TRIMMER TR90 / TR90+

SERVICE MANUAL

January12, 2004
Subject to change

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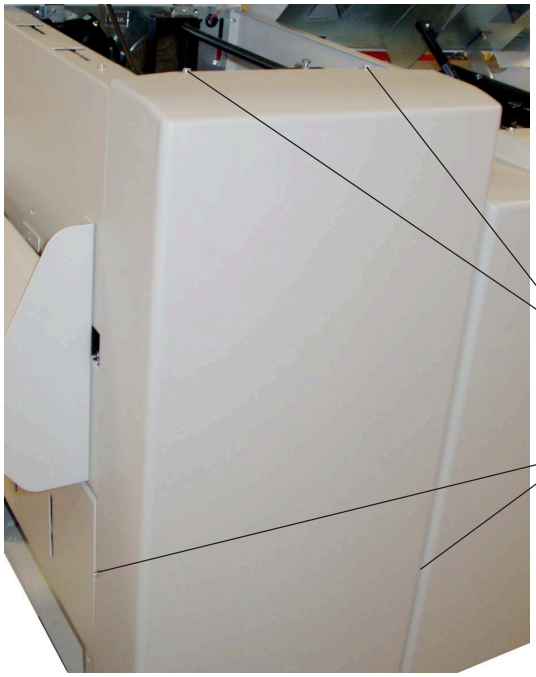
1. REPLACEMENT AND ADJUSTMENT

1.1 COVERS

1.1.1 FRONT AND REAR COVER

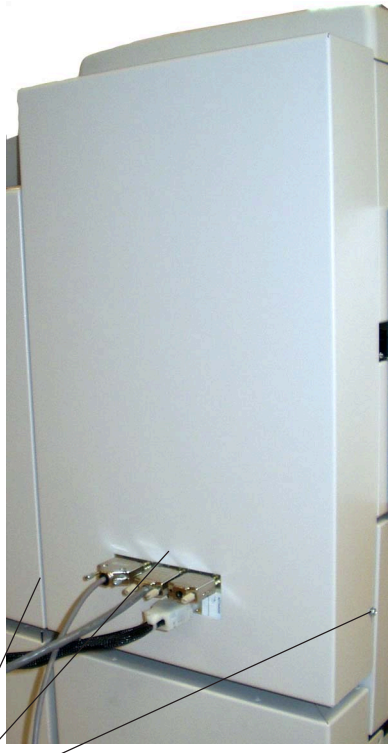


Front Cover

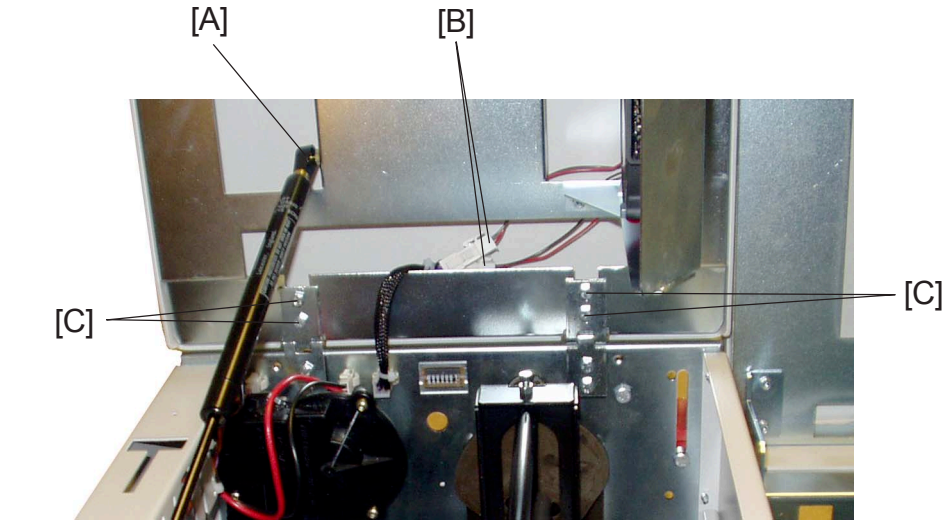
1. Open the Top Cover.
2. Remove screws [A] (x2)
3. Loosen screws [B] (x2)

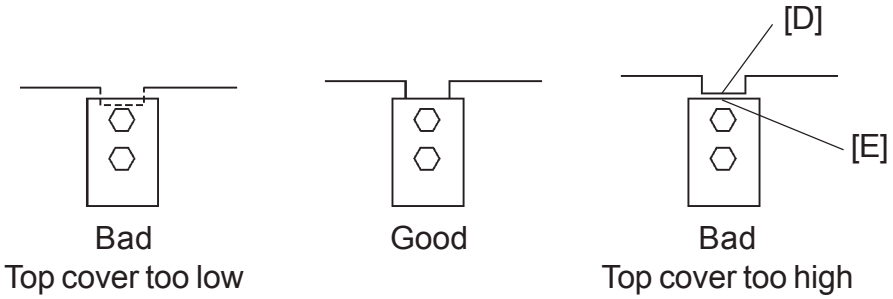
Rear Cover

1. Loosen screws [C] (x3)



1.1.2 TOP COVER





Removal

1. Pry off the Gas spring [A] using a screw driver.
2. Remove connectors [B](x2).
3. Remove screws and nuts [C] (x4, x4).

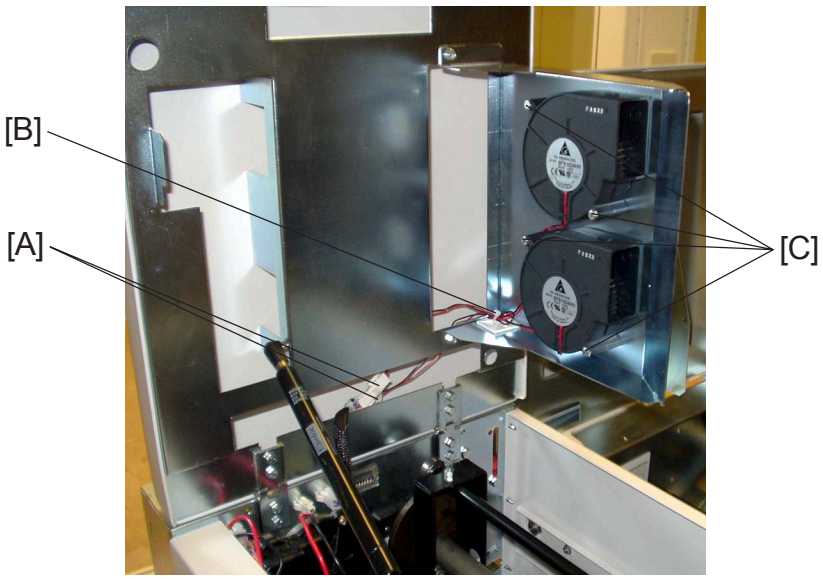
Replacement

1. Reverse the removal procedure.

Adjustment

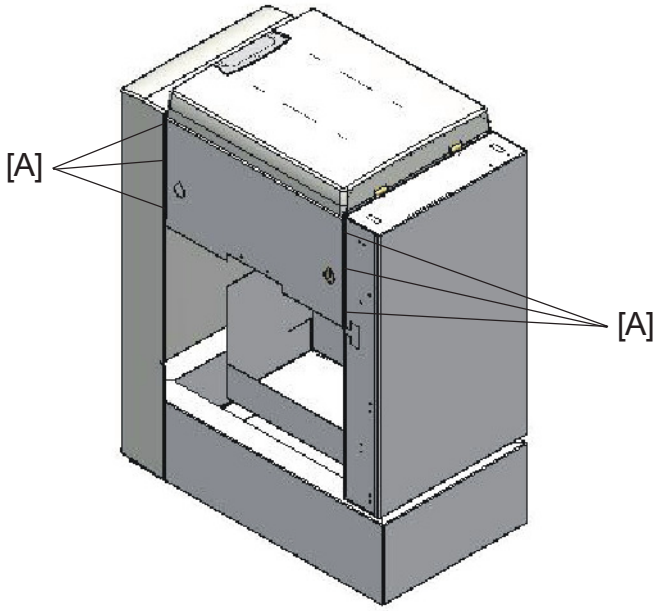
1. Loosen screws and nuts [C] (x4, x4).
2. Adjust Top cover so top cover frame edge [D] is aligned with top of the hinge [E]. See drawings above.
3. Tighten screws and nuts [C] (x4, x4).

1.1.3 BLOWER MOTOR M5 / M6



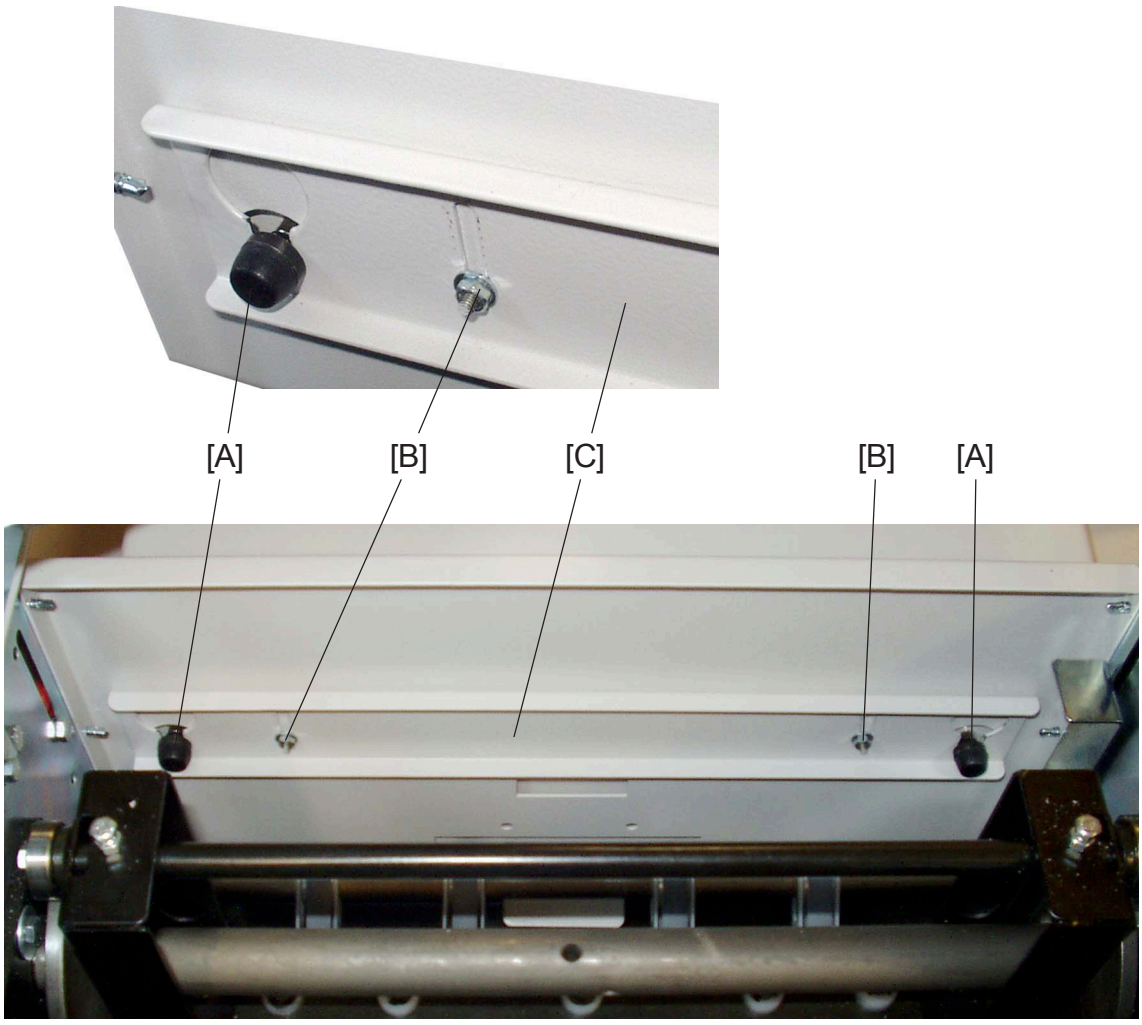
1. Remove connector [A](x2).
2. Cut cable tie [B].
3. Remove screws [C] (x4).

