

FILM-TECH

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INSTRUCTION MANUAL

BALLANTYNE PRO-70

Special Application Cinema Projector



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PREFACE

THIS 70mm PROJECTOR is designed and manufactured by Ballantyne of Omaha, Inc. for use in special application cinema presentation. It includes all proven features and durability of Ballantyne projectors manufactured for the general motion picture exhibition industry.

THE MAIN FRAME is designed for ruggedness and simplicity. All driving gears are contained within the main frame and submerged in oil. No gears are visible on the drive side of the projector. The mechanism has been designed with roominess for ease of threading, operation, service, and cleaning. Film wearing parts can be removed and replaced with great ease.

THE CONICAL SHUTTER is positioned close to the aperture for highest light efficiency. Aperture plates, for any ratio, are easily replaced. The bi-directional lens holder is designed to accept four inch and 2-25/32 inch diameter lenses with complete prefocusing facilities. The lens mount is of heavy, rugged cast iron construction to add weight and bulk for positive anchorage and elimination of any fragility. The lens carriage is positioned on its base with double V lens slides on each axis with micro adjustments.

THE INTERMITTENT MOVEMENT is designed for continuous duty with a large star and cam. The starwheel shaft features a unique webbed Geneva gear for long life and positive registration.

THE FILM GATE and trap are made as a subassembly for correct alignment. The three-part segmented pressure pad assembly permits a stable focal plane at the film aperture. The separate intermittent shoe assembly is spring loaded independently of the pressure pad to minimize picture jump.

THE FILM TRAP includes a cooling plate and ducting to permit connection to a water circulator for improved cooling at high wattages.

