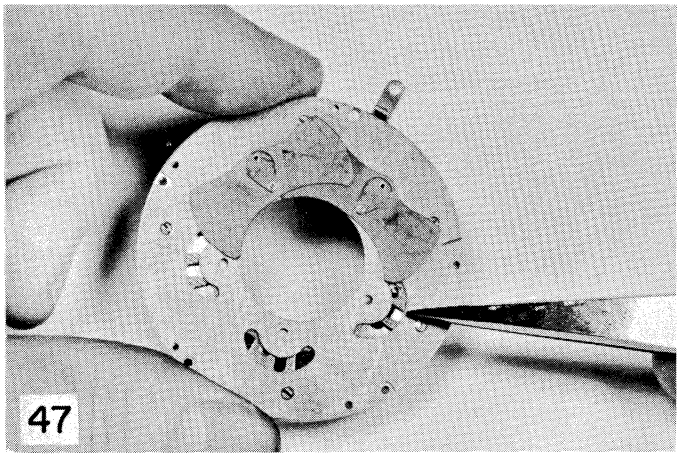
1. Reassemble (46) and (45).

2. Position the five diaphragm wings on the diaphragm actuating ring in a circle with the wings about one-half open. Place the diaphragm actuating ring assembly in the recess of the case so that the embossings on the wings fit into the five slots of the case. Rotate the actuating ring assembly to be sure that the diaphragm operates correctly and freely. Hold the ring in position and replace the two screws (44).

3. Reassemble (43). Check blades for flatness. Be sure that blades are reassembled as shown.

4. Lubricate the inside and outside diameter of the blade controller. Use special Molykote lubricant; stir well. ***Apply a very thin film.*** (42). Blade controller center bearing must fit over hub on mechanism plate within .001-inch maximum play.

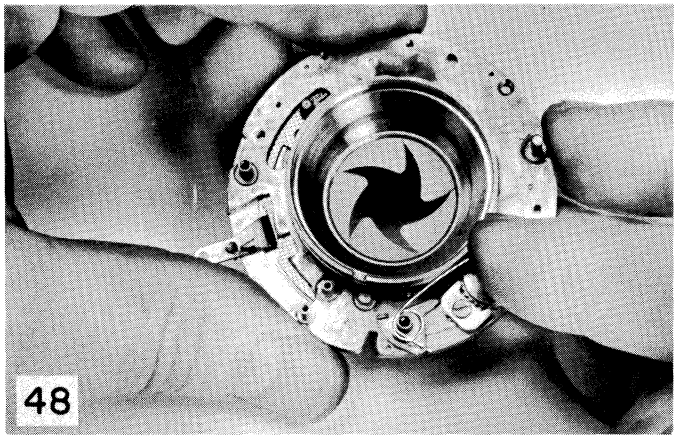
5. Reassemble (41). After replacing screws be sure that no burrs from the screws extend above the surface of the plate. This surface must be smooth and flat.



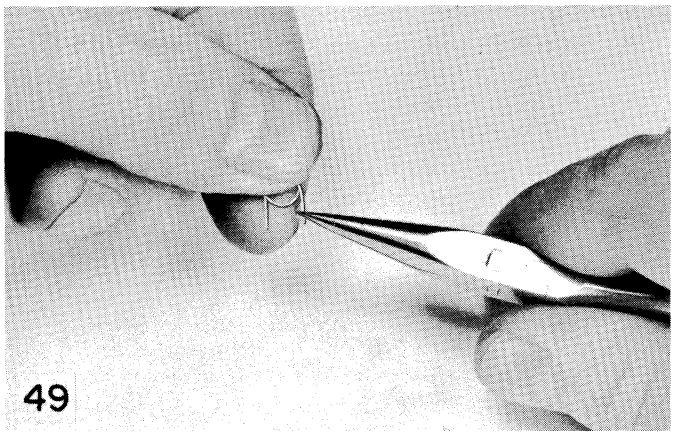
6. Figure 47 - Shows position of blades and slots in blade controller. Reassemble in same order as indicated by numbers put on during disassembly. Be sure that blades are dry and clean.

7. Reassemble (39). Be sure that the one short screw goes in the set lever handle cutout.

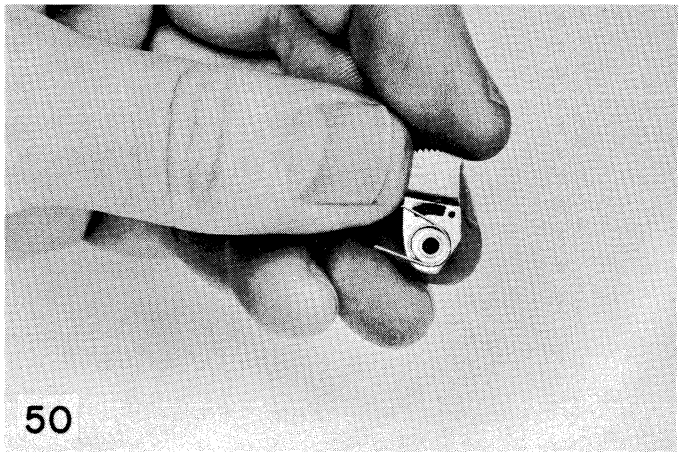
8. Reassemble (38).



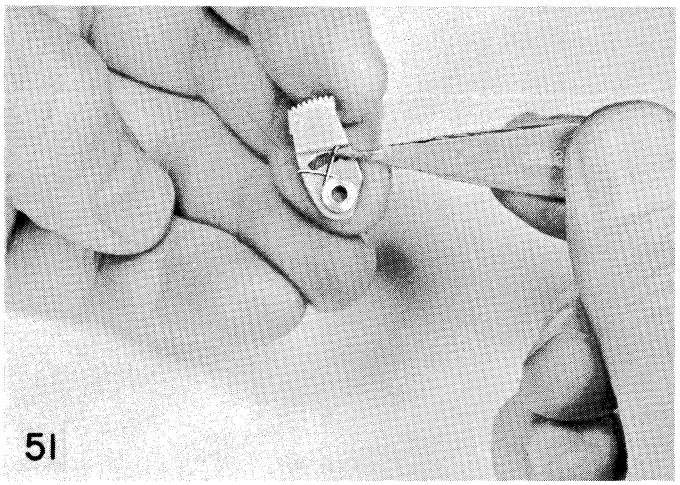
9. Figure 48 - Reassemble synchro retard weight assembly (28), synchro pallet (22), synchro sector latch assembly with spring (21). Place the end of the synchro sector latch spring in groove of mechanism plate.



