



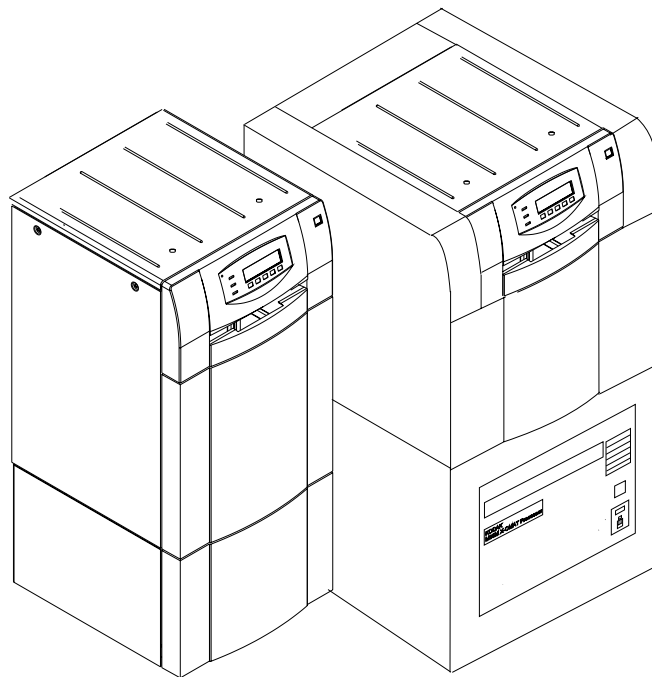
SERVICE MANUAL

for the

KODAK Miniloader 2000

and for the

KODAK Miniloader 2000 P



PLEASE NOTE

The information contained herein is based on the experience and knowledge relating to the subject matter gained by Kodak prior to publication. No patent license is granted by this information. Kodak reserves the right to change this information without notice, and makes no warranty, express or implied, with respect to this information. Kodak shall not be liable for any loss or damage, including consequential or special damages, resulting from the use of this information, even if loss or damage is caused by Kodak's negligence or other fault.

TABLE OF CONTENTS

ELECTROSTATIC DISCHARGE	I-I
SAFETY WARNINGS	I-II
1. SPECIAL TOOLS	1-1
2. REPLACEMENTS.....	2-1
INTRODUCTION.....	2-1
CASSETTE TRANSPORT	2-1
REMOVAL OF THE FRONT PANEL.....	2-1
REMOVAL OF THE INPUT PANEL	2-2
REPLACEMENT OF CASSETTE INPUT FLAP MOTOR M1.....	2-3
REPLACEMENT OF THE FRONT SOFT ROLLER SHAFT ASSY.....	2-4
REPLACEMENT OF THE FRONT TRANSPORT ROLLER.....	2-6
REPLACEMENT OF THE SHORT TRANSPORT ROLLER	2-7
REPLACEMENT OF THE LONG TRANSPORT ROLLER.....	2-8
REPLACEMENT OF THE CASSETTE TRANSPORT MOTOR M2.	2-10
REPLACEMENT OF THE CASSETTE OPENER MOTOR M5	2-12
REPLACEMENT OF THE CASSETTE OPENER SOLENOID Y4.....	2-17
MAGAZINE OPENER	2-18
REPLACEMENT OF THE MAGAZINE OPENER MOTOR M14.....	2-18
FILM POCKET	2-19
REPLACEMENT OF THE FILM POCKET STEPPER MOTOR M10.	2-19
REPLACEMENT OF THE FILM POCKET SUCKER BAR MOTOR M15.....	2-21
REPLACEMENT OF FILM POCKET SPRING.	2-22
RECEIVING MAGAZINE INTERFACE (ML2000 only)	2-23
REPLACEMENT OF STEPPER MOTOR INTERFACE M13.....	2-23
REMOVAL OF THE RECEIVING MAGAZINE TUNNEL(ML2000 only)	2-25
CONVEYOR	2-26
REMOVAL OF THE CONVEYOR	2-26
DISASSEMBLY OF THE CONVEYOR	2-28
REPLACEMENT OF THE FILM PICK UP MOTOR BELT (CARRIAGE)	2-30
REPLACEMENT OF FILM PICK UP MOTOR (CARRIAGE) M6.....	2-30
REPLACEMENT OF CARRIAGE ASSEMBLY DRIVE BELTS	2-32
REPLACEMENT OF SOLENOID CASSETTE SUCKER BAR TILTING Y7	2-33
REPLACEMENT OF THE SENSOR SUCKER BAR TILT B19.....	2-34
3. ADJUSTMENTS.....	3-1
INTRODUCTION.....	3-1
EXAMPLE:	3-1

SENSORS and DAYLIGHT	3-1
CASSETTE AREA	3-1
INPUT FLAP	3-1
CASSETTE OPENER MECHANISM	3-2
CASSETTE SUCKER BAR	3-5
How to clean the SUCKERS	3-5
CASSETTE LENGTH	3-11
SENSOR B20 VACUUM OFF	3-12
DRIVE BELT TENSION	3-14
FILM POCKET	3-15
CLEAN THE SUCKERS	3-15
FILM POCKET CHAIN	3-15
FILM POCKET ADJUSTMENT	3-18
MAGAZINE EMPTY SENSOR	3-34
DOUBLE SHEET SENSOR B59	3-35
MAGAZINE LEVELS	3-39
NEARLY EMPTY ADJUSTMENT	3-40
SCAN RUN	3-41
MAGAZINE AREA	3-41
MAGAZINE OPENER	3-41
STEPPER MOTOR FILM POCKET M10/M_PO	3-43
RECEIVING MAGAZINE INTERFACE (ML2000 only)	3-44
STEPPER MOTOR INTERFACE M13/M_PI	3-44
RECEIVING MAGAZINE (ML2000 only)	3-47
SENSOR B24/C_RM_E RECEIVING MAGAZINE ENTRANCE SENSOR B25/C_RM_F RECEIVING MAGAZINE FULL	3-47
4. PARAMETER	4-1
INTRODUCTION	4-1
HOW TO SET A PARAMETER	4-2
MINILOADER TYPE	4-2
CASSETTE UNIT	4-2
1. VACUUM OFF TIME	4-2
2. REST TIME	4-3
3. 8x10 inch V (ML2000 P only)	4-4
4. CASSETTE OFFSET	4-4
5. DISABLE INTERFACE (ML2000 P only)	4-5
6. CASS OPEN RETURN	4-5
MAGAZINE UNIT	4-6
1. TILT POSITION	4-6
2. ADDITIONAL STEPS	4-7

3. LOWER POCKET	4-7
4. MAGAZINE LEVELS	4-8
5. NEARLY EMPTY	4-9
6. PROCESSOR SPEED /TIME FEED 24 cm (ML2000 P only)	4-9
5. RESIZING MAGAZINES	5-1
6. PREVENTIVE MAINTENANCE	6-1
PREPARATION:	6-1
GENERAL ACTIVITIES:	6-1
CASSETTE AREA:	6-2
SPECIAL REPLACEMENTS AFTER 120000 CYCLES	6-3
SPECIAL REPLACEMENTS AFTER 200000 CYCLES	6-4
VENTING (ML2000 P only)	6-4
FINAL CHECK-OUT:	6-5

ELECTROSTATIC DISCHARGE

OVERVIEW

ESD—electrostatic discharge—is a primary source of:

- Product downtime
- Lost productivity
- Costly repairs.

While we cannot even feel a static charge of less than 3,500 volts, as few as 30 volts can damage or destroy essential components in the electronic equipment upon which you rely. As technology continues to advance, these advanced components will be even more vulnerable to ESD destruction. The conclusion is clear. To take charge of productivity and profitability, you must take care of ESD, now. Effective ESD control requires the following things.

AWARENESS

Everyone in your organisation needs to be aware of ESD, because partial ESD control is no ESD control at all. Everyone needs to remember that:

ESD is a primary source of frustrating equipment failures and intermittent malfunctions.
ESD affects productivity and profitability.
ESD can be controlled.

ACTION

To take charge of ESD, you must take action. And that means everyone from senior management to the evening security crew.

If you repair and maintain electronic equipment, it means always wearing grounding straps and working at ESD-protected sites.

If you ever work around electronic equipment, it means keeping static generators like plastic trash bags away from sensitive components.

For everyone, taking charge of ESD means making the simple ESD controls a way of life. (See the following sections for special tips).

EFFECTIVE ESD CONTROL IS EVERYONE'S RESPONSIBILITY._

EVERY DAY

Put trash in its place. And that place is away from static-sensitive equipment. Plastic materials, like trashcan liners and plastic foam cups, generate the static electricity that damages or destroys electronic components.

Look for the label. Static-sensitive components are marked with bright graphic labels. Look for these labels. Follow label directions.

Spray the carpet. ESD that is generated when you walk over carpet is a major culprit in component destruction. In some cases, especially in low-humidity environments, you may need to periodically spray carpets with an anti-static preparation, available at local stores.

DURING MAINTENANCE AND REPAIR

Wear a grounding strap when you deal with static-sensitive components. Always make certain that the clip is attached to a properly grounded, unpainted surface.

Use a portable grounding mat if you cannot repair components at an ESD-protected workstation. (Kodak's Customer Equipment Services Division can assist you in setting up ESD-protected workstations.)

Use protective packaging when you transport components from one area to another. Transparent anti static bags, available from a variety of manufactures, shield your just-repaired components from further damage.

SAFETY WARNINGS

1.

BE CAREFUL WHEN WORKING IN THE CASSETTE OPENER AREA. THE OPENER MOTOR AND THE OPENER MECHANISM ARE VERY STRONG. THEY CANNOT BE MOVED MANUALLY. THEY MAY SQUEEZE YOUR HAND AND TRAP YOU IF YOU TRY TO STOP THEM MANUALLY. NEVER START THE CASSETTE OPENER MOTOR WHEN SOMEONE'S HANDS ARE IN THE CASSETTE AREA.

2.

DISCONNECT THE POWER WHEN WORKING AT THE POWER SUPPLY. IT IS POSSIBLE TO TOUCH THE MAINS VOLTAGE.

3.

IF YOU TAKE OFF PANELS OR COVERS OR WIRE TIES TO GET EASIER ACCESS TO PARTS, INSTALL THEM BEFORE YOU MOUNT THE SIDE PANELS WHEN THE SERVICE CALL OR THE PM IS FINISHED. ENSURE THAT ALL PROTECTIVE GROUND WIRES ARE CONNECTED AGAIN.

4.

BE CAREFUL WHEN WORKING ON CIRCUIT BOARDS A4 AND A8. THERE IS 120 VAC ON THESE BOARDS. BE ESPECIALLY CAREFUL WHEN MEASURING ON THE REAR SIDE OF THE CIRCUIT BOARDS. AN ELECTRIC SHOCK MAY RESULT.

5.

ENSURE THAT AFTER A SERVICE CALL OR PREVENTIVE MAINTENANCE THE INTERLOCK SWITCHES ARE FUNCTIONING.

1. SPECIAL TOOLS

Beside the standard TOOL KIT the following SPECIAL TOOLS are required:

VERNIER CALIPER	TL 1727
GREASE.....	TL 2247
METRIC ALLEN SET	TL 2764
METRIC ALLEN SET BALL ENDED	TL 3789
METRIC OPEN END WRENCH SET	TL 2765
METRIC OPEN END WRENCH 5.5mm.....	TL 1936
METRIC OPEN WRENCH 7mm.....	TL 1938
ESD KIT	TL 3346
DENTIST MIRROR	TL 2753
EXTRACTION TOOL.....	TL 1580
EXTRACTION TOOL.....	TL 1654
THICKNESS GAUGE	TL 2372
LAPTOP DATA CABLE	TL 4391
TORX WRENCH SET	TL 3261
BLOW PIPE POSITIONER MAGAZINE	TL 4582
CES SERVICE SOFTWARE	G9904474
LAPTOP COMPUTER, has to be bought locally.	

2. REPLACEMENTS

INTRODUCTION

In this section it is frequently explained how to use the CES SERVICE SOFTWARE. The first line always tells what should be performed. In the next lines it is explained how to reach this goal. These additional explanations are printed italic and can be skipped if you are experienced with the CES SERVICE SOFTWARE.

EXAMPLE:

1. Start the CASSETTE INPUT FLAP MOTOR M1

Start the SERVICE PROGRAM.

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select COMPONENT TEST from the MAIN MENU press ENTER

Select CASSETTE MOTORS press ENTER

Select INPUT FLAP MOT M1 press ENTER

Select CLOSE/OPEN press ENTER

CASSETTE TRANSPORT

REMOVAL OF THE FRONT PANEL

PURPOSE:

To get better access to the INPUT FLAP, to the FRONT ROLLERS of the CASSETTE TRANSPORT, to the DISPLAY and to take off the TOP FRAME, the FRONT PANEL has to be removed.

1. Switch off ML2000 (ML2000 P).
2. Open the TOP COVER.
3. Take off the SIDE PANELS.
4. Take out MOUNTING SCREWS 1, 2 and 3.
5. Loosen MOUNTING SCREW No. 4. Do not take it out!
6. Pull up the BRACKET. It is now possible to take off the FRONT PANEL.

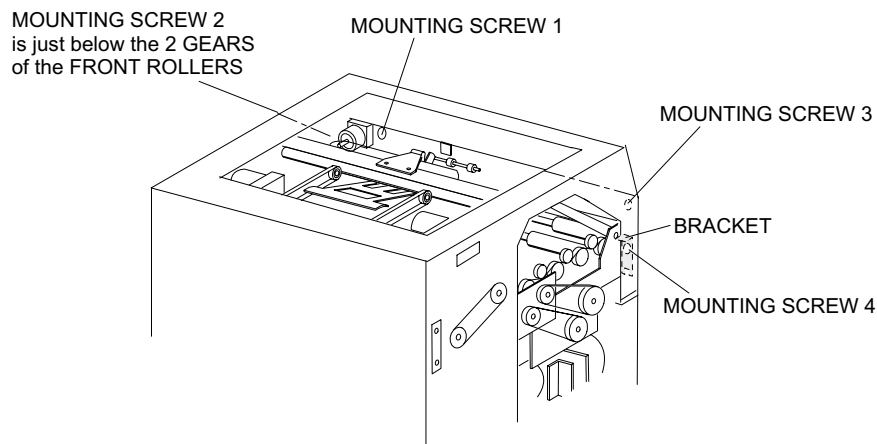


figure 2-1

REMOVAL OF THE INPUT PANEL.

PURPOSE:

To get better access to the FRONT ROLLERS of the CASSETTE TRANSPORT, the INPUT PANEL has to be removed. Use the following procedure.

NOTE

The FRONT PANEL must be removed first.

1. Take out the INPUT FLAP MOTOR M1.
2. Take out the 4 MOUNTING SCREWS.

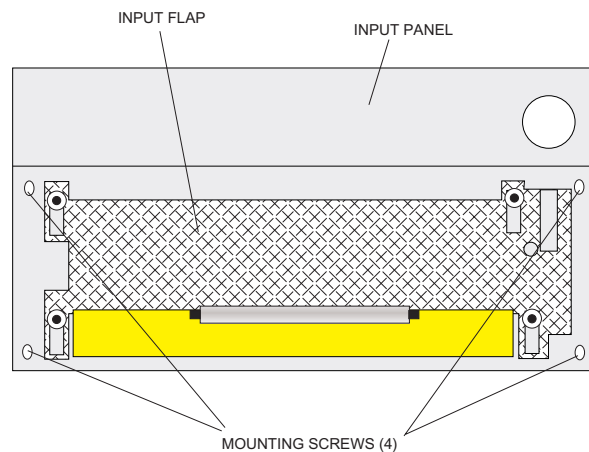


figure 2-2

3. Disconnect the INTERLOCK REED SWITCH of the TOP COVER to prevent breaking its wires when the INPUT PANEL is taken out.
4. Carefully pull out the INPUT PANEL. Secure it with a WIRE TIE to the FRAME.
5. When reinstalling the INPUT PANEL, ensure that the INTERLOCK SWITCH is connected again.

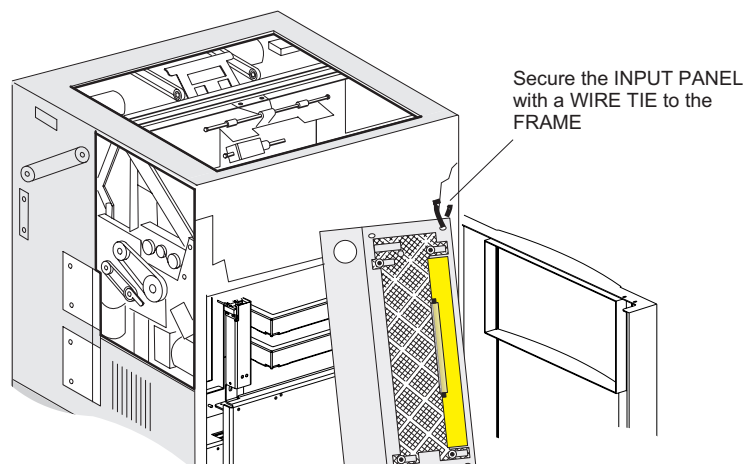


figure 2-3

REPLACEMENT OF CASSETTE INPUT FLAP MOTOR M1.

1. Switch off the ML2000 (ML2000 P).
2. Take off the SIDE PANELS.
3. Take off the FRONT PANEL with DISPLAY.

CAUTION

The CABLE to the DISPLAY is short. Disconnect it when the FRONT PANEL is off. The PROTECTIVE GROUND WIRE from the DISPLAY is short too. It is connected to the GROUND TERMINAL CLOSE TO MOTOR M1. Disconnect it too.

4. Manually turn the INPUT FLAP MOTOR CAM to fully lower the INPUT FLAP. This gives access to the 3 MOTOR MOUNTING SCREWS.

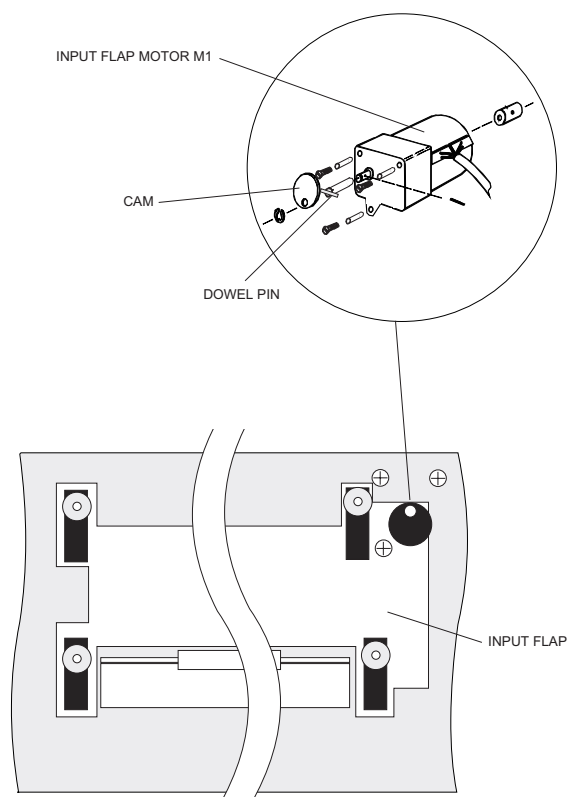


figure 2-4

5. Take off the INPUT FLAP CAM.

NOTE

Take care when removing the CAM. There is a DOWEL PIN behind it.

6. Take out the 3 MOUNTING SCREWS of the INPUT FLAP MOTOR.
7. Install the new MOTOR.
8. Install the FRONT PANEL. Ensure that the CABLE to the DISPLAY and the PROTECTIVE GROUND WIRE is connected properly.

FUNCTION TEST

1. Start the CASSETTE INPUT FLAP MOTOR M1
Start the SERVICE PROGRAM.
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select CASSETTE MOTORS press ENTER
Select INPUT FLAP MOT M1 press ENTER
Select CLOSE/OPEN press ENTER
2. Make sure that the MOTOR CAM turns clockwise. If it turns counter-clockwise interchange PIN 1 and 3 at the MOTOR CONNECTOR.
3. Exit the SERVICE PROGRAM
Press BACKSPACE 3 times.
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE..... press ENTER
Select Quit the program press ENTER

REPLACEMENT OF THE FRONT SOFT ROLLER SHAFT ASSY.

1. Switch off ML2000 (ML2000 P).
2. Take off the PANELS.
3. Take out the INPUT FLAP MOTOR M1 and the INPUT PANEL. This gives better access to the SOFT ROLLER SHAFT.
4. Loosen the BELT TENSIONERS and take off the DRIVE BELT. See the drawing on the next page.
5. Take off the C-RING at the DRIVE PULLEY.
6. Take off the CAP.

NOTE

Take care when removing the CAP. There is a DOWEL PIN underneath. Removing the DRIVE BELT in step 4 allows to turn the SOFT ROLLER SHAFT ASSY until the DOWEL PIN is in a horizontal position.

7. Take out the DOWEL PIN.
8. Take off the DRIVE GEAR.
9. Take out the WASHER and the C-RING on the left-hand side of the SOFT ROLLER SHAFT ASSY. Remove the SOFT ROLLER SHAFT ASSY.
10. Install the new SOFT ROLLER SHAFT ASSY.

FUNCTION TEST

1. Check that a CASSETTE is transported correctly forward and backward.
2. Ensure that all PANELS are mounted correctly and that all PROTECTIVE GROUND CABLES are properly connected.

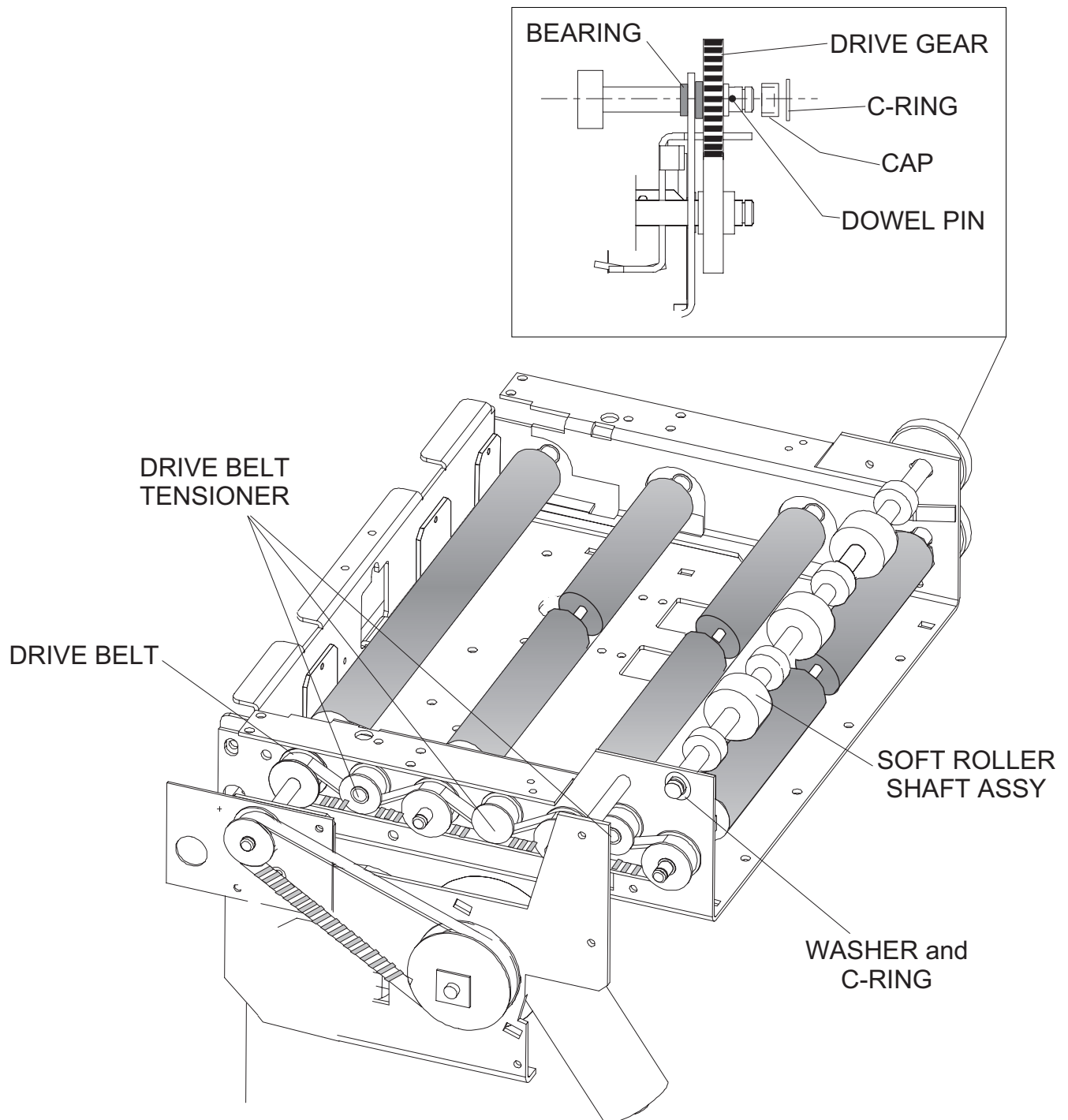


figure 2-5

REPLACEMENT OF THE FRONT TRANSPORT ROLLER.

1. Switch off the ML2000 (ML2000 P).
2. Take off the SIDE PANELS and the FRONT PANEL.
3. Take out the INPUT FLAP MOTOR M1 and the INPUT PANEL. This gives better access to FRONT ROLLER.

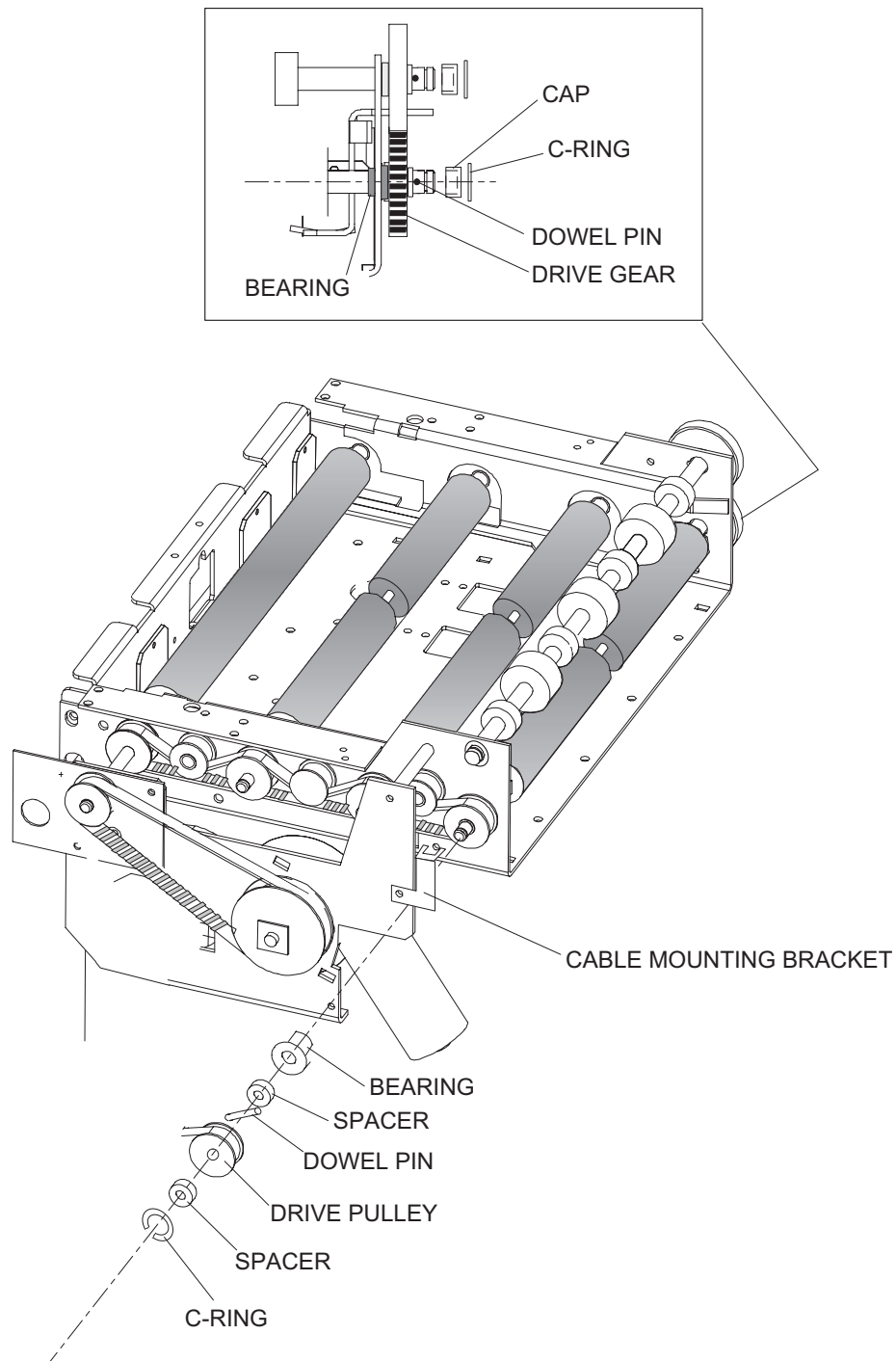


figure 2-6

4. Loosen the BELT TENSIONERS and take off the DRIVE BELT. This allows the FRONT TRANSPORT ROLLER to turn and bring the DOWEL PINS to a horizontal position. This prevents them from coming lost.
5. Take off the C-RING and the SPACER at the DRIVE PULLEY.
6. Carefully pull the DRIVE PULLEY off the SHAFT.

NOTE

There is a DOWEL PIN behind the DRIVE PULLEY. If it is not in a horizontal position, it may fall down and becomes lost. Therefore turn the FRONT TRANSPORT ROLLER if necessary.

7. Take out DOWEL PIN, SPACER and BEARING.
8. Take off the C-RING from the DRIVE GEAR on the right-hand side.
9. Take off the CAP and the DOWEL PIN underneath.
10. Shift the FRONT TRANSPORT ROLLER fully to the left and take off the DRIVE GEAR.
11. Take out the BEARING.
12. Take out the FRONT TRANSPORT ROLLER and replace it with a new one.

FUNCTION TEST.

1. Check that a CASSETTE is transported correctly forward and backward.
2. Ensure that all PANELS are mounted correctly and that all PROTECTIVE GROUND CABLES are properly connected.

REPLACEMENT OF THE SHORT TRANSPORT ROLLER

NOTE

For details see the drawing on the next page.

1. Switch off ML2000 (ML2000 P).
2. Take off the PANELS.
3. Loosen the BELT TENSIONERS and take off the DRIVE BELT.
4. Take off the C-RING and SPACER at the DRIVE PULLEY.
5. Take off the DRIVE PULLEY.

NOTE

There is a DOWEL PIN behind the DRIVE PULLEY. If it is not in a horizontal position, it may fall down and becomes lost. Therefore turn the FRONT TRANSPORT ROLLER if necessary.

6. Take out the DOWEL PIN, SPACER and the BEARING.
7. Take off the right-hand C-RING of the SHORT TRANSPORT ROLLER.
8. Take out the BEARING.
9. Replace the SHORT TRANSPORT ROLLER with a new one.

FUNCTION TEST.

1. Check that a CASSETTE is transported correctly forward and backward.

2. Ensure that all PANELS are mounted correctly and that all PROTECTIVE GROUND CABLES are properly connected.

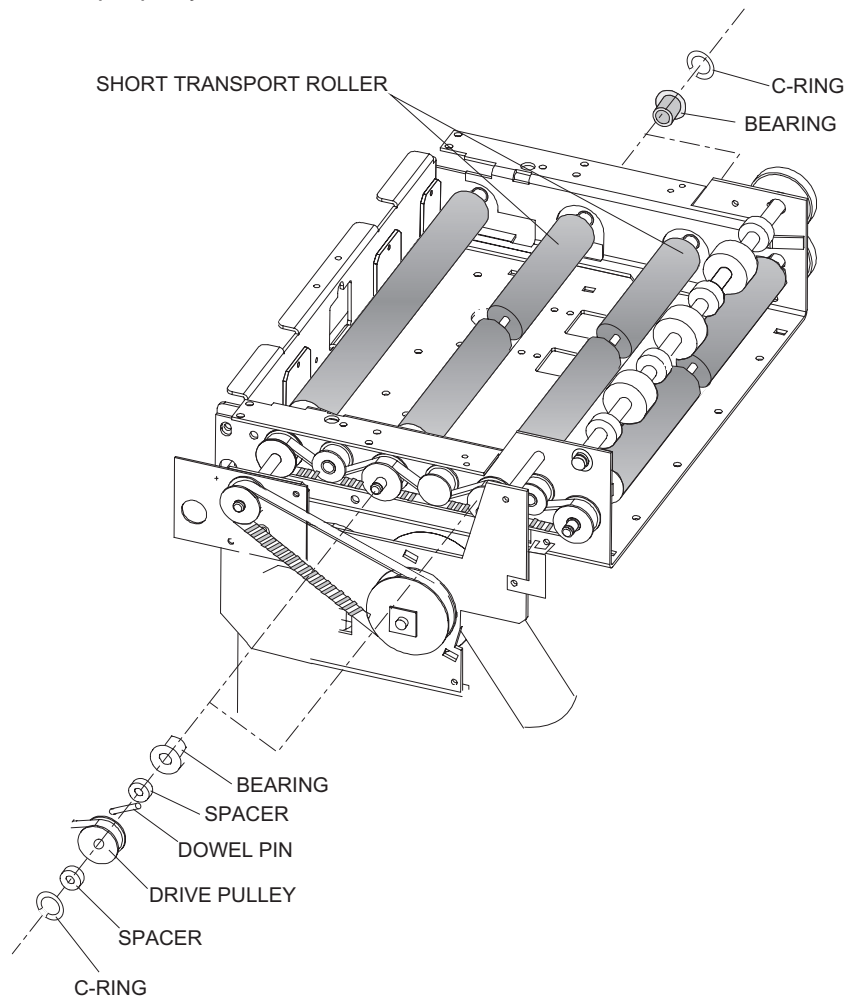


figure 2-7

REPLACEMENT OF THE LONG TRANSPORT ROLLER

1. Switch off ML2000 (ML2000 P).
2. Take off the SIDE PANELS.
3. Take off the C-RING and BEARING at the right-hand side of the LONG TRANSPORT ROLLER. See the drawing on the next page.
4. Loosen the MOUNTING SCREWS (3) of the CASSETTE TRANSPORT MOTOR.
5. Take off the C-Ring and the DRIVE PULLEY together with the DRIVE BELT 1 from the left-hand side of the TRANSPORT ROLLER.

NOTE

There is a DOWEL PIN behind the DRIVE PULLEY. Do not lose it.