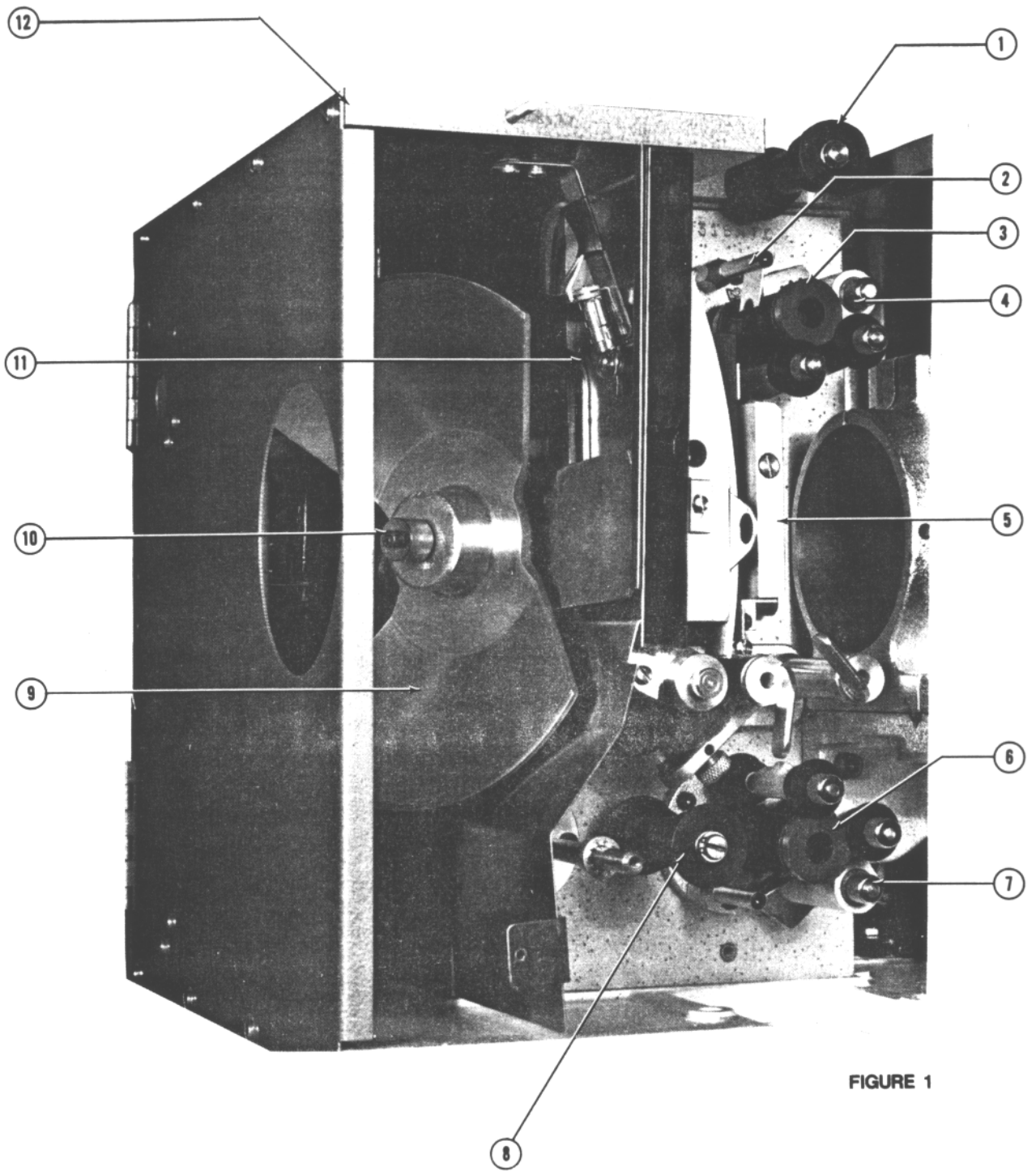


FIGURE 1

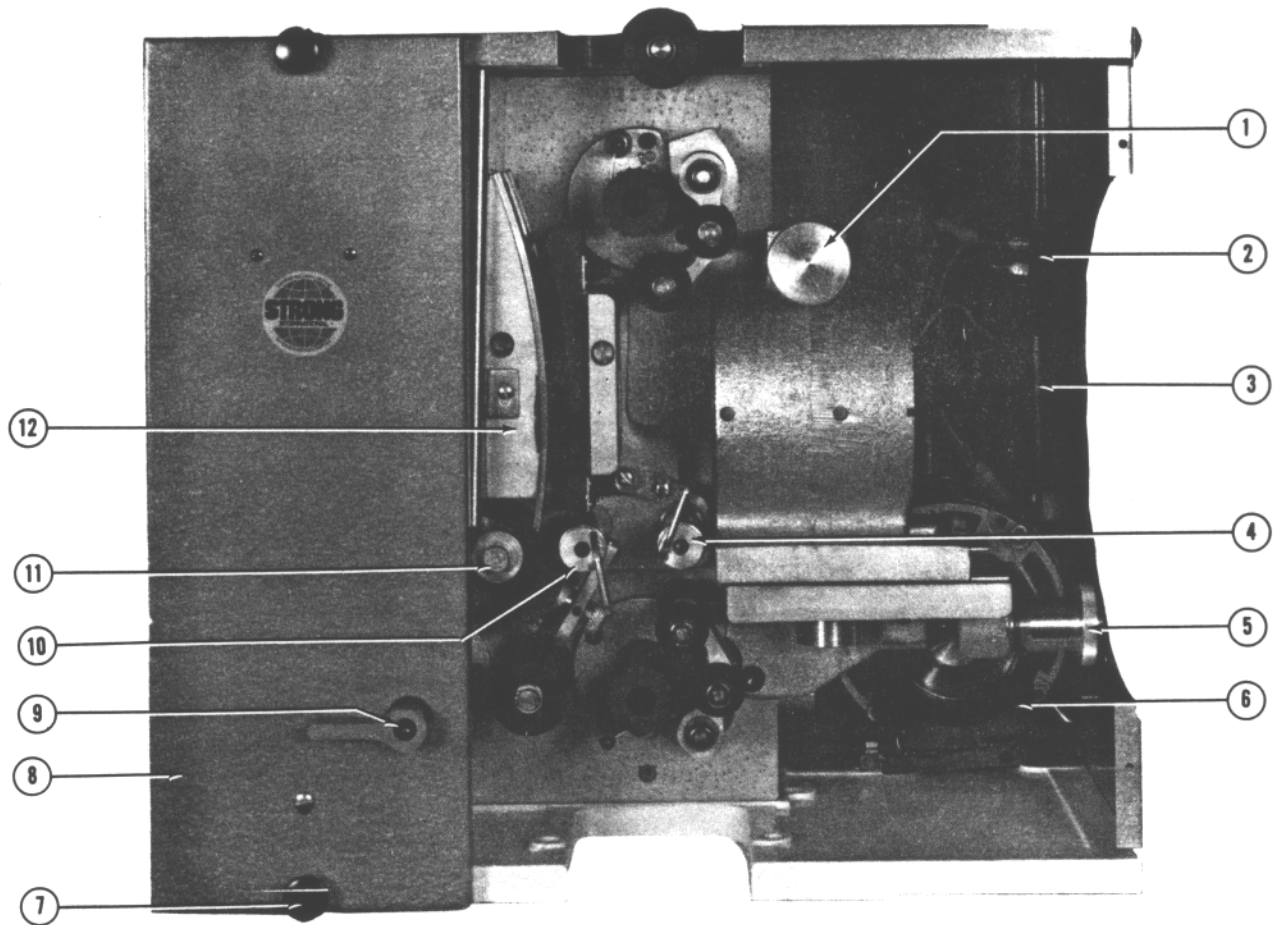


FIGURE 2

FIGURE 1

<u>Item</u>	<u>Description</u>
1	Upper Guide Roller
2	Film Stripper
3	Feed Sprocket
4	Upper Pad Roller Assembly
5	Film Gate Assembly
6	Holdback Sprocket
7	Lower Pad Roller Assembly
8	Lower Guide Roller
9	Shutter
10	Shutter Retaining Bushing
11	Framing Lamp
12	Top Plate

FIGURE 2

<u>Item</u>	<u>Description</u>
1	Lens Clamping Knob
2	Motor Capacitor
3	Motor Capacitor
4	Gate Release Lever
5	Focus Knob
6	Inching Knob, Projector Drive Motor
7	Quarter Panel Mounting Knob
8	Quarter Panel (Shutter Guard)
9	Framing Lever (Some Models; as req'd.)
10	Intermittent Shoe Release Lever
11	Intermittent Sprocket Assembly
12	Film Trap Assembly

OPERATOR ADJUSTMENTS & MAINTENANCE

THIS PROJECTOR includes **no** provision for correcting picture framing when the machine is running. It is the responsibility of the operator to correctly frame the picture, with the intermittent sprocket at rest, prior to each performance.

THE PAD ROLLERS must be maintained in a position (2) film thicknesses from the face of the sprockets. Pad rollers are set in the following manner:

1. The inner pad roller (closer to the pivot shaft) is mounted on an eccentric shaft. Loosen the set screw retaining this eccentric shaft and rotate the pad roller away from the sprocket.
2. Close the pad rollers. Check for (2) film thicknesses at the outer pad roller.
3. If incorrect (too close or too far), loosen the set screw locking the pivot shaft and correct the pad roller position. Retighten the set screw.