1.1.4 INFEED COVER



1. Undock the Trimmer
2. Remove Front and Rear cover ((☛ 1.1.1)
3. Remove screws [A] (x6)

1.1.5 LOCKING BRACKET



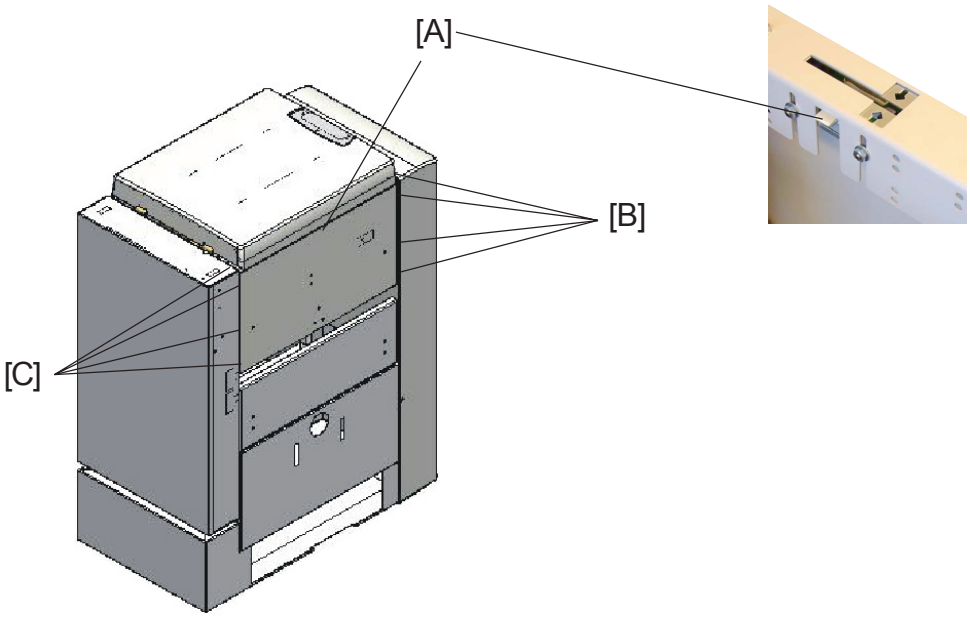
Removal

1. Loosen nuts [B] (x2).
2. Push down Locking bracket [C].
3. Remove nuts and washers [B] to remove bracket (x2).

Replacement

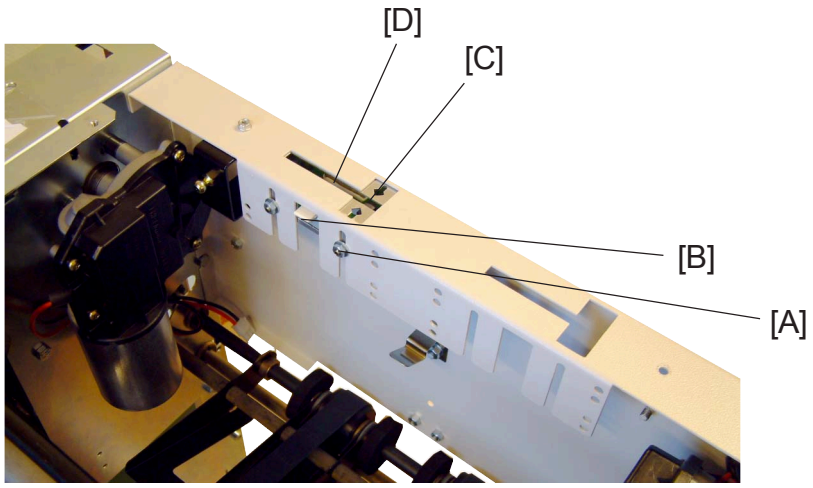
1. Fit the Locking bracket onto screws [B].
2. Mount washers and nuts [B] without tightening (x2).
3. Push Trimmer against Bookletmaker.
   Push up Locking bracket [C] so it latches studs [A].
4. Tighten nuts [B] (x2).

1.1.6 UPPER OUTFEED COVER



1. Remove Belt stacker.
2. Remove Front and Rear cover ((☛ 1.1.1).
3. Open the Top Cover.
4. Remove the Gas spring by prying it off using a screw driver.
5. Remove connector [A] (x1).
6. Cut cable ties inside cover.
7. Remove screws [B] (x4).
8. Remove screws [C] (x4).

1.1.7 INTERLOCK SWITCH S9 &S10



Removal

1. Remove connector [B](x1).
2. Remove nuts [A] (x2).

Replacement

1. Reverse the removal procedure.

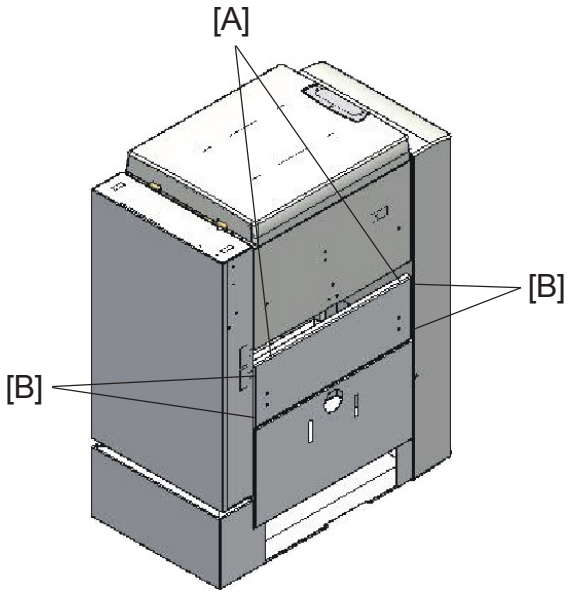
Adjustment

1. Loosen nuts [A] (x2).
2. Adjust the interlock so that Top cover actuates interlock switch 2 mm (5/64”) before closed.
   NOTE: Make sure both rubber dampers contacts the front cover when closed.
3. Tighten nuts [A] (x2).

⚠ WARNING

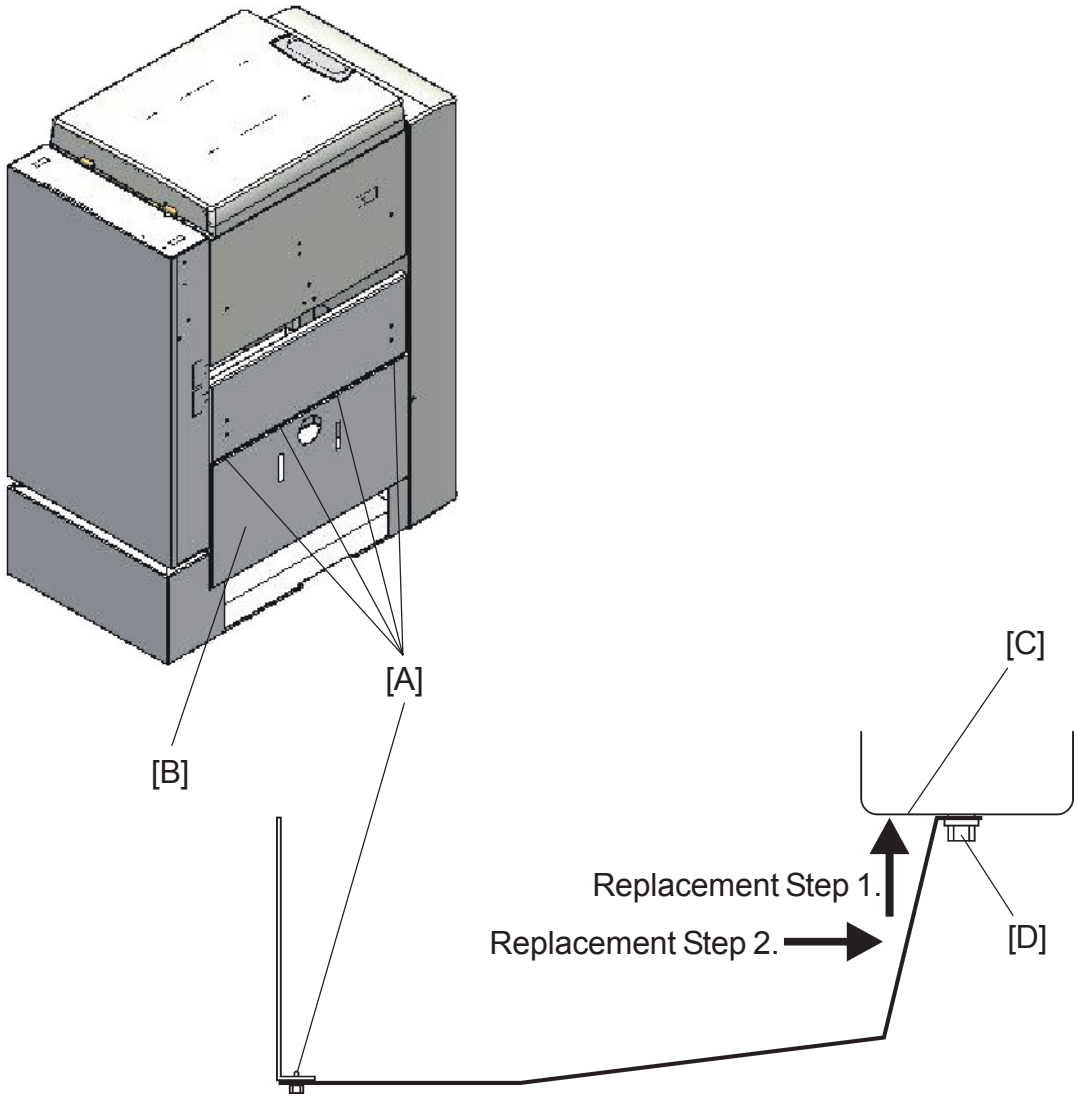
Overriding or cheating the interlock allows the SR90 system to operate with the top cover open which can result in personal injury. Never give the operator access to the cheater or show how ovverriding the interlock system is carried out.

1.1.8 LOWER OUTFEED COVER



1. Remove Belt stacker.
2. Remove Front and Rear cover ((☛ 1.1.1).
3. Remove Protection Cover ((☛ 1.1.9).
4. Loosen screws [A] (x2).
5. Remove screws [B] (x4).

1.1.9 PROTECTION COVER



Removal

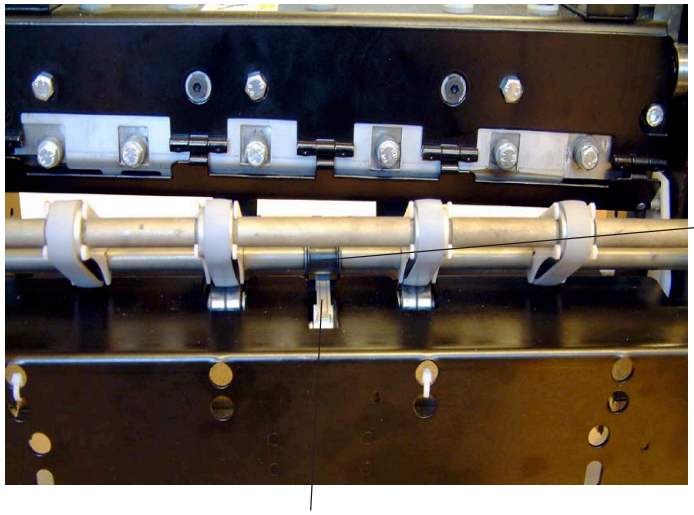
1. Lift out scrap paper bin [B].
2. Remove screws [A] (x4).

Replacement

1. Place the front end of the cover up against the lower knife beam [C].
2. Push in cover so it hooks onto the screws [D].
3. Mount screws [A] (x4).

1.2 AREA C

1.2.1 INFEED SWITCH S1



Removal

1. Undock the Trimmer.
2. Remove nuts inside bracket holding the Switch (x2).
3. Remove connectors from the Switch (x2).

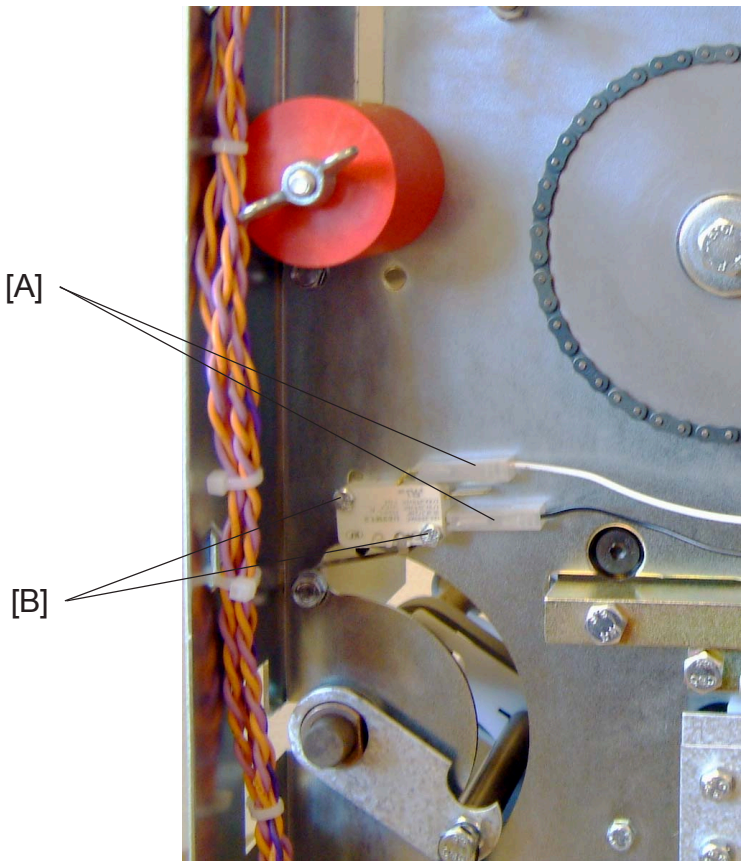
Replacement

1. Reverse the removal procedure.

Adjustment

1. Insert 1 sheet 80 gsm (20# bond) between Swith arm [A] and Roller [B].
2. Make sure the switch activates by the sheet.
3. To adjust, loosen nuts inside bracket holding the Switch (x2).
4. Reposition switch to obtain adjustment.
5. Tighten nuts (x2).
   NOTE: If switch arm is deformed so adjustment can not be obtained by repositioning the switch, form the switch arm gently to obtain adjustment.