6. Take out the black and white SPACERS at the left-hand side of the TRANSPORT ROLLER.

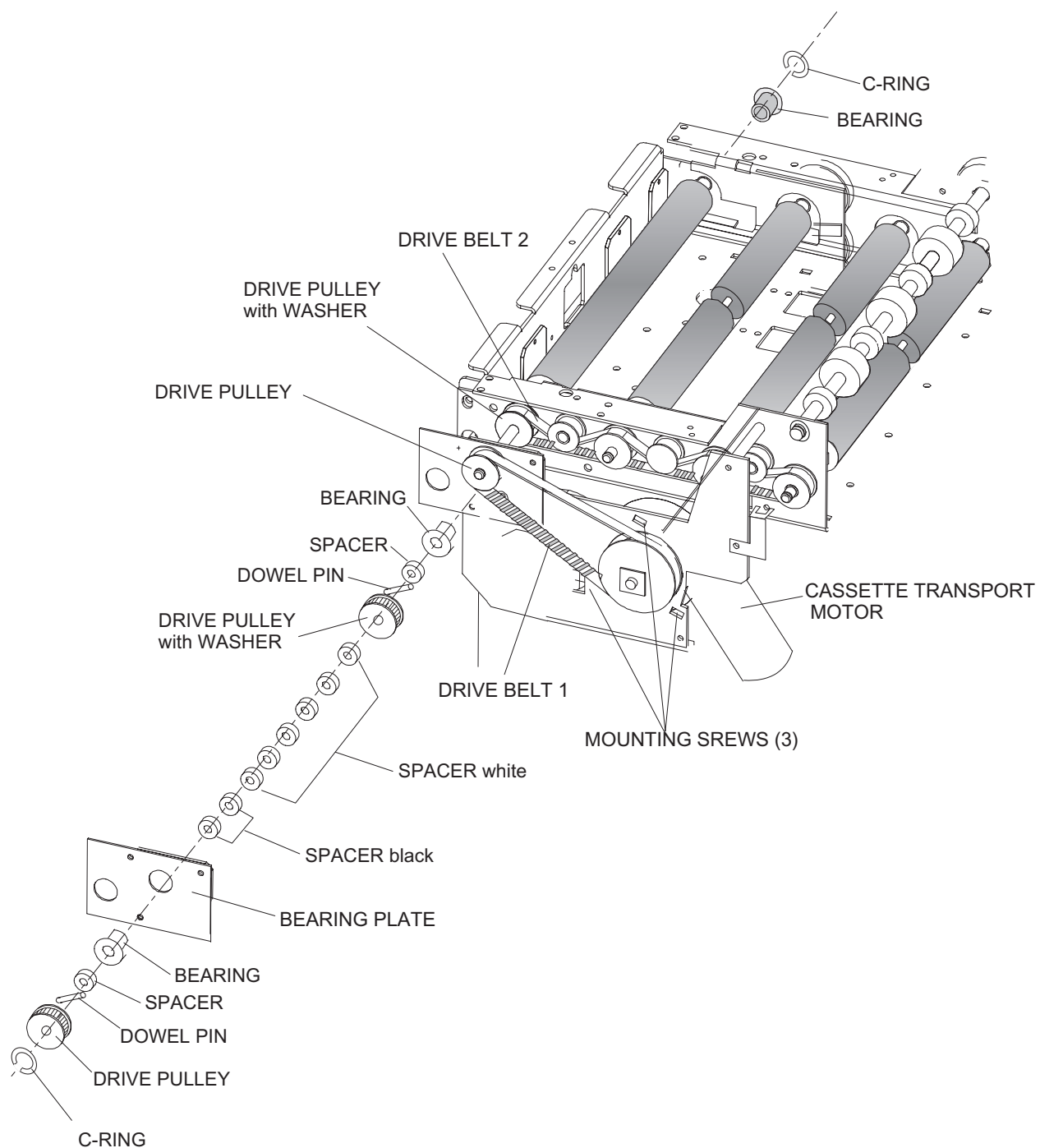


figure 2-8

7. Move the DRIVE PULLEY with WASHER to the left and take out the DOWEL PIN.
8. Manually open the CASSETTE CENTRING.
9. Shift the TRANSPORT ROLLER fully to the left to disengage the TRANSPORT ROLLER on the right-hand side.
10. Lift the right-hand end off the TRANSPORT ROLLER up as far as possible and **carefully pull it out to the right.**

NOTE

Do not loose the parts which are still on the left-hand side of the TRANSPORT ROLLER.

11. Install the new LONG TRANSPORT ROLLER

FUNCTION TEST.

1. Check that a CASSETTE is transported correctly forward and backward.
2. Ensure that all PANELS are mounted correctly and that all PROTECTIVE GROUND CABLES are properly connected.

REPLACEMENT OF THE CASSETTE TRANSPORT MOTOR M2.

NOTE

Always order MOTOR PN 9228010 and RETAINING RING PN 4500416

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.

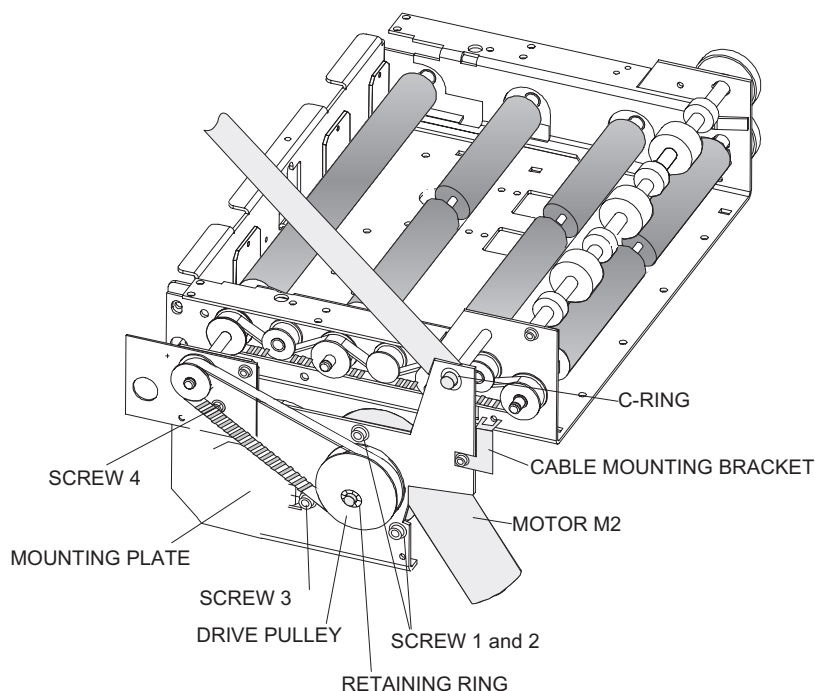


figure 2-9

3. Loosen SCREWS 1, 2 and 3.
4. Take off the RETAINING RING and then the DRIVE PULLEY with the DOWEL PIN and the TIMING BELT.

NOTE

THE DOWEL PIN MAY FALL DOWN.

5. Take off the CABLE MOUNTING BRACKET and the C-RING. Then loosen (do not take it out) SCREW 4. This allows to move the MOUNTING PLATE forward.
6. Take out the MOUNTING SCREWS of the CASSETTE TRANSPORT MOTOR (SCREWS 1, 2 and 3)

NOTE

The SPACERS between the MOTOR and the MOUNTING PLATE may fall down.

7. Take out the CASSETTE TRANSPORT MOTOR. To do so move the MOUNTING PLATE out as far as possible.
8. Install the new MOTOR. Fix the cable with WIRE TIES.

FUNCTION TEST.

1. Start the CASSETTE TRANSPORT MOTOR M2
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed press ENTER
UNIT Data are displayed press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select CASSETTE MOTORS press ENTER
Select CASSETTE TRANSPORT M2 press ENTER
2. Check that the MOTOR is running forward/backward.
Select FORWARD/BACKWARD
3. Exit the SERVICE PROGRAM
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER
4. Ensure that all PANELS are mounted correctly and that all PROTECTIVE GROUND CABLES are properly connected.

REPLACEMENT OF THE CASSETTE OPENER MOTOR M5

1. Switch off the ML2000 (ML2000 P).
2. Remove the PANELS.
3. Take off the ACTUATOR

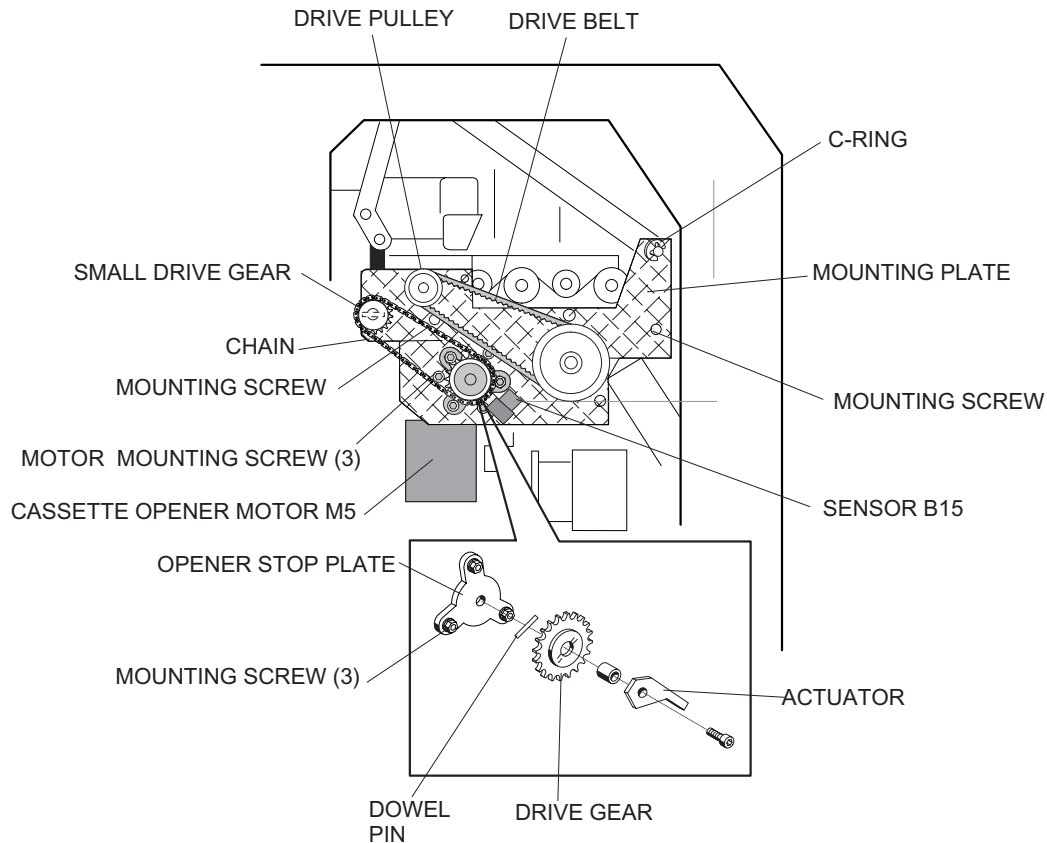


figure 2-10

4. Take out the 3 CASSETTE OPENER MOTOR MOUNTING SCREWS.
5. Mark the position of the OPENER STOP PLATE.
6. Take out the 3 OPENER STOP PLATE MOUNTING SCREWS.
7. Take out the DOWEL PIN of the MOTOR SHAFT.
8. Take out the STOP PLATE.
9. Take off the DRIVE GEAR with the CHAIN.

WARNING

Hold with one hand the CASSETTE OPENER MECHANISM. As soon as you take off the CHAIN, the mechanism moves down and may squeeze in your fingers. When the GEAR is off lower the CASSETTE OPENER MECHANISM to its bottom position.

10. Take out the 2 MOUNTING SCREWS of the MOUNTING PLATE
11. Disconnect SENSOR B15.
12. Take off the SMALL DRIVE GEAR.

NOTE

There is a DOWEL PIN behind the SMALL DRIVE GEAR.

13. Loosen the MOUNTING SCREWS of CASSETTE TRANSPORT MOTOR M2.
14. Take off the DRIVE PULLEY and the DRIVE BELT.

NOTE

There is a DOWEL PIN behind the DRIVE PULLEY.

15. Move out the MOUNTING PLATE. This gives access to the CASSETTE OPENER MOTOR.
16. Take out the CASSETTE OPENER MOTOR.

NOTE

The MOTOR comes off with a THREAD PLATE. This THREAD PLATE must be inserted again with the new MOTOR. It holds the OPENER STOP PLATE.

17. Insert the new CASSETTE OPENER MOTOR together with the THREAD PLATE. Fix it with 3 MOUNTING SCREWS. Mount SENSOR B15 at this time.
18. Mount the MOUNTING PLATE. Use the 2 SCREWS removed in step 10.
19. Mount the OPENER STOP PLATE. Use the marks made in step 5 as reference. Tighten the MOUNTING SCREWS just a bit, that the STOP PLATE can still be moved.
20. Mount the DRIVE PULLEY and the DRIVE BELT of the CASSETTE TRANSPORT MOTOR. Tension the DRIVE BELT and fasten the MOUNTING SCREWS of MOTOR M2.
21. Switch on the ML2000 (ML2000 P)

WARNING

BE CAREFUL WHEN WORKING IN THE CASSETTE OPENER AREA. THE OPENER MOTOR AND THE OPENER MECHANISM ARE VERY STRONG. THEY CANNOT BE MOVED MANUALLY. THEY MAY SQUEEZE YOUR HAND AND TRAP YOU IF YOU TRY TO STOP THEM MANUALLY. NEVER START THE CASSETTE OPENER MOTOR WHEN SOMEONE'S HANDS ARE IN THE CASSETTE AREA.

22. To mount the MOTOR DRIVE GEAR the DOWEL PIN has to be in the correct position in relation to the STOP BOLTS of the STOP PLATE. To rotate the MOTOR SHAFT use the SERVICE PROGRAM. Switch on the CASSETTE OPENER MOTOR M5 until the DOWEL PIN is in a horizontal position. See the drawing on the next page.

Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed press ENTER
UNIT DATA are displayed press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select CASSETTE MOTORS press ENTER
Select CASSETTE OPENING M5 press ENTER
Select DOWN or UP until the DOWEL PIN is in a horizontal position.

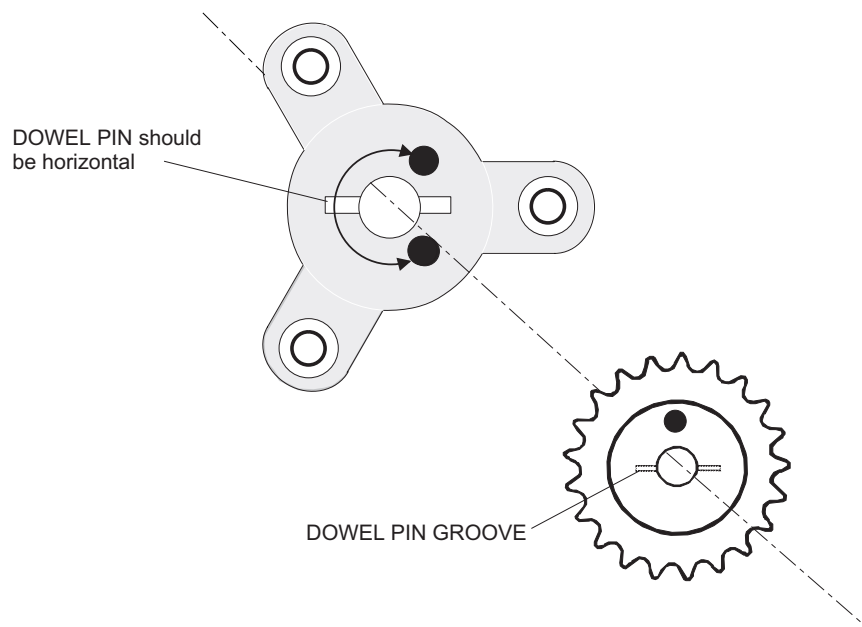


figure 2-11

- 23.** Mount the DRIVE GEAR onto the MOTOR SHAFT. Ensure that it is seated properly on the DOWEL PIN. Mount the ACTUATOR removed in step 3 to hold the DRIVE GEAR on the SHAFT. Do not tighten the ACTUATOR SCREW at this time.

NOTE

The STOP PIN of the DRIVE GEAR has to be to the left of the bottom STOP BOLT. If it is to the right the CASSETTE OPENER cannot move the full distance.

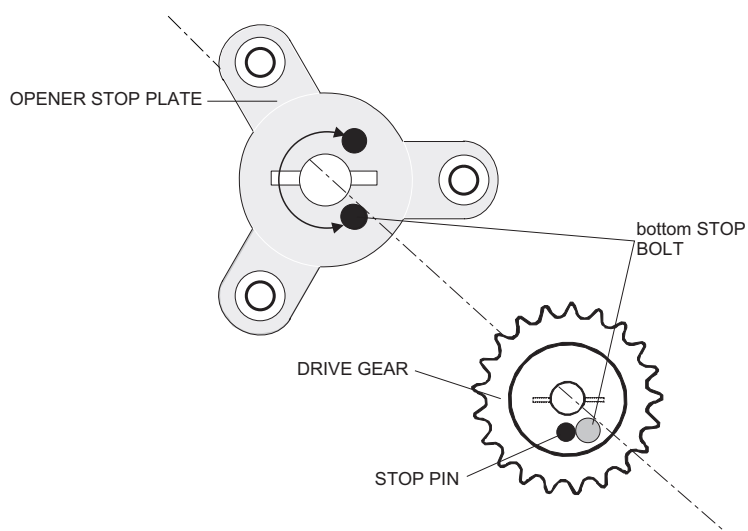


figure 2-12

- 24.** To mount the CHAIN is the next step. To do this the CASSETTE OPENER MECHANISM and the MOTOR DRIVE GEAR have to be in the correct position.
- The CASSETTE OPENER MECHANISM must be in its bottom position.
 - The STOP PIN of the DRIVE GEAR should just touch the bottom STOP BOLT of the STOP PLATE.

Select DOWN until the STOP PIN just touches the STOP BOLT.

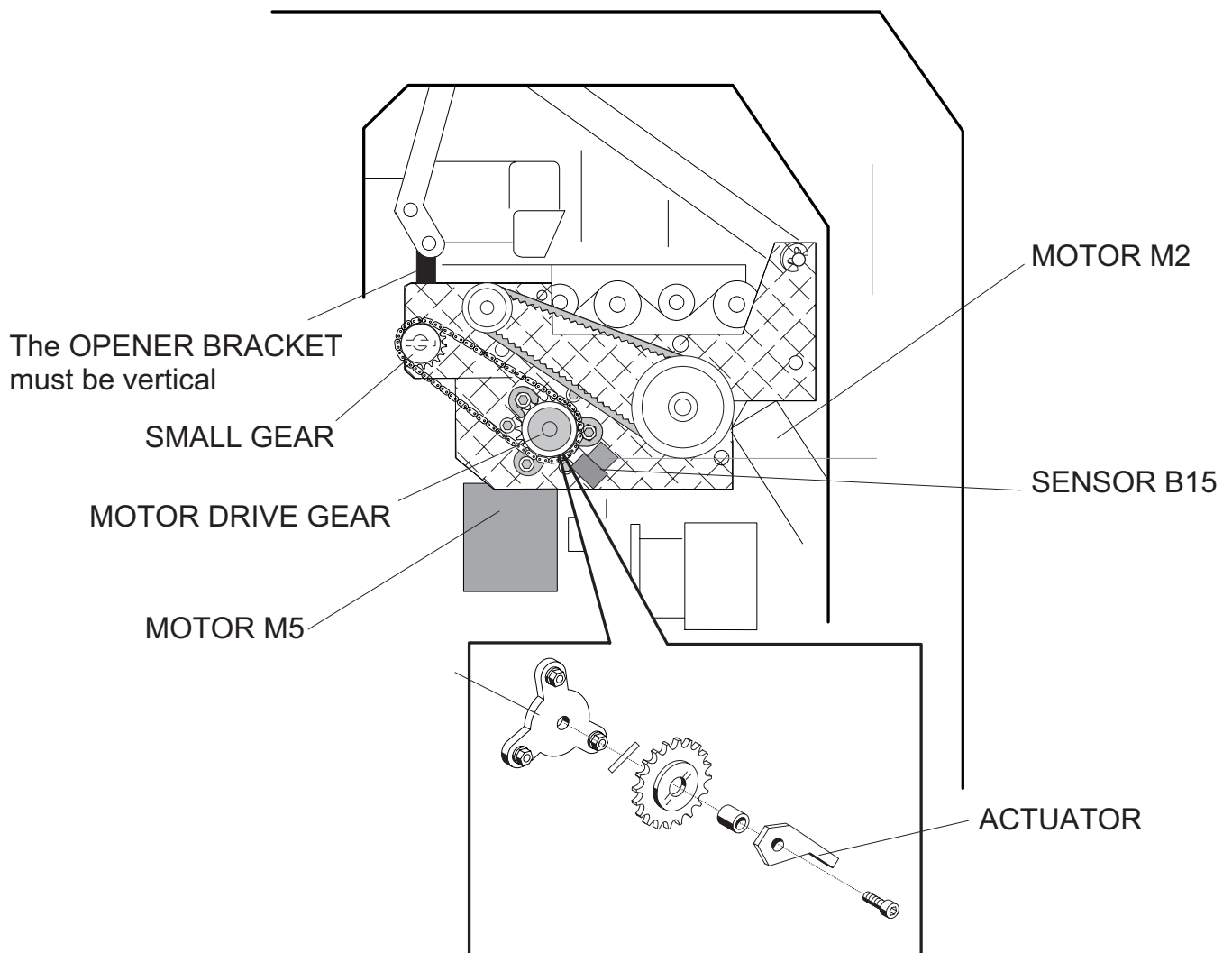


figure 2-13

25. Mount the CHAIN onto the MOTOR DRIVE GEAR and onto the SMALL GEAR.
26. Put the small GEAR onto its SHAFT and secure it with the C-RING.
27. Tension the CHAIN by moving the CASSETTE OPENER MOTOR to the right.
28. Tighten the MOTOR MOUNTING SCREWS.
29. Move the CASSETTE OPENER to its fully up position. Select UP until the OPENER BRACKET is vertical.
30. Adjust the ACTUATOR so that SENSOR B15 is actuated. Tighten its MOUNTING SCREW.
31. The ACTUATOR must now be set to a position that the CASSETTE OPENER MOTOR is switched off as soon as the OPENER BRACKET is vertical. Select DOWN until the OPENER is fully down Select UP until the OPENER stops.
32. If the OPENER BRACKET is vertical proceed with step 33. If not, reposition the ACTUATOR as required and proceed with step 31.
33. SENSOR B15 is now adjusted correctly. The next step is to adjust the OPENER STOP PLATE.
34. The OPENER is still in the upper position. Turn the STOP PLATE counter-clockwise until the STOP BOLT touches the STOP PIN of the DRIVE GEAR. Turn the STOP PLATE clockwise until there is a gap of approximately 1 mm between the STOP PIN and the STOP BOLT.

NOTE

It is not possible to see this gap. You have to set it by feeling.

35. Tighten the MOUNTING SCREWS of the STOP PLATE.
36. Check the position of the STOP PLATE.
 - Disconnect SENSOR B15.
 - Select UP. The MOTOR M5 must turn for a short distance and is stopped then.
A high pitched tone can be heard at the same time.
 - Connect SENSOR B15.
 - Select DOWN until the CASSETTE OPENER stops in its bottom position.
 - Manually actuate SENSOR B15. Do not break its thin PLASTIC ACTUATOR.
 - Select DOWN again. MOTOR M5 should turn for a short distance and is stopped then.
A high pitched tone can be heard at the same time.
 - Select UP until the CASSETTE OPENER stops in its uppermost position.
 - If the UP and DOWN positions are correct, proceed with step 37. Otherwise reposition the STOP PLATE and repeat step 33.
37. Exit the SERVICE MODE.
 - Press BACKSPACE 3 times
 - Select LEAVE THE COMPONENT TEST press ENTER
 - Select QUIT ML2000 SERVICE MODE..... press ENTER
 - Select Quit the program press ENTER

FUNCTION TEST.

WARNING

BE CAREFUL WHEN WORKING IN THE CASSETTE OPENER AREA. THE OPENER MOTOR AND THE OPENER MECHANISM ARE VERY STRONG. THEY CANNOT BE MOVED MANUALLY. THEY MAY SQUEEZE YOUR HAND AND TRAP YOU IF YOU TRY TO STOP THEM MANUALLY. NEVER START THE CASSETTE OPENER MOTOR WHEN SOMEONE'S HANDS ARE IN THE CASSETTE AREA.

1. Take out the MAGAZINES loaded with CUSTOMER FILMS to avoid film fogging.
2. Run several cycles with test films.
3. Check that the OPENER BRACKET is vertical when the CASSETTE is open.
4. Check that the CASSETTE is correctly closed.

REPLACEMENT OF THE CASSETTE OPENER SOLENOID Y4.

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Lower the CASSETTE OPENER to the approximate mid position. Unplug the CASSETTE OPENER SOLENOID (Connector X40).
4. Take out the 2 SCREWS from the CASSETTE OPENER SOLENOID.

NOTE

Take care when replacing the SOLENOID. The ARMATURE is spring loaded and all parts may snap apart.

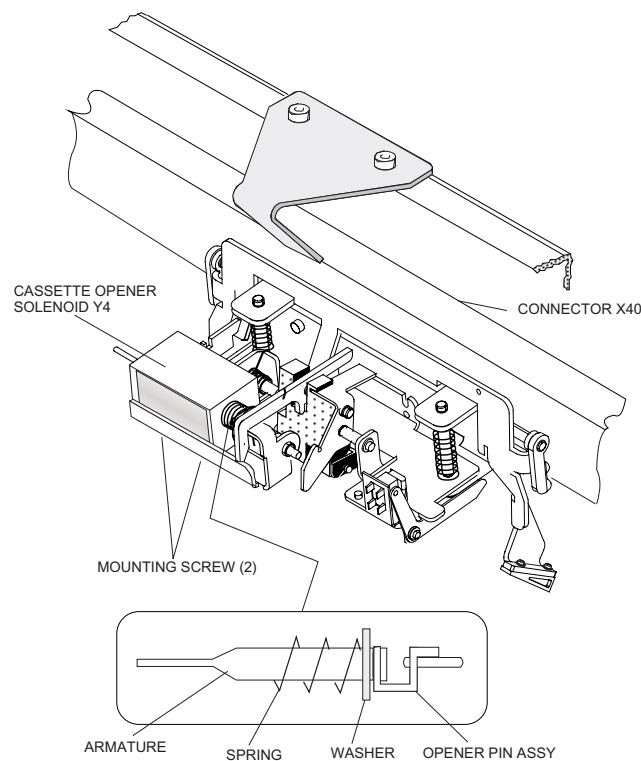


figure 2-14

5. Install the new CASSETTE OPENER SOLENOID.

FUNCTION TEST.

1. To avoid fogging CUSTOMER FILMS load the MAGAZINES with TEST FILMS.
2. Run several cycles with different CASSETTES. Check that they are opened correctly.
3. Reload the MAGAZINES with CUSTOMER FILMS.

MAGAZINE OPENER

REPLACEMENT OF THE MAGAZINE OPENER MOTOR M14.

1. Switch off the ML2000 (ML2000 P).
2. Take off the left-hand SIDE Panel.
3. Manually move the MAGAZINE OPENER to the "CLOSED" position.
4. Take out all MAGAZINES.
5. Take out SCREWS 1 and 2 and the C-RING.
6. Disconnect SENSOR B15.

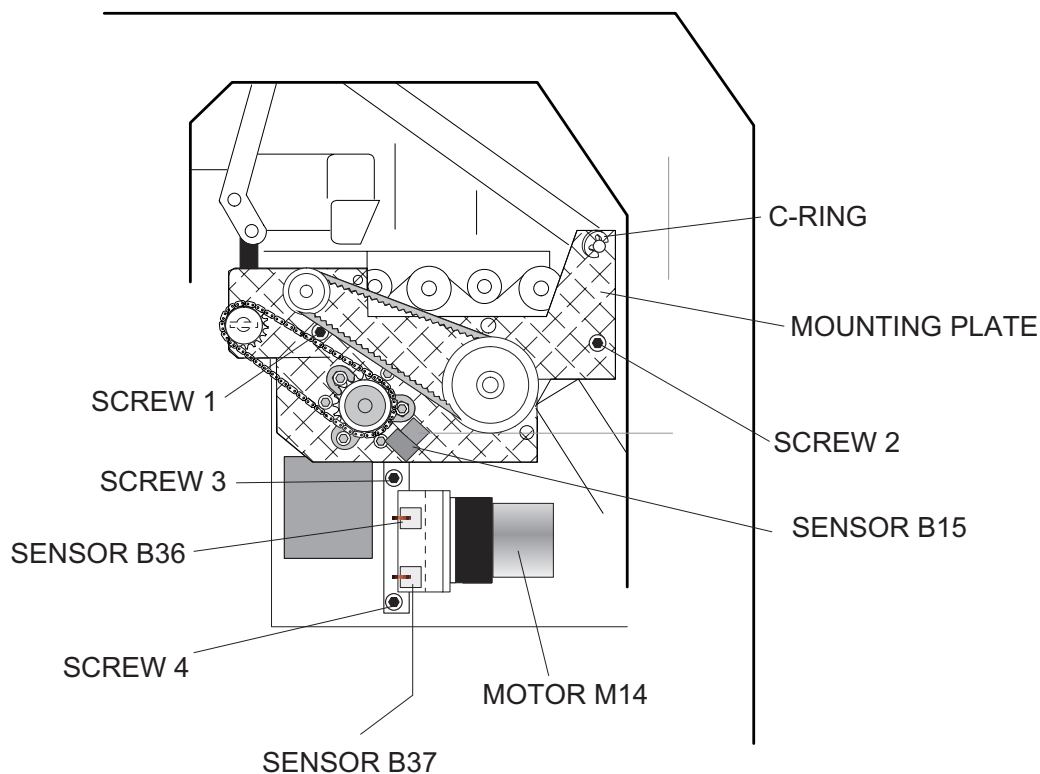


figure 2-15

7. Take out SCREWS 3 and 4.
8. Move the MOUNTING PLATE forward as far as possible and take out the OPENER ASSEMBLY.
9. Replace MOTOR M14.

10. Install all parts and connect all SENSORS.
11. Check the function and the adjustment of SENSORS B36 and B37.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU..... press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select COMPONENT TEST from the MAIN MENU..... press ENTER

Select MAGAZINE MOTORS..... press ENTER

Select MAGAZINE OPENING M14..... press ENTER

Select FORWARD / BACKWARD

NOTE

To avoid fogging of customer films, load the MAGAZINES with test films.

12. Check that the MAGAZINE OPENER goes fully down. If necessary adjust the position of SENSOR B37.
13. Ensure that the MAGAZINES are fully opened. The MAGAZINE LIDS must not touch the above MAGAZINE GUIDES. If necessary adjust the position of SENSOR B36.
14. Exit the SERVICE MODE.

Press BACKSPACE 3 times

Select LEAVE COMPONENT TEST..... press ENTER

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

FUNCTION TEST.

No special FUNCTION TEST is necessary. The function of MOTOR M14 was tested during the adjustments. Ensure that all PROTECTIVE GROUND WIRES are mounted correctly.

FILM POCKET

REPLACEMENT OF THE FILM POCKET STEPPER MOTOR M10.

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Take out the FILM CHUTE (ML2000 only)
4. Take out the PROTECTIVE GUARD. See the drawing on the next page.
5. Loosen the STEPPER MOTOR MOUNTING SCREWS.
6. Take off MOTOR SPROCKET and CHAIN.

NOTE

Take care of the DOWEL PIN it may fall down.

7. Take out the STEPPER MOTOR MOUNTING SCREWS.
8. Install new the STEPPER MOTOR.
9. Move the STEPPER MOTOR up to tension the CHAIN.

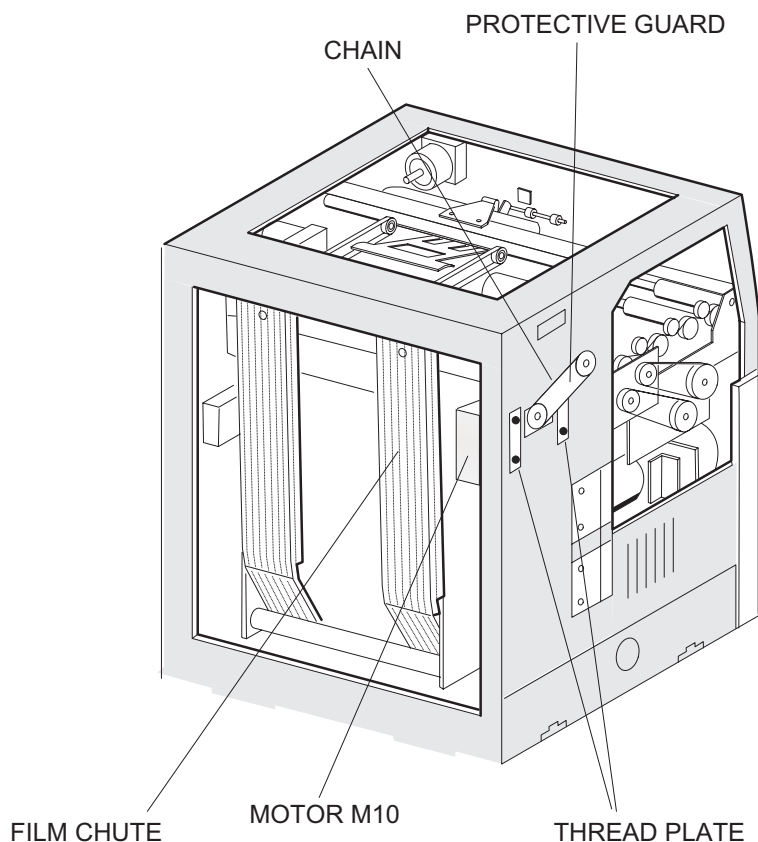


figure 2-16

10. Tighten the MOUNTING SCREWS.

NOTE

Do not tighten the CHAIN to much. If MOTOR M10 is deenergised, the FILM POCKET should travel slowly down.

FUNCTION TEST

1. To test the function of the FILM POCKET STEPPER MOTOR do a SCAN RUN.

Start the SERVICE PROGRAM.

Select SERVICE MODE from the GLOBAL MENU..... press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select CHANGE ML2000 DATA press ENTER

Select CHANGE PARAMETERpress ENTER

Select SCAN RUNpress ENTER

Select STORE PARAMETERSpress ENTER

2. Exit the SERVICE PROGRAM

Press BACKSPACE twice

Select QUIT ML2000 press ENTER

Select Quit the programpress ENTER

REPLACEMENT OF THE FILM POCKET SUCKER BAR MOTOR M15.

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Take out the FILM CHUTE.
4. Cut the WIRE TIE and unplug the FILM POCKET MOTOR.

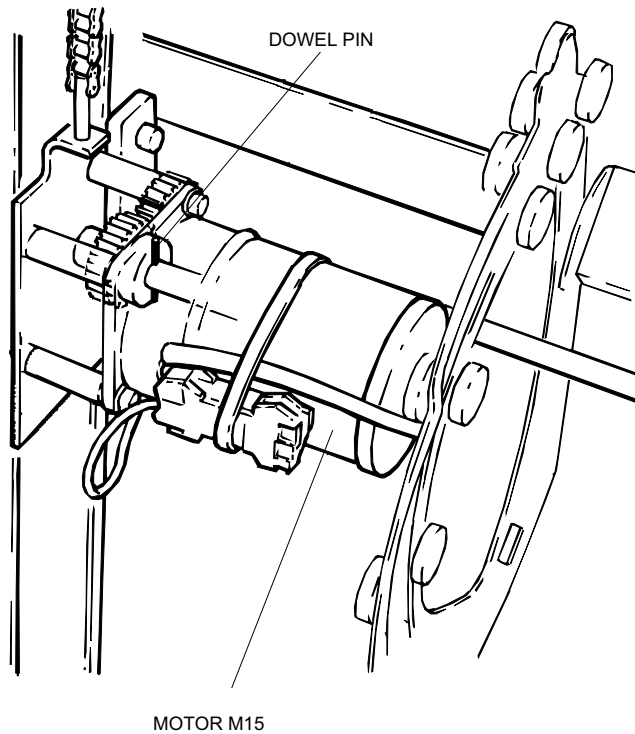


figure 2-17

5. Take out the 4 MOUNTING SCREWS.
6. Install the new FILM POCKET MOTOR.

NOTE

Use the DOWEL PIN and the GEAR from the old MOTOR.

FUNCTION TEST.

1. Take out all MAGAZINES.
2. Check that the FILM POCKET SUCKER BAR ARM moves forward and backward.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed press ENTER

Select COMPONENT TEST press ENTER

Select MAGAZINE MOTORS press ENTER

Select FILM PICK UP MAGAZINE M15 press ENTER

Select forward and backward

3. Exit the SERVICE PROGRAM

Press BACKSPACE 3 times

Select LEAVE COMPONENT TEST press ENTER

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

REPLACEMENT OF FILM POCKET SPRING.**NOTE**

AFTER THE TORSION SPRING IS REPLACED NO ADJUSTMENT is required.

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Take out the FILM CHUTE.
4. Loosen the COLLAR. This allows to shift the right-hand CLUTCH DISK a bit to the right.
5. Replace the old SPRING with a new one.

