Film-Tech

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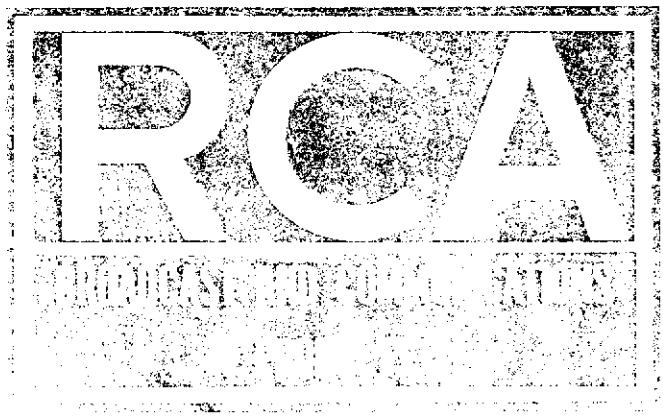

16mm PROJECTOR

Type 1600

MI-35051-A (60 CYCLE, 120V)
MI-35051-AF (50 CYCLE, 120V)
MI-35053-F (50 CYCLE, 230V)

SERVICE INSTRUCTIONS

RADIO CORPORATION OF AMERICA

IB-8027051-2

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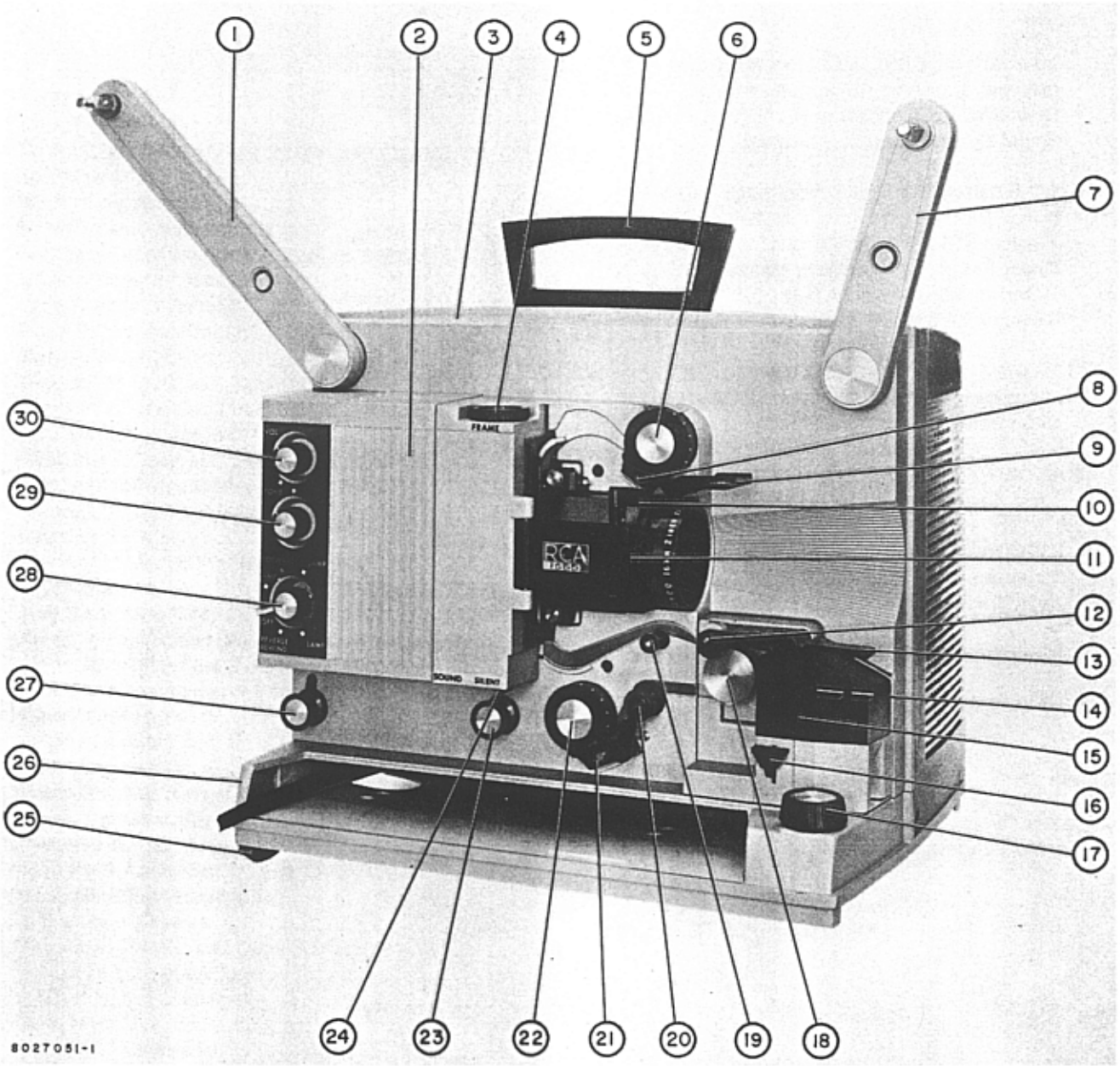
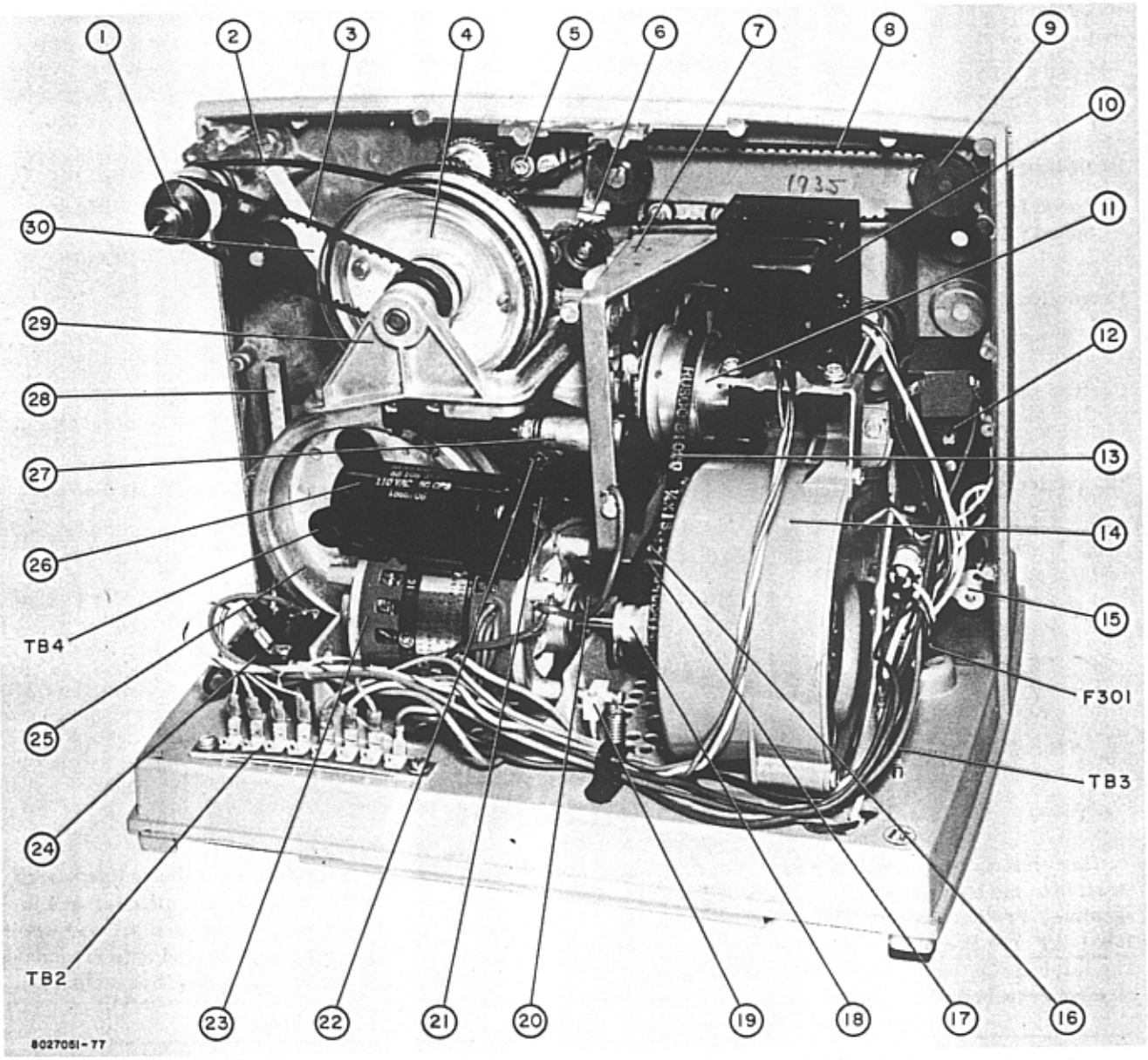


1. Rear Reel Arm.
2. Lamphouse Cover
3. Main Frame
4. Framing Knob
5. Handle
6. Upper Sprocket
7. Front Reel Arm.
8. Upper Sprocket Shoe
9. Rewind Lever
10. Focus Lever
11. Lens Gate Assembly
12. Pressure Roller
13. Pressure Roller Arm
14. Exciter Lamp
15. Exciter Lamp Cover
16. Film Cutter
17. Tilt Control
18. Sound Drum
19. Upper Guide Pulley
20. Damper Assembly
21. Lower Sprocket Shoe
22. Lower Sprocket
23. Tension Roller
24. Selector Control
25. Pad-Foot
26. Base Assembly
27. Snubber Roller
28. Function Switch
29. Tone Control
30. Volume Control

Figure 1. 16mm Projector, Front View (Cover Removed)



1. Pulley/Ratchet Assembly
2. Rewind Belt
3. Reverse Drive Belt
4. Fluid Clutch
5. Drive Gear Assembly
6. Idler/Tension Assembly
7. Back Plate
8. Forward Drive Belt
9. Rear Reel Drive Gear
10. Power Transformer
11. Cam-Pulley Assembly
12. Function Switch
13. Drive Belt
14. Blower Housing
15. Snubber Roller Arm
16. Cam-Stop Assembly
17. Speed Selector
18. Drive Pulley
19. Motor Damper
20. Puck-Reverse Assembly
21. Lower Sprocket Drive Belt
22. Lower Sprocket Tensioner
23. Motor
24. Motor Starting Relay
25. Flywheel
26. Motor Starting Capacitor
27. Framing Plate
28. Tilt Mechanism
29. Main Shaft Support
30. Rewind Arm

Figure 2. 16mm Projector, Rear View (Internal)

TECHNICAL DATA

Power Required

105 to 125 volts, 60 cycles
830 with 750 watt lamp
1080 with 1000 watt lamp
1280 with 1200 watt lamp

Projector Lens

Speed f/1.6, 2"
Speed f/1.4, 2"

Projection Lamp (Supplied)

1000 watt, 25 hr, (Type CTS)

Exciter Lamp

7 volt, (Type BTD)

Transistor Complement

3 - 2N2925
2 - 2N3053
1 - 2N270
1 - 40250
2 - 40050

Diode Complement

2 - 1N3193
1 - 1N3029-B

Fuse

F301 - 1.5 Ampere, 125 Volt, SLO-BLO for 105-125 Volt Supply
F301 - .75 Ampere, 250 Volt, SLO-BLO for 210-230 Volt Supply
F101 - 1 Ampere, 250 Volt, SLO-BLO Pigtail

Amplifier

Output - 12 watts peak
Load Impedance - 8 ohms

Dimensions

Width - 15 inches
Depth - 11-1/8 inches
Height - 14-7/8 Handle Up.
Height - 13-1/8 Handle Down.

Weight

30 - Pounds

INTRODUCTION

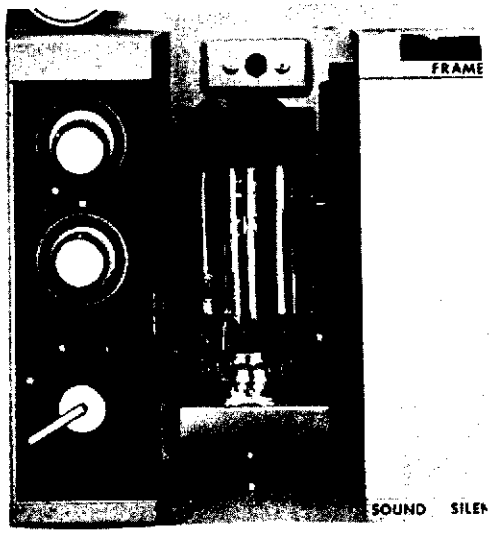
This Instruction Book contains service data relative to the 16 MM, Sound and Silent Speed, Reversible, Projector — MI-35051-A (60 cycle), MI-35051-AF (50 cycle) and MI-35058-F (50 cycle). The information and instructions contained in this book cover technical data, removal and replacement procedures, operational checks and adjustments, belt replacement and adjustment, cleaning and lubrication, standard and special tools, and servicing aids for both the projector and safe threader. Also, a wiring diagram and amplifier schematic are provided.

REMOVAL AND REPLACEMENT PROCEDURES

The following paragraphs contain information and instructions to remove, disassemble, and replace the various parts, assemblies, and subassemblies that make up the projector. When replacing a particular part or assembly, perform only enough of the various removal procedures to permit the removal or replacement of the defective part. In some cases, special tools are required to reassemble a part or parts and to perform the various alignment and adjustment procedures. Do not force the assembly of any part or parts as this could cause damage to other parts of an assembly. It should not be necessary to alter any replacement part to enable it to be assembled.

LAMPHOUSE COVER, SHIELD, AND PROJECTION LAMP

1. Remove lamphouse cover by pulling out at top and bottom.
2. To remove shield from lamphouse cover, remove four (4) mounting screws and washers.
3. To remove projection lamp, hold lamp and lift ejection lever at base of lamphouse.
4. To replace projection lamp, align keyway and insert in socket. Make sure that lamp is fully seated.
5. To replace shield and lamphouse cover, reverse removal procedures.



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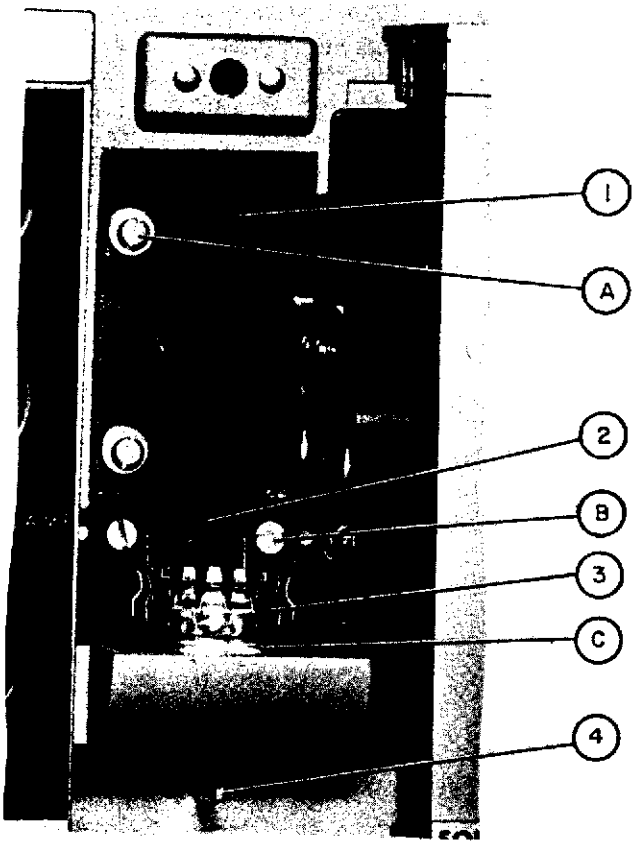
PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
LAMPHOUSE COVER, SHIELD, AND PROJECTION LAMP			
	237965	3467101-501	COVER - LAMP HOUSE, COMPLETE
	234386	3470602- 1	COVER - LAMPHOUSE
	234289	3462106- 1	SHIELD - LAMPHOUSE COVER
	234273	3454114- 1	BALL AND STUD
	234219	3457051- 1	WASHER - INSULATING
	237864	3463408- 4	LAMP - 750 WATT (120V)
	237742	3463408- 2	LAMP - 1000 WATT (120V)
	237865	3463408- 1	LAMP - 1200 WATT (120V)
	239321	3463408- 3	LAMP - 1000 WATT (220/230V)

PROJECTION LAMP SOCKET AND REFLECTOR

1. Remove lamphouse cover by pulling out at top and bottom.
2. Eject projection lamp by holding lamp and lifting ejection lever (4).
3. To remove projection lamp socket, remove two (2) mounting screws (C) at base of socket (3).
4. Lift socket out of lamphouse and disconnect filament leads by pulling off plugs.
5. To remove reflector (1), remove two (2) mounting screws (A), washers, and spacers.
6. To replace socket and reflector, reverse removal procedures.



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EJECTION LEVER AND BRACKET

1. Remove lamphouse cover by pulling out at top and bottom.
2. Eject projection lamp by holding lamp and lifting ejection lever (4).
3. Remove two (2) mounting screws (C) of projection lamp socket (3) and pull socket out of lamp house.
4. Remove two (2) mounting screws (B) from ejection bracket.
5. Lift ejection lever and bracket out of lamp housing.
6. To replace, reverse removal procedures.

PARTS LIST

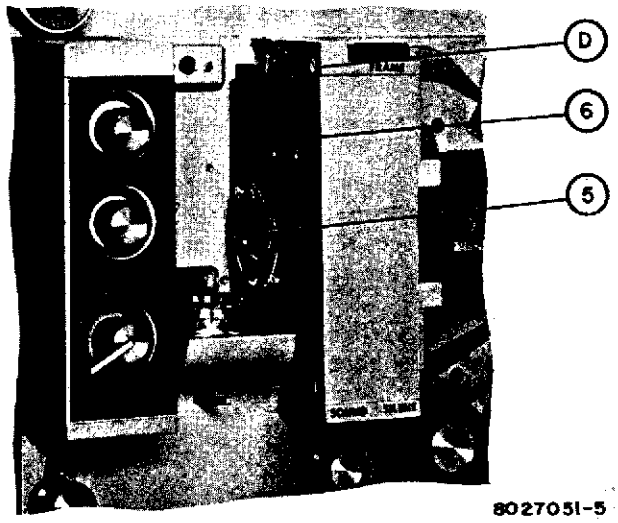
Illus. No.	Stock No.	Drawing No.	Description
			LAMP SOCKET, REFLECTOR, AND EJECTION LEVER
1	234340	3463407- 1	REFLECTOR - LAMPHOUSE
2	234288	3462105- 1	BRACKET - LEVER
3	234308	3462349- 1	SOCKET
4	234212	3453467- 1	LEVER
	242719	3457051- 1	WASHER - INSULATING (Behind Reflector)
A			SCREW #6-32 x .312 Pan Head
B			SCREW #6-32 x .25 Flat Head
C			SCREW #4-40 x .25 Pan Head

CONDENSER LENS AND MOUNTING PLATE

1. Remove lamphouse cover by pulling out at top and bottom of cover.
2. Remove projection lamp by holding lamp and lifting ejection lever.
3. To remove condenser lens (5), press back on reflector adjacent to condenser lens and slide lens out of condenser mounting plate (6).
4. Disassemble condenser lens as shown below.
5. Before reassembling condenser lens, make certain that lens are clean. Use lens tissue or cleaning fluid.

   CAUTION: Lenses must be mounted with most curved faces toward each other.

6. To remove mounting plate, remove three (3) mounting screws (D).
7. To replace mounting plate and condenser lens, reverse removal procedures.



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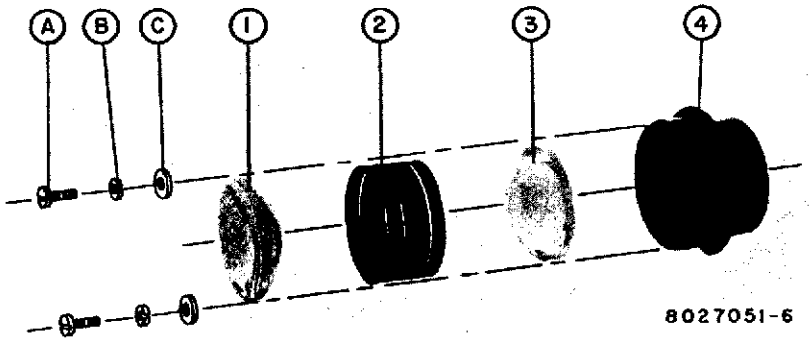

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PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
CONDENSER LENS AND MOUNTING PLATE ASSEMBLY			
1	242299	3730002- 2	LENS - CONDENSER ASPHERIC
2	242301	3453672- 3	SPACER - LENS
3	242298	3730002- 1	LENS - CONDENSER ASPHERIC
4	241504	3468411- 1	MOUNTING - LENS
6	241848	3468418-501	MOUNT - CONDENSER SUB-ASSEMBLY
A			SCREW #2-56 x .25 PAN HD
B			WASHER - LOCK #2
C			WAHSER - FLAT #2
D			SCREW - 6-32 x .250 FLAT HD

LENS GATE ASSEMBLY

NOTE: The lens gate can be completely disassembled without being removed from the Projector.

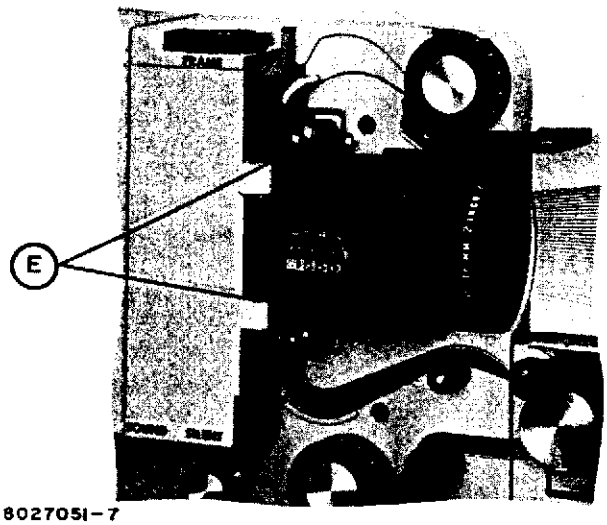
1. To remove lens gate, loosen upper and lower pivot screws (E) and remove lens gate.
2. Disassemble lens gate as shown below.

CAUTION: After installing a reassembled lens gate on Projector, close carefully to ensure that film shoe is not damaged by striking either of the rails.

3. With lens removed, sight through lens barrel and adjust pivot screws (E), loosened in step 1, until hole in aperture plate is centered in hole in film shoe.

NOTE: When reassembling barrel in lens gate, apply a very light film of grease. (Stock Number 205148).

4. After reassembly, press in bottom of film shoe and ensure that lower adjusting block (14) does not bind on monitoring screw (13). If binding occurs, rotate set screw (C) on bottom side of lens gate until no binding occurs.
5. Refer to Film Shoe Adjustment for final adjustment.



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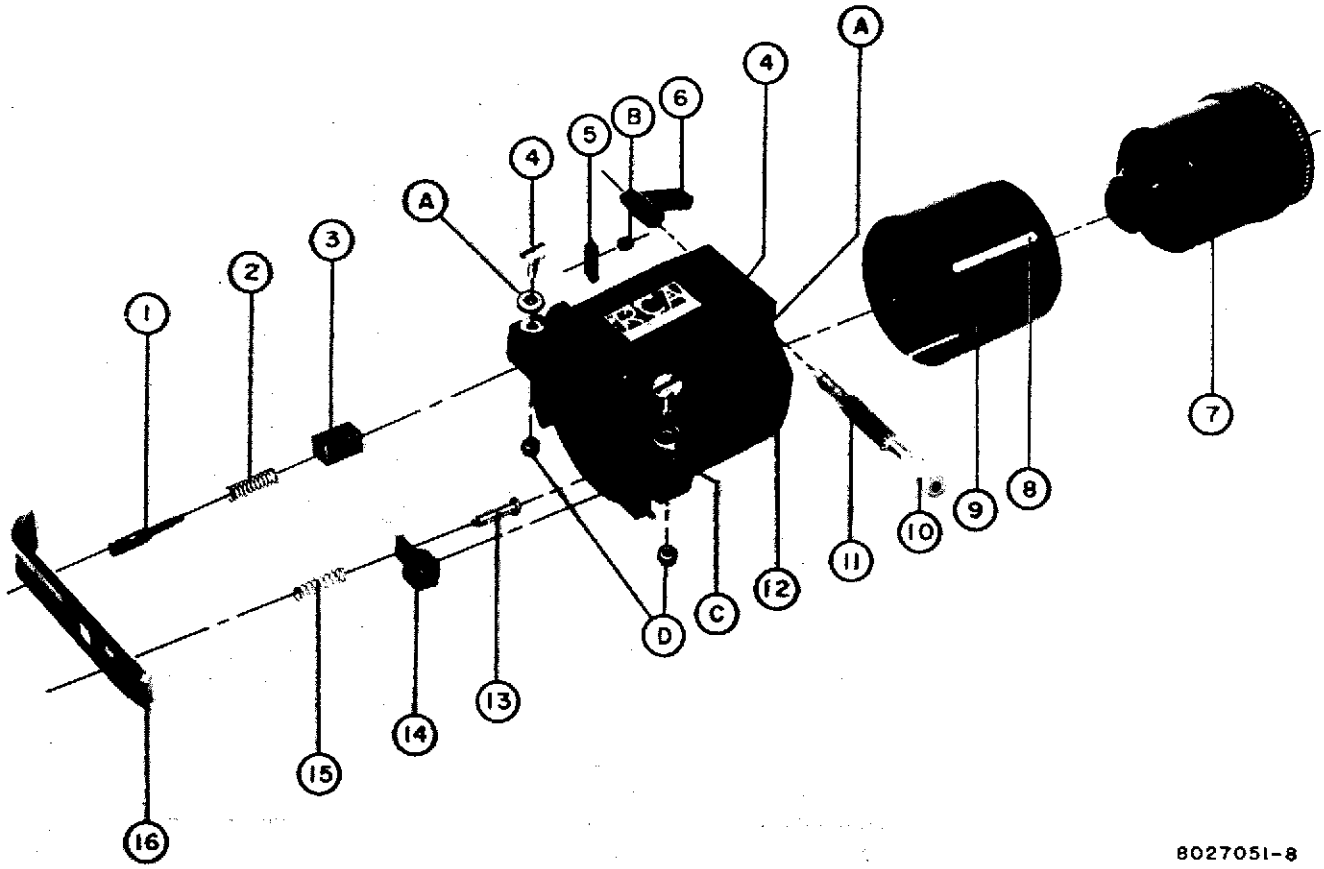

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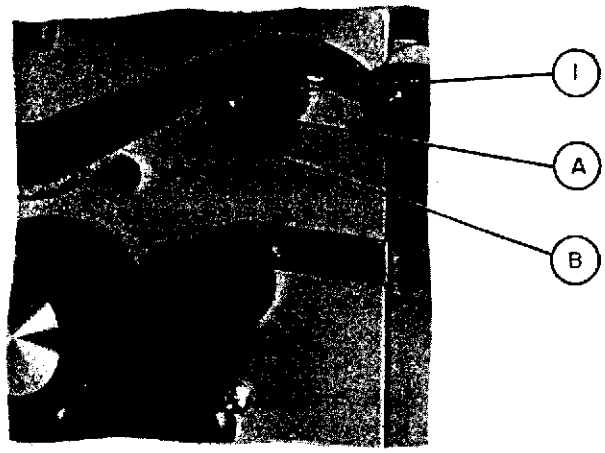
PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
		LENS GATE ASSEMBLY	
1	234220	3453503- 1	PIN - PRESSURE SHOE
2	238332	3454071- 2	SPRING - LENS GATE
3	234253	3454061- 1	BLOCK - UPPER ADJUSTING
4	234255	3454066- 1	SCREW - BLOCK ADJUSTING
5	234218	3453500- 1	CAM
6	234330	3463218- 1	LEVER
7	234310	3462396- 1	LENS PROJECTION, 2 IN. F/1.6 16MM
8	234291	3462112- 1	SPRING - BARREL GUIDE
9	234290	3462110- 1	BARREL
10	242689	3458097- 1	BUSHING - FRICTION (TEFLON)
11	234221	3453504- 1	GEAR - PINION
12	234410	3471290- 1	GATE - LENS
13	234254	3454065- 1	SCREW - MOUNTING
14	234328	3463214- 1	BLOCK - LOWER ADJUSTING
15	234256	3454071- 1	SPRING - LENS GATE
16	234354	3465644- 1	SHOE - FILM
	234331	3463219- 1	LENS PROJECTION, 2 IN. F/1.4 16MM
A	242686	3458035- 1	WASHER - SPRING
B	254876	8811181- 5	NUT - HEXLOCK
C		3458099- 12	SCREW - ALLEN
D	242687	8811181- 4	NUT - HEXLOCK
E	234219	3453502- 1	PIVOT SCREW - ALLEN

UPPER GUIDE PULLEY

1. Remove retainer ring (A), and slide upper guide pulley (1) off fixed shaft.

   NOTE: When replacing pulley, make certain that the shouldered end of the pulley is placed next to the main frame.