1.2.2 CONTROL SWITCH S2



Removal

1. Remove Rear cover ((☛ 1.1.1).
2. Remove connectors [A] (x2).
3. Remove screws [B] (x2).

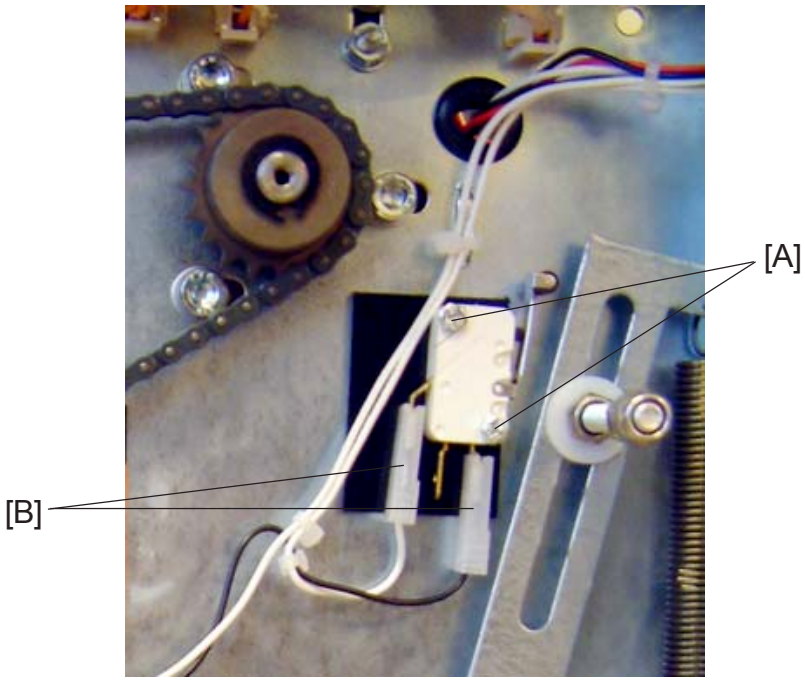
Replacement

1. Reverse the removal procedure.

Adjustment

1. Lift the Infeed shaft.
2. Make sure the Switch activates slightly before the shaft latches in upper position.
3. To adjust, loosen screws [B] (x2).
4. Reposition switch to obtain adjustment.
5. Tighten screws [B] (x2).

1.2.3 CONTROL SWITCH S3



Removal

1. Remove Rear cover ((☛ 1.1.1).
2. Remove connector [B] (X2).
3. Remove screw [A] (x2).

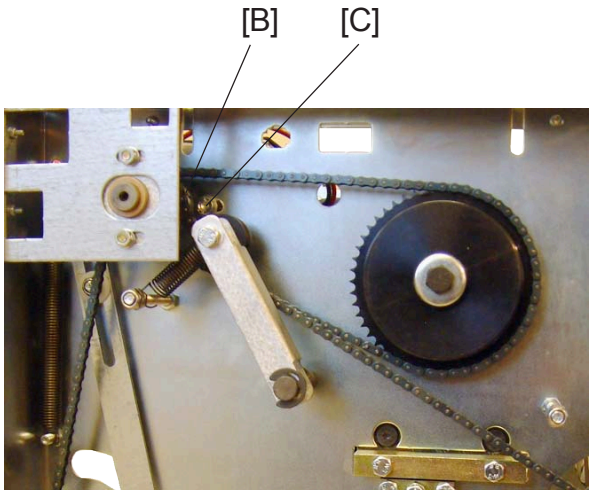
Replacement

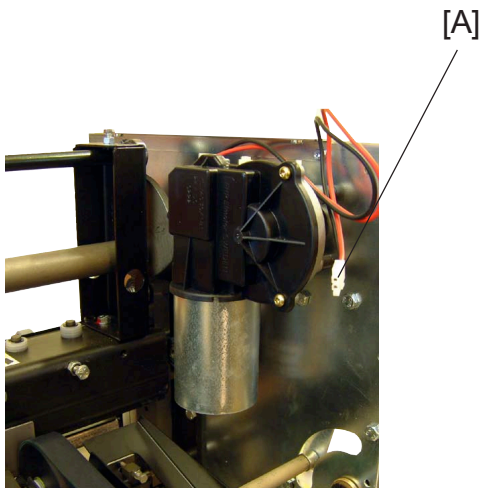
1. Reverse the removal procedure.

Adjustment

1. Lift the compressing bracket.
2. Make sure the Switch activates approximatly 10 mm from the compressing bracket lathces in upper position.
3. To adjust, loosen screws [A] (x2).
4. Reposition switch to obtain adjustment.
5. Tighten screws [A] (x2).

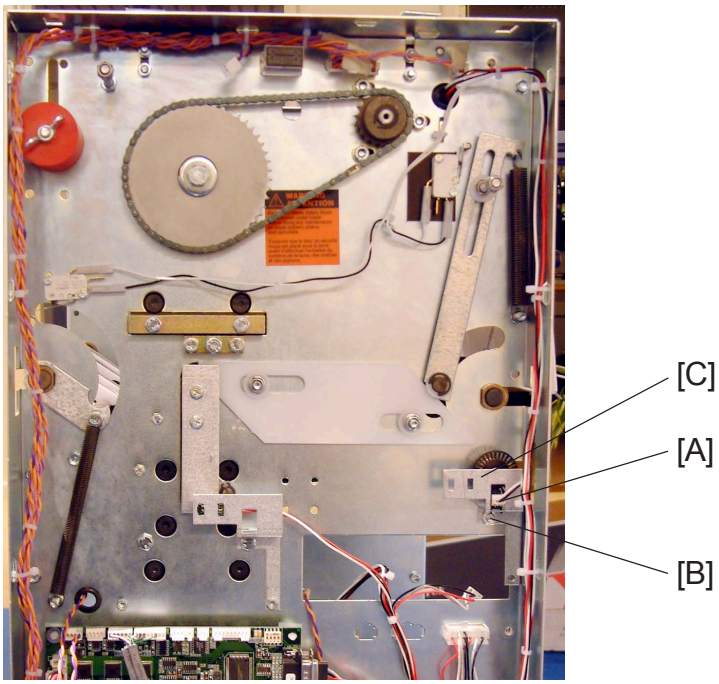
1.2.4 TRANSPORT MOTOR M1





1. Remove Transmission chain ((☛ 1.2.17).
2. Remove Knife support chain ((☛ 1.2.18).
3. Remove connector [A] (x1).
4. Grab the inner sprocket to pull out the whole sprocket assembly [B].
5. Remove screws [C] holding the motor (x3).
   NOTE: Hold the spacers between motor and frame when removing screws.

1.2.5 TRANSPORT BELT SENSOR Q4



Removal

1. Remove Rear cover ((☛ 1.1.1).
2. Remove connector [A] (x1).
3. Remove nut and screw [B] (x1, x1).
4. Remove bracket [C].
5. Squeze the barbs of the sensor to remove.

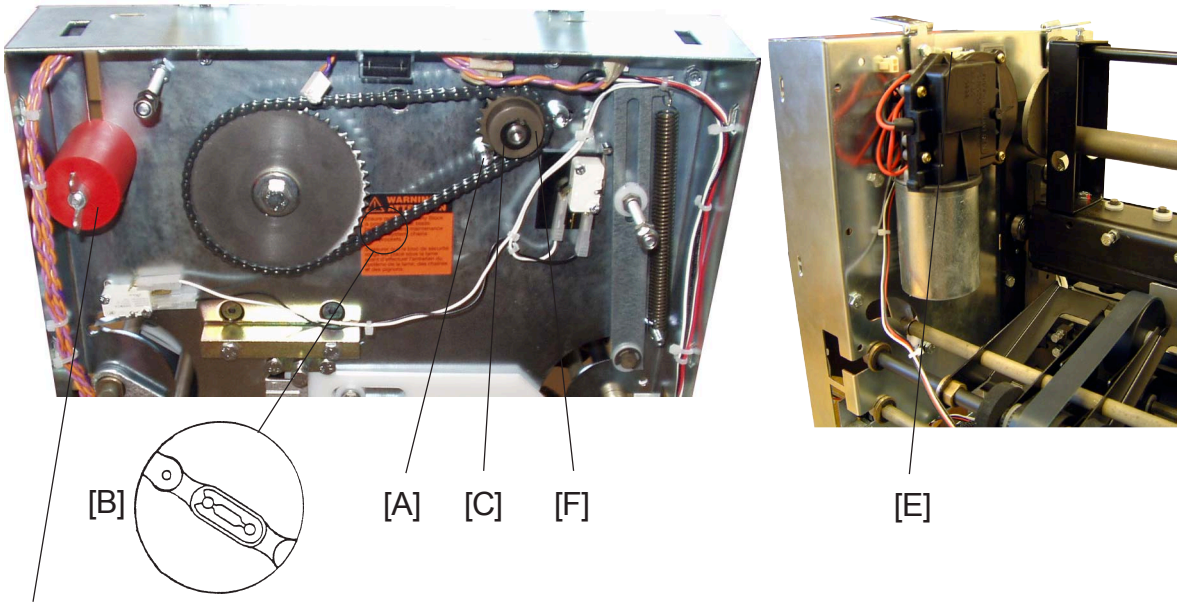
Replacement

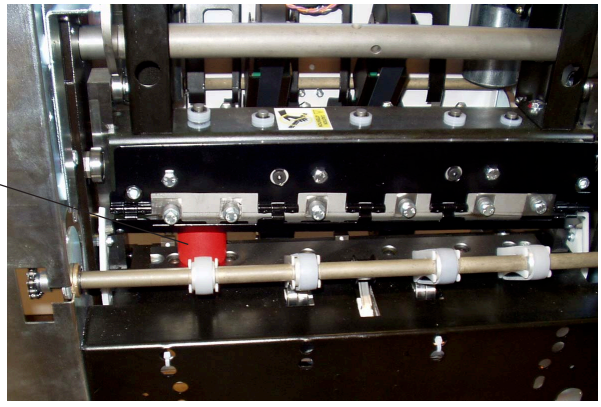
1. Reverse the removal procedure
   NOTE: When tightening nut/screw make sure there is a space between encoder disc and sensor.
2. Enter service program mode and start the belts (motor M1). Check speed (m/s) is registered ((☛ Service Manual SR90: 5.1.1, 5.1.2).
3. If no, or irratic speed, loosen screw/nut [B] (x1, x1).
4. Reposition sensor to obtain correct speed registration.
5. Tighten screw/nut [B] (x1, x1).

1.2.6 TRIM KNIFE MOTOR M2

⚠ WARNING

Place the safety block [D] between lower knife and upper knife beam. When removing the chain nothing holds upper knife beam and knife in position.





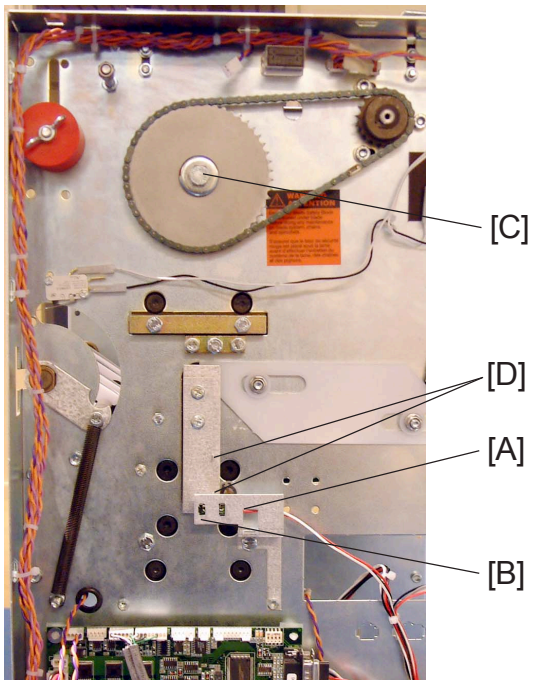
Removal

1. Remove Rear cover ((☛ 1.1.1).
2. Remove connector [E] (x1).
3. Remove circlip [C] using a circlip plier.
4. Loosen screws [A] holding the motor (x3).
5. Remove sprocket [F].
6. Remove screws [A] holding the motor (x3).

Replacement

1. If it is difficult to mount sprocket [F] remove master link [B].
2. Reverse the removal procedure.
3. Tension the chain so there is no slack when tightening screws [A] (x3).

1.2.7 TRIM KNIFE HOME POSTITON SENSOR Q5



Removal

1. Remove Rear cover ((☛ 1.1.1).
2. Remove connector [A] (x1).
3. Squeze the barbs of the sensor to remove.
   NOTE: Gently pull bracket [B] to remove.