4. Rotate the inner pad roller to a position matching that of the outer pad roller. Retighten the eccentric shaft set screw.
5. Make certain the pad rollers are centered over the sprocket, and that the roller flanges are not bearing on the sprocket.

ALL PAD ROLLERS must be cleaned on **at least** a daily basis. Inspect the pad rollers in the course of the cleaning. If a pad roller develops a flat spot, or a cut in the flange, replace it immediately.

FILM SPROCKETS must also be cleaned on the same interval. Replace any sprocket with a broken or hooked tooth.

A TOOTHBRUSH is an excellent tool for the above cleaning operations.

THE FILM GATE and trap must be cleaned as frequently as the daily performance schedule permits. Use a clean, dry cloth to remove all dirt, wax, and film residue.

THE PRESSURE PAD ASSEMBLY may be removed from the film gate by removing the mounting screw from the side of the assembly. Align the pressure pad assembly carefully to the (2) pins when reinstalling.

THE TENSION SPRINGS on the film gate and intermittent shoe assembly may be adjusted while the machine is running. **Do not overtighten these springs.** The optimum tension setting is a steady picture with minimum transport noise. If this setting cannot be accomplished, inspect the pads and shoes for wear. These are film wearing parts, and can be easily replaced.

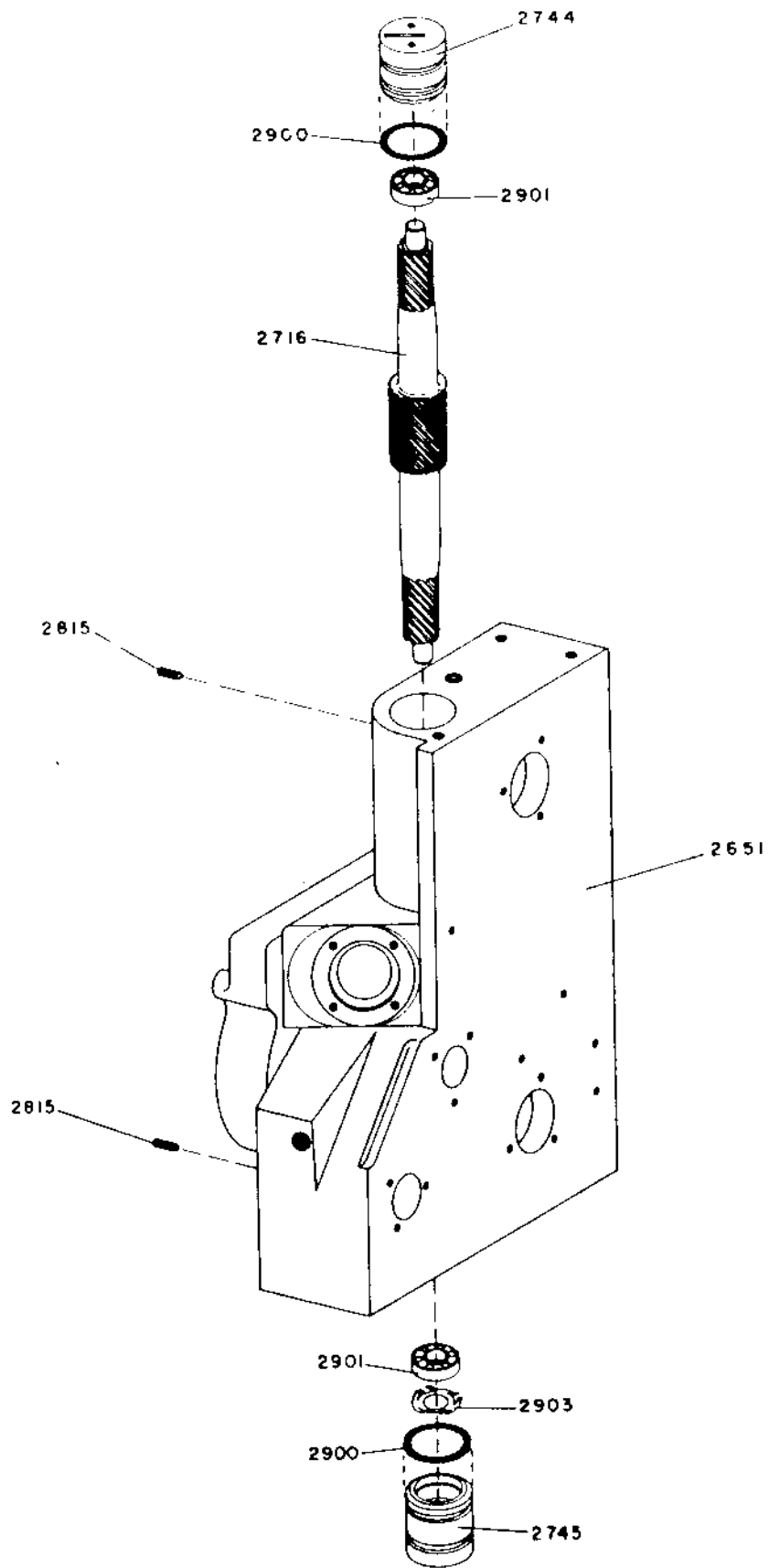
THE PROJECTOR DRIVE MOTOR is permanently lubricated. The drive belt, however, is subject to wear and should be inspected periodically. Replace as required.

CHANGE THE PROJECTOR OIL every (6) months of normal operation. Use **only the projector oil supplied by Ballantyne.** Order Part No. 21-98126.

