FUJIFILM

IX AUTOFEEDER

SERVICE MANUAL

FUJI NDT SYSTEMS
1055 STEVENSON COURT
BUILDING 105
ROSELLE, ILLINOIS 60172

Front Cover Lock Mechanism

The closed front cover is retained by ball latches. To lock the front cover the lock claw is engaged with the claw support.

When the lock release button is pressed, it causes the lock claw to push down so that it is released from the claw support.

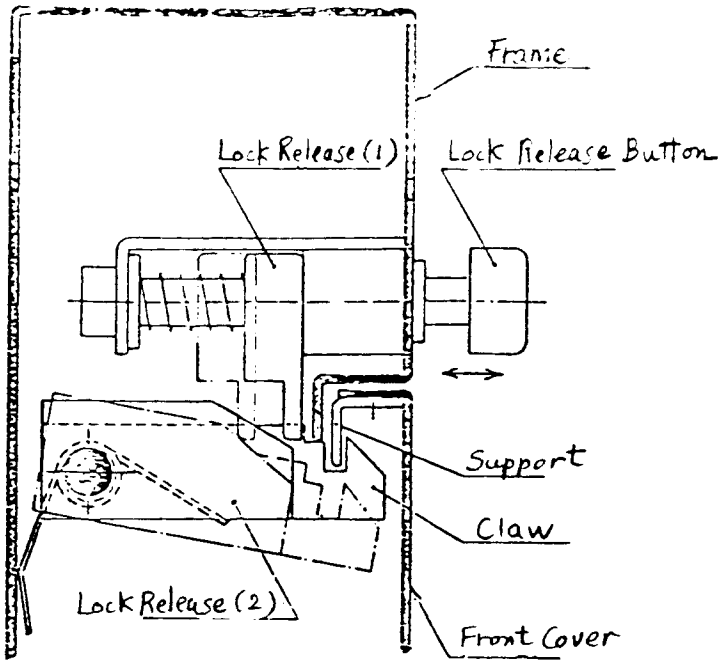


Fig. 1

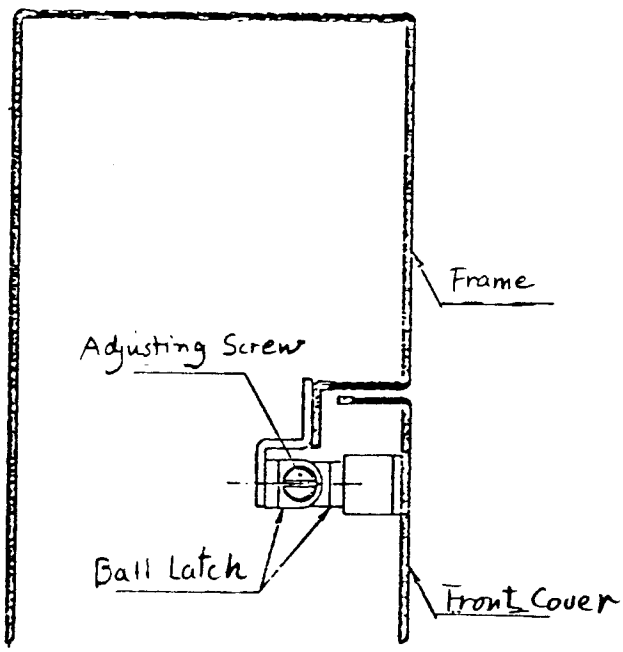


Fig.2

Leak Cam and Leak Valve

The specially shaped leak cam triggers the leak valve to open the air piping line so suction cups can release film.

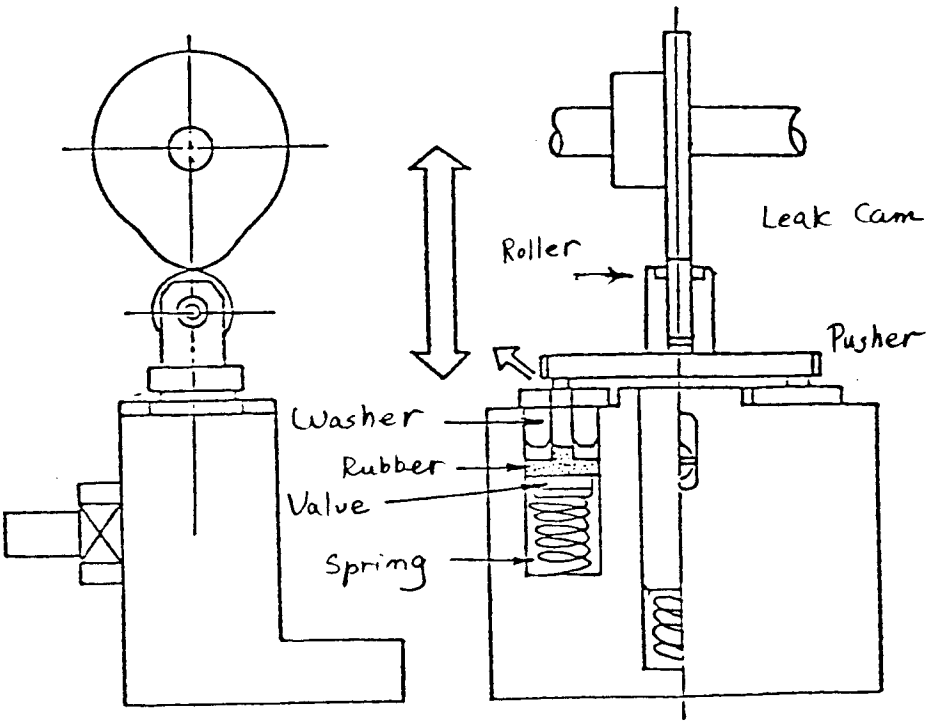


Fig. 5 Schematics of Leak Valve Assembly

Film Suction Link Motor (M1) Stop Cam

The stop cam is incorporated with the microswitch (LS1) which turns off the film suction link drive motor (M1). The indented edge of the cam activates the microswitch to stop M1 and the vacuum pump.

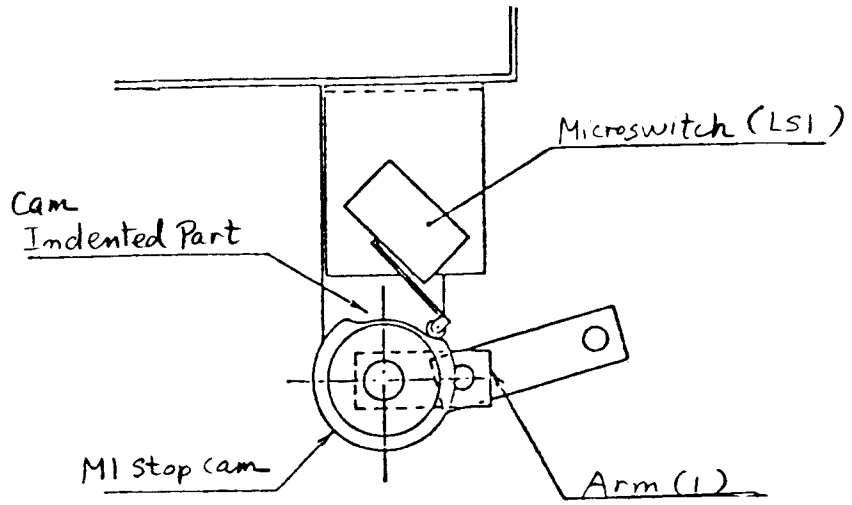


Fig. 6 Schematics of M1 Stop Cam

Film Suction Link Mechanism

With one rotation of the drive shaft, the arm shaft (2) moves in the direction as illustrated in Fig. 3.

This arm shaft motion is transmitted to the suction cups, which move as indicated in Fig. 4 (D-C-B-A-B-C-B-C-D) to remove films one by one so that films are successively fed into the processor.

The arm shaft (6) acting as the fulcrum, governs motion A-B. Motion A-B is matched to the number of films left in the film loading tray.

The arm shaft (4) acting as the fulcrum, governs motion B-C. This motion is carried out to sway a sheet of film with the aid of guide rollers so as to avoid picking up double sheets of film.

The arm shaft (5), acting as the fulcrum, governs motion C-D, to dispense a film from the film loading tray.

The gear (3) and the arm shaft (2) are so incorporated that the motions are integrated to the drive shaft.