⚠ WARNING

Stay clear from upper knife. The knife edge may cause serious injuries.

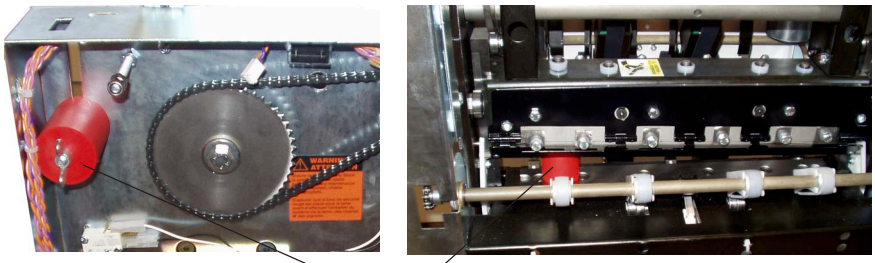
Replacement

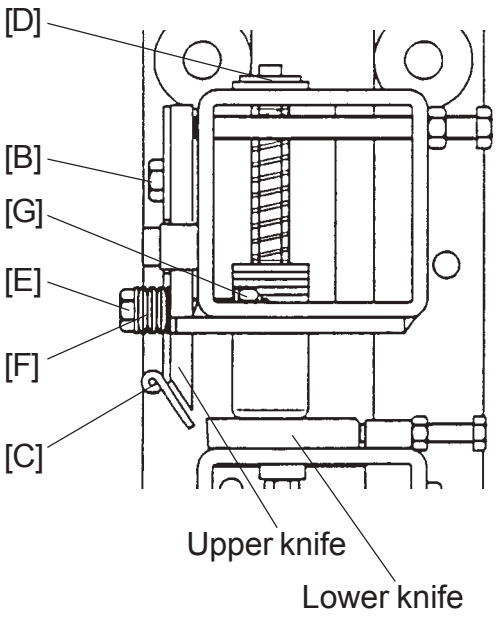
1. Reverse the removal procedure.
2. Enter service program mode to check that sensor Q5 changes state when blocked/unblocked ((☛ Service Manual SR90: 5.1.1, 5.1.2).
   NOTE: Do not cheat the interlock.
3. Move the Upper knife by turning crank [C] using a 13 mm wrench.
4. Check on the LCD that sensor Q5 changes state when blocked/unblocked by actuators [D].

1.2.8 TRIM KNIFE

⚠ WARNING

Stay clear from upper knife. The knife edge may cause serious injuries. Place the safety block [A] between lower knife and upper knife beam. Keep the safety block in that position as much time as possible throughout this procedure.





Removal

1. Remove the belt stacker.
2. Undock the Trimmer.
3. Latch the compressing bracket in upper position.
4. Remove the infeed cover ((☛ 1.1.4).
5. Remove protection cover ((☛ 1.1.9).

Removal Upper knife

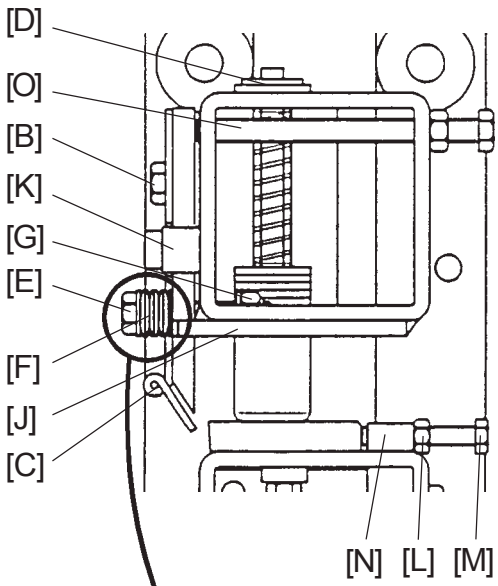
6. Remove screws [B] (x3).
7. Remove knife protection plate [C].
8. Move transport protection from the new to the old knife or use the transport protection supplied in the Trimmer installation kit.
9. Remove the e-clip [D] from the middle plunger, to release the Set clamp (x1).
10. Remove screws [E] and cup spring washers (x6).
    NOTE: When removing screws [E] the nuts [G] will fall down through the cut-out in bottom of knife beam.

Removal Lower knife

6. Remove screws [H] (x4).
7. Remove screws [I] and cup spring washers (x2).

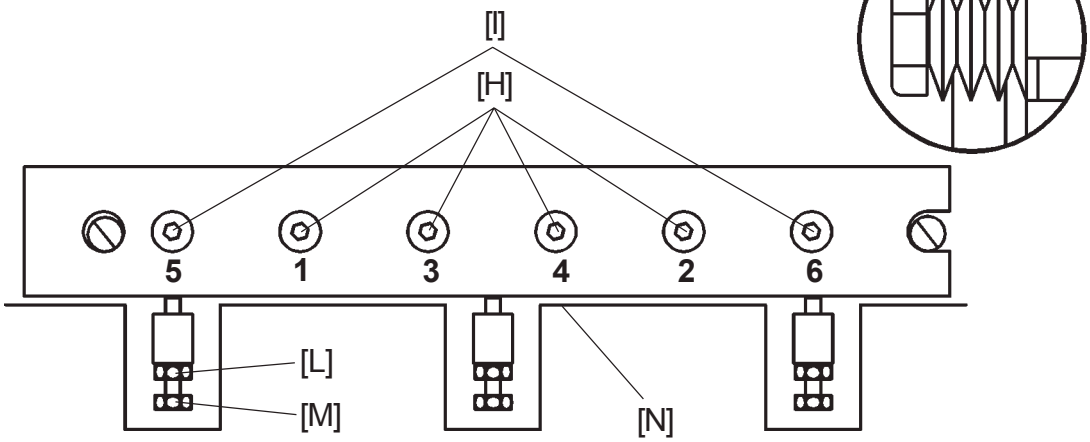
Replacement Upper knife

1. Move transport protection from the old to the new knife.
2. Clean and apply grease on guide bars [J] and side guides [K].
3. Fit upper knife onto guide bars [J].
   Apply grease on the cup spring washers [F] closest to the knife.
   Mount screws [E] with nuts [G] (x6, x6).
   NOTE: Make sure each screw has 7 cup spring washers placed according to figure.
4. Remove transport protection and mount it on the old knife.
5. Mount knife protection plate [C].
6. Mount the set clamp in position with e-clip [D] (x1) .



Replacement Lower knife

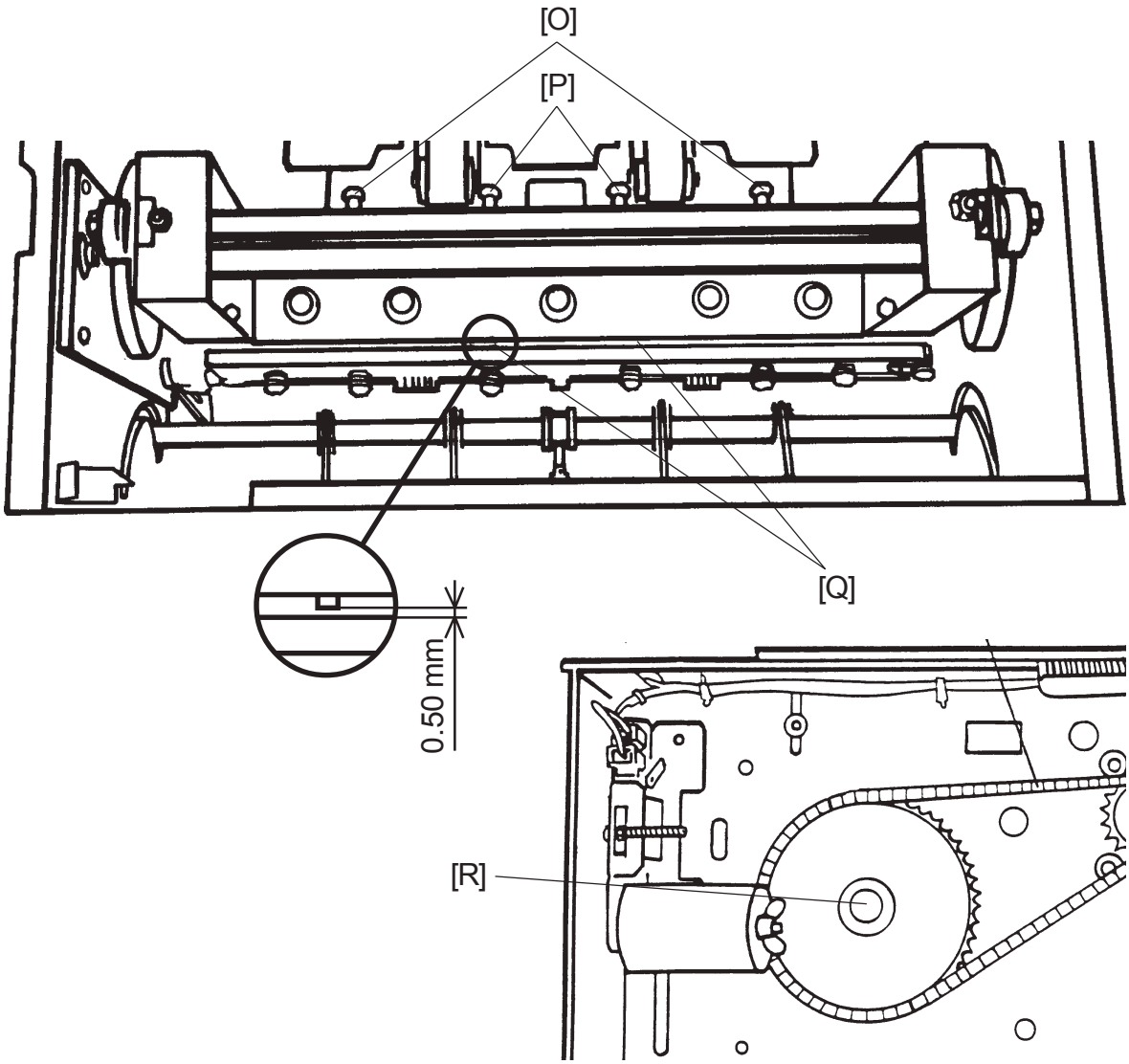
1. Place the lower knife onto the lower knife beam.
2. Apply grease on both washers.
3. Mount screws [I] (x2) and cup spring washers.
4. Mount screws [H] (x4).



Adjustment

1. Turn screws [E] so there is no tension and no play between cup spring washers and upper knife.
2. Then turn screws [E] one revolution clockwise each.
3. Loosen nuts [L] (x3)
   Turn screws [M] (x3) counter clockwise until they passes edge [N].
4. Loosen screws [I] & [H] (x6).
5. Push the Lower knife against the bracket [N].

6. Use a feeler gauge and check that the space [Q] between upper knife and the two red marked reference screws in the middle [P] is 0.50 mm.
   NOTE: Never touch the red painted reference screws [P].
7. Adjust the space if necessary with screws [O] (x2).



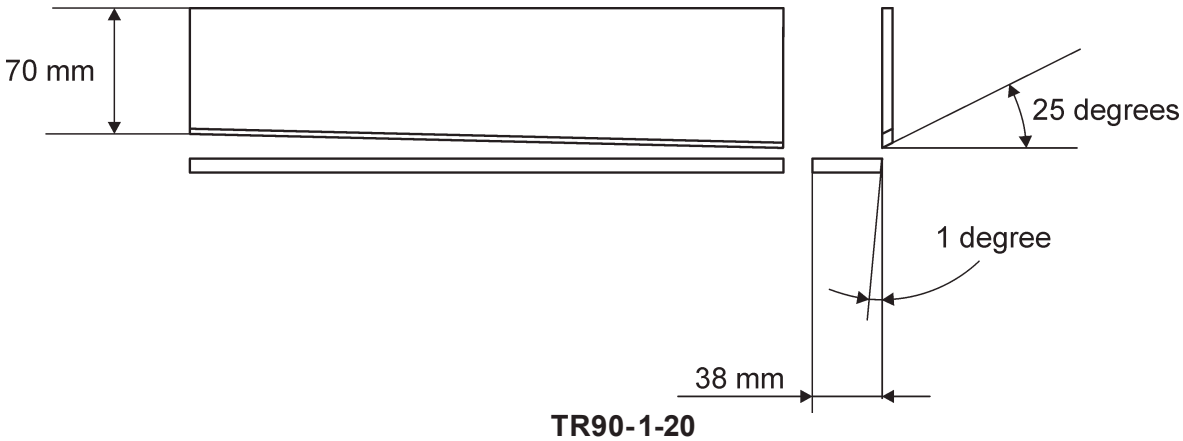
8. Bring the Upper knife down to the bottom position by turning crank [R] using a 13 mm wrench.
   NOTE: When bringing the Upper knife down, make sure it does not touch the Lower knife.
9. Gently push in the Lower knife against the Upper knife.
   NOTE: Listen that it touches on both sides.
10. Raise the upper knife to the top position by turning crank [R].
11. Tighten screws [I] & [H] (x6).
    NOTE: Tighten a little at first according to the sequence 1-6. Then tighten a little harder to finally fully tighten the screws. Always according to the sequence 1-6.
12. Turn screws [M] (x3) so they touch the lower knife.