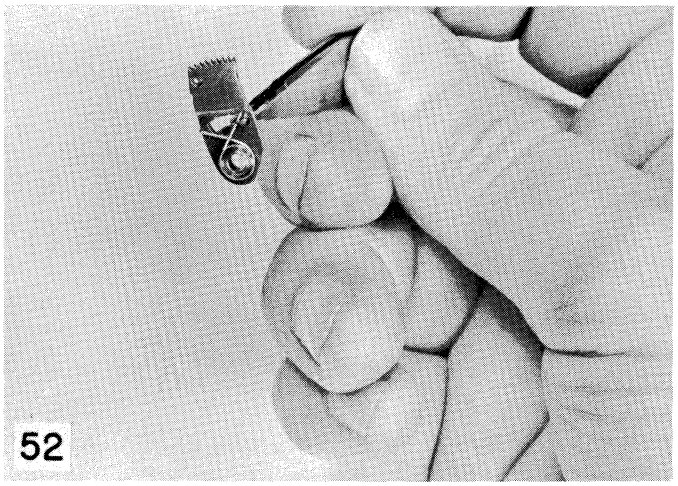
10. Figure 49 - Form the end of the synchro sector spring as shown. The shape of the formed spring can be seen in figure 9 of parts list No. 1-5250.



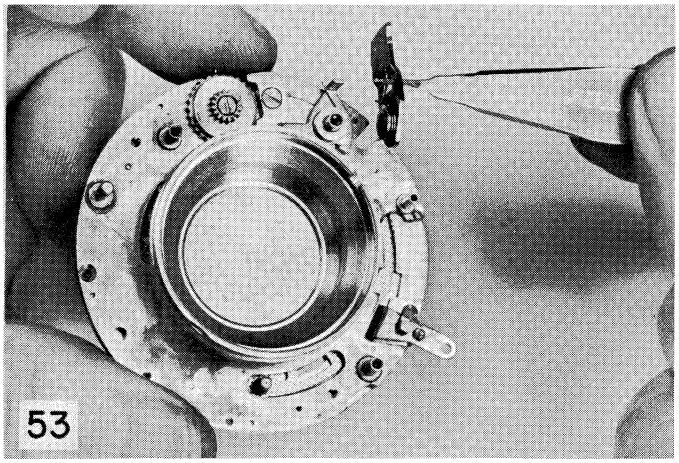
11. Figure 50 - Position spring with hook over the edge of the sector.



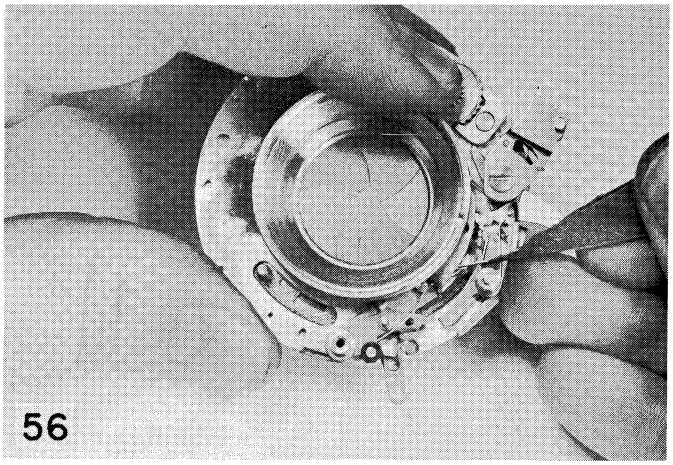
12. Figure 51 - Pull the free end of the spring to the position shown. Hold it in this position with the thumb.



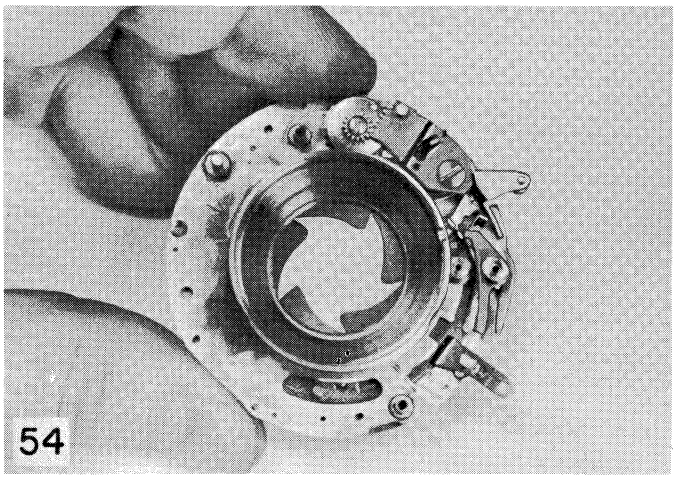
13. Figure 52 - Put one jaw of tweezer through round hole and other jaw through oblong opening and over spring. Hold in this manner to place on stud.



14. Figure 53 - Place on stud with oblong opening over lug of synchro sector latch. When positioned correctly, spring tension is transferred to lug. Replace screw.