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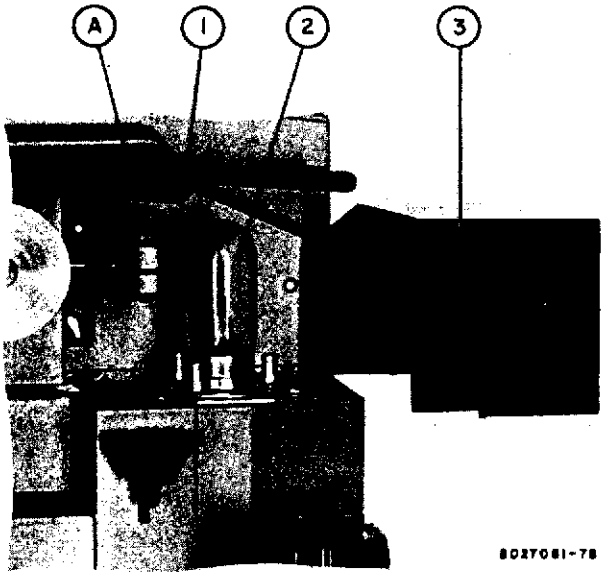
PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
		UPPER GUIDE PULLEY	
1	234258	3454079- 1	PULLEY - FILM GUIDE
A	77269	93605- 3	WASHER - C
B	238390	3454078- 1	SHAFT - FILM GUIDE

SOUND OPTICAL LENS

NOTE: The adjustment of the optic lens is very critical, therefore it should not be removed or adjusted unless it is known to be defective or out of adjustment. Periodically clean the optic lens (in place) with lens tissue or a Q-Tip and lens cleaning fluid.



To remove sound optic lens, proceed as follows:

1. Open exciter lamp cover (3) . If necessary, remove cover by lifting off hinge pin.
2. Remove exciter lamp (2) by lifting up and turning counterclockwise.
3. Loosen set screw (A) in sound optical bracket.
4. Remove sound optic lens (1) by pulling out of bracket.
5. To replace optic lens, reverse removal procedures. Refer to Sound Optical Lens Adjustment for final adjustment.

PARTS LIST

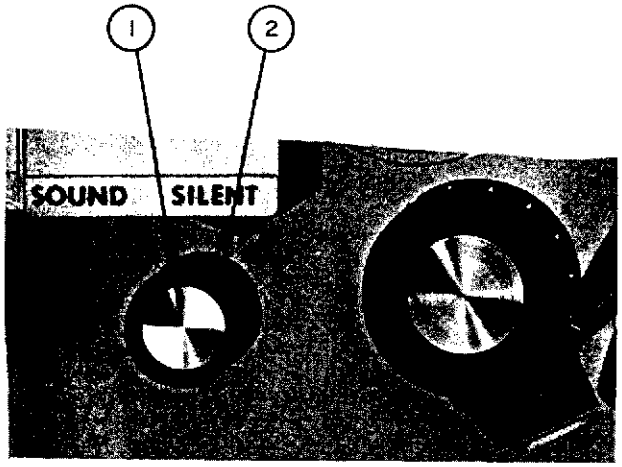
Illus. No.	Stock No.	Drawing No.	Description
		SOUND OPTICAL LENS	
1	234284	3462028- 1	LENS - OPTICAL SLIT ASSEMBLY
2	237961	3462398- 1	LAMP - EXCITER

TENSION PULLEY ASSEMBLY

1. Remove trim plate from end of roller by prying off.
2. Use spanner wrench (if available) or points of needle nose pliers and rotate shaft counterclockwise until shaft screws out of main frame.

   NOTE: On later models, use applicable socket wrench to remove pulley shaft.

3. To remove roller from shaft, remove retaining ring and slide roller off shaft.
4. To replace roller and shaft, reverse removal procedures.
5. To replace trim, activate cement on back of trim with toluol and install trim.



PARTS LIST

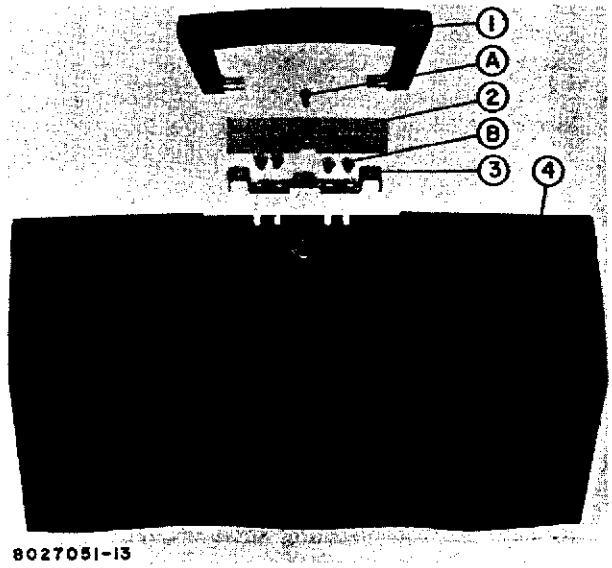
Illus. No.	Stock No.	Drawing No.	Description
		TENSION PULLEY ASSEMBLY	
1		3453660- 5	TRIM - PULLEY
2	234259	3454084- 1	PULLEY - SNUBBER
	239691	3464656- 1	SHAFT - PULLEY
	238298	480366- 5	RING - RETAINING

REAR COVER ASSEMBLY

CAUTION: Unplug power cord before removing rear cover.

1. Remove center screw (A), bracket cover (2).
2. Loosen 4 screws (B) attaching handle bracket to projector.
3. Remove 3 screws around bottom of rear cover.
4. Loosen set screws and remove TONE and VOL control knobs.
5. Remove rear cover from projector and very carefully disconnect following wires from terminal block 2 (TB2):

TB No.	Wire Color Code
6	Black (shield)
7	White
8	White/Green
9	Yellow
10	Red
11	Red/Yellow
12	Red
13	Green



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PARTS LIST

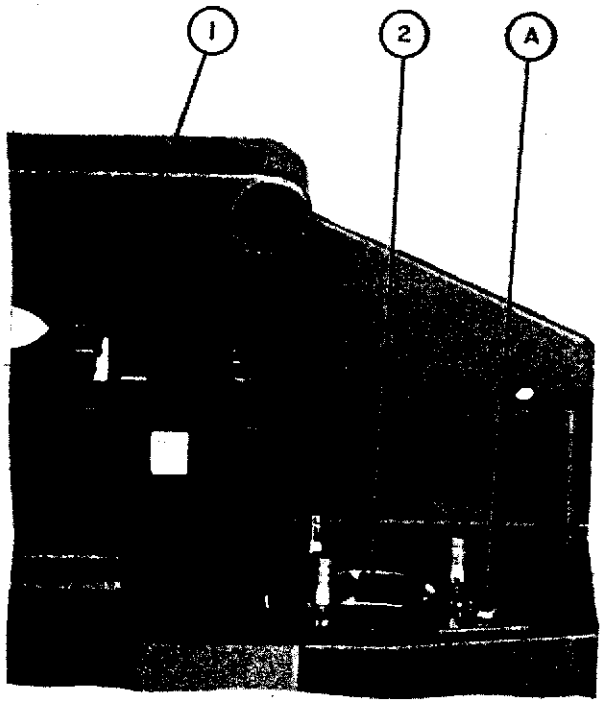
Illus. No.	Stock No.	Drawing No.	Description
		REAR COVER ASSEMBLY	
1	234345	3463416- 1	HANDLE
2		3463413- 1	COVER - HANDLE BRACKET
3	234343	3463412- 1	BRACKET - HANDLE
4	237967	3471304-501	COVER - REAR, COMPLETE
5, 6	238323	3464657-501	KNOB ASSEMBLY
A			SCREW #6-32 x .250 PAN Hd
B			SCREW #8-32 x .375 PAN Hd

SOLAR CELL

1. Perform Rear Cover Removal Procedures.
2. Perform Flywheel and Sound Drum Removal Procedures.
3. Disconnect solar cell leads from terminal lock (TB4) on rear of sound head assembly. Note location of leads for reconnection.

   NOTE: The solar cell (1) is attached to the mounting bracket with cement. To remove, break cell loose and clean mounting surface with solvent.

4. To install new solar cell, apply a coat of white silicone rubber cement (GE-RTV-102) to mounting bracket and solar cell. Allow cement to get tacky.
5. Center solar cell on mounting bracket so that end of solar cell extends 1/32 of an inch past end of bracket. Hold in place until cement adheres and allow 8 hours for cement to dry.



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SOUND LAMP SOCKET

1. Perform Rear Cover Removal Procedures.
2. Open exciter lamp cover and remove by lifting up.
3. Remove exciter lamp by lifting lamp up and twisting counterclockwise.
4. Disconnect wires from terminal lock (TB4) on rear of sound head assembly.
5. Remove socket mounting screws (A) and washer (B) and lift out socket (2).
6. To install new lamp socket, reverse removal procedures.

PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
		SOLAR CELL AND SOUND LAMP SOCKET	
1	234282	3460369- 1	CELL - SOLAR ASSEMBLY
2	234283	3462019- 1	SOCKET - PREFOCUS
A			SCREW - 4-40 x .250 PAN HD
B			WASHER - #4

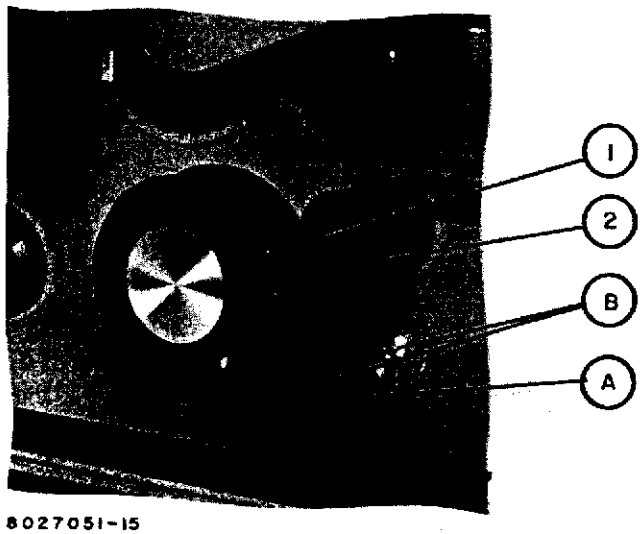
TENSION/DAMPER ROLLER ASSEMBLY

To remove the tension/damper roller assembly, perform the following procedures:

1. To remove tension arm, loosen two set screws (A) and slide arm (1) off shaft.
2. Remove retainer ring (C) from tension shaft.
3. Remove damper roller (2) from tension shaft.
4. Perform Rear Cover Removal Procedure.
5. Perform Flywheel Removal Procedures.
6. Remove two mounting screws (B) on front of projector and remove damper assembly from rear of projector.
7. To completely disassemble damper assembly, remove screw (G).

   NOTE: Before reassembling the barrel (8) on to the housing assembly (3), apply a light coat of silicone fluid DC-210 to the outside of the housing assembly.

8. When reassembling damper assembly, make certain that spring (4) engages hole in washer (9).
9. Install housing assembly on to main frame.
10. Position damper arm on shaft and position roller as shown and secure with set screws (B).



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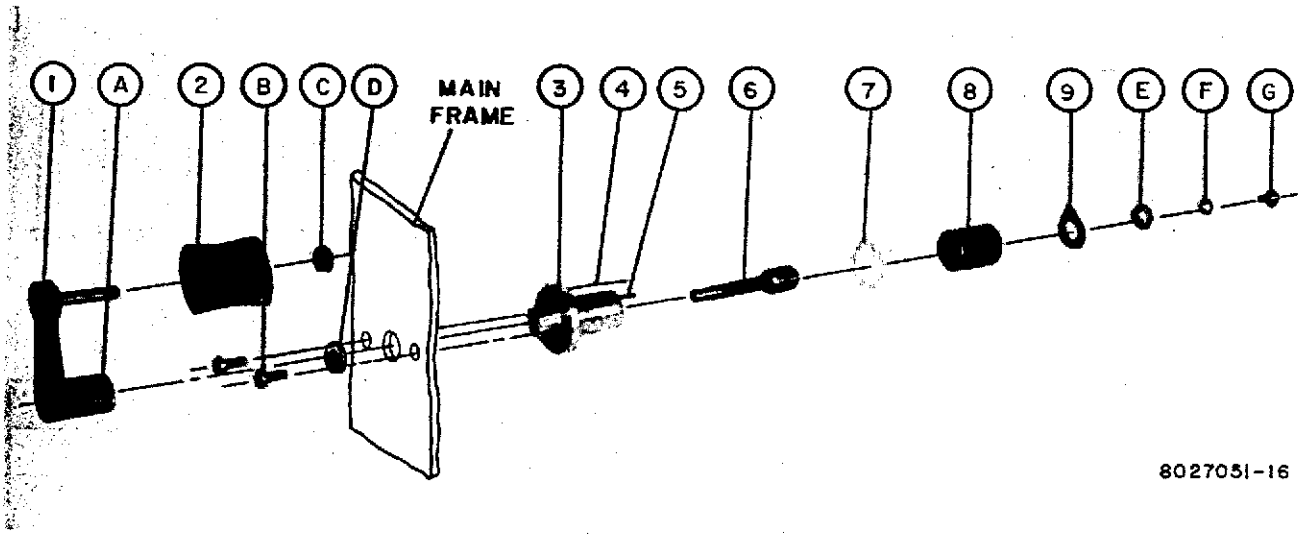

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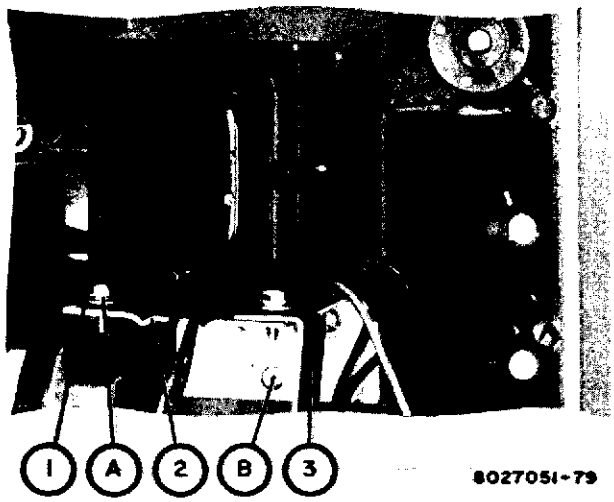
PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
			TENSION/DAMPER ROLLER ASSEMBLY
1	238294	3458061-501	ARM - TENSION
2	238293	3458060- 1	PULLEY - FILM GUIDE
	238290	3458056-501	DAMPER ASSEMBLY
3	238291	3458058- 1	HOUSING - DAMPER - SHAFT
4	238295	3458062- 1	SPRING - DAMPER ASSEMBLY
5	238296	3458062- 2	SPRING - DAMPER ASSEMBLY
6	238297	3464676- 1	SHAFT - DAMPER ASSEMBLY
7	222521	188545- 6	WASHER - FELT, FLUID SEAL
8	222519	8946085- 1	BARREL
9	242690	8953537- 2	WASHER - FLAT
A			SETSCREW #4-40 x .125
B			SCREW #4-32 x .250 PHILLIPS HEAD
C	238298	480366- 4	RING - RETAINING
D		480366- 5	RING - RETAINING
E		82278-104	WASHER - FLAT #6
F		93620-107	WASHER - LOCK #6
G	232292		SCREW #6-32 x .18 PAN HD
		990164- 9	FLUID - SILICONE, 2 OZ TUBE

POWER TRANSFORMER AND MOUNTING BRACKET

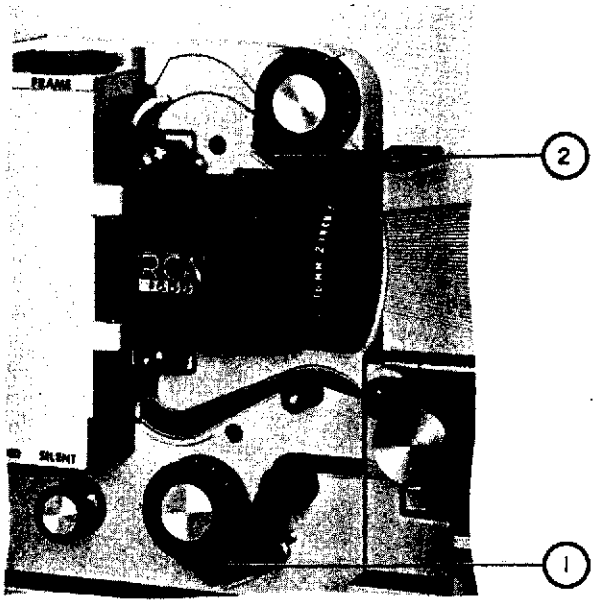
1. Perform Rear Cover Removal Procedures.
2. To remove power transformer (1) from mounting bracket (2), remove 4 mounting screws (A).
3. To remove power transformer from projector, note location of leads and disconnect.
4. Remove mounting bracket (2) by removing mounting screws (B).
5. To replace mounting bracket and power transformer, reverse removal procedures.



PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
			POWER TRANSFORMER AND MOUNTING BRACKET
1	234335	3463 02- 1	TRANSFORMER
2	234369	3468410- 1	BRACKET - TRANSFORMER ASSEMBLY
3		3458048- 1	BRACKET - STABILIZER
A			SCREW - SELFTAPPING #6
B			SCREW #6-32 x .25 PAN HD

SPROCKET SHOE ASSEMBLIES



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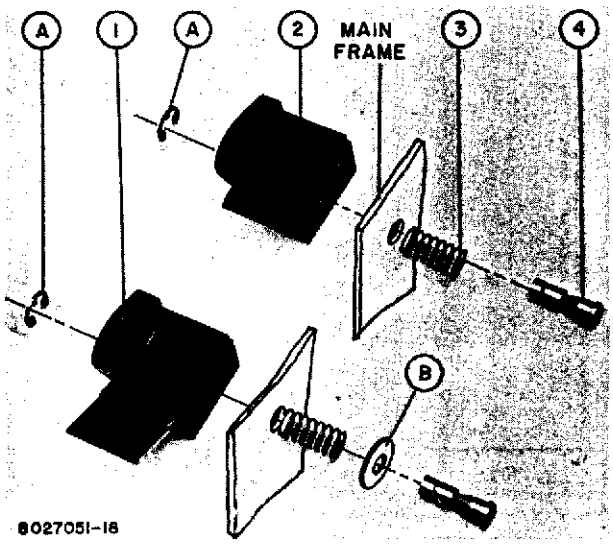
1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. From rear of Projector, push in and hold on sprocket shoe pin (4) and remove c-washer (A) on front of sprocket shoe. If replacing shoe only, continue to hold pin and replace shoe and c-washer.
4. Remove sprocket shoe pin (4) and sprocket shoe spring (3) from main frame.
5. To replace sprocket shoe, reverse removal procedures.

Lower

1. Perform Rear Cover Removal Procedures.
2. Insert end of Sprocket Shoe Pin Remover tool Stock Number 239746 under motor and past puck-reverse assembly. Rotate end of tool until it engages sprocket shoe pin then push in and hold. If replacing shoe only, continue to hold pin and replace shoe and c-washer (A).
3. Perform steps (4) and (5) of upper sprocket shoe removal.



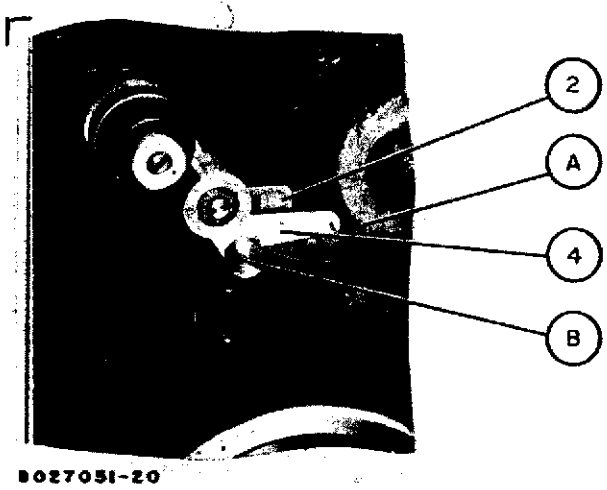
8027051-18

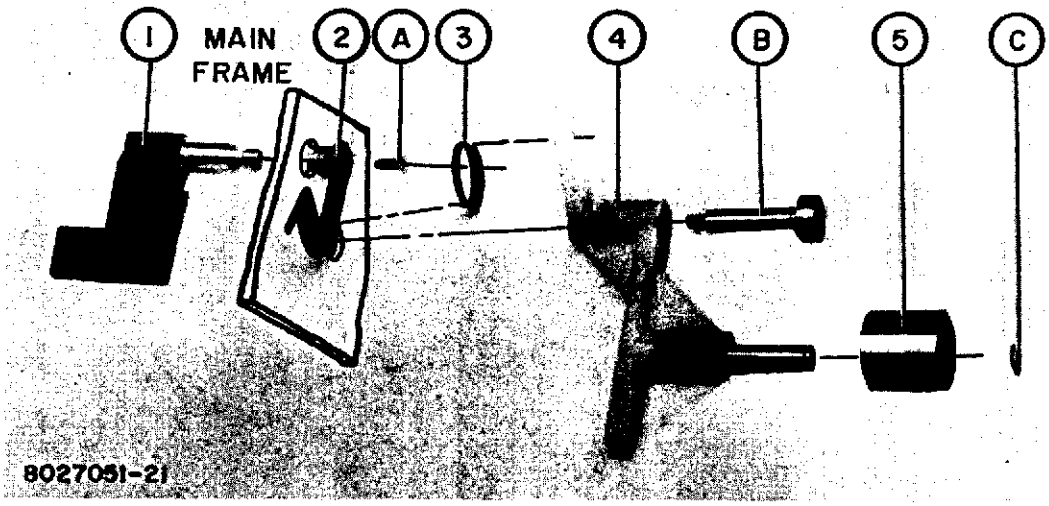
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		UPPER AND LOWER SPROCKET SHOE ASSEMBLIES	
1	234336	3463403- 1	SHOE - BOTTOM SPROCKET
2	234353	3465630- 1	SHOE - UPPER SPROCKET
3	238344	8850022- 3	SPRING - SPROCKET SHOE
4	238328	3458015- 2	PIN - SPROCKET SHOE
A	204043	93605- 6	WASHER - C
B		82278-405	WASHER - FLAT

REWIND LEVER ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Remove shoulder screw (B) and rewind arm (4) and spring (3).
4. Remove screw (A) and remove arm and collar assembly (2).
5. Remove rewind knob (1) from front of projector.
6. To remove roller assembly (5), remove retaining ring (C).
7. To reassemble, reverse removal procedures.





PARTS LIST

Illus. No.	Stock No.	Drawing No.	Description
		REWIND LEVER ASSEMBLY	
1	234350	3465595-501	KNOB - REWIND ASSEMBLY
2	234361	3465684-501	ARM AND COLLAR ASSEMBLY
3	237953	3453682- 1	SPRING - HELICAL
4	234360	3465683-502	ARM AND SHAFT ASSEMBLY
5	239287	3458068- 1	ROLLER ASSEMBLY
A			SCREW #4-40 x .375 FLAT HD
B	234234	3453678- 1	SCREW - SHOULDER
C	238330	480366- 6	RING - RETAINING

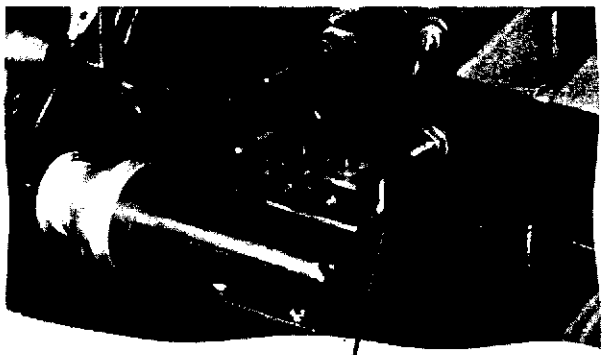
SOUND-SILENT SPEED SELECTOR ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Lift motor and remove drive belt from cam-pulley.
3. Remove two (2) screws (A) and washers (B) and (C) attaching slide bracket (3) to main frame.
4. Pull slide bracket (3) forward until it disengages selector shaft.
5. To remove fork (1) and block (2) from slide bracket (3), loosen two (2) setscrews in block and remove fork.
6. To remove selector shaft (4) from main frame, loosen set screws (D) on SOUND-SILENT selector on front of projector.
7. Pull selector shaft through main frame until shaft disengages spring (5) and SOUND-SILENT selector drops free.

   NOTE: It may be necessary, when replacing the selector shaft, to remove the Blower Housing. If so, refer to Blower Housing Removal procedures.

8. To reassemble selector assembly, reverse removal procedures.

   NOTE: Before replacing blower assy, check operation of shifter with projector running (do not turn on lamp) and adjust position of slide bracket (3) for equal clearance between belt and fork in both positions.



SOUND-SILENT SPEED SELECTOR

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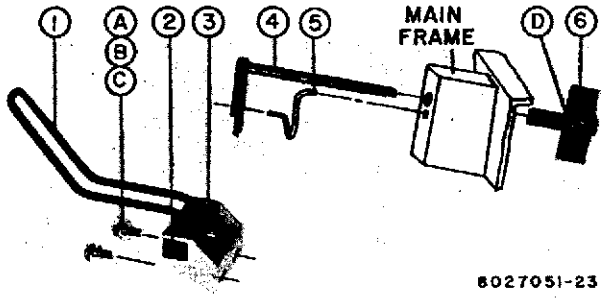

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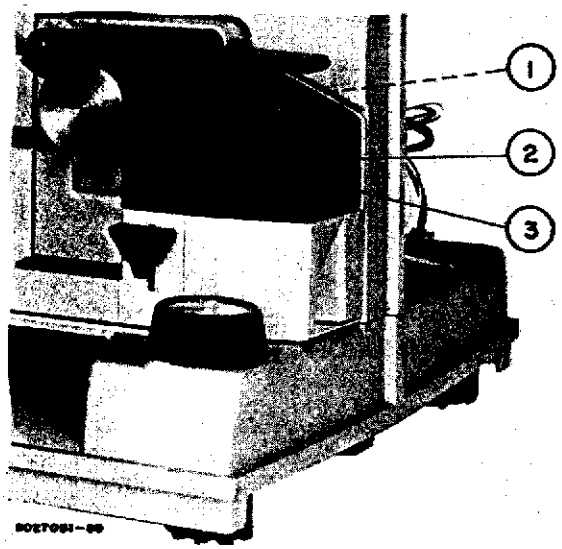
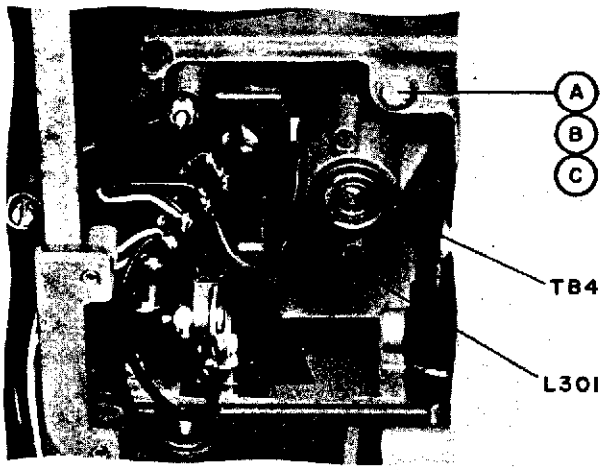
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
			SOUND-SILENT SPEED SELECTOR ASSEMBLY
1	234236	3453745- 1	FORK
2	234329	3463216-501	BLOCK - SLIDE ASSEMBLY
3	234327	3463213- 1	BRACKET - SLIDE
4	234300	3462246-501	SHAFT - SELECTOR ASSEMBLY
5	242691	3458096- 1	SPRING
6	234297	3462185-501	SELECTOR AND SHAFT ASSEMBLY
A			SCREW #8-32 x .375 PAN HEAD
B			WASHER - LOCK #8
C			WASHER - FLAT #8
D			SETSCREW #6-32 x .25

SOUNDHEAD ASSEMBLY



1. Perform Rear Cover Removal Procedures.
2. Perform Flywheel Removal Procedures. Sound drum and shaft need not be completely removed.
3. Disconnect wires from terminal block (TB4). Note location of each wire for reconnection.
4. Remove four (4) attaching screws (A) from back of assembly and remove sound head from front of projector.
5. To remove terminal block (TB4), note location of wires and unsolder. Remove attaching screws at each end of block.