13. Slowly and carefully without paper lower the upper knife by turning crank [R].
    Check that the upper knife does not contact the lower knife. In that case, back up the upper knife and start over from step 3. If no contact proceed to the bottom position.
    NOTE: Look through the cut out in the side frames while turning crank.
14. Make 5 different booklets in the SR90 required for the adjustment. The booklets should have 2, 15, 20 & 25 sheets A3 (11“x17“) 80 gsm (20# bond).
15. Place the 2 sheet booklet in cutting position.
    Trim the set by turning crank [R].
    Inspect the trim result. Check if the lowest sheet of the booklet is cut clean throughout the length.
    If good, trim and inspect the 15 sheet booklet the same way.
    If good, trim and inspect the 20 sheet booklet the same way.
    If the set is not correctly cut on one of the ends, loosen the five screws [I] & [H] on the bad end and keep the one screw [I] tightened at the good end.
    Turn screw [M] on the bad end 1/36 revolution or 10° clockwise (x1).
16. Repeat from step 11 until trim result is perfect.
    NOTE: As guidance, trim the over spec. 25 sheet booklet to clearer see if and where it does not cut clean.
17. If not correctly cut in the middle, loosen the four screws [H] and keep the screws [I] tightened.
    Turn screw [M] in the middle 1/72 revolution or 5°clockwise (x1).
    Repeat from step 11.
    NOTE: If the knife/knives has been damaged, they have to be replaced or resharpened even if a correct result is obtained, due to shortened life time.
18. Tighten the lock nuts [L] without turning screws [M] (x3).
19. Reverse removal procedure step 1-5.

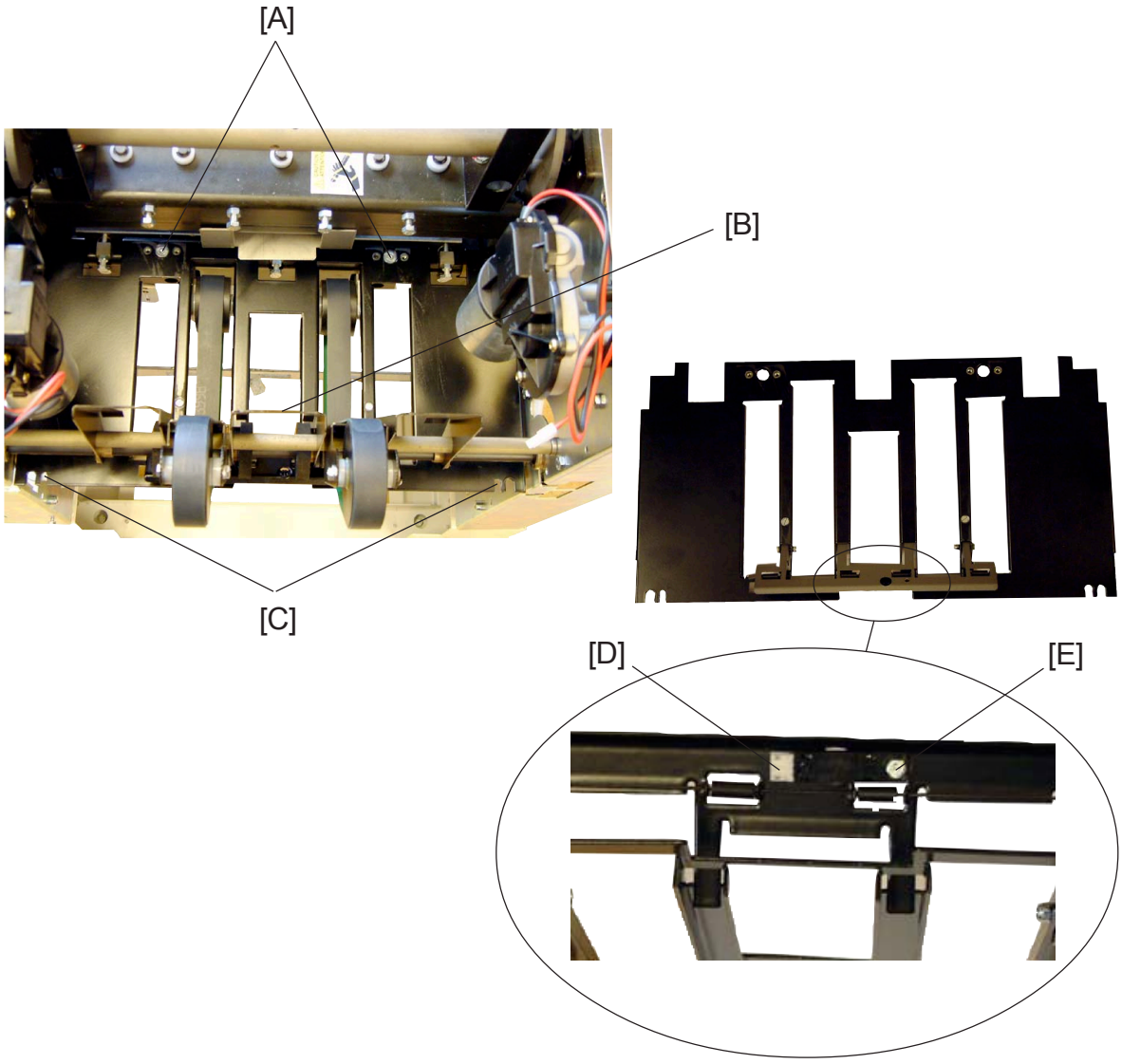
NOTE: When the knives become dull it is possible to resharpen them.

The upper knife can be resharpened until it is 70 mm (2”3/4) wide at the shorter end. Resharpen at a 25° angle.

The lower knife can be resharpened until it is 38 mm (1”½) wide.
Resharpen at a 1° angle.

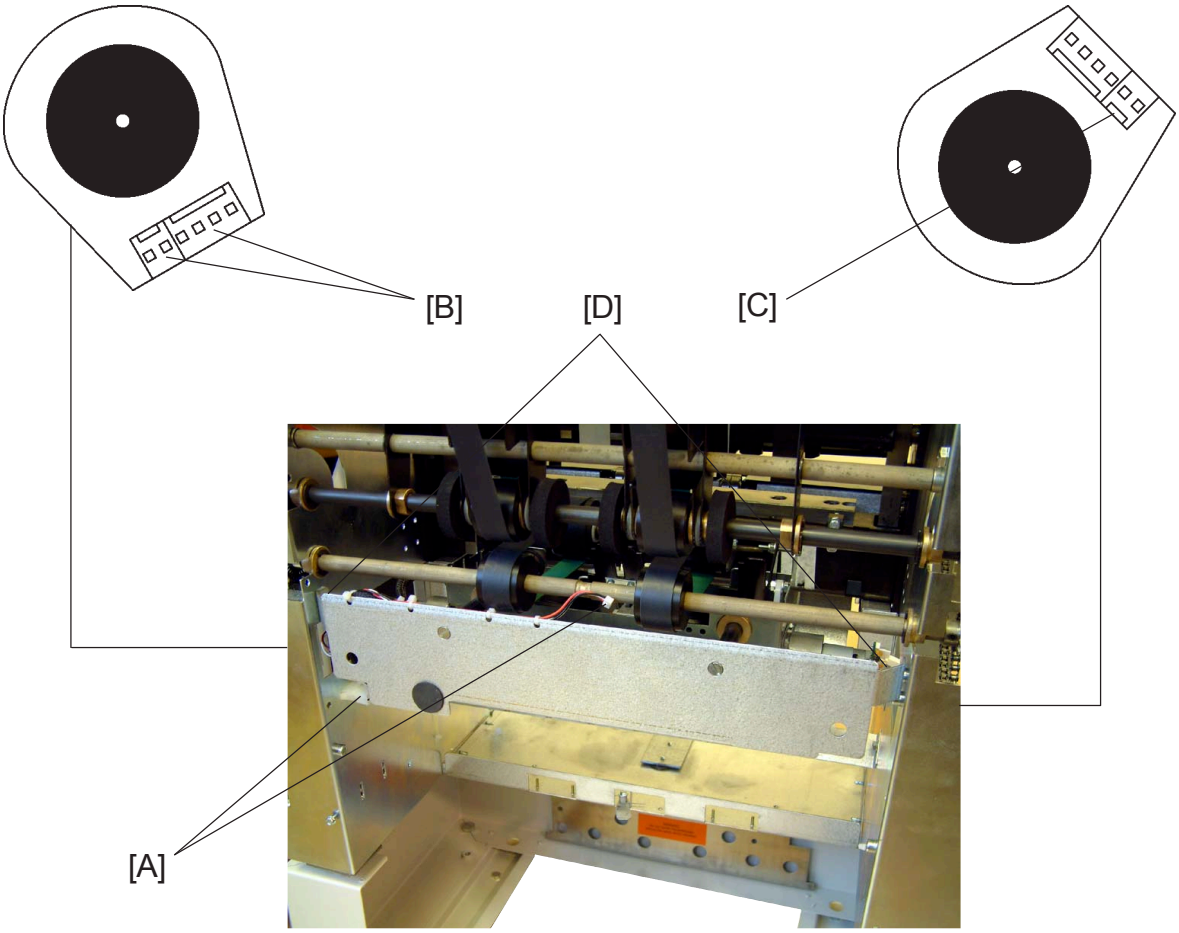


1.2.9 PAPER PATH & OUTFEED SENSOR Q6



1. Remove connector [D] (x1).
2. Lift up and latch compressing bracket [B].
3. Remove screws [A] (x2).
4. Remove screws [C] (x2).
5. Pull Paper path out through the outfeed.
6. To remove sensor, remove screw [E] (x1).

1.2.10 STOP GATE CARRIAGE



Removal

1. Before switching off the power,
   set the Trimmer to A4 (8.5x11") and Trimming to off.
2. Remove Lower outfeed cover ((☛ 1.1.8).
3. Remove connectors [A] (x2).
4. Remove connectors [B] (x2).
5. Remove connector [C] (x1).
6. Pull out the Carriage gently.

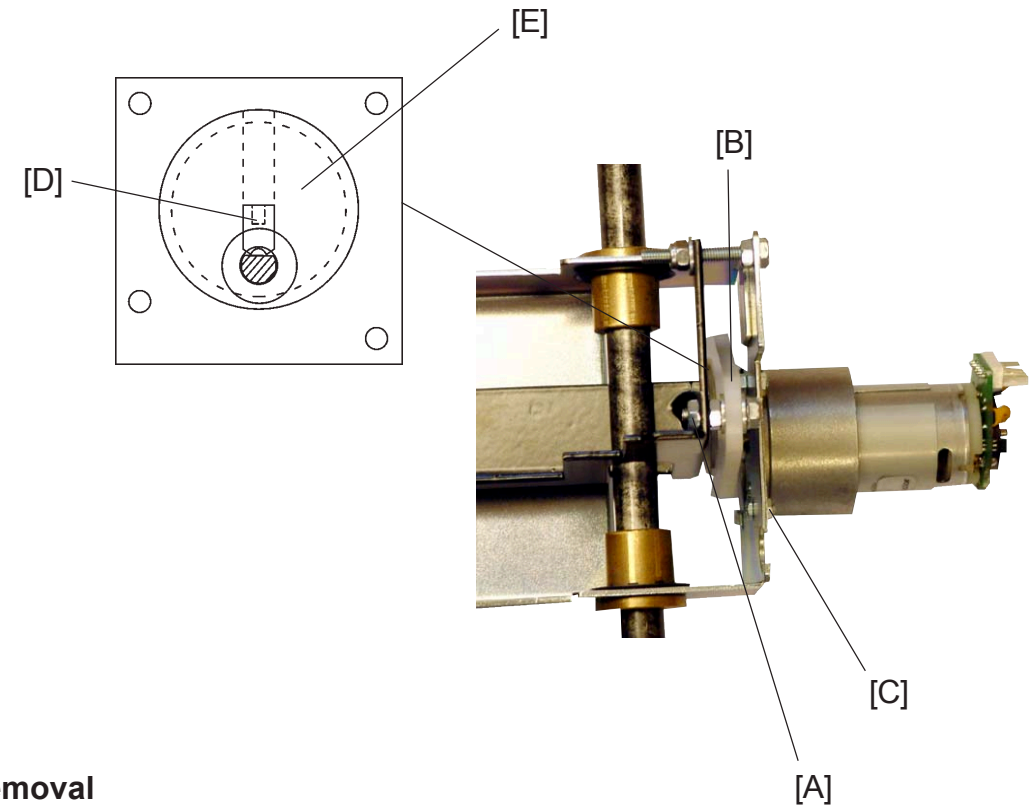
⚠ CAUTION

When removing the Carriage, watch out so the motor connectors [B] & [C] not get damaged by the side frame cut-outs.