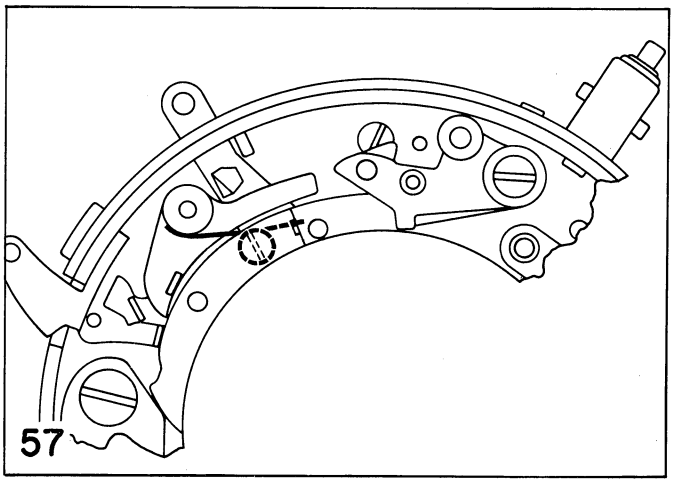


18. Figure 56 - Place the free end of the spring against the trigger bushing as shown. Replace the release lever screw.

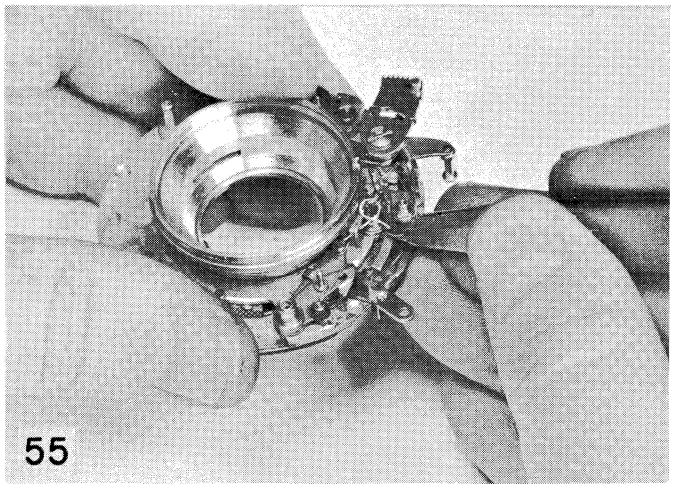


15. Figure 54 - Replace the trigger assembly as shown.

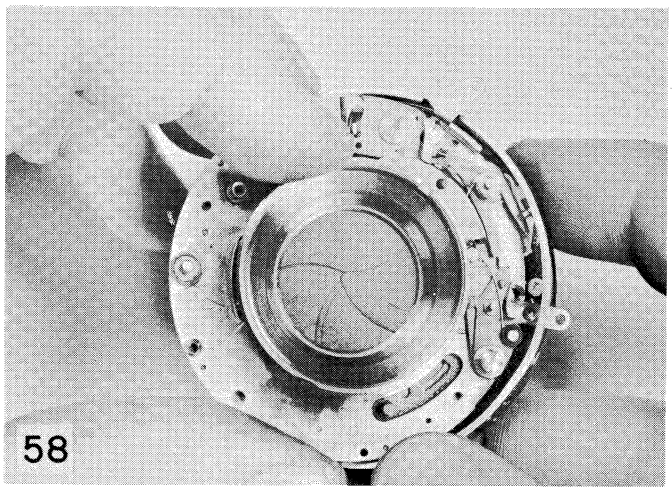
16. Replace the release lever and release lever spring (10).



19. Figure 57 - Shows relative position of release lever spring.

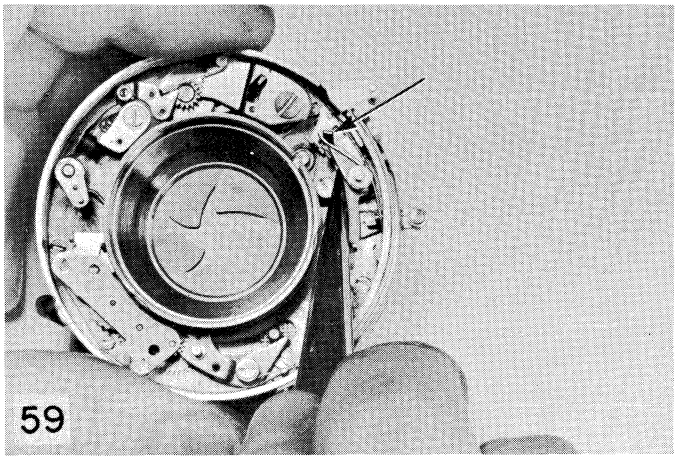


17. Figure 55 - Raise the release lever slightly; place the shorter end of the spring in the slot of the release lever as shown. Fit the coil over the shoulder of the trigger latch screw.

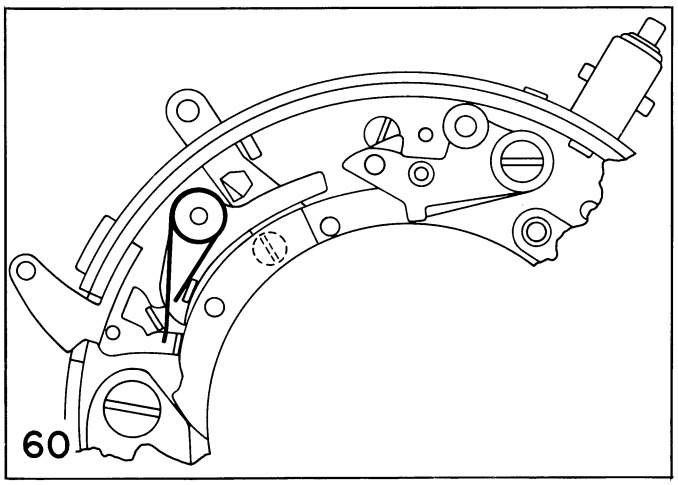


20. Figure 58 - Place the mechanism plate in the case. Open cover blades to size of aperture and ease the trigger stud into slots of cover blades.

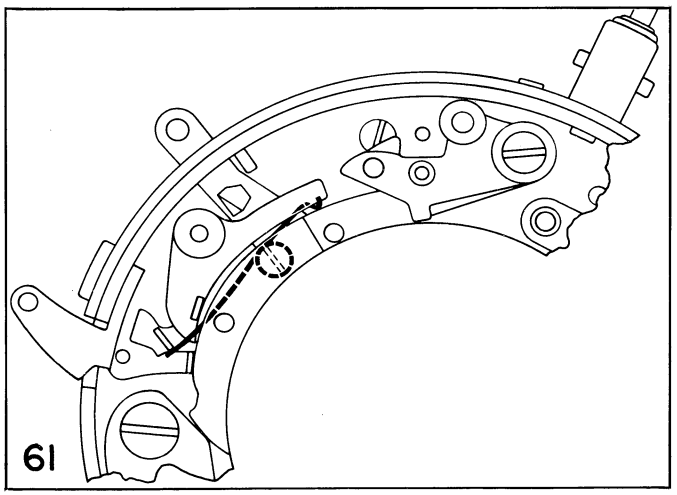
21. Replace the two back case screws (35) first. Replace the two front screws (36).