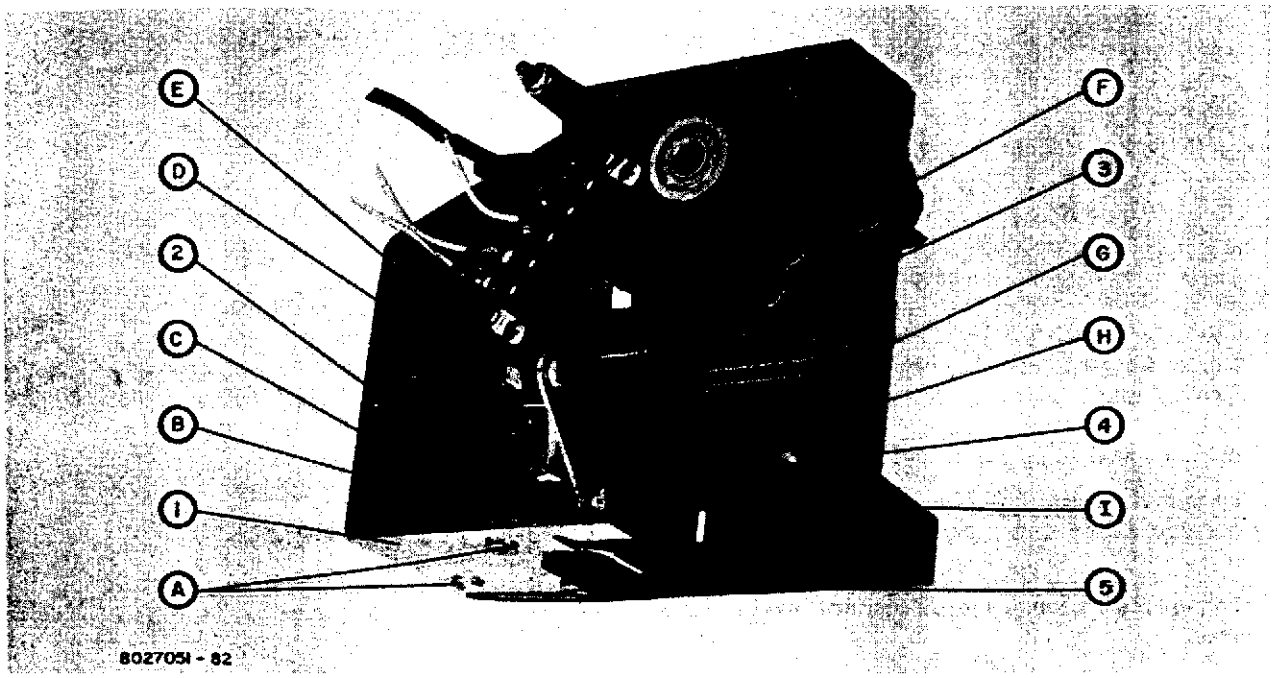


PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		SOUND HEAD ASSEMBLY	
1	237961	3462398- 1	LAMP - EXCITER
2	234347	3465556- 1	COVER - OPTICAL BRACKET
2	242169	3465556- 2	COVER - OPTICAL BRACKET (For Safe Threader)
3	238392	3450585- 4	LENS - RUBY, RED
TB4	240435	3450181- 24	BLOCK - TERMINAL
L301	237963	3463115-116	REACTOR - CHOKE, 22.0 MICROHENRY
A			SCREW #6-32 x .438 PAN HD
B			WASHER - LOCK #6
C			WASHER - FLAT #6

FILM CUTTER ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Sound Head Assembly Removal Procedures.
3. To remove film cutter arm (4), remove nut (9) and washer (H) from pin (I). Slide arm out of assembly.
4. To remove cutter arm plate (3), remove nut (D) and washer (E) from screw (F).
5. To remove guide spring (2) and film cutter plate (1), remove nuts (C) and washers (B). Remove guide spring and plate from assembly.
6. To replace film cutter arm (4), cutter arm plate (3), guide spring (2), and film cutter plate (1), reverse removal procedures and reinstall sound head assembly.



PARTS LIST

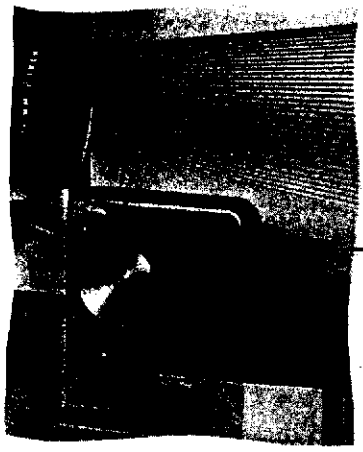
Illus No.	Stock No.	Drawing No.	Description
		FILM CUTTER ASSEMBLY	
1	239566	3464686- 1	CUTTER - FILM
2	240432	3458089- 1	GUIDE SPRING - FILM CUTTER
3	240431	3458088- 1	PLATE - HINGE FILM CUTTER
4	239565	3464685-501	ARM - FILM CUTTER WITH KNOB
5	242694	3452555- 5	PAD - RUBBER
A		57466-409	SCREW #6-32 x .25 FLAT HD
B	240249	3458046- 7	WASHER
C			NUT
D		8825442- 11	LOCKNUT #6-32
E		77880-152	WASHER - FLAT #6
F		990386-413	SCREW #6-32 x .50 PAN HD
G		57435-404	NUT - LOCK
H			WASHER - FLAT
I	240430	3458092- 1	PIN - ARM FILM CUTTER

PRESSURE ROLLER ARM

1. Perform Rear Cover Removal Procedures.
2. Rotate tilt knob until projector is fully tilted.
3. Remove sound lamp cover and sound lamp.
4. Hold pressure roller arm (1) and remove locking nut (B) and washer (A).
5. Remove pressure roller arm (1) and spring (4).
6. To replace, insert spring (4) into housing and rotate until tip on spring engages hole in housing.
7. Insert pressure roller arm shaft (1) through spring (4) until end of shaft engages hole in housing.
8. Rotate arm two turns clockwise and push shaft through hole until arm is flush with housing. While holding in place, install washer (A) and nut (B) and tighten until roller on pressure arm is directly over sound drum.

   NOTE: Refer to Buzz Track Adjustment for final adjustment of pressure roller arm.

9. Replace sound lamp and sound lamp cover.
10. To remove roller (2), loosen set screw on pressure roller arm and push shaft out of arm.
11. To replace roller, reverse removal procedures.



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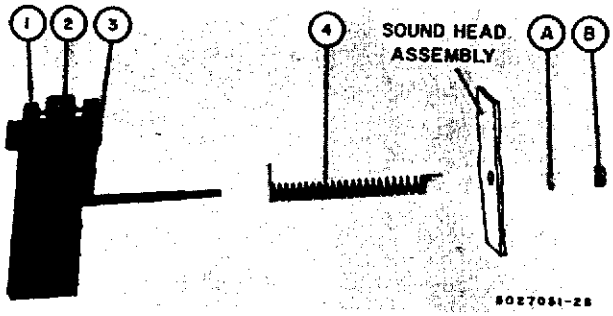

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PARTS LIST

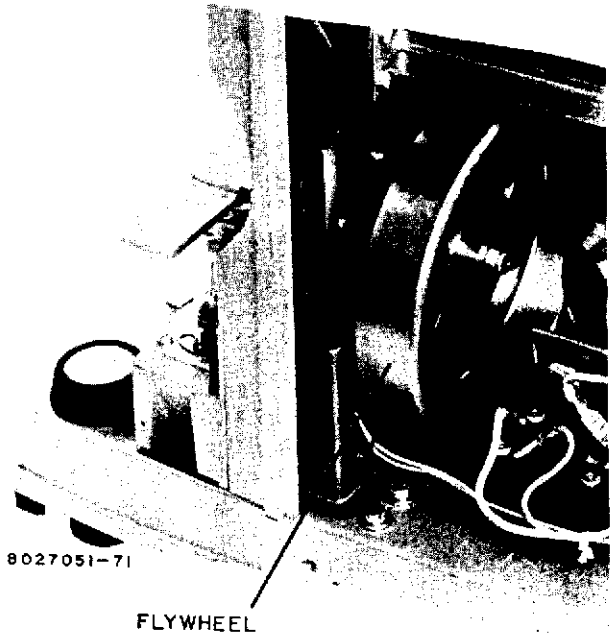
Illus No.	Stock No.	Drawing No.	Description
		PRESSURE ROLLER ARM	
1	237962	3463004-501	ARM PRESSURE ROLLER, COMPLETE
1	234409	3463004-502	ARM PRESSURE ROLLER
2	234285	3462086-501	ROLLER PRESSURE
3	234214	3453483- 2	SHAFT
4	234237	3453853- 1	SPRING
A	242693	874282- 8	WASHER - FIBRE #4
B			NUT - LOCK #4-40

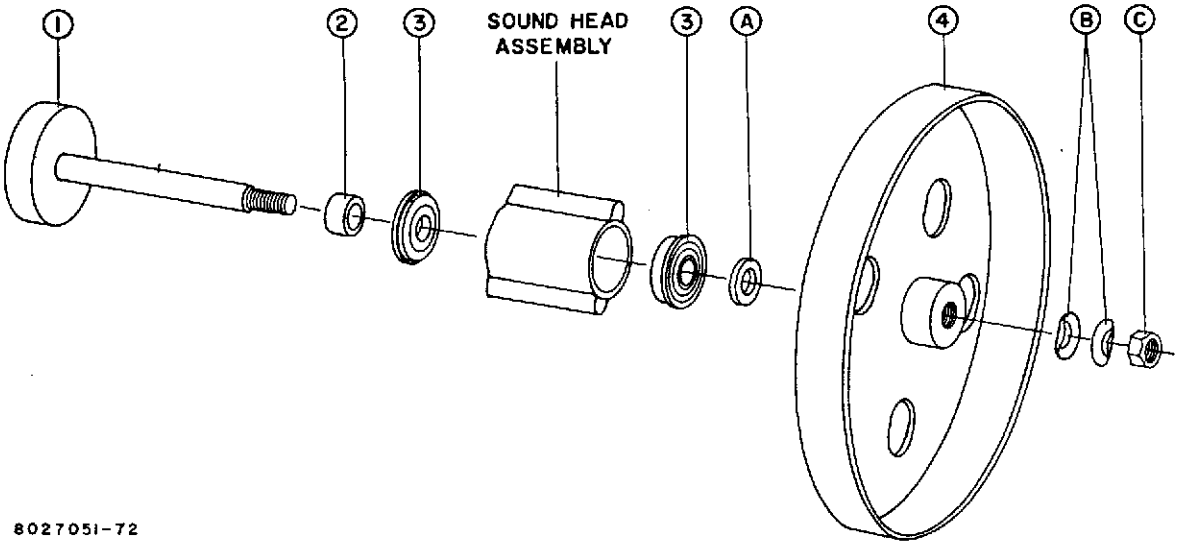
FLYWHEEL AND SOUND DRUM ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Remove sound lamp cover by opening and lifting up.
3. Hold sound drum (1) from turning and remove lock-nut (C) and spring washer (B) from shaft.
4. Push sound drum shaft through sound head assembly and remove flywheel (4), and spacer (A).

   NOTE: The bearings are secured in place with a bearing mounting compound. When replacing the bearing, clean mounting surface and apply mounting compound (Loctite) to surfaces. Make certain that bearings are properly seated against machine faced surfaces. These bearings are precision bearings. Do not attempt to clean or repair.

5. When replacing sound drum and flywheel, use .010 inch tolerance gauge between spring washer (B) and edge of flywheel and tighten lock-nut. For final adjustment, refer to Flutter and Wow Adjustment.

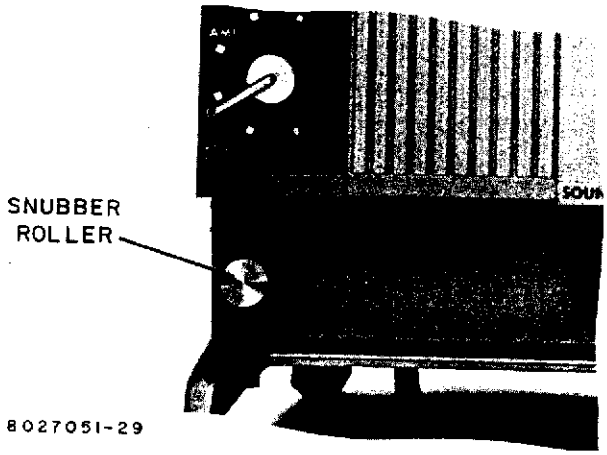




PARTS LIST

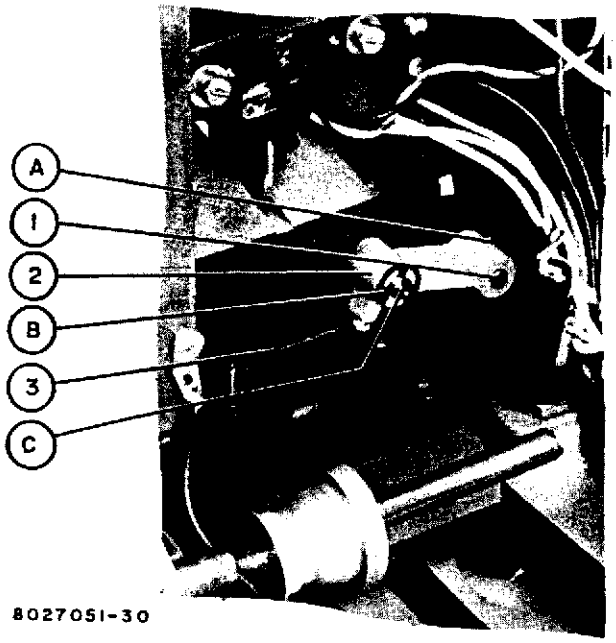
Illus No.	Stock No.	Drawing No.	Description
		FLYWHEEL AND SOUND DRUM ASSEMBLY	
1	234349	3465568-501	DRUM - SOUND ASSEMBLY
2	238339	3458057- 1	SPACER - SOUND DRUM
3	234249	3454037- 1	BEARING
4	234348	3465559- 1	FLYWHEEL
A		3458057- 2	SPACER
B		886211- 4	WASHER - SPRING (2 Used)
C		8825442- 16	NUT - LOCK

SNUBBER ROLLER ASSEMBLY



8027051-29

1. Perform Rear Cover Removal Procedures.
2. Perform Blower Housing Removal Procedures.
3. Detach tension spring (3) from snubber arm (2).
4. Remove retainer (B) clip.
5. Loosen set screw (A) and pull snubber arm (2).
6. Push snubber shaft through main frame to free snubber roller.
7. To remove snubber roller from shaft (1), remove retaining ring next to roller.
8. To replace snubber roller, reverse removal procedures.



8027051-30

PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		SNUBBER ROLLER ASSEMBLY	
	234259	3454084- 1	PULLEY - SNUBBER
1	234260	3464679- 1	SHAFT - SNUBBER
2	234337	3463404-501	ARM - SNUBBER ASSEMBLY
3	234333	3463241- 1	SPRING - SNUBBER
A			SETSCREW
B	238298	480366- 5	RING - RETAINING
C	238391	3454078- 1	SHAFT - SNUBBER ASSEMBLY

MAIN SHAFT SUPPORT AND FLUID CLUTCH

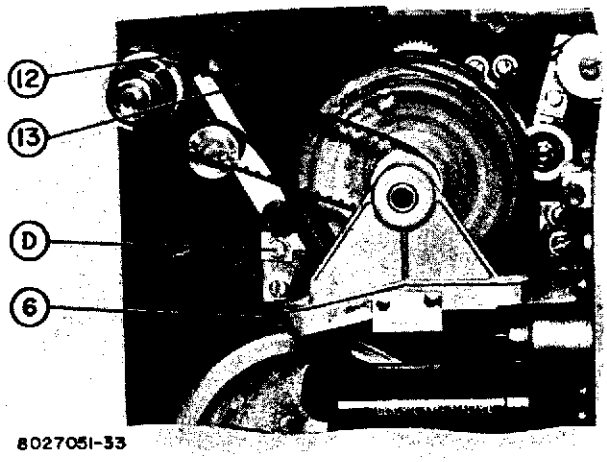
1. Perform Rear Cover Removal Procedures.
2. Remove mounting screws (D) from main shaft support. (4-places), and remove idler support bracket.
3. Remove main shaft support assembly (6) from projector.
4. Remove reverse drive belt (13) .
5. Remove rewind belt (12).
6. Remove end retainer ring (B) .
7. Remove reverse pulley (5) .
8. Remove second retainer ring (B) .
9. Remove fluid clutch (4) .

   NOTE: The Fluid Clutch Assembly is a sealed unit and must be returned to the factory for servicing.

10. Remove retainer ring (B) and pulley (3) .
11. Remove washer (A) .
12. To remove gear and main shaft assembly (2) , loosen setscrew on upper sprocket and remove sprocket. Then pull shaft out of main frame.

    NOTE: When replacing fluid clutch, press down on drag pad to avoid loosening pad.

13. To replace main shaft assembly, fluid clutch, and support assembly, reverse removal procedures.



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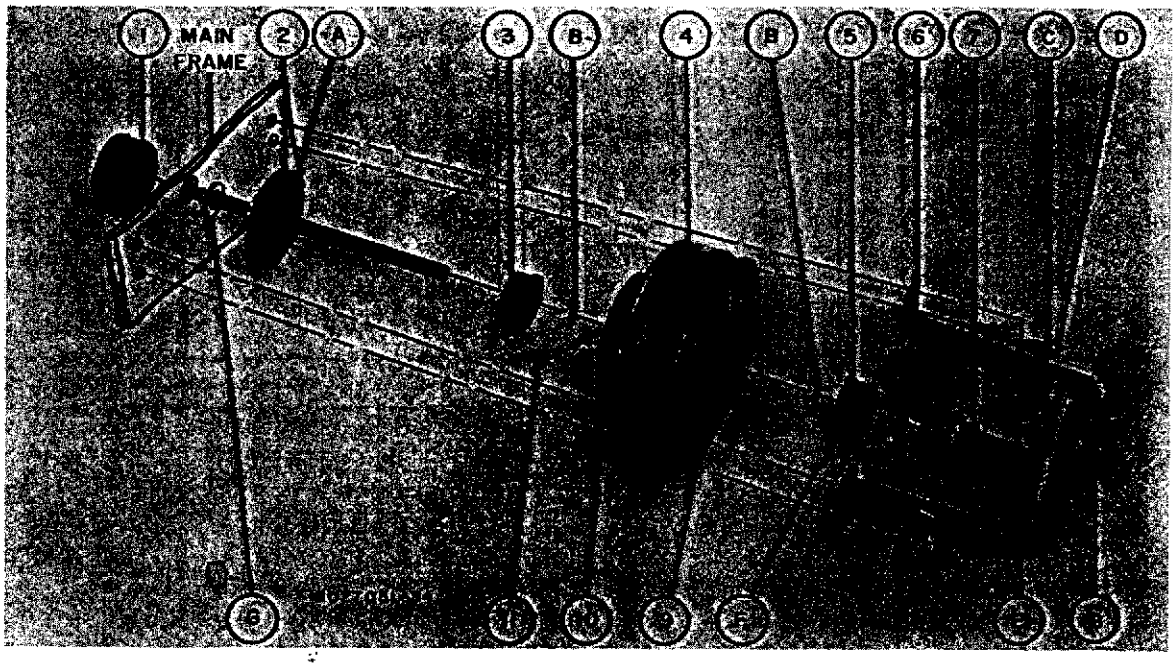
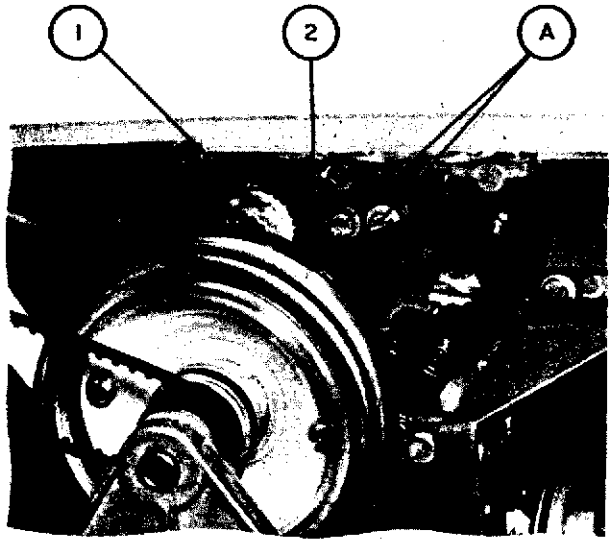


PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		MAIN SHAFT SUPPORT AND FLUID CLUTCH	
1	234391	3471302-501	SPROCKET ASSEMBLY
2	234339	3463406-501	GEAR - SPROCKET ASSEMBLY
3	234294	3462140- 1	PULLEY - CLUTCH FACE
4	234368	3465834-502	FLUID CLUTCH ASSEMBLY
5	240697	3467104-502	PULLEY - CLUTCH, REVERSE ASSEMBLY
6	234377	3467100-501	MAIN SHAFT SUPPORT ASSEMBLY
7	234268	3454102- 1	PAD - DRAG
8	234267	3454100- 1	BEARING - MAIN SHAFT
9	240543	3462100- 2	CLUTCH - FACE LOCKING
10		3463026- 1	GEAR - HELICAL
11	234287	3462100- 1	CLUTCH - FACE LOCKING
12	234342	3463410- 1	BELT - REWIND
13	234320	3463164- 3	BELT - REVERSE
A	234269	3454103- 1	WASHER
B	104284	480366- 7	RING - RETAINING
C	110954	886399- 5	RING - RETAINING
D		93618-409	WASHER - LOCK #8
E		990388-113	SCREW #8-32 x .312 PAN HEAD
F	238329	474846- 7	RING - RETAINING
G		286391- 26	WASHER

GEAR DRIVE ASSEMBLY AND BRACKET

1. Perform Rear Cover Removal Procedures.
2. Remove screws (A) from mounting plate of gear drive assembly and remove assembly.
3. To completely disassemble the gear drive assembly, remove set screws in end of mounting plate.
4. To reassemble, reverse removal procedures.



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PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		GEAR DRIVE ASSEMBLY AND BRACKET	
	234379	3467103-501	GEAR - DRIVE ASSEMBLY
1	238395	3462089-501	GEAR - DRIVE
2	234370	3454104- 1	PLATE - MOUNTING
	234271	3454105- 1	SHAFT
A			SCREW #8-32
			WASHER - FLAT #8
			WASHER - LOCK #8

PARTS LIST

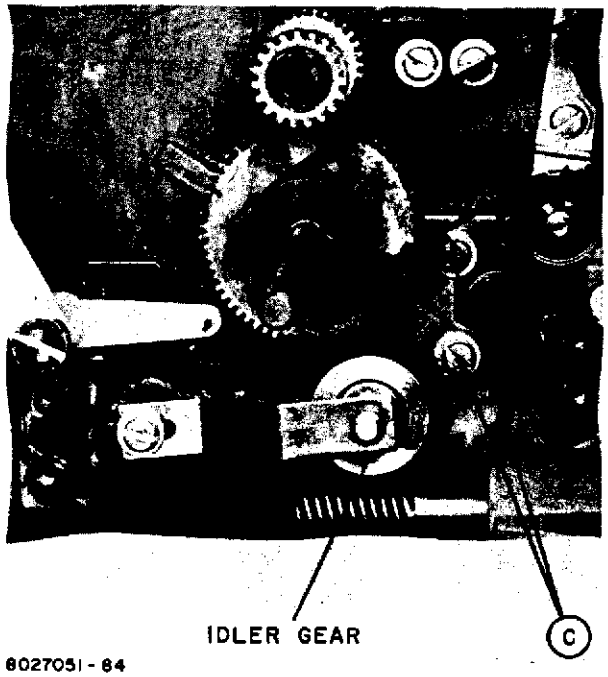
Illus No.	Stock No.	Drawing No.	Description
GEAR DRIVE ASSEMBLY AND BRACKET (CONT)			
		3458099- 33	SETSCREW - ALLENHEAD
		3458078- 1	WASHER - FLAT # (2 Used on Shaft)
		3453271- 16	WASHER - THIN FLAT (Used on Shaft)

FIRST IDLER GEAR AND BRACKET

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Remove screws (C) from first idler gear mounting bracket and gear assembly out of projector.
4. Completely disassemble idler gear from shaft as shown below.

   NOTE: When reassembling the idler gear and bearings on the shaft, just tighten the nut until there is no end play in the bearings but gear turns freely. Then back nut off 1/12 turn.

5. Install locking nut. Make sure that idler gear turns freely with no end play.
6. To replace idler gear and mounting bracket, slide in to place and fasten with mounting screws removed in step 3.
7. Position idler gear between worm and sprocket gear by adjusting for minimum backlash. Tighten idler bracket mounting screws. Engagement between idler and its mating gears should be snug but with preceptible backlash.



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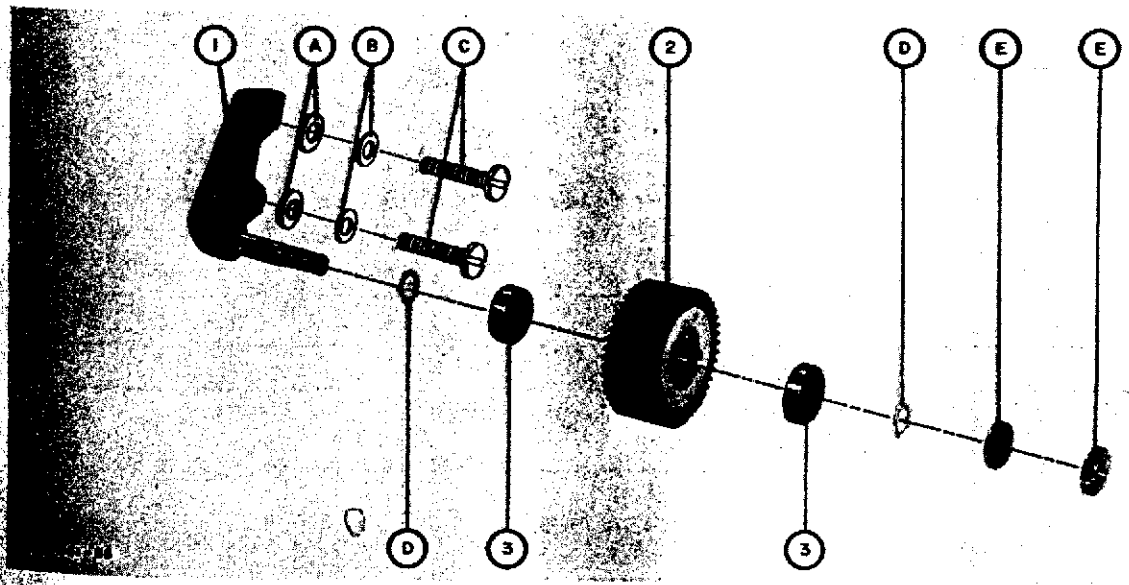


PARTS LIST

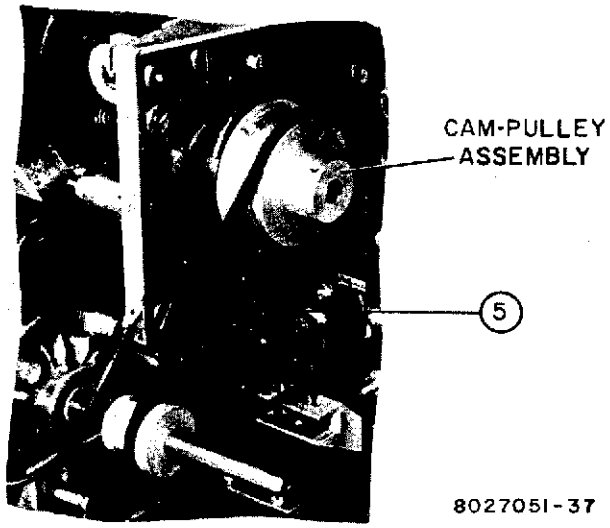
Illus No.	Stock No.	Drawing No.	Description
			FIRST IDLER GEAR AND BRACKET
1	234315	3458049-501	BRACKET ASSEMBLY - 1ST IDLER
2	234292	3464670-501	GEAR - IDLER, NUMBER 1
3	238337	3458029- 1	BEARING
A			WASHER - FLAT #8
B			WASHER - LOCK #8
C			SCREW #8-32 x .500 PAN HD
D			WASHER - FLAT
E			NUT - HEX (.250-32)
F			WASHER - FLAT

CAM-PULLEY ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Loosen screws on First Idler Gear Bracket.
4. Lift motor and slide drive belt (5) off pulley.
5. Loosen three allen screws in pulley assembly (4).
6. Remove assembly from worm gear shaft by pushing worm gear shaft to left.
7. To remove cams and shutter from pulley, remove two screws (A) from constant diameter cam.

   NOTE: When reassembling the shutter and cams on to the pulley, the holes in the cams and shutter must all be aligned with the hole in the pulley. To ensure proper alignment of the holes, the cams and shutter should be assembled on a worm gear shaft or special tool shaft.

8. To install cam-pulley assembly on worm gear shaft, the worm gear shaft must be properly positioned in cam hanger. Refer to step 7 through 12 of Worm Gear and Shaft Assembly Procedures.
9. Replace and tighten parts removed in steps 1 through 4. Adjust first idler in accordance with First Idler Gear and Bracket Procedures.



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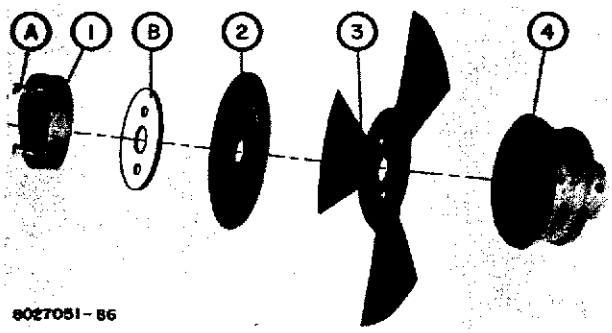


8027051-86

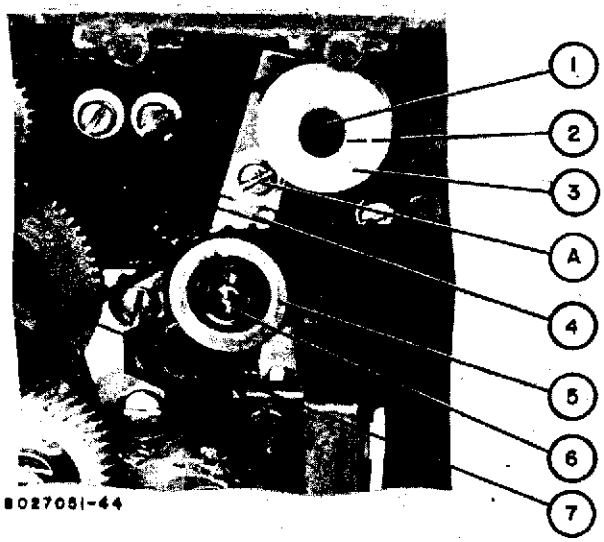
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		CAM-PULLEY ASSEMBLY	
1	237860	3462274- 1	CAM - CONSTANT DIAMETER
2	242121	3468415- 1	CAM - IN OUT
3	237859	3462161- 1	SHUTTER
4	234381	3467105-501	PULLEY - DRIVE ASSEMBLY
5	237743	3463410- 2	BELT - DRIVE, 60 CYCLE
	239306	3463410- 3	BELT - DRIVE, 50 CYCLE
A		3458030- 1	SCREW #6-32 x .500 3/16 SLOT HEAD
B	242698	3458113- 1	SPACER - NYLON

BELT TENSION ASSEMBLY (TAKE-UP BELT)

1. Perform Rear Cover Removal Procedures.
2. Loosen shoulder screw (1) and remove idler gear (5) and shoulder screw.
3. Remove forward drive belt (7) from roller (5) and rear reel drive pulley.
4. To remove gear from shoulder screw, remove retainer (2).
5. Loosen mounting screw (A) and remove tension assembly (4).
6. To remove roller (5), remove retainer washer (6).
7. To replace idler and tension assembly, reverse removal procedures.