Replacement

1. When positioning the carriage in place, make sure the two sliding rods and the gear rack enters their holes and slot.
2. Reverse the removal procedure.

1.2.11 STOP GATE MOTOR M3 & SENSOR Q7



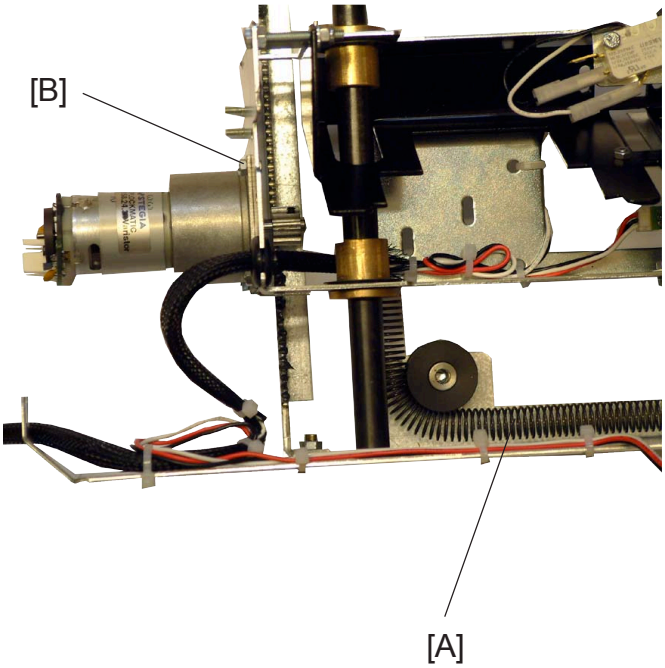
Removal

1. Remove Stop gate carriage ((☛ 1.2.10).
2. Remove nut [A] (x1).
3. Remove Crank arm [B].
4. Remove screws [C] holding the motor (x4).
5. Loosen set screw [D] (x1).

Replacement

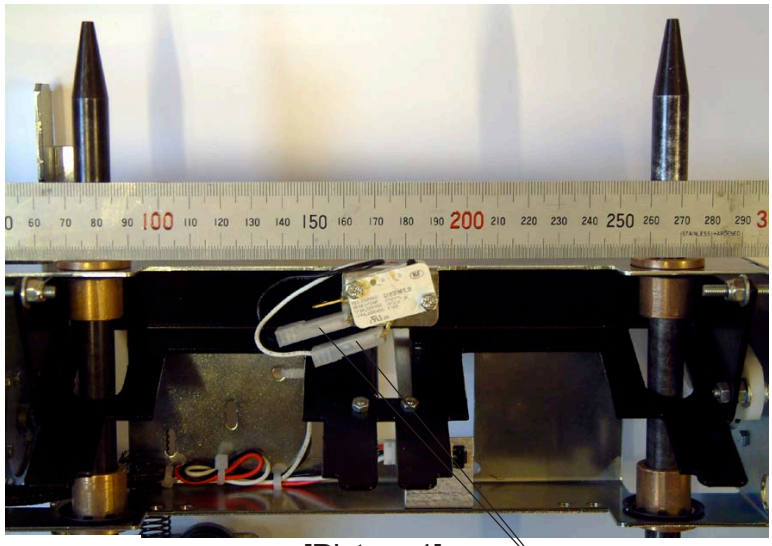
1. Mount the Crank pulley [E] without tightening the set screw [D] (x1).
2. Mount motor with screws [C] (x4).
3. Mount Crank arm [B].
4. Tightening nut [A] (x1).
   NOTE: Make sure play for Crank arm [B] is maintained.
5. Position the Crank pulley [E] so it is aligned with Crank arm [B].
6. Tighten set screw [D] (x1) on the flat of the shaft..
7. Reinstall Stop gate carriage ((☛ 1.2.10).

1.2.12 LENGTH ADJUSTMENT MOTOR M4 & SENSOR Q12

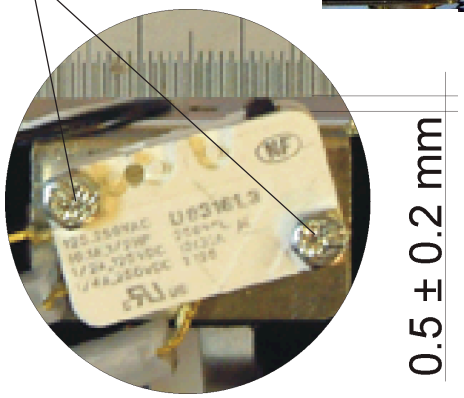


1. Remove Stop gate carriage ((☛ 1.2.10).
2. Unhook spring [A].
3. Remove screws [B] holding the motor (x4).

1.2.13 LENGTH ADJUSTMENT HOME POSITION SWITCH S11



[Picture 1]



[Picture 2]

Removal

1. Remove Stop gate carriage ((☛ 1.2.10).
2. Remove screws [B] (x2).
3. Remove connectors [A] (x2).

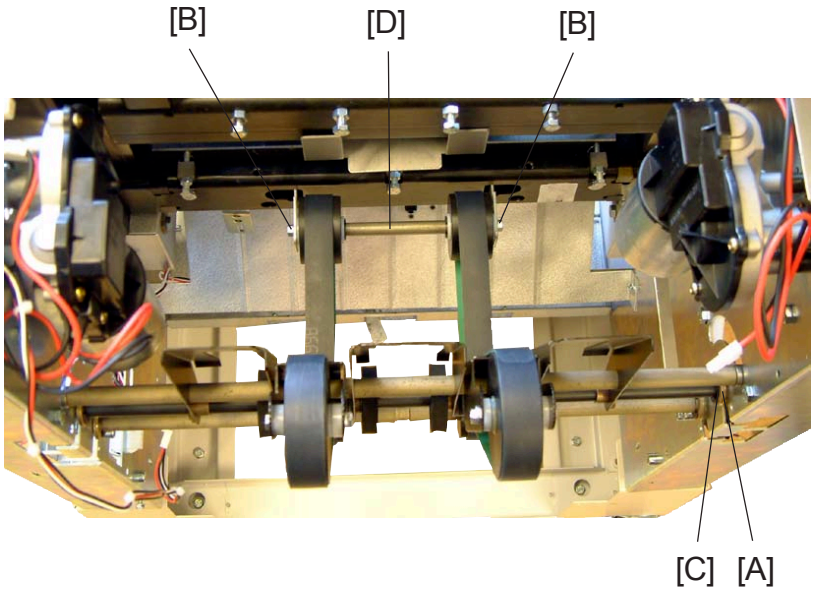
Replacement

1. Reverse the removal procedure.

Adjustment

1. Place a ruler across the slide rods and up against the flange bushings [Picture 1].
2. Position the switch so it is activated by the ruler and so there is a 0.5 mm ± 0.2 mm gap between switch body and ruler [Picture 2].
3. Tighten screws [B] (x2).

1.2.14 LOWER OUTFEED BELTS



Removal

1. Remove Stop gate carriage ((☛ 1.2.10).
2. Remove Paper path ((☛ 1.2.9).
3. Remove Transmission chain ((☛ 1.2.17).
4. Remove screws [B] (x2).
5. Remove e-clip [C] (x1).
6. Slide Flange bushing [C] towards the center of the shaft and tilt the shaft out through the cut-out in the side frame.

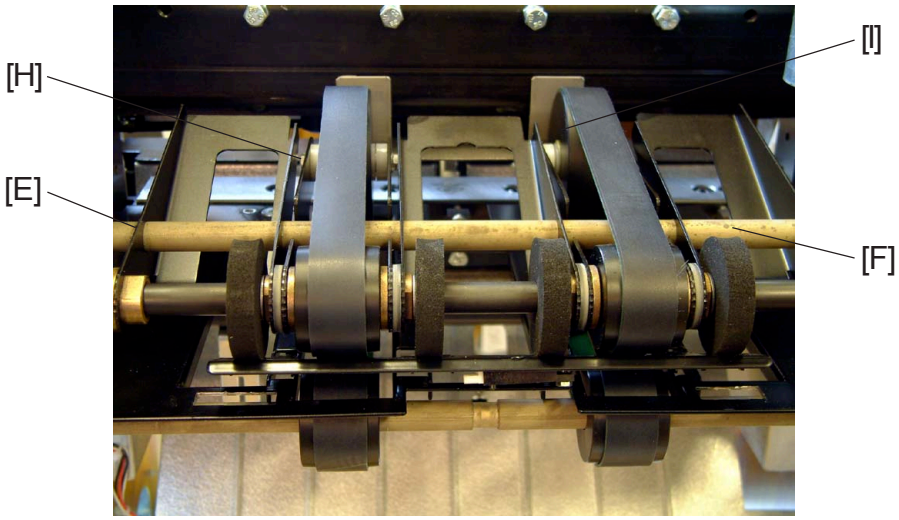
Replacement

1. Reverse the removal procedure.

Adjustment

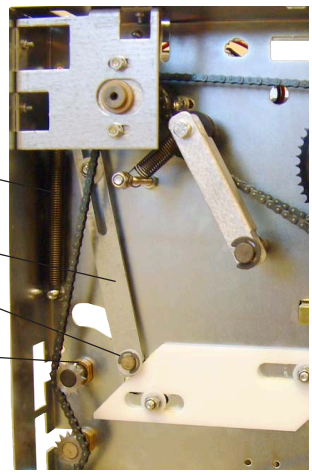
1. Loosen screws [B] (x2).
2. The belts should be adjusted so they have no slack and even tension.
3. Pull shaft [D] to obtain adjustment and tighten screws [B] (x2).

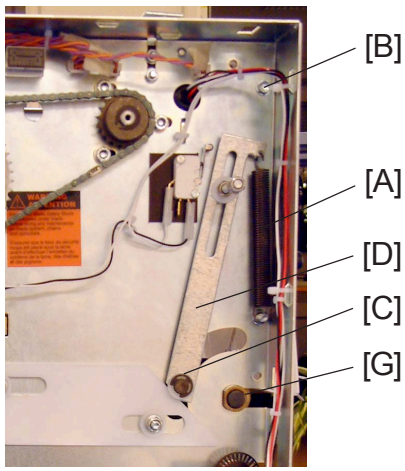
1.2.15 UPPER OUTFEED BELTS



Removal

1. Remove Belt stacker.
2. Remove Front and Rear cover ((☛ 1.1.1).
3. Remove Transmission chain ((☛ 1.2.17).
4. Unhook springs [A] (x2).
5. Remove screws [B] (x6).
   NOTE: Leave the screw at the top on each side for the outfeed cover to pivot around.
6. Remove e-clip [C] (x2).
   Remove nylon washer [C] (x2).
   Unhook link arm [D] (x2).
   Remove needle bearing [C] (x2).
7. Remove e-clip [E] (x2).
8. Pull out shaft [F].
9. Remove e-clips [G] (x2) inside frames.
10. Slide Flange bushings [G] towards the center of the shaft and pull out the whole assembly through the outfeed.
11. Loosen screws [H] (x4) and remove belts.





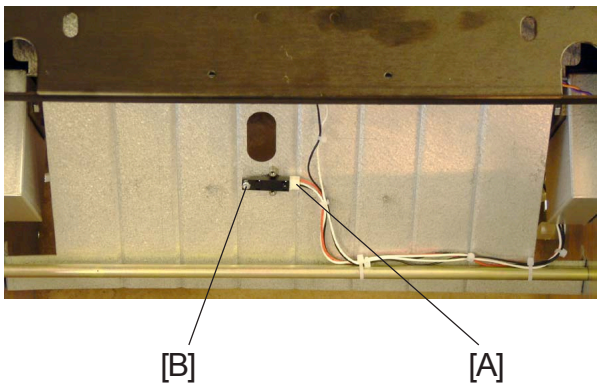
Adjustment

1. The belts should be adjusted so they have no slack and even tension.
2. Pull runner pulleys [I] to obtain adjustment and tighten screws [H] (x4).

Replacement

1. Reverse the removal procedure.

1.2.16 TRIM BIN FULL SENSOR Q8

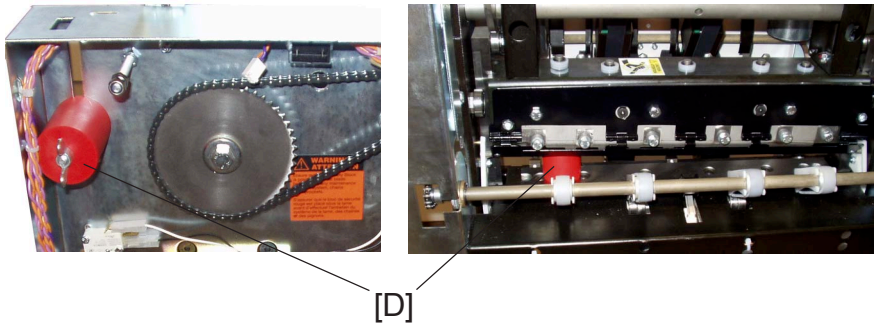


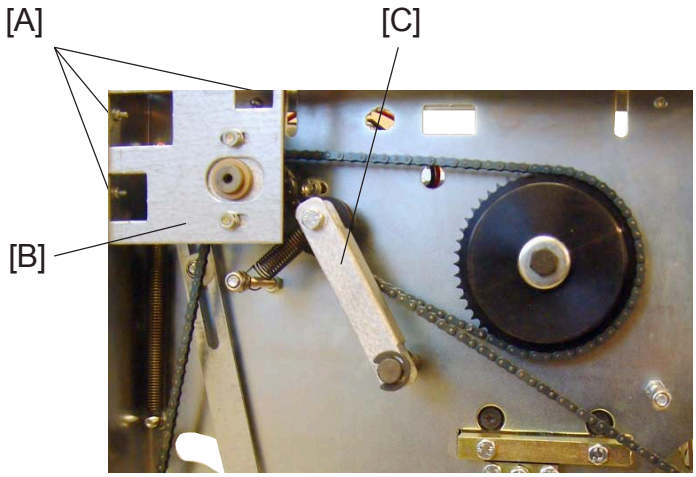
1. Undock the Trimmer.
2. Remove connector [A] (x1).
3. Remove screw [B] (x1).