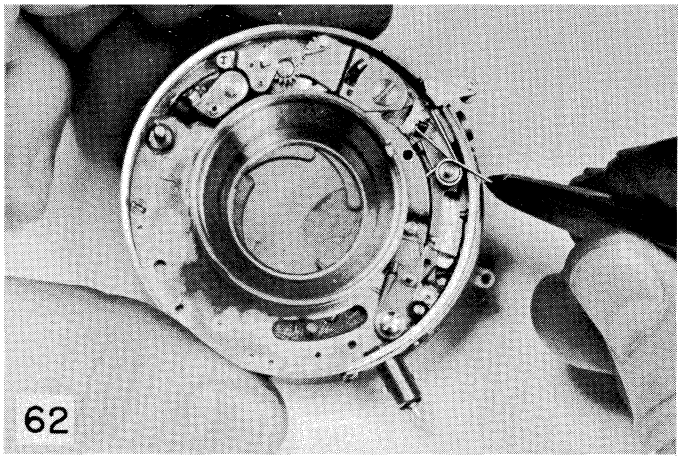
22. Figure 59 - Place the bulb lever spring over the trigger bushing with the kinked end in front of the trigger latch lug (arrow) and the short end behind the lug on the trigger.



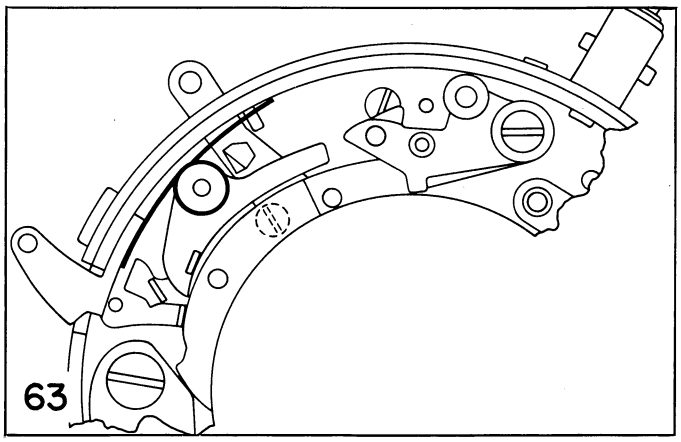
23. Figure 60 shows relative position of bulb lever spring.



24. Figure 61 - Shows old style bulb lever spring in position.



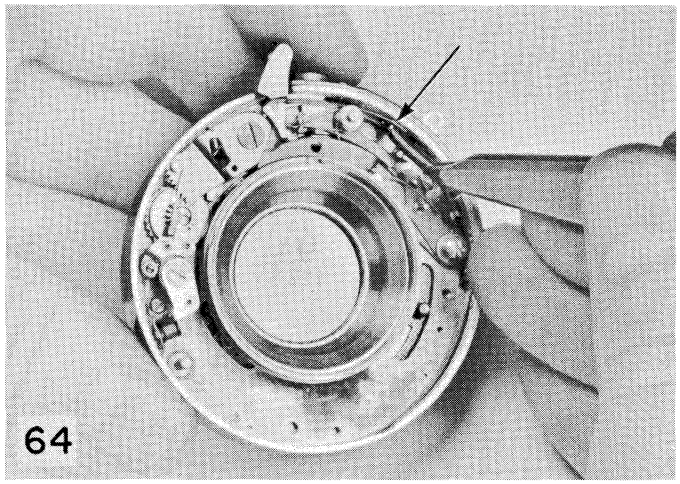
25. Figure 62 - Place the coil of the trigger spring over the trigger bushing. Trigger spring coil must be above bulb lever spring when assembled on recess of trigger bushing to avoid binding.



26. Figure 63 - Locate ends of spring as shown in drawing.

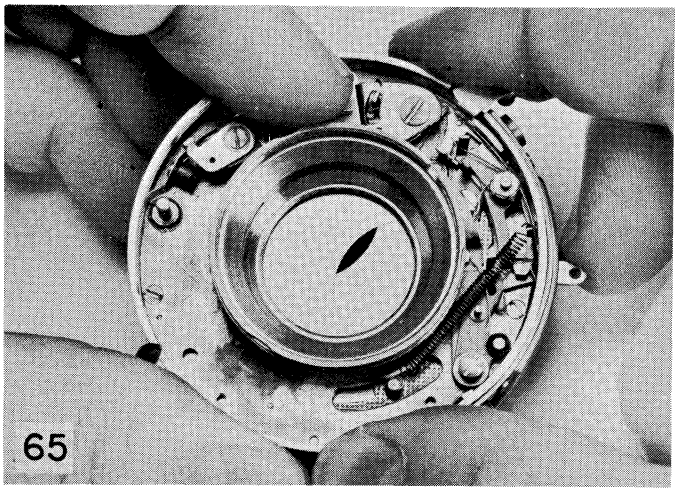
27. Reassemble the setting lever cover assembly with long connector attached (29).

28. Reassemble contact lever assembly onto end of long connector and into case (26), (25), (24), (23).

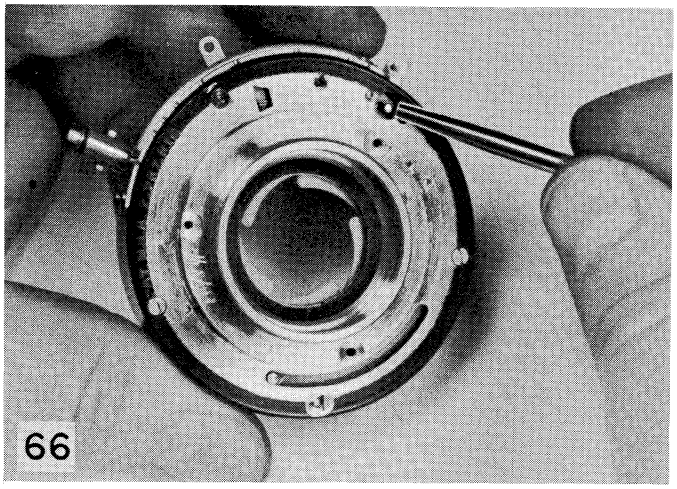


29. Figure 64 - Reassemble main spring. Hook end with loop at center of coil through hole in stud (arrow) from right-to-left. Roll spring to right with remaining loop down before hooking on blade controller stud.