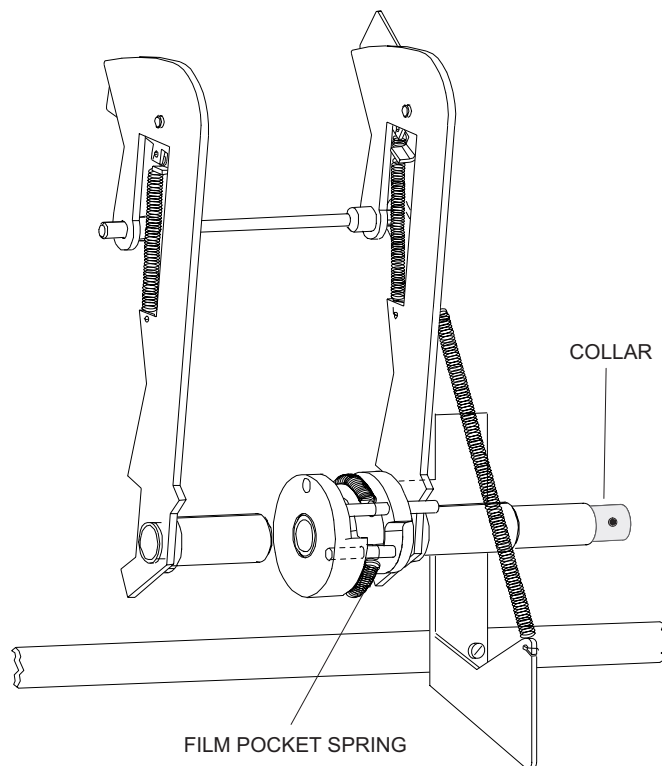


figure 2-18

6. Move the COLLAR to the left and tighten it.

FUNCTION TEST.

1. Check that small and large FILMS are picked up correctly from the magazines.

RECEIVING MAGAZINE INTERFACE (ML2000 only)**REPLACEMENT OF STEPPER MOTOR INTERFACE M13**

1. Switch off the ML2000
2. Take off the PANELS.
3. Take out the 3 MOUNTING SCREWS
4. Lift the RECEIVING MAGAZINE INTERFACE up to the CUT-OUT in the FRAME and pull it out.

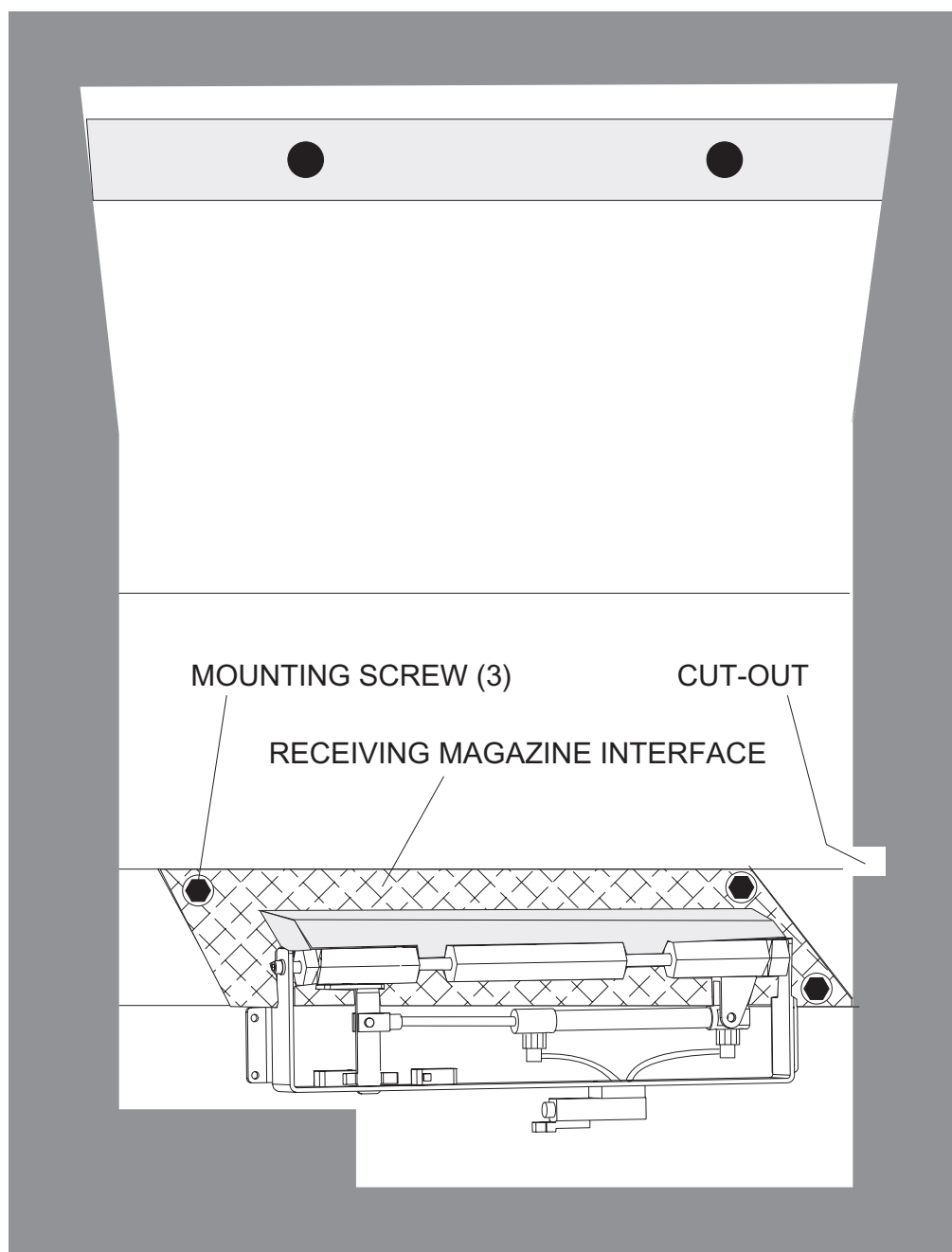


figure 2-19

5. Take off the DRIVE BELT.
6. Take off the MOTOR MOUNTING SCREWS.
7. Install the new MOTOR.

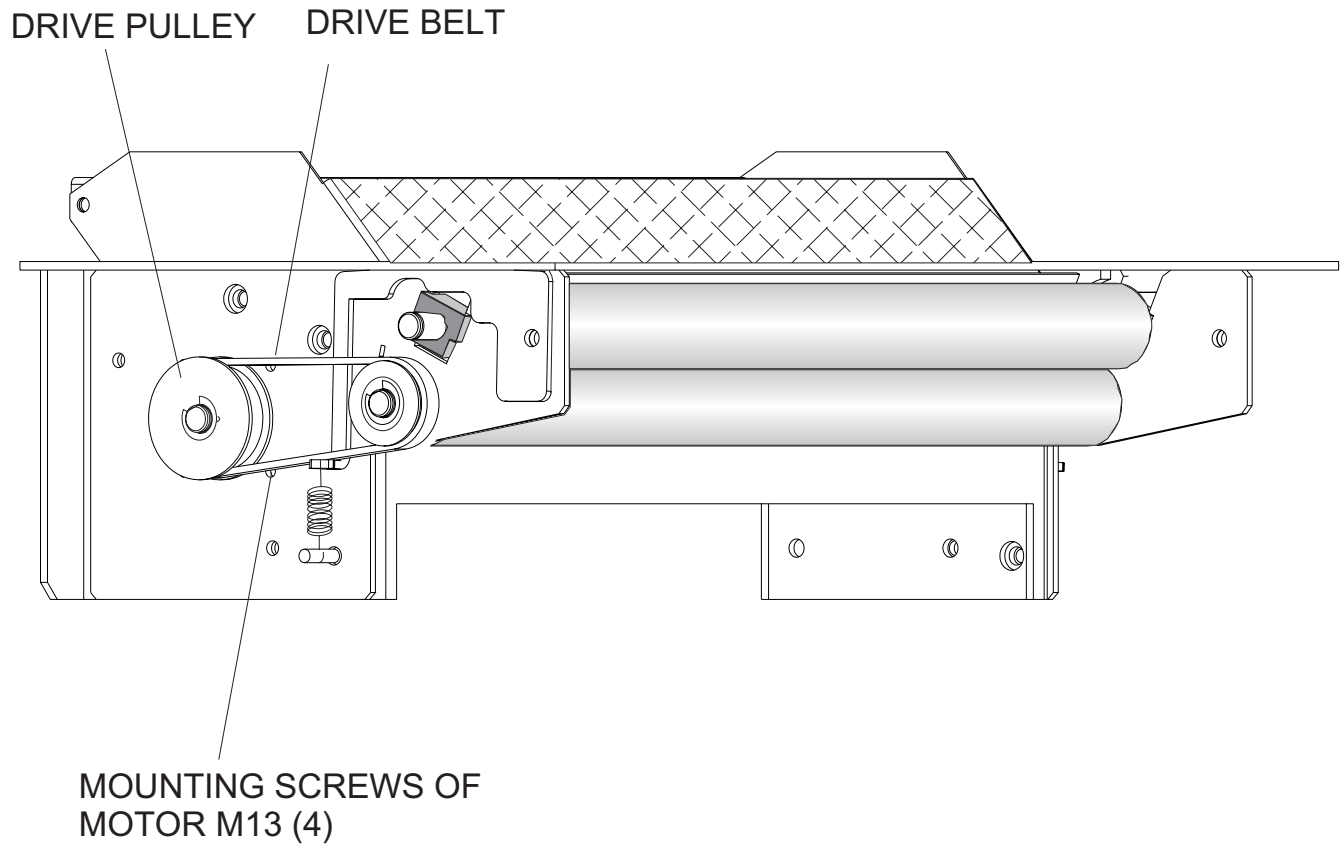


figure 2-20

FUNCTION TEST.

1. Check that the STEPPER MOTOR INTERFACE is running.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed press ENTER
UNIT DATA are displayed press ENTER
Select COMPONENT TEST press ENTER
Select INTERFACE/FILM MOT press ENTER
Select STEPPER MOTOR INTERFACE M13 press ENTER
Select ON/OFF
2. Exit the SERVICE PROGRAM
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER.

REMOVAL OF THE RECEIVING MAGAZINE TUNNEL(ML2000 only)

PURPOSE:

The RECEIVING MAGAZINE TUNNEL has to be removed if one of the following SENSORS has to be replaced or adjusted, or if the MAIN SWITCH has to be replaced.:

B24/C_RM_E RECEIVING MAGAZINE ENTRANCE

B25/C_RM_F RECEIVING MAGAZINE FULL

B34/C_RM_C RECEIVING MAGAZINE CODE.

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Take out the 4 MOUNTING SCREWS.

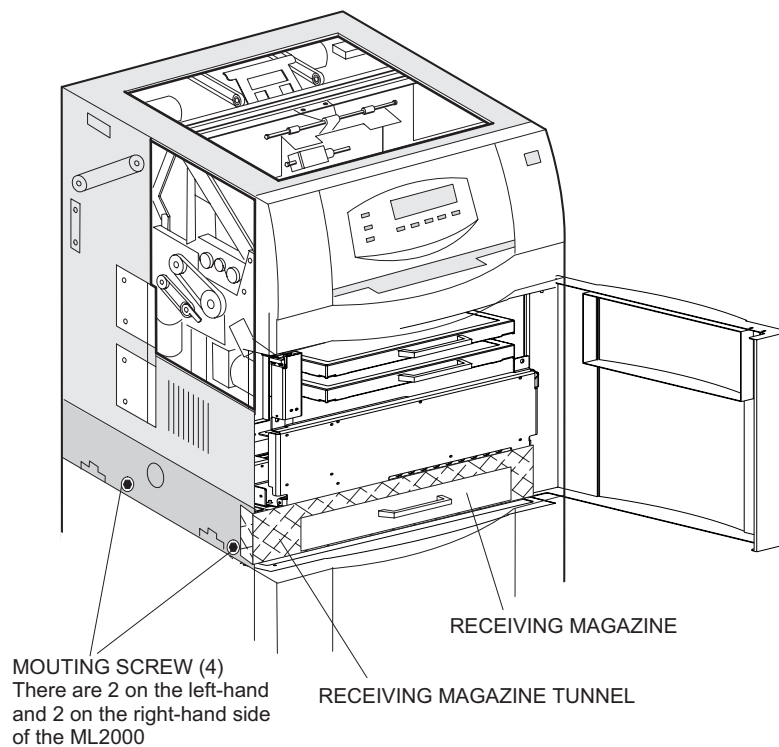


figure 2-21

4. Carefully pull out the RECEIVING MAGAZINE TUNNEL and disconnect the SENSORS.

NOTE

To adjust the SENSORS an EXTENSION CABLE is required. This EXTENSION CABLE is sent out with the ML2000 and it is stored in the PNEUMATIC AREA.

CONVEYOR

REMOVAL OF THE CONVEYOR

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Disconnect the TOP COVER INTERLOCK SWITCH B23/TCI and then take off the TOP FRAME.
4. Disconnect CONNECTOR X55 and CONNECTOR X60.

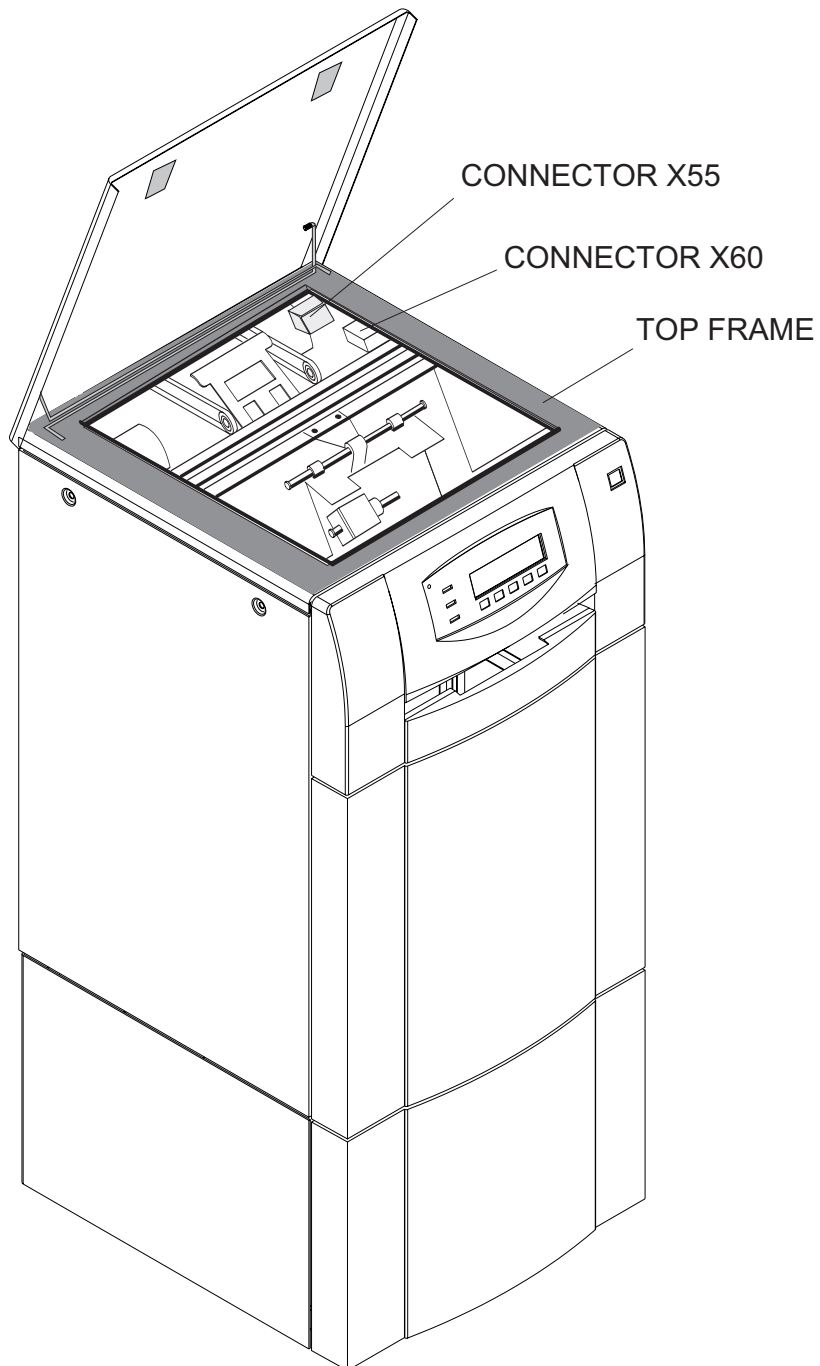


figure 2-22

5. Take off the TOP COVER.

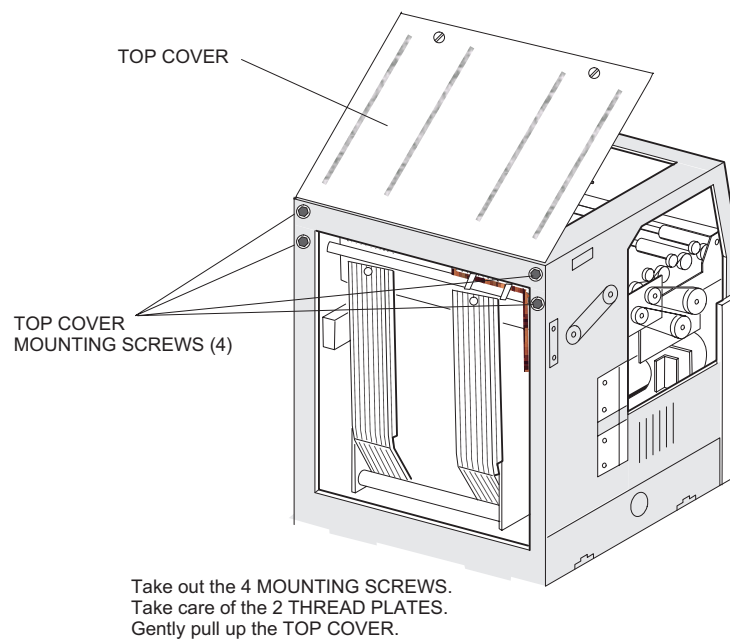


figure 2-23

NOTE

There is a THREAD PLATE for each of the 2 TOP COVER MOUNTING SCREWS.

6. Cut the WIRE TIE and mark the position of it.
7. Disconnect the translucent HOSE.

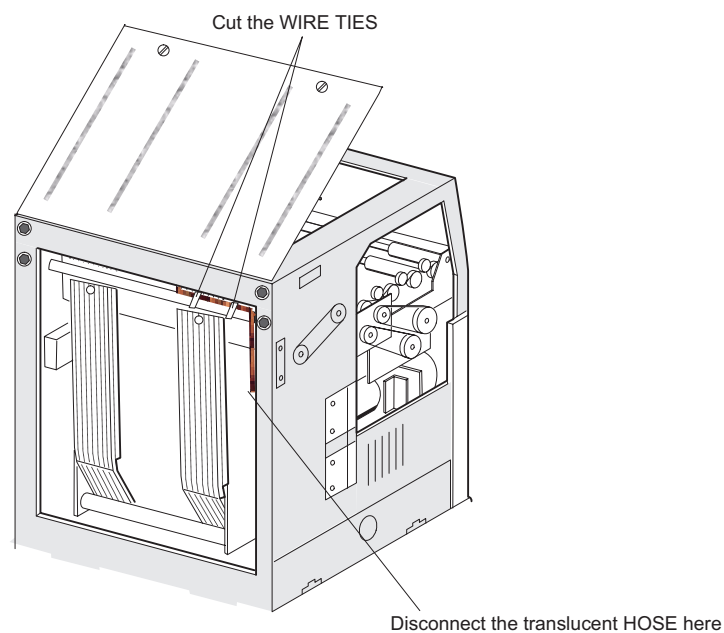


figure 2-24

8. Remove the SCREWS from each of the RETAINERS on each side of the CONVEYOR.

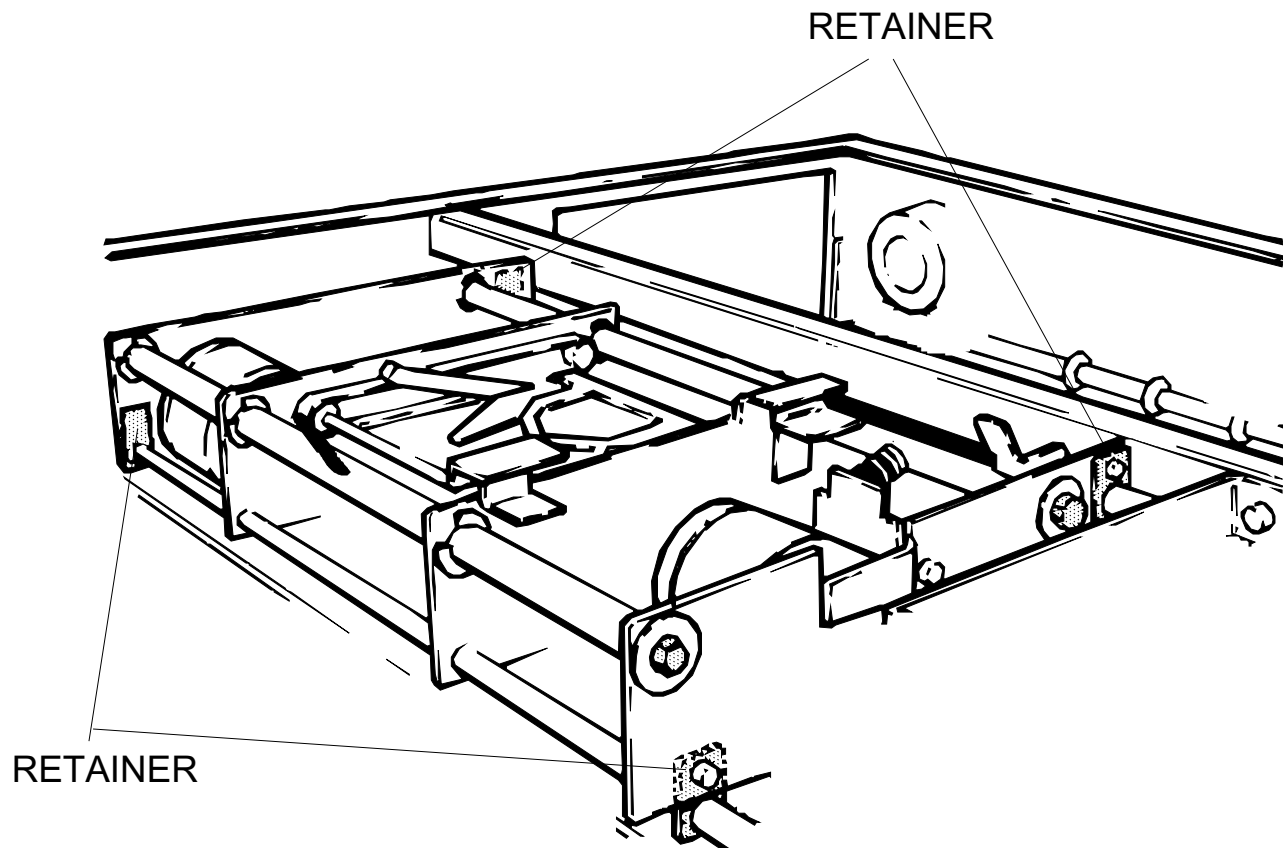


figure 2-25

9. Lift out the CONVEYOR.

DISASSEMBLY OF THE CONVEYOR

Disassembly of the CONVEYOR is needed for removing the following:

DRIVE SHAFTS

CARRIAGE ASSEMBLY

DRIVE BELTS

1. Do PROCEDURE "REMOVAL OF CONVEYOR".
2. Cut the WIRE TIES along the upper TIE RODS. Mark the position of the WIRE TIES. See figure 2-26 on the next page
3. Take out the 4 NUTS at the TIE RODS.
4. Remove the 12 C-RINGS from the upper 2 TIE RODS.
5. Remove the CARRIAGE STOP.
6. Slide out both upper TIE RODS.
7. Take out C-RINGS at both PRESSURE ROLLER SHAFTS and slide SHAFTS outwards. See figure 2-27 on the next page.
8. Take out SPRINGS.
9. Disconnect the VACUUM SOLENOID CONNECTOR.

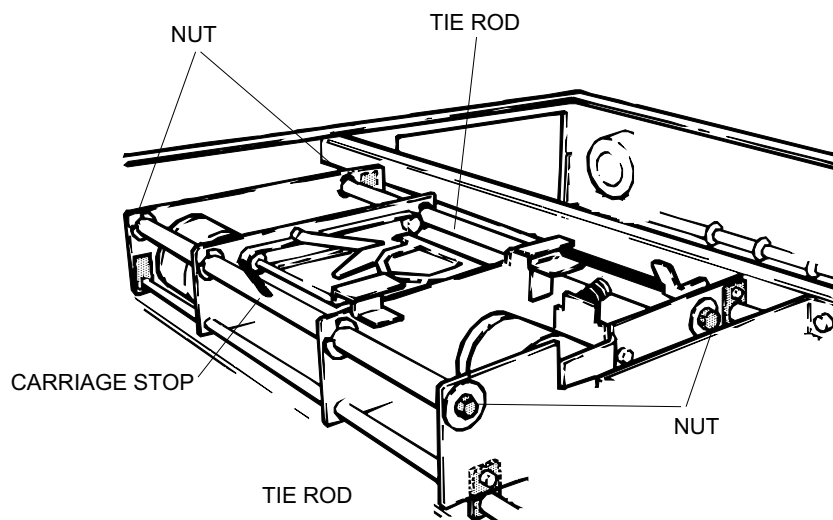


figure 2-26

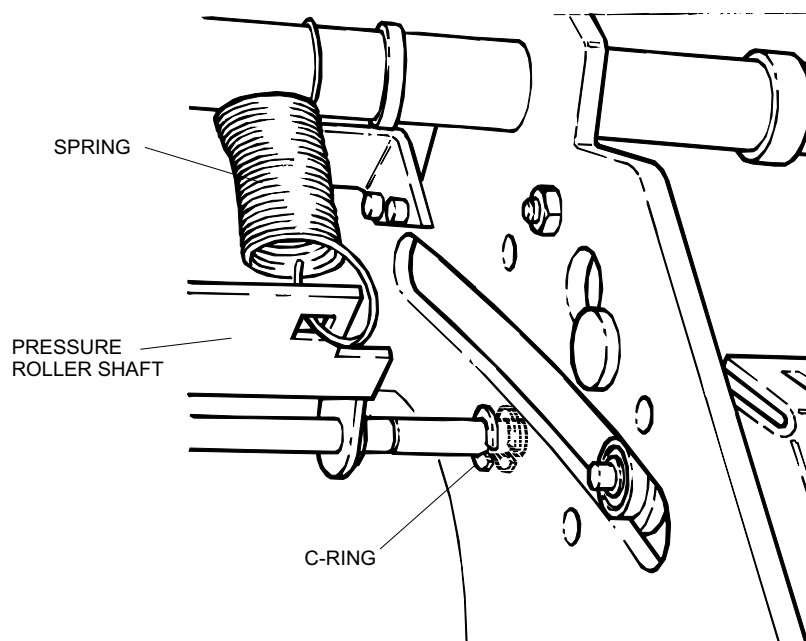


figure 2-27

- 10.** Disconnect the GROUND WIRE at the ROLLER MOTOR.
- 11.** Disconnect the CONNECTORS of both CARRIAGE POSITION SENSORS.
- 12.** Disconnect the CONNECTOR of the SENSOR VACUUM OFF (B20).
- 13.** Carefully lift out the CARRIAGE ASSEMBLY.

NOTE

Do not lose the SPACER of the PRESSURE ROLLER SHAFT located on the ROLLER MOTOR side.

FUNCTION TEST

1. Check that the WIRE TIES are at the correct position. Use the marks from step 4 as reference.
2. Check that the CONVEYOR is seated properly. It must be as far as possible to the front (e.g. to the INPUT FLAP).
3. Run a TEST CYCLE.
4. Check that the FILM is picked up from the CASSETTE.
5. Check that the FILM is transported correctly into the FILM CHUTE.
6. Use various FILM SIZES.

REPLACEMENT OF THE FILM PICK UP MOTOR BELT (CARRIAGE)

1. Do Procedure "REMOVAL OF CONVEYOR".
2. Remove the 3 MOUNTING SCREWS of the FILM PICK UP MOTOR.
3. Replace the BELT with a new one.

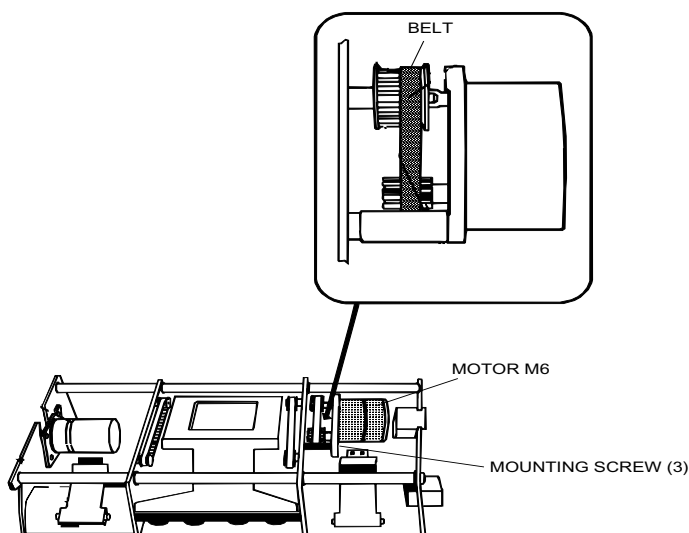


figure 2-28

FUNCTION TEST

1. Check that the CONVEYOR is seated properly. It must be as far as possible to the front (e.g. to the INPUT FLAP).
2. Run a TEST CYCLE.
3. Check that the FILM is picked up from the CASSETTE.
4. Check that the FILM is transported correctly into the FILM CHUTE.
5. Use various FILM SIZES.

REPLACEMENT OF FILM PICK UP MOTOR (CARRIAGE) M6

1. Do PROCEDURE "REMOVAL OF CONVEYOR".
2. Remove the 3 MOUNTING SCREWS.
3. Take out the 3 MOTOR WIRES from the CONNECTOR X60. Use Extraction Tool TL1580. See figure 2-29 on the next page.

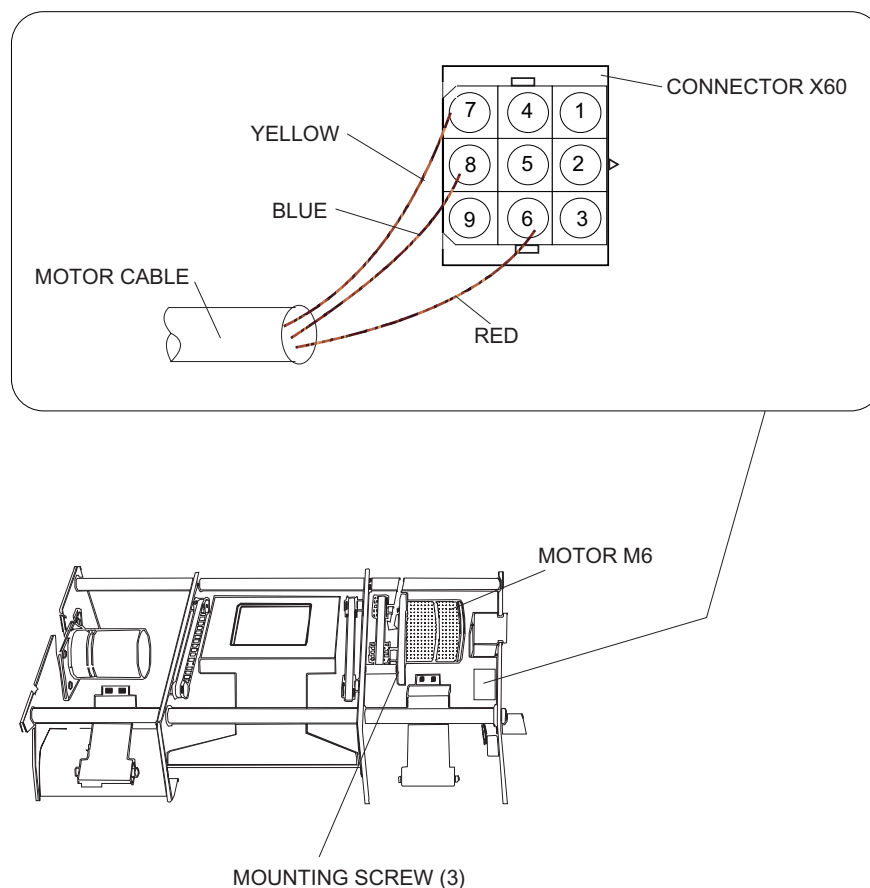


figure 2-29

4. Take out the MOTOR.
5. Install the new MOTOR.

FUNCTION TEST

1. Check that the FILM PICK UP MOTOR M6 is running.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE IS DISPLAYED press ENTER
UNIT DATA are displayed press ENTER
Select COMPONENT TEST press ENTER
Select CASSETTE MOTORS..... press ENTER
Select FILM PICK UP M6 press ENTER
Select forward press ENTER
Select backward press ENTER
2. Exit the SERVICE PROGRAM
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select Quit ML2000 SERVICE MODE..... press ENTER
Select Quit the program press ENTER.

REPLACEMENT OF CARRIAGE ASSEMBLY DRIVE BELTS

Note

Replace both Drive Belts at the same time.

1. Do PROCEDURE "REMOVAL OF CONVEYOR".
2. Do PROCEDURE "REPLACEMENT OF FILM PICK UP MOTOR" step 1 to 3.
3. Mark the position of the BELT-LINKS on the MECHANISM PLATES. These marks are used as a reference when installing the new DRIVE BELTS.

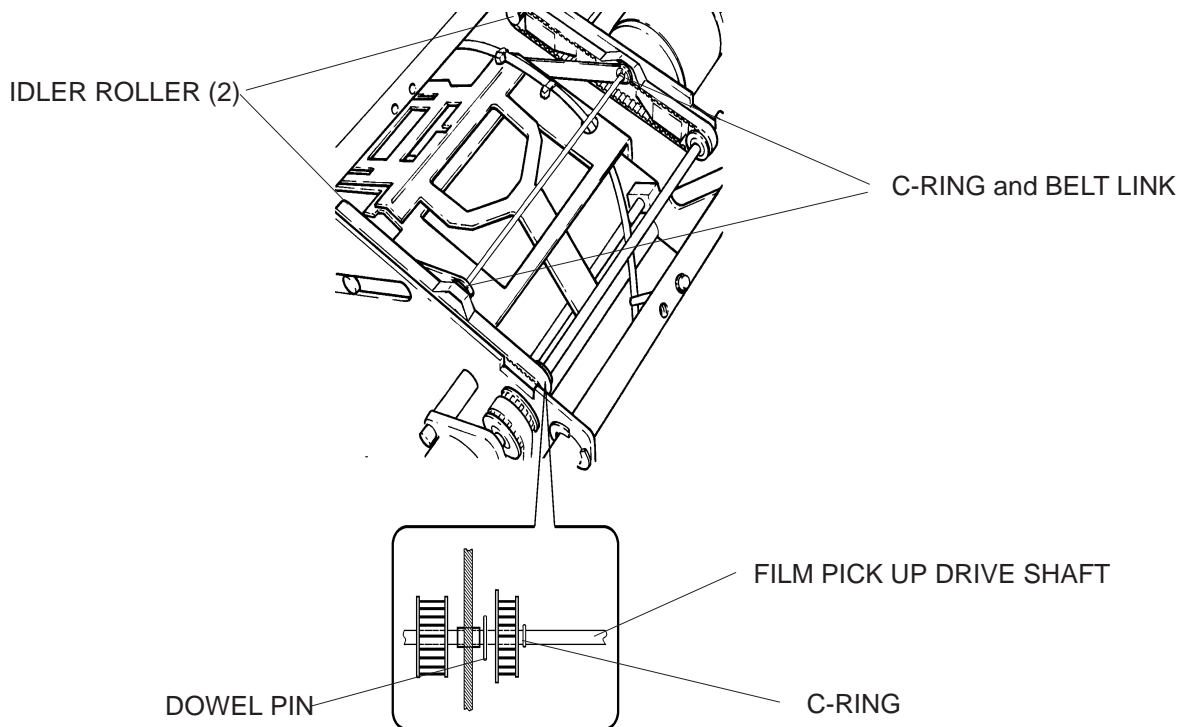


figure 2-30

4. Remove the IDLER ROLLERS.
5. Remove the small C-RINGS at the BELT LINKS.
6. Slide the GEAR to the right and remove the DOWEL PIN.
7. Slide the FILM PICK UP DRIVE SHAFT to the left.
8. Replace the BELTS.