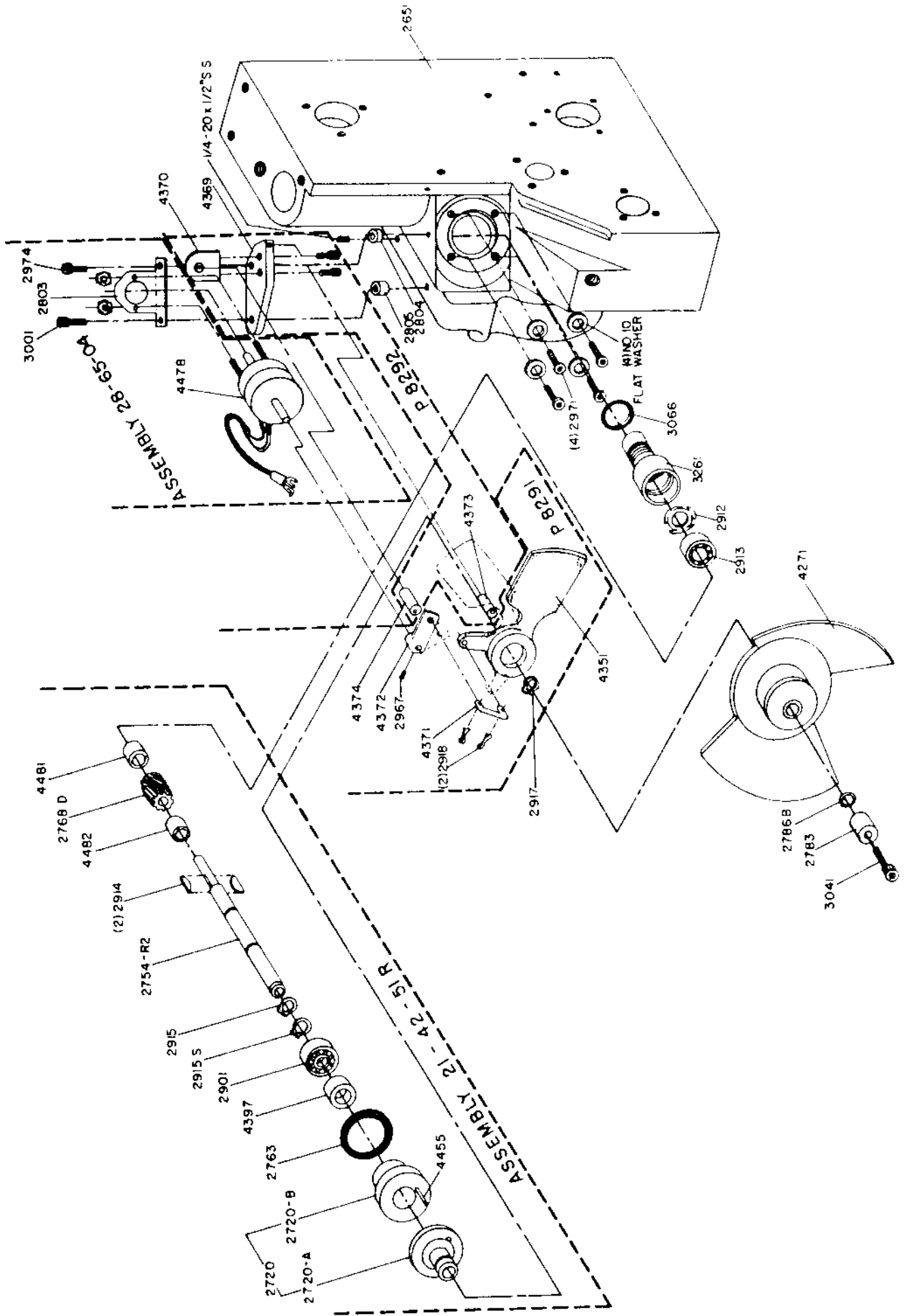
A MIS-TIMED SHUTTER will cause flicker or "ghosting" on screen. The shutter timing can be corrected as follows:

1. Remove the rear quarter panel behind the film trap to expose the shutter.
2. Loosen the socket head cap screw retaining the shutter to the shutter shaft, allowing the shutter to "free wheel".
3. Rotate the mechanism by hand to bring the intermittent sprocket to the rest position. Mark (1) sprocket tooth using a screwdriver tip or a pocket scale, and advance the intermittent sprocket **2-1/2** teeth. This indicates that the intermittent movement is at center travel.
4. Align the center of one of the shutter blades to the center of the aperture of the film trap. Secure the shutter to the shutter shaft by retightening the socket head cap screw.
5. Replace the rear quarter panel.

THE INTERMITTENT MOVEMENT is assembled by trained personnel using specially made tools and fixtures. **Contact the factory before attempting any field repair of the intermittent movement.**