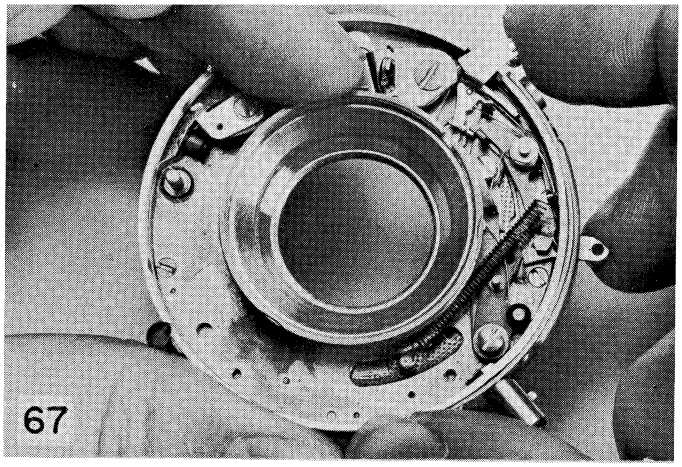
CAUTION: Before the speed control ring is placed on the shutter, do not trip the shutter without holding the set lever or the bulb lever will be damaged.



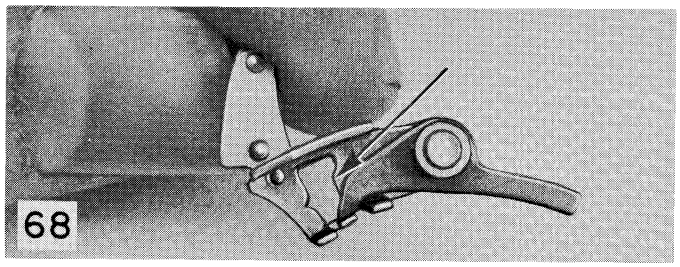
30. Figure 65 - To check cover blades, cock shutter and trip with trigger. Hold the synchro sector in, and the blade set lever at the position shown, push lug of trigger latch inward, and move the trigger in and out to check freeness of cover blades. In the closed position, blades should overlap about 1/16 inch.



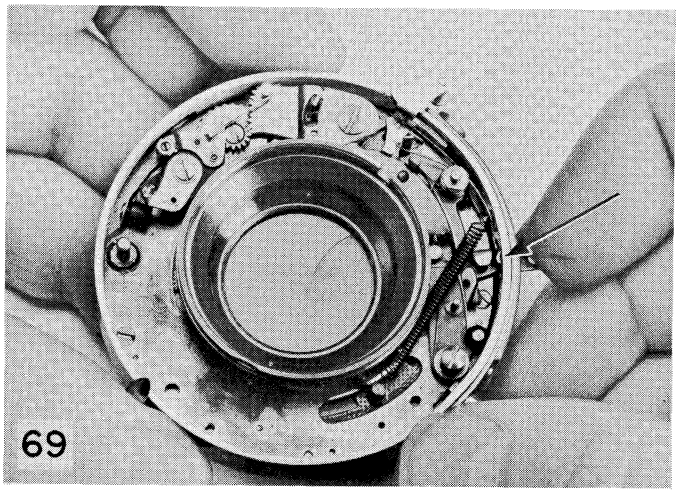
31. Figure 66 - If blades overlap too much or not enough, use tool RF723 to bend trigger stud. Bend stud away from center if blades overlap.



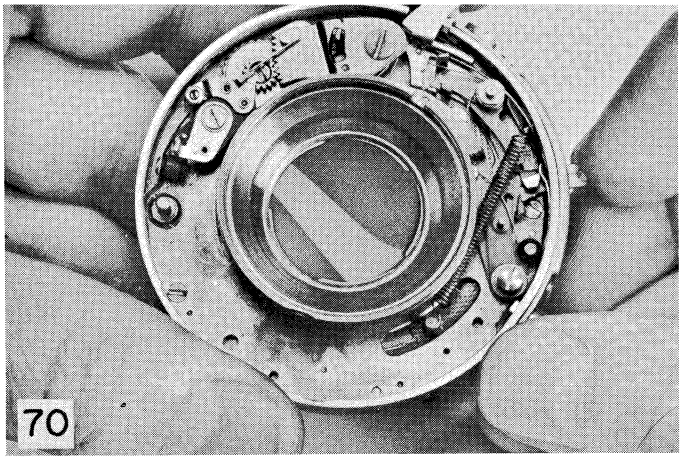
32. Figure 67 - Holding controls in the same manner as in paragraph 30, push trigger in as far as it will go (extreme open position). When trigger is pushed further, the blades should not drop into aperture.



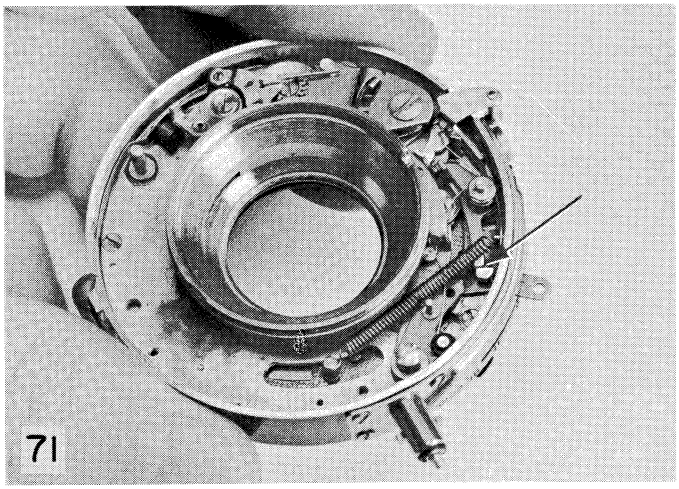
33. Figure 68 - If blades do drop into aperture, swedge trigger at point indicated by arrow. Allow slight amount of play in trigger. If blades continue to drop in, readjust trigger stud (66).