Note

A CARRIAGE JAM OCCURS IF THE BELT LINKS ARE NOT ALIGNED WITH THE REFERENCE MARKS FROM STEP 3.

FUNCTION TEST

1. Check that the CONVEYOR is seated properly. It must be as far as possible to the front (e.g. to the INPUT FLAP).
2. Run a TEST CYCLE.

3. Check that the FILM is picked up from the CASSETTE.
4. Check that the CASSETTE SUCKER BAR CARRIAGE moves freely forward and backward.
5. Check that the FILM is transported correctly into the FILM CHUTE.
6. Use various FILM SIZES.

REPLACEMENT OF SOLENOID CASSETTE SUCKER BAR TILTING Y7

1. Do PROCEDURE "REMOVAL OF CONVEYOR".
2. Put CARRIAGE ASSEMBLY upside down.
3. Pull CASSETTE SUCKER BAR carefully forward to get access to the SOLENOID CASSETTE SUCKER BAR TILTING Y7.

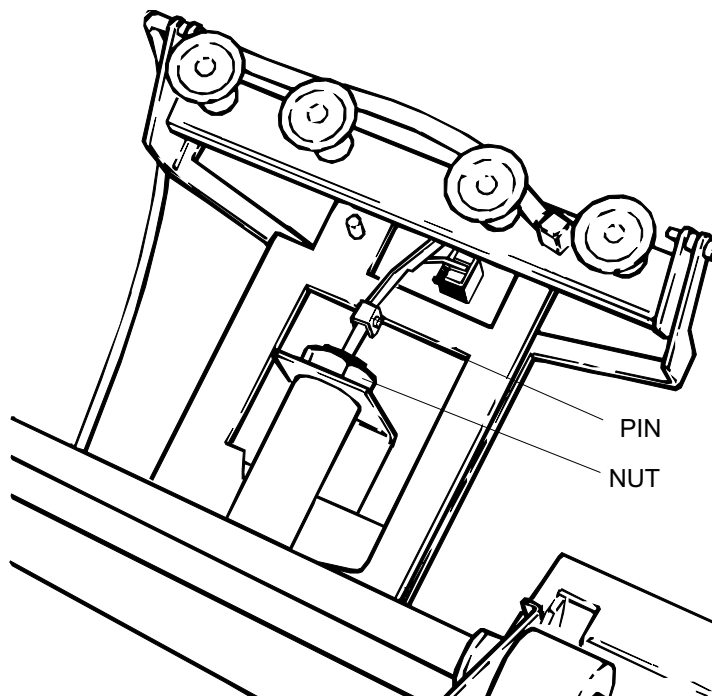


figure 2-31

4. Remove the PIN to disconnect the ARMATURE from the ACTUATOR.
5. Undo the NUT.
6. Cut the WIRE TIES.
7. Replace the SOLENOID.

FUNCTION TEST

1. Check that the SOLENOID CASSETTE SUCKER BAR TILTING Y7 tilts the CASSETTE SUCKER BAR.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed..... press ENTER

Select COMPONENT TEST press ENTER

Select SOLENOIDS press ENTER

- Select SOLENOID ON press ENTER*
Select SOLENOID OFF press ENTER
2. Exit the SERVICE PROGRAM
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER

REPLACEMENT OF THE SENSOR SUCKER BAR TILT B19

1. Switch off the ML2000 (ML2000 P).
2. Take off the TOP COVER, the REAR and the RIGHT-HAND PANEL.
3. Manually move the CASSETTE SUCKER BAR to the front.
4. Take out SENSOR B19. Mark the position of the WIRE TIES.

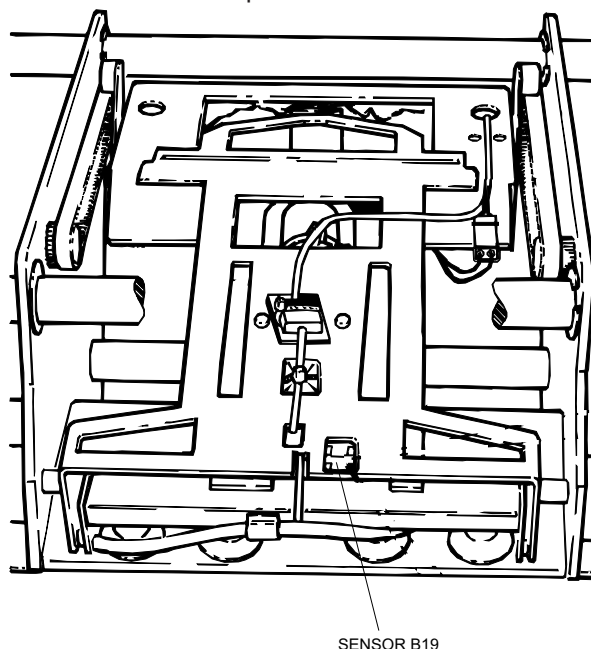


figure 2-32

5. Install the new SENSOR.
6. Fix the harness with WIRE TIES. Use the marks from step 4 as reference.

FUNCTION TEST

1. Switch on the ML2000 (ML2000 P)
2. Test the function of SENSOR B19 with the SENSOR TEST.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed press ENTER
UNIT DATA are displayed..... press ENTER
Select COMPONENT TEST press ENTER
Select SENSORS..... press ENTER
Select WITH/WITHOUT SOUND press ENTER

3. Manually tilt the CASSETTE SUCKER BAR. B19 must now be indicated ON.
4. Exit the SERVICE PROGRAM
 - Press BACKSPACE 3 times*
 - Select LEAVE COMPONENT TEST press ENTER*
 - Select QUIT SERVICE MODE press ENTER*
 - Select QUIT THE PROGRAM press ENTER*

3. ADJUSTMENTS

INTRODUCTION

In this section it is frequently explained how to use the CES SERVICE SOFTWARE. The first line tells always what should be performed. In the next lines it is explained how to reach this goal. These additional explanations are printed *italic* and can be skipped if you are experienced with the CES SERVICE SOFTWARE.

EXAMPLE:

1. Start the CASSETTE INPUT FLAP MOTOR M1
Start the SERVICE PROGRAM.
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select CASSETTE MOTORS..... press ENTER
Select INPUT FLAP MOT M1..... press ENTER
Select CLOSE/OPEN press ENTER

SENSORS and DAYLIGHT

The SENSORS are sensitive to daylight and to room light. This can result in wrong measurements when you do an adjustment, or a SENSOR becomes triggered and the ML2000 (ML2000 P) tries to bring the various units to HOME POSITION. For this reason dim the light or cover the SENSORS when you do the adjustments. This is especially important when you measure the output voltage of a SENSOR.

CASSETTE AREA

INPUT FLAP

PURPOSE:

This adjustment ensures that the INPUT FLAP is closed light-tight when a CASSETTE is fed into the ML2000 (ML2000 P).

1. Take off the PANEL.
2. Take off the FRONT PANEL with the DISPLAY.
3. Close the INPUT FLAP.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select CASSETTE MOTORS..... press ENTER
Select CASSETTE INPUT FLAP M1..... press ENTER
Select CLOSE
4. Adjust SENSOR B4/C_IF_EC INPUT FLAP CLOSED until the INPUT FLAP is fully closed.

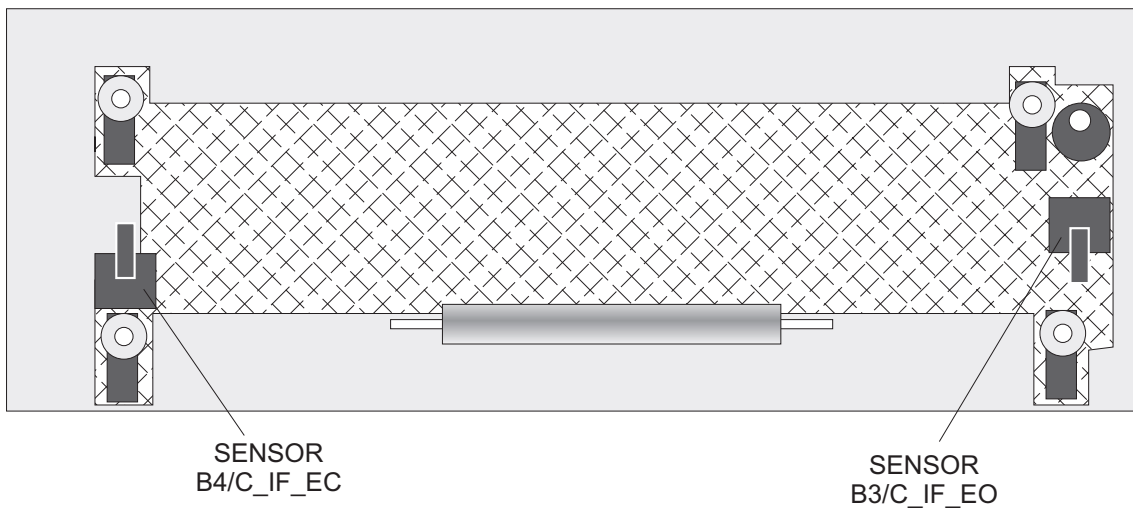


figure 3-1

5. Open the INPUT FLAP.
Select OPEN
6. Adjust SENSOR B3/C_IF_EO INPUT FLAP OPEN until the FLAP is fully open.
7. Exit the SERVICE MODE.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE..... press ENTER
Select Quit the program press ENTER.

CASSETTE OPENER MECHANISM

PURPOSE:

This adjustment makes sure that all CASSETTES are opened and closed correctly and that the OPENER MECHANISM moves over the correct distance to avoid scratches on the CASSETTE LID SCREEN caused by the CASSETTE SUCKER BAR.

WARNING

BE VERY CAREFUL WHEN DOING THIS ADJUSTMENT. THE OPENER MOTOR AND THE OPENER MECHANISM ARE VERY STRONG. THEY MAY SQUEEZE YOUR HAND AND TRAP YOU IF YOU TRY TO STOP IT MANUALLY. NEVER START THE CASSETTE OPENER MOTOR WHEN SOMEONE'S HANDS ARE IN THE CASSETTE AREA.

NOTE

This adjustment may affect the adjustment REST POSITION.

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Loosen the MOUNTING SCREWS of the OPENER STOP PLATE.

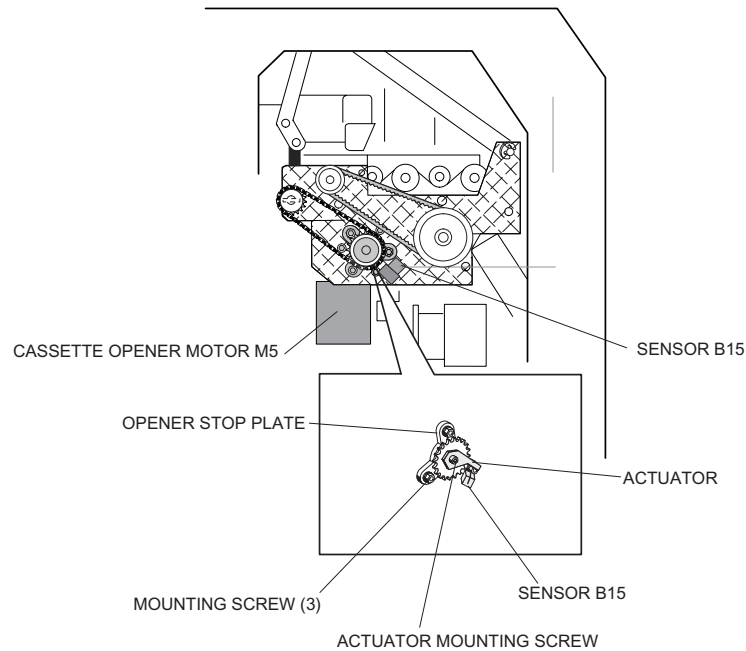


figure 3-2

4. Move the CASSETTE OPENER to its fully up position.

Start the SERVICE PROGRAM press ENTER
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed press ENTER
UNIT DATA are displayed press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select CASSETTE MOTORS press ENTER
Select CASSETTE OPENING M5 press ENTER
Select UP

5. If the OPENER BRACKET is vertical proceed with step 8, or else proceed with step 6.

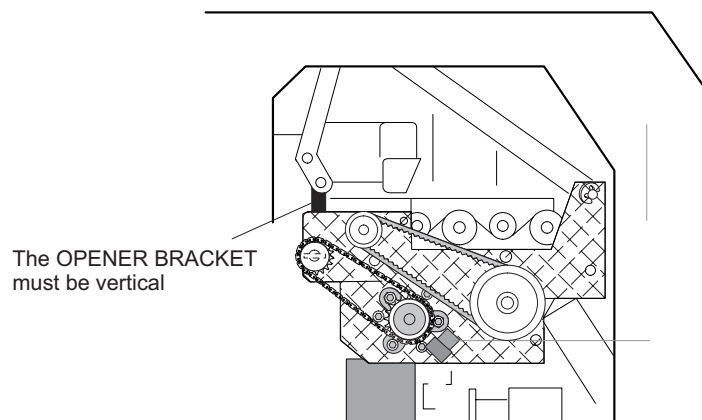


figure 3-3

6. Adjust the ACTUATOR of SENSOR B15/C_OP_EO CASSETTE OPENER END SWITCH OPEN as required.
7. Move the CASSETTE OPENER fully down.
Select DOWN
Proceed with step 4.
8. Fasten the ACTUATOR MOUNTING SCREW.
9. With the OPENER still in the upper position, turn the STOP PLATE counter-clockwise until the STOP BOLT touches the STOP PIN of the DRIVE GEAR. Turn the STOP PLATE clockwise until there is a gap of approximately 1 mm between the STOP PIN and the STOP BOLT.

NOTE

It is not possible to see the gap of 1 mm. You have to set it by feeling._

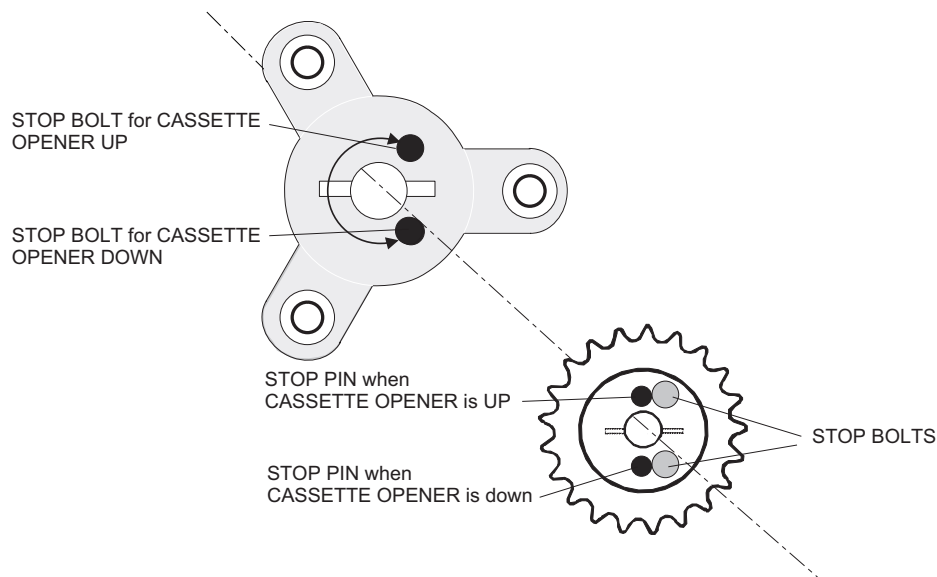


figure 3-4

10. Tighten the MOUNTING SCREWS of the STOP PLATE.
11. Check the position of the STOP PLATE.
 - Disconnect SENSOR B15(CONNECTOR X9)
 - Select UP. The MOTOR M5 must turn for a short distance and is stopped then (A high pitched tone can be heard at the same time.)
 - Connect SENSOR B15.
 - Select DOWN until the CASSETTE OPEN_ER stops in its bottom position.
 - Manually actuate SENSOR B15. Do not break its thin PLASTIC ACTUATOR.
 - Select DOWN again. MOTOR M5 should turn for a short distance and is stopped then. A high pitched tone can be heard at the same time.
 - Select UP until the CASSETTE OPENER stops in its uppermost position.

If the UP and DOWN positions are correct proceed with step 12. Otherwise reposition the STOP PLATE and repeat step 11.

12. Exit the SERVICE MODE.

Press BACKSPACE 3 times

Select LEAVE THE COMPONENT TEST press ENTER

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

CASSETTE SUCKER BAR**Purpose:**

This adjustment ensures that the CASSETTE SUCKER BAR CARRIAGE travels the correct distance, that the rear end position is correct, and the CASSETTE SUCKERS are withdrawn correctly from the film as it is picked up by the TRANSPORT ROLLERS to avoid static or pressure marks.

How to clean the SUCKERS**NOTE**

The main cause of SUCKER MARKS is contamination of the sucker surface. This contamination can be any number of substances ranging from natural body oil, sweat or even KODAK Intensifying Screen Cleaner and anti static Solution (which has sometimes been recommended for cleaning SUCKERS!). Do not use KODAK Intensifying Screen Cleaner and Anti Static Solution to clean the SUCKERS! Use the following procedure if the SUCKERS are touched or if new ones are fitted.

1. Abrade the surface of the SUCKER carefully using Emery Cloth grade 400 or a similar material.
2. Lightly coat the SUCKER with NATURAL (un-perfumed) talcum powder, available from chemists and pharmacies.

Special Tools:

VERNIER CALLIPER

ADJUSTMENT PLATE TL 4804

PART 1

1. Take off the TOP PANEL.

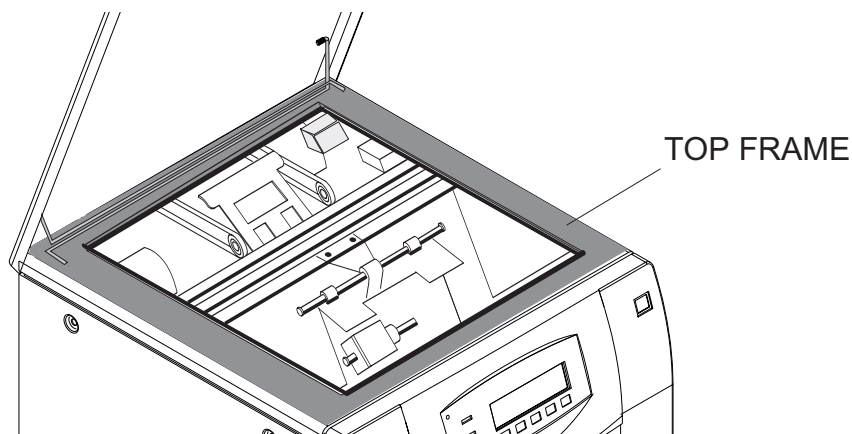


figure 3-5

- Set the MOUNTING BRACKET of SENSOR B17 at a distance of 154 ± 1 mm to the inner side of the REAR STEEL ROD.

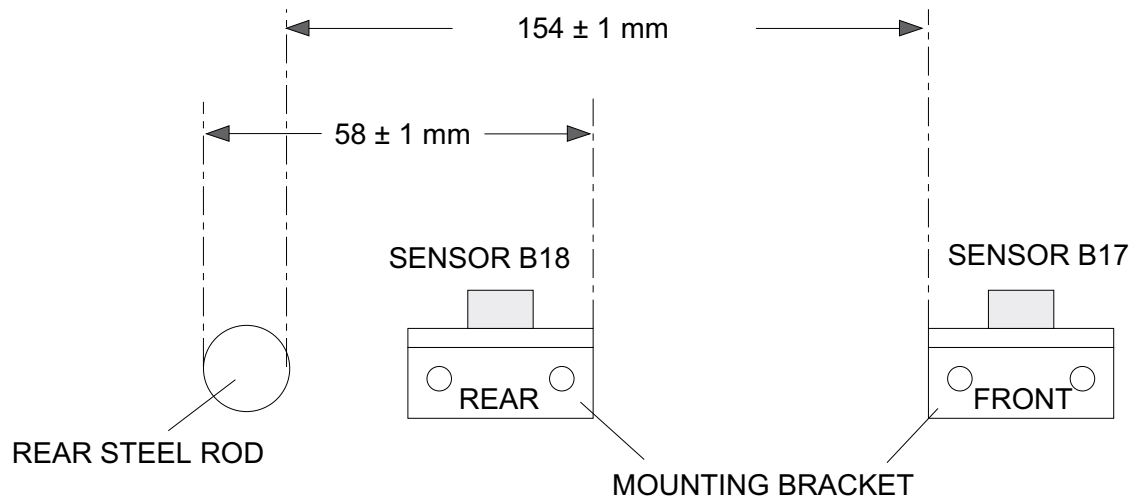


figure 3-6

- Set the MOUNTING BRACKET of SENSOR B18 at a distance of 58.5 ± 1 mm to the outer side of the REAR STEEL ROD.

PART 2: CASSETTE SUCKER BAR ADJUSTMENT

- Place the ADJUSTMENT PLATE TL 4804 on the TRANSPORT ROLLERS and push it to the CASSETTE END STOP.

NOTE

This is a ML700 TOOL.

- Manually move the CASSETTE SUCKER BAR CARRIAGE forward for approximately 40 mm. This allows the CASSETTE SUCKER BAR to tilt.

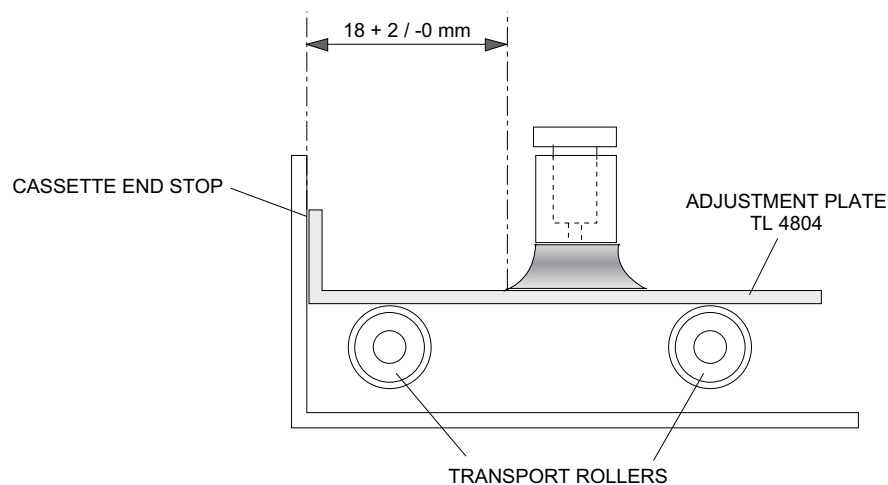


figure 3-7

3. Tilt the CASSETTE SUCKER BAR.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU.....press ENTER

ENTER SERVICE MODE MESSAGE is displayed.....press ENTER

UNIT DATA are displayed.....press ENTER

Select COMPONENT TEST from the MAIN MENU.....press ENTER

Select SOLENOIDS.....press ENTER

Select TILTING CASSETTE SUCKER BAR Y7.....press ENTER

Select SOLENOID ON

NOTE

The SOLENOID Y7 will be switched on for 59 seconds. This time is limited to avoid overheating of the SOLENOID.

- 4.** Manually move the CASSETTE SUCKER BAR CARRIAGE forward until the CASSETTE SUCKERS reach the ADJUSTMENT PLATE TL 4804.
- 5.** Check that the rear edges of the SUCKERS are 18 mm +2 -0 away from the rear of the adjustment plate.

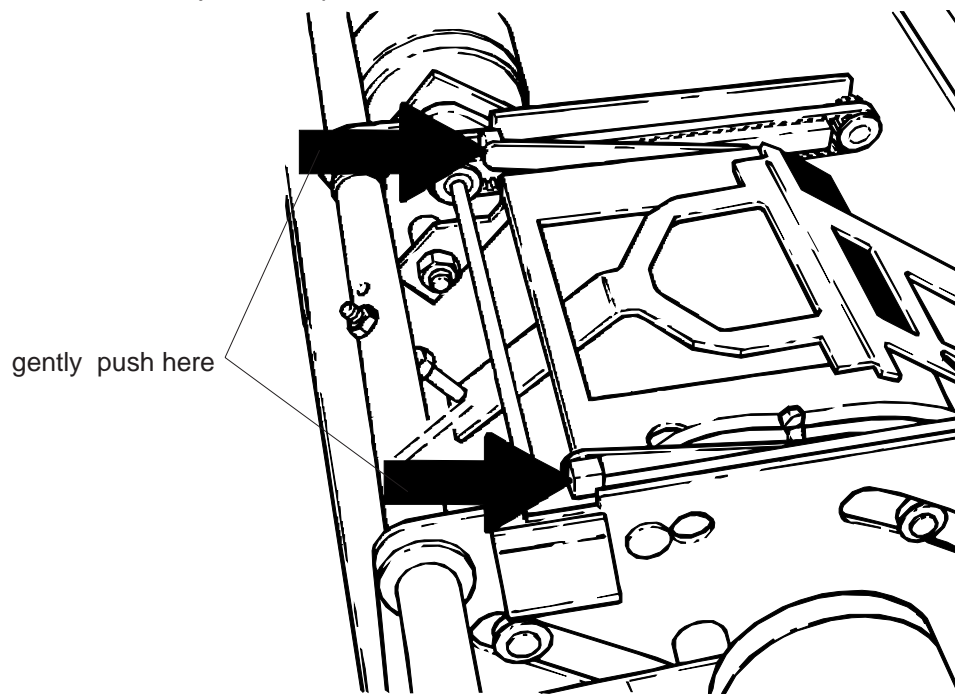


figure 3-8

- 6.** If the distance is not correct, loosen the RETAINERS and move the CONVEYOR forward or backward as required, and fasten the RETAINERS. See drawing 3-10 on the next page.
- 7.** If it is not possible to reach the 18 mm, bend the parts shown up or down as required. See figure 3-10 on the next page.

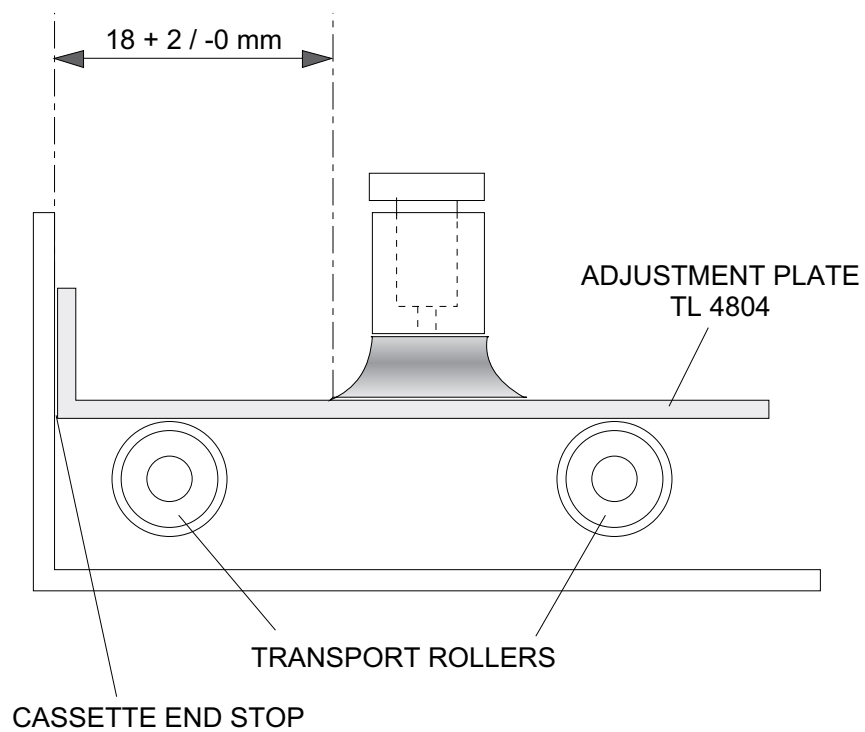


figure 3-9

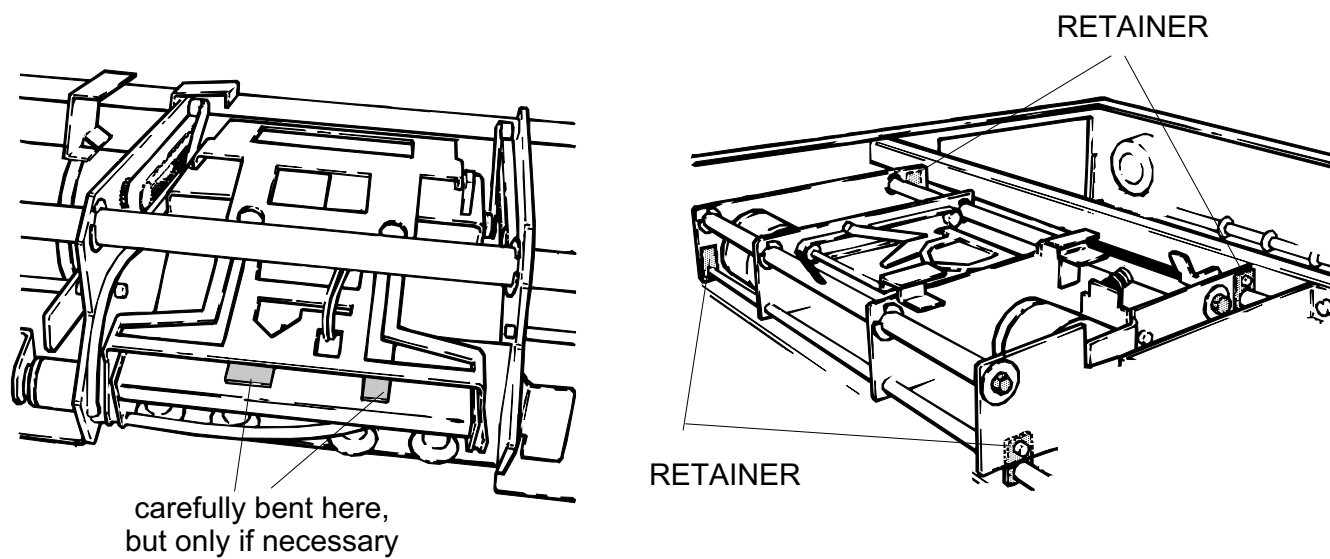


figure 3-10

8. Exit the SERVICE MODE.

Press BACKSPACE 3 times

Select LEAVE COMPONENT TEST press ENTER

Select Quit ML2000 (ML2000 P) SERVICE MODE press ENTER

Select Quit the program press ENTER

FUNCTION TEST

1. Enable the CONTINUOUS LOOP MODE.

Move SWITCH S1-1 on PCB A1 to the ON (up) position.

Select FUN at the OPERATORS DISPLAY

Select SYSTEM at the OPERATORS DISPLAY

Select CONTAIN at the OPERATORS DISPLAY

Select CLEAR at the OPERATORS DISPLAY

The ML2000 (ML2000 P) is now set to the CONTINUOUS LOOP MODE. This means after a loaded CASSETTE is fed in, this CASSETTE becomes unloaded and loaded repeatedly.

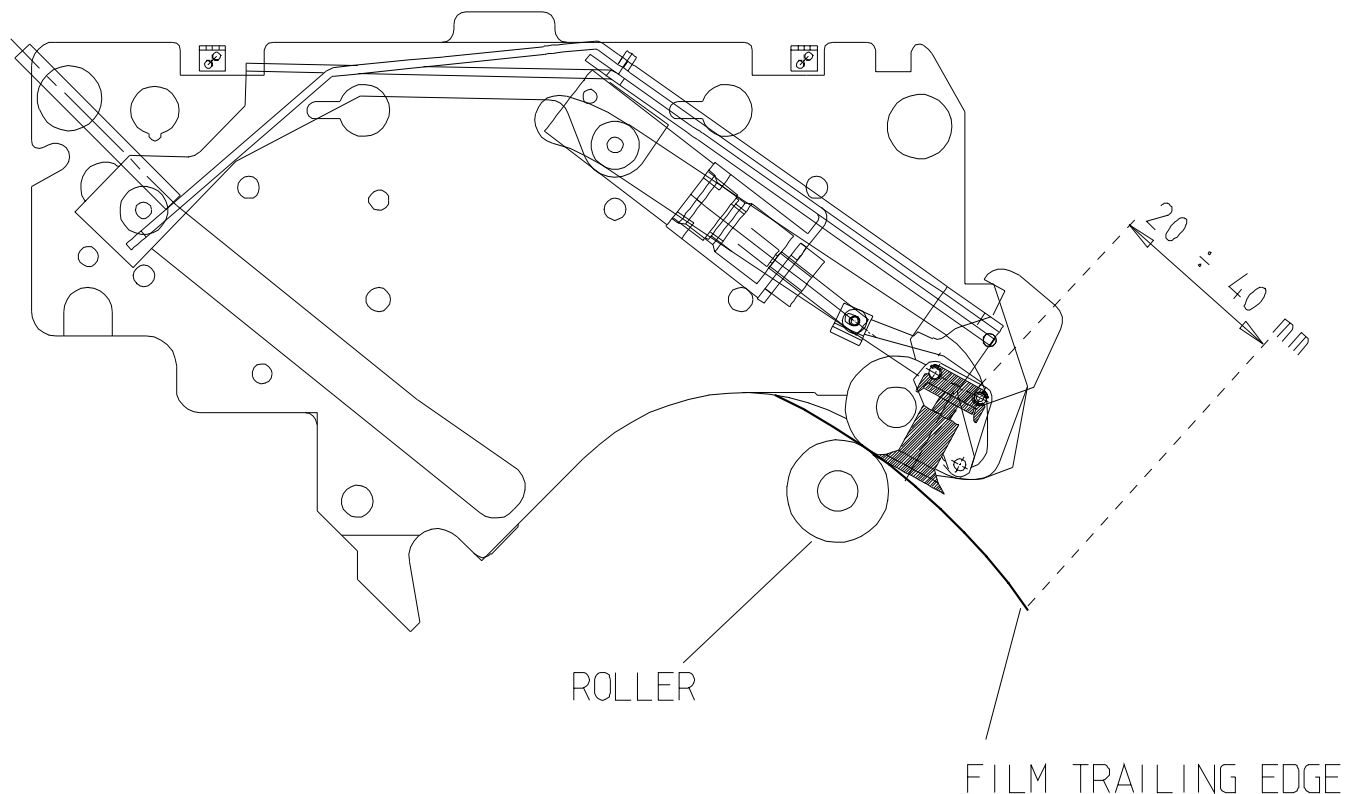
2. Feed in a loaded CASSETTE 18x24 cm.**3.** Observe from the side that the trailing edge of the FILM just touches the CASSETTE SUCKERS (look at the middle of the SUCKER BAR), when the FILM is transported into the CONVEYOR.

figure 3-11

4. If the distance between FILM and SUCKERS is not correct, turn the END STOP SCREW in or out as required.

NOTE

Do not forget to lock the NUTS on the END STOP.

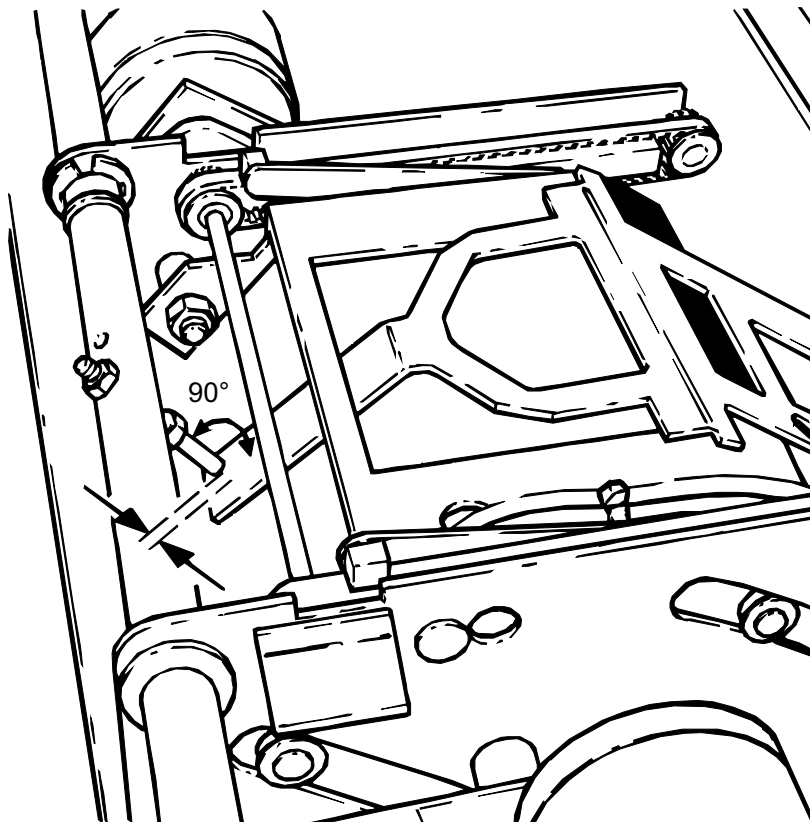


figure 3-12

NOTE

The END STOP SCREW will lift the CASSETTE SUCKER BAR away from the film when it enters the ROLLERS.