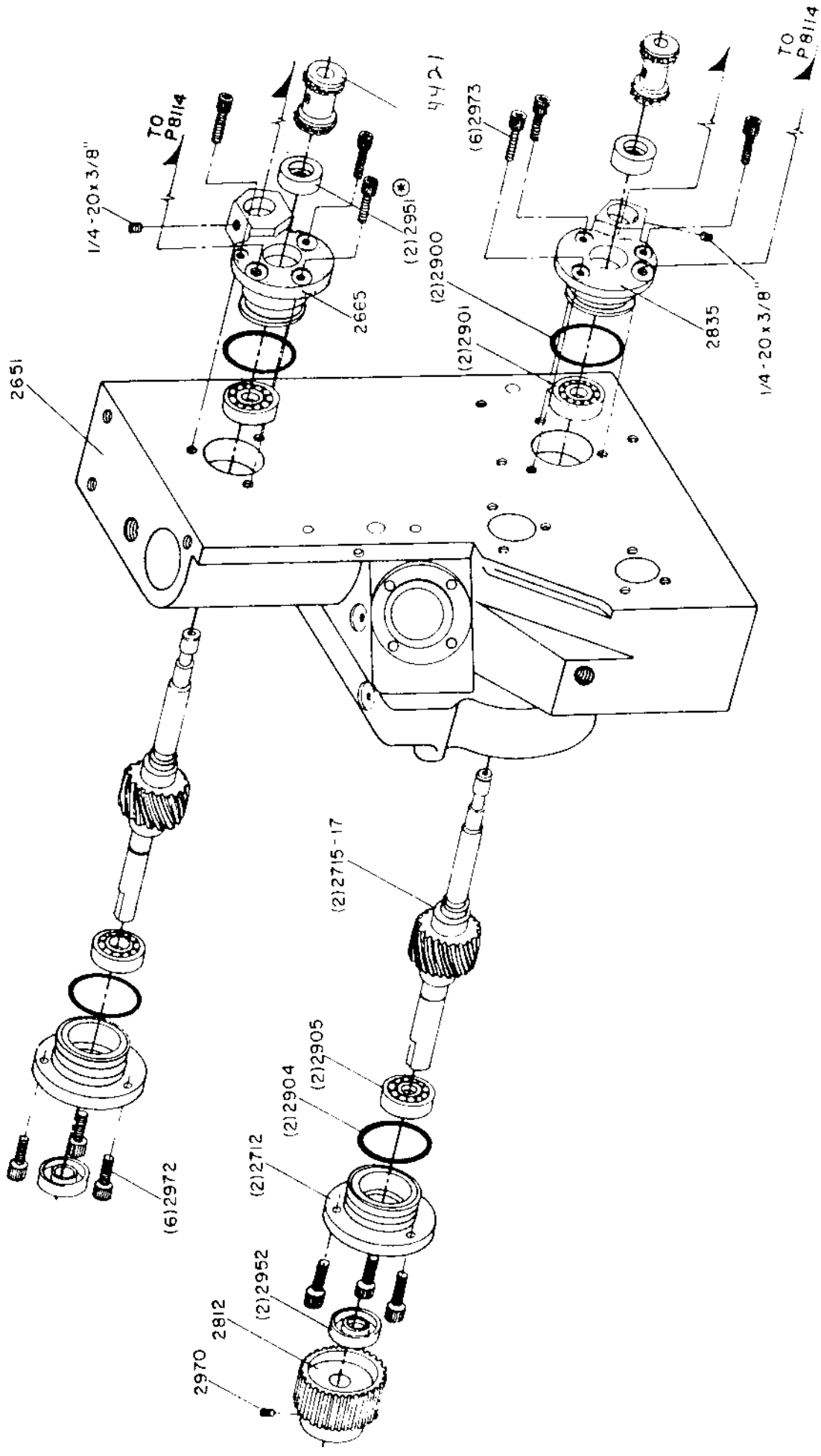


VERTICAL SHAFT ASSEMBLY

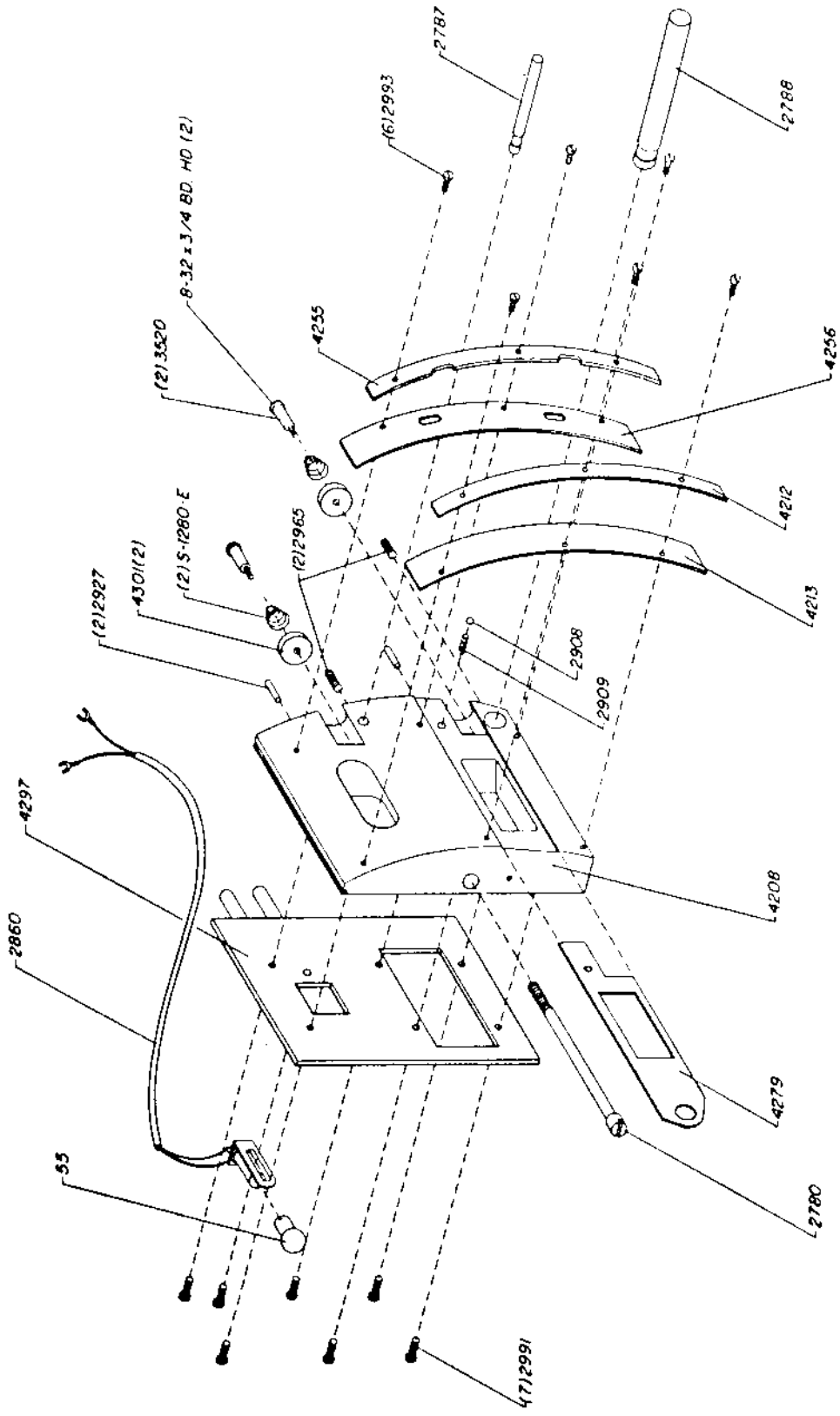


SHUTTER SHAFT ASSEMBLY

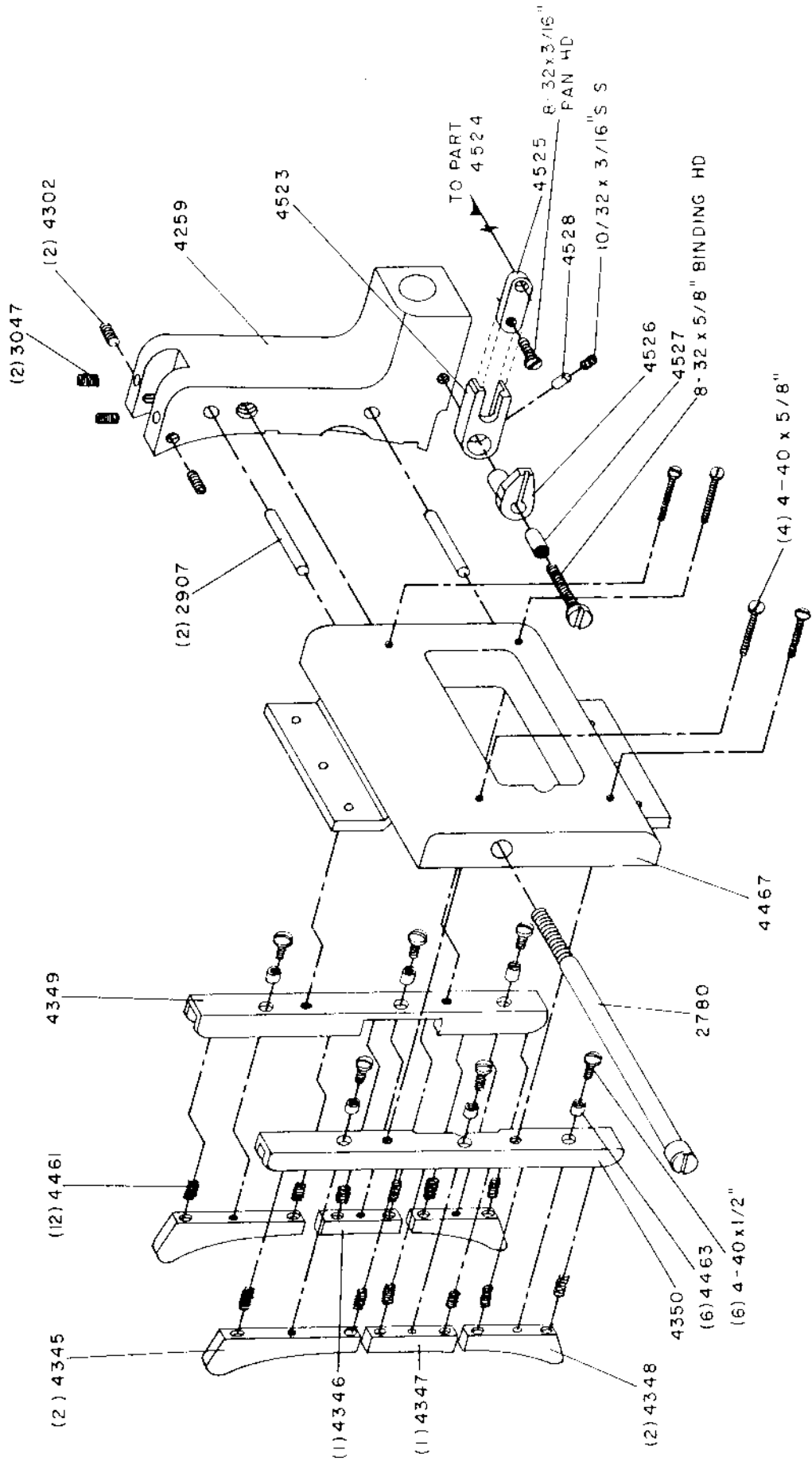
⊕ UP TO PROJECTOR SERIAL NO. 2448
 USE PART NO. 2951 AFTER S.N. 2448
 USE P.N. 4397