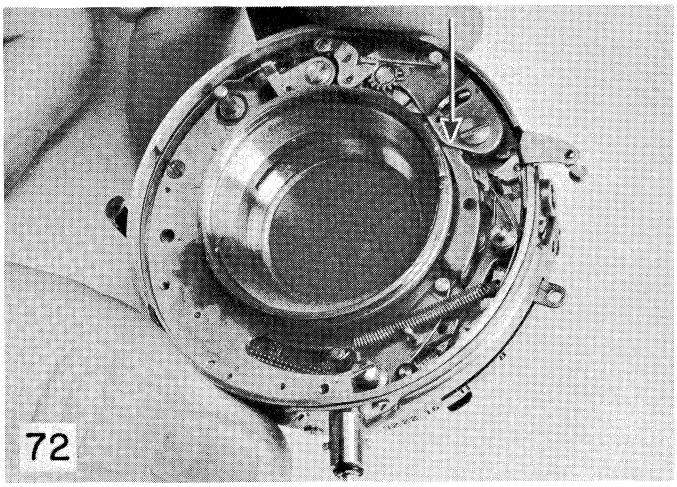
34. Figure 69 - Check clearance between release lever lock stud and formed tip of long connector (arrow) for proper Kodatron contact. Clearance should be about 1/16 inch on setting stroke. Shape contact.



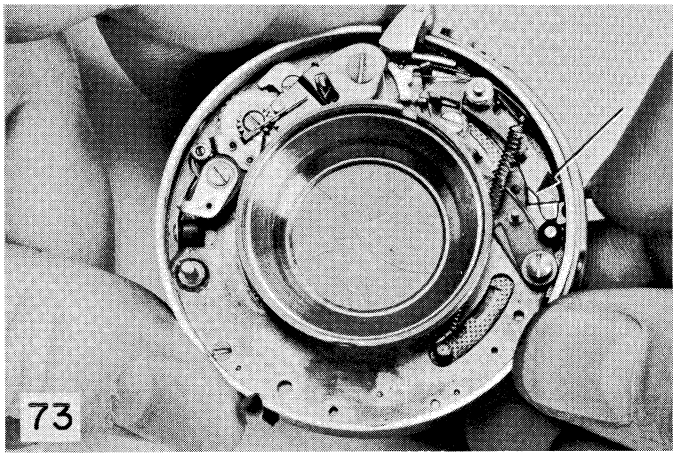
35. Figure 70 - Checking contact between stud and tip of long connector. Let lever back slowly. Contact should be firm and only at tip. Be sure stud does not touch connector before it reaches contact end.



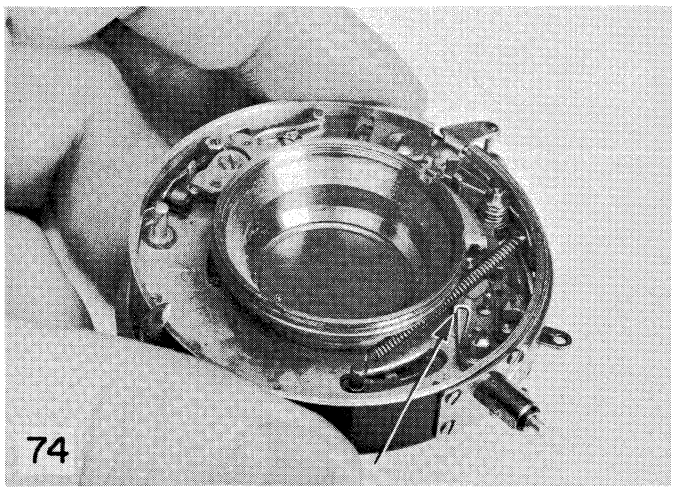
36. Figure 71 - Contact of release lever lock stud and end of bulb lever (arrow). Top of stud should be about even with top of bulb lever. Contact should be as shown.



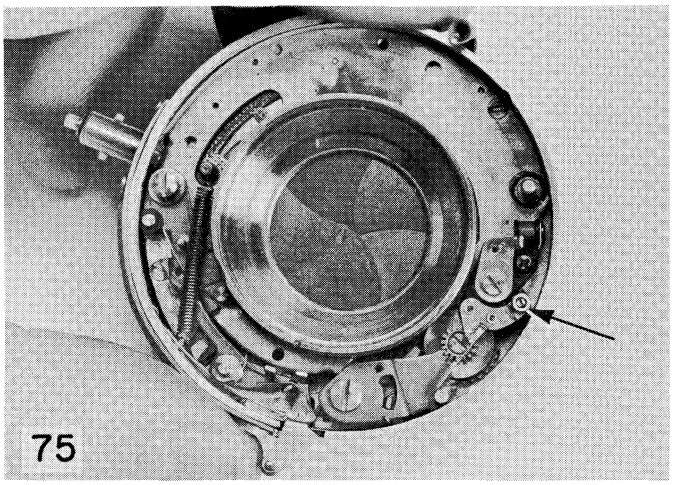
37. Figure 72 - Release lever should ride on synchro sector as shown.



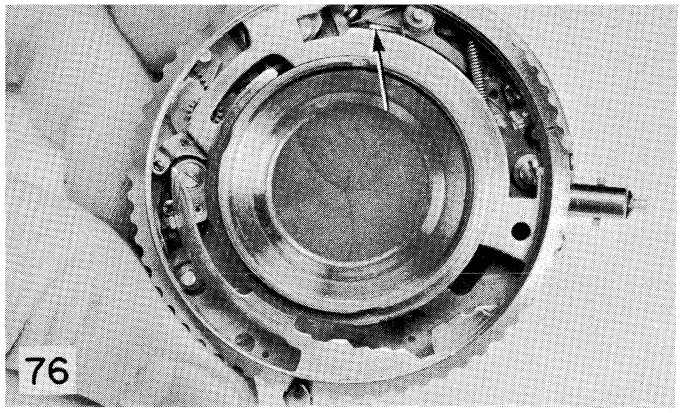
38. Figure 73 - Release lever latch should miss release lever lock stud as shown.