5. Disable the CONTINUOUS LOOP MODE.
Pull out the CASSETTE
Switch off the ML2000 (ML2000 P). Wait 5 seconds and switch it on again.
6. Move SWITCH S1-1 on PCB A1 to OFF (down) for normal operation.

CASSETTE LENGTH

Purpose:

This adjustment ensures that the correct CASSETTE LENGTH is measured.

WARNING

BE CAREFUL WHEN WORKING IN THE CASSETTE OPENER AREA. THE OPENER MOTOR AND THE OPENER MECHANISM ARE VERY STRONG. THEY CANNOT BE MOVED MANUALLY. THEY MAY SQUEEZE YOUR HAND AND TRAP YOU IF YOU TRY TO STOP THEM MANUALLY. NEVER START THE CASSETTE OPENER MOTOR WHEN SOMEONE'S HANDS ARE IN THE CASSETTE AREA.

1. Take off the TOP COVER.
2. Start the SENSOR TEST.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select SENSORS..... press ENTER
Select SENSOR TEST WITH SOUND..... press ENTER
3. Manually actuate SENSOR B11/C_CE_CL CASSETTE CENTRED LEFT and fix it in position with a piece of tape.
4. With a CASSETTE carefully actuate SENSOR B12/C_CE_CR CASSETTE CENTRED RIGHT.
5. SENSOR B12 has to be actuated when the CASSETTE is 1.5 ± 0.5 mm away from the right-hand CENTRING BAR.
6. If the distance is not correct, change the position of B12.
7. Manually actuate SENSOR B12/C_CE_CR CASSETTE CENTRED RIGHT and fix it in position with a piece of tape.
8. Take off the tape from SENSOR B11.
9. With a CASSETTE carefully actuate SENSOR B11/C_CE_CL CASSETTE CENTRED LEFT.
10. SENSOR B11 has to be actuated when the CASSETTE is 1.5 ± 0.5 mm away from the right-hand CENTRING BAR.
11. If the distance is not correct, change the position of B11.
12. Take off the tape from SENSOR B12.
13. Start the option CASSETTE LENGTH of the SCREEN PARAMETER.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select CHANGE ML2000 DATA from the MAIN MENU press ENTER
Select CHANGE PARAMETER press ENTER
Select CASSETTE LENGTH..... press ENTER

14. Key in the measured length (NOT THE FILM SIZE !) of the selected CASSETTE in mm.

NOTE

A small CASSETTE preferably 18x24 should be used.

15. Insert the selected CASSETTE and press ENTER. The ML2000 (ML2000 P) measures the CASSETTE LENGTH and calculates the correction value.
16. This correction value must be stored in the ML2000 (ML2000 P) MEMORY.
Select STORE PARAMETERS press ENTER
17. Take out the CASSETTE.
18. Exit the SERVICE PROGRAM.
Press BACKSPACE twice
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER
19. Close the TOP COVER.

SENSOR B20 VACUUM OFF

Purpose:

This adjustment ensures that the LEADING EDGE of the exposed CASSETTE FILM is detected to turn off the CASSETTE SUCKER BAR VACUUM. Use only SENSORS P/N 9228991. They are selected and known to be good.

CAUTION

Take proper ESD SAFETY PRECAUTIONS when doing this adjustment.

1. Start the SENSOR TEST.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select COMPONENT TEST from the MAIN MENU..... press ENTER
Select SENSORS..... press ENTER
Select SENSOR TEST WITH SOUND..... press ENTER
2. Set the JUMPER of A8X50 to the upper position (pin 3-4). See the figure 3-13 on the next page.
3. Adjust the position of the MIRROR of B20, so that B20 is indicated as off. See figure 3-14 on the next page.
4. Set the JUMPER of A8X50 to the lower position (pin 1-6). SENSOR B20 must now be indicated as off when there is no FILM and it must be indicated as ON when there is a FILM. If this is not correct, go back to step 3 else proceed with step 5.

NOTE

Use all types of CUSTOMER FILM to ensure correct operation.

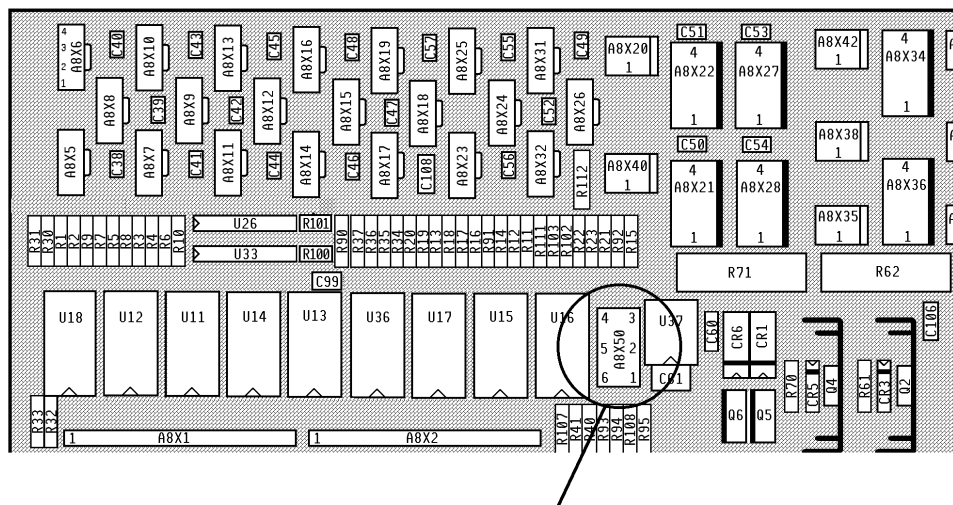
**CONNECTOR A8X50**

figure 3-13

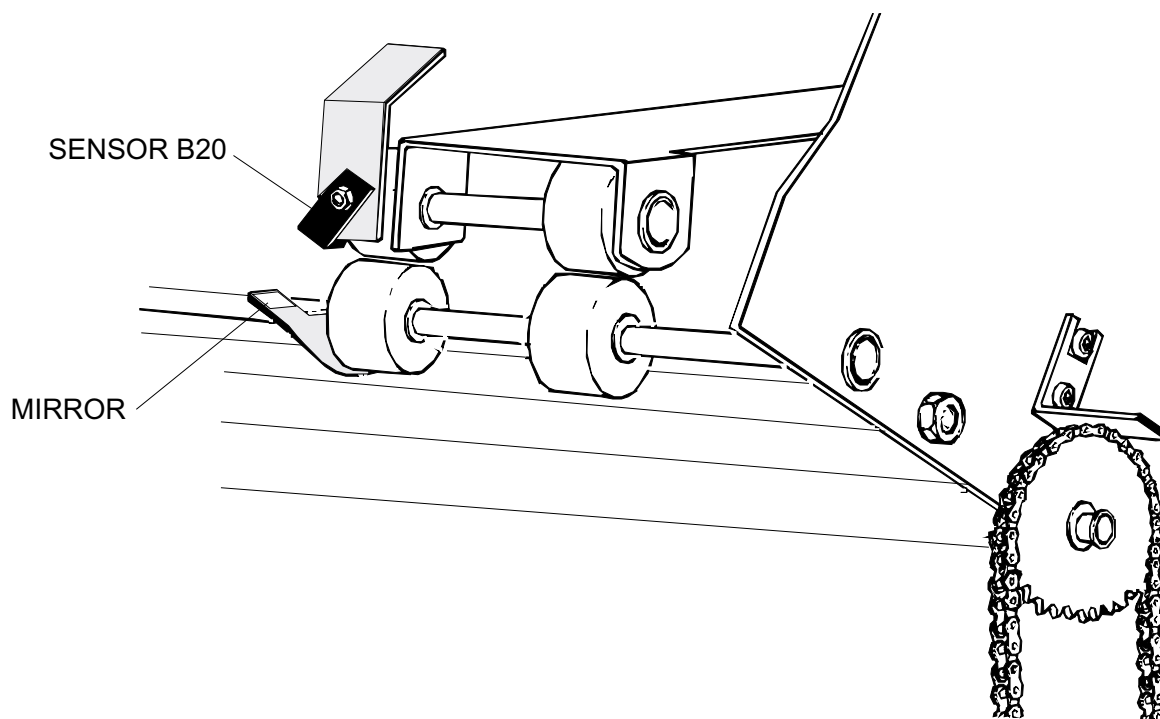


figure 3-14

5. Set the JUMPER of A8X50 to the MIDDLE POSITION (pin 2-5). **This is the position for normal operation.**
6. Exit the the SERVICE PROGRAM.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE..... press ENTER
Select Quit the program press ENTER
7. Run several cycles with all types of CUSTOMER FILMS to ensure correct operation.

DRIVE BELT TENSION

Purpose:

This adjustment ensures that the CASSETTE is correctly transported in and out.

1. Move the BELT TENSIONERS up or down, to tension the DRIVE BELT.

NOTE

There is no fixed value for the DRIVE BELT tension. The tension of the DRIVE BELT is not critical.

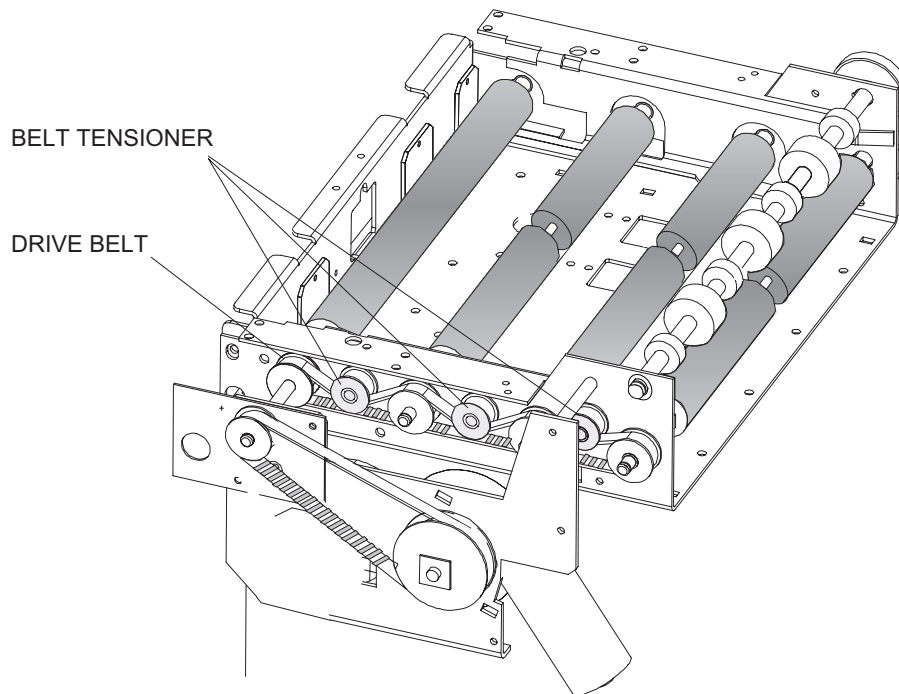


figure 3-15

FILM POCKET

CLEAN THE SUCKERS

The main cause of SUCKER MARKS is contamination of the sucker surface. This contamination can be any number of substances ranging from natural body oil, sweat or even KODAK Intensifying Screen Cleaner or anti static Solution (which has sometimes been recommended for cleaning SUCKERS!). Do not use KODAK Intensifying Screen Cleaner and Anti Static Solution to clean the SUCKERS!

NOTE

This procedure should be followed if the SUCKERS are touched or if new ones are fitted.

1. Abrade the surface of the SUCKER carefully using Emery Cloth grade 400 or a similar material.
2. Lightly coat the SUCKER with NATURAL(un-perfumed) talcum powder, available from chemists and pharmacies.

FILM POCKET CHAIN

Prerequisites:

When doing this adjustment, the unit must be levelled.

Purpose:

This adjustment ensures that there is no offset between the left and the right CHAIN and that the FILM POCKET DRIVE SHAFT is parallel to the BASE PLATE of the MAGAZINE CHAMBER.

NOTE

After you have done this adjustment, check the adjustment of the FILM POCKET

1. Switch off the ML2000 (ML2000 P).
2. Take off the PANELS.
3. Take out the FILM CHUTE.
4. Take out all MAGAZINES.
5. Disconnect the STEPPER MOTOR
6. Manually move FILM POCKET to a position so that the top surface of one of the counterweights is level with the top edge of the GUIDE RAIL.

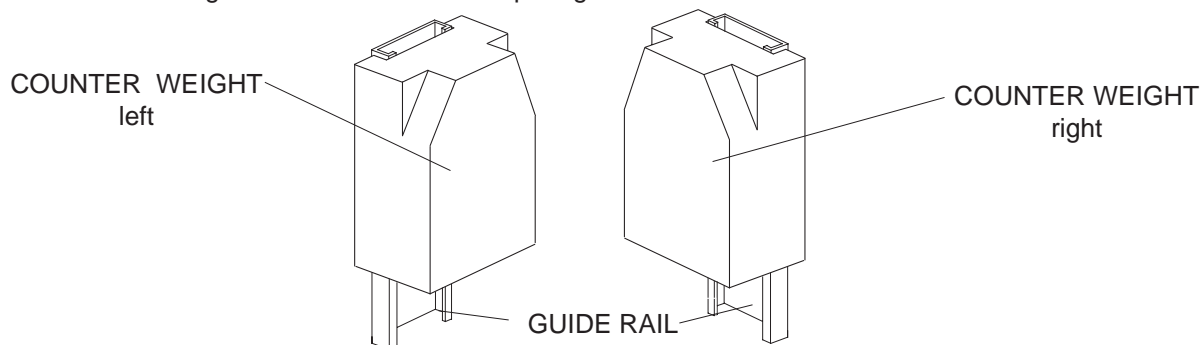


figure 3-16

7. Check that the second counterweight is also approx. level with the top of the GUIDE.
8. If necessary, move the CHAIN to the correct position on the GEAR.
9. Insert a CASSETTE (18x24) with the tube side up and the metal edge towards the FILM POCKET into magazine position 2. The CASSETTE is just used as a gauge.
10. Carefully move the FILM POCKET up above level 2.
11. Carefully rotate the FILM POCKET SUCKER BAR ARM into its fully upright position.
12. Switch on the ML2000 (ML2000 P).
13. Tilt the SOLENOID SUCKER BAR TILTING Y14.

Start the SERVICE PROGRAM.

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select COMPONENT TEST from the MAIN MENU press ENTER

Select SOLENOIDS press ENTER

Select TILTING MAGAZINE SUCKER BAR Y14 press ENTER

Select ON

NOTE

Do not leave the SOLENOID Y14 switched on for a long time. It becomes very hot.

14. Manually move the FILM POCKET SUCKER BAR close to the CASSETTE in MAGAZINE POSITION 2.
15. Check that the MAGAZINE SUCKERS are parallel to the metal edge of the CASSETTE. This is best seen from the front.

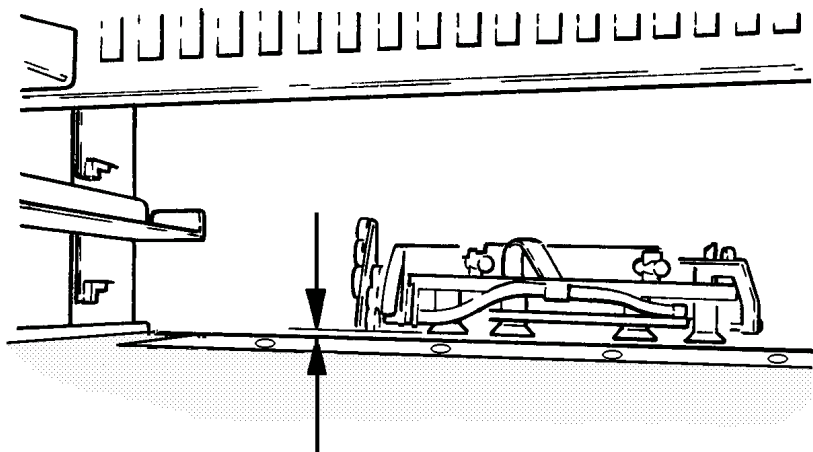


figure 3-17

16. If they are not parallel loosen the CHAIN LOCK NUTS and lengthen or shorten the chain as required.

NOTE

You cannot compensate with this adjustment for a bent FILM POCKET SUCKER BAR. Do this adjustment only if the complete FILM POCKET ASSEMBLY is not parallel to the CASSETTE.

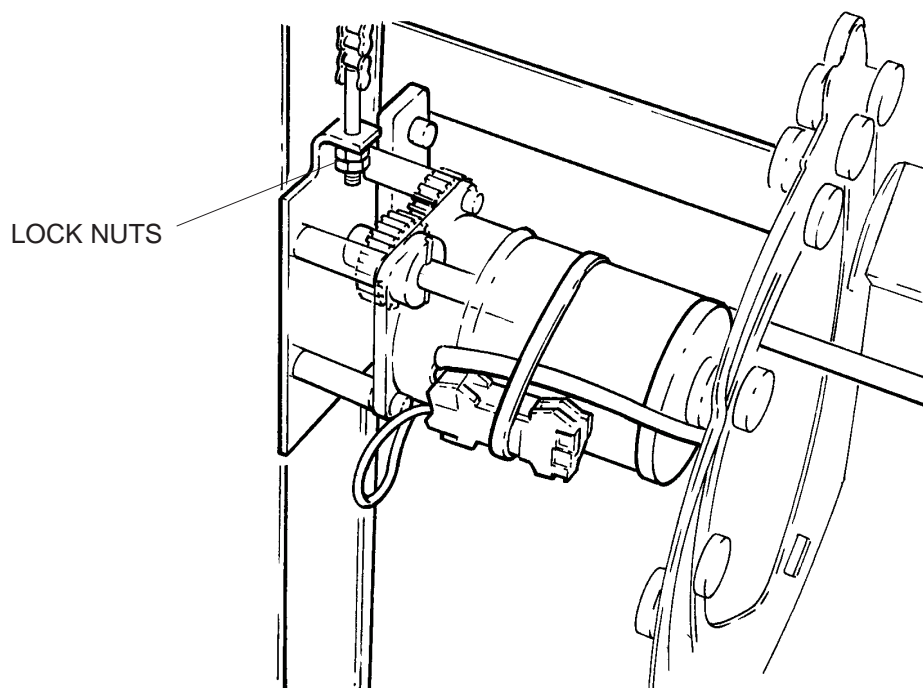


figure 3-18

17. Tighten the LOCK NUTS, connect the FILM POCKET STEPPER MOTOR and take out the CASSETTE.

FILM POCKET ADJUSTMENT

Special tools:

DENTIST MIRROR TL 2753

BLOW PIPE POSITIONER MAGAZINE TL-4582

Purpose:

This adjustment ensures that a FILM is picked up from the MAGAZINE.

1. Take out all MAGAZINES from the ML2000 (ML2000 P).
2. Empty one MAGAZINE in the dark-room.
3. Take off the LID from the empty MAGAZINE.
4. Draw a reference line 3 mm away from the leading edge of a film.
5. Put this film into the empty MAGAZINE.
6. Make sure that the film is at the MAGAZINE WALL.

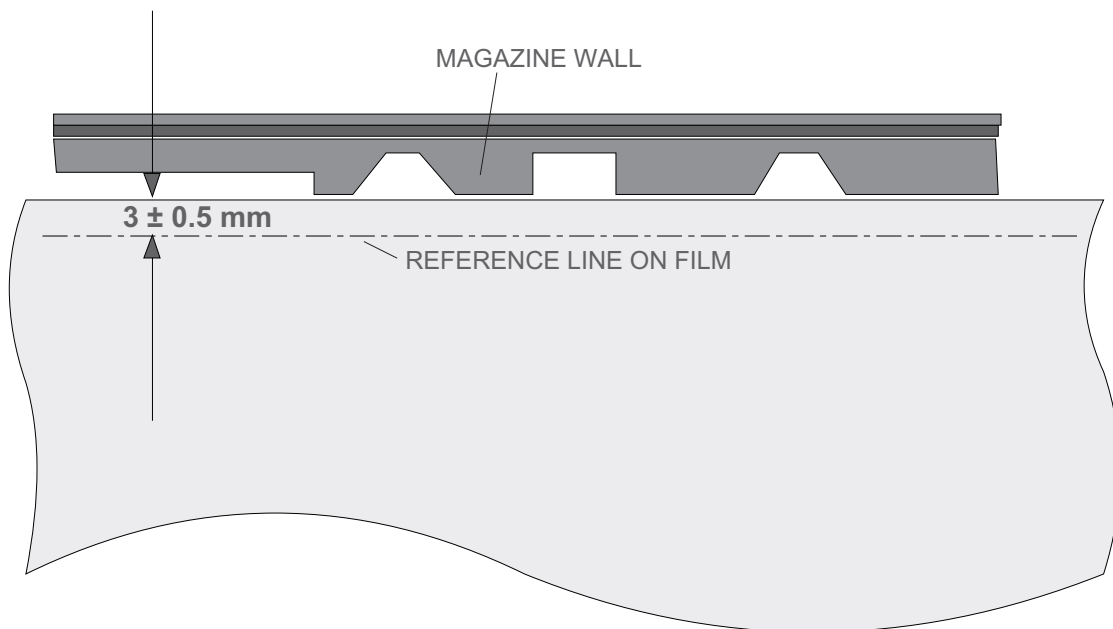


figure 3-19

7. Insert the prepared MAGAZINE into position 3.
8. Take out the FILM CHUTE.
9. Switch off the ML2000 (ML2000 P).
10. Defeat the INTERLOCK with a PERMANENT MAGNET.
11. Connect the LAP TOP COMPUTER to the ML2000 (ML2000 P) and start the SERVICE SOFTWARE.
12. **Move the FILM Pocket to level23.**

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU.....press ENTER

ENTER SERVICE MODE MESSAGE is displayed.....press ENTER

UNIT DATA are displayed.....press ENTER

Select COMPONENT TEST from the MAIN MENU.....press ENTER

Select MAGAZINE MOTORS.....press ENTER

Select *STEPPER MOTOR FILM POCKET M10* press *ENTER*
 Select *MOVE TO LEVELS/HOME POSITION* press *ENTER*
 Select *MOVE TO MAGAZINE 2*

- 13.** Rotate the FILM POCKET SUCKER BAR ARM to its vertical position, so that the BALL BEARING is fully engaged in the DETENT.

Press *BACKSPACE* twice to come back to the screen *TEST MAGAZINE MOTORS*

Select *FILM PICK UP MAGAZINE M15* press *ENTER*

Select *FORWARD*

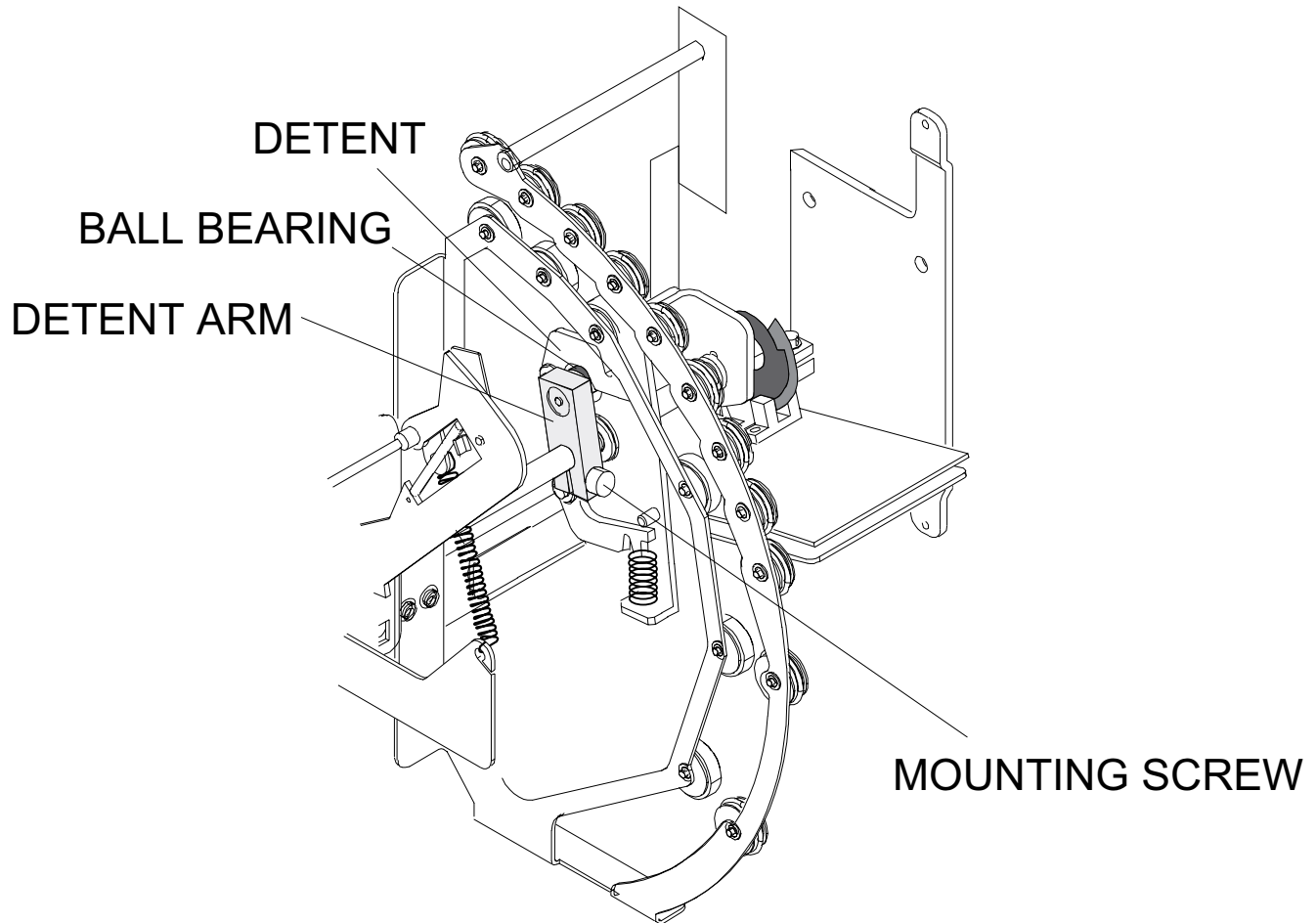


figure 3-20

- 14.** Move the SUCKER BAR by hand using low force. If it can be moved proceed with step 15 else proceed with step 23.
- 15.** Start the SENSOR TEST.
 Press *BACKSPACE* twice to go back to the screen *COMPONENT TEST*
 Select *SENSORS*..... press *ENTER*
 Select *SENSOR TEST WITH SOUND*..... press *ENTER*
- 16.** Make sure that the BALL BEARING is still engaged in the DETENT.
- 17.** Loosen the SET SCREW of the LEFT TIMING DISK.
- 18.** Push the SUCKER BAR forward by hand until there is no clearance.

19. Rotate the LEFT HAND TIMING DISK in the direction of the arrow until SENSOR B56/M_PU_EF is interrupted.

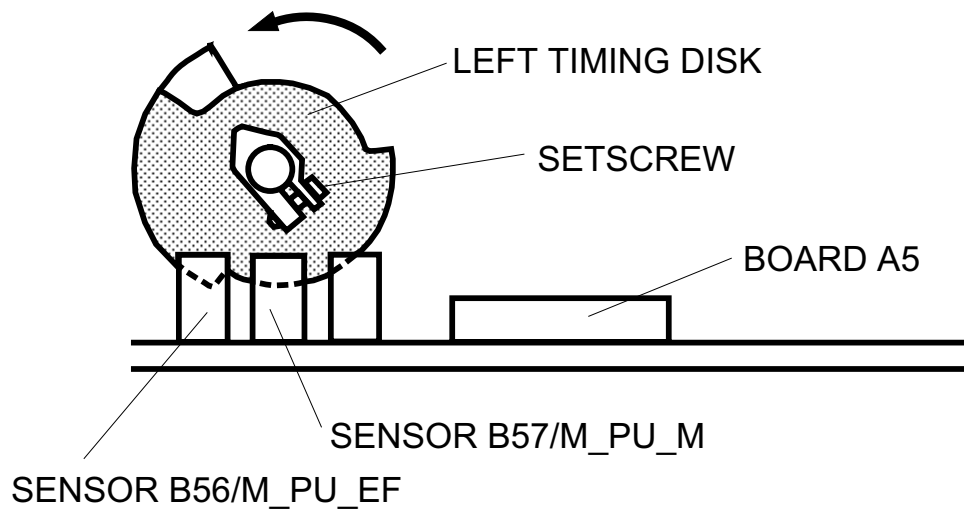


figure 3-21

20. Tighten the SET SCREW.
21. Check that the FILM POCKET SUCKER BAR reaches the FRONT POSITION without bouncing.
- Press BACKSPACE twice to come back to the screen COMPONENT TEST*
Select MAGAZINE MOTORS..... press ENTER
Select FILM PICK UP MAGAZINE M15 press ENTER
Select BACKWARD
Select FORWARD
22. If the BALL BEARING is not fully engaged in the DETENT or if the FILM POCKET SUCKER BAR does not stop without bouncing go back to step 18 else proceed with step 25.
23. Exit the SERVICE MODE.
- Press BACKSPACE 3 times*
Select LEAVE COMPONENT TEST..... press ENTER
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER
24. Insert a loaded MAGAZINE into the ML2000 (ML2000 / P M35-M).
25. Run a few cycles; if the FILM does not interfere with parts of the CASSETTE TRANSPORT MODULE, proceed with step 34, else proceed with step 26.
26. Start the SENSOR TEST.
- Start the SERVICE PROGRAM*
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select COMPONENT TEST from the MAIN MENU..... press ENTER
Select SENSORS..... press ENTER
Select SENSOR TEST WITH SOUND..... press ENTER

- 27.** Manually rotate the SUCKER BAR ARM fully down, until the BALL BEARING is fully engaged in the LOWER DETENT.

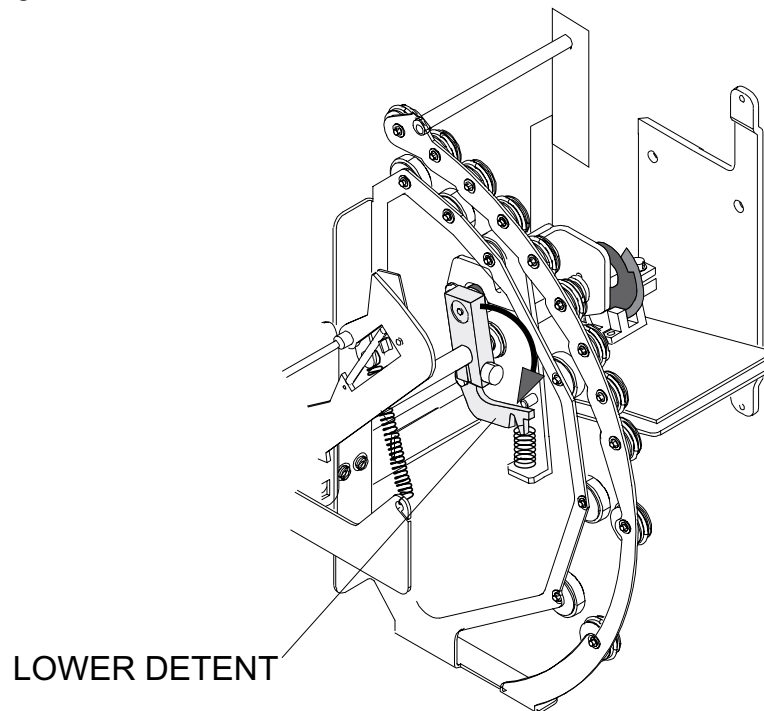


figure 3-22

- 28.** Open the SET SCREW of the right hand TIMING DISK.
29. Turn the SUCKER BAR backward by hand until there is no clearance.
30. Rotate the right hand TIMING DISK in the direction of the arrow until SENSOR B58/M_PU_ER is interrupted. This is indicated by a BEEP from the SENSOR TEST.

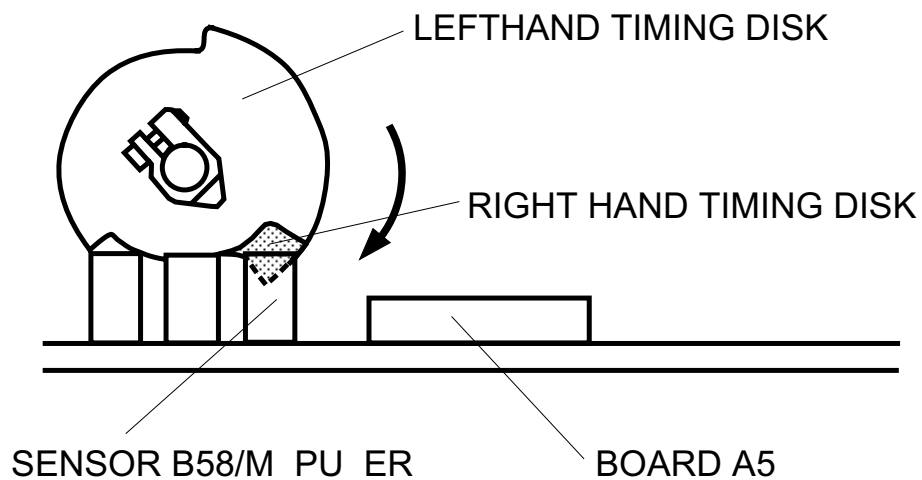


figure 3-23

- 31.** Tighten the SET SCREW.
32. Check that the FILM POCKET SUCKER BAR reaches the REAR POSITION without bouncing.

Press BACKSPACE twice to come back to the screen COMPONENT TEST

Select MAGAZINE MOTORS..... press ENTER

Select FILM PICK UP MAGAZINE M15 press ENTER

Select FORWARD

Select BACKWARD

- 33.** Run a few cycles; if the FILM does not interfere with parts of the CASSETTE TRANSPORT MODULE, proceed with step 34, else go back to step 27.
- 34.** Move the FILM POCKET to MAGAZINE LEVEL 3
 - Start the SERVICE PROGRAM*
 - Select SERVICE MODE from the GLOBAL MENU press ENTER*
 - ENTER SERVICE MODE MESSAGE is displayed..... press ENTER*
 - UNIT DATA are displayed..... press ENTER*
 - Select COMPONENT TEST from the MAIN MENU press ENTER*
 - Select MAGAZINE MOTORS..... press ENTER*
 - Select STEPPER MOTOR FILM POCKET M10 press ENTER*
 - Select MOVE TO LEVELS/HOME POSITION press ENTER*
 - Select MOVE TO MAGAZINE 3*
- 35.** After the FILM POCKET has reached LEVEL 2, rotate the FILM POCKET SUCKER BAR to its vertical position, so that the BALL BEARING is fully engaged in the DETENT.
 - Press BACKSPACE twice to come back to the screen COMPONENT TEST*
 - Select MAGAZINE MOTORS..... press ENTER*
 - Select FILM PICK UP MAGAZINE M15 press ENTER*
 - Select FORWARD*
- 36.** Check that the CABLE PROTECTING BRACKET AT SENSOR B61 FILM AT SUCKER BAR is not bent. Otherwise the BRACKET will ride on the MAGAZINE WALL and the SUCKERS do not reach the FILMS in the MAGAZINE.
- 37.** Move the FILM Pocket to the FILM in the MAGAZINE with the FILM POCKET SUCKER BAR tilted.
 - Press BACKSPACE twice to go back to the SCREEN COMPONENT TEST.*
 - Select SOLENOIDS press ENTER*
 - Select TILTING MAGAZINE SUCKER BAR Y14 press ENTER*
 - Press BACKSPACE twice to go back to the SCREEN COMPONENT TEST.*
 - Select MAGAZINE MOTORS press ENTER.*
 - Select STEPPER MOTOR FILM POCKET M10 press ENTER.*
 - Select MOVE TO A SPECIAL POSITION press ENTER.*
 - Select POCKET TO FILM (MAG)*

NOTE

Do not energise the SOLENOID Y14 for too long. It will become very hot.