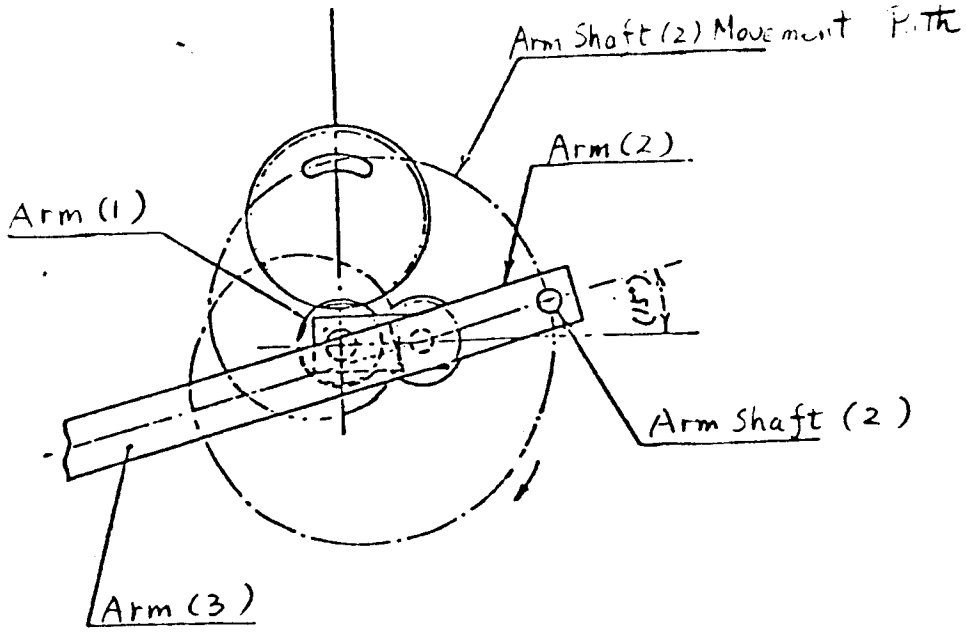


Fig. 3

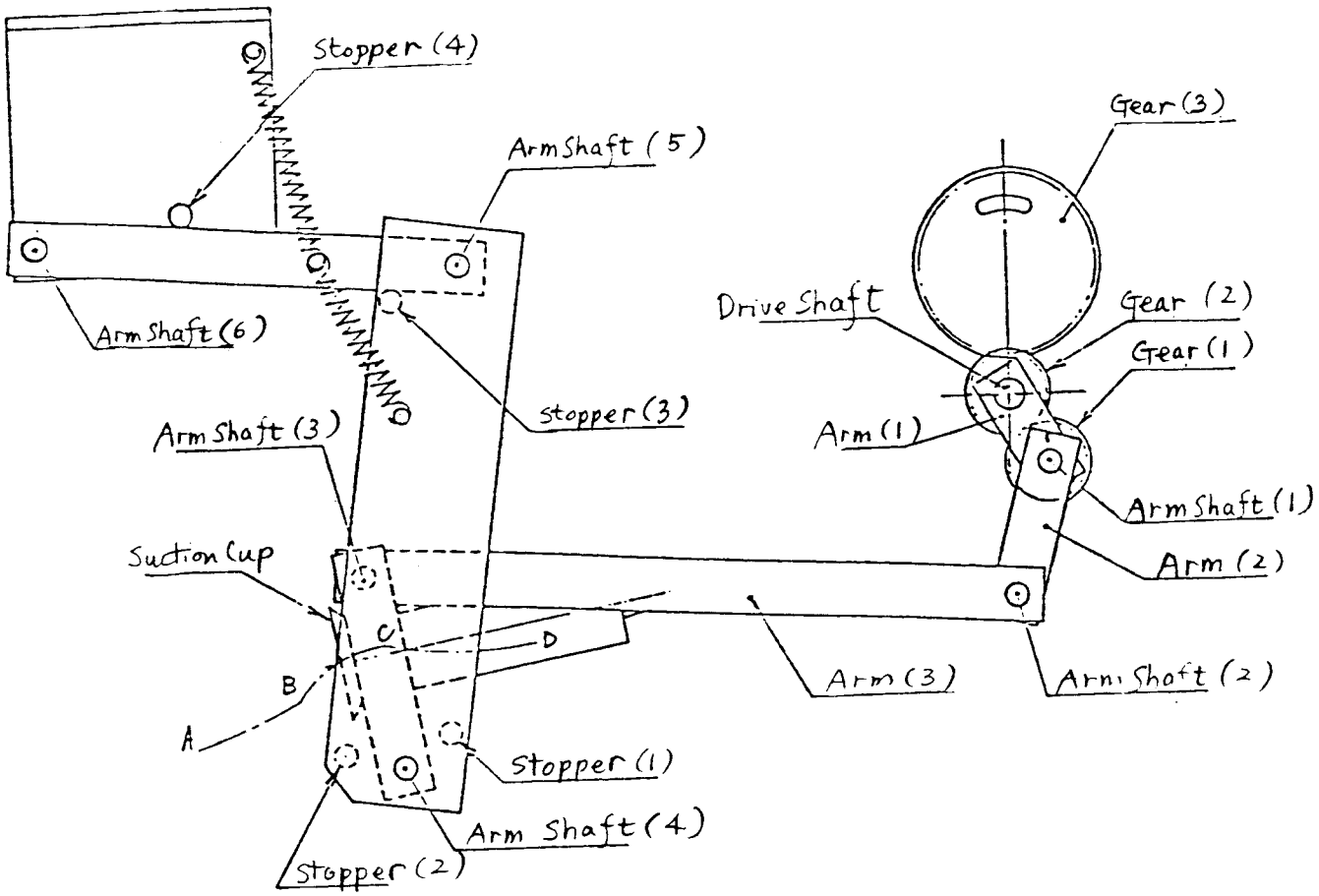


Fig. 4 Schematics of Suction Link

Film Transport Roller and Superposed Film Detector

The superposed film detector link shown in the diagram (Fig. 6) determines thickness of film nipped between transport rollers by magnifying film thickness by 2.1 times. When the microswitch (LS6) detects that more than one sheet of film are being fed, the system orders the transport roller to stop.

The detecting range can be adjusted via adjusting bolts. At the initial setting, the microswitches are OFF when a single sheet is transported: they activate when two or more sheets of film are nipped between rollers.