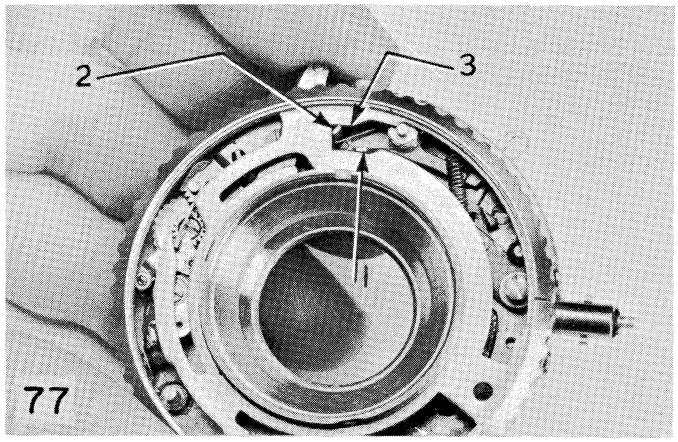
39. Figure 74 - If release lever latch hits stud, use tool RF720 to bend lug (arrow).



40. Figure 75 - Be sure that the short connector does not touch case. Use tool RF721 on nut (arrow) and small screwdriver through center of tool to increase tension on coil. Tension should be sufficient to give good, continuous contact with stud on synchro sector.



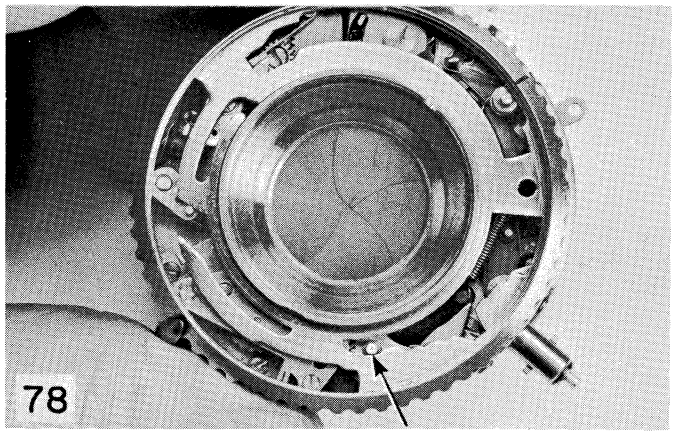
41. Figure 76 - Contact check. Place the speed ring on shutter in position shown. Using a 49 radio pilot light bulb with any 3-volt, 2-cell flasholder, check shutter for contact. If there is a flash or glow of the bulb, contact is sufficient. If no glow, increase tension on coil. (par. 40). When lug (arrow) is in position shown, stud on set lever should miss end of bulb lever.



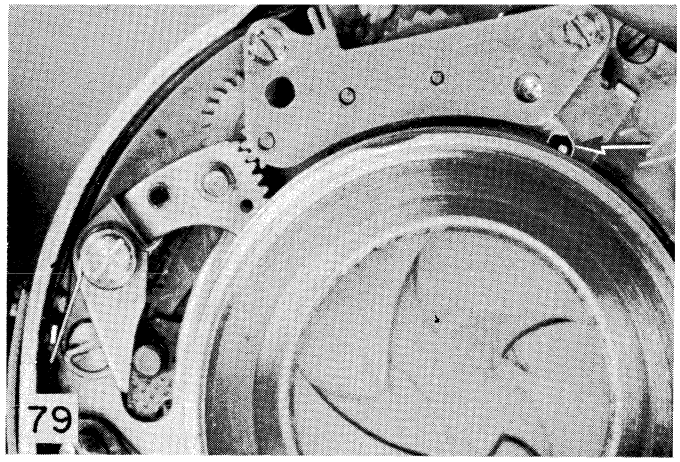
42. Figure 77 - With lug (arrow 1) in position shown, lug on set lever should contact bulb lever for at least ¾ of the width of the bulb lever.

With shutter in set position, ring should turn without lug (arrow 2) catching at point (arrow 3). With lug (2) in position shown, trigger should be free.

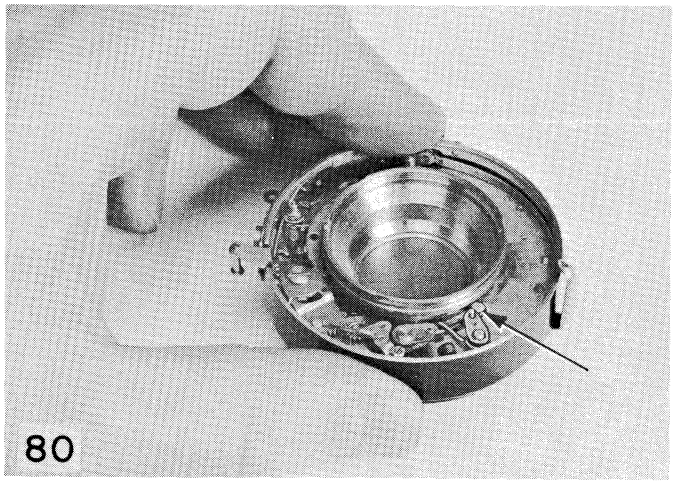
43. Reassemble gear plate and retard sector. (15 through 11).



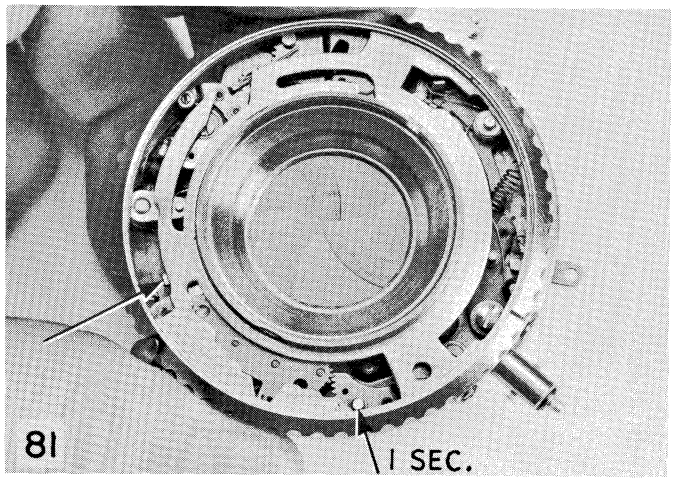
44. Figure 78 - Positioning gear plate. Place speed ring on with stud (arrow) in position shown. Move set lever to move stud on blade controller over retard sector. Play between stud (arrow) and speed ring should be very slight. Move gear plate until play is slight; then tighten gear plate screws.