NOTE: To adjust the tension on the forward drive belt, refer to Forward Drive Belt Replacement and Adjustment procedures.



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PARTS LIST

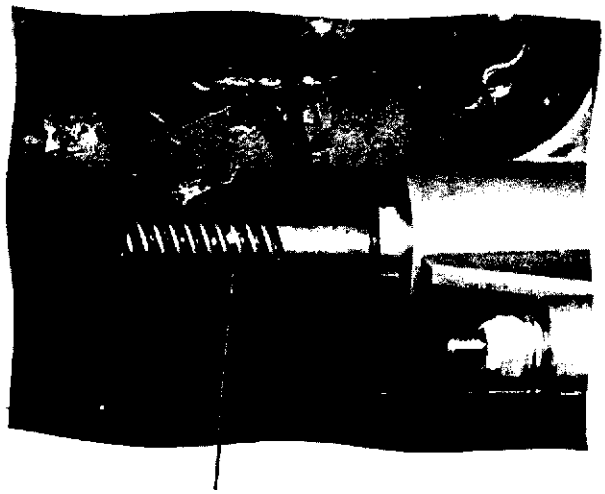
Illus No.	Stock No.	Drawing No.	Description
		BELT TENSION ASSEMBLY	
1	234279	3454644- 1	SCREW - SHOULDER
2	238330	480366- 6	RING - RETAINING
3	234366	3465766-501	GEAR ASSEMBLY
4	234356	3465669-502	BRACKET
5	234334	3463401- 1	ROLLER
6	234272	3454106- 1	WASHER - SELF-LOCKING
7	234322	3463164- 5	BELT - FORWARD DRIVE
A			SCREW #8-32 x .375 PAN HD

WORM GEAR AND SHAFT ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Perform Cam-Pulley Assembly Removal Procedures.
4. Remove bushing (4) from end of worm gear shaft on shutter side of cam bearing hanger.
5. Slide worm gear (1), bearing (2), washer (A), and spring (3) out of cam hanger.

   NOTE: To install the worm gear shaft, use Worm Gear Spring Compressor, Stock Number 239747 and perform the following steps.

6. Install bearing (shield out), washers and spring on worm gear shaft and insert end of shaft through cam hanger.
7. Install bushing (4) (small side toward cam hanger) over end of shaft and push shaft through until it stops.
8. Install Worm Gear Spring Compressor as shown, and rotate adjusting screw counter-clockwise until it starts to push shaft through cam hanger.
9. Align hole in cam-pulley with shaft and push cam-pulley on to shaft as far as it will go.
10. Rotate adjusting screw on Worm Gear Spring Compressor until outside edge of bearing on worm gear shaft is flush with edge of hanger. Make certain when positioning cam-pulley assembly that oiler on claw body is not damaged.
11. Rotate worm shaft until flat on shaft lines up with setscrews in cam-pulley assembly and tighten setscrews.
12. Loosen adjusting screw and remove Worm Gear Spring Compressor.
13. Replace parts removed in steps 1, 2, and 3.



WORM GEAR AND SHAFT

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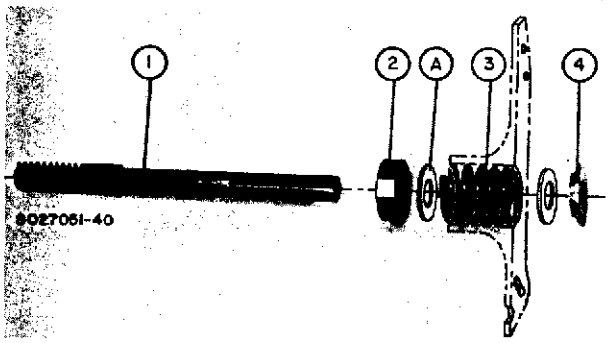
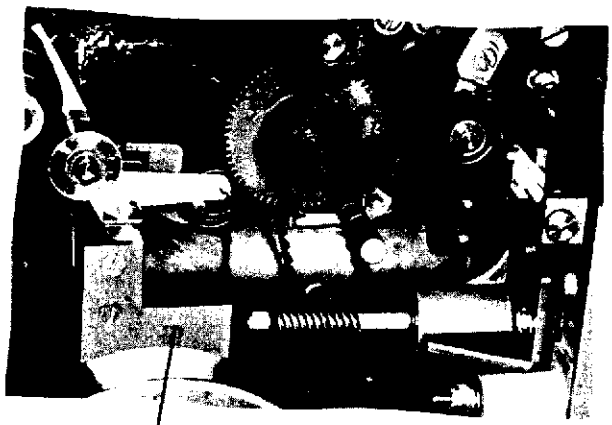




WORM GEAR SPRING COMPRESSOR

8027051-41

PARTS LIST

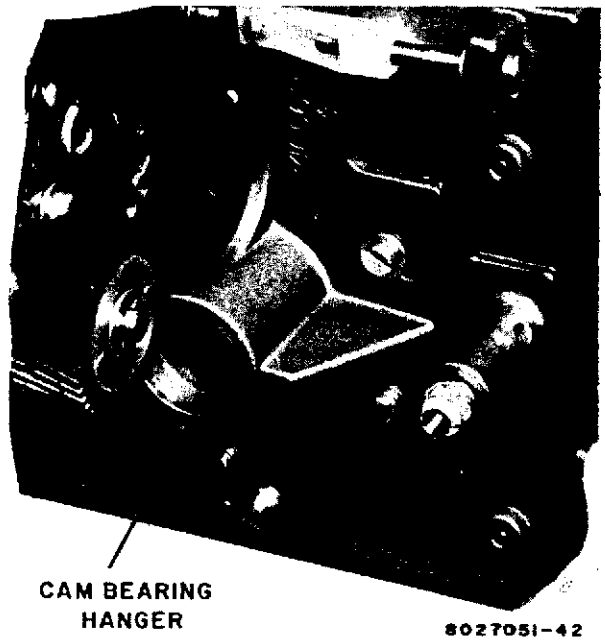
Illus No.	Stock No.	Drawing No.	Description
		WORM GEAR AND SHAFT ASSEMBLY	
1	234293	3462133- 2	GEAR - WORM
2	234238	3453856- 1	BEARING
3	238327	3464662- 1	SPRING
4	238338	3458032- 1	BUSHING
A	239729	3458046- 3	WASHER

CAM HANGER ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Perform First Idler Procedures.
4. Perform Cam-Pulley Assembly Removal Procedures.
5. Perform Worm Gear Removal Procedures.
6. Remove c-washer (A) from claw travel adjusting link (2), and slip end of link off pin.
7. Remove three mounting screws (B) and washers from cam hanger assembly (1).
8. On shutter side of back plate, remove mounting screw (B) and washers.
9. Remove shoulder screw (G).

   NOTE: It is not necessary to remove retainer ring (E) from cam hanger when replacing the cam hanger bearing (3). When replacing bearing, apply a light coat of bearing mounting loctite to outer edge of bearing and press into hanger. Make certain bearing is seated properly and allow loctite to dry. The bearings are precision type bearings, pre-lubricated and should be replaced when found too dirty or defective. Do not attempt to clean.

10. To replace cam hanger assembly, reverse removal procedures.
11. Refer to Claw Travel Adjustment for final adjustment of cam hanger assembly.



CAM BEARING HANGER

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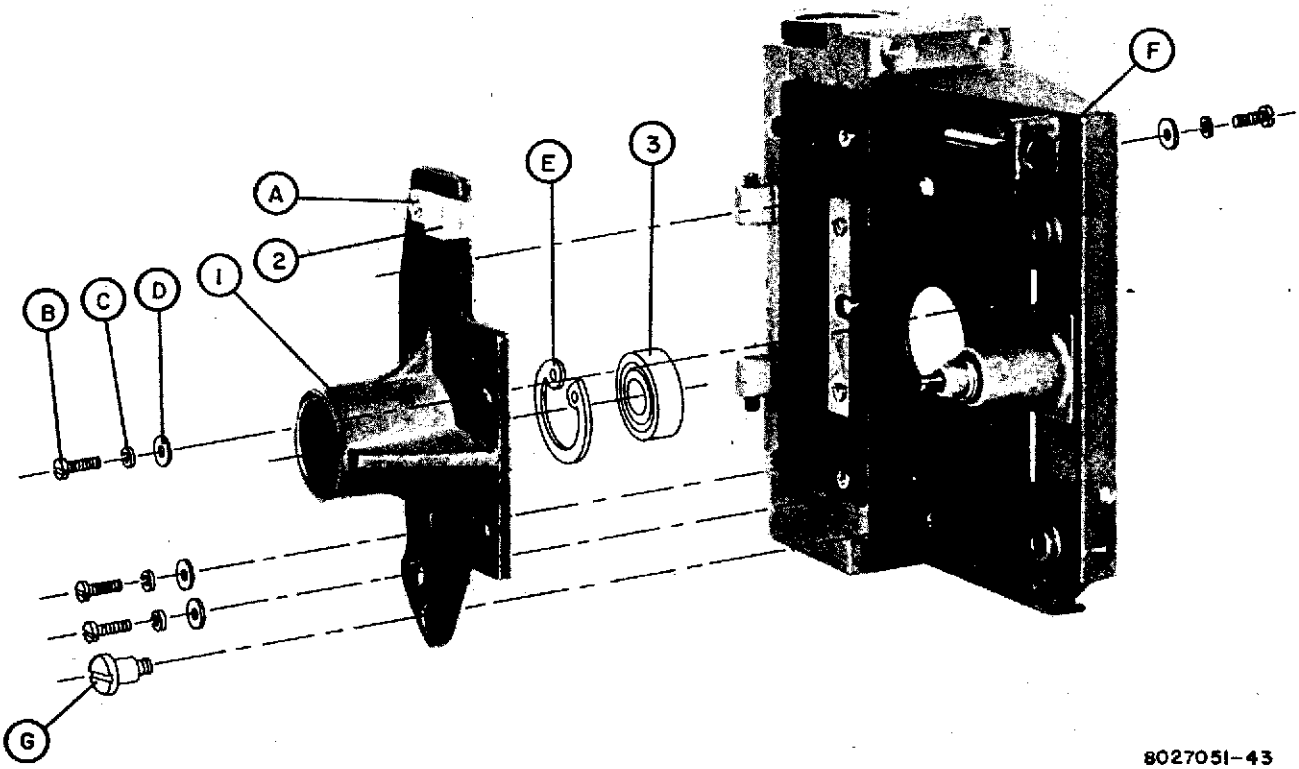
CAM HANGER ASSEMBLY (Continued)



8027051-43

PARTS LIST

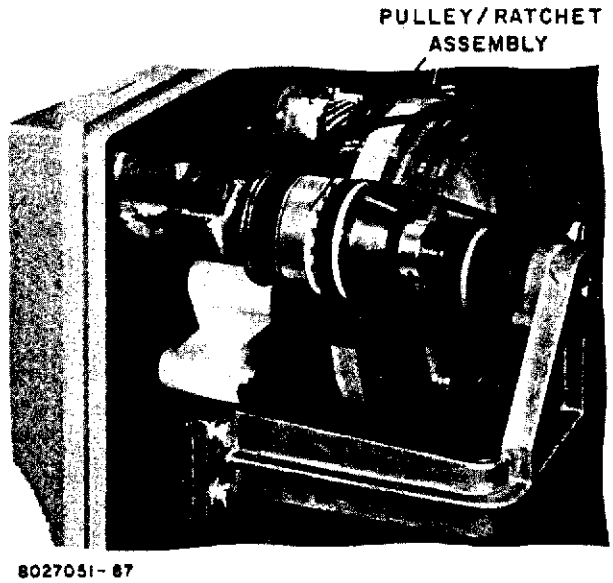
Illus No.	Stock No.	Drawing No.	Description
		CAM HANGER ASSEMBLY	
1	237964	3465819-501	HANGER, CAM AND BEARING ASSEMBLY
2	59859	8876086- 1	LINK
3	234238	3453856- 1	BEARING - CAM, HANGER
A	78651	93605-403	WASHER - C
B			SCREW #6-32 x .375 PAN HD
C			WASHER - LOCK #6
D			WASHER - FLAT #6
E	229139	480355-713	RING - RETAINER
F	234229	3453578- 1	SCREW - SHOULDER
G	234213	3453468- 1	SCREW - SHOULDER

PULLEY/RATCHET ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Loosen setscrew in collar assembly (16) and remove collar.
3. Grasp items (1) through (15) and pull off end of shaft.

   NOTE: To remove the gear and shaft assembly, refer to Front Reel Arm Removal Procedures.

4. To disassemble pulley assembly, remove hex nut (A), and slide items (1) through (8) off clutch hub (10).
5. To remove clutch hub (10) from pulley (9), remove pulley liner (11) from clutch hub (10).
6. To reassemble and replace pulley and ratchet assembly, reverse disassembly and removal procedures. Refer to Rewind Clutch Adjustment for final adjustment of pulley assembly.



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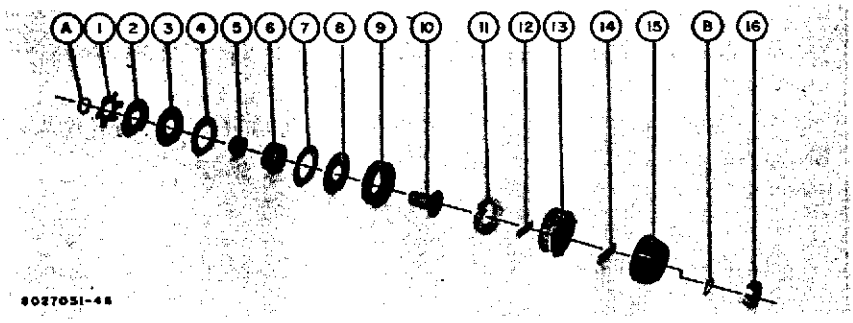


8027051-46

PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		PULLEY/RATCHET ASSEMBLY	
1	239689	3458077- 1	WASHER - BOW
2	239688	3458069- 1	SPACER
3	239684	3458070- 1	BEARING
4	239685	3458075- 1	FLANGE - HUB
5	239686	3458093-501	BUSHING
6	239687	3458071- 1	PULLEY
7	239685	3458075- 1	FLANGE - HUB
8	239684	3458070- 1	BEARING
9	239682	3458072- 1	RATCHET
10	239683	3458076- 1	HUB - CLUTCH
11	239690	3458020- 1	LINER - PULLEY
12	242304	3458086- 1	PLATE - RATCHET
13	234364	3465704-501	GEAR ASSEMBLY
14	242303	3458085- 1	PLATE-RATCHET
15	234235	3453742- 1	RATCHET
16	234252	3454055-501	COLLAR ASSEMBLY
A			NUT - HEX .375-32
B	225378	3450423- 1	WASHER - SPRING

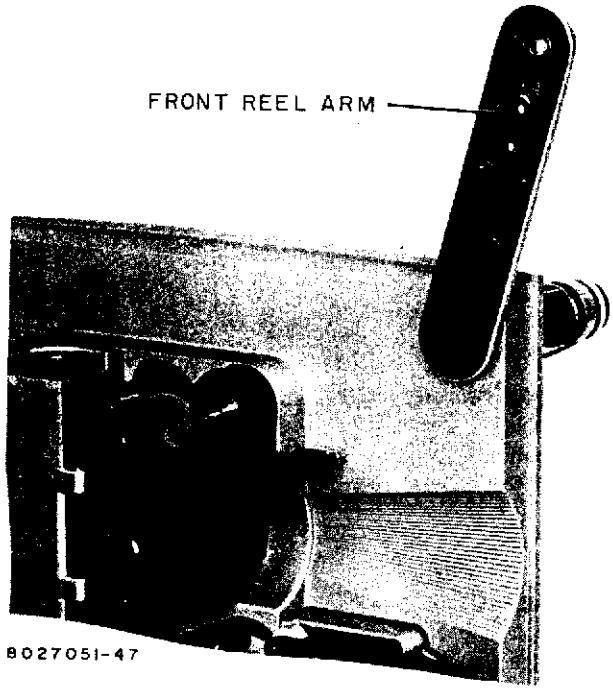
REEL ARM, SHAFT, AND GEAR ASSEMBLY

NOTE: The disassembly of the front and rear reel arms is basically the same, therefore only the front reel arm assembly is shown and discussed.

1. Raise front reel arm to operate position

NOTE: Items 7, 8, and 11 are held in place by the reel arm cover (3). When removing the cover, place hand under arm to catch parts.

2. Remove screws (A) on rear of reel arm (3), carefully remove cover (3), and disengage reel arm belt from upper and lower gear.
3. To remove shaft (1) and spacer (2), loosen setscrew in gear (6) and slide out of reel arm cover (3).
4. To remove gear and shaft assembly (14), perform Pulley/Ratchet Assembly Removal Procedures and slide gear and shaft out of Projector.
5. To completely remove reel arm (3) from Projector, perform Pulley/Ratchet Assembly Removal Procedures and remove gear and shaft (14).
6. Remove screws (B) from retainer (13) and remove arm (3) and washer (12).
7. To replace reel arm (10) and reassemble reel arm, reverse removal procedures.



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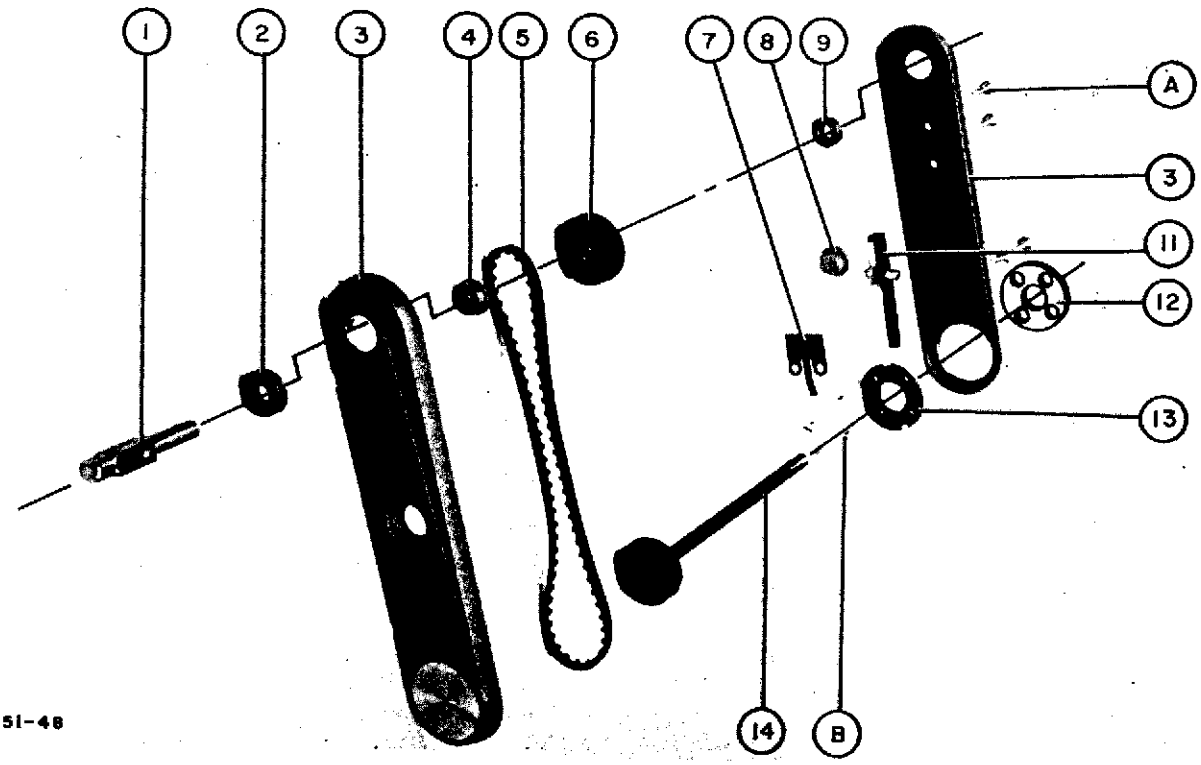


8027051-48

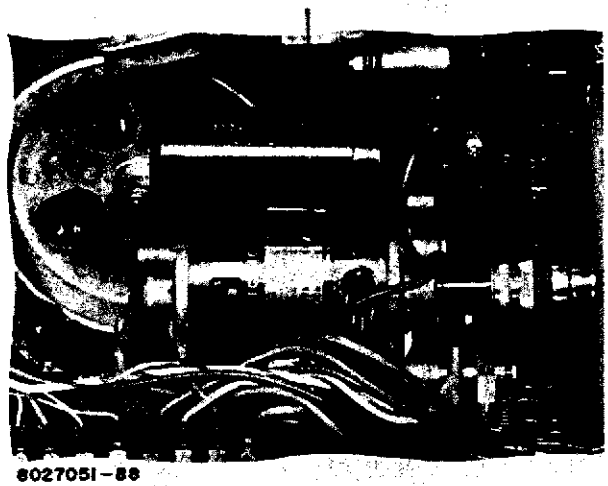
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
			REEL ARM, SHAFT, AND GEAR ASSEMBLY
1	234242	3453985-501	SHAFT - REEL ASSEMBLY (FRONT AND REAR ARMS)
2	239700	3458011- 1	SPACER
3	234346	3465547-501	ARM - REEL FRONT ASSEMBLY
3A	234387	3471022-501	ARM - REEL BACK ASSEMBLY
4	234323	3463165- 1	BEARING
5	234319	3463164- 2	BELT - REEL ARM FRONT
6	234363	3465687-502	GEAR ASSEMBLY
7	239701	3458022-1	SPRING - DETENT
8	234224	3453515- 1	BUTTON - PAWL
9	234324	3463165- 2	BEARING
	234318	3463164- 1	BELT - REEL ARM BACK
10	234346	3465547-501	ARM REEL FRONT ASSEMBLY
11	234317	3463163-501	PAWL ASSEMBLY
12	239426	3454054- 2	WASHER - FRONT REEL ARM
12A	239427	3454054- 3	WASHER - REAR REEL ARM
13	234225	3453516- 1	RETAINER - REAR REEL ARM
13A	242624	3458025- 1	RETAINER - FRONT REEL ARM
14	234303	3462266-501	GEAR AND SHAFT ASSEMBLY (FRONT REEL ARM)
A			SCREW
B			SCREW

MOTOR STARTING CAPACITOR AND MOUNTING BRACKET

NOTE: Capacitor and mounting bracket are supplied as part of motor assembly.

1. Perform Rear Cover Removal Procedure.
2. Remove motor starting capacitor by prying out each side of bracket until capacitor is freed.
3. Remove cap from side of capacitor and disconnect wires.
4. To remove bracket, remove screw attaching bracket to motor.
5. To replace capacitor and bracket, reverse removal procedures.



8027051-88

PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
			MOTOR STARTING CAPACITOR AND MOUNTING BRACKET
	242182		CAPACITOR - MOTOR STARTING (50/60 Cycle 115V)
	242996		CAPACITOR - MOTOR STARTING (50 Cycle 230V)

LOWER SPROCKET AND PUCK-REVERSE ASSEMBLY

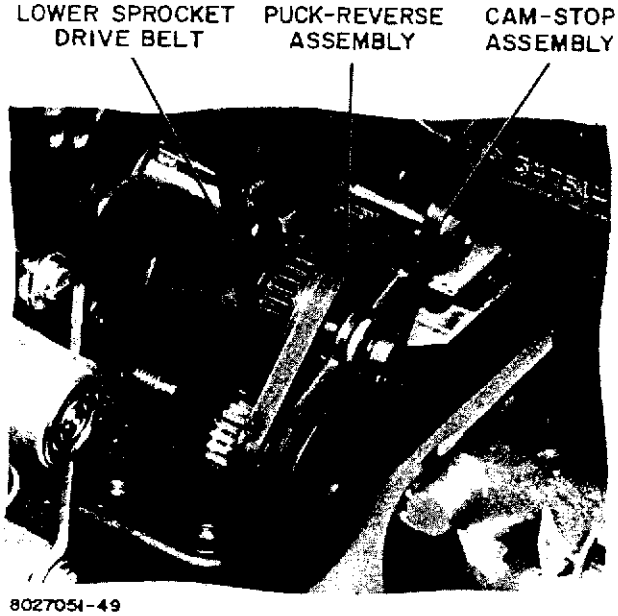
1. Perform Rear Cover Removal Procedures.
2. Perform Flywheel and Sound Drum Removal Procedures.

   NOTE: The complete puck assembly can be removed without disassembling by removing the set screws from the lower sprocket and sliding the shaft through the projector casting.

3. To completely disassemble the puck assembly, loosen setscrew (A) and remove puck.
4. Remove retainer ring (D) and washer (B) and (C) and slide puck arm (6) and drive gear (4) off shaft (2).

   NOTE: When reassembling the puck (7) on to the shaft (5), allow .003 end play by inserting .003 tolerance gauge between puck (8), puck arm (6), press the assembly tight with fingers, tighten setscrew, remove gauge.

5. To replace puck-reverse assembly, reverse removal procedures.
6. Replace flywheel and sound drum.
7. Adjust Cam-stop assembly for 0.040 clearance between puck-reverse tire and edge of flywheel.
8. Replace Rear Cover.



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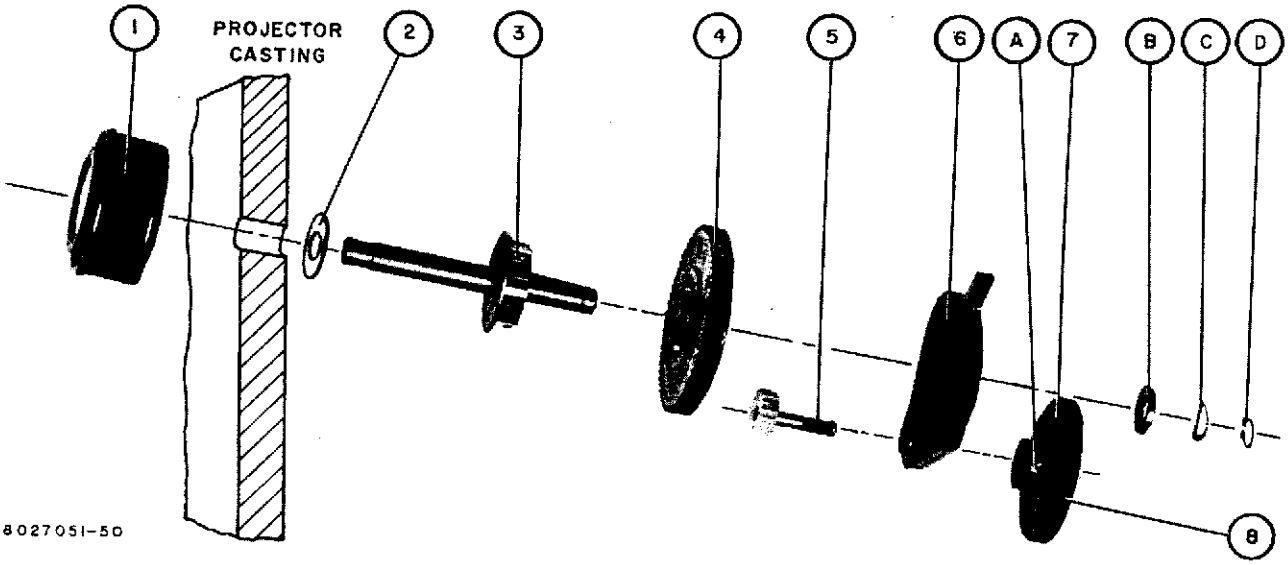


8027051-50

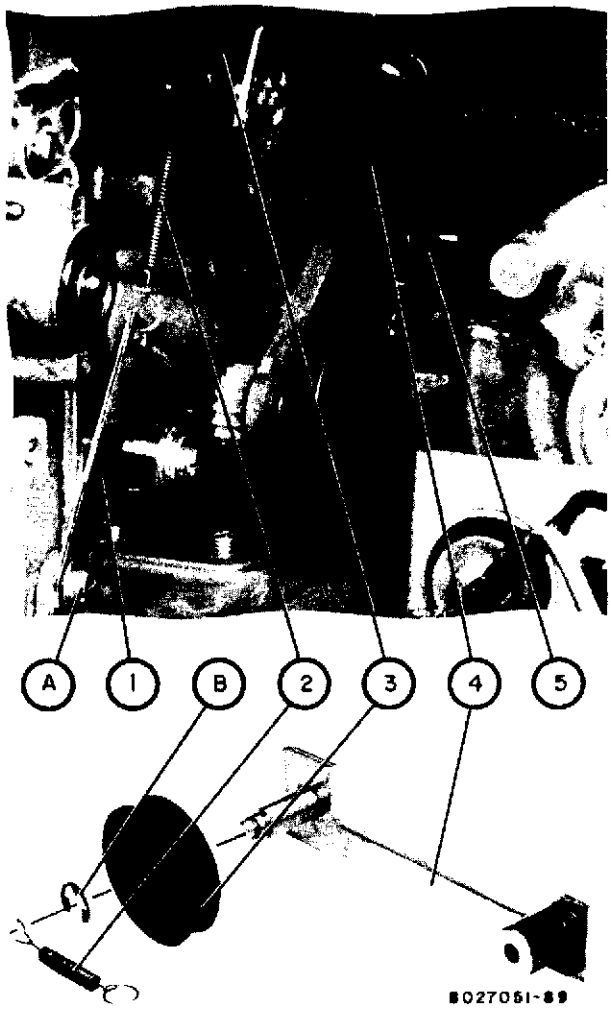
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
			LOWER SPROCKET AND PUCK-REVERSE ASSEMBLY
1	234391	3471302-501	SPROCKET ASSEMBLY
2	238338	3458032- 1	SPACER
3	234296	3462177-501	SHAFT ASSEMBLY LOWER SPROCKET
- 4	234298	3462198- 1	GEAR - CLUTCH REVERSE
- 5	234363	3465687-502	GEAR AND SHAFT ASSEMBLY
- 6	239341	3463225- 1	PUCK ARM - REVERSE
7	234332	3463222- 1	PUCK
8	238336	3458021- 1	RING - PUCK ASSEMBLY
	221746	8958892- 2	CAM - STOP
	234321	3463164- 4	BELT - LOWER SPROCKET DRIVE
A			SETSCREW #6-32 x .25 LG
B	28377	286391- 17	WASHER - METALLIC
C			WASHER, SPRING
D			RETAINER RING

LOWER SPROCKET BELT TENSIONER ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Flywheel and Sound Drum Removal Procedures.
3. Disconnect spring (2) from bracket (1).
4. Remove Cam-stop (5) and slide belt tensioner (4) off Cam-stop shaft.
5. To remove the gear assembly (3) from belt tensioner (4), remove E washer (A) and slide gear off shaft.
6. To reassemble belt tensioner and install, reverse removal procedures.