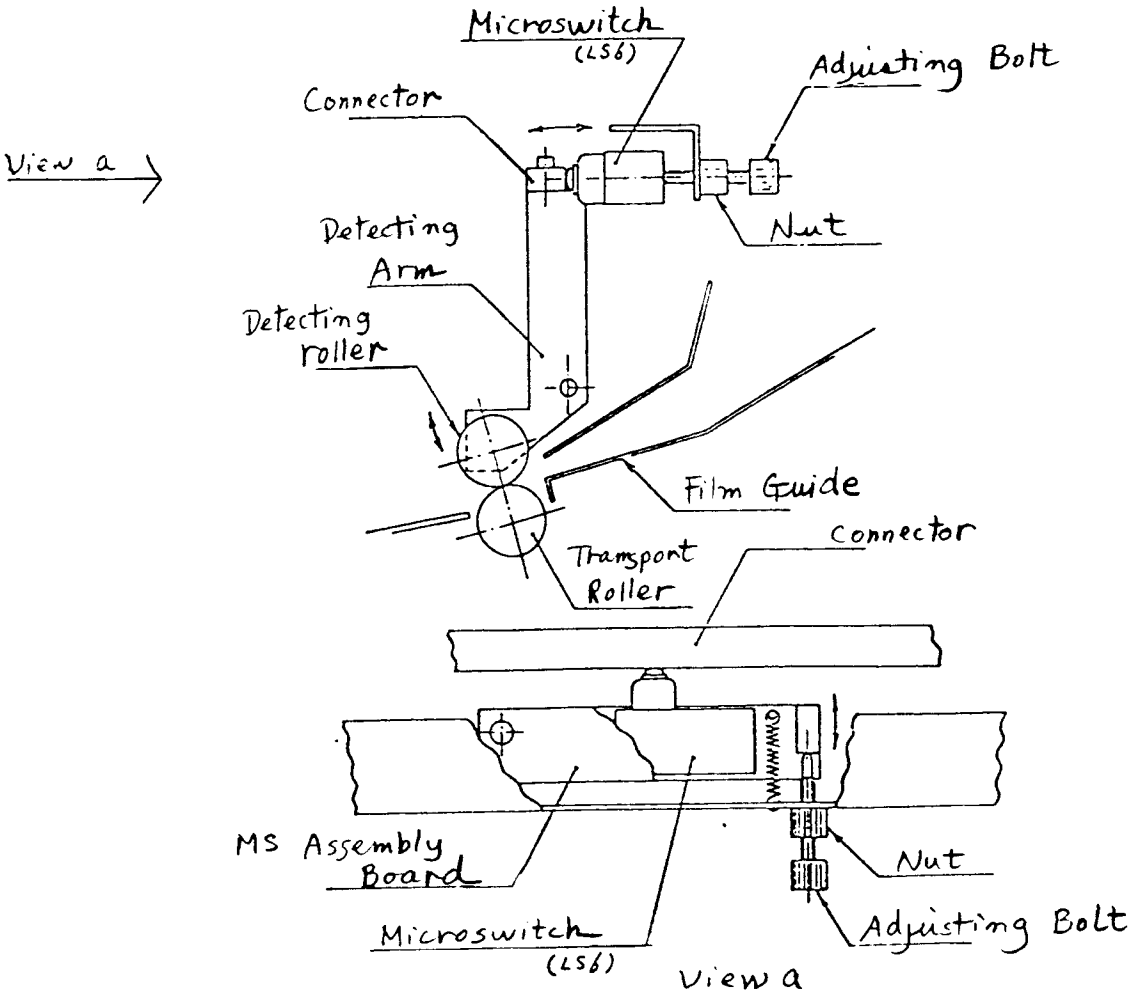


Fig. 7 Schematics of Superposed Film Detector and LS6

Shutter Mechanism

This shutter shuts off gas flow from the processor when the FILM lamp is off.

*Note: While the film lamp lights, the fan operates to increase atmospheric pressures inside Autofeeder so as to keep fumes out.

As illustrated in the diagram (Fig. 8) below, the motor (M3) turns on to rotate shutter open/close arms. Shutter open/close timing is controlled by two microswitches (LS2 - Open shutter; LS3 - Close shutter). These two microswitches are then governed by M3 stop cam.

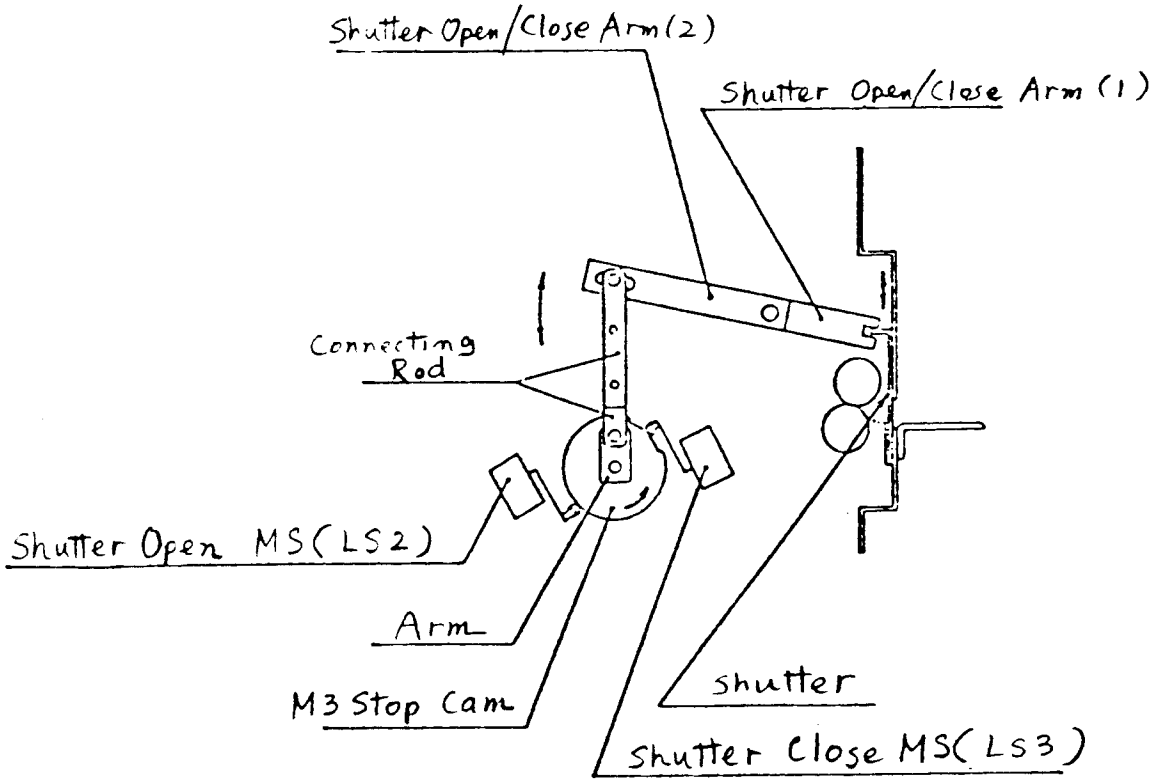


Fig. 8 Schematics of Shutter Mechanism

Nomenclature and Description

°113F0034 - Relay Board

Controls operation of motors, buzzer, display lights, etc.

°T0, T1 - Film Timer (Built-in the relay board)

Delays lighting time of FILM lamp (PL6) after the tail edge of the last film is detected by Autofeeder.

°K8, K9 - Relays

Controls operations of shutter mechanism

° M1 - Motor for film suction link drive

Drives the film Suction link.

° M2 - Motor for film transport

Drives the film transport rollers.

°M3 - Motor for shutter operation

Drives the shutter open/close mechanism

°FAN -

Takes outside air into the autofeeder to increase atmospheric pressures.

°P - Vacuum pump

Operates suction cups.

° BZ - Buzzer

Produces alarm when ERROR (2 SHEETS) lamp (PL4) lights on.

° LS1 - Microswitch to stop M1

Stops operation of the film suction link drive motor (M1) when the indented part of M1 stop cam comes in contact with the microswitch actuator)

°LS2 - Microswitch to open the shutter

Stops M3 operation (Shutter open/close motor) to retain the shutter at the open position when the indented part of M3 stop cam comes to the actuator.

°LS3 - Microswitch to close the shutter

Stops M3 operation (Shutter open/close motor) while the shutter is closed to retain the shutter at the close position when the indented part of M3 stop cam comes in contact with the microswitch actuator.)

°LS4 - Microswitches (4 pcs) to detect whether the film loading tray contains film or not.

This microswitch turns on when the film loading tray is loaded with film.

°LS5 - Microswitches (4 pcs) to detect whether film is on film guide section or not.

This microswitch turns on while the film guide is holding film.

°LS6 - Microswitches (2 pcs) to detect when superposed sheets of film are transported. (Superposed Film Detector)

Turns on when superposed sheets of film are nipped by the transport rollers.

°SW0 - POWER switch

When this switch is pressed, power turns on.

°SW1 - START switch

When this switch is pressed, the film suction link drive motor (M1) turns on.

°SW2 - STOP switch

When a cycle of film feeding is completed, the film suction link drive motor (M1) turns off if this switch is pressed.

°PL1 - POWER lamp

Indicates whether power is on or off.

°PL2 - STOP lamp

Indicates whether STOP switch is on or off.

°PL3 - SHUTTER (Open) lamp

Lights when the shutter is open.

°PL4 - ERROR (2 SHEETS) lamp

Lights when superposed sheets of film are transported.

°PL5 - OPERATE lamp

Lights when Autofeeder is in operation.

°PL6 - FILM lamp

Lights when Autofeeder contains film.

°PL7 - START lamp

Indicates [START] switch position.

°NE1, NE2 - Front cover lights

Displays front cover position.

Ball Latch

Adjust this ball latch by turning adjusting screws indicated in Fig. 1 when the latch is too loose to hold the front cover or too tight to operate smoothly.

To tighten it up, turn adjusting screws in clockwise direction.

Turn adjusting screws in counter-clockwise direction to loosen it.

Note: Adjust right- and left-screws in the same amount so that strength of both latches is uniform.