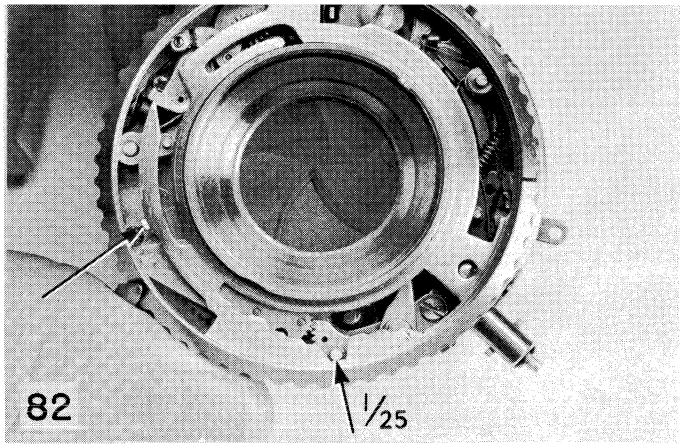
45. Figure 79 - Check for freedom of gear train. Move retard sector to check. If not free, form lug (arrow) to keep pallet from dragging too heavily.



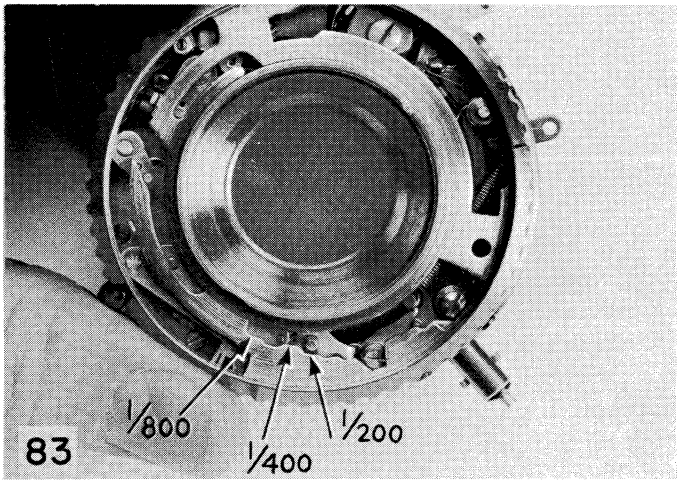
46. Figure 80 - Replace high speed spring. Stud on blade controller (arrow) should be in position shown.



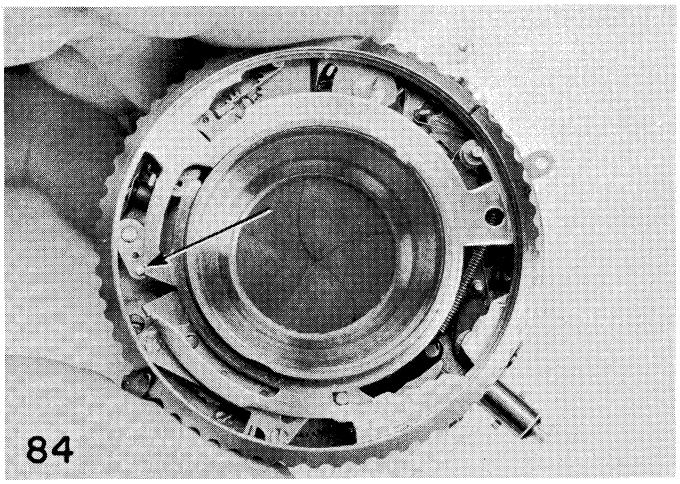
47. Figure 81 - Set speed ring for 1 second as shown. Check speed at 1 second on synchro checker. If 1 second is not obtained, adjust lug (arrow, figure 79) as required. Lug (arrow) should be forward to give full gear train action.



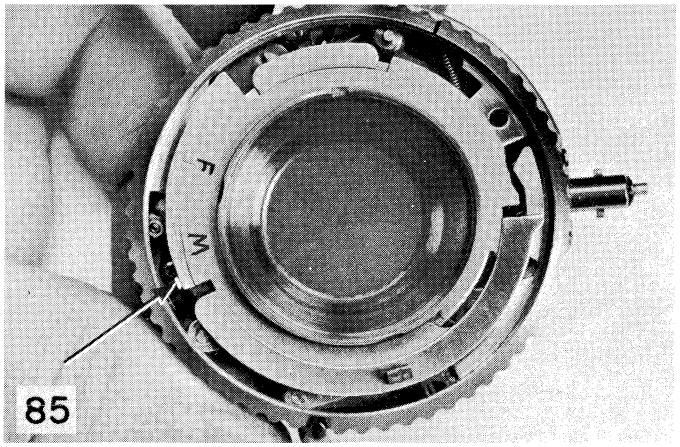
48. Figure 82 - Checking speed at 1/25. Form lug (arrow) until there is no pallet action on gear train.



49. Figure 83 - After checking and setting at 1 second and 1/25, check at 1/200. If speed ring has not been replaced, other speeds should be satisfactory. If speed ring has been replaced, shutter should be checked at all speeds, swedging or filing speed ring to obtain correct speeds.



50. Figure 84 - Speed ring should have very small notch at arrow to hold high speed cam stud at 1/800 position so that it will not slip off ring during repeated trippings.



51. Figure 85 - Checking milliseconds. Set lug (arrow) in position shown. If synchro checker indicates short, bend lug toward center of lens just enough to eliminate short. Space between contact arm and synchro sector stud should be just sufficient to operate repeatedly without shorting.

Check on M. If reading is within 2 or 3 ms, swedge or file synchro ring to obtain correct reading.

Check on F. Swedge or file for correct reading.

If the reading is not within 2 or 3 ms at M, the release lever may be letting go before the synchro sector has traveled far enough. If release lever is not holding long enough to obtain proper milliseconds, it may be adjusted as in figure 74 or the release lever latch angle re-squared with a stove, if wear is in evidence.

52. Replace index plate (5). Check at X. Should have no ms reading.

53. Reassemble (34) through (30).

54. Reassemble (3) through (1).

55. Place the shutter on the camera and refocus.

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