9. Remove rear mounting screws (4) and lift motor out of bracket.
10. To replace motor, reverse removal procedures.

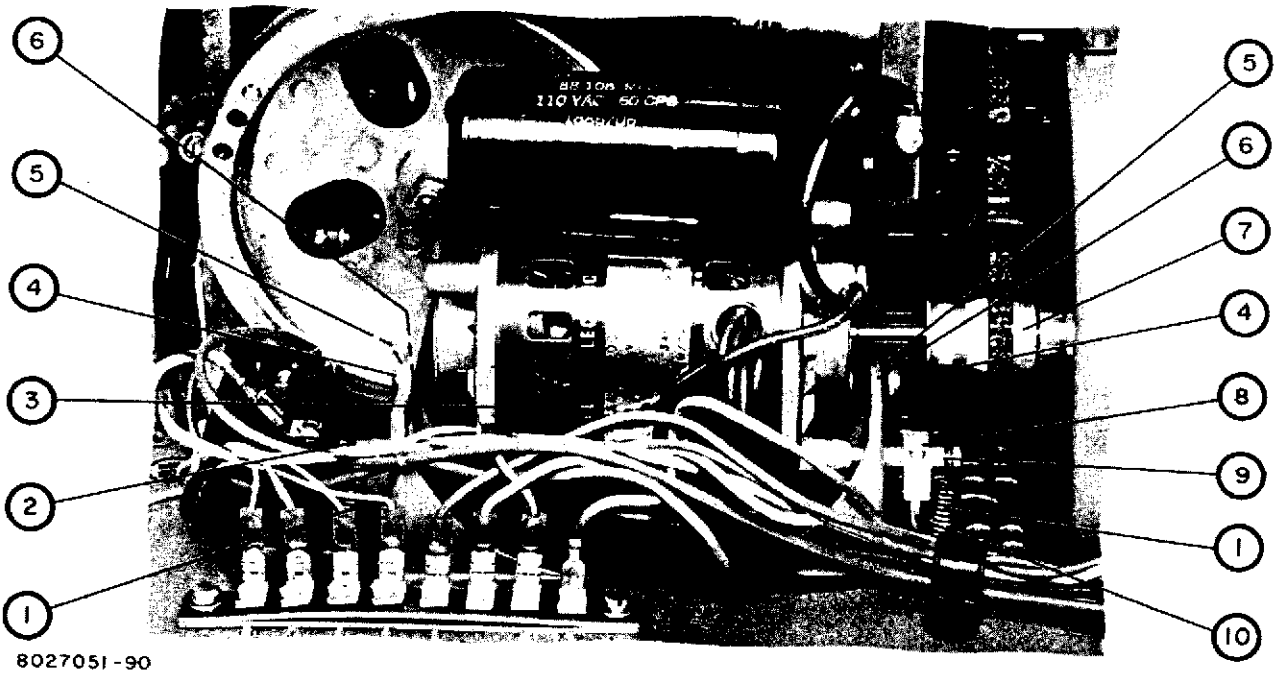


PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		LOWER SPROCKET BELT TENSIONER ASSEMBLY	
1	242627	3458131- 1	BRACKET
2	234333	3463241- 1	SPRING - TENSION
3	242625	3730007-502	ARM - SHAFT ASSEMBLY
4	221746	8958892- 2	CAM - STOP
5	234362	3465687-501	GEAR - ASSEMBLY
A	204043	93605- 6	E RING

MOTOR ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Remove side plate from blower assembly. Refer to Blower Assembly Removal Procedures.
3. Remove cable clamp adjacent to motor.
4. Disconnect motor wires from terminal board (3) (TB3) on blower side plate and motor starting relay next to motor. Note location of each wire.
5. Disconnect ground wire from motor.
6. Slide damper and pin (8) off shoulder screw (9) and out of bushing (10).
7. Remove shoulder screw (2) and (9) and tension springs (1) on front side of motor.
8. To remove pulley (7), loosen setscrew in impeller and slide off motor shaft. Loosen setscrew in pulley (7) and slide pulley off shaft.
9. Remove rear mounting screws (4) and lift motor out of bracket.
10. To replace motor, reverse removal procedures.



8027051-90

PARTS LIST

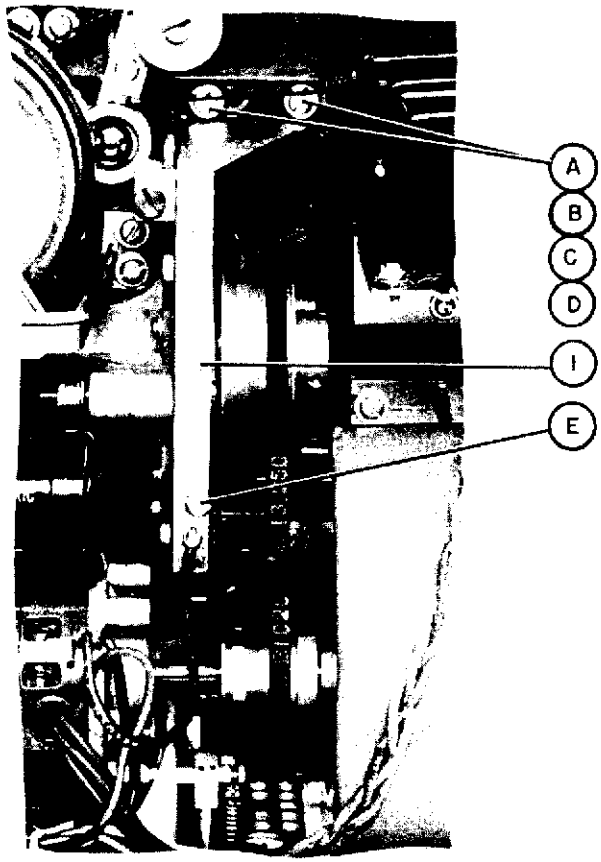
Illus No.	Stock No.	Drawing No.	Description
		MOTOR ASSEMBLY	
1	237956	3454124- 1	SPRING
2	237955	3454123- 2	SCREW - SHOULDER
3	240542	3468414-501	MOTOR - (WITH CAPACITOR - 115V 60 Cycle)
	241630	3468414-503	MOTOR - (WITH CAPACITOR - 220/230 V 50 Cycle)
4	237958	8849375-119	SCREW - #10-24 x .88 PAN HD
5	237952	894157- 4	GROMMET
6	237957	3454125- 1	BUSHING
7	241434	3458109- 1	PULLEY - BELT 60 CYCLE
	241633	3468414-504	MOTOR - WITH CAPACITOR - 115V 50 Cycle)
8	240484	3458045-501	DAMPER ASSEMBLY
9	237954	3454123- 1	SCREW - SHOULDER
10		3458045- 1	BUSHING DAMPER
	239320	3463460- 2	PULLEY - BELT 50 CYCLE

BACK PLATE ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Loosen First Idler Gear mounting screws.
4. Perform Cam-Pulley Assembly Removal Procedures.
5. Perform Worm Gear Removal Procedures.
6. Perform Cam-Hanger Removal Procedures.
7. Disconnect motor ground wire (E) from rear of back plate (1).
8. Loosen set screws on sound-silent selector on front of projector.
9. Remove four (4) mounting screws (A), (B), (C), and (D).
10. Slide back plate out through front of projector. Sound-silent selector will drop out of bottom of back plate.

    NOTE: Do not overtighten mounting screws (A) when replacing back plate.

11. To replace back plate, reverse removal procedures.



8027051-54

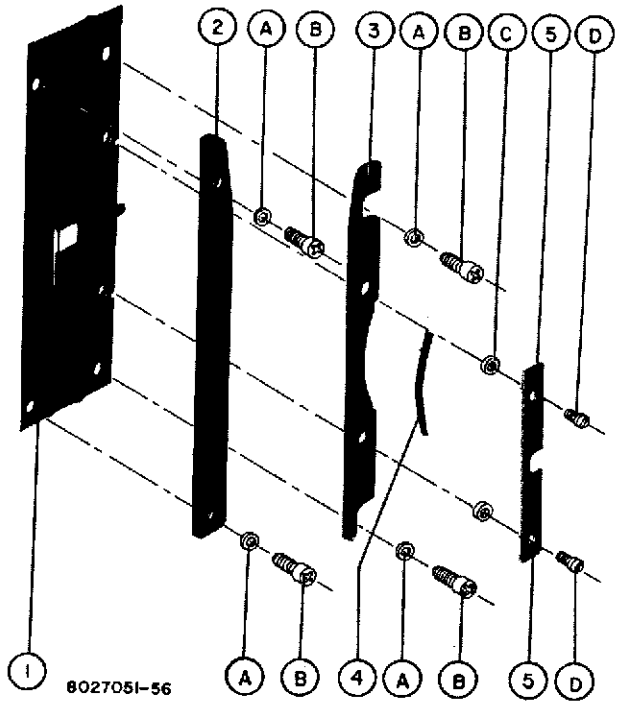
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		BACK PLATE ASSEMBLY	
1*	234393	3475140- 1 (J2)	PLATE BACK - CASTING
1*	241550	3475140- 1 (L2)	PLATEBACK - CASTING
A			SCREW #8-32 x .438 PAN HD
B			WASHER - LOCK #8
C			WASHER - FLAT #8
D	239729	3458019- 1	WASHER - RUBBER
E			SCREW #8-32 x .125 PAN HD

*When ordering a replacement part, check part number stamped on assembly and order by corresponding stock number.

APERTURE PLATE ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Blower Assembly Removal Procedures.
3. Perform Cam Pulley Assembly Removal Procedures.
4. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
5. Perform Back Plate Removal Procedures.
6. Lay back plate on back.
7. Remove 4 screws (B) and washers (A) and left-hand rail (2), allowing aperture plate assembly to be removed.
8. To further disassemble, remove retainer screws (D), remove retainer (5), washers (C) and retainer spring (4).
9. To replace aperture plate, reverse removal procedures.
10. Refer to Moveable Rail Adjustment, procedures.

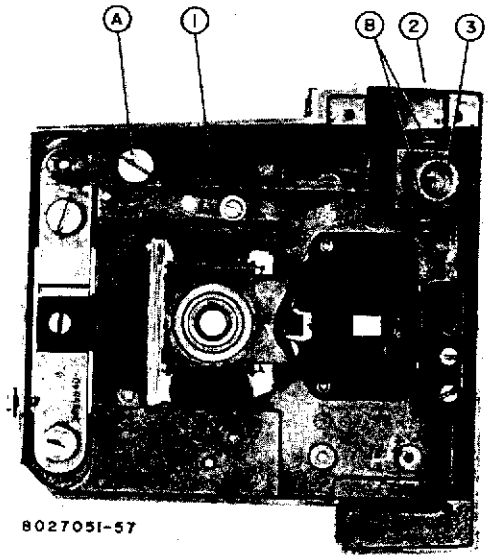


PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
			APERTURE PLATE ASSEMBLY
1	234367	3465824-501	APERTURE ASSEMBLY
2	234226	3453520- 1	RAIL - LEFT HAND
3	234307	3462340- 1	RAIL - RIGHT HAND
4	234228	3453524- 1	SPRING - (2 Used)
5	234227	3453521- 1	RETAINER
A			WASHER - LOCK #6
B			SCREW #6-32 x .312 FILLISTER HD
C		3458046- 2	WASHER
D			SCREW #4-40 x .188 PAN HD

BEAM FRAMING ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Rotate Shutter blades until shoulder screw (A) can be removed. Remove power transformer to gain access to shoulder screw.
3. Remove eccentric shoulder screw (A) and slide beam (1) out of back plate.
4. To remove framing knob (2), remove c-washers (C) and unscrew from nut (3).
5. Replace framing knob (2) and nut (3) by reversing step 4.
6. Replace beam assembly by reversing step 3. Tighten eccentric screw (A) until it shoulders up tight
7. Adjust framing knob (2) until nut (3) is centered between c-washers (C).
8. Connect leads from rear cover to projector and plug in power cord.
9. Install film and start Projector. Adjust for focus.
10. With Projector running, observe framing. Stop and start projector and adjust eccentric screw A until picture is properly framed. This will allow equal framing with the external framing knob.
11. Stop projector, unplug power cord, and replace rear cover.



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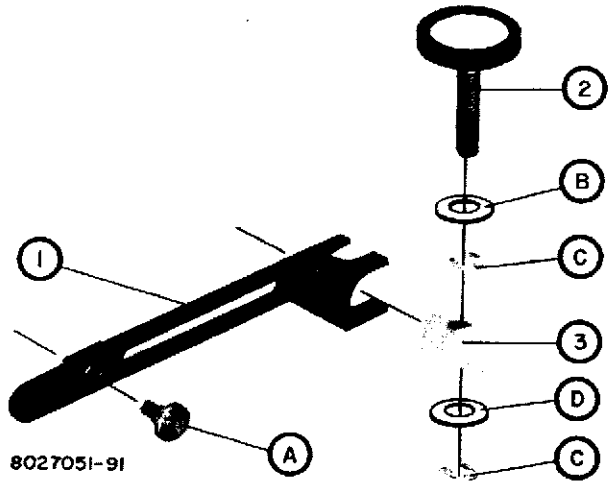
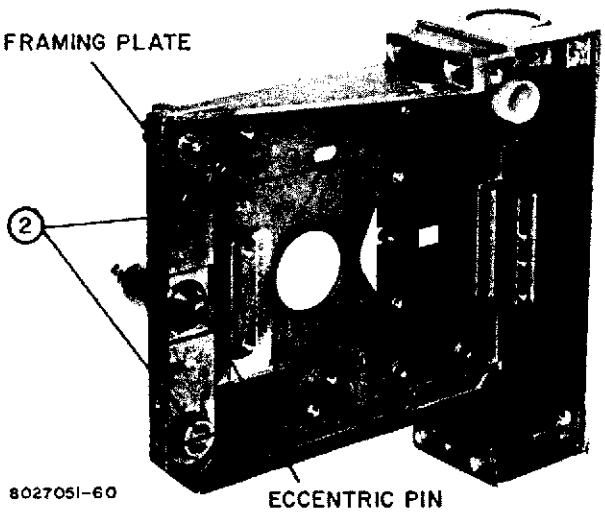


8027051-91

PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		BEAM FRAMING ASSEMBLY	
1	234351	3465609- 1	BEAM - FRAMING ASSEMBLY
2	234309	3462376-502	KNOB
3	234222	3453506- 1	NUT - FRAMING
A			SCREW - SHOULDER ECCENTRIC
B			WASHER - FLAT
C		93605-406	E-WASHER
D		99161-39	WASHER - FLAT

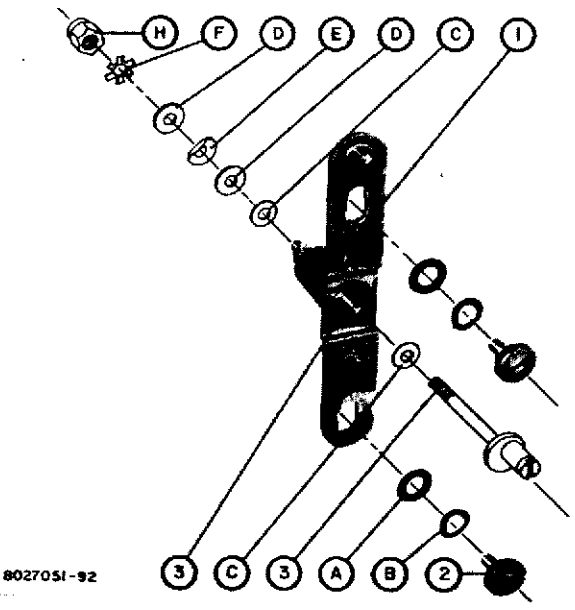
FRAMING PLATE ASSEMBLY



1. Perform Rear Cover Removal Procedures.
2. Perform Blower Assembly Removal Procedures.
3. Perform Cam-Pulley Assembly Removal Procedures.
4. Perform Beam Assembly Removal Procedures.
5. Perform Claw Assembly Removal Procedures.
6. Remove shoulder screws (2), spring washers (B), and flatwashers (A) from framing plate.
7. Remove framing plate (1).
8. To remove eccentric pin (3), remove locknut (H), lockwasher (F), flat washers (D), spring washer (E) and flat washer (C).

   NOTE: Clean and lubricate eccentric pin and bushing with silicone lubricate Stock No. 242288.

9. To replace eccentric pin (3), insert end of eccentric pin through hole in framing plate assembly and install flat and spring washers and lock nut.
10. Tighten lock nut until spring washer is completely compressed then back nut up one full turn. Use screw driver and orientate eccentric pin as shown on assembled view.
11. To replace framing plate, install spring washers and shoulder screws removed in step 6 and tighten shoulder screws until plate moves with 2-1/2 to 5 inch ounces of force.



PARTS LIST

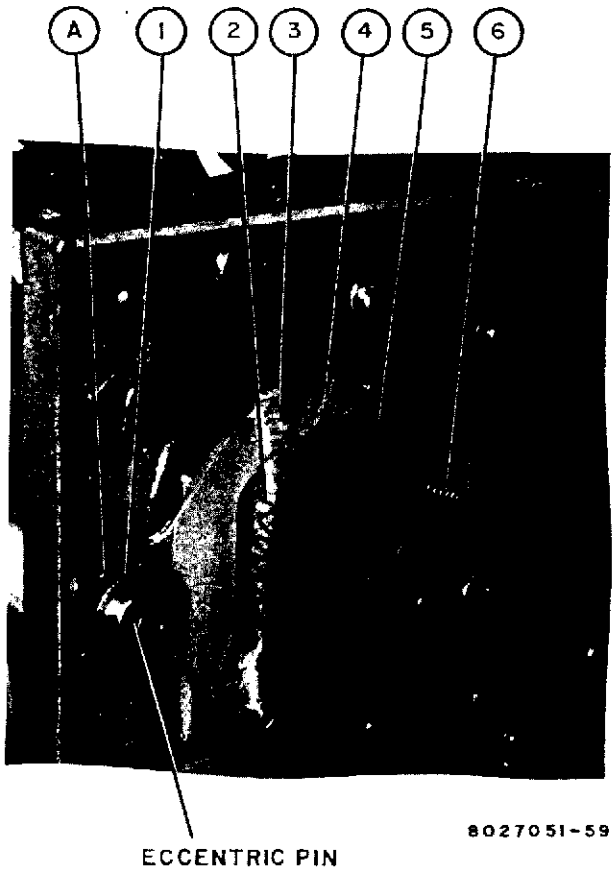
Illus No.	Stock No.	Drawing No.	Description
		FRAMING PLATE ASSEMBLY	
1	234314	3463023-501	PLATE - FRAMING ASSEMBLY
2	234247	3454031- 1	SCREW - SHOULDER
3	234306	3462307- 1	PIN - ECCENTRIC
A	239652	3458046- 5	WASHER - FLAT
B	225378	3450423- 1	WASHER - SPRING
C	28377	286391- 17	WASHER - THIN FLAT
D		82278-405	WASHER - FLAT #8
E		3458035- 1	WASHER - SPRING
F		93610-409	WASHER - LOCK
H	255180	8825442- 14	NUT-LOCK #8-32
	242288	3460709- 18	FLUID - SILICONE (2 OUNCE)

CLAW ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures to expose Idler Gear Bracket.
3. Loosen mounting screws on Idler Gear Bracket. Refer to Idler Gear and Bracket Removal Procedures for location of Gear and Bracket.
4. Perform Cam-Pulley Assembly Removal Procedures.
5. Slide Worm Gear and Shaft out of Cam Hanger far enough to permit removal Cam-Pulley Assembly.
6. Loosen setscrews (A) on claw assembly collar (1) and slide claw body assembly (4) off eccentric pin.
7. Remove claw body assembly, being careful not to lose claw return spring (6).

   NOTE: To install new rails or add or remove shims from under rails, clip wire at one end of rail and slide end of rail off of claw body. Replace rails by holding in place and secure with wire .020 diameter x 1.00 inch long.

8. When replacing the claw body and return spring, it may be necessary to remove the condenser lens mounting plate, (Refer to applicable procedures) and the flare inside the back plate assembly to permit positioning of return spring over pin on back plate.
9. After installation of claw body assembly is complete, replace parts removed in steps 1 through 4.
10. When reassembly is complete, perform Claw torque, lateral, protrusion, and travel adjustments.



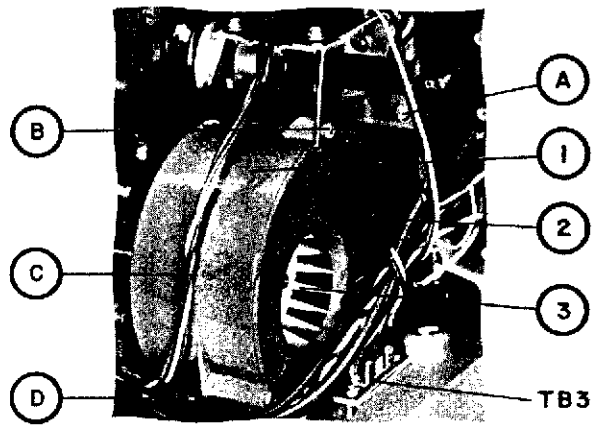
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		CLAW ASSEMBLY	
1	237857	3472455-501	BODY - CLAW ASSEMBLY
2	237858	3458043- 1	SPRING - CAM LUBRICATION
3	237857	3458041- 1	FELT - CAM LUBRICATION
4	237856	3472455-501	BODY - CLAW ASSEMBLY
5	237855		KIT - RAIL REPLACEMENT
	237855	3453584- 1	RAIL
		3453584- 2	RAIL - (NYLON)
		2010036-124	WIRE - .0201 DIA X 1.00 LONG
		3458033- 1	SHIM - .001 INCH
		3458032- 2	SHIM - .005 INCH
6	238288	3458012- 1	SPRING - COMPRESSION

BLOWER HOUSING ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Remove 3 mounting screws (B) attaching side plate (2) to blower housing (1) and remove side plate.
3. Loosen impeller set screw (C) and slide impeller (3) off motor shaft.
4. Remove 2 mounting screws (A) attaching blower housing to main frame.
5. Tilt Projector back and remove 2 mounting screws (D) from underside of Projector.
6. To replace blower housing and side plate, reverse removal procedures.

NOTE: Refer to wiring diagram for connection of wiring on terminal block TB-3.



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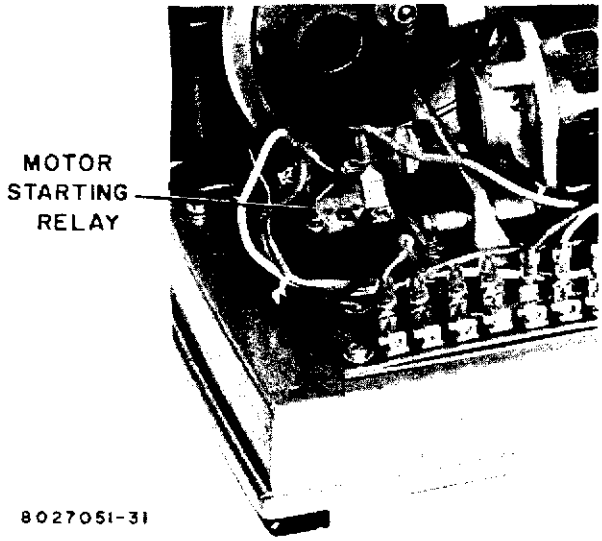
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		BLOWER HOUSING ASSEMBLY	
1	234388	3472457- 2	BLOWER - HOUSING ASSEMBLY
2	240700	3463730- 1	COVER ASSEMBLY - BLOWER
3	234358	3465673-501	IMPELLER ASSEMBLY
A		90388-409	SCREW #8-32 x .438 PAN HD
B		93600-157	SCREW #8 - SELF TAPPING
C			SETSCREW
D		93600-157	SCREW #8 - SELF TAPPING

MOTOR STARTING RELAY



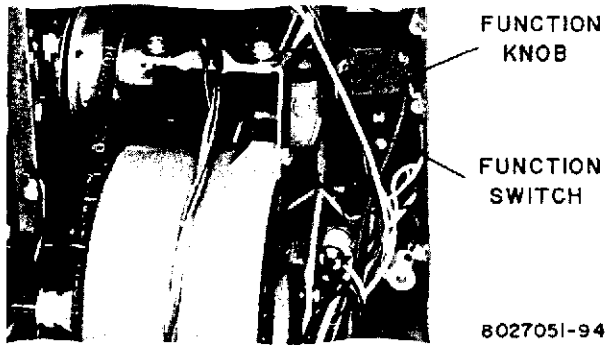
1. Perform Rear Cover Removal Procedures.
2. Disconnect wires from motor starting relay terminals. Note location of wires.
3. Remove two (2) screws at base of relay.
4. To replace relay, reverse removal procedures.

FUNCTION SWITCH

1. Perform Rear Cover Removal Procedures.
2. Loosen setscrew on function switch knob and remove knob.
3. Remove retainer nut and washer from function switch shaft.
4. Carefully push switch through main frame and remove from rear of projector.
5. Disconnect wires from function switch terminals:

Terminal	Wire Color Code
A	White (Wire from TB1)
C	White/Brown
1	White (Wire from TB3-5)
2	White (Wire from fuse)
2A	Black (Jumpered to 2D)
2D	Black
2B	Green
2C	Green (Jumpered to 2B)
22	White (Wire from TB3-4)
21	Violet

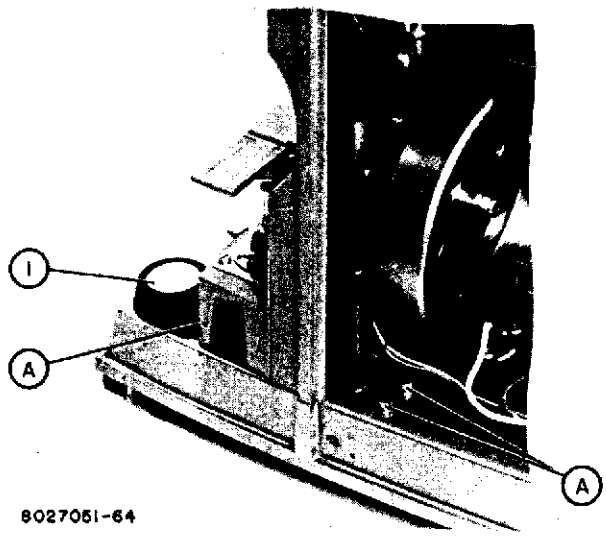
6. To replace function switch, reverse removal procedures.



PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
K301	241096	3454129- 1	RELAY - MOTOR STARTING (50/60 cycle - 115v)
	234313	3463021- 1	SWITCH - ROTARY FUNCTION
K301	241629	3454129- 4	RELAY - MOTOR STARTING (50 cycle - 230v)
	234341	3468413-502	KNOB - FUNCTION

TILT MECHANISM



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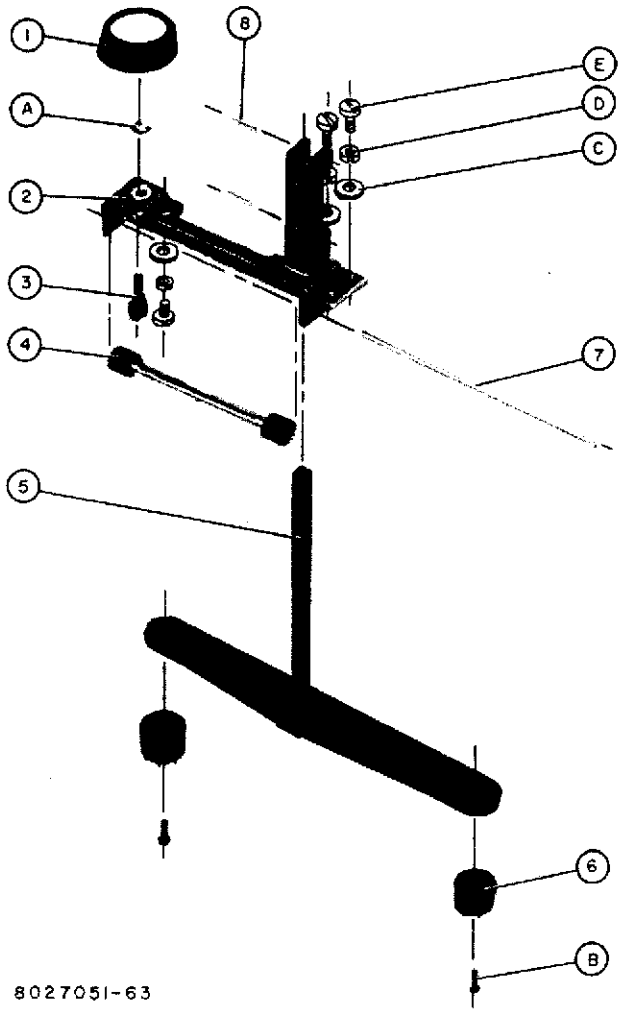
To remove tilt mechanism from Projector, proceed as follows:

1. Perform Rear Cover Removal Procedures.
2. Rotate tilt knob until tilt mechanism is fully extended.
3. Loosen set screw and remove tilt knob (1).
4. Remove two mounting screws (E) on top of projector base. Tilt Projector back and remove mounting screw adjacent to worm gear on bottom of Projector and slide tilt mechanism out of Projector.
5. Completely disassemble tilt mechanism as shown below.

   NOTE: To remove pin (7) from gear and shaft assembly (2), press pin (7) out of gear and shaft assembly from the knurled end of pin.

6. To replace tilt mechanism, reverse removal procedures.



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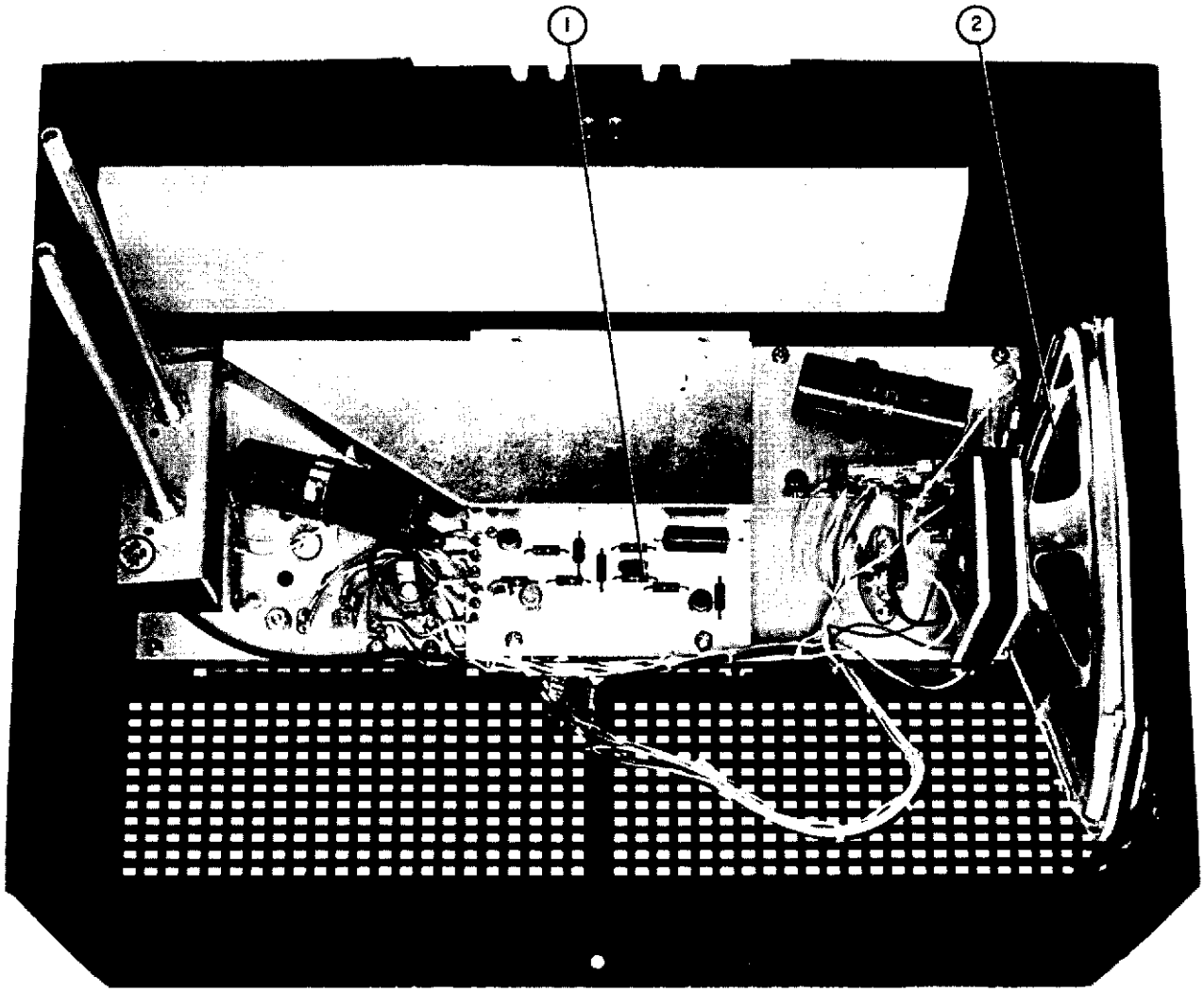
PARTS LIST

Illus No.	Stock No.	Drawing No.	Description
		TILT MECHANISM ASSEMBLY	
1	234326	3463196-501	KNOB - TILT ASSEMBLY
2*	234376	3467072-501	HOUSING
2*	241547	3467072- 2 (F2)	HOUSING
3	242300	3454023- 1	WORM
4	234325	3463194-501	GEAR AND SHAFT ASSEMBLY
5	234375	3467065-501	RACK AND FOOT ASSEMBLY
6	234248	3454034- 1	PAD
7	234246	3454024- 1	PIN
A	238334	3458013- 4	RING - RETAINING
B		93603-416	SCREW #8 - SELF TAPPING HEX HEAD
C			WASHER - FLAT #6 (2-PLACES)
D			WASHER - PLAIN #8 (3-PLACES)
E			WASHER - LOCK #8 (3-PLACES)
F			SCREW #8-32 x .375 PH (3-PLACES)
G		990331-467	PIN - SPRING (2-PLACES)

*When ordering a replacement part, check part number stamped on assembly and order by corresponding stock number.

SPEAKER AND AMPLIFIER ASSEMBLY

1. Perform Rear Cover Removal Procedures.
2. Remove 4 nuts attaching speaker (2) to rear cover and disconnect wires from speakers.
3. Remove 8 screws attaching amplifier (1) to rear cover.
4. To remove amplifier shield, remove attaching screws.



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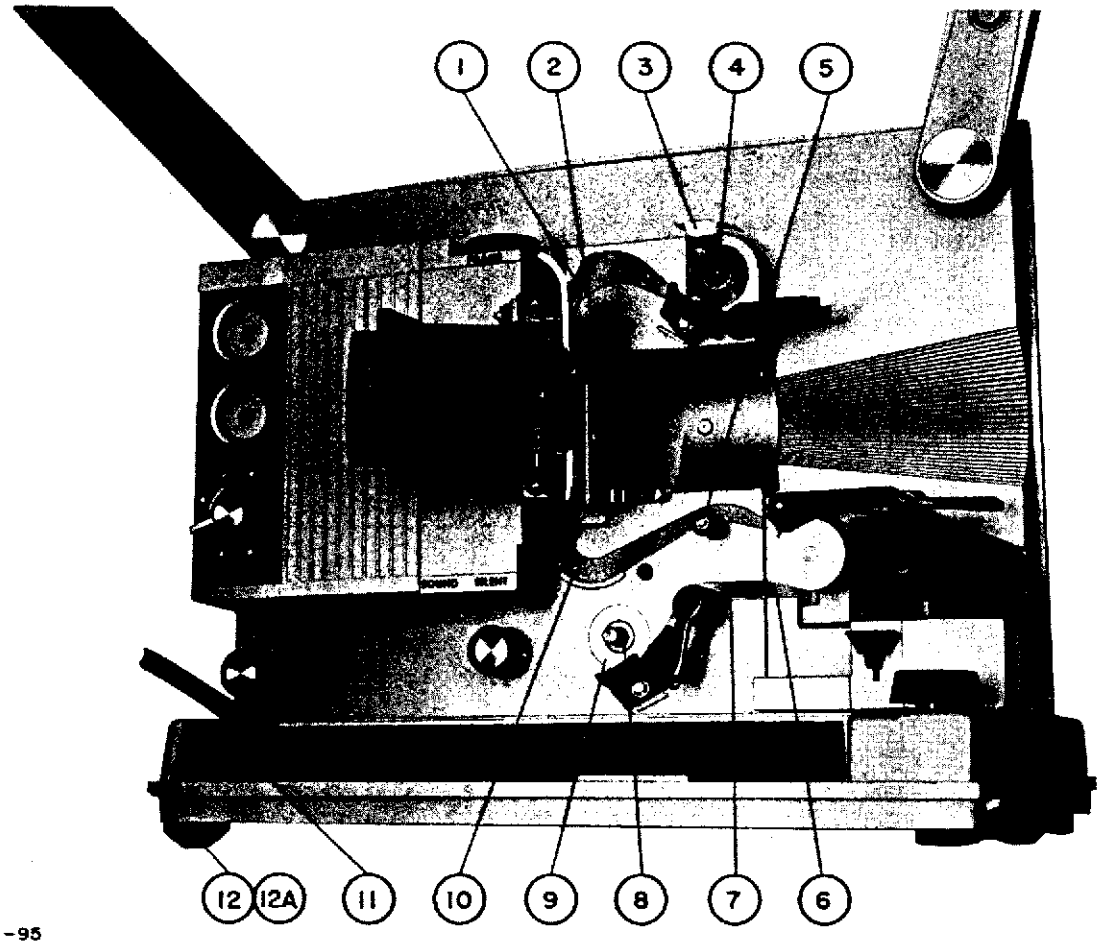
PARTS LIST

Symbol	Stock No.	Drawing No.	Description
			SPEAKER AND AMPLIFIER ASSEMBLY
		3458067-501	AMPLIFIER 16MM PROJECTOR
C101	237339	3462303- 1	CAPACITOR - ELECTROLYTIC, 1500 MF 40 V
C102	237346	3454642- 5	CAPACITOR - ELECTROLYTIC, 500 MF 25 V
CR101	234565		DIODE - TYPE 1N3193
CR102	234565		DIODE - TYPE 1N3193
CR103	239188		DIODE - TYPE 1N3029B
F101	211912	8908413-108	FUSE - 1 AMP, PIGTAIL
J101	101526	8887792- 5	JACK
J102	237344	3454622- 1	JACK
Q101	232628	3463100- 1	TRANSISTOR - POWER SILICON N-P-N
Q102	234305	3462306- 1	TRANSISTOR - TYPE 40050
Q103	234305	3462306- 1	TRANSISTOR - TYPE 40050
R101	237738	3470235- 10	RESISTOR - VARIABLE, 10,000 OHMS 20% 1/8 W
R102	237739	3470235- 11	RESISTOR - VARIABLE, 5000 OHMS 20% 1/8 W
R103	502122	82283- 54	RESISTOR - FIXED COMP., 220 OHMS 5% 1/2 W
R104	110496	3450123- 46	RESISTOR - WIREWOUND, 100 OHMS 5% 7 W
RT101	234276	3454612- 1	THERMISTOR
	234277	3454614- 1	INSULATOR
	242785	3464678- 1	SHIELD
		3454621-503	PRINTED CIRCUIT BOARD ASSEMBLY
			CAPACITORS
C1	223258	3462286- 1	ELECTROLYTIC, 25 MF 6 V
C2	223086	3462286- 3	ELECTROLYTIC, 50 MF 12 V
C3	106772	990786- 87	PLASTIC, 1 MF 10% 50 V
C4	300237	993025-237	MICA, 100 PF 10% 100 V
C5	235779	3462014-129	FILM, 0.10 MF 10% 200 V
C6	237989	3462286- 2	ELECTROLYTIC, 10 MF 10 V
C7	223258	3462286- 1	ELECTROLYTIC, 25 MF 6 V
C8	229969	3462014- 13	FILM, .0047 MF 20% 200 V
C9	300292	3462286- 5	ELECTROLYTIC, 50 MF 25 V
C10	237989	3462286- 2	ELECTROLYTIC, 10 MF 10 V
C11	217350	3462286- 4	ELECTROLYTIC, 10 MF 25 V
C12	238400	3462014- 11	FILM, .0033 MF 20% 200 V
C13	232927	3462304- 3	CERAMIC, 0.47 MF 3 V
C16	300187	993025-245	MICA, 220 PF 10% 100 V
Q1	234304	3462269- 1	TRANSISTOR - TYPE 2N2925
Q2	234304	3462269- 1	TRANSISTOR - TYPE 2N2925
Q3	234304	3462269- 1	TRANSISTOR - TYPE 2N2925
Q4	232841		TRANSISTOR - TYPE 2N3053/40053
Q5	232841		TRANSISTOR - TYPE 2N3053/40053
Q6	300541		TRANSISTOR - TYPE 2N270
			RESISTORS - FIXED COMPOSITION, UNLESS NOTED
R1	502310	82283-183	10,000 OHMS 5% 1/2 W
R2	502256	82283-177	5600 OHMS 5% 1/2 W
R3	502022	82283- 42	22 OHMS 10% 1/2 W
R6	502210	82283- 62	1000 OHMS 10% 1/2 W
R7	502224	82283-168	2400 OHMS 5% 1/2 W
R8	502151	82283-152	510 OHMS 5% 1/2 W
R9	502218	82283-165	1800 OHMS 5% 1/2 W
R10	502222	82283-167	2200 OHMS 5% 1/2 W

Symbol	Stock No.	Drawing No.	Description
R11	502324	82283-192	24,000 OHMS 5% 1/2 W
R12	502210	82283- 62	1000 OHMS 10% 1/2 W
R13	502210	82283-159	1000 OHMS 5% 1/2 W
R14	502347	82283-199	47,000 OHMS 5% 1/2 W
R15	502233	82283-171	3300 OHMS 5% 1/2 W
R16	502213	82283-162	1300 OHMS 5% 1/2 W
R17	502215	82283- 64	1500 OHMS 10% 1/2 W
R18	502210	82283-159	1000 OHMS 5% 1/2 W
R19	502315	82283-187	15,000 OHMS 5% 1/2 W
R20	502210	82283-159	1000 OHMS 5% 1/2 W
R21	502116	82283-140	160 OHMS 5% 1/2 W
R23	502133	82283- 56	330 OHMS 10% 1/2 W
R24	502110	82283- 50	100 OHMS 10% 1/2 W
R25	502110	82283- 50	100 OHMS 10% 1/2 W
	254187	8985442- 1	WASHER - INSULATOR
← 2	234384	3467107- 1	SPEAKER - 4 IN x 8 IN

MISCELLANEOUS PARTS



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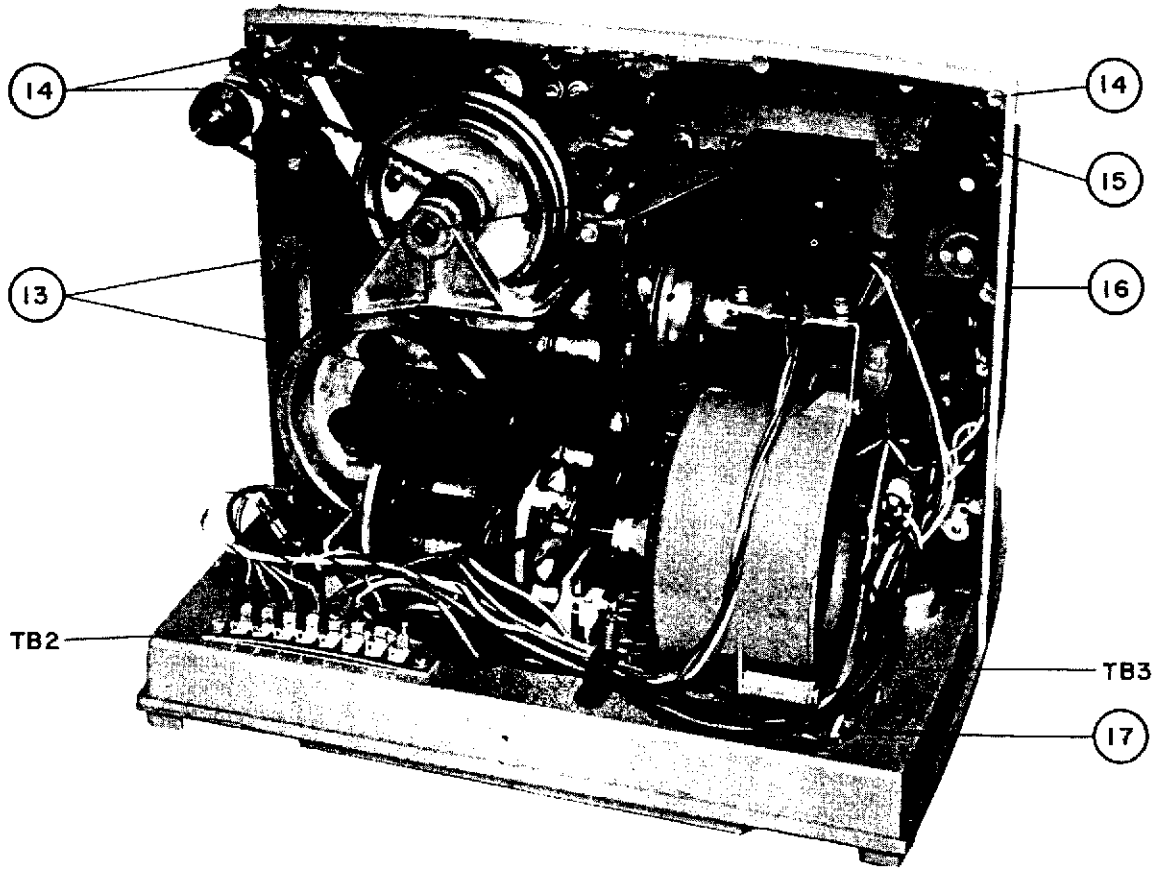
PARTS LIST

Symbol	Stock No.	Drawing No.	Description
		MISCELLANEOUS PARTS	
1	242928	3467110- 1	FILM GUIDE - TO LENS GATE
2	234257	3454073- 1	SPRING - RETAINER (LENS GATE LOCK)
3	242926	3458063- 1	SHIELD - UPPER SPROCKET
4	238385	3463042- 2	BEARING - UPPER SPROCKET
5	238390	3454078- 1	SHAFT - UPPER GUIDE PULLEY
6	240427	3458082- 1	FILM GUIDE - SOUND HEAD
7	242930	3467110- 4	FILM GUIDE - TO LOWER SPROCKET
8	238387	3463042- 4	BEARING - LOWER SPROCKET
9	242925	3458014- 1	FILM GUIDE - LOWER SPROCKET
10	242929	3467110- 2	FILM GUIDE - TO SOUND HEAD
11	234392	3471306- 1	REEL HOLDER
12	237959	3454128- 1	PAD - BASE, RIGHT (Viewed from Rear of Projector)
12A	237960	3454128- 2	PAD - BASE, LEFT (Viewed from Rear of Projector)

MISCELLANEOUS PARTS (Continued)



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PARTS LIST

Symbol	Stock No.	Drawing No.	Description
		MISCELLANEOUS PARTS (CONTINUED)	
13	239336	3464681-501	BUSHING - (USED WITH SAFE THREADER)
13A	242438	3464681- 3	SPRING - (USED ON BUSHING 3464681-501)
14	238388	3463042- 5	BEARING - REEL ARM (3 PLACES)
15	234363	3465687-502	PULLEY
16*	234390	3471300-502 (L1)	MAIN FRAME SUB ASSEMBLY COMPLETE
16*	241551	3471300-502 (L1)	MAIN FRAME SUB ASSEMBLY COMPLETE
17	234275	3454122- 1	BUSHING - POWER CORD
TB2	234338	3463405-501	BOARD - TERMINAL ASSEMBLY
TB3		3464693-501	BOARD - TERMINAL ASSEMBLY
	237966	3467108-501	COVER
	234344	3463415- 1	KNOB - FRONT COVER
	241626	3463414- 1	LATCH - FRONT COVER
	234286	3462097- 1	FLARE - LOCATED ON BACKPLATE BEHIND CONDENSER LENS
	242302	3462097-2	FLARE - LOCATED ON BACKPLATE BEHIND CONDENSER LENS

*When ordering a replacement part, check part number stamped on assembly and order by corresponding stock number.

OPERATIONAL CHECKS AND ADJUSTMENTS

FILM SHOE AND LATERAL FOCUS ADJUSTMENT

To adjust the film shoe, perform the following procedures:

CAUTION: If the film shoe has just been replaced, care must be used when closing the lens gate to make certain that the film shoe is not damaged by striking either of the rails.

1. Install SMPTE Registration 16 Test film and turn on projector.
2. Observe screen and adjust for proper focus and framing.
3. Adjust film shoe adjusting screws on side of lens gate until no shadow appears on right side projected picture.
4. On side of projector adjacent to lens gate assembly, adjust focusing screw until numbers on either side of the picture are clearly focused.
5. Turn off Projector and remove Registration film.

FLUTTER AND WOW ADJUSTMENT

When the flywheel or sound drum is removed, it is necessary to adjust the position of the flywheel for minimum flutter and wow. If flutter and wow meters are not available, the following alternate method can be used.

1. Install a 3000 cycle Flutter Test Film in Projector (SMPTE - ASA PH-22.43).
2. Set TONE control for midrange.
3. Place function switch to FORWARD position and allow film speed to stabilize.
4. Listen to tone output for chirping or warbling and adjust VOL control for desired level.

NOTE: If a chirping or a warbling sound is present in output, perform Rear Cover Removal Procedures, if necessary, but do not disconnect leads from Projector. Perform either step 5 or 6.

5. When chirping is present, stop Projector and tighten nut on flywheel shaft a half turn. Start Projector and listen to tone. Repeat until tone is constant.
6. When warbling is present, stop Projector and loosen nut on flywheel shaft a half turn. Start Projector and listen to tone. Repeat until tone is constant.
7. When adjustment is completed, replace rear cover and remove test film.

INTERNAL FRAMING ADJUSTMENT

The internal framing adjustment must be made each time the beam framing assembly is removed. Refer to the Beam Framing Assembly Removal Procedures and perform the applicable procedures.

APERTURE PLATE MOVEABLE RAIL ADJUSTMENT

To check and adjust the side pressure of the aperture plate moveable rail, perform the following procedures:

1. To check adjustment while installed on projector, open lens gate assembly.
2. Position gauge (Model N-300) so as to engage center of moveable rail and check force required to move rail. The proper force is between 160 to 190 grams.
3. If force is more or less than specified, remove retainer plate and bend or straighten spring as required, then replace and recheck.

NOTE: The force of the moveable rail can also be checked and adjusted on aperture plate with plate removed from the projector.

BUZZ TRACK ADJUSTMENT

When the sound pressure roller is properly adjusted, no high or low frequency tone will be present in the output of the amplifier. To adjust the sound pressure roller, perform the following procedures:

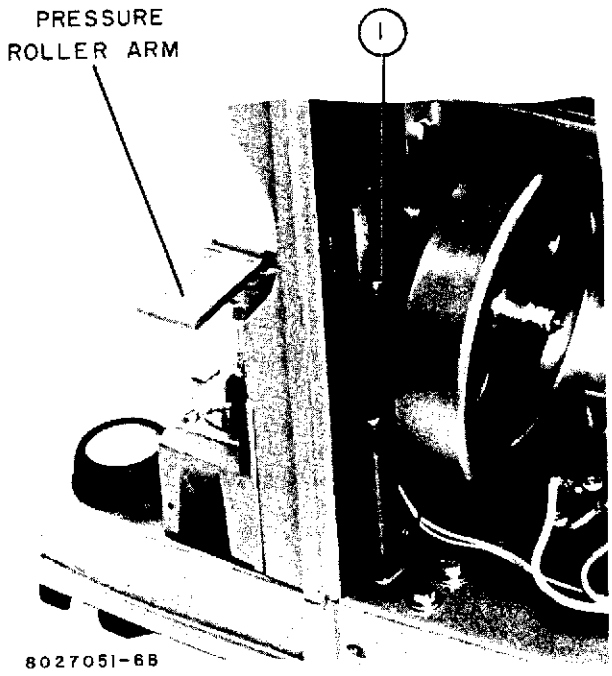
1. Install buzz track film SMPTE ASA Z22.57-1947 in projector.
2. Adjust VOL control to midscale.
3. With Projector running, listen for a high or low frequency tone in the output.

   NOTE: If either tones are present in the output, perform Rear Cover Removal Procedures, if necessary, but do not disconnect leads from Projector.

4. When a high frequency tone is present, rotate nut (1) on pressure roller arm shaft counterclockwise until tone is quieted.
5. When a low frequency tone is present, rotate nut (1) on pressure roller arm shaft clockwise until tone is quieted.

   NOTE: When adjustment is complete, with projector running, press in on sound pressure roller arm. A high frequency tone should be heard in the output. Pulling out on the pressure roller arm should cause a low frequency tone. Release arm, no tone should be present.

6. Shut off projector, remove buzz track film, and replace rear cover.



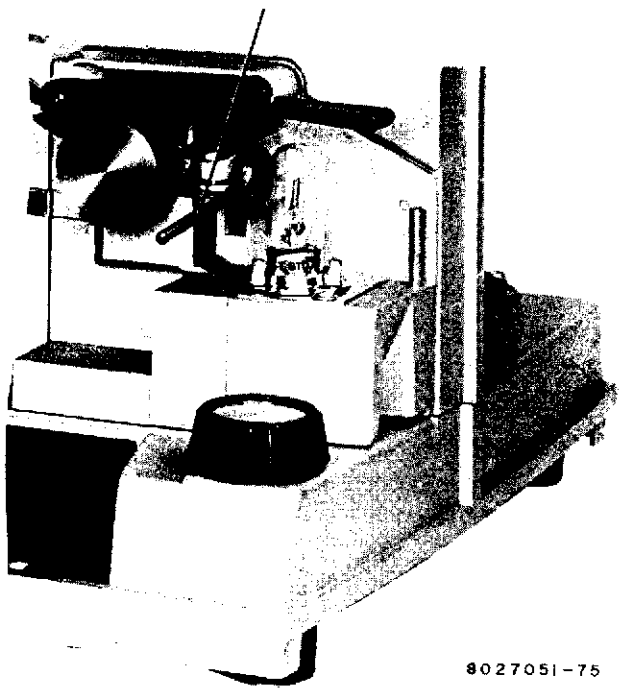
SOUND OPTICAL LENS ADJUSTMENT

The sound optic lens is adjusted for focus and azimuth at the factory. The focus and azimuth are critical adjustments and require the use of special tools. Should it be necessary to readjust the lens, perform the following procedures:

> NOTE: In order to get an accurate voltage indication when adjusting the sound optic lens, perform the Buzz Track Adjustment.

1. Perform Rear Cover Removal Procedures, but do not disconnect leads from Projector.
2. Install a 7000 Cycle Focusing and Azimuth Test Film (SMPTE ASA PH-22-42) in Projector.
3. Connect leads of a low reading AC voltmeter across speaker voice coil.
4. Open and remove sound lamp cover by lifting up.
5. Install Spanner Wrench on to sound optic lens as shown.
6. Insert Modified Allen wrench into setscrew on sound optic bracket and loosen just to allow lens to be rotated.
7. Set VOL control for maximum and TONE control for midrange.
8. Place function switch to FORWARD position.
9. Using Spanner wrench, simultaneously adjust azimuth (rotate) and focus (move horizontally) for a voltage peak indication of 3.5 to 5 volts.
10. Tighten setscrew and ensure that meter indication does not change.
11. Recheck Buzz Track Adjustment and then recheck azimuth and focus for proper voltage indication.
12. Disconnect voltmeter, power cord, replace rear cover, and unthread test film.

SPANNER WRENCH



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INTERMITTENT CLAW ASSEMBLY ADJUSTMENTS

Claw Torque Adjustment

To adjust the torque of the claw on the constant diameter cam, perform the following procedures.