1.2.17 TRANSMISSION CHAIN

⚠ WARNING

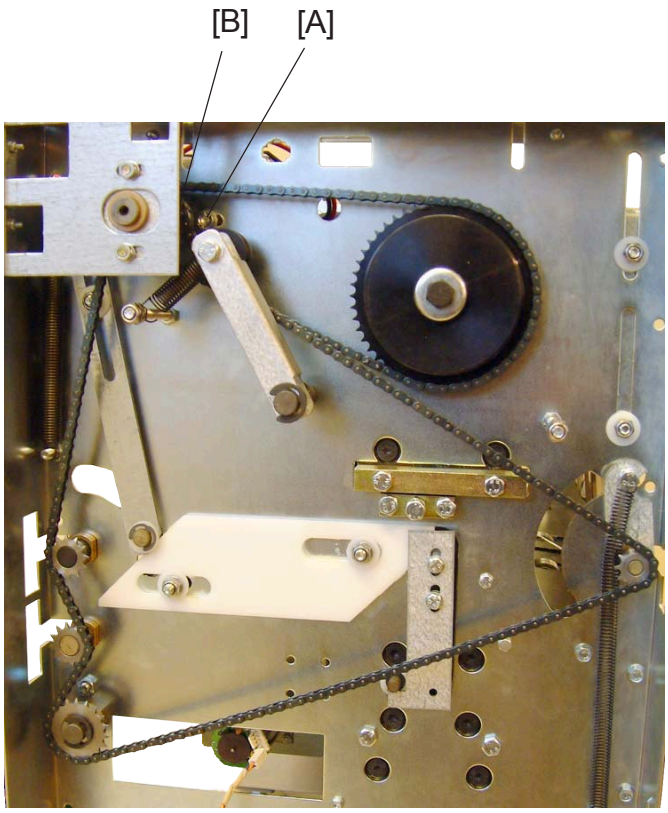
Place the safety block [D] between lower knife and upper knife beam. When removing the chain nothing holds upper knife beam and knife in position.





1. Remove Front cover ((☛ 1.1.1).
2. Remove screws [A] (x3).
3. Remove bracket [B].
4. Pull Tensioner [C] to release tension when removing chain.

1.2.18 KNIFE SUPPORT CHAIN



1. Remove Front cover ((☛ 1.1.1).
2. Remove Transmission chain ((☛ 1.2.17).
3. Loosen screws [A] (x3).
4. Remove chain from sprocket [B].

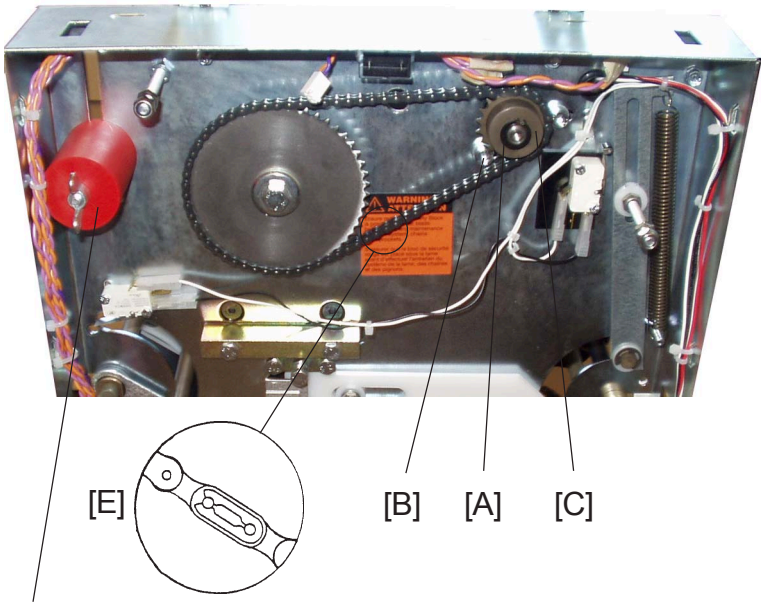
Replacement

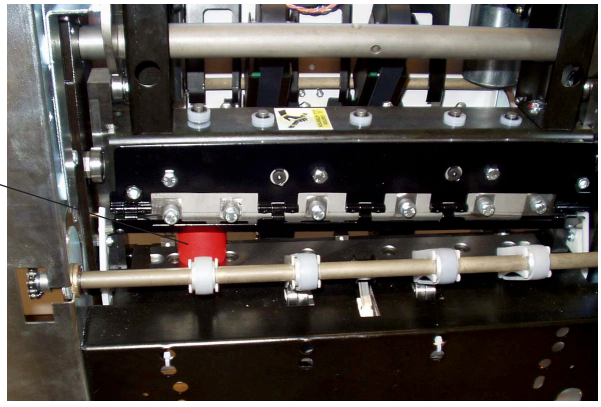
1. Reverse the removal procedure.
2. Tension the chain so there is no slack when tightening screws [A] (x3).

1.2.19 KNIFE CHAIN

⚠WARNING

Place the safety block [D] between lower knife and upper knife beam. When removing the chain nothing holds upper knife beam and knife in position.





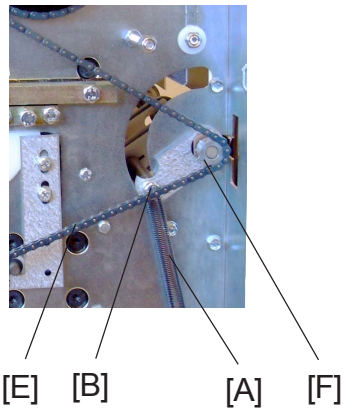
Removal

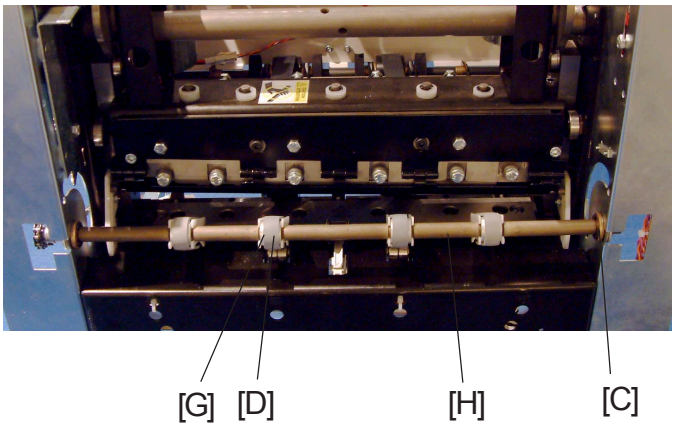
1. Remove Rear cover ((☛ 1.1.1).
2. Remove retaining ring [A].
3. Loosen screws [B] holding the motor (x3).
4. Remove sprocket [C].

Replacement

1. If it is difficult to mount sprocket [C] remove master link [E].
2. Reverse the removal procedure.
3. Tension the chain so there is no slack when tightening screws [B] (x3).

1.2.20 INFEED BELTS





Removal

1. Undock the Trimmer.
2. Remove Infeed cover ((☛ 1.1.4).
3. Remove Front and Rear cover ((☛ 1.1.1).
4. Unhook Transmission chain [E] from sprocket [F].
   NOTE: Unhooking chain from outfeed shaft sprockets first to gain more slack.
5. Unhook Springs [A] on both ends of the shaft (x2).
6. Remove screws [B] on both ends of the shaft (x2) .
7. Remove Plastic retaining clips [G] (x8).
8. Remove Belts [D] (x4) from Lever shaft [H].
   NOTE: Move the belts to one end and the lever shaft to the opposite end.
9. Remove e-clip [C] and slide flange bushing towards the center of the shaft. (x1)
10. Tilt the shaft out through the cut-out in the side frame on that end to remove the Belts [D] (x4).

Replacement

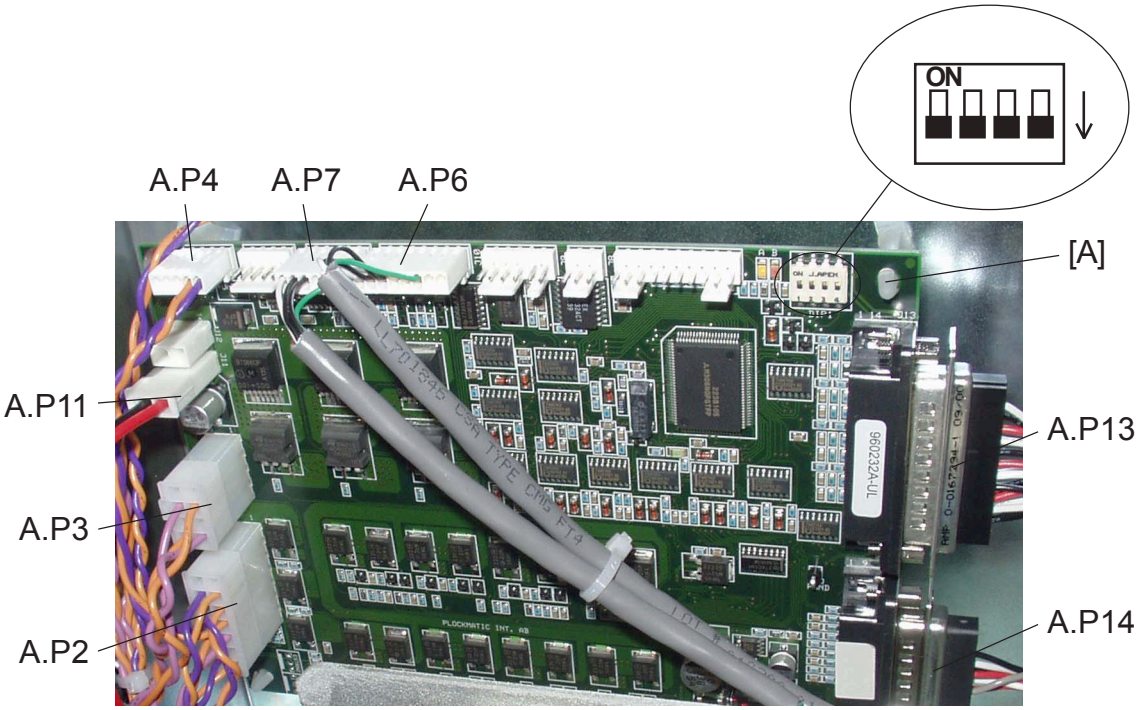
1. Reverse the removal procedure.

Adjustment

1. Loosen nuts [B] (x2) slightly.
2. Place a piece of paper (80 gsm) between the two center belts and the ball bearings.
3. Pull the sheet a little, by each of the center belts to verify even pressure.
4. Unskew shaft until even pressure is obtained and tighten nuts [B] (x2).

1.3 PCB

1.3.1 MD6DC PCB "A"



⚠ CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors - Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure ((☛ Service Manual SR90 3.1).

Removal

1. Remove Rear cover ((☛ 1.1.1).
2. Remove all connectors from the PCB (x8).
3. Squeeze the barbs of the four pins [A] and lift out the PCB.

Replacement

1. Position the PCB on the pins [A] and snap it in place.
2. Connect all plugs to PCB according to picture (x8).
3. Make sure all DIP-switches are set to OFF according to picture.
   NOTE: Make sure replacement PCB has matched software with the system refering to the latest Technical Bulletin.
   Download software if needed ((☛ Service Manual SR90 5.2).
4. Reinstall Rear cover ((☛ 1.1.1).

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2. TROUBLESHOOTING

2.1 FAULT CODE DESCRIPTIONS

TR-001

Fault Code TR-001, indicates that the Transport motor (TR-M1) do not receive any displacement pulses.

Initial Actions

- Check fuse F2 on Transformer.
- Make sure that the Transport belt sensor (TR-Q4) is installed correctly, according to 1.2.5.

Procedure

Enter the Service mode and select Transport motor (TR-M1) in check motors. **Does the encoder run properly, PL 10 Item 17?**

Y **N**

1. Check transmission according to 1.2.17.
2. Replace motor TR-M1.

1. Replace sensor TR-Q4.
2. Disconnect plug B.P14 from PCB “A”. Measure between J14-13 and J14-15? (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB “A”.