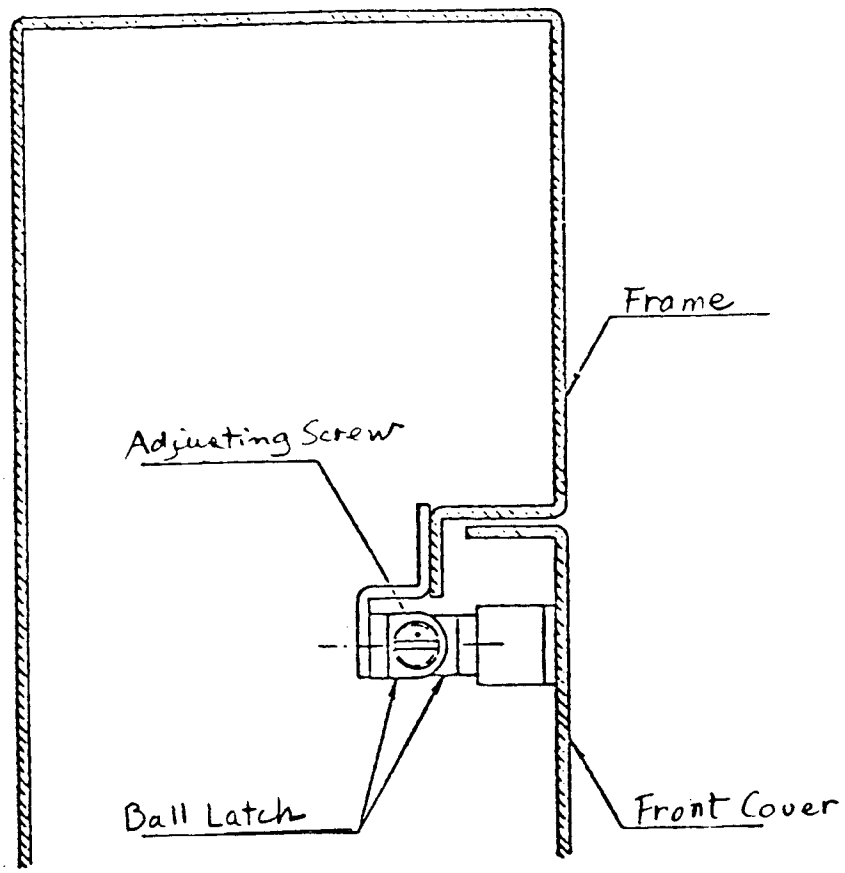


Fig. 1

Lock Release Assembly

Adjust the lock release in the following procedure if the lock claw touches Film Loading Tray or the lock is not smoothly released.

PROCEDURE

A. When the lock claw touches Film Loading Tray;

1. Loosen retaining screws of Lock Release (2).
2. Loosen screws connecting Lock Release (1) and Slide Shaft.
3. Move Slide Shaft so that the distance between Lock Release Button and Frame (distance "a" indicated in Fig. 2) becomes narrower.
4. Set Lock Release (1) to Slide Shaft at the adjusted position.
5. Press the angled edge of Lock Release (2) against Lock Release (1), and fix Lock Release (2) at the position.
6. Open and close the front cover several times to check for smooth operation of Lock Release.

B. When the lock is not smoothly released;

Set the distance "a" wider, and follow the same procedure described in A.

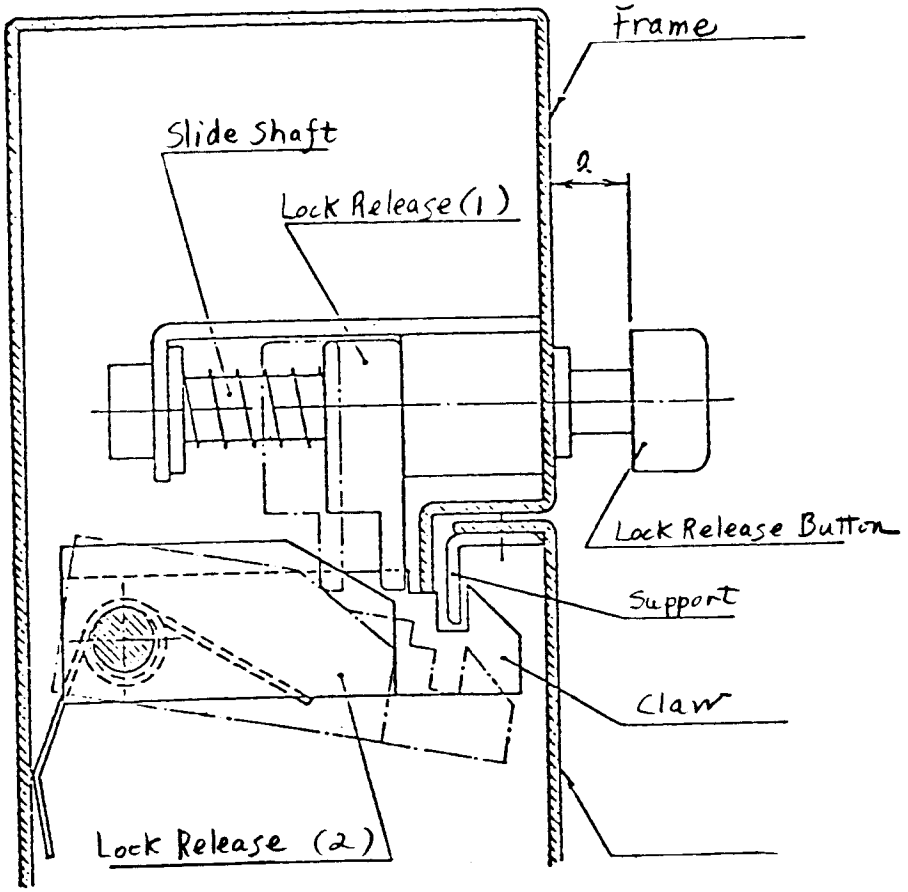


Fig. 2 Schematics of Lock Release Assembly

Film Detector (LS4)

If FILM lamp does not light up after film is set, or FILM lamp does not go off when processing is done, or processed film bears scratches caused by an actuator of microswitch, adjust the microswitch (LS4) at the film loading tray in the following procedure.

PROCEDURE

As O_1 or O_2 acting as the fulcrum, rotate the microswitch and change fixing position (actuating angle) to satisfy the following conditions.

1. Load a sheet of film on the tray, and close the front cover gradually. LS4 should activate immediately before the front cover is completely closed.

2. Open the front cover. LS4 should turn off.

3. When there is no film in the tray, the tip of the actuator should go under the cover.

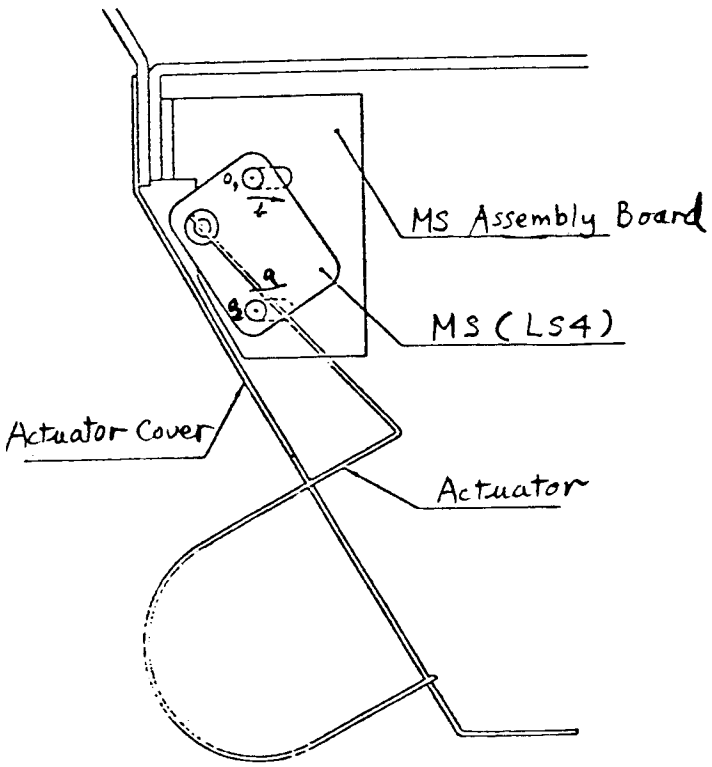


Fig. 3 Schematic of LS4

Film Suction Link

When the right- and left-hand links are out of alignment, or Arm (1) and Arm (2) are out of balanced linkage, or the suction cups fail to remove the bottom sheet, adjust the link in the following procedure.

PROCEDURE

1. Rotate the drive shaft untill Arm (1) faces the processor in very horizontal position, then hold the drive shaft at this position.

2. Loosen two retaining screws of Gear (3), and rotate the gear so that Arm (2) and Arm (3) form one straight bar. At this position, the angle between Arm (1) and Arm (2) is 15°.

3. Fasten Gear (3) at this position.

4. When suction cups fail to remove the bottom sheet, rotate Gear (3) slightly in "a" direction (See Fig. 4. The angle between Arm (1) and Arm (2) becomes larger.) in desirable amount. Fasten Gear (3) at the position.