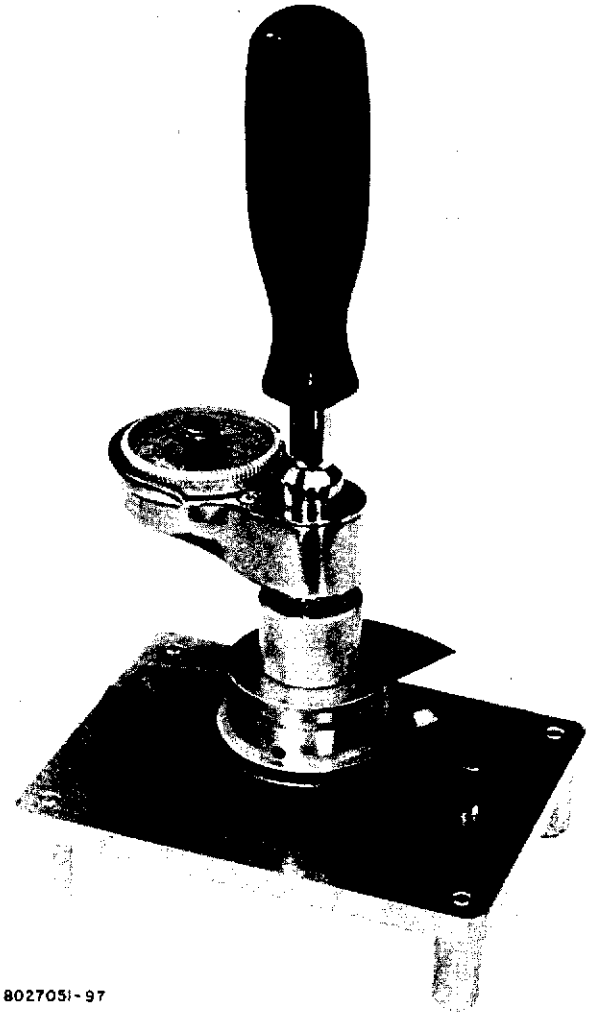
NOTE: If the Pulley, Cams, and Shutter Assembly and Claw Assembly are not already removed, perform the applicable procedures.

1. Slide claw assembly over constant diameter cam with claw facing away from pulley.

   NOTE: The pivot pin that the end of the in-out spring engages must be positioned through the fixture just for enough to engage the end of the in-out spring.

2. Assemble claw assembly and pulley, cam, and shutter assembly on to claw torque wrench and test fixture as shown below. Make sure that in-out spring is attached to claw body and engages pivot pin on fixture.
3. Back outer setscrew on pulley out of pulley about 1/8 of an inch.
4. Attach adapter to torque wrench and install over end of pulley and rotate clockwise. Proper torque indication should be between 8 to 23 inch ounces. Torque will vary with rotation between these values.

   NOTE: If torque is less than 8 inch ounces, remove claw from fixture. Insert a .001 inch shim, from Rail Replacement Kit Stock Number 237855, under one of the rails on the claw body. Replace assembly on torque fixture and check torque. Install claw and pulley, cam, and shutter back in projector and run in for 4 hours. Then remove and recheck torque.



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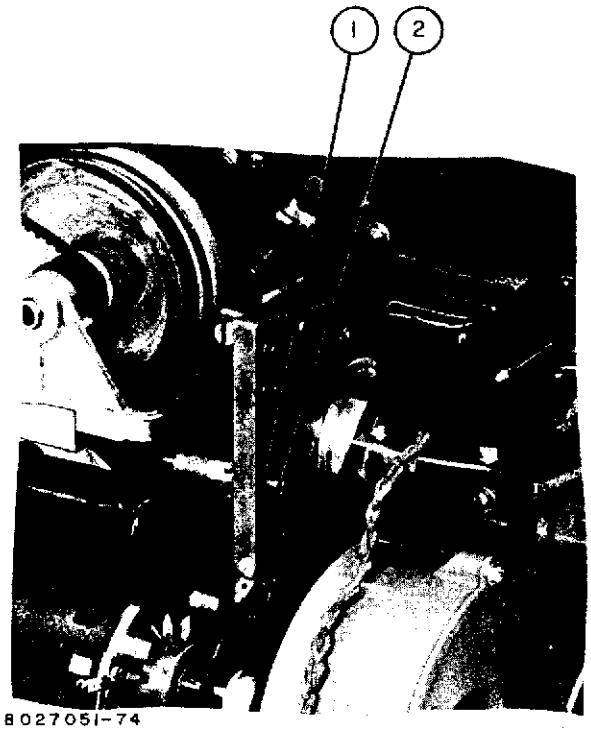
Claw Lateral Position Adjustment

1. Perform Rear Cover Removal Procedures.
2. Open lens gate and if necessary, unthread film from upper sprocket and push film forward.
3. From the rear of the projector, rotate drive pulley until teeth on claw protrude through aperture plate and are positioned at the top of the downward travel.
4. Slide thin side of claw lateral gauge between claw teeth and edge of lefthand rail. Gauge should pass freely.
5. Reverse gauge and insert thick side between claw teeth and edge of lefthand rail. Gauge should stick.
6. If claw lateral position needs adjusting, perform following steps.
7. On claw assembly, loosen setscrews 1 just enough to allow eccentric pin to turn.
8. Insert thin side of gauge between claw teeth and lefthand rail.
9. Insert screwdriver in eccentric pin 2 and turn clockwise until claw presses firmly enough against gauge to hold gauge in place.
10. Slowly turn eccentric pin counterclockwise until gauge drops out by its own weight.
11. Perform Claw Protrusion adjustment Procedures.



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Claw Travel Adjustment

To adjust the travel of the claw, perform the following procedures:

1. Perform Rear Cover Removal Procedures.
2. Perform Claw Travel Gauge Installation Procedures.
3. On front of projector, turn FRAME knob until framing beam (3) is centered between C-washers on framing screw. Check adjustment of eccentric screw on beam framing assembly. Refer to Beam Framing Assembly Removal Procedures.
4. Rotate drive pulley until claw protrudes through aperture plate and engages pawl on travel gauge shaft. It may be necessary to pull shaft down to engage claw teeth. At this point of claw travel the shutter blade should be covering the lower half of the aperture plate opening.
5. Loosen knurled thumb screw on side of gauge and zero outer scale.
6. Rotate drive pulley counterclockwise until claw moves to bottom of claw travel slot. At this point of claw travel, the shutter blade should be covering the upper half of the aperture plate opening. Proper claw travel should be .2985 (+.001 or -.000).

NOTE: If the claw travel is more or less than specified in step 6, perform the following steps.

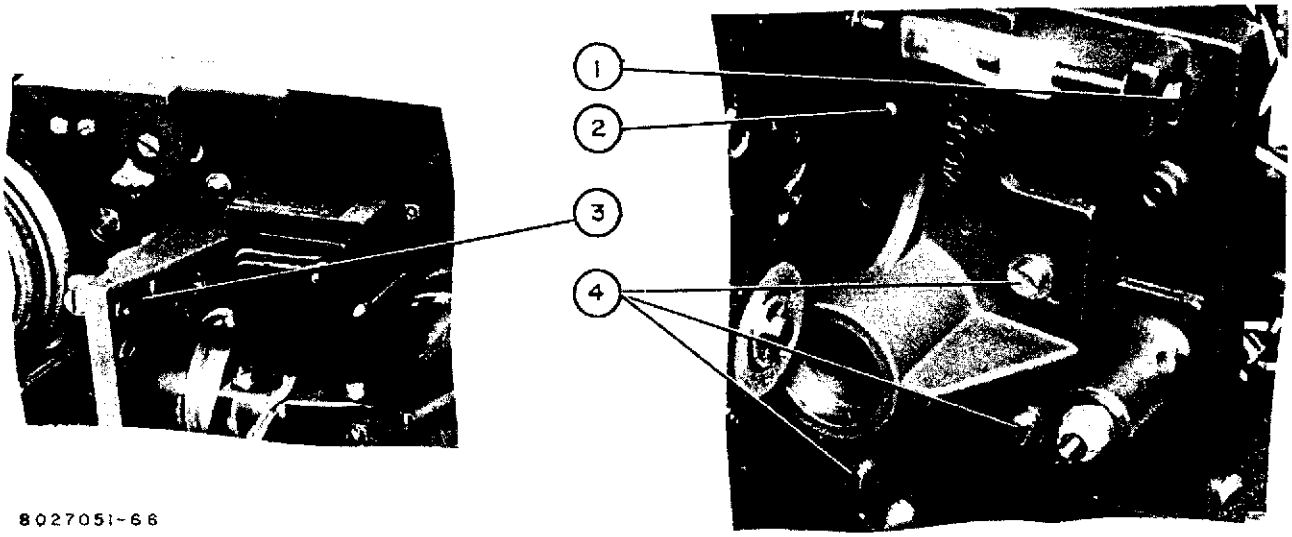
4. Loosen three lock screws (4) on front of cam-hanger assembly and one lock screw (2) on shutter side of back plate assembly. Do not loosen excessively.

8. If claw travel was less than .2985 (+.001 or -.000), rotate claw travel screw (1) clockwise. If travel is more, rotate claw travel screw (1) counterclockwise. About 1/2 turn of the claw travel screw is equal to .001 inch of claw travel. Rezero and recheck claw travel after each adjustment of the claw travel screw.

9. When proper claw travel is obtained, retighten screws loosened in step 7 and recheck claw travel.

10. Remove claw travel gauge and replace left-hand rail on aperture plate. Make certain that rail lies against side of rail on aperture plate. Recheck lateral position of the claw.

11. Replace Rear Cover.



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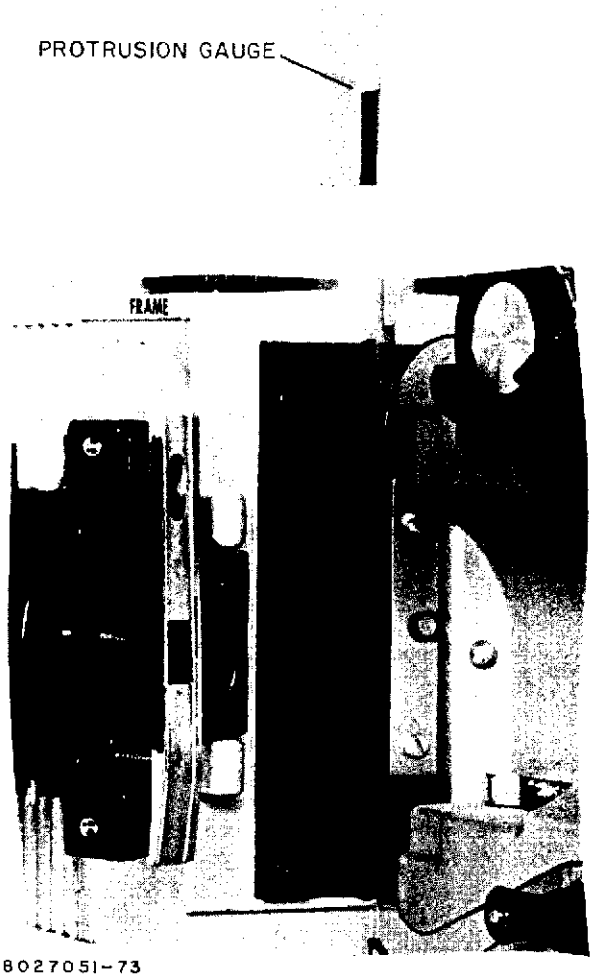
Claw Protrusion Adjustment

1. Perform Claw Lateral Position Procedures.
2. From rear of projector, rotate drive pulley until teeth on claw protrude through aperture plate and are positioned approximately halfway down in its travel.
3. Insert Protrusion Gauge into top of aperture plate, as shown, with HIT side out.
4. Slide gauge down through aperture plate. Gauge should just hit claw teeth. If claw is misadjusted, perform following steps.
5. On eccentric pin shaft, move claw assembly in or out as needed and simultaneously slide gauge up and down until gauge just hits teeth.
6. Lock one setscrew and turn gauge around exposing CLEAR and slide gauge past claw. When properly adjusted, claw teeth will clear the gauge.
7. Tighten other setscrew and recheck HIT and CLEAR and recheck LATERAL position.

NOTE: If the proper claw protrusion cannot be obtained, it may be necessary to install an adjustment spacer (Stock Number 239684) on the worm gear shaft between the bushing and the cam-pulley assembly. To do this, remove the cam-pulley assembly from the worm gear shaft and install spacer. (Refer to Cam-Pulley Assembly for removal procedures.) Replace the cam-pulley assembly and perform the necessary claw assembly adjustment.



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7. Tighten other setscrew and recheck HIT and CLEAR and recheck LATERAL position.
8. Perform Claw Travel Adjustment Procedures.

REWIND CLUTCH ADJUSTMENT

To adjust the rewind clutch, perform the following procedures:

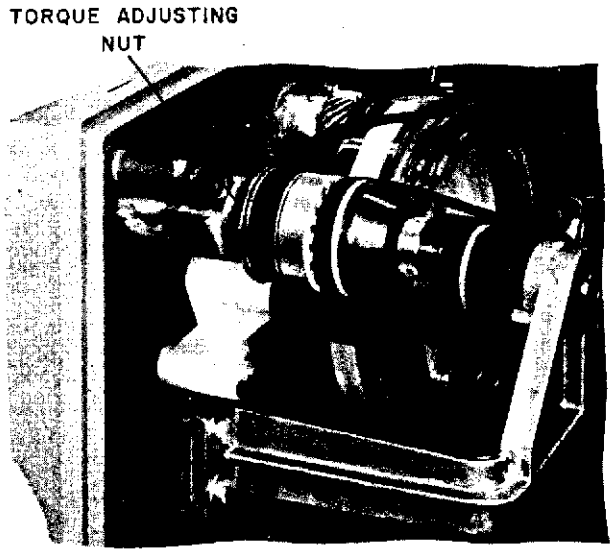
1. Perform Rear Cover Removal Procedures, but do not disconnect wires from rear cover.
2. Plug in power cord.
3. Raise front reel arm to operate position.
4. Place Rewind lever in rewind (UP) position.

   NOTE: There are two methods of adjusting the rewind clutch. If a torque wrench calibrated in inch pounds and an adapter is available for adjusting the torque of the rewind clutch, perform steps 5 through 8. If a torque wrench and adapter is not available, perform steps 9 through 13.

5. Attach torque wrench to front reel arm reel shaft.
6. Set function switch to REVERSE REWIND and observe torque indication. Proper torque should be 7 to 8 inch pounds.
7. To adjust torque, rotate torque adjusting nut for 7 to 8 inch pounds. Stop Projector.
8. Install a 2000 foot reel of film on rear reel arm and thread for rewind. Start Projector and rewind film completely and observe that film rewinds properly.
9. Attach a 1-1/2 pound weight to the edge of the 2000 foot reel as shown. A short length of cord or wire can also be used to suspend the weight from the reel. When using a cord or wire, suspend the weight approximately 6 inches from the edge of the reel.

   NOTE: Do not loosen torque adjusting nut more than one full turn or the flange will slip off shoulder of pulley.

10. Back the torque adjusting nut off slightly to decrease the existing torque setting.
11. Hold the reel and turn the projector to REVERSE REWIND and lift the rewind lever to rewind (UP) position.
12. Gradually release the reel and slowly adjust the torque adjusting nut until the weight moves from the lowest point to 90° of counterclockwise travel. Grasp reel, shut off projector, and remove weight.
13. Install a 2000 foot reel of film on rear reel arm and thread for rewind. Start Projector and rewind film completely and observe that film rewinds properly.



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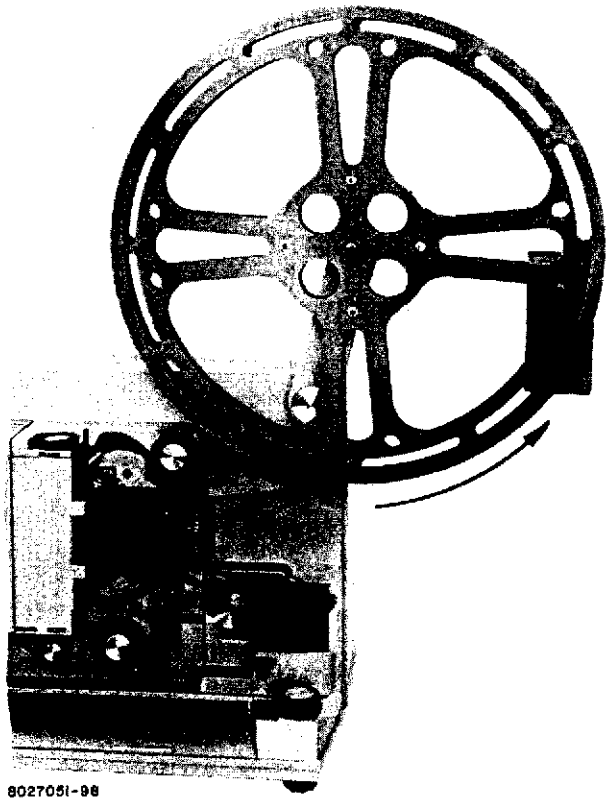
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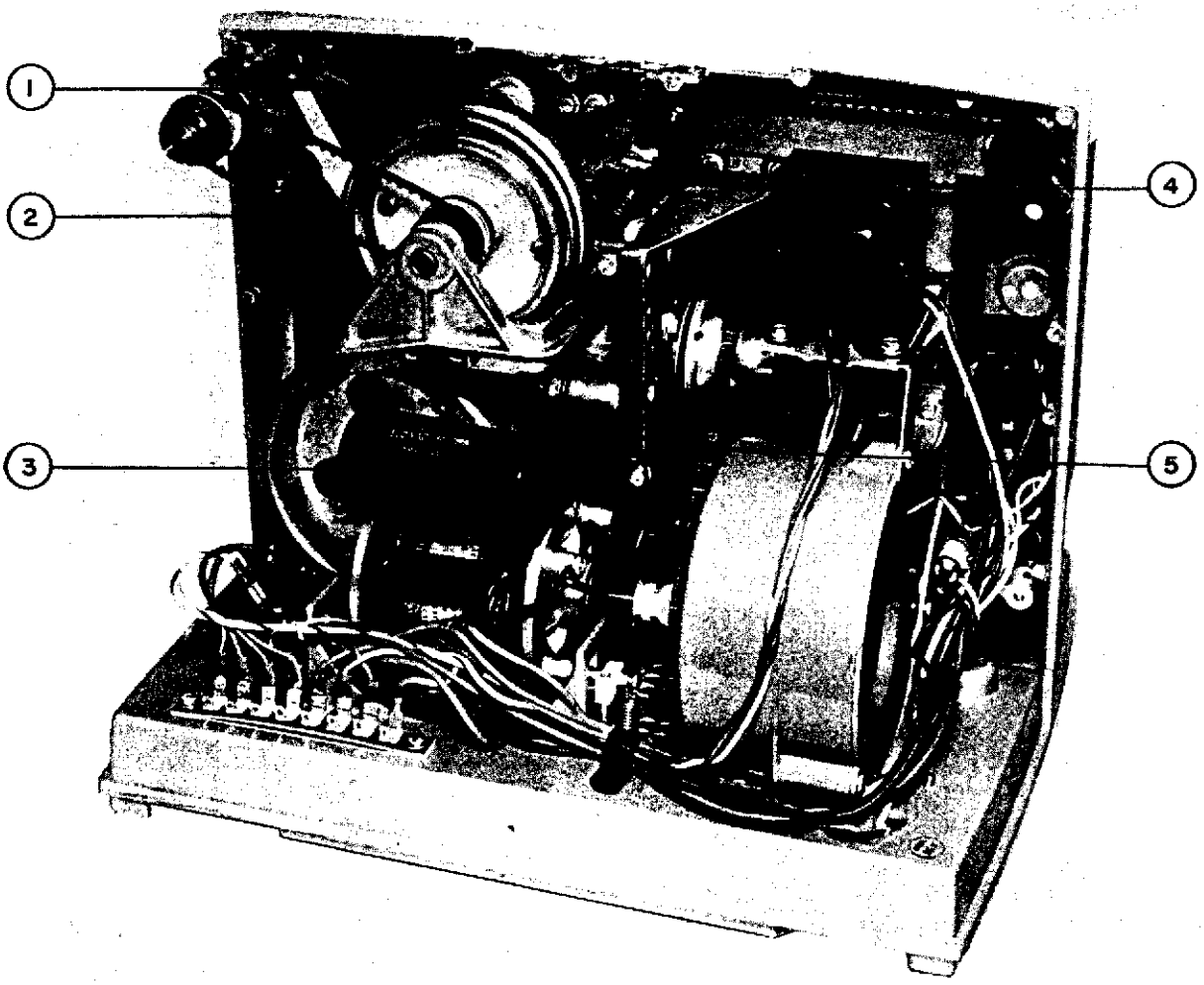
BELT REPLACEMENT AND ADJUSTMENT



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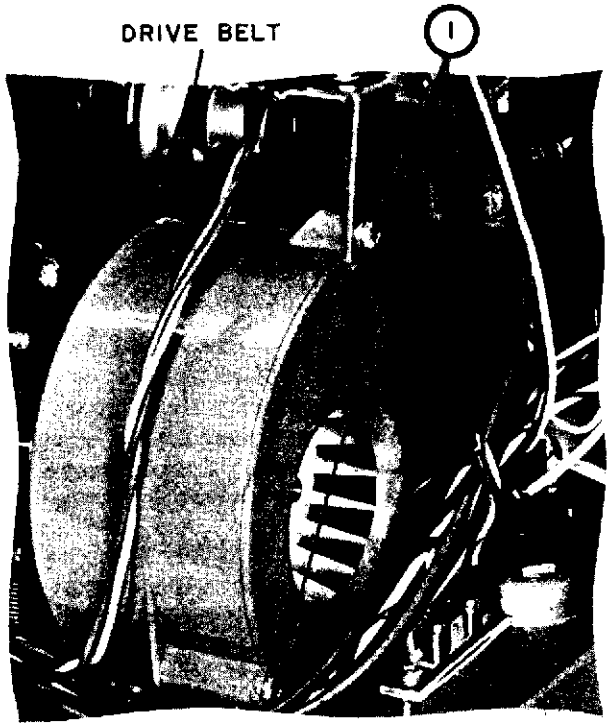
REPLACEMENT BELTS

Symbol	Stock No.	Drawing No.	Description
1	234342	3463410- 1	BELT - REWIND
2	234320	3463164- 3	BELT - REVERSE
3	234321	3463164- 4	BELT - LOWER SPROCKET DRIVE
4	234322	3463164- 5	BELT - FORWARD DRIVE
5	237743	3463410- 2	BELT - DRIVE, 60 CYCLE
5	239306	3463410- 3	BELT - DRIVE, 50 CYCLE
Not	234319	3463164- 2	BELT - REEL ARM FRONT
Shown	234318	3463164- 1	BELT - REEL ARM REAR

DRIVE BELT



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To replace the drive belt, perform the following procedures:

1. Perform Rear Cover Removal Procedures.
2. Remove three (3) mounting screws (1) from side of blower housing.
3. Lift motor to release tension on drive belt and slide belt off cam-pulley and through belt shifter.
4. Slide belt through blower assembly and over impeller.
5. To install new drive belt, reverse removal procedures. No adjustment is required.

REVERSE DRIVE AND REWIND BELT

To replace either the reverse drive or the rewind belt or both, perform the following procedures.

1. Perform Rear Cover Removal Procedures.
2. Remove Main Shaft Support. Refer to Main Shaft Support and Fluid Clutch Removal Procedures.
3. Remove reverse drive belt by rotating drive pulley and sliding belt over edge of pulley.
4. Remove rewind belt by sliding belt off rewind roller and fluid clutch.
5. To replace either belt, reverse removal procedures.

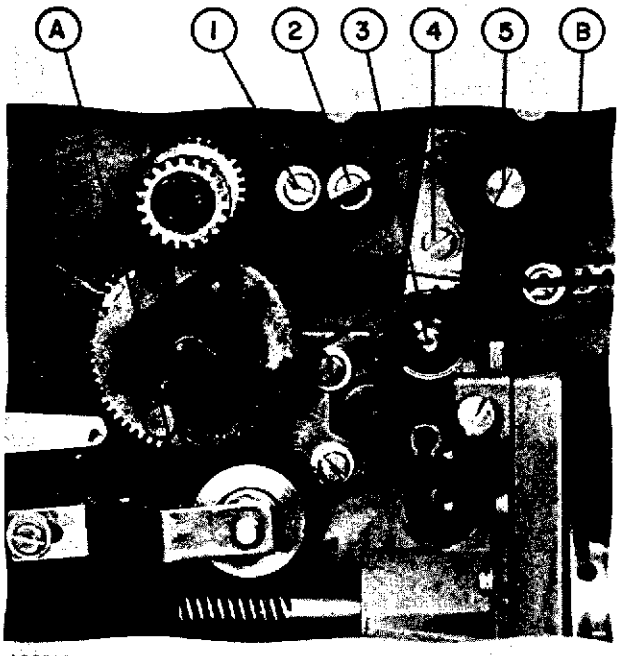
FRONT AND REAR REEL ARM BELTS

To remove and replace the front and rear reel arm belts, refer to the Reel Arm, Shaft, and Gear Assembly Removal Procedures and perform the applicable procedures.

FORWARD DRIVE BELT

To replace and adjust the tension of the forward drive belt, perform the following procedures:

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Loosen idler gear screw (5) and tension assembly pivot screw (4).
4. Slide forward drive belt B off rear reel pulley and remove belt.
5. Install new belt as shown.
6. Adjust tension assembly until firm finger pressure at point A will cause approximately 1/2 inch deflection in belt. Tighten pivot screw (4) and idler gear screw (5).
7. Replace parts removed in steps 1 and 2.



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LOWER SPROCKET DRIVE BELT

To replace the lower sprocket drive belt, perform the following procedures:

1. Perform Rear Cover Removal Procedures.
2. Perform Main Shaft Support and Fluid Clutch Removal Procedures.
3. Perform Flywheel Removal Procedures.
4. Perform First Idler Gear Removal Procedures.
5. Perform Puck-Reverse Assembly Removal Procedures.
6. Perform Forward Drive Belt Replacement Procedures.
7. Loosen gear drive assembly screw (2) and remove screw (1). Push gear drive assembly up and tighten screw (2).
8. Slide lower sprocket drive belt (A) off gear on lower sprocket shaft off belt tensioner around worm gear and over upper sprocket drive gear.
9. Install new belt.
10. Loosen screw (2) and reposition gear drive assembly so that gear engages upper sprocket drive gear and tighten. Engagement should be snug but with preceptible backlash.
11. Replace parts removed in steps 1 through 6.

CLEANING AND LUBRICATION

CLEANING

If the Projector is to give consistently good performance, it must be kept clean at all times. Every time the Projector is put into operation after a long storing period or whenever the parts appear dirty, the following points should be dusted with a soft lint-free cloth or a camel's-hair brush:

1. Projection Lens
2. Reflector
3. Condenser Lens
4. Aperture Plate
5. Sound Optic Lens

Periodically, the items listed above should be inspected and thoroughly cleaned as follows:

CAUTION: Do not use carbon tetrachloride for cleaning any plastic parts in the projector.

a. Clean the upper and lower sprockets with a bristle brush moistened with isopropyl alcohol. Make sure that all dust and emulsion deposits are removed from sprocket teeth.

b. Open lens gate and clean the claw teeth, aperture plate, and film shoe with a bristle brush and soft cloth moistened with isopropyl alcohol.

c. Clean the sound drum with a soft cloth moistened with isopropyl alcohol.

d. Clean the pressure roller with a soft cloth moistened with isopropyl alcohol.

e. Remove the condenser lens and clean with lens paper or a soft lint-free cloth moistened with isopropyl alcohol.

f. Clean sound optic lens with lens tissue or a Q-Tip with lens cleaning fluid.

After 1000 hours of operation or at the annual preventive maintenance check period whichever occurs first or whenever the Projector is being serviced, a thorough inspection should be made of all bushing, bearings, belts, and other moving parts for excess dirt and signs of wear. Excessively dirty areas should be cleaned and lubricated. For the recommended types of lubricants, refer to Table 1. Worn or defective parts should be replaced and the necessary alignment and adjustment procedures performed.

LUBRICATION

The 16 MM Projector is designed to, under normal operating conditions, operate for a 1000 hours between lubrications. Table 1 contains a list of the lubrication points, the type of lubricant to be used, and in some cases the amount of lubricant.

Table 1. Lubrication Chart

Lubrication Point	Lubricant	Interval
Drive Gear Assembly	Light Grease, RCA Stock Number 205148	Light Smear every 1000 hours or when reassembling parts
Upper Sprocket Drive Gear	Light Grease	Light Smear every 1000 hours or when reassembling parts
Pulley/Ratchet Assembly (Front Reel Arm)	Light Grease	Light Smear every 1000 hours or when reassembling parts
Block/Slide, Speed Selector	Light Grease	Light Smear every 1000 hours or when reassembling parts
First Idler Gear and Worm Gear	Heavy Grease, Andok "C" No. 67510-24, Humble Oil and Refining Co.	Light Smear every 1000 hours or when reassembling parts
Tilt Mechanism Worm and Gears	Heavy Grease	Light Smear every 1000 hours or when reassembling parts

Table 1. Lubrication Chart (Continued)

Lubrication Point	Lubricant	Interval
Felt Oiler on Claw body	Gulf Semi Fluid "D"	3 drops every 1000 hours, once a year, or when servicing
All non bearinged shafts	SAE 30 Motor Oil (acid free)	1 to 2 drops every 1000 hours or once a year
Motor	SAE 30 Motor Oil	1 drop every 1000 hours or once a year
Film Shoe Pins (Lens Gate Assembly)	Light Non gumming oil (SAE 10 Motor Oil)	Light film every 1000 hours or when reassembling parts
Sound Pressure Roller	SAE 10 Motor Oil	1 to 2 drops every 1000 hours or once a year
Tension/Damper Assembly	Silicone fluid, Dow Corning Type 210, 300,000 C.S.	Re-saturate entire orifice every 1000 hours or when reassembling parts.
Rewind-puck Gear	Light grease	Very light smear every 1000 hours or when assembling parts.
In/Out Cam	Anderol 761	Clean cam thoroughly and light smear every 1000 hours or when assembling parts.