- 38.** Check that all SUCKERS are parallel on the FILM.

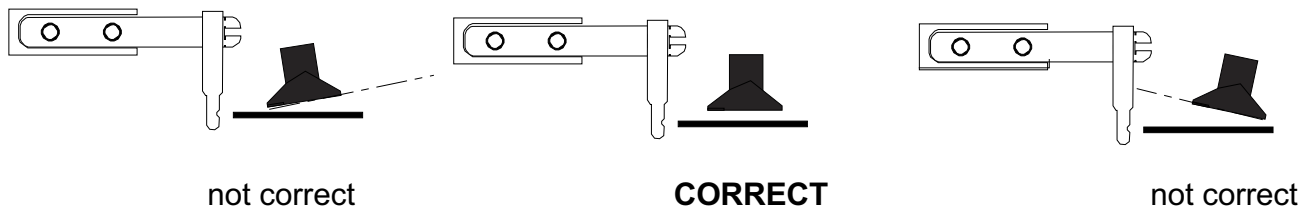


figure 3-24

- 39.** If the SUCKERS are not plane on the FILM proceed with step 40, else proceed with step 41.
- 40.** Loosen the 2 MOUNTING SCREWS of the TILTING MAGAZINE SUCKER BAR SOLENOID Y14. Move the Solenoid up or down as required and tighten the MOUNTING SCREWS.

NOTE

The SOLENOID Y14 is still energised.

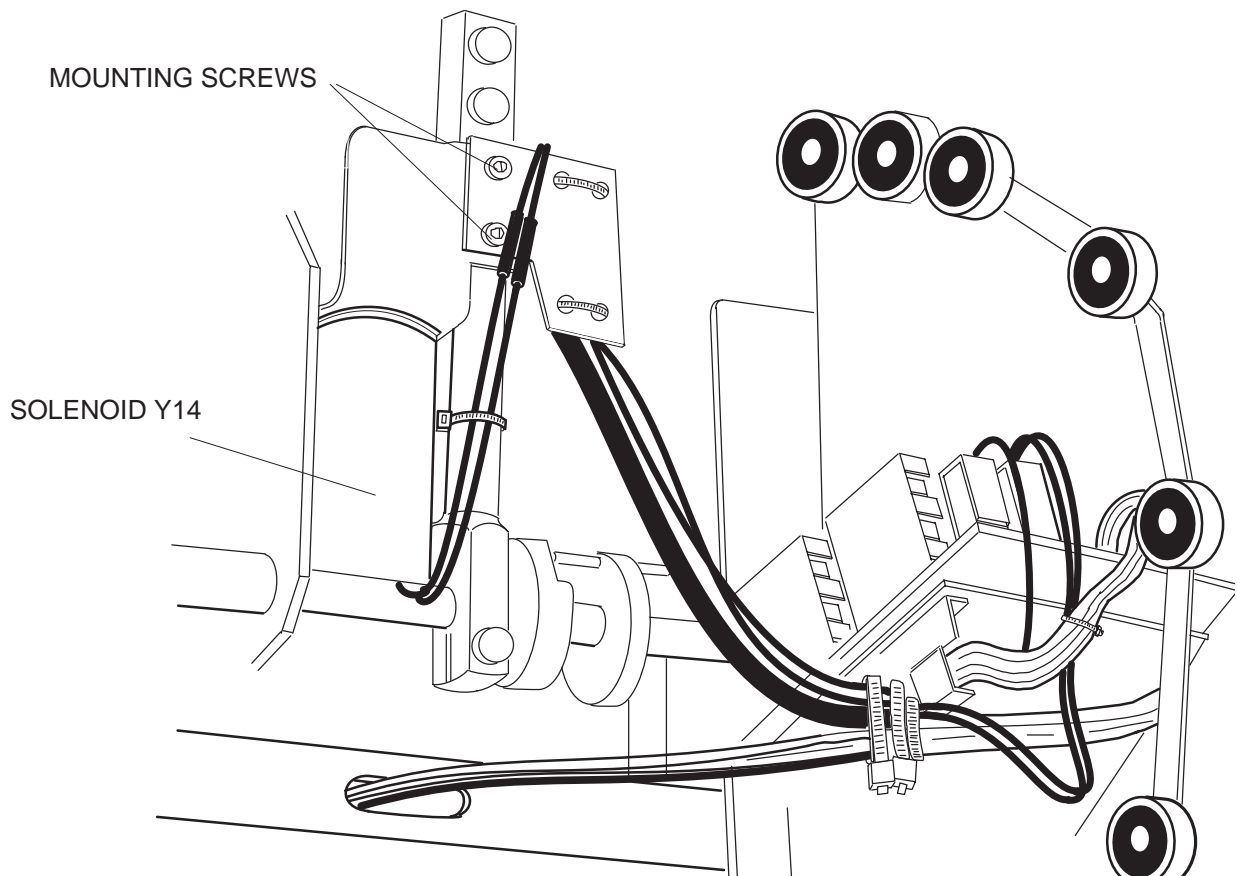


figure 3-25

- 41.** Check that the MAGAZINE SUCKERS are $3 \text{ mm} \pm 0.5$ away from the leading edge of the film. Use the DENTIST MIRROR to observe the position of the FILM POCKET SUCKERS. Make sure that the FILM is touching the MAGAZINE WALL.

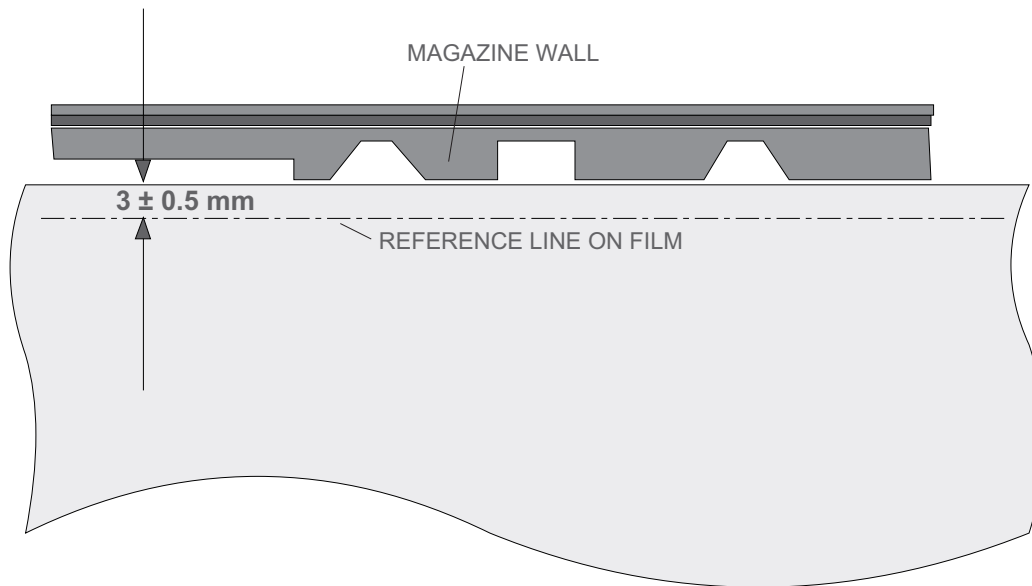


figure 3-26

- 42.** If the distance is not correct, or if the MAGAZINE SUCKER BAR touches the MAGAZINE WALL proceed with step 43. Otherwise proceed with step 50.
- 43.** Move the FILM POCKET up, so that it can be rotated out of the MAGAZINE.
Select MOVE OUT POSITION
- 44.** Loosen the MOUNTING SCREW of the FILM POCKET SUCKER BAR ARM and rotate the SUCKER BAR in or out as required. Tighten MOUNTING SCREW and LOCK NUT.

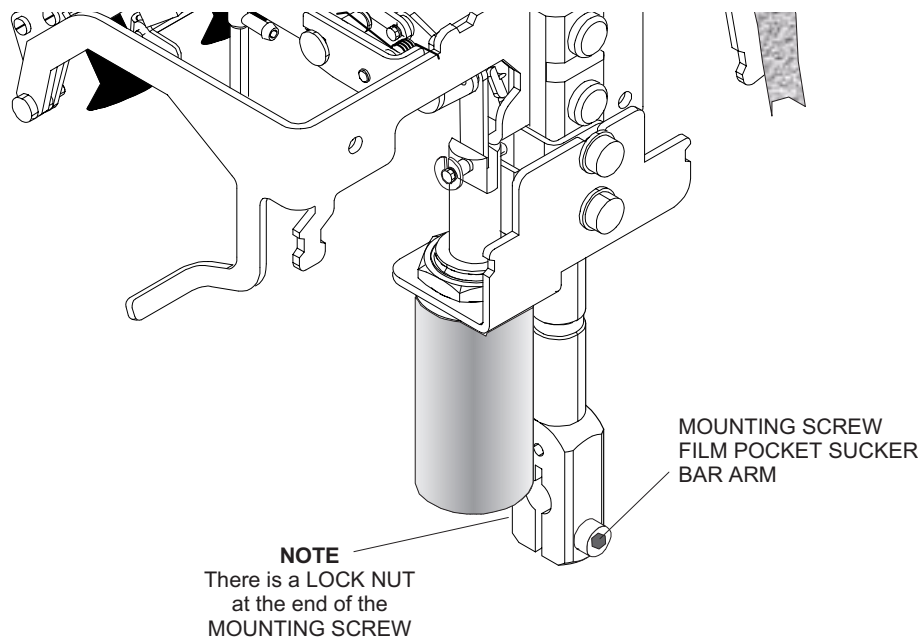


figure 3-27

45. Press Backspace until you reach the screen COMPONENT TEST.
46. Switch off the SOLENOID TILTING MAGAZINE SUCKER BAR Y14 to avoid overheating and let it cool down if necessary .
Press BACKSPACE 3 times
Select SOLENOIDS press ENTER
Select TILTING MAGAZINE SUCKER BAR Y14 press ENTER
Select SOLENOID OFF
Press BACKSPACE twice to go back to the screen COMPONENT TEST
47. Manually rotate the SUCKER BAR fully out.
48. Move the FILM POCKET to MAGAZINE LEVEL 2.
Select MAGAZINE MOTORS..... press ENTER
Select STEPPER MOTOR FILM POCKET M10 press ENTER
Select MOVE TO LEVELS/HOME POSITION press ENTER
Select MOVE TO MAGAZINE 3
49. Go back to step 35, to verify correct setup of SUCKERS in Mag. Level 2.
50. Switch off the SOLENOID TILTING MAGAZINE SUCKER BAR Y14 to avoid overheating and let it cool down if necessary .
Press BACKSPACE 3 times
Select SOLENOIDS press ENTER
Select TILTING MAGAZINE SUCKER BAR Y14 press ENTER
Select SOLENOID OFF
51. Check that the BLOW PIPES are not touching the side of the MAGAZINE RECESSES. The BLOWPIPES must not be in the recess areas shaded grey.

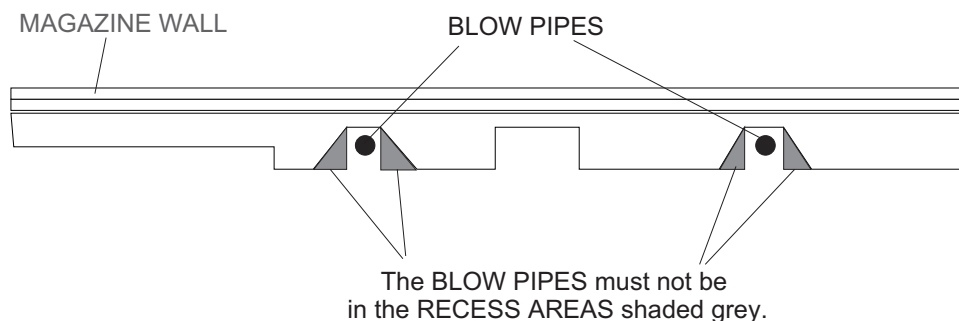


figure 3-28

52. If they are too far to the left or to the right, loosen SCREW 1 and carefully move the SUCKER BAR ARM in the desired direction. Make sure the SUCKER Bar does not interfere with the DOUBLE FILM DETECTOR. See figure 3-29 on the next page.

NOTE

If the SUCKER BAR ARM is too far to the left, SCREW 2 from the COLLAR has also to be loosened.

NOTE

Ensure that the position of the MAGAZINE SUCKER BAR in relation to the 3 mm reference line is not changed (see step 40).

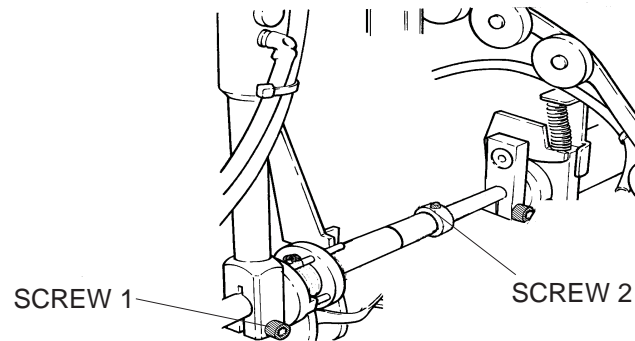


figure 3-29

53. Tighten SCREW 1

Note

It is most important that SCREW 1 is tightened. If it is not tight, the relationship between the 2 FILM POCKET TIMING DISKS and the MAGAZINE SUCKER BAR will be lost. It is then impossible to pick up a film from the MAGAZINE.

54. Move the COLLAR with SCREW 2 to the left as far as possible and tighten SCREW 2.

55. Check that the BLOW PIPES are correct in the MAGAZINE RECESSES. The BLOWPIPES must not be in the shaded areas. They have to be between the centreline of the recess and the MAGAZINE WALL. They must not touch the MAGAZINE WALLS. If this distance is not correct, loosen the LENGTH ADJUSTMENT SCREWS of the BLOWPIPES and shift them forward or backward. Tighten the screws. See the figure on the next page.

NOTE

Do not tighten the LENGTH ADJUSTMENT SCREWS too much, otherwise they dig into the BLOW-PIPES and a fine adjustment is no longer possible.

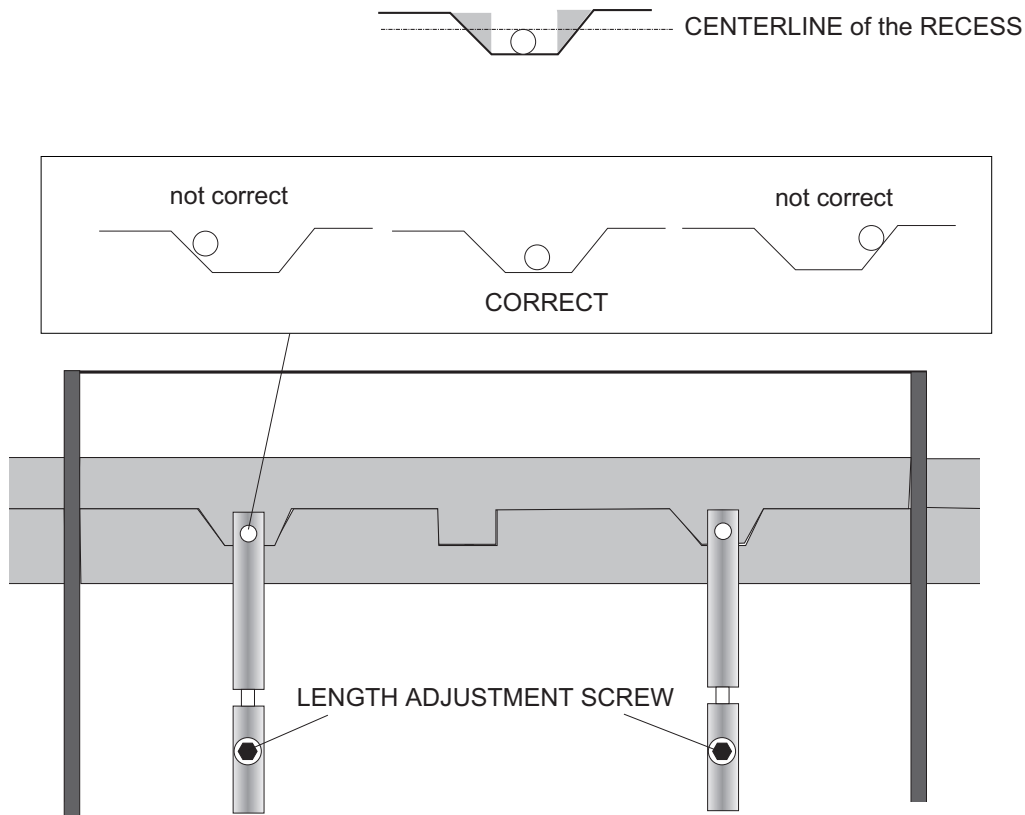


figure 3-30

- 56.** Manually rotate the FILM POCKET SUCKER BAR out of the MAGAZINE.
- 57.** Test the position of the BLOW PIPE HOLES in relation to the FILM POCKET SUCKERS. To do this the COMPRESSOR must be switched on, SOLENOID VALVE Y12 must be energised and SOLENOID TILTING MAGAZINE SUCKER BAR Y14 must be switched on.

Press BACKSPACE twice to come back to the screen COMPONENT TEST

Select MAGAZINE MOTORS..... press ENTER

Select COMPRESSOR M16..... press ENTER

Select MOTOR ON

Press BACKSPACE twice to come back to the screen COMPONENT TEST

Select SOLENOID VALVES..... press ENTER

Select MAGAZINE SUCKING Y12 press ENTER

Select SOL: VALVE ON..... press ENTER

Press BACKSPACE twice to come back to the screen COMPONENT TEST

Select SOLENOIDS press ENTER

Select TILTING MAGAZINE SUCKER BAR Y14 press ENTER

Select SOLENOID ON

NOTE

Do not leave on the SOLENOID Y14 for too long. It will become very hot.

- 58.** Place the BLOWPIPE POSITIONER GAUGE TL 4582 onto the FILM POCKET SUCKERS.

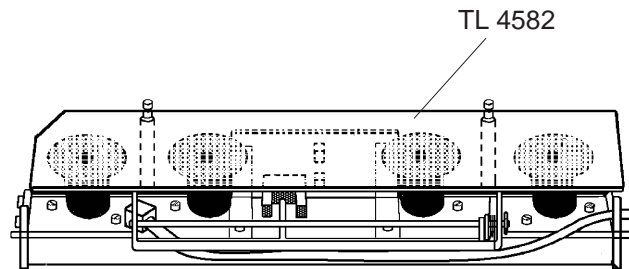


figure 3-31

- 59.** Check that the 0.5 mm HOLE of the BLOWPIPES is just above the BLOWPIPE POSITIONER.
- 60.** If the position of the HOLE is not correct, loosen the HEIGHT ADJUSTMENT SCREWS of the BLOW PIPES and move the BLOWPIPES up or down as required. Then fasten the SCREWS.

NOTE

The position of the hole in the BLOWPIPES is important to separate the films in the MAGAZINES.

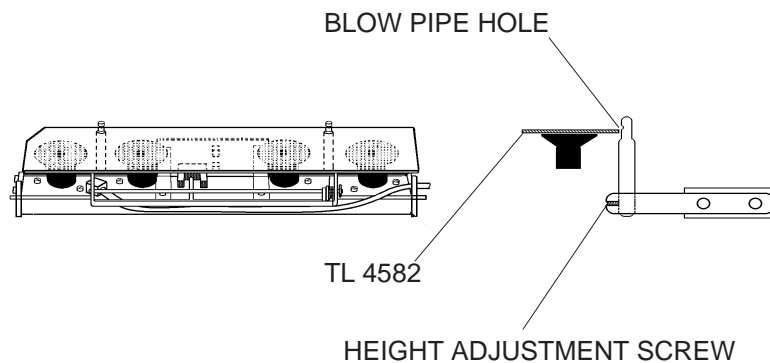


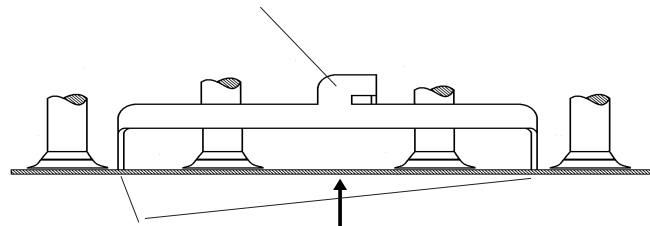
figure 3-32

- 61.** Switch off the SOLENOID Y14.
Select SOLENOID OFF
- 62.** Remove the BLOW PIPE POSITIONER TOOL from the SUCKERS. The TOOL can only be taken off, after SOLENOID VALVE Y12 is switched off and air is blown into the SUCKERS.
Press BACKSPACE twice to come back to the screen COMPONENT TEST
Select SOLENOID VALVES press ENTER

Select MAGAZINE SUCKING Y12 press ENTER
Select SOL. VALVE OFF
Press BACKSPACE
Select MAGAZINE BLOW SUCKER Y10 press ENTER
Select SOL. VALVE ON
Select SOL. VALVE OFF
Press BACKSPACE twice to come back to the screen COMPONENT TEST
Select MAGAZINE MOTORS press ENTER
Select COMPRESSOR M16 Press ENTER
Select MOTOR OFF

- 63.** To do the adjustment of the SENSOR B61, place the BLOW PIPE POSITION TOOL TL-4582 onto the MAGAZINE SUCKERS and start the SENSOR TEST.
Press BACKSPACE twice to come back to the screen COMPONENT TEST
Select SENSORS press ENTER
Select SENSOR TEST WITH SOUND press ENTER
- 64.** Carefully press down the tool onto the SUCKERS. After 0.2 - 0.5 mm, SENSOR B61 should be actuated.
- 65.** If the SENSOR is not actuated, carefully bend the ACTUATOR BRACKET.

CAREFULLY BEND HERE. BUT ONLY IF NECESSARY!



Both ACTUATORS must touch the tool at the same time.

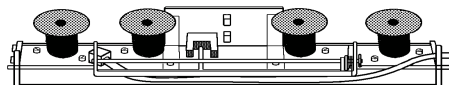


figure 3-33

- 66.** Exit the SENSOR TEST.
Press BACKSPACE twice to come back to the screen COMPONENT TEST
- 67.** Insert an empty MAGAZINE into position 2.
- 68.** Check that there is a gap of 0 to 1 mm between the BLOW PIPES and the MAGAZINE WALL.
Select MAGAZINE MOTORS press ENTER
Select STEPPER MOTOR FILM POCKET M10 press ENTER
Select MOVE TO LEVELS/HOME POSITION press ENTER
Select Move to MAGAZINE 3 START
Press BACKSPACE twice to come back to screen TEST MAGAZINE MOTORS

Select *FILM PICK UP MAGAZINE M15*press *ENTER*
 Select *FORWARD*

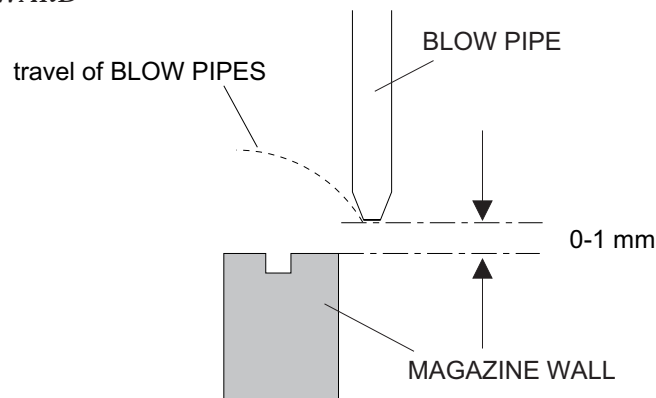


figure 3-34

- 69.** If this distance is not correct, proceed with step 70 else proceed with step 74.
- 70.** Rotate out the FILM POCKET SUCKER BAR.
 Select *BACKWARD*
- 71.** Loosen the MOUNTING SCREWS of the MAGAZINE LEVEL BRACKET and move it up or down as required. Then fasten the MOUNTING SCREWS. See the drawing on the next page.

NOTE

The gap given in figure 3-34 has to be correct. The distances given for the MAGAZINE LEVEL ADJUSTMENT are just a starting point.

- 72.** Do a SCAN RUN.
 Press *BACKSPACE* 3 times
 Select *LEAVE COMPONENT TEST*press *ENTER*
 Select *CHANGE ML2000 (ML2000 P) DATA*press *ENTER*
 Select *CHANGE PARAMETER*press *ENTER*
 Select *SCAN RUN*press *ENTER*
 Select *NEARLY EMPTY*press *ENTER*
 Select *STORE PARAMETERS*press *ENTER*
 Select *RETURN TO MAIN MENU*press *ENTER*
 Select *COMPONENT TEST*press *ENTER*
 Select *MAGAZINE MOTORS*press *ENTER*
- 73.** Proceed with step 75.
- 74.** Rotate out the FILM POCKET SUCKER BAR.
 Select *BACKWARD* press *ENTER*
- 75.** Press Backspace to go back to the screen TEST MAGAZINE MOTORS.
- 76.** Insert the MAGAZINE into position 1.

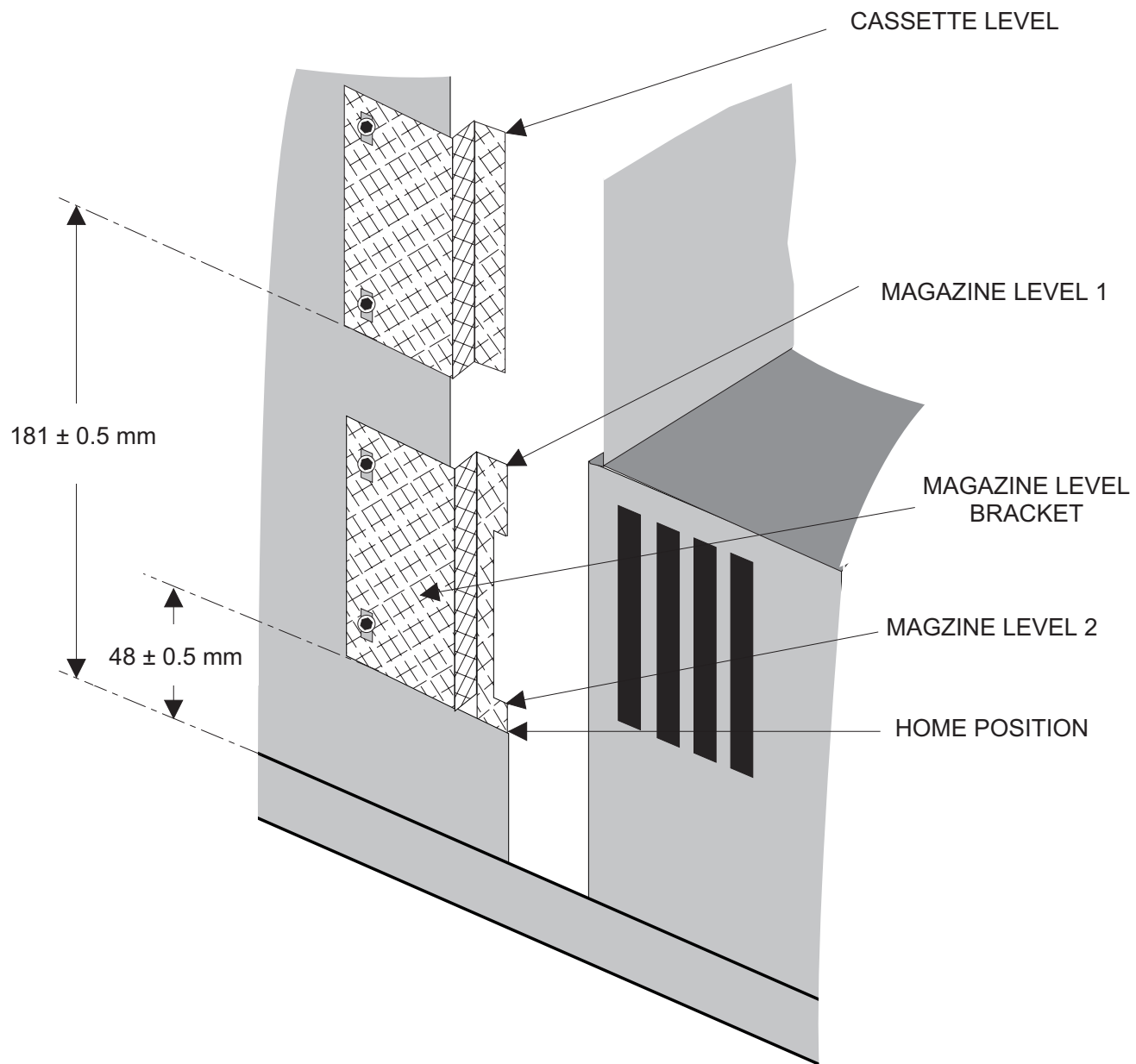


figure 3-35

- 77.** Check that the BLOW PIPES have the correct distance of 0-1 mm to the wall of MAGAZINE 1.
- Select STEPPER MOTOR FILM POCKET M10 press ENTER*
Select MOVE TO LEVELS/HOME POSITION press ENTER
Select Move to MAGAZINE 1 START
Press BACKSPACE twice to come back to screen TEST MAGAZINE MOTORS
Select FILM PICK UP MAGAZINE M15 press ENTER
Select FORWARD
- 78.** If the distance is not correct, go back to step 70 and alter the MAGAZINE LEVEL ADJUSTMENT.

NOTE

Find a compromise between MAGAZINE LEVEL 1 and 2.

- 79.** Rotate out the FILM POCKET SUCKER BAR.
Select BACKWARD
- 80.** Exit the SERVICE PROGRAM.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER
- 81.** Run several cycles.
- 82.** Make sure that the MAGAZINE BLOW PIPES do not interfere with the CASSETTES.

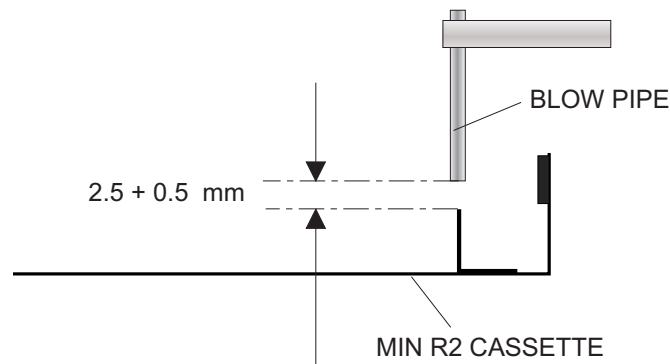


figure 3-36

- 83.** If the distance is not as shown in the figure on the previous page, loosen the MOUNTING SCREWS of the CASSETTE LEVEL BRACKET and move it up or down as required. Then fasten the MOUNTING SCREWS.
- 84.** Do a SCAN RUN.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select CHANGE ML2000 DATA press ENTER

Select CHANGE PARAMETER press ENTER
Select SCAN RUN press ENTER
Select NEARLY EMPTY..... press ENTER
Select STORE PARAMETERS..... press ENTER
Select RETURN TO MAIN MENU press ENTER
Select COMPONENT TEST press ENTER
Select MAGAZINE MOTORS..... press ENTER

85. Exit the SERVICE PROGRAM.

Press BACKSPACE 3 times

Select LEAVE COMPONENT TEST press ENTER

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

86. Do a FUNCTION TEST

87. Enable the CONTINUOUS LOOP MODE.

Move SWITCH S1-1 on PCB A1 to the ON (up) position.

Select FUNC at the OPERATORS DISPLAY

Select SYSTEM at the OPERATORS DISPLAY

Select CONTIN at the OPERATORS DISPLAY

Select CLEAR at the OPERATORS DISPLAY

88. Insert a MAGAZINE loaded with TEST FILMS.(use small and large film sizes)

89. Run approximately 30 cycles.

90. Observe the various movements of the FILM POCKET.

MAGAZINE EMPTY SENSOR

PURPOSE:

This adjustment makes sure that a MAGAZINE is recognised as being empty after the last FILM is removed.

1. Insert an empty MAGAZINE into position 1.
2. Open the MAGAZINE and rotate the FILM POCKET SUCKER BAR fully in.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select COMPONENT TEST from the MAIN MENU..... press ENTER
Select MAGAZINE MOTORS..... press ENTER
Select STEPPER MOTOR FILM POCKET M10 press ENTER
Select MOVE TO LEVELS/HOME POSITION press ENTER
Select MOVE TO MAGAZINE 1
Press BACKSPACE twice to come back to screen TEST MAGAZINE MOTORS
Select MAGAZINE OPENING M14..... press ENTER
Select FORWARD
Press BACKSPACE
Select FILM PICK UP MAGAZINE M15 press ENTER
Select FORWARD
3. Look across the SENSOR MAGAZINE EMPTY, to the MIRROR and then to the REFLECTIVE STICKER in the MAGAZINE.

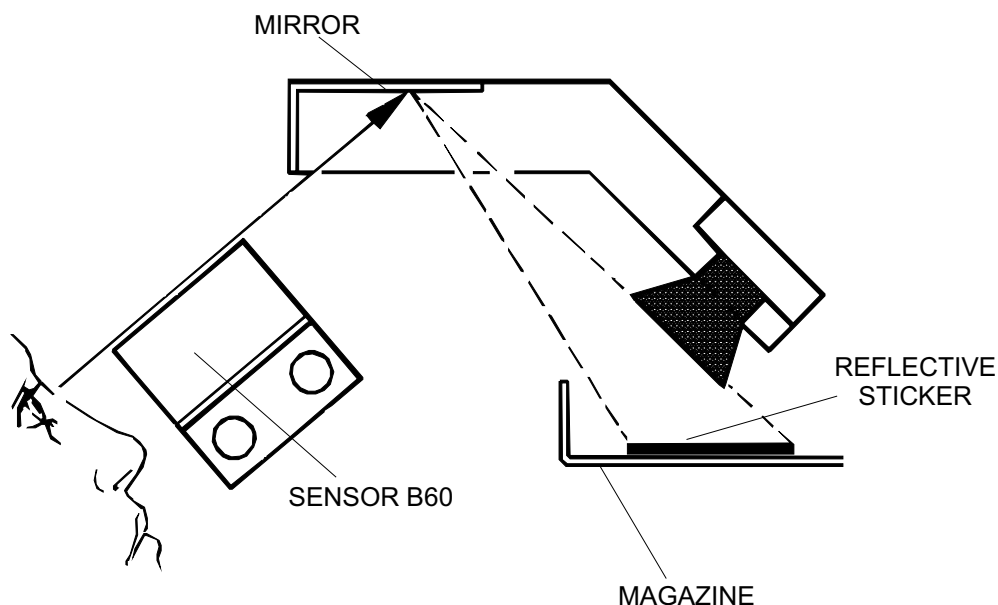


figure 3-37

4. If the REFLECTIVE STICKER is not visible open the MOUNTING SCREWS of SENSOR and move it up or down until the REFLECTIVE STICKER becomes visible. If necessary adjust the position of the MIRROR.
5. Tighten the SCREWS.
6. Start the SENSOR TEST. Otherwise the SENSOR MAGAZINE EMPTY is not turned on.

Press BACKSPACE twice to come back to screen COMPONENT TEST

Select SENSORS..... press ENTER

Select SENSOR TEST WITH SOUND..... press ENTER

7. Rotate the GAIN ADJUSTMENT SCREW of the SENSOR counter-clockwise until the indicator LED turns red. Now turn the GAIN ADJUSTMENT SCREW one step (20..30 degrees) clockwise until the INDICATOR LED is pulsating green.

NOTE

Do not set the gain too high. It might be possible that the INFRARED LIGHT BEAM is reflected by FILM in a MAGAZINE triggering the SENSOR and recognising the MAGAZINE as being empty.

8. Exit the SERVICE MODE.

Press BACKSPACE 3 times

Select LEAVE COMPONENT TEST..... press ENTER

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

DOUBLE SHEET SENSOR B59

PURPOSE:

This adjustment makes sure that a DOUBLE FILM CONDITION is recognised.