5. Check the operation by feeding a sheet of film through the machine.

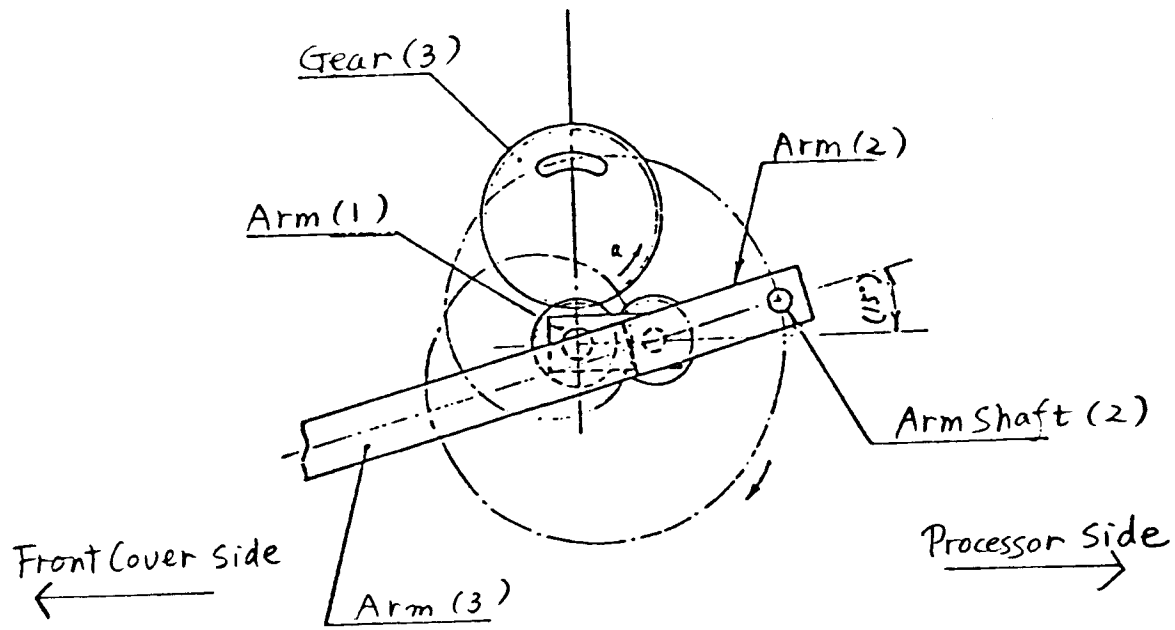


Fig. 4 Adjustment of Link

Film Suction Link Drive Motor (M1) Stop Cam

When the motor does not stop at the specified timing, adjust the stop cam in the following procedure.

PROCEDURE

Move Arm (1) toward the processor. (See the schematic below.) Then, adjust the stop cam so that the drive shaft stops at this position.

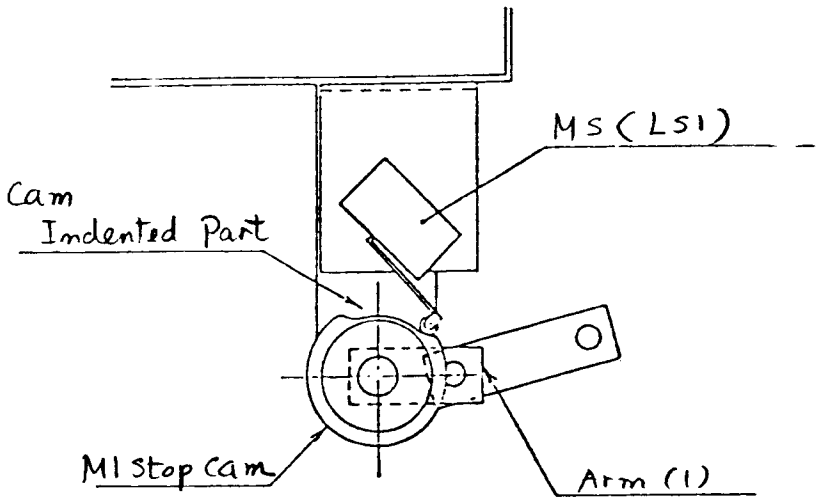


Fig. 5 Schematic of M1 stop cam

Leak Cam

When leak timing is improper, adjust the leak cam in the following procedure.

PROCEDURE

Adjust leak cam position so that the leak valve opens immediately after suction cups remove a film from the tray.

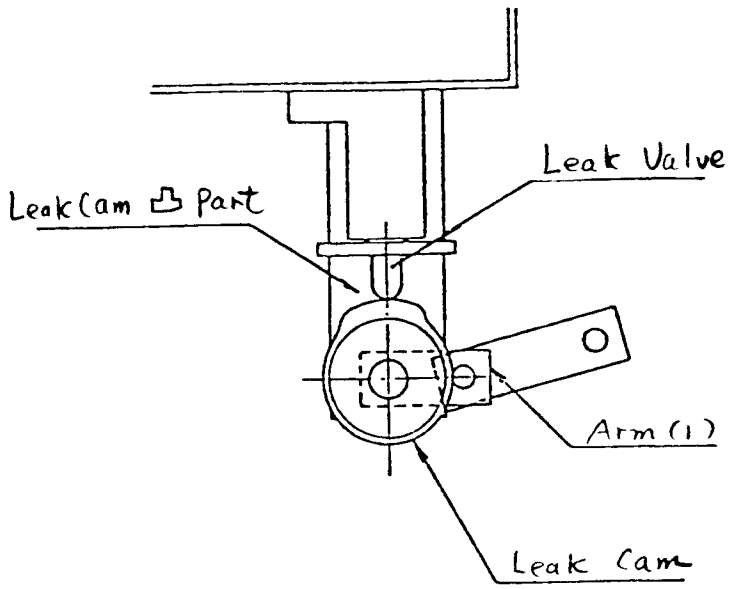


Fig. 6 Schematic of Leak Cam

Film Detector at Guide Section (LS5)

If Film Feed Link operates continuously, or if film is not fed successively when one cycle of processing is done, adjust LS5 in the following procedure.

PROCEDURE

Adjust fixing angle of LS5 to satisfy the following two conditions.

1. When the actuator is pressed in the maximum range, the tip of actuator should go under the film guide surface as illustrated in Fig. 7-2. (However, it is desirable the distance from the guide surface is as minimum as possible.)

2. When the microswitch turns on, check the distance between the tip of actuator and the film guide surface, "a" in Fig. 7-3. It should be more than 15mm. (It is desirable however that the distance is as maximum as possible.)