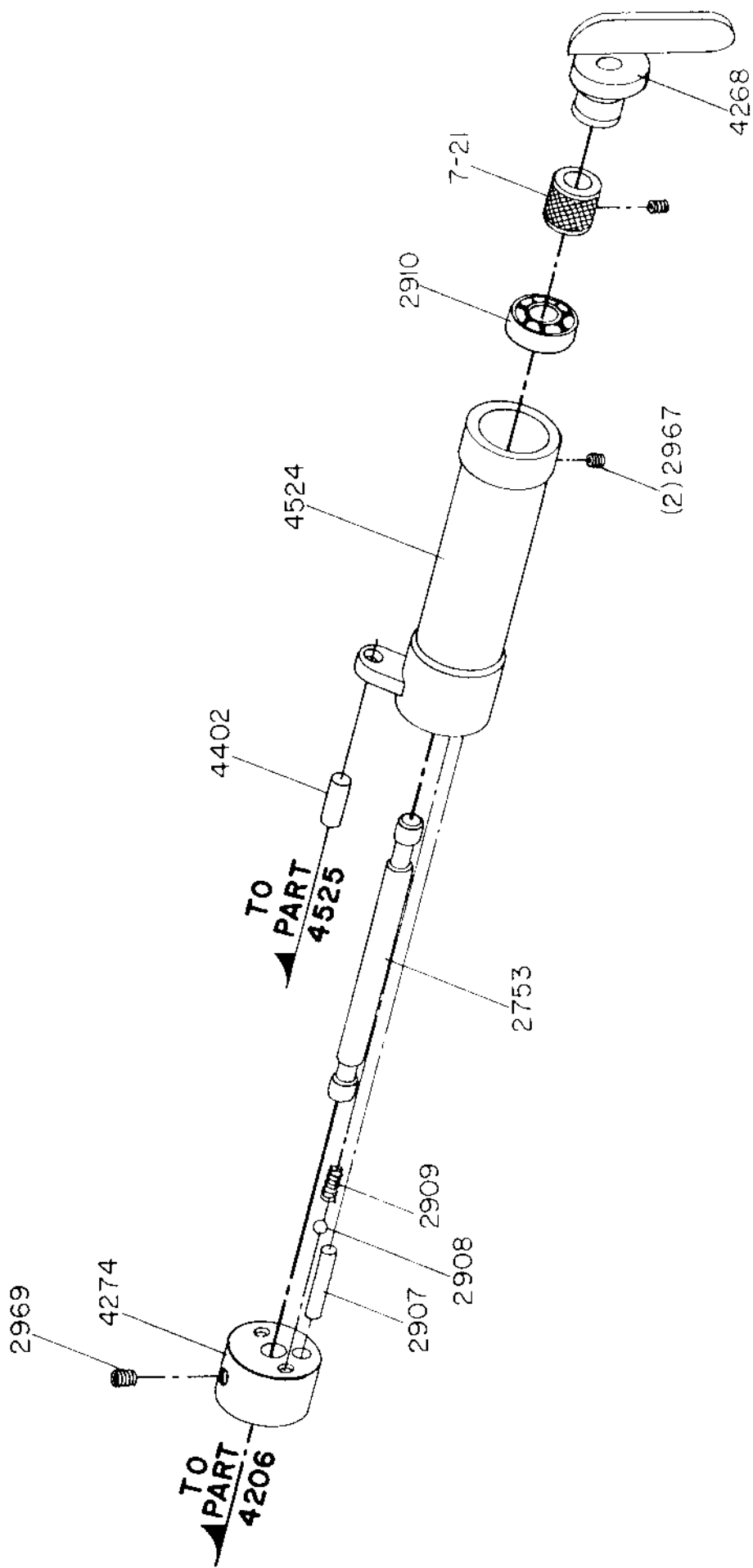
HORIZONTAL UPPER & LOWER SHAFT ASSEMBLY



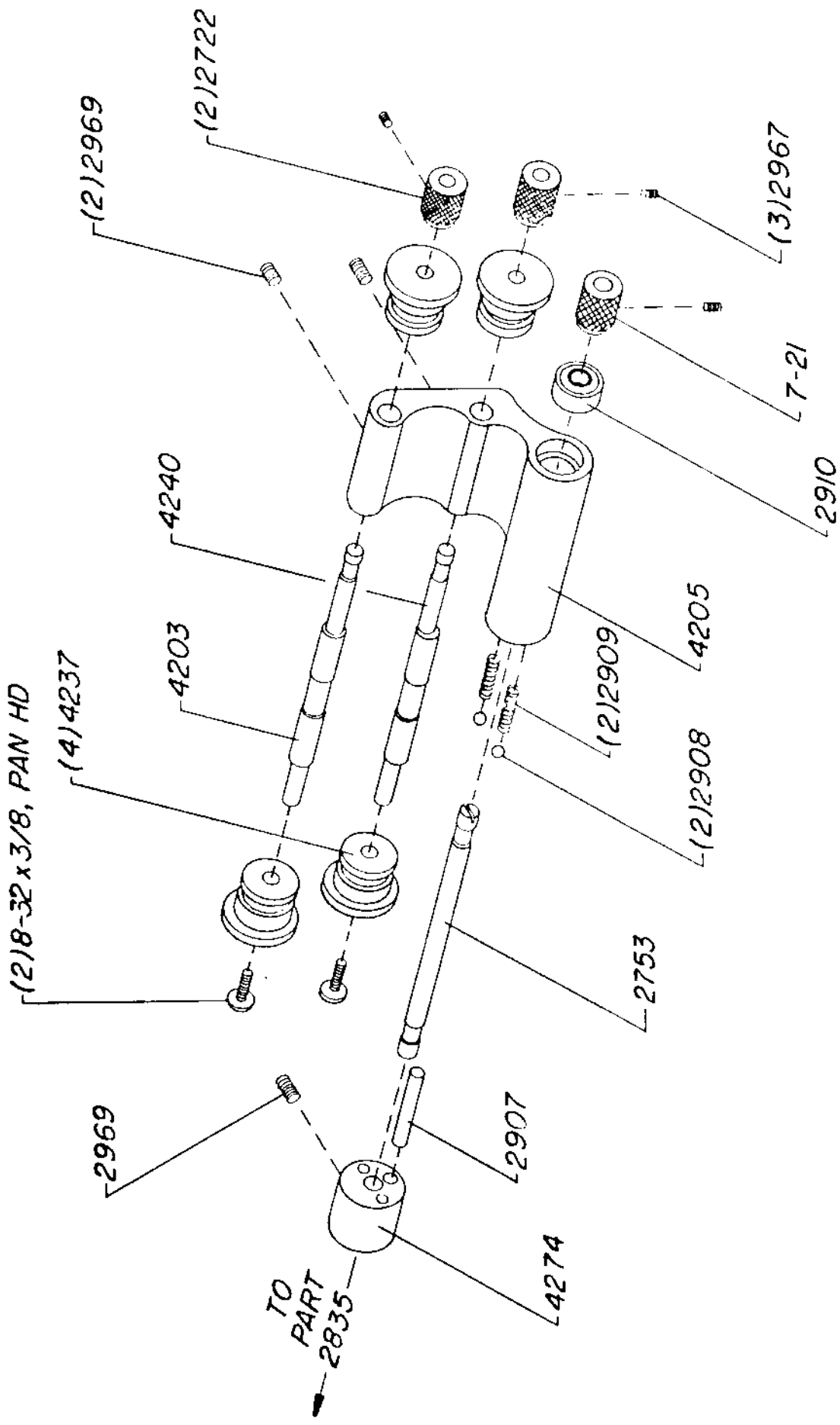
P8111
FILM TRAP PLATE ASSEMBLY



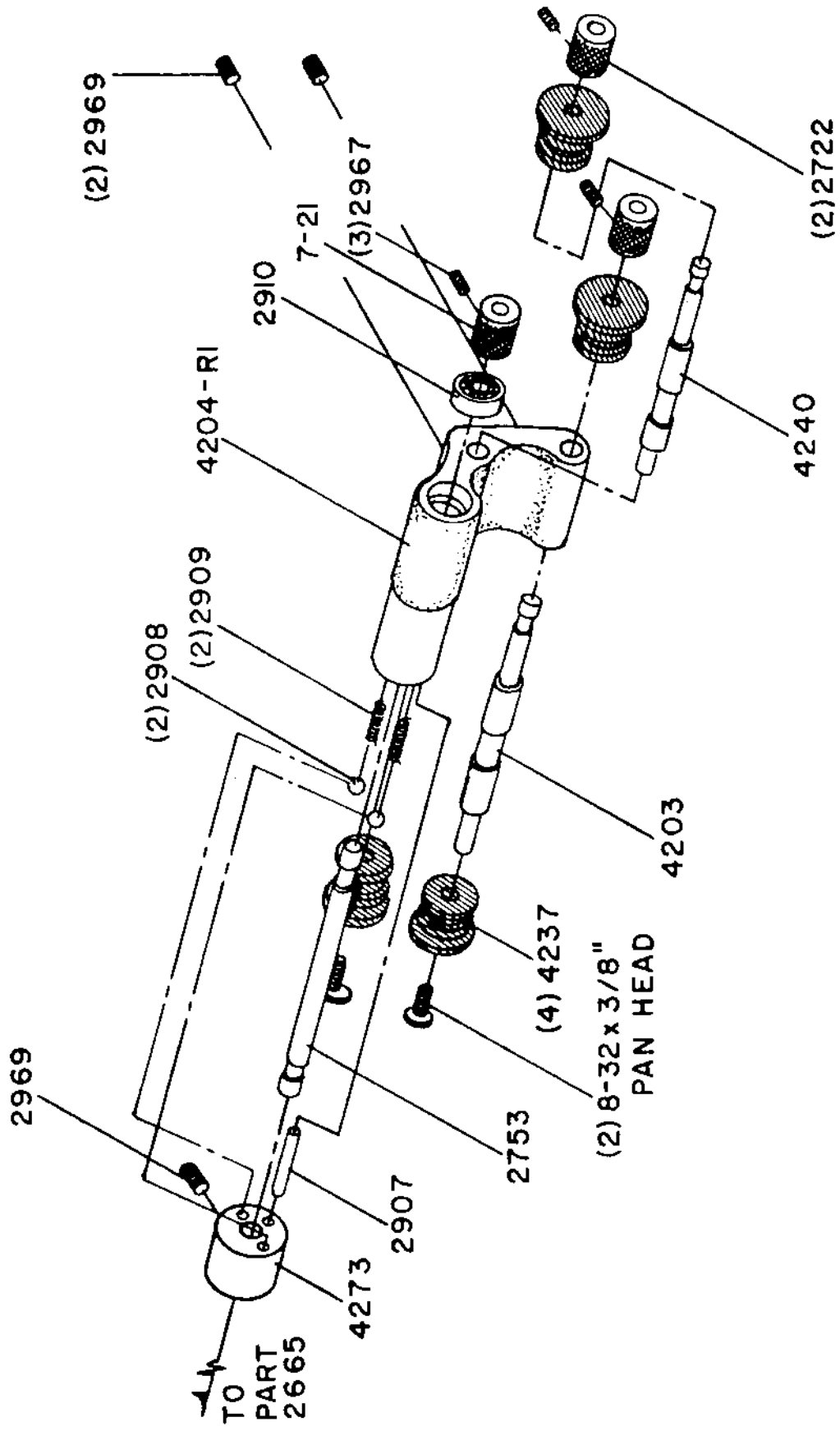
P-8246
 PRESSURE PAD & GATE ASSEMBLY