FUNCTIONAL DESCRIPTION

If there are 2 or more FILMS between the DETECTOR ROLLERS the path of light in SENSOR B59 is interrupted by AREA 2 of the DOUBLE SHEET SENSOR ARM.

If there is 1 FILM between the DETECTOR ROLLERS the light passes through the SLOT in the DOUBLE FILM SENSOR ARM. During the adjustment this slot must be positioned precisely over the light beam of the SENSOR B59.

If there is no FILM between the DETECTOR ROLLERS the path of light in SENSOR B59 is interrupted by AREA 1 of the DOUBLE SHEET SENSOR ARM.

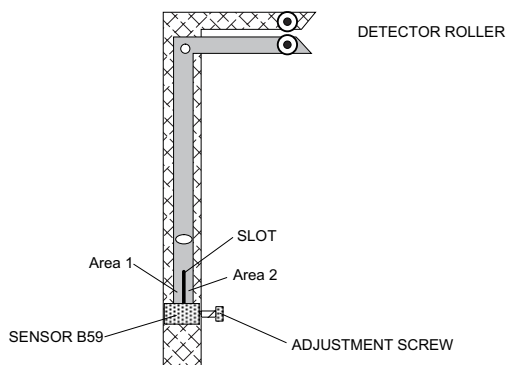


figure 3-38

SPECIAL TOOLS: DIGITAL VOLTMETER
TEST LEAD TIPS TL 2095 (or similar)

NOTE

Do this adjustment in case of false DOUBLE SHEET DETECTION only.

1. Take of the PANELS of the ML2000 (ML2000 P).

CAUTION

Do not enable the INTERLOCK SWITCHES. The MOTORS must not run during this adjustment procedure.

2. Connect the DVM to TP4 (GND) and to the right-hand side of RESISTOR R14 (both on PCB A5). Use TEST LEAD TIPS TL 2095 (or similar).

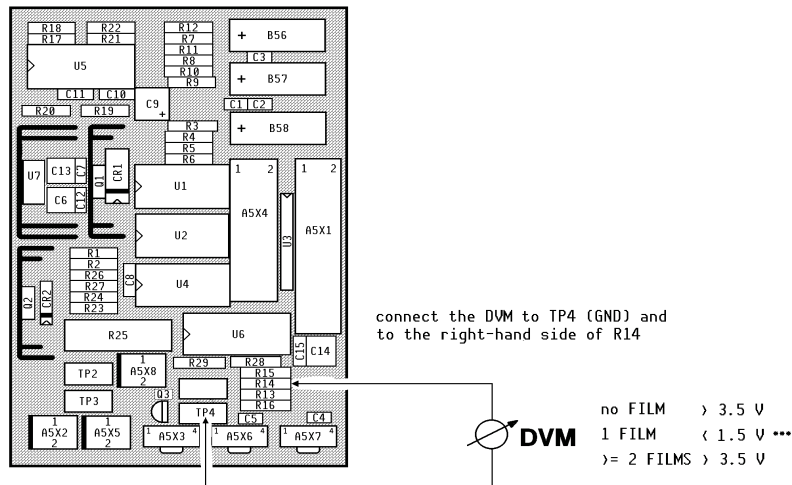
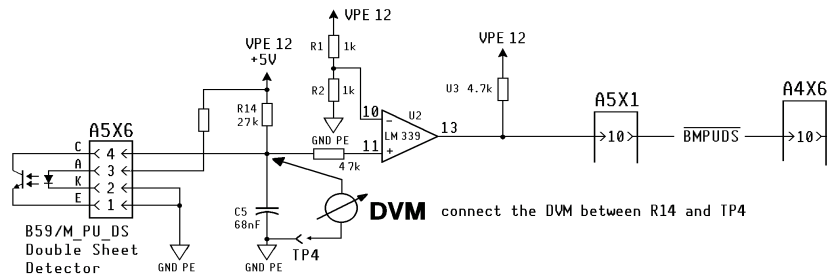
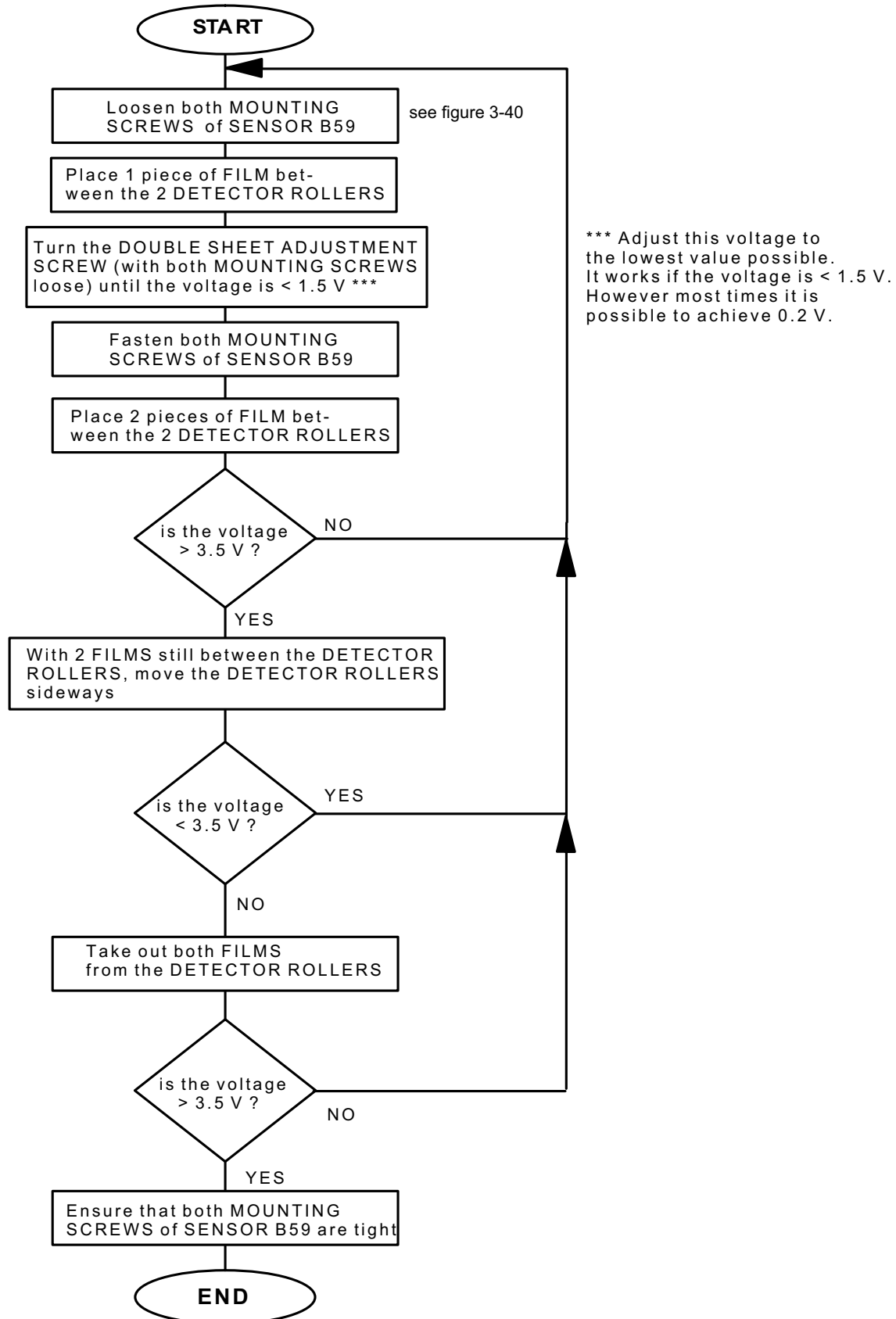


figure 3-39

3. Rotate out the MAGAZINE SUCKER BAR to get better access to the DOUBLE SHEET SENSOR B59.
4. Do the ADJUSTMENT.



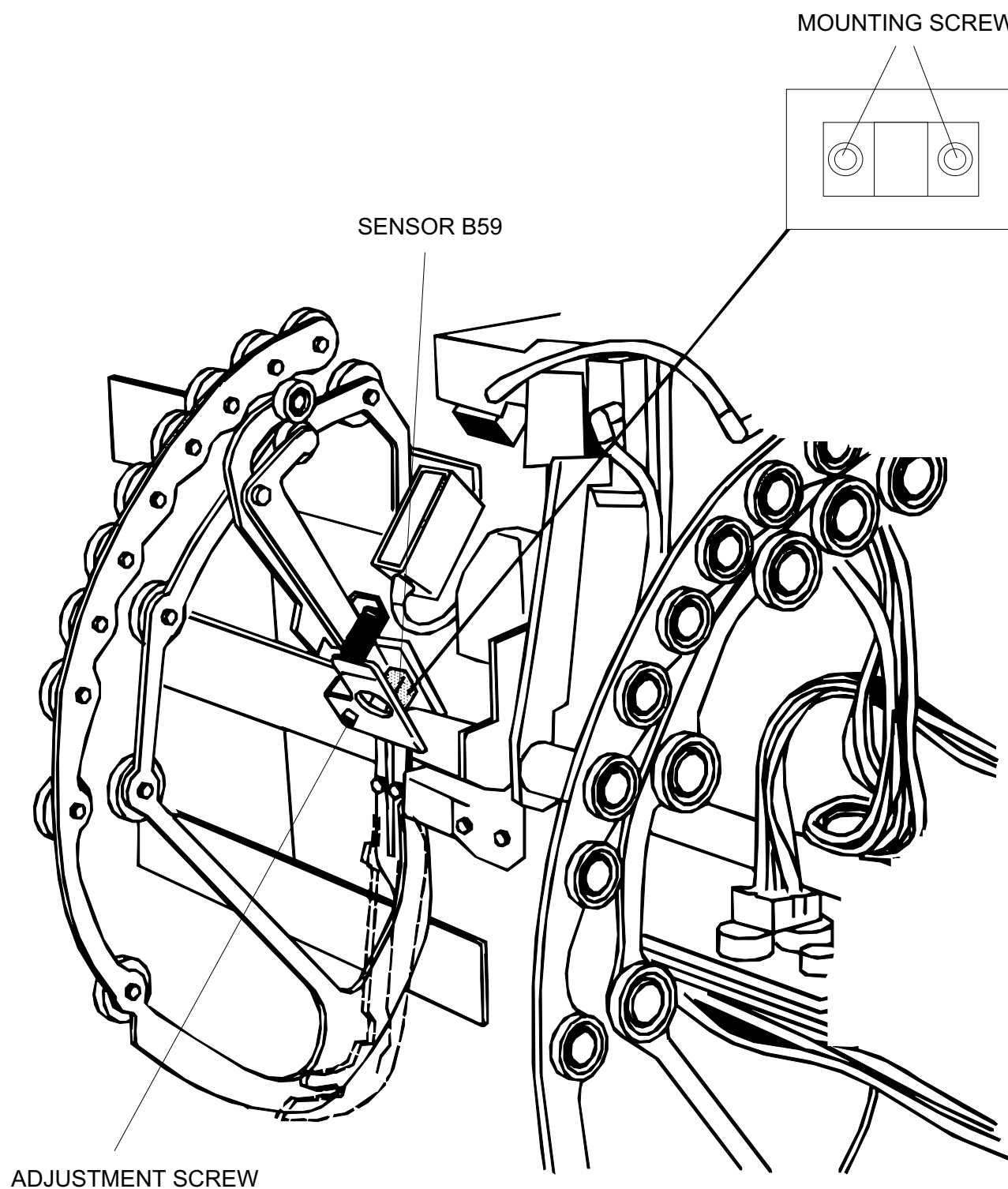


figure 3-40

5. Mount the PANELS.
6. Run a few cycles with various cassette sizes to ensure proper operation.

MAGAZINE LEVELS

PURPOSE:

This adjustment makes sure that the FILM POCKET SUCKER BAR rotates freely into the MAGAZINES and into the CASSETTE.

NOTE

This adjustment is just a starting point. After it is performed the FILM POCKET ADJUSTMENT must be checked and if necessary the position of the MAGAZINE LEVEL BRACKET and the CASSETTE LEVEL BRACKET must be changed.

1. Loosen the MOUNTING SCREWS of the MAGAZINE LEVEL BRACKET.
2. Set the edge of the MAGAZINE LEVEL BRACKET to a distance of 48 ± 0.5 mm to the BASE PLATE.

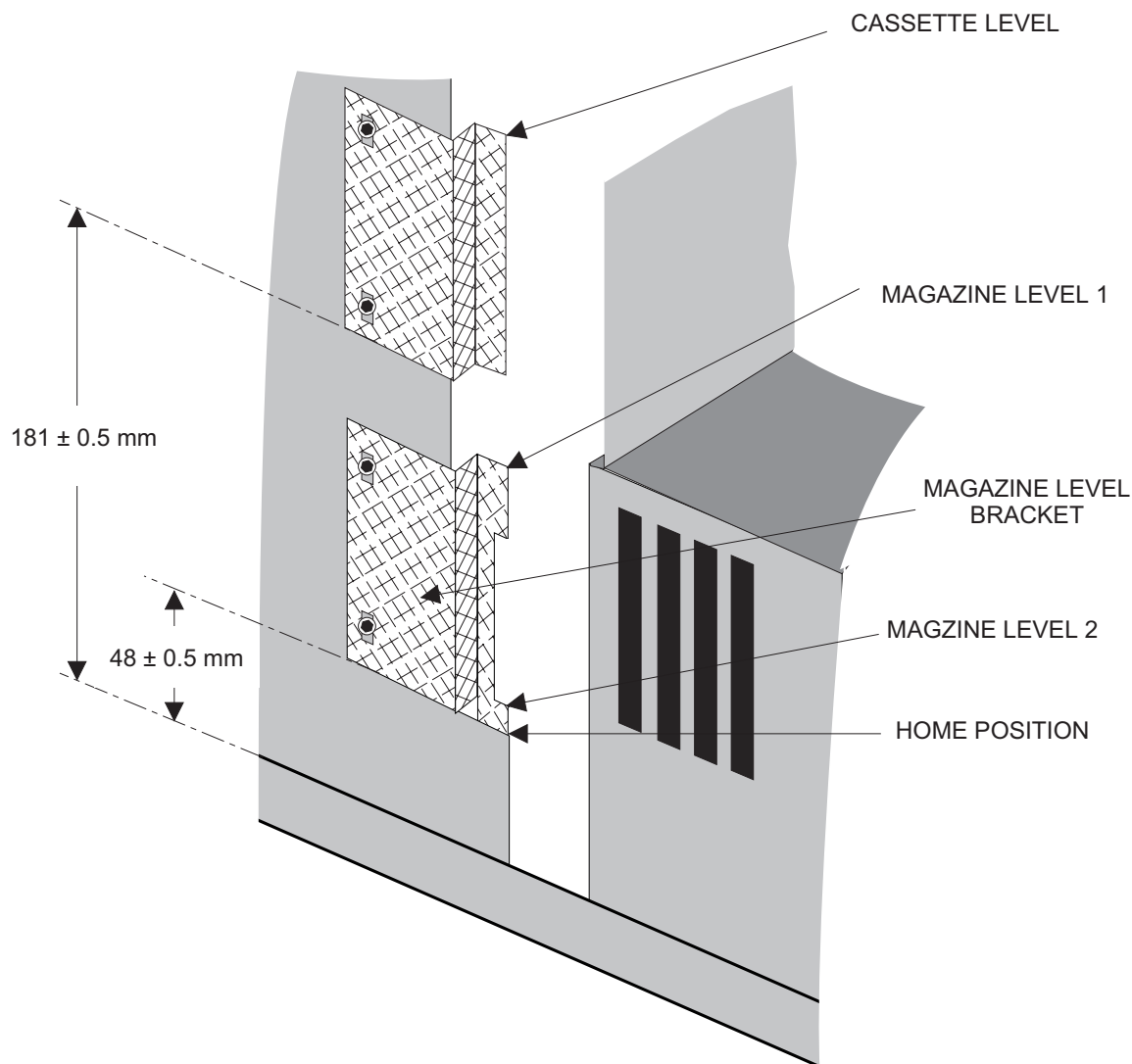


figure 3-41

3. Fasten the MOUNTING SCREWS.
4. Loosen the MOUNTING SCREWS of the CASSETTE LEVEL BRACKET.
5. Set the edge of CASSETTE LEVEL to a distance of 181 ± 0.5 mm from the BASE PLATE.
6. Fasten the MOUNTING SCREWS.
7. Start the SCAN RUN.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select change ML2000 DATA from the MAIN MENU..... press ENTER
Select CHANGE PARAMETER..... press ENTER
Select SCAN RUN..... press ENTER
Select STORE PARAMETERS..... press ENTER
8. Do the NEARLY EMPTY adjustment.
Select NEARLY EMPTY..... press ENTER
9. Exit the SERVICE MODE
Select STORE PARAMETERS..... press ENTER
Press BACKSPACE twice
Select QUIT ML2000 SERVICE MODE..... press ENTER
Select Quit the program..... press ENTER
10. Check the FILM POCKET ADJUSTMENT.

NEARLY EMPTY ADJUSTMENT

PURPOSE:

This adjustment finds automatically the correct value of NEARLY EMPTY.

NOTE

An empty MAGAZINE has to be used for this procedure.

1. Start the NEARLY EMPTY ADJUSTMENT
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select CHANGE ML2000 DATA from the MAIN MENU..... press ENTER
Select CHANGE PARAMETER..... press ENTER
Select NEARLY EMPTY..... press ENTER
2. Follow the instructions given on the LAP TOP SCREEN.

3. Store the result.
Select STORE PARAMETER press ENTER
4. Exit the SERVICE MODE.
Press BACKSPACE twice
Select QUIT ML2000 SERVICE MODE..... press ENTER
Select Quit the program press ENTER

SCAN RUN

PURPOSE:

This adjustment calculates automatically the distance between the various FILM POCKET POSITIONS and stores them in the battery backed up RAM.

NOTE

Do the NEARLY EMPTY adjustment after a SCAN RUN

1. Start the SCAN RUN
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER
UNIT DATA are displayed..... press ENTER
Select CHANGE ML2000 DATA from the MAIN MENU press ENTER
Select CHANGE PARAMETER..... press ENTER
Select SCAN RUN press ENTER
2. Store the result.
Select STORE PARAMETER press ENTER
3. Exit the SERVICE MODE.
Press BACKSPACE twice
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER

MAGAZINE AREA

MAGAZINE OPENER

PURPOSE:

To fully open and close the MAGAZINES.

1. Take all PANELS off.

NOTE

USE EMPTY MAGAZINES

2. Start the MAGAZINE OPENER MOTOR to open the MAGAZINES. .
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU..... press ENTER
ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed.....press ENTER
Select COMPONENT TEST from the MAIN MENU.....press ENTER
Select MAGAZINE MOTORS.....press ENTER
Select MAGAZINE OPENING M14.....press ENTER
Select FORWARD
Select BACKWARD
Select FORWARD

3. Check if all magazines are fully opened.
4. If necessary readjust the position of the SENSOR B36/M_OP_EO.

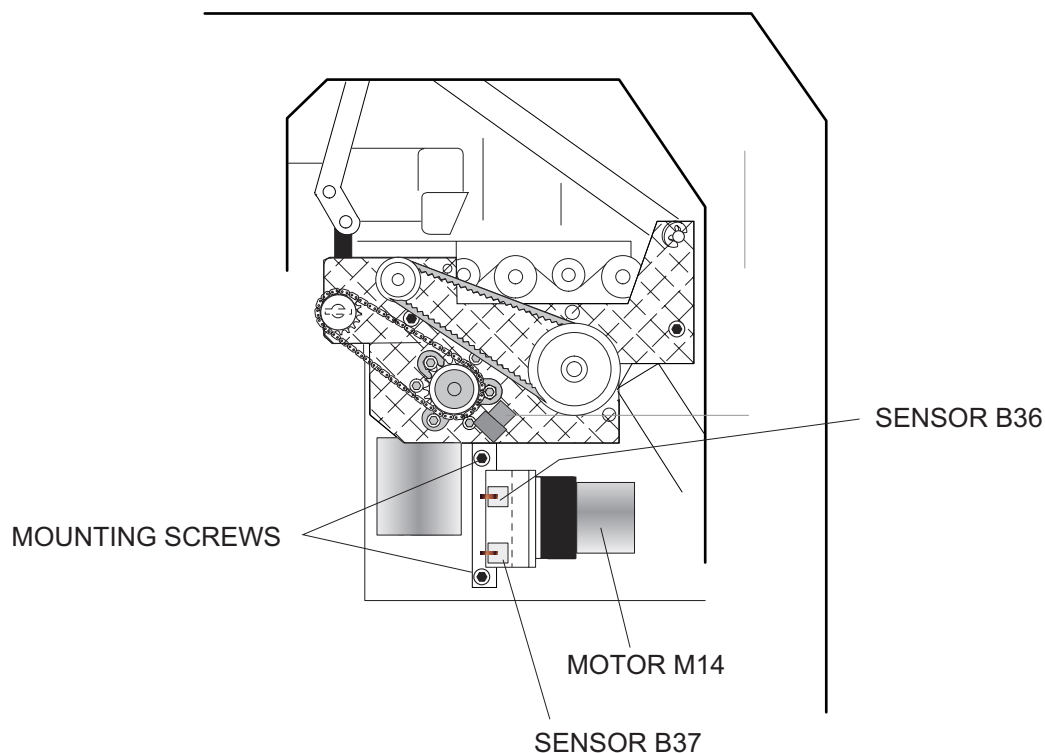


figure 3-42

5. Make sure that the MAGAZINE LIDS do not touch the MAGAZINE HOLDER above.
6. Close the MAGAZINES.
Select BACKWARD
7. If necessary readjust the position of the SENSOR B37/M_OP_EC.
8. Exit the SERVICE MODE.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST.....press ENTER
Select QUIT ML2000 SERVICE MODEpress ENTER
Select Quit the programpress ENTER
9. Reload the MAGAZINES.

STEPPER MOTOR FILM POCKET M10/M_PO

PURPOSE:

To adjust the phase current of M10 to the correct value. If the current is too low M10 will not run correctly and steps are lost. If the current is too high the POWER AMPLIFIERS U46 and U47 on CIRCUIT BOARD A4 sheet 5 will become overloaded.

1. Start the STEPPER MOTOR FILM POCKET

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU..... press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

Select COMPONENT TEST from the MAIN MENU..... press ENTER

Select MAGAZINE MOTORS..... press ENTER

Select STEPPER MOTOR FILM POCKET M10 press ENTER

Select MOVE TO CASSETTE LEVEL

3. Connect the GROUND LEAD of the DVM to TP11 on CIRCUIT BOARD A4 sheet 9.

4. Connect the POSITIVE LEAD of the DVM to TP15 on CIRCUIT BOARD A4 sheet 5.

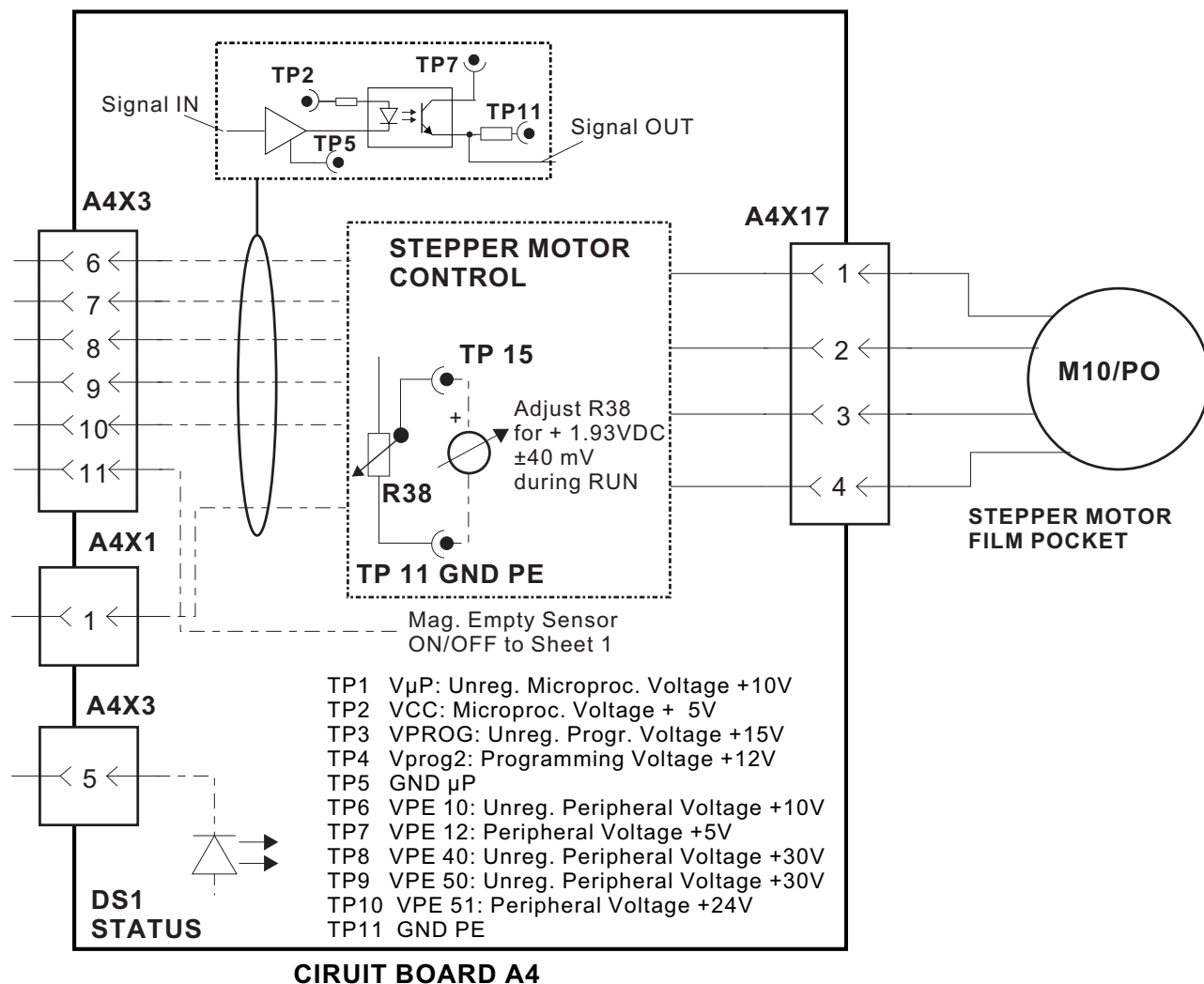


figure 3-43

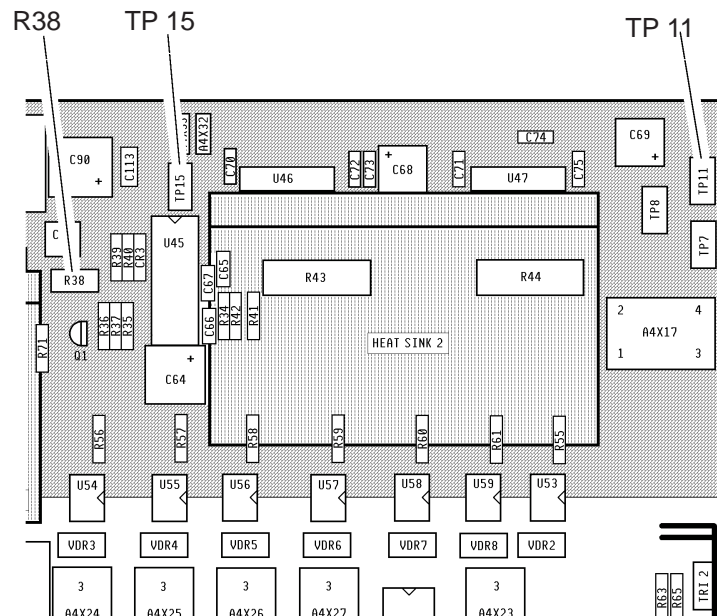


figure 3-44

5. Adjust R38 to 1.93V \pm 40 mV, while the motor is running.
6. Disconnect the DVM.
7. Exit the SERVICE MODE.

Press BACKSPACE 3 times

Select LEAVE COMPONENT TEST press ENTER

Select QUIT ML2000 SERVICE MODE press ENTER

Select Quit the program press ENTER

RECEIVING MAGAZINE INTERFACE (ML2000 only)

STEPPER MOTOR INTERFACE M13/M_PI

PURPOSE:

To adjust the phase current of M13 to the correct value. If this current is too low M13 will not run correctly. If this current is too high the POWER AMPLIFIERS U43 and U44 on CIRCUIT BOARD A4 sheet 4 will become overloaded.

1. Start STEPPER MOTOR PROCESSOR INTERFACE.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed.....press ENTER
 Select COMPONENT TEST from the MAIN MENU.....press ENTER
 Select INTERFACE/FILM MOT.....press ENTER
 Select MAGAZINE ROLLER MOTOR M13press ENTER
 Select MOTOR ON

3. Connect the GROUND LEAD of the DVM to TP 11 GND PE on CIRCUIT BOARD A4.

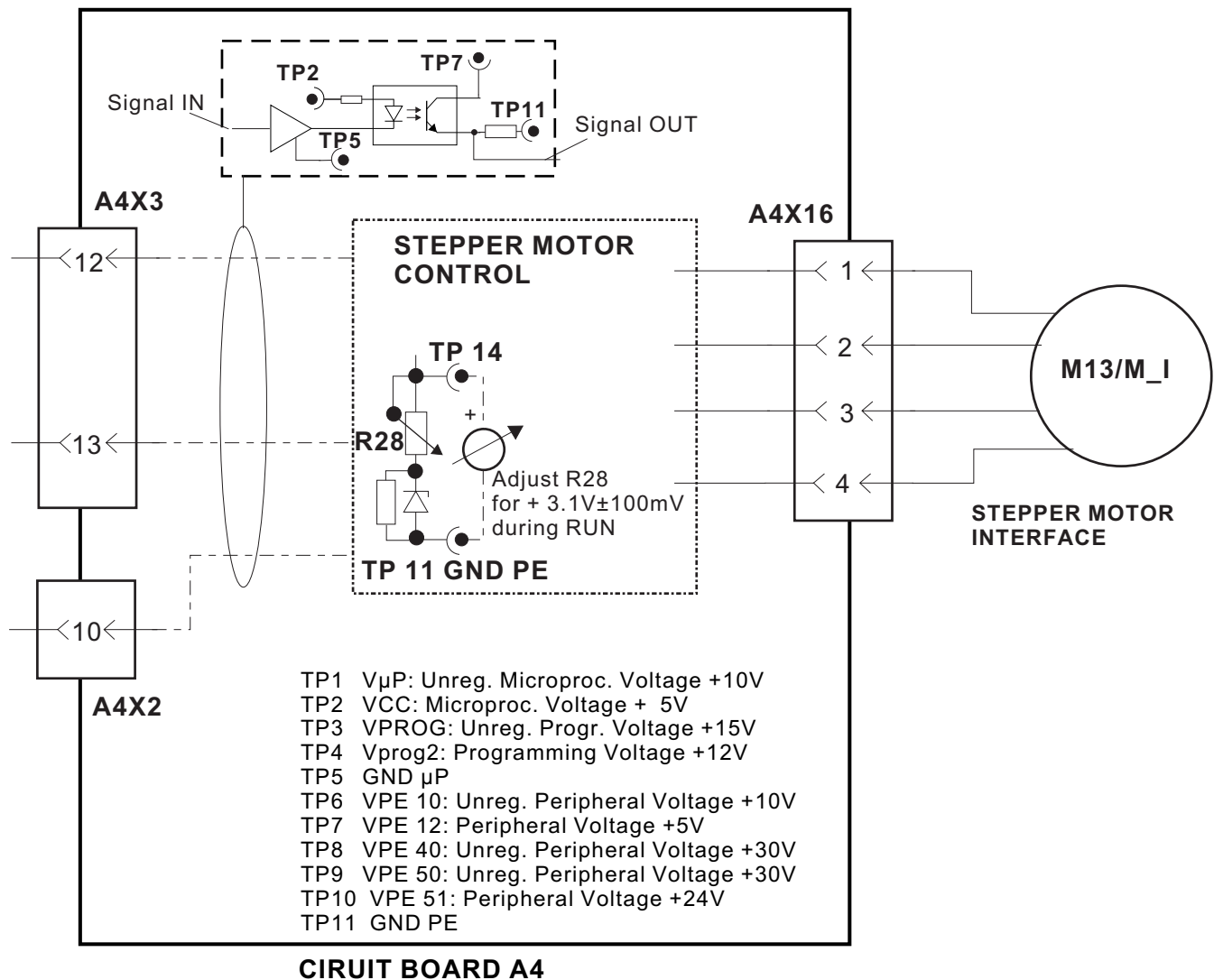


figure 3-45

4. Connect the POSITIVE LEAD of the DVM to TP 14 on CIRCUIT BOARD A4 sheet 4.
5. Adjust R28 to $3.1V \pm 100mV$, while the motor is running.

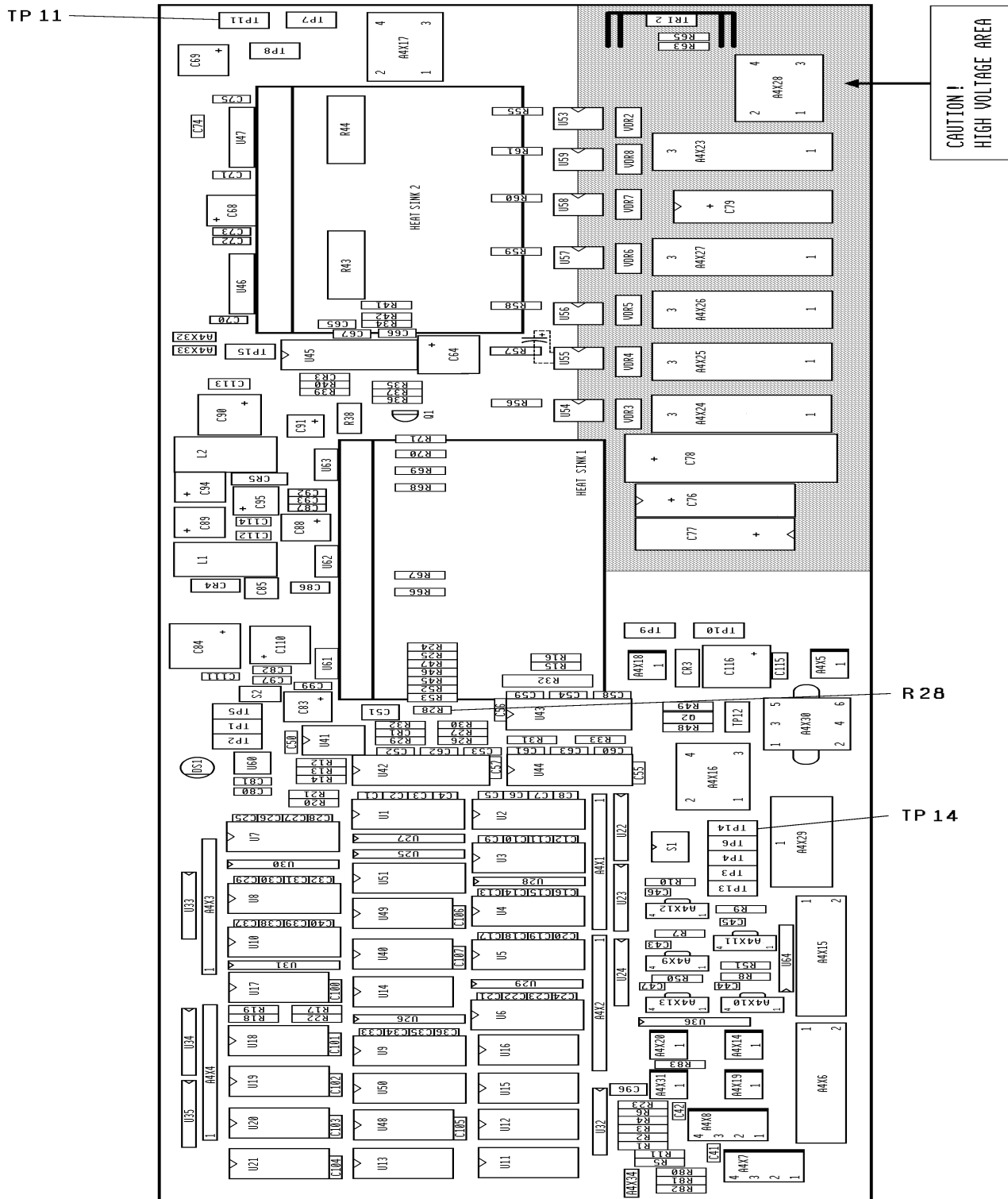


figure 3-46

6. Disconnect the DVM.
7. Stop the STEPPER MOTOR.
Select MOTOR OFF
8. Exit the SERVICE MODE.
Press BACKSPACE 3 times
Select LEAVE COMPONENT TEST press ENTER
Select QUIT ML2000 SERVICE MODE press ENTER
Select Quit the program press ENTER

RECEIVING MAGAZINE (ML2000 only)

SENSOR B24/C_RM_E RECEIVING MAGAZINE ENTRANCE SENSOR B25/C_RM_F RECEIVING MAGAZINE FULL

PURPOSE

SENSOR B24 checks if a FILM is fully in the RECEIVING MAGAZINE

SENSOR B25 checks if the RECEIVING MAGAZINE is full (approx. 120 FILMS)

NOTE

To avoid film fogging in the RECEIVING MAGAZINE, SENSORS B24 and B25 are not part of the SENSOR TEST. Both SENSORS can only be adjusted after they have been enabled via the COMPONENT TEST - RECEIVE MAG. SENSORS. The ADJUSTMENT PROCEDURE is the same for both SENSORS.