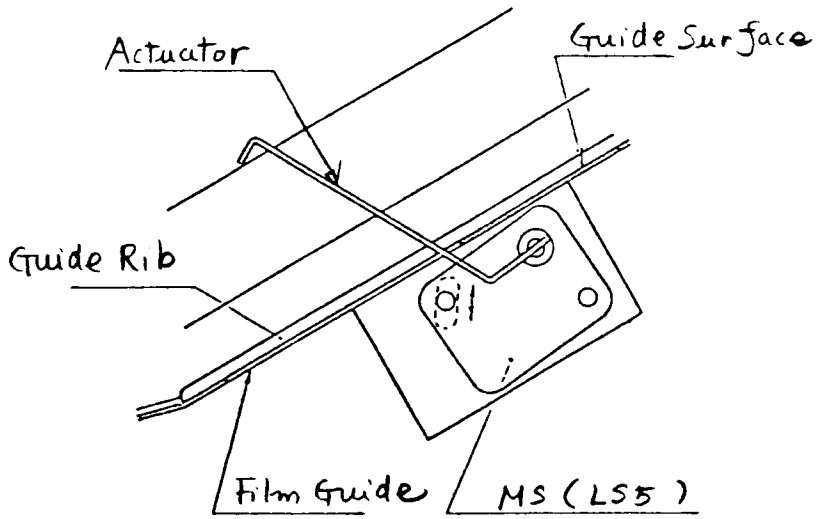


Fig. 7-1

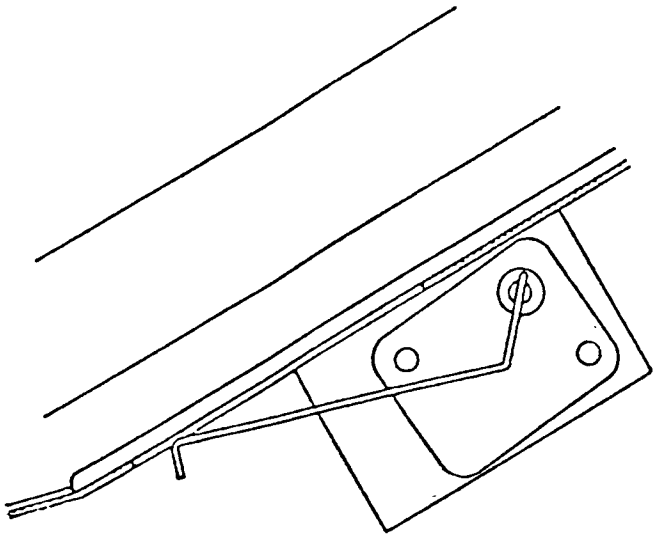


Fig. 7-2

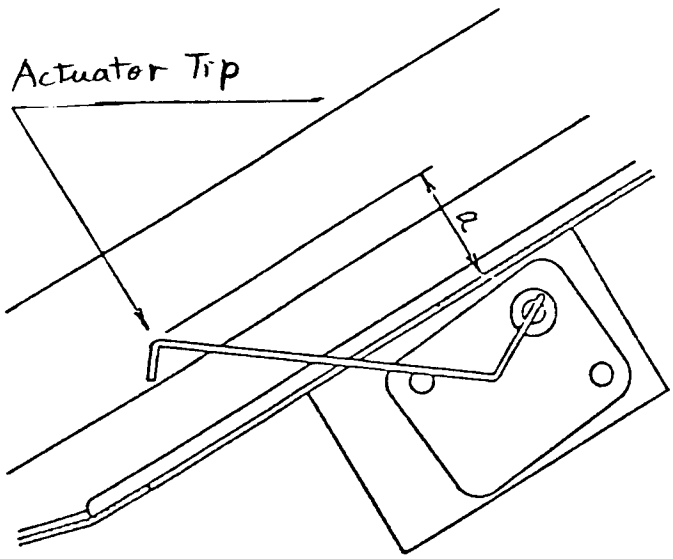


Fig. 7-3

Superposed Film Detector (LS6)

When ERROR (2 sheets) lamp lights although only single sheet is dispensed, or when the lamp fails to light although more than one superposed sheets are dispensed, adjust the detector in the following procedures.

PROCEDURE

1. Set two sheets of film of 14x17 size between rollers. See Fig. 8-1.

2. Gradually turn an adjusting bolt at either right- or left-side in clockwise while watching activation of LS6. At the point where LS6 turns ON, mark the adjusting bolt with "x1".

3. Rotate the transport roller by 1/9 of full turn (two latchets), and mark the adjusting bolt with "x2". Refer to the illustration, Fig. 8-2.

4. Repeat the procedure (3) till the transport roller makes a full turn. (marks x3 - x9)

5. Remove one sheet of film placed between rollers so only one sheet of film is nipped between rollers.

6. Turn the adjusting bolt till LS6 turns on.

7. Turn gradually the adjusting bolt in counter-clockwise till LS6 turns OFF. Mark the adjusting bolt with "y1" at the point where LS6 turns OFF.

8. Repeat the procedure (7) till the transport roller makes a full turn. (marks y2 - y9)

9. Measure the distance between the x max. and the y min. be referring to Fig. 8-2, and divide it by 3. Mark the point at 1/3 from the x max., which is the reference mark to set the adjusting bolt.

10. Fasten the adjusting bolt with the nut.

11. Repeat the same procedure of "1 to 10" above on the adjusting bolt of the other side.

12. Insert film of 3-1/2-wide through the inner raw of film guide, and make sure that the microswitch does not turn on.

12. Test the microswitch twice. If it turns on with one sheet

of film, move and re-fasten the adjusting bolt at the point where the adjusting bolt is more pushed in.

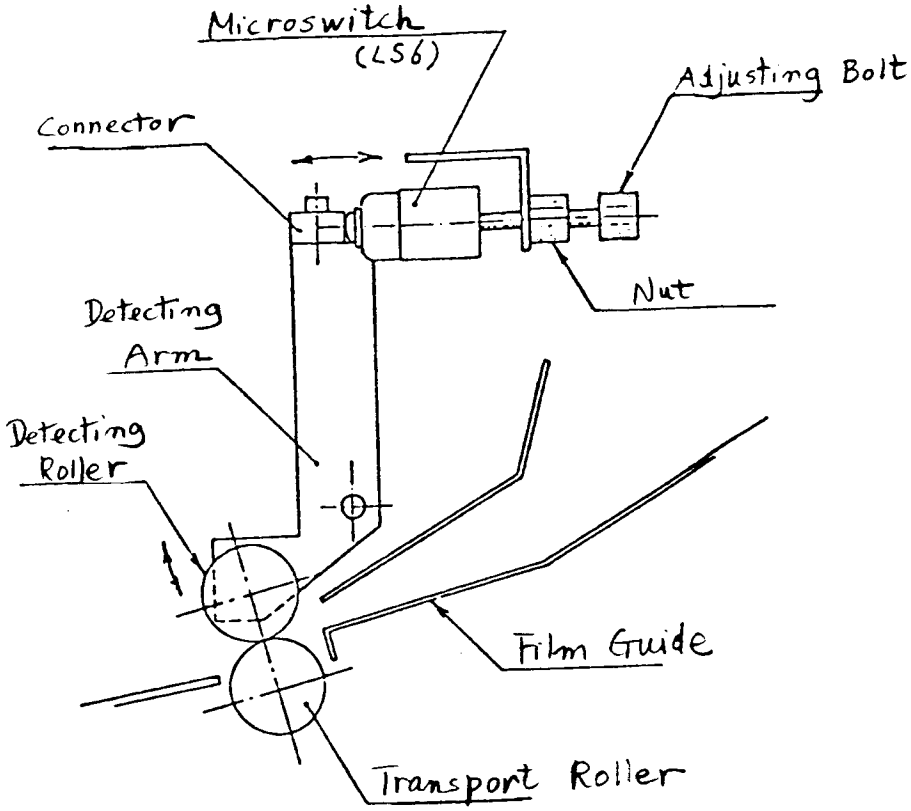


Fig. 8-1

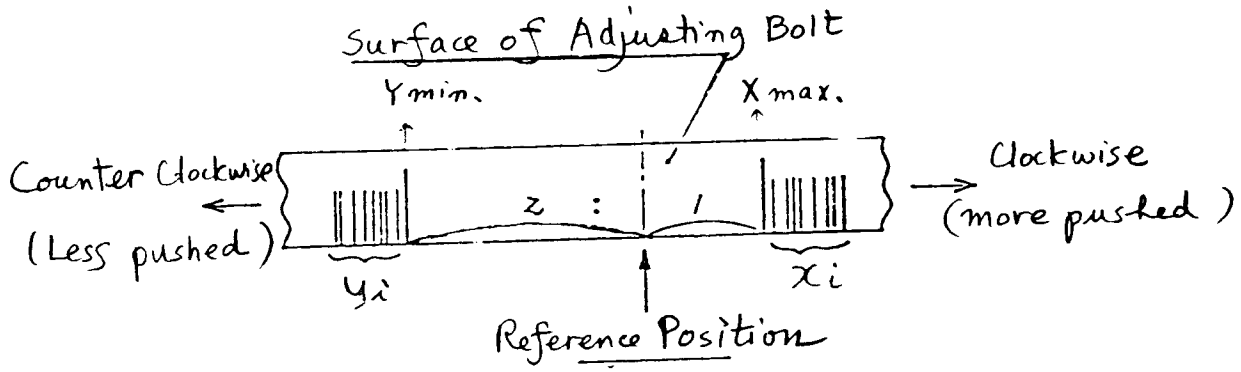


Fig. 8-2 Adjusting Bolt Marking

Shutter Mechanism

When the shutter does not open thoroughly although FILM lamp lights, or when the shutter does not close thoroughly although FILM lamp goes off, adjust the shutter assembly in the following procedures.

PROCEDURE

A. Connecting Rods

First temporarily fasten the connecting rods at the center of oval hole of the shutter open/close arm (2) shown in Fig. 9. Then check the following points.

1. Bring the arm up till it is placed to the connecting rods in a straight line. Make sure that the shutter edge should reach below the exit opening by 5 mm or more. Fastening the connecting rods with two fixing screws securely so the connecting rods maintain the appropriate length.

2. Bring the arm down till it is placed to the connecting rods in a straight line. Make sure that the shutter stops above the exit opening and the shutter open/close arm (1) is free from any contacts with the back cover.