STANDARD AND SPECIAL TOOLS

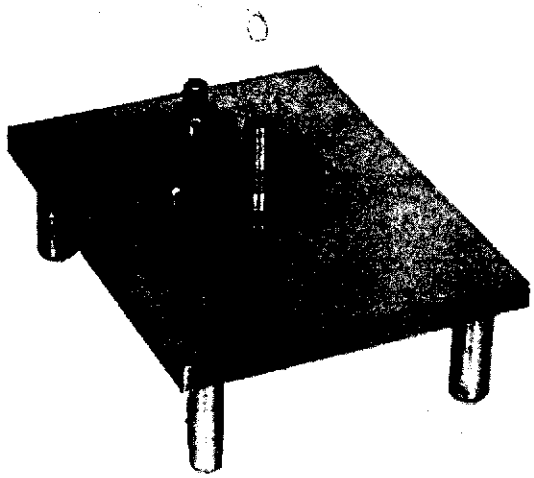
To aid the maintenance personnel in servicing the 16 MM Projector, the following list of standard hand tools, are recommended but not supplied. In addition, a list of the special tools, test fixtures, and gauges required to perform the various removal, replacement, alignment, and adjustment procedures necessary to maintain the Projector are provided. These special tools can be procured, under RCA Stock Number, from the Parts and Accessory Department, Deptford, New Jersey.

Standard Tools Required But Not Supplied

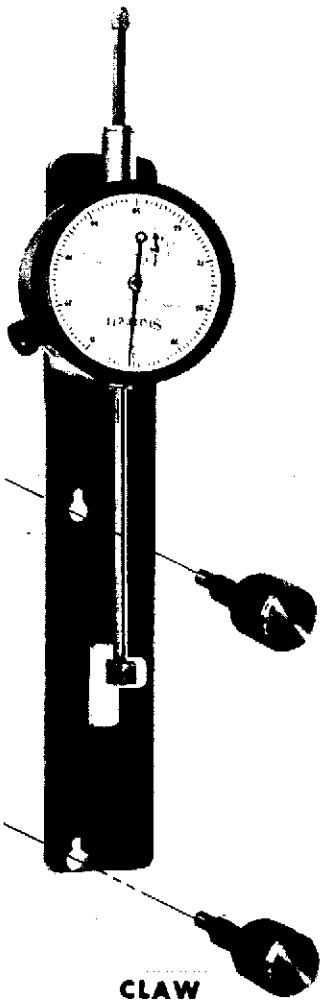
Tool	Manufacturer	Part Number	Purpose
Retaining Ring Pliers	Tru-ark	5100-25	Remove and install spring-type retaining rings.
C-Washer Applicators	Waldes	E-9, E-12, and XE-31	Install C-Washers.
Hand Crimping Tool	Amp		Install terminals on leads.
Allen Wrench (Modified)	Allen Head	Size 7/64	To adjust optic lens assembly.
Allen Wrenches (Regular and straight with long handle)	Allen Head	Assorted Sizes	To remove and replace gears, pulleys, etc. and perform various adjustments.
Torque Screw Driver	Richmont Products Cleco Div. Reed Roller Belt Co.	CAL. 30 RO ROTO TORQ	To torque first idler gear bracket.
Torque Wrench	Snap-on Tool Co.	TQ5-025-FU	Used to torque claw body on constant diameter cam.
Pressure Gauge	P. K. Neuses	N-300	Used to adjust side pressure of moveable rail on aperture plate assembly.
Torque Wrench	Snap-on-Tool Co.	TQE-3-FU	Used for checking and adjusting torque of rewind clutch.

Special Tools

Stock No.	Description
239749	Gauge - Tolerance - 0.002 in. thick
239750	Gauge - Tolerance - 0.003 in. thick
239751	Gauge - Tolerance - 0.005 in. thick
239752	Gauge - Tolerance - 0.010 in. thick
239745	Fixture and Adapter - Claw Torque (See Standard Tools for torque wrench)
239747	Spring Compressor - Worm Gear
239753	Gauge - Claw Protrusion (.040 - .045 inch)
242920	Gauge - Claw protrusion (.030-.035 inch)
239754	Gauge - Claw Lateral
239743	Gauge - Claw Travel
239744	Spanner Wrench - Sound Optic Lens
239746	Remover - Sprocket Shoe
239755	Clip - Solar Cell Mounting
239748	Shaft - Pulley-Clutch, Shutter, Cam Assembler

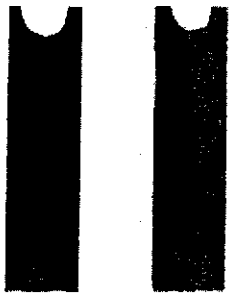


CLAW TORQUE WRENCH AND FIXTURE



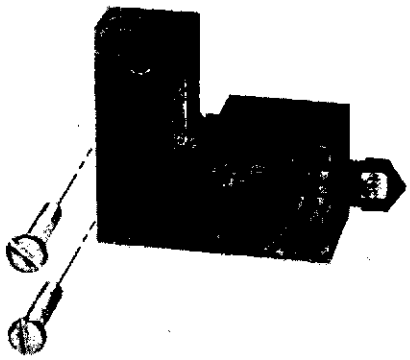
PROTRUSION GAUGE

LATERAL GAUGE

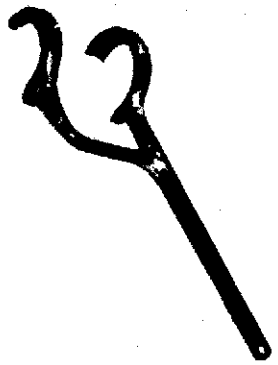


TOLERANCE GAUGES

CLAW TRAVEL GAUGE



WORM GEAR SPRING COMPRESSOR



SPANNER WRENCH

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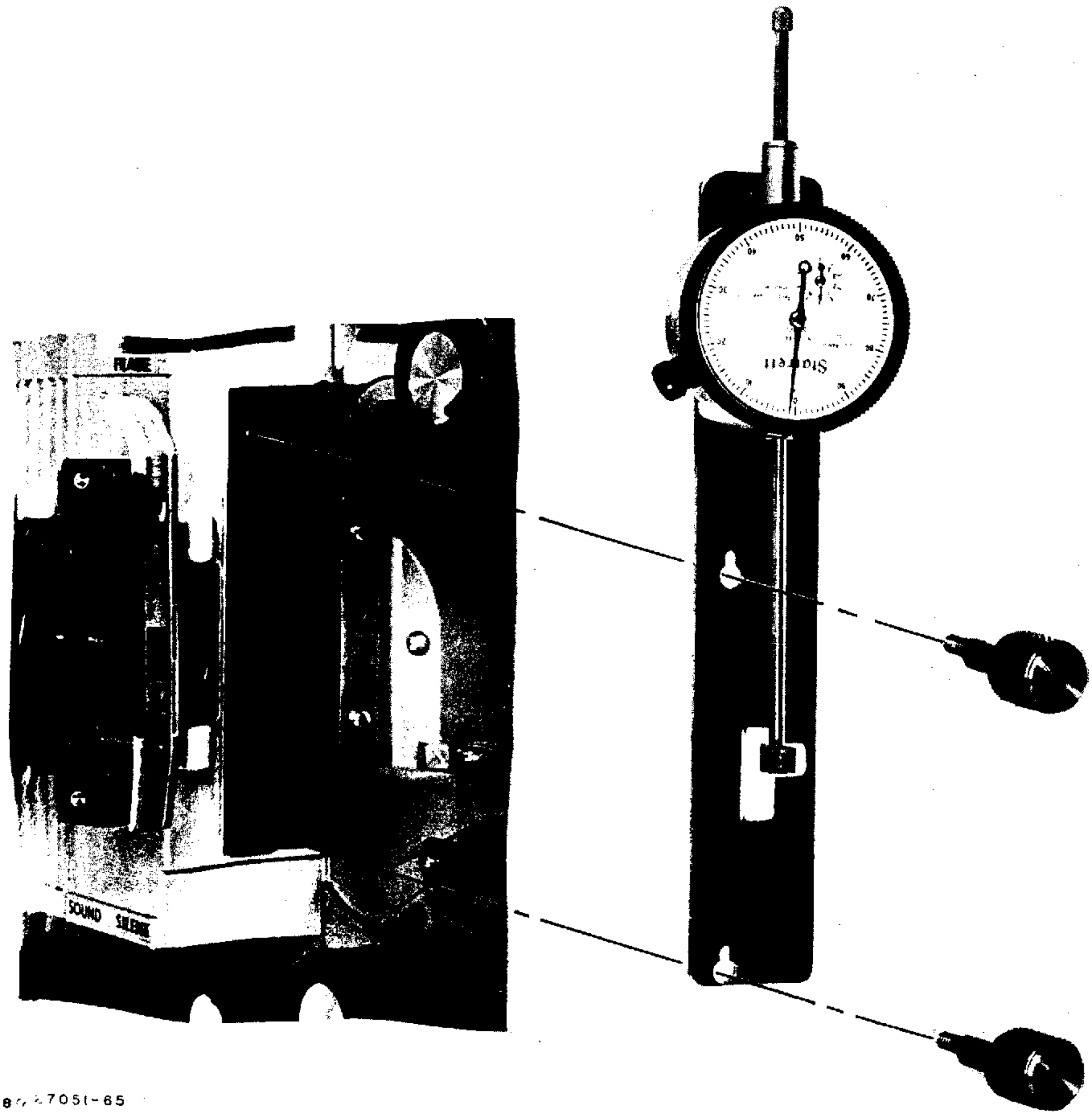
Figure 3. Special Tools

CLAW TRAVEL GAUGE INSTALLATION

To install claw travel gauge, perform the following procedures:

1. Open lens gate.
2. Lift take-up reel arm in to operating position.
3. Remove left-hand rail from aperture plate.
4. Install claw travel gauge with knurled screws provided with gauge as shown below.



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SERVICING AIDS

Since the 16 MM Projector is primarily a mechanical device, improper operation can easily be detected either visably or audibly during the running of a film. The following information and instruction have been prepared to aid maintenance personnel in troubleshooting and maintaining the Projector. The information is presented so as to provide the technician with a logical sequence of checks to localize the cause of a given effect to a specific area and the suggested corrective action necessary to restore the Projector to operating condition.

Projector

Symptom	Probable Cause	Correction
Weak Sound	Dust on optic lens	Clean
	Dust on solar cell	Clean
	Sound lamp defective	Replace
	Solar Cell loose or out of position	Reposition and glue
	Defective amplifier	Repair or replace
	Pressure roller arm bent or misadjusted	Repair or adjust (Refer to Buzz Track Adjustment)
No Sound	Fuse blown on underside of Projector (Check amplifier if condition continues)	Replace
	Sound lamp burned out	Replace
	Amplifier defective	Repair or replace
	Solar cell loose or out of position	
	Microphone Plug in jack	Remove plug
	Fuse blown on amplifier assembly (Indicates defective output transistor or shorted speaker cable)	Replace and repair amplifier
	Cable plugged into speaker jack	Remove plug
Distorted Sound	Dirty optic lens	Clean
	Dirty or defective solar cell	Clean or replace
	Pressure roller arm bent or misadjusted	Repair and adjust (Refer to Buzz Track Adjustment)
Unsteady Sound (Wow or flutter)	Film not threaded properly	Rethread
	Sound drum dirty	Clean drum
	Pressure roller dirty or binding on shaft	Clean and lubricate
	Damper arm out of position or binding	Readjust
	Damper roller binding on shaft	Clean and lubricate
	Locknut on sound drum shaft not adjusted properly	Readjust (Refer to removal procedures)
	Puck assembly dragging on flywheel	Readjust (Refer to removal procedures)
No Picture	Projection lamp burned out, missing, or not seated properly in socket	Replace or install corcorectly
	Defective function switch	Replace
Lose Both Loops	Worn or defective sprocket shoes	Replace
	Reel arm shafts binding	Repair
	Improper reels	Replace
	Upper sprocket loose on shaft	Tighten sprocket

SERVICE AIDS (Continued)

Symptom	Probable Cause	Correction
Loses Lower Loop	Broken sprocket holes	Cut out and splice film
	Bad splice	Resplice
	Film binding in lens gate	Check for thick splices or adjustment of rails
	Dirty Claw	Clean dirt and emulsion from teeth
	Claw travel extremely low	Adjust (Refer to Claw Travel Adjustment)
Improper Takeup (Forward)	Reel arm shafts binding or gears loose on shafts	Repair or tighten gears
	Forward drive belt adjusted to tight or to loose	Readjust (Refer to Forward Belt Replacement)
	Drag pad on main shaft support missing or worn	Replace pad
Improper Takeup (Forward and Reverse)	First Idler gear not adjusted for proper backlash	Readjust (Refer to removal procedures
	Gears loose on reel arm shafts	Check and tighten
Film Spills of Supply (Front) Reel.	Ratchet assembly binding on rewind clutch	Replace ratchet plate, hub linger, or hub pulley of rewind clutch (Refer to Pulley/Ratchet Assembly Removal)
Clicking Noise in Rewind	Ratchet assembly binding on reverse takeup drive.	Replace ratchet plate, hub liner, or hub pulley of rewind clutch (Refer to Pulley/Ratchet Assembly Removal)
Film Noise	Claw travel excessive	Adjust claw for travel, protrusion, and lateral position
	Film shoe out of adjustment	Adjust film shoe (Refer to Film Shoe Adjustment)
Mechanical Noise	Check Cam Torque (Too loose)	Perform Claw Torque Adjustment
	Check overall Projector	
Picture Unsteady (Weave or Jitter)	Claw misadjusted (Travel low)	Check Claw for travel, protrusion, and lateral position
	Dirty Claw	Clean claw teeth
	Film Shoe misadjusted	Adjust film shoe (Refer to Film Shoe Adjustment)
	Dirt in aperture assembly	Clean aperture assembly
	Right hand rail binding or insufficient pressure	Clean and check pressure
	Film shoe pins dirty or lower black misadjusted	Clean and adjust (Refer to Lens Gate Assembly)
	Lens gate not latched securely	Check lens gate stop.
	Defective film	Check film
	Improper film threading	Check threading
	Claw Cam worn	Check claw torque (Refer to Claw Torque Adjustment)

SERVICE AIDS (Continued)

Symptom	Probable Cause	Correction
Picture indistinct or illumination low	Projection lens dirty Condenser lens dirty or missing Condenser lens incorrectly assembled Projection lamp defective Low line voltage	Clean Clean or replace Check Lens (Refer to Condenser lens removal) Check or replace Check line voltage
Film Scratched	Film rails dirty, damaged, or out of adjustment Aperture plate dirty or damaged Guide roller dirty or dragging Pressure roller dirty or binding Emulsion hardened on film shoe Emulsion hardened on sprocket shoes	Clean, replace, or adjust rails. (Refer to Aperture Plate Assembly Removal) Clean or replace Clean and lubricate Clean or replace Clean Clean
Improper Rewind	Rewind belt worn or oil on belt Rewind clutch out of adjustment Gears loose on front reel arm shafts. Excessive drag in rear reel arm assembly	Replace Adjust (Refer to Rewind Clutch Adjustment) Check and tighten Check shafts and belt tension
Improper film take-up at sound drum in REVERSE	Oil on grease on surface of Puck-Reverse drive pulley tire. Puck-reverse drive pulley tire worn. Puck-reverse drive pulley does not engage flywheel hub. Sound drum shaft binding Lower sprocket loose on shaft	Clean surface of tire and flywheel with alcohol Replace tire Check and readjust (Refer to Puck-Reverse Removal Procedures) Adjust locknut on Sound drum shaft. (Refer to Sound Drum and Flywheel removal) Tighten sprocket
High hum in amplifier	Defective filter capacitor C115	Change filter capacitor C115

Safe Threader

Symptom	Probable Cause	Correction
Leader wraps around upper sprocket, instead of entering threading track.	Excessive curl on end of leader.	Make sure that leader does not have excessive curl. If curling is apparent, replace or straighten leader.

Symptom	Probable Cause	Correction
Leader exits from bottom of the "lens gate assembly" and spills out instead of feeding into lower section of "Safe Threader".	Film shoe pressure misadjusted.	Check pressure adjustment of "film shoe". Reference page 54 of IB-8027051 for adjustment procedure.
Leader exits between sound drum pressure roller arm and exciter lamp cover.	Excessive curl on end of leader.	Check reverse curl of leader and straighten if so indicated.
Leader hits sound optical lens and stops threading operation.	Space between exciter lamp cover and sound drum to large	Adjust gap between exciter lamp cover and sound drum for .018 inch to .036 inch. The gap adjustment may be made by changing slightly, the vertical position of the exciter lamp cover pivot pin. Otherwise, a slight relocation of the pivot pin either to the right or left will make the gap adjustment. The movement of the pivot pin may be made with a pliers or a gentle tapping.
Threading operation stops after leader has passed by sound drum	Incorrect film shoe pressure.	Adjust set screw "C", reference page 54, for increase of film shoe pressure. (This increase of pressure is at the bottom end of the film shoe).
Hesitation to let leader pass by stainless steel film path guide located immediately after sound drum.	Film path guide misadjusted.	Increase deflection angle of stainless steel film path guide adjacent to the lower side of sound drum.
Leader catches in recess of projector body which contains stainless steel film path guide under damper assembly.	Stainless steel film path guide not properly install in recess.	Remove film path guide and reinstall with guide as close to top of recess to eliminate gap.
Film stoppage at lower film shoe.	Filmguide along outer edge of film shoe worn off.	Replace shoe with new part, stock number 234336. Refer to IB-8027051 for installation instructions.
Increase in wow and/or flutter.	Improper pressure of pressure roller arm	Check clearance of pressure roller arm and upper guide section of the exciter lamp cover and adjust.

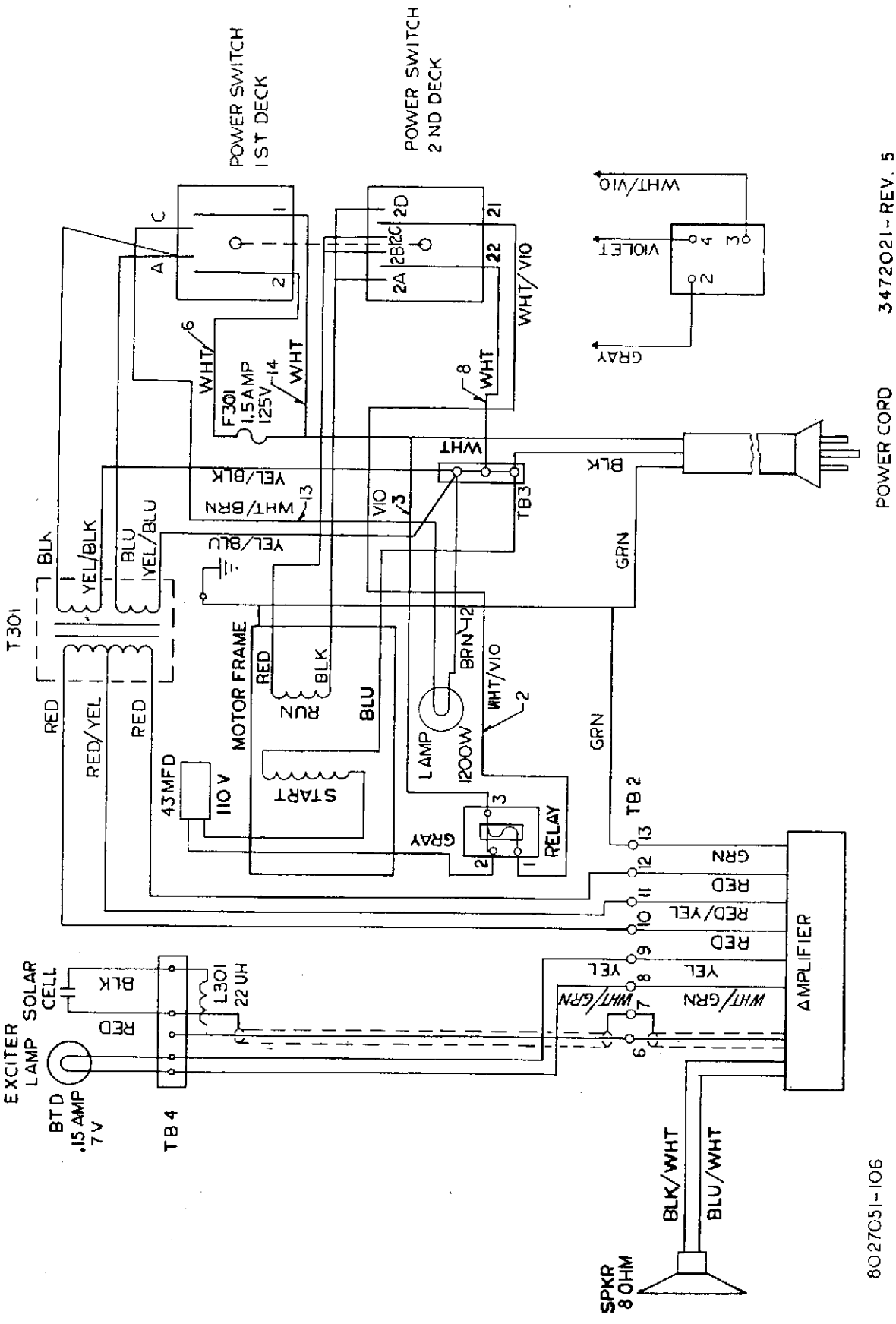
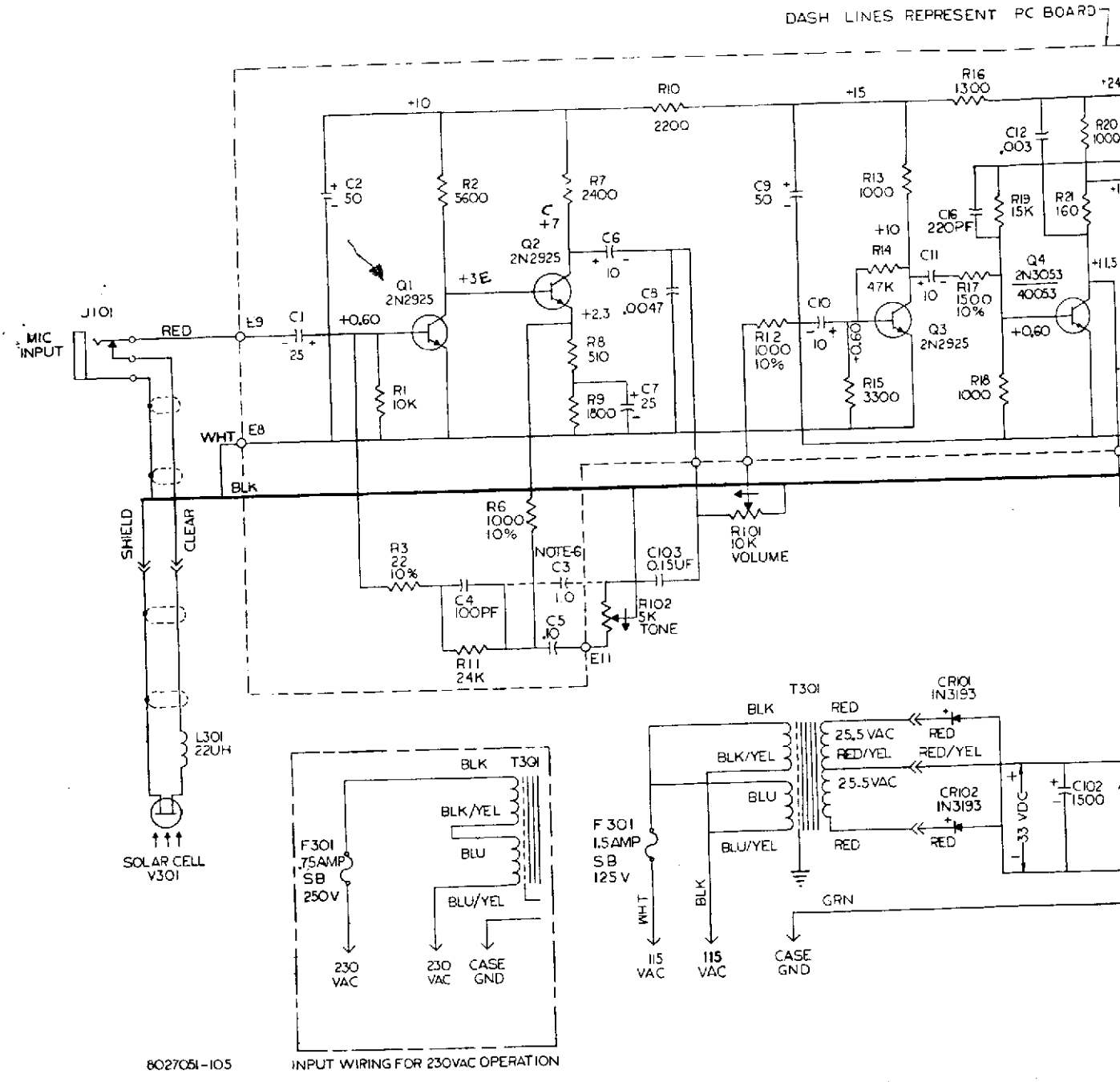
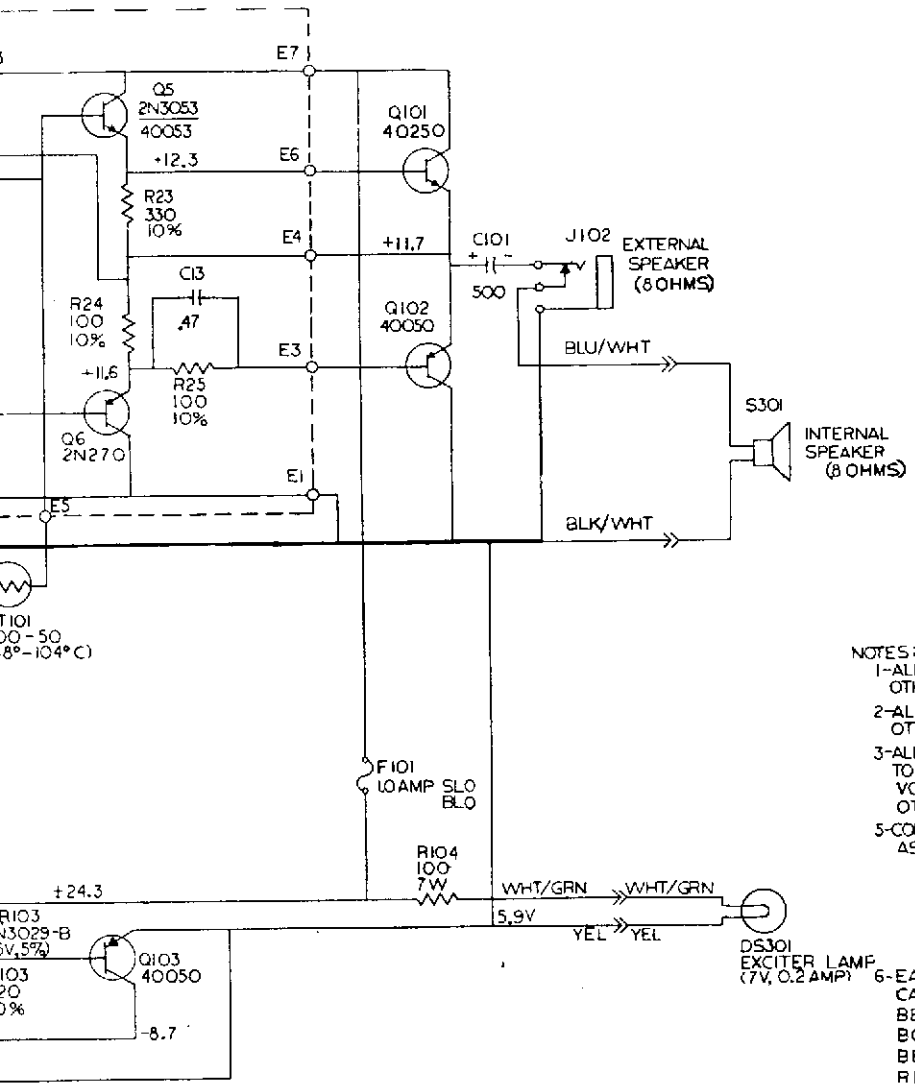


Figure 4. Wiring Diagram of Projector MI-35051-A, MI-35051-AF, and MI-95053-F

Part one (Left Side)





NOTES:
1-ALL RESISTORS TO BE 1/2W, ±5%, UNLESS OTHERWISE SPECIFIED.
2-ALL CAPACITOR VALUES ARE IN UF, UNLESS OTHERWISE SPECIFIED
3-ALL VOLTAGES ARE DC, MEASURED WITH RESPECT TO CASE GROUND WITH A HIGH-IMPEDANCE VOLTMETER, WITH NO INPUT SIGNAL, UNLESS OTHERWISE SPECIFIED
5-COMPONENT DESIGNATIONS REFLECT LOCATIONS AS FOLLOWS:
1 THRU 99 LOCATED ON PRINTED CIRCUIT BOARD (3454621-503)
100 SERIES LOCATED ON HEATSINK (3458067-501)
300 SERIES LOCATED OUTSIDE OF AMPLIFIER ASSY (MAIN ASSY)
6-EARLY MODEL AMPLIFIERS INCORPORATED CAPACITOR C3 IN PLACE OF C103. WHEN C3 BECOMES DEFECTIVE CLIP C3 FROM PRINTED BOARD AND INCORPORATE C103 (STOCK NO. 232934) BETWEEN THE TERMINALS OF RESISTORS R101 AND R102 AS SHOWN ON SCHEMATIC.

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Figure 5. Amplifier Schematic Diagram