1. Switch off the ML2000.
2. Take off the PANELS.
3. Take out the RECEIVING MAGAZINE and empty it.
4. Take out the RECEIVING MAGAZINE TUNNEL, disconnect the SENSORS and lay down the RECEIVING MAGAZINE TUNNEL on the floor.
5. Connect the SENSORS with the EXTENSION CABLE (stored in the PNEUMATIC chamber) to the ML2000.
6. Insert an empty RECEIVING MAGAZINE into the RECEIVING MAGAZINE TUNNEL.
7. Switch on the ML2000.
8. Connect the LAP TOP COMPUTER and start the RECEIVING MAGAZINE SENSORS.
Start the SERVICE PROGRAM
Select SERVICE MODE from the GLOBAL MENU press ENTER
ENTER SERVICE MODE MESSAGE is displayed press ENTER
Select COMPONENT TEST from the MAIN MENU press ENTER
Select RECEIVE MAG. SENSORS press ENTER
Select TEST ON
9. Loosen the 2 horizontal SENSOR MOUNTING SCREWS and manually move the SENSOR from fully left to fully right. On both sides the SENSOR LED will turn red. Set the SENSOR to the mid position and fasten the horizontal MOUNTING SCREWS. See the drawing on the next page.
10. Loosen the 2 vertical SENSOR MOUNTING SCREWS and manually move the SENSOR fully up and down. On both sides the SENSOR LED will turn red. Set the SENSOR to the mid position and fasten the vertical MOUNTING SCREWS.

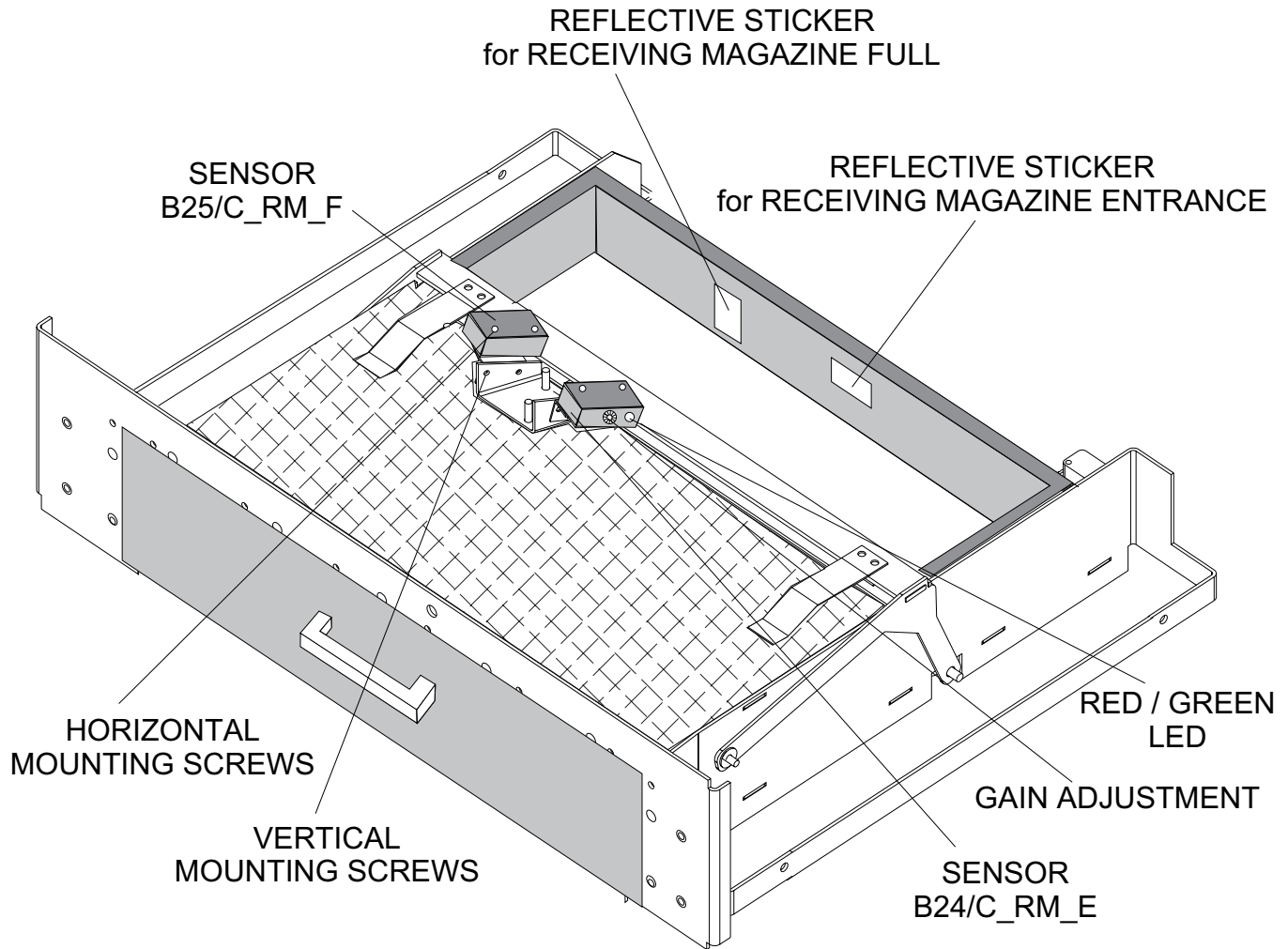


figure 3-47

- 11.** Turn the GAIN ADJUSTMENT SCREW until the LED turns RED. Slowly turn the GAIN ADJUSTMENT SCREW until the LED turns green again. Turn one step further to ensure that the SENSORS switches safely.
- 12.** Exit the SERVICE MODE.
 - Press BACKSPACE twice*
 - Select LEAVE COMPONENT TEST press ENTER*
 - Select QUIT ML2000 SERVICE MODE press ENTER*
 - Select Quit the program press ENTER*

4. PARAMETER

INTRODUCTION

The purpose of the PARAMETERS is to optimise the function of the ML2000 (ML2000 P). There are 2 types of PARAMETERS. The value of the first type ends with an H (for example 18H) and the second type ends with a D (for example 15D). The H means this is a hexa-decimal value. The D means this is a decimal value. Only the PARAMETERS with hexa-decimal value can be altered by keying in a new value. The PARAMETERS with decimal values can only be altered by starting a special option.

PARAMETER	CHANGE WITH OPTION
CASSETTE-OFFSET	CASSETTE-LENGTH
MAGAZINE LEVEL	SCAN RUN
HOME POSITION	SCAN RUN
GEAR BACKLASH.....	SCAN RUN
NEARLY EMPTY	NEARLY EMPTY

For every hexa-decimal PARAMETER an allowed range exists.

For example LOWER POCKET:

RANGE	0h....64h
DEFAULT	40h

This means every value between 0h and 64h can be used. It does not mean that with every value the ML2000 (ML2000 P) works best. In general the MINILOADER works best with the DEFAULT (or STANDARD) setting. If a value outside the range is used and ENTER is pressed, the displayed value will default automatically to the DEFAULT VALUE.

The range is different for every PARAMETER.

If the PARAMETER represents a time, 1 increment is 10 msec.

If the PARAMETER represents a distance, 1 increment is 0.09 mm.

If you need to convert a hexadecimal number to decimal, use the following procedure:

dec	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

$$\begin{array}{r}
 \text{FF} \\
 \begin{array}{|l} \hline 15 \times 16 = 240 \\ + 15 \\ \hline \end{array} \\
 \hline
 = 255
 \end{array}$$

$$\begin{array}{r}
 \text{1A} \\
 \begin{array}{|l} \hline 1 \times 16 = 16 \\ + 10 \\ \hline \end{array} \\
 \hline
 = 26
 \end{array}$$

HOW TO SET A PARAMETER

In this section it is explained with every PARAMETER, how to use the CES SERVICE SOFTWARE. The first line tells always what should be performed. In the next lines it is explained how to reach this goal. These additional explanations are printed *italic* and can be skipped if you are experienced with the CES SERVICE SOFTWARE.

EXAMPLE:

1. Change PARAMETER XYZ

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU..... press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER..... press ENTER

Select PARAMETER XYZ

Key in the new value..... press ENTER

Select STORE PARAMETER press ENTER

NOTE

It is very important to STORE PARAMETERS. If this is not done only the DISPLAY of the LAP TOP shows the new values. However they are not transferred into the battery backed up memory of the ML2000 / ML2000P.

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

MINILOADER TYPE

This PARAMETER is needed to select ML2000 or ML2000 P.

00H: ML2000

01H: ML2000 P

CASSETTE UNIT

1. VACUUM OFF TIME

PURPOSE:

To turn off the CASSETTE SUCKERS VACUUM at the correct time.

The CASSETTE SUCKER BAR picks up the exposed FILMS from the CASSETTE. As soon as SENSOR B20 VACUUM OFF detects the LEADING EDGE of the FILM, the VACUUM OFF

TIME is started. When this time is terminated the vacuum is released and the FILM is picked up by the TRANSPORT ROLLERS.

1 increment = 10 msec

RANGE:00h...0Fh

DEFAULT:08h

1. Start CHANGE PARAMETER.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER press ENTER

Select VACUUM OFF TIME

Key in the new value press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE press ENTER

Select Quit the program press ENTER

2. REST TIME

PURPOSE:

The CASSETTE OPENER is stopped for a short time. This allows the FILM to become separated from the LID SCREEN.

1 increment = 10 msec

RANGE:0h...FFh

DEFAULT:00h

1. Change REST TIME.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER press ENTER

Select REST TIME press ENTER

Key in the new value press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE press ENTER

Select Quit the program press ENTER

3. 8x10 inch V (ML2000 P only)

PURPOSE:

To enable the MULTILoader to handle 8x10 inch Video Film Holder.

8x10" Video FILM HOLDER.....00h

15x30cm X-Ray CASSETTE (not available)01h

1. Change 8x10"V / 15x30 cm.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER..... press ENTER

*Select 8x10"V/15x30 cm **press ENTER***

Key in the new value..... press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

4. CASSETTE OFFSET

PURPOSE:

To measure the correct CASSETTE LENGTH.

When the FUNCTION "CASSETTE LENGTH" is started, a CASSETTE with a known length is put into the ML 2000. The program compares the known length against the amount of CENTRING STEPS and calculates the necessary offset. From now on this offset is used to determine the correct CASSETTE SIZE.

1. Start NEARLY EMPTY.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER..... press ENTER

*Select CASSETTE LENGTH..... **press ENTER***

NOTE

Use the smallest CASSETTE available. (18x24cm)

Key in the measured CASSETTE LENGTH..... press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.*Press BACKSPACE twice**Select QUIT ML2000 SERVICE MODE..... press ENTER**Select Quit the program press ENTER***5. DISABLE INTERFACE (ML2000 P only)****Purpose:****NOTE**

Use this PARAMETER during service only.

It allows to run the ML2000 P with the FILM CHUTE out. This feature is important when you want to observe the function of the FILM POCKET.

ML2000 P with FILM CHUTE in place00h**ML2000 P without FILM CHUTEAAh****1. Disable the FILM CHUTE.***Start the SERVICE PROGRAM**Select SERVICE MODE from the GLOBAL MENU..... press ENTER**ENTER SERVICE MODE MESSAGE is displayed..... press ENTER**UNIT DATA are displayed..... press ENTER**Select CHANGE ML2000 DATA from the MAIN MENU press ENTER**Select CHANGE PARAMETER..... press ENTER**Select **DISABLE INTERF** **press ENTER****Key in AA press ENTER**Select STORE PARAMETER press ENTER***2. Exit the SERVICE PROGRAM.***Press BACKSPACE twice**Select QUIT ML2000 SERVICE MODE press ENTER**Select Quit the program press ENTER***NOTE**

Do not forget to set this PARAMETER to 00 before you hand over the ML2000 P to the customer.

6. CASS OPEN RETURN**Purpose:**

It can be selected if an empty CASSETTE is returned opened or closed. The preferred setting is CLOSED.

Empty CASSETTE returned closed.....00H

Empty CASSETTE returned open01H

1. Select CLOSED.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER press ENTER

Select CASS OPEN RETURN press ENTER

Key in 00 press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE press ENTER

Select Quit the program press ENTER

MAGAZINE UNIT

1. TILT POSITION

PURPOSE:

To separate the FILMS in the MAGAZINE.

This PARAMETER gives the distance in steps, the FILM POCKET SUCKER BAR has to move up from the top of the FILM STACK after an unexposed FILM was picked up. After the TILT POSITION is reached, the FILM POCKET SUCKER BAR is tilted back. This separates the top FILM from the remaining FILMS in the MAGAZINE.

1 increment = 0.09mm

RANGE:0h...46h

DEFAULT:14h

1. Change the PARAMETER TILT POSITION.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER press ENTER

Select TILT POSITION press ENTER

Key in the new value press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE press ENTER

Select Quit the program press ENTER

2. ADDITIONAL STEPS

PURPOSE:

To achieve good contact between MAGAZINE SUCKERS and the top FILM in the MAGAZINE. This PARAMETER gives the number of additional steps after the FILM PIN reached the top FILM in the MAGAZINE. This ensures that the SUCKERS are in close contact with the top FILM.

NOTE

If too many ADDITIONAL STEPS are used PRESSURE MARKS on the FILM may show up.

1 increment = 0.09mm

RANGE:0h...1Eh

DEFAULT:0Ah

1. Change the PARAMETER ADDITIONAL STEPS.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed press ENTER

UNIT DATA are displayed press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER press ENTER

Select ADDITIONAL STEPS press ENTER

Key in the new value press ENTER

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE press ENTER

Select Quit the program press ENTER

3. LOWER POCKET

PURPOSE:

To place the unexposed FILM correctly into the CASSETTE.

Additional down-steps for the FILM POCKET SUCKER BAR into the CASSETTE. It prevents the unexposed FILM from floating out of the CASSETTE.

1 increment = 0.09mm

RANGE:0h...64h

DEFAULT:2Ah

1. Change the PARAMETER LOWER POCKET ST.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

- ENTER SERVICE MODE MESSAGE is displayed.....press ENTER*
UNIT DATA are displayed.....press ENTER
Select CHANGE ML2000 DATA from the MAIN MENUpress ENTER
Select CHANGE PARAMETER.....press ENTER
Select LOWER POCKET STpress ENTER
Key in the new value.....press ENTER
Select STORE PARAMETERpress ENTER
2. Exit the SERVICE PROGRAM.
- Press BACKSPACE twice*
Select QUIT ML2000 SERVICE MODE.....press ENTER
Select Quit the programpress ENTER

4. MAGAZINE LEVELS.

Purpose:

These values are used to transport the FILM POCKET to the correct level. One increment is equal to 0.09 mm.

The VALUES in the table are just an example. They depend on the position of the LEVEL BRACKETS. This means the values are not the same for every Miniloader. If the position of a LEVEL BRACKET is changed a SCAN RUN must be performed.

NOTE

After a SCAN RUN was performed do the nearly empty adjustment.

.....	EXAMPLE
MAGAZINE LEVEL 1	1507D
MAGAZINE LEVEL 2	2600D
MAGAZINE HOMEPOS	2704D
GEAR BACKLASH.....	0006D

To change these values start the OPTION SCAN RUN of CHANGE PARAMETERS.

1. Start the SCAN RUN.
- Start the SERVICE PROGRAM*
Select SERVICE MODE from the GLOBAL MENU.....press ENTER
ENTER SERVICE MODE MESSAGE is displayed.....press ENTER
UNIT DATA are displayed.....press ENTER
Select CHANGE ML2000 DATA from the MAIN MENUpress ENTER
Select CHANGE PARAMETER.....press ENTER
Select SCAN RUN.....press ENTER
Select STORE PARAMETERpress ENTER
2. Exit the SERVICE PROGRAM.
- Press BACKSPACE twice*
Select QUIT ML2000 SERVICE MODE.....press ENTER
Select Quit the programpress ENTER

5. NEARLY EMPTY.

To change the value start the OPTION **NEARLY EMPTY** of CHANGE PARAMETER.

1. Start NEARLY EMPTY.

Start the SERVICE PROGRAM

Select SERVICE MODE from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select CHANGE ML2000 DATA from the MAIN MENU press ENTER

Select CHANGE PARAMETER..... press ENTER

Select NEARLY EMPTY press ENTER

Follow the instructions displayed

Select STORE PARAMETER press ENTER

2. Exit the SERVICE PROGRAM.

Press BACKSPACE twice

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

6. PROCESSOR SPEED /TIME FEED 24 cm (ML2000 P only)

Purpose:

As there is no communication between the PROCESSOR M35-M and the ML2000 P the PROCESSOR SPEED must be set as a PARAMETER during installation of the system. If the speed is keyed in as inch/minute the time needed for transportation of 24cm FILM is calculated automatically. If the time needed to transport 24 cm of FILM is keyed in the PROCESSOR SPEED in inch/minute is calculated automatically. Select the method most convenient for you.

5. RESIZING MAGAZINES

The following **SIZE CONFIGURATIONS** are possible:

18 x 24 cm MAMMOGRAPHY FILM

24 x 30 cm MAMMOGRAPHY FILM

8 x 10 inch CRT FILM

It is also possible to code each FILM SIZE from the list above as a TYPE 2 FILM to use two different TYPES OF FILMS of the same SIZE in the ML2000 (ML2000 P).

To change **MAGAZINE SIZES** do the following:

1. Place the MAGAZINE on a flat surface.
2. Place the REFLECTIVE STICKERS for SIZE Coding as shown.

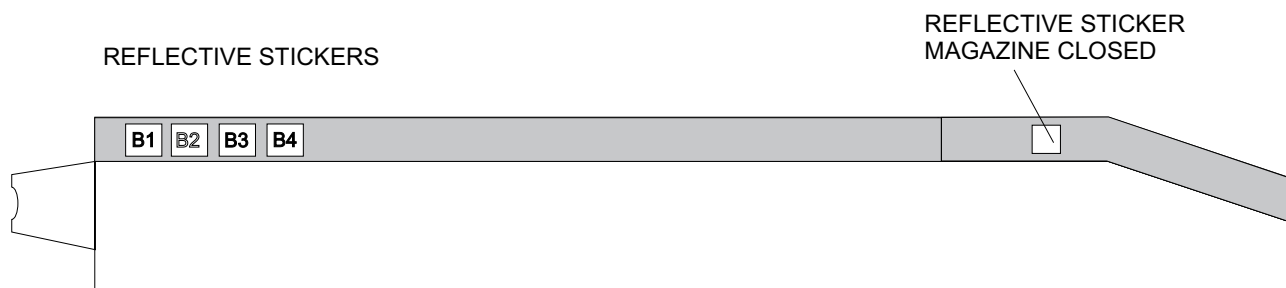


figure 5-1

FILM SIZE	REFLECTOR B1	REFLECTOR B2	REFLECTOR B3	REFLECTOR B4 (TYPE 2)
18 x 24 cm M	YES	no	no	no
18 x 24 cm M #2	YES	no	no	YES
24 x 30 cm M	YES	YES	no	no
24 x 30 cm M #2	YES	YES	no	YES
8 x 10 in V	no	YES	no	no
8 x 10 in V #2	no	YES	no	YES

3. Remove the TOP COVER of the MAGAZINE.
4. Place the SEPARATORS L, R and REAR in the RECESSES corresponding to the selected FILM SIZE. See the drawing on the next page. The RECESSES are marked with the FILM SIZE. For 8x10 in use the SEPARATOR with the LABEL on.

Note:

Make sure that SEPARATOR Left and SEPARATOR Right are mounted correctly with the long STUD towards the HANDLE. OTHERWISE it is impossible to close the MAGAZINE and then all the films will fall out when the MAGAZINE is carried.

5. Install TOP COVER to the MAGAZINE.
6. Apply the correct FILM SIZE LABEL to the MAGAZINE.

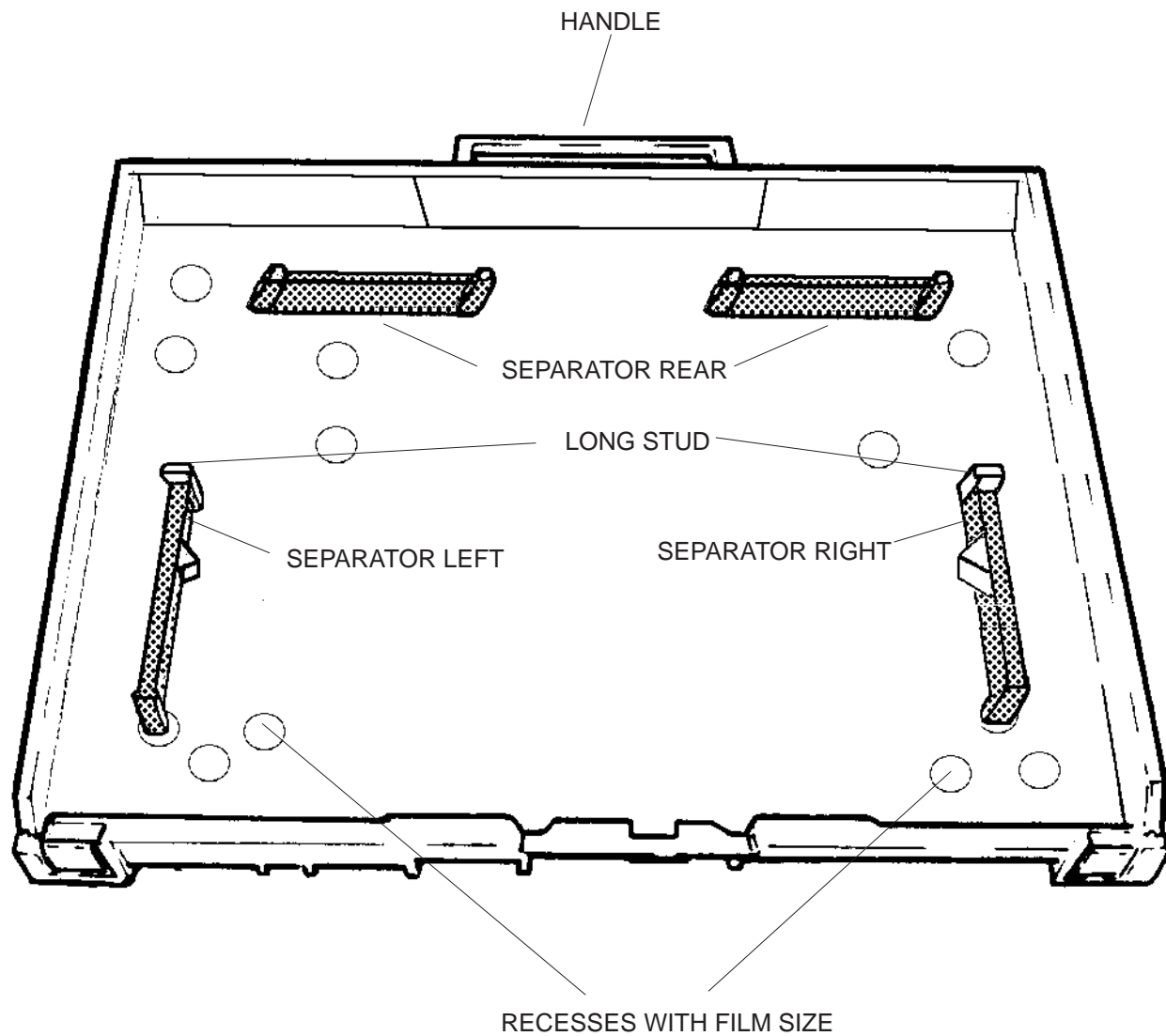


figure 5-2

6. PREVENTIVE MAINTENANCE

NOTE

This procedure is only for the Miniloader part. For PROCESSOR Preventive Maintenance see PROCESSOR Service Manual.

PREPARATION:

- Ask the operator for any problems.
- Remove all MAGAZINES to avoid fogging of customer films.
- Remove all PANELS.
- Override INTERLOCK SWITCHES.
- Connect the Lap Top and start the Service Program.

GENERAL ACTIVITIES:

1. Analyse the last 100 malfunctions .Check all error codes that occurred very often and ask the operator for details (i.e., C-74, C-88, C92, C-94 etc.)
 - Start the SERVICE PROGRAM*
 - Select TROUBLE SHOOTING from the GLOBAL MENU..... press ENTER*
 - Select Malfunctions of ML2000..... press ENTER*
 - Use for each code the description in the Service Software or Diagnostic Manual and step through the described actions for the possible causes.**
- Check the less frequent error codes too, they may have been created because of lost films.

NOTE

Working through the error code list is the most essential activity of the MULTILoader preventive maintenance. Always follow the activities mentioned in the Diagnostics Manual or Service Software, even if it seems to be an operator caused malfunction.

2. Exit the SERVICE PROGRAM
 - Press Escape until the Main Menu Trouble Shooting is reached*
 - Select Quit Trouble Shooting..... press ENTER*
 - Select Quit the program press ENTER*

3. Check MAGAZINE DOOR hinges (may be loose).
4. Drain and clean both water traps and check movability of drain piston.
5. Check the FAN of the ELECTRONIC BOX.
6. Check the FAN of the FILM CHUTE. (ML2000 P only!)

CASSETTE AREA:

WARNING

CAREFUL WHEN WORKING IN THE CASSETTE OPENER AREA. THE OPENER MOTOR AND THE OPENER MECHANISM ARE VERY STRONG. THEY CANNOT BE MOVED MANUALLY. THEY MAY SQUEEZE YOUR HAND AND TRAP YOU IF YOU TRY TO STOP THEM MANUALLY. NEVER START THE CASSETTE OPENER MOTOR WHEN SOMEONE'S HANDS ARE IN THE CASSETTE AREA.

1. Remove any dust and dirt from BASE PLATE under CASSETTE TRANSPORT ROLLERS.
2. Check CASSETTE OPENER mechanism. The OPENER must be in the uppermost position. Move the OPENER up and down. Check if at the end of the movement a high pitch noise occurs. If so, the adjustment of the CASSETTE OPENER STOP PLATE is not correct. Do the necessary adjustment. If necessary tension the OPENER CHAIN first.

The OPENER BRACKET must be vertical

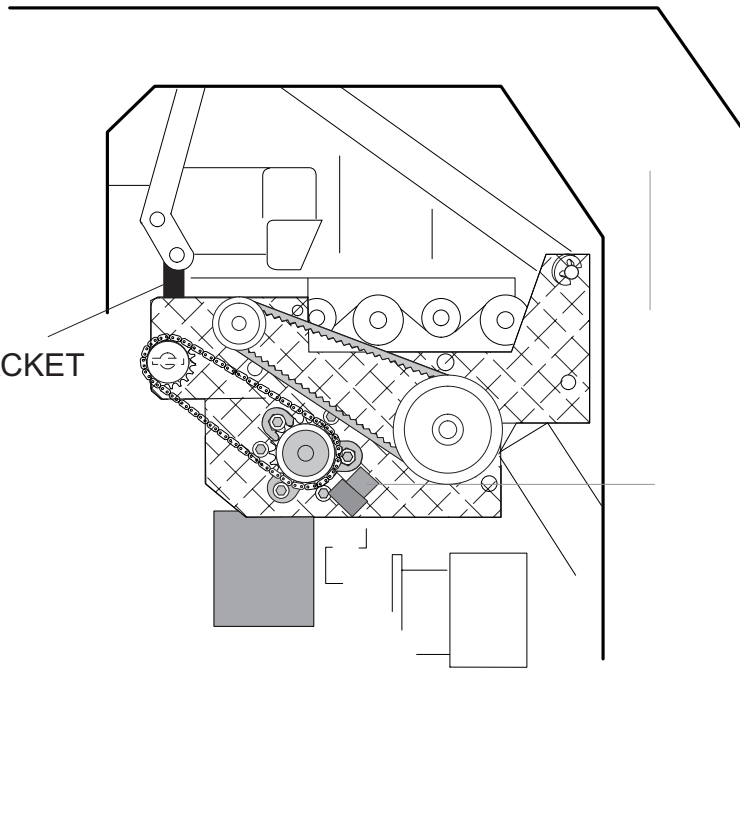


figure 6-1

Start the SERVICE PROGRAM

Select Service Mode ML2000 from the GLOBAL MENU press ENTER

ENTER SERVICE MODE MESSAGE is displayed..... press ENTER

UNIT DATA are displayed..... press ENTER

Select COMPONENT TEST from the MAIN MENU press ENTER

Select CASSETTE MOTORS..... press ENTER

Select CASSETTE OPENING M5..... press ENTER

Select DOWN

Select UP

3. Exit the SERVICE PROGRAM

Press 3 times BACKSPACE

Select LEAVE COMPONENT TEST press ENTER

Select QUIT ML2000 SERVICE MODE..... press ENTER

Select Quit the program press ENTER

4. Lubricate CASSETTE PRESSURE BOLTS with grease TL-2247.

SPECIAL REPLACEMENTS AFTER 120000 CYCLES

1. After 120000 CYCLES the 2 DOWEL PINS (PN 9212831) of the CASSETTE OPENER MECHANISM must be replaced.
2. Do the CASSETTE OPENER ADJUSTMENT.

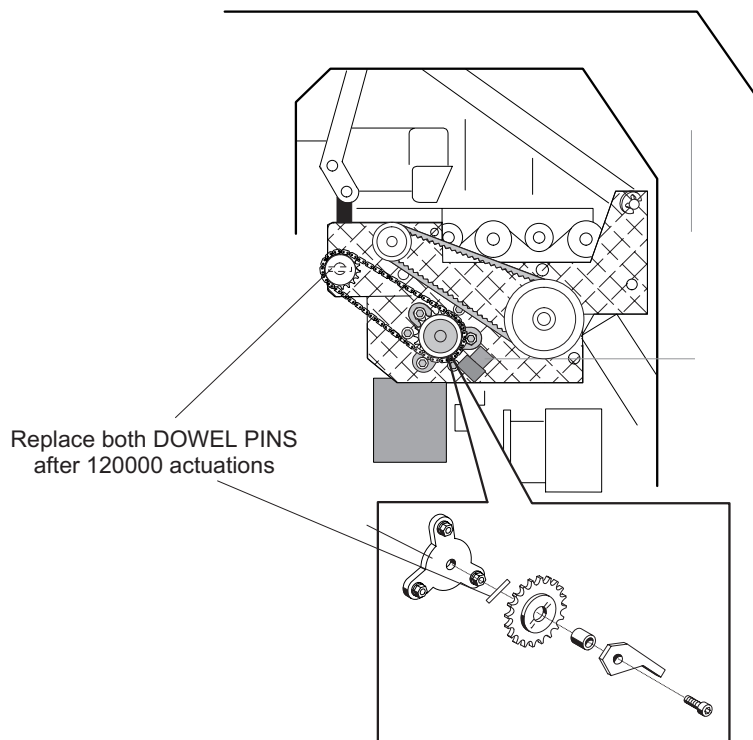


figure 6-2

SPECIAL REPLACEMENTS AFTER 200000 CYCLES

1. After 200000 the CASSETTE OPENER ASSEMBLY (PN 922076) has to be replaced.

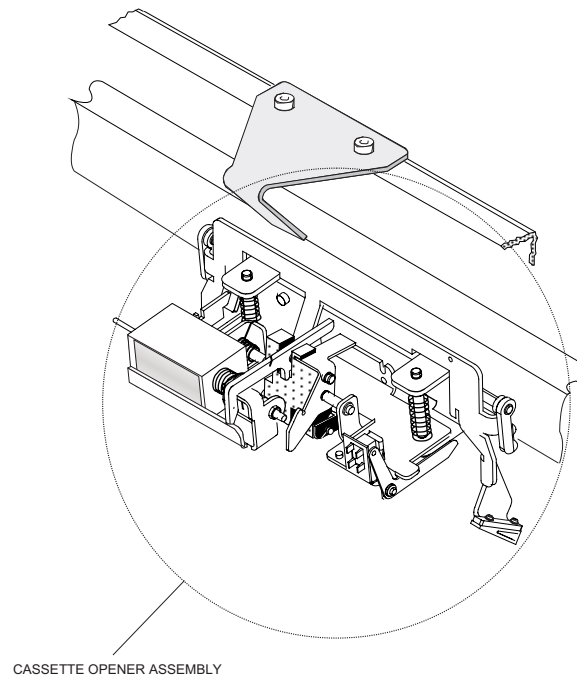


figure 6-3

VENTING (ML2000 P only)

1. Check that the ML2000 is vented correctly. Use the following procedures to check the negative air flow of the site.

NOTE

This procedure is designed to check the negative exhaust flow of the building not the processor.

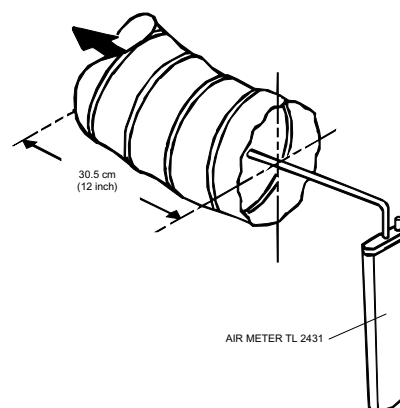


figure 6-4

2. Verify that the processor is switched off.
3. Use AIR METER TL-2431 to measure negative static pressure in the EXHAUST DUCT 30.5 cm (12 in.) from the end that is connected to the processor.
4. Adjust the gap between the BUILDING EXHAUST DUCT and the DUCT from the PROCESSOR to obtain the required static pressure.

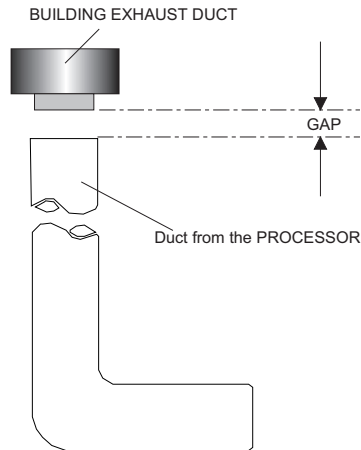


figure 6-5

Negative Static Pressure, Water Head		
DUCT DIAMETER	MIN	MAX
76 mm (3 in)	0.76 mm (0.03 in)	1.02 mm (0.04 in)
102 mm (4 in)	0.25 mm (0.01 in)	0.51 mm (0.02 in)

5. Connect the EXHAUST HOSE to the EXHAUST CONNECTION of the PROCESSOR.

CAUTION:

Do not run the ML2000 P as long as the negative pressure of the EXHAUST is not correct !
Incorrect venting may cause serious damage.

FINAL CHECK-OUT:

1. Run the MINILOADER in continuous cycle, look and listen to all functions:
CASSETTE opening
FILM pick-up from CASSETTE
MAGAZINE opening
FILM pick-up from MAGAZINE
BLOW PIPE function
2. Mount all PANELS.
3. Clean all PANELS.



CUSTOMER EQUIPMENT SERVICES KODAK AG STUTTGART