3. If the shutter stops somewhere in mid of the exit opening, shorten the length of connecting rods by setting them towards the back side of the oval hole. (Towards right in the schematic below)

4. If the shutter gets in contact with the back cover, set the rods towards the front side of the oval hole. (Towards left in the schematic below)

B. Shutter Open/Close Motor (M3) Stop Cam

The cam should be set at the stop position when the arm is brought up and forms a straight line with the rods when FILM lamp goes off.

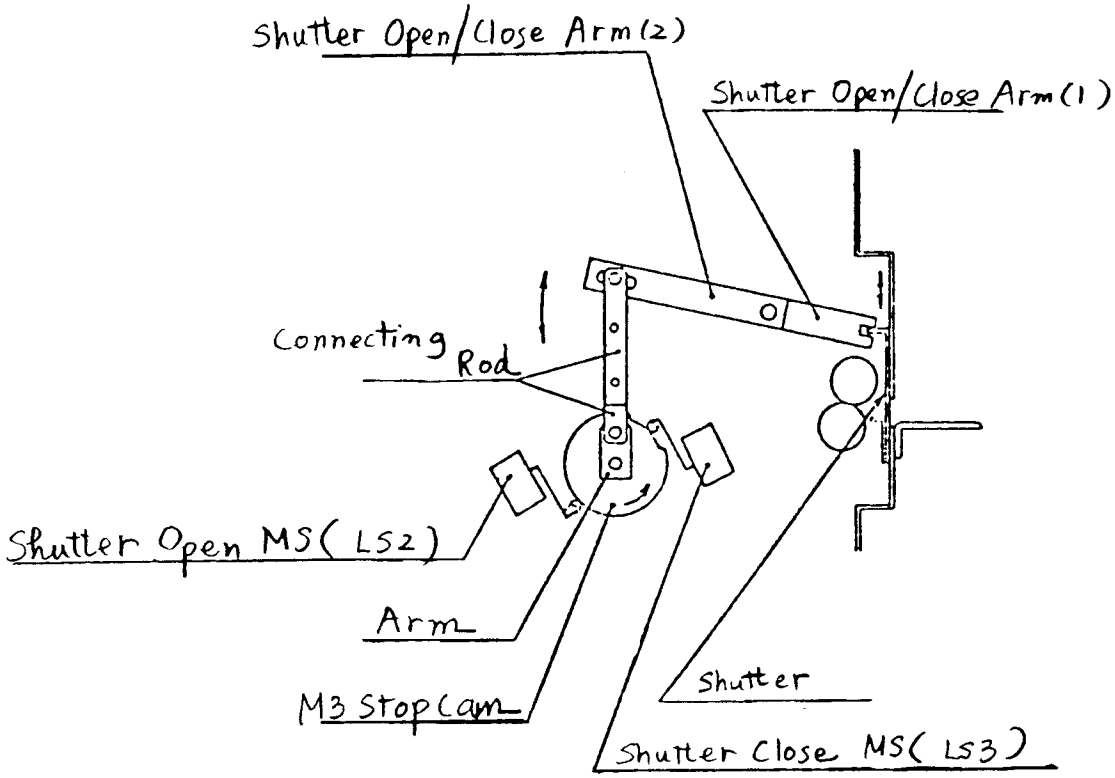


Fig. 9 Schematic of Shutter Open/Close Assembly

TROUBLE	CAUSE	TROUBLESHOOTING
Autofeeder does not start although START switch is pressed.	* Microswitch (LS4) at Film Loading Tray is not properly adjusted, or out of order.	Check. Adjust, or replace.
	* Microswitch (LS5) at Film Guide is not properly adjusted, or out of order.	Check. Adjust, or replace.
	* START switch is out of order.	Check and replace.
	* K1, K2, K4, K5, K7 or K9 is out of order.	Check and replace.
	* The motor (M1) for Film Suction Link is out of order.	Check and replace.
Film Suction link does not stop operation.	* M1 stop microswitch (LS1) position is incorrect, or LS1 is out of order.	Check. Adjust, or replace.
	* Microswitch (LS5) at Film Guide is not properly adjusted, or out of order.	Check. Adjust, or replace.
	* K1 is out of order.	Check and replace.
Auto feeder does not stop although all films have been completely transported.	* Microswitch (LS4) at Film Loading Tray is not properly adjusted, or out of order.	Check. Adjust, or replace.
	* K4 is out of order.	Check and replace.
	* Timer is out of order.	Check and replace.
Film Suction link does not proceed operation after a film has been transported.	* STOP switch is out of order.	Check and replace.
	* Microswitch (LS5) at Film Guide is not properly adjusted, or out of order.	Check. Adjust, or replace.
	* K1 is out of order.	Check and replace.
Film Suction link operates but a film is not transported to Film Guide.	* Film may stick together in Film Loading Tray.	Flex films in a dark room.
	* Vacuum pump output has decreased, or pump is out of order.	Check and replace.
	* Leak valve (vacuum release valve) is out of order, or air tubing bears some leaking part.	Check and adjust.
	* Leak timing (vacuum release timing) is inappropriate.	Check and adjust.
	* Film Suction Link adjustment is improper.	Check and re-adjust.
	* Suction cup nozzle is improperly set to the assembly board.	Check and repair.
	* Suction cup is dirty, deformed, or worn-out.	Clean or replace.

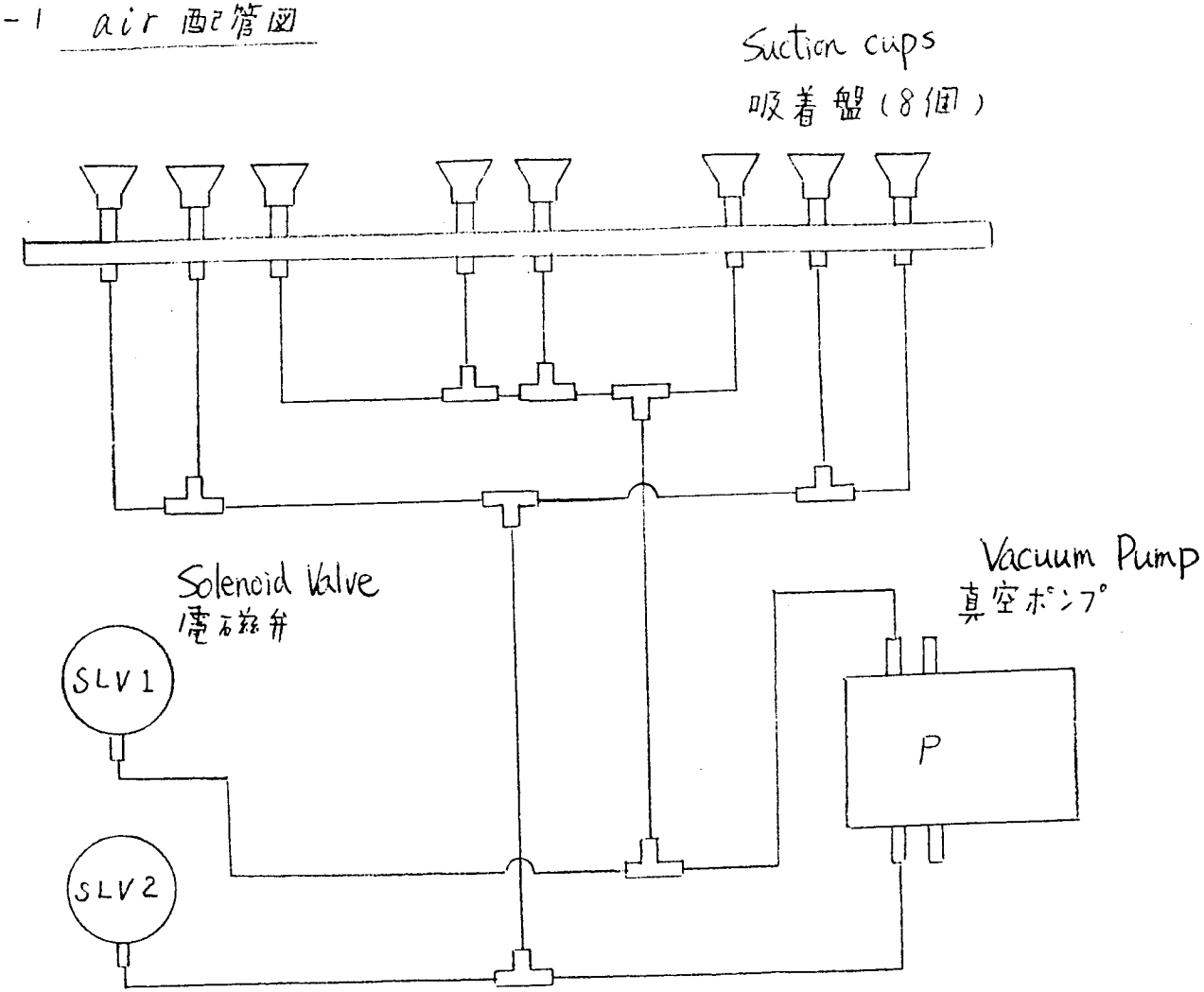
TROUBLE	CAUSE	TROUBLESHOOTING
Film transport roller fails to rotate.	* Film transport roller drive motor (M2) is out of order.	Check and replace.
	* Timer (To or T1) is out of order.	Check and replace.
	* K1, K2, K4 or K9 is out of order.	Check and replace.
ERROR (2 SHEETS) lamp lights up although only one sheet of film is dispensed.	* Superposed film detector adjustment is incorrect.	Check and adjust.
	* Microswitch (LS6) is out of order.	Check and replace.
	* Rollers are contaminated.	Check and clean.
ERROR (2 SHEETS) lamp does not light although more than one sheet of film are dispensed.	* Superposed film detector adjustment is improper.	Check and adjust.
	* Microswitch (LS6) is out of order.	Check and replace.
	* ERROR lamp is broken.	Check and replace.
OPERATE lamp does not light.	* K1, K2 or K6 is out of order.	Check and replace.
	* OPERATE lamp is broken.	Check and replace.
FILM lamp does not light.	* Microswitch (LS4) adjustments are improper, or LS4 is out of order.	Check. Adjust, or replace.
	* Timer (To or T1) is out of order.	Check and replace.
	* K1, K2 or K4 is out of order.	Check and replace.
STOP lamp does not light.	* STOP switch is out of order.	Check and replace.
	* STOP lamp is broken.	Check and replace.
SHUTTER lamp does not light.	* Microswitch (LS2) setting position is incorrect or, LS2 is out of order.	Check. Adjust, or replace.
	* K8 is out of order.	Check and replace.
	* SHUTTER lamp is broken.	Check and replace.
POWER lamp does not light. START lamp does not light. Front cover light does not light.	* Switch is out of order.	Check and replace.
	* Lamp is broken.	Check and replace.
	* Fuse is melted, or broken.	Check the cause, and solve the problem. Replace fuse.
Fan does not operate.	* Fan is out of order.	Check and replace.
ERROR (2 SHEETS) lamp lights, but buzzer does not sound.	* Buzzer is out of order.	Check and replace.
	* K2 is out of order.	Check and replace.