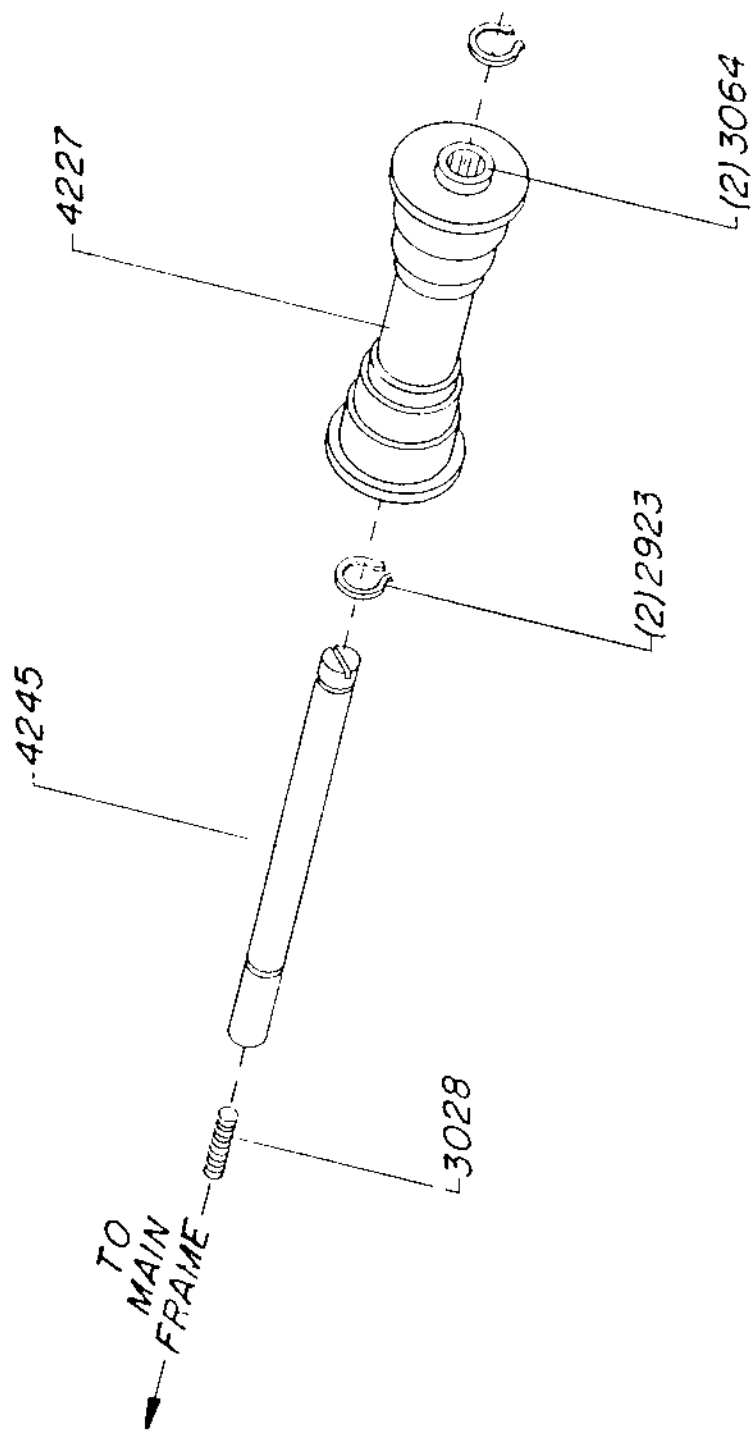
GATE OPENING DEVICE
P 8107



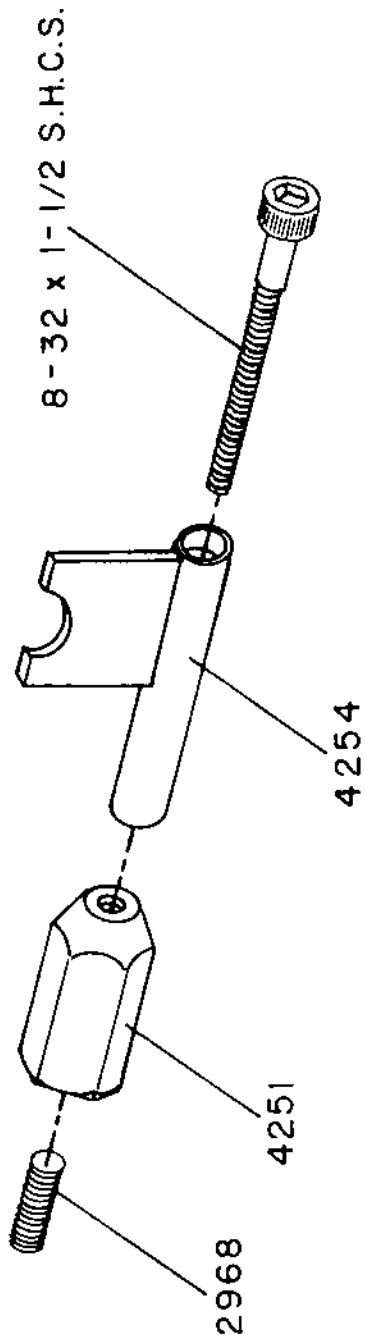
P8110
 LOWER PAD ROLLER ASSEMBLY



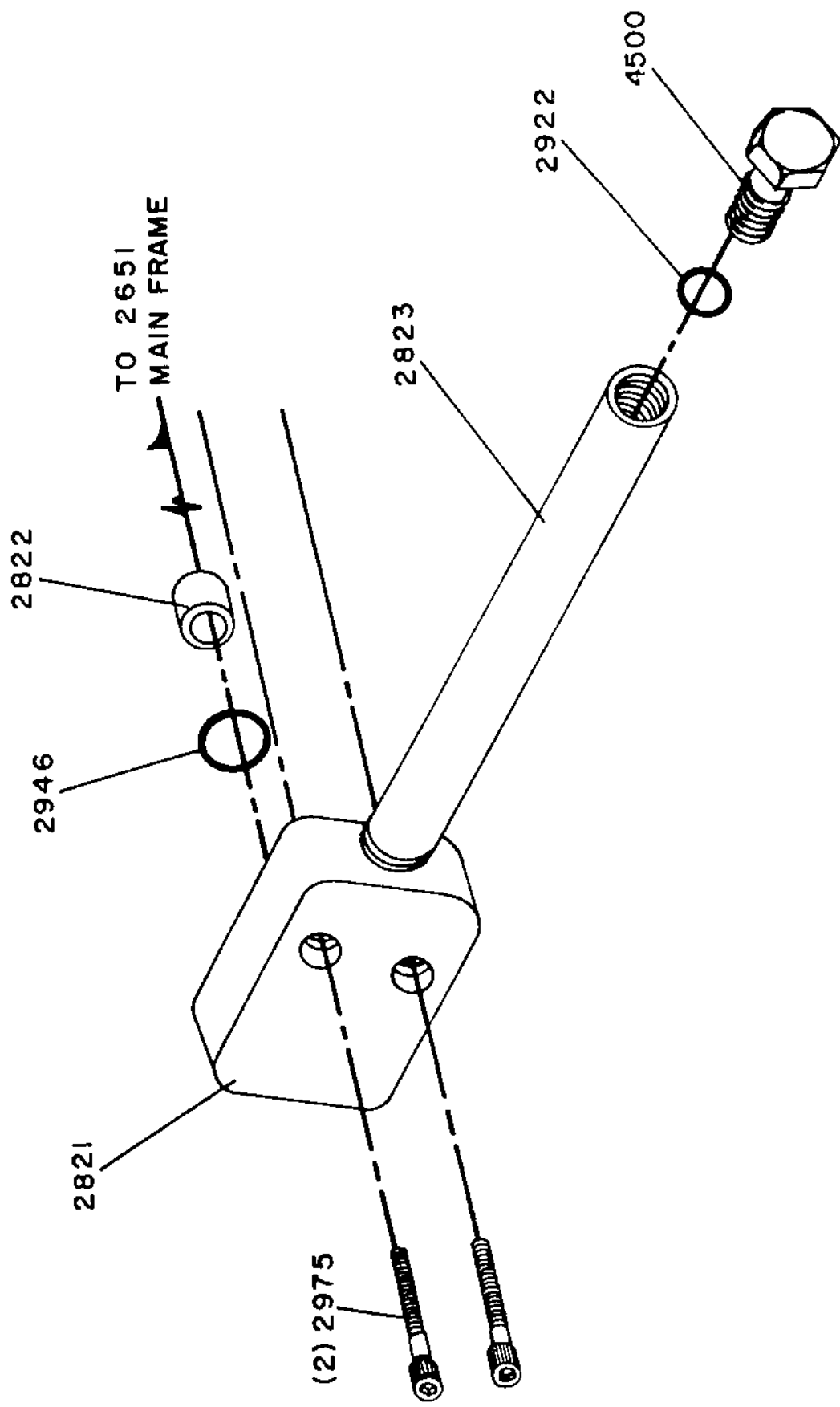
70 mm
 UPPER PAD ROLLER ASSEMBLY
 P 8109