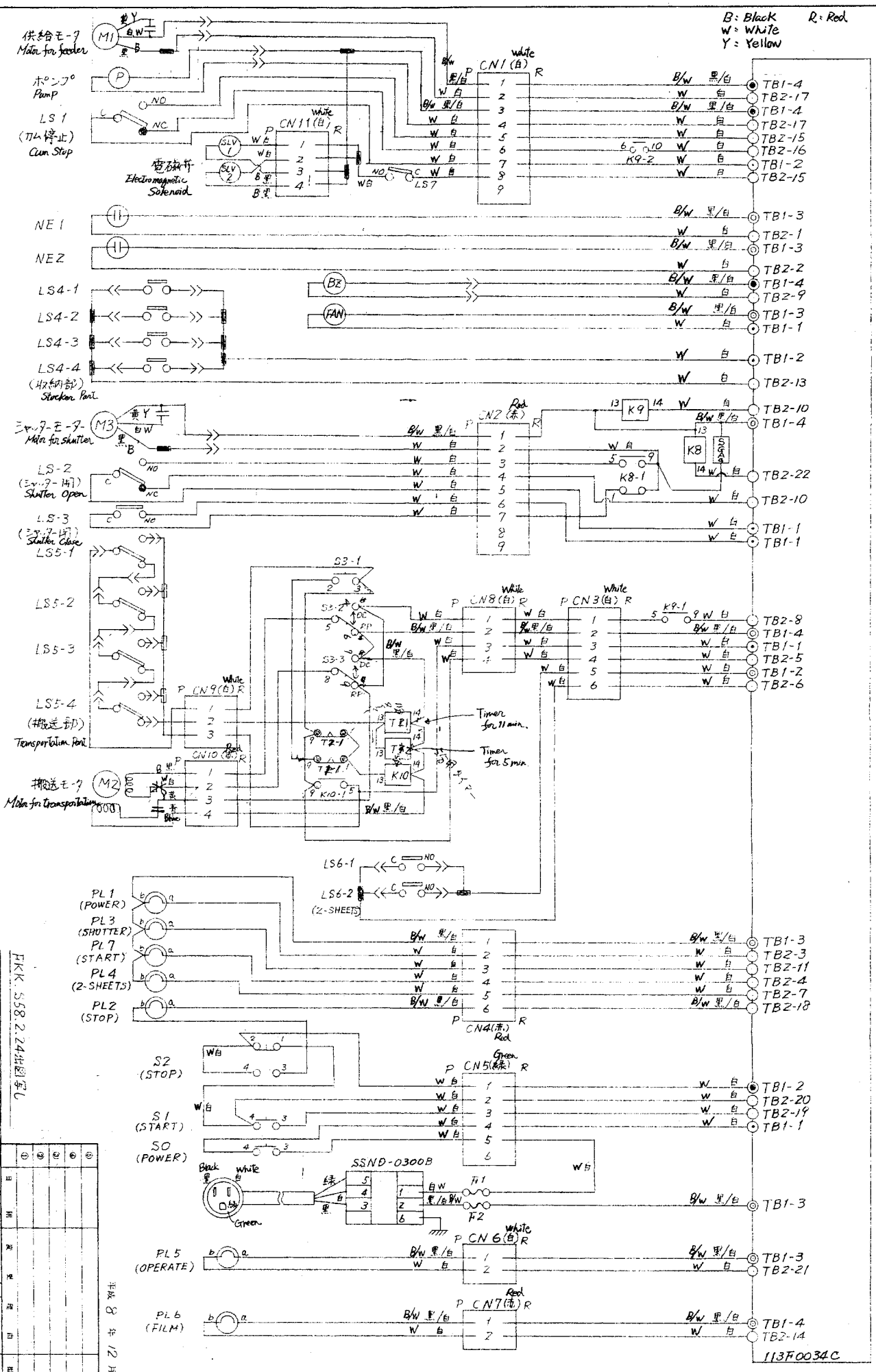
TROUBLE	CAUSE	TROUBLESHOOTING
SHUTTER does not open.	* Motor (M3) is out of order.	Check and replace.
	* Microswitch (LS2) is out of order.	Check and replace.
	* K8 is out of order.	Check and replace.
Shutter does not close.	* Motor (M3) is out of order.	Check and replace.
	* Microswitch (LS3) is out of order.	Check and replace.
	* K8 is out of order.	Check and replace.
Shutter does not open completely. Shutter does not close completely.	* Shutter open/close mechanism adjustments are incorrect.	Check and adjust.
	* M3 stop cam setting is incorrect.	Check and adjust.
The last film is nipped by the shutter.	* Timer (To or T1) setting is incorrect, or timer is out of order.	Check. Adjust or replace.
	* K5 is out of order.	Check and replace.
If the front cover is opened immediately after FILM lamp goes off, the last film is fogged.	* Timer (To or T1) setting is incorrect, or timer is out of order.	Check. Adjust or replace.
	* K5 is out of order.	Check and replace.
Front cover latch is too tight. Front cover latch is too weak.	* Ball latch is improperly adjusted.	Check and adjust.
Front cover lock claw hits the frame. Front cover lock is not released.	* Front cover lock mechanism is improperly adjusted.	Check and adjust.

AF IX-L3

May 21, 1995

9-1 air 配管図





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野村工業株式会社			
AFIX 速度切換			
実装図			
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AFIX L-3仕様			

平成8年12月4日

OPERATEランプ
Operation Lamp
STOPランプ
Stop Lamp
真空ポンプ
Vaccume Pump
供給用モーター
Motor for feeding
FILMランプ
Film Lamp
電磁弁
Electro magnetic Solenoid
シャッターランプ
Shutter Lamp
シャッター用モーター
Motor for shutter
ERRORランプ
Error Lamp
搬送用モーター
Motor for transpotation
警報ブザー
Alarm buzzer
ファン
Fan
PSTARTランプ
Start Lamp
POWERランプ
Power Lamp
前面蓋灯
Front Panel Cover Lamp
Front Panel Cover Lamp
(POWER)
SSND
-0300B