P8113
FILM GUIDE ROLLER ASSEMBLY

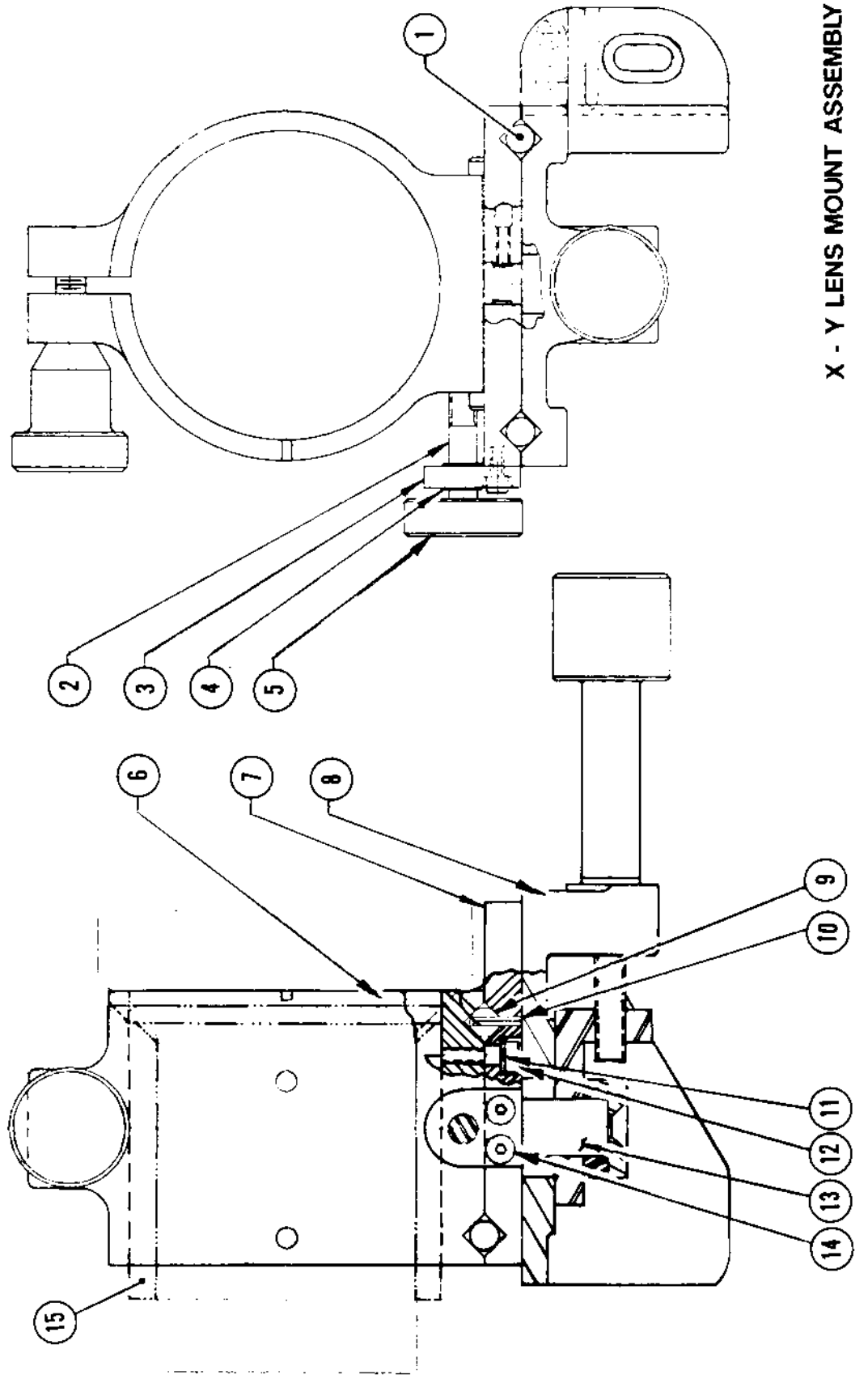


UPPER & LOWER
FILM STRIPPER ASSEMBLY
P 8114



DRAIN BLOCK ASSEMBLY

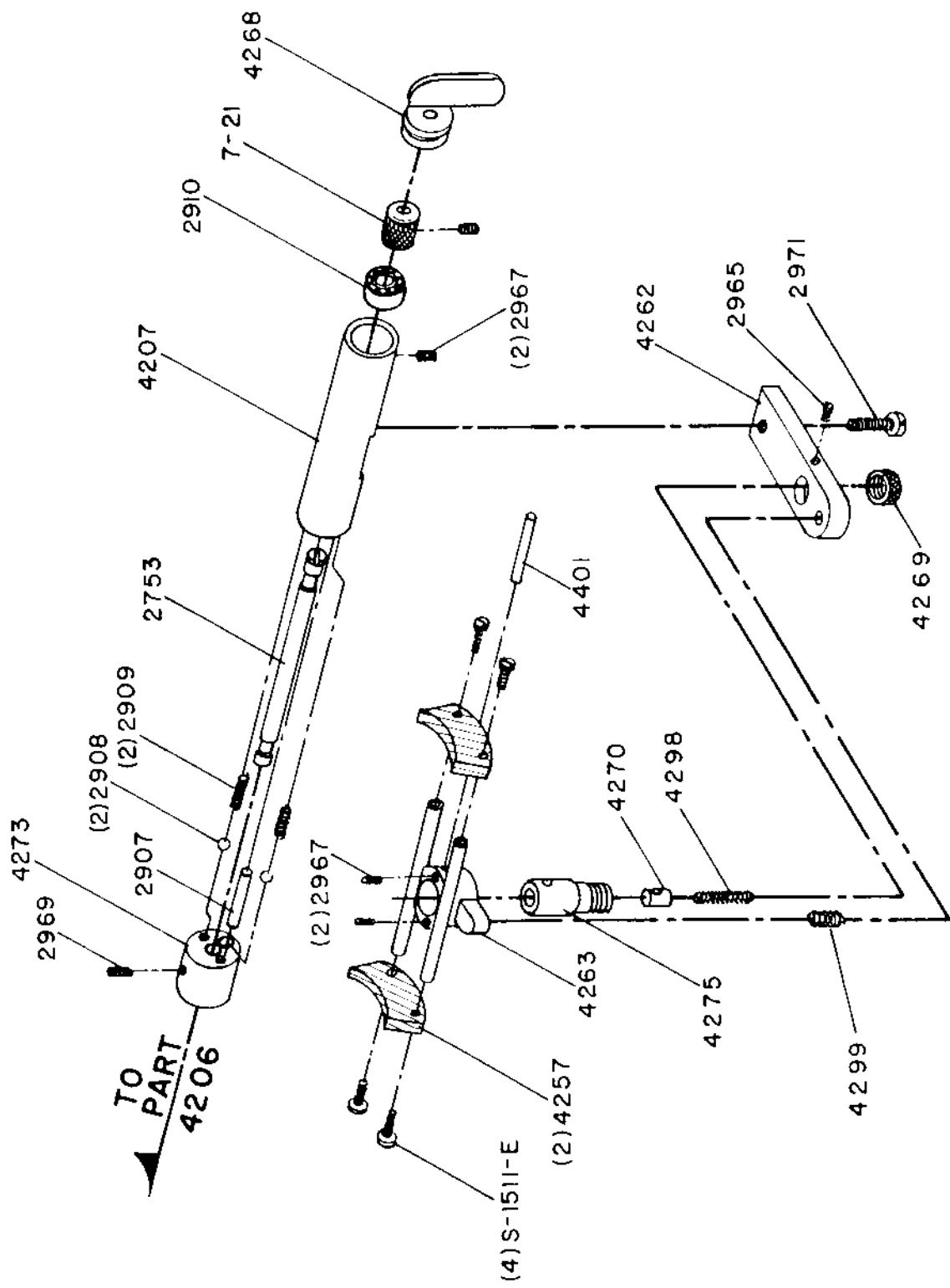
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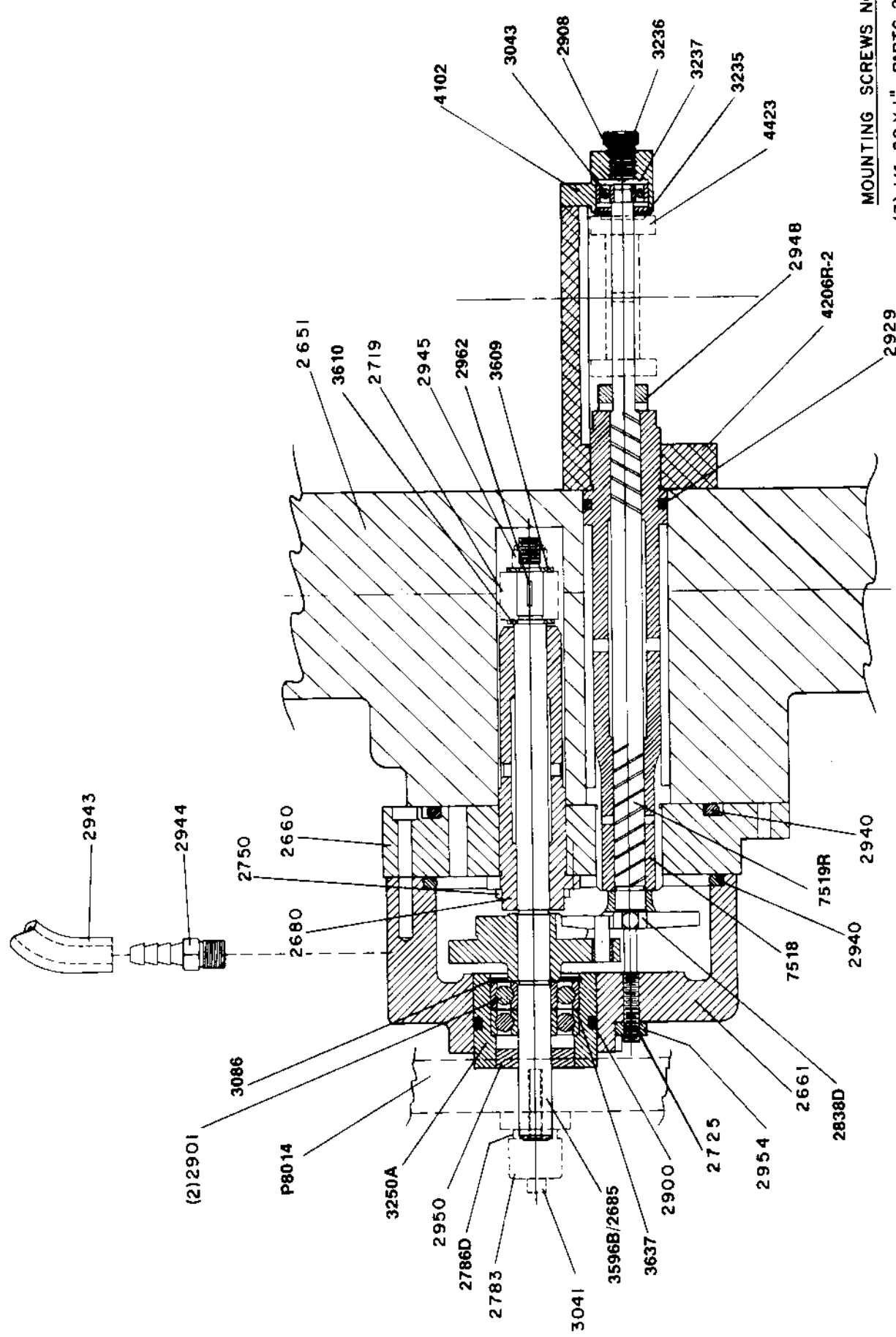
X - Y LENS MOUNT ASSEMBLY

PARTS LIST
X - Y Lens Mount

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	2771	Lens Slide Rod
	3075	Roll Pin, 1/8 x 3/4"
2	22-21154	Adjustment Screw
3	22-21144	Screw Support Block
4	4391	Retaining Ring, .375"
5	22-21143	Adjusting Knob
6	22-21207	Casting, Lens Holder
7	22-21156	Plate, Lens Mount
8	22-21204	Base, Lens Mount
	3057C	Nylon Cage Bearing
	2777	Bearing Spacer
	2923	Retaining Ring, .375"
9	22-21153	Slide Rod
10	2927	Roll Pin, 1/8 x 1/2"
11	21-70029	Wave Spring Washer
12	21-51032	Shoulder Bolt, 10-24 x 1/4"
13	22-21152	Lens Mount Drive Pin
	41-51269	Set Screw, 10-32 x 1" Soc. Hd.
14	41-51331	Flat Socket Head Cap Screw, 10-24 x 5/8
	2775	Rubber Bushing
15	5114	Lens Reducer
	2807R	Lens Barrel Clamping Knob
	2778	Lens Barrel Clamping Shaft
	3057W	Washer



**INTERMITTENT SHOE ASSEMBLY
P-8108**



- MOUNTING SCREWS NOT SHOWN**
- (3) 1/4 - 20 X 1" - PARTS 2660 TO 2661
 - (3) 10 - 32 X 1 1/4" - PARTS 2661 TO 2660
 - (1) 10 - 32 X 1/2" - PARTS 2750 TO 2660

INTERMITTENT MOVEMENT ASSEMBLY