Disconnect plug from sensor TR-Q4. Check wires for Continuity / Short circuit from, the white wire Q4 to B:P14-14. **Is there Continuity and no Short circuit?**

Y **N**

Replace Wire Harness

Connect plug B.P14 to PCB “A”. Measure between the red wire Q4 and the black wire Q4 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB “A”.

TR-002

Fault Code TR-002, indicates that either the Transport motor (TR-M1) or the Trim Knife motor (TR-M2) had a Cycle time out.

Initial Actions

- Check fuse F2 on Transformer.
- Make sure that the Trimmer knife home position sensor (TR-Q5) is installed correctly.

Procedure

Enter the Service mode and select Trimmer knife home position sensor (TR-Q5) in check sensors. **The Trimmer knife home position sensor indicates :1 when the sensor is blocked, and :0 when the sensor is unblocked?**

Y **N**

1. Replace sensor TR-Q5.
2. Disconnect plug B.P13 from PCB “A”. Measure between J13-23 and J13-25 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB “A”.

Disconnect plug from sensor TR-Q5. Check wires for Continuity / Short circuit from, the white wire Q5 to B:P13-24. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug B.P13 to PCB “A”. Measure between the red wire Q5 and the black wire Q5 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB “A”.

Enter the Service mode and select Transport motor (TR-M1) and Trim Knife motor (TR-M2) in check motors. **Both motors energizes?**

Y **N**

Disconnect the motor plug M1 to Transport / Knife motor (TR-M1). Enter the Service mode and start Transport motor (TR-M1) in check motors. Measure between the orange wire M1 and the violet wire M1 (PWM 36V and ground). **The voltage is approximately 22 VDC?**

Y **N**

Disconnect plug B.P3 from PCB “A”. Measure between J3-2 and J3-3 (PWM 36 and ground). **The voltage is approximately 22 VDC?**

Y **N**

Replace PCB “A”.

Replace wire Harness.

Disconnect the motor plug M2 to Trim Knife motor (TR-M2). Enter the Service mode and start Trim Knife motor (TR-M2) in check motors. Measure between the orange wire M2 and the violet M2 (PWM 36 and ground). **The voltage is approximately 28 VDC?**

Y **N**

Disconnect plug B.P3 from PCB “A”. Measure between J3-6 and J3-7 (PWM 36 and ground). **The voltage is approximately 28 VDC?**

Y **N**

Replace PCB “A”.

Replace wire Harness.

1. Make sure that nothing interferes with the mechanical movement.
2. Lubricate where needed.

1. Make sure that nothing interferes with the mechanical movement.
2. Lubricate where needed.

TR-003

Fault Code TR-003, indicates that the Transport motor (TR-M1) has a Short circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M1. Run the SDS again. **Fault code TR-004 (Open circuit) is displayed?**

Y **N**

Disconnect plug B.P3 from PCB "A". Check wires for Short circuit across leads the orange wire M1 to B.P3-3 (violet) and the violet wire M1 to B.P3-2 (orange). **Is there Short circuit?**

Y **N**

Replace PCB "A".

Replace wire Harness.

Replace motor TR-M1.

TR-004

Fault Code TR-004, indicates that the Transport motor (TR-M1) has a Open circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M1. Enter Service mode and start Transport motor (TR-M1) in check motors. Measure between the orange wire M1 and the violet wire M1 (PWM 36 and ground). **The voltage is approximately 22 VDC?**

Y **N**

Disconnect plug B.P3 from PCB "A". Measure between J3-2 and J3-3 (PWM 36 and ground). **The voltage is approximately 22 VDC?**

Y **N**

Replace PCB "A".

Replace wire Harness.

Replace motor TR-M1.

TR-005

Fault Code TR-005, indicates that the Trim knife motor (TR-M2) has a Short circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M2. Run the SDS again. **Fault code TR-006 (Open circuit) is displayed?**

Y **N**

Disconnect plug B.P3 from PCB "A". Check wires for Short circuit across leads the orange wire M2 to B.P3-6 (violet) and the violet wire M2 to B.P3-7 (orange). **Is there Short circuit?**

Y **N**

Replace PCB "A".

Replace wire Harness.

Replace motor TR-M2.

TR-006

Fault Code TR-006, indicates that the Trim knife motor (TR-M2) has a Open circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M2. Enter Service mode and start Trim knife motor (TR-M2) in check motors. Measure between the orange wire M2 and the violet wire M2 (PWM 36 and ground). **The voltage is approximately 22 VDC?**

Y **N**

Disconnect plug B.P3 from PCB “A”. Measure between J3-6 and J3-7 (PWM 36 and ground). **The voltage is approximately 22 VDC?**

Y **N**

Replace PCB “A”.

Replace wire Harness.

Replace motor TR-M2.

TR-007

Fault Code TR-007, indicates that the Stop gate motor (TR-M3) had a Cycle time out.

Initial Actions

- Check fuse F2 on Transformer.
- Enter the Service mode and select Stop gate motor (TR-M3) in check motors.
- Make sure that the Paper stop gate home position sensor (TR-Q7) is installed correctly.

Procedure

Enter the Service mode and select Paper stop gate home position sensor (TR-Q7) in check sensors. **The Paper stop gate home position sensor indicates :1 when the sensor is blocked, and :0 when the sensor is unblocked?**

Y **N**

1. Replace sensor TR-Q7.
2. Disconnect plug B.P13 from PCB “A”. Measure between J13-7 and J13-9 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB “A”.

Disconnect plug from sensor TR-Q7. Check wires for Continuity / Short circuit from, the white wire Q7 to B:P13-8. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug B.P13 to PCB “A”. Measure between the red wire Q7 and the black wire Q7 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB “A”.

Are you able to move the Stop gate up and down without it interfering with anything?

Y **N**

Make sure that the Stop gate does not interferes with the “Deck plate”. Adjust if necessary according to Adj ???.

1. Check the allen screw on the “cam” to TR-M3.
2. Replace motor TR-M3.

TR-008

Fault Code TR-008, indicates that the Stop gate motor (TR-M3) has a Short circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M3. Run the SDS again. **Fault code TR-009 (Open circuit) is displayed?**

Y

Replace motor TR-M3.

N

Disconnect plug B.P2 from PCB "A". Check wires for Short circuit across leads the orange wire M3 to B.P2-11 (violet) and the violet wire M3 to B.P2-4 (orange). **Is there Short circuit?**

Y

Replace wire Harness.

N

Replace PCB "A".

TR-009

Fault Code TR-009, indicates that the Stop gate motor (TR-M3) has a Open circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M3. Enter Service mode and start Stop gate motor (TR-M3) in check motors. Measure between the orange wire M3 and the violet wire M3 (PWM 36V and ground). **The voltage is approximately 36 VDC?**

Y

Replace motor TR-M3.

N

Disconnect plug B.P2 from PCB "A". Measure between J2-4 and J2-11 (PWM 36V and ground). **The voltage is approximately 36 VDC?**

Y

Replace wire Harness.

N

Replace PCB "A".

TR-010

Fault Code TR-010, indicates that the Length adjustment motor (TR-M4) do not receive any displacement pulses.

Initial Actions

- Check fuse F2 on Transformer.
- Enter the Service mode and select Length adjustment motor (TR-M4) in check motors.

Procedure

Disconnect the sensor plug Q12 to motor M4. Measure between the red wire Q12 and the black wire Q12 (5V and Signal ground). **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug B.P14 from PCB "A". Measure between the J14-3 and J14-5 (5V and Signal ground). **The voltage is approximately 5 VDC.**

Y **N**

Replace PCB "A".

Replace wire harness.

Disconnect plug B.P14 from PCB "A". Check wires for Continuity / Short circuit from the grey wire Q12 to B.P14-7, the white wire Q12 to B.P14-4, the black wire Q12 to B.P14-3, the red wire Q12 to B.P14-5. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire harness.

1. Replace motor TR-M4.
2. Replace PCB "A".

TR-011

Fault Code TR-011, indicates that the Length adjustment motor (TR-M4) had a Cycle time out.

Initial Actions

- Check fuse F2 on Transformer.
- Enter the Service mode and select Length adjustment motor (TR-M4) in check motors.
- Make sure that the Length adjustment home position switch (TR-S11) is installed correctly.

Procedure

Enter the Service mode and select Length adjustment home position switch (TR-S11) in check switches. **The Length adjustment home position switch indicates :1 activated, and :0 deactivated?**

Y **N**

Disconnect plug B.P13 from PCB "A". Measure between J13-2 and J13-3 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB "A".

Connect plug B.P13 to PCB "A". Measure between the white wire S11 and the black wire S11 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

1. Replace switch TR-S11
2. Replace PCB "A.

Enter the Service mode and select Length adjustment motor (TR-M4) in check motors. **The motor energizes?**

Y **N**

Replace motor TR-M4.

2. Check the allen screw on the "cam" to the "Stop gate push rod".
1. Lubricate were needed.

TR-012

Fault Code TR-012, indicates that the Length adjustment motor (TR-M4) has a Short circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M4. Run the SDS again. **Fault code TR-013 (Open circuit) is displayed?**

Y

Replace motor TR-M4.

N

Disconnect plug B.P2 from PCB "A". Check wires for Short circuit across leads the orange wire M4 to B.P2-9 (violet) and the violet wire M4 to B.P2-2 (orange). **Is there Short circuit?**

Y

Replace wire Harness.

N

Replace PCB "A".

TR-013

Fault Code TR-013, indicates that the Length adjustment motor (TR-M4) has a Open circuit.

Initial Actions

- Check fuse F2 on Transformer.

Procedure

Disconnect the motor plug M4. Enter Service mode and start Length adjustment motor (TR-M4) in check motors. Measure between the orange wire M4 and the violet wire M4 (PWM 36V and ground). **The voltage is approximately 36 VDC?**

Y

Replace motor TR-M4.

N

Disconnect plug B.P2 from PCB "A". Measure between J2-2 and J2-9 (PWM 36V and ground). **The voltage is approximately 36 VDC?**

Y

Replace wire Harness.

N

Replace PCB "A".

TR-016

Fault Code TR-016, indicates that the Infeed switch (TR-S1) is faulty.

Initial Actions

- Make sure that the Infeed shaft and the Outfeed compressing bracket is in it's lower position.

Procedure

Enter the Service mode and select Infeed switch (TR-S1/S2/S3) in check switches. **The Infeed switch indicates D:1 activated, and D:0 deactivated?**

Y

Replace PCB "A".

N

Disconnect the two connectors to switch S1. Measure between the two connectors to switch S1 (5V and ground). **The voltage is approximately 5 VDC?**

Y

Replace Infeed switch (TR-S1).

N

1. Replace Control switch infeed (TR-S2) and Control switch outfeed (TR-S3).
2. Replace wire harness.
3. Replace PCB "A".

TR-017

Fault Code TR-017, indicates that the Outfeed sensor Trimmer (TR-Q6) is faulty.

Initial Actions

- Make sure that the Outfeed sensor Trimmer (TR-Q6) is installed correctly.

Procedure

1. Replace sensor TR-Q6.
2. Disconnect plug B.P13 from PCB “A”. Measure between J13-4 and J13-6 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB “A”.

Disconnect plug from sensor TR-Q6. Check wires for Continuity / Short circuit from, the white wire Q6 to B:P13-5. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug B.P13 to PCB “A”. Measure between the red wire Q6 and the black wire Q6 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB “A”.

TR-018

Fault Code TR-018, indicates that the Trim bin full sensor (TR-Q8) is faulty.

Initial Actions

- Make sure that the Trim bin full sensor (TR-Q8) is installed correctly.

Procedure

1. Replace sensor TR-Q8.
2. Disconnect plug B.P13 from PCB “A”. Measure between J13-10 and J13-12 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB “A”.

Disconnect plug from sensor TR-Q8. Check wires for Continuity / Short circuit from, the white wire Q8 to B:P13-11. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug B.P13 to PCB “A”. Measure between the red wire Q8 and the black wire Q8 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB “A”.

TR-150

Fault Code TR-150, indicates that the 36V input is low.

Procedure

Measure between P14-2 in the SR90. **The voltage is approximately 36V?**

Y **N**

Replace the SR90 Interlock PCB.

Measure between P14-7 and P14-8 in the SR90. **The voltage is approximately 36V?**

Y **N**

Replace the SR90 Interlock PCB.

Power off the machine. Remove the power cable between the booklet maker and the trimmer. Measure for continuity in the wires between Pin 1, 2, 7 and 8 on both ends of the cable. **Is there continuity between all cables?**

Y **N**

Replace the power cable between the SR90 and TR90.

Measure for continuity between J25-1 and P12-1, between J25-2 and P12-2. **Is there continuity in both cables?**

Y **N**

Replace wire harness.

Measure for continuity between J25-7 and P11-1, between J25-8 and P11-2. **Is there continuity in both cables?**

Y **N**

Replace wire harness.

Replace PCB “A”.

TR-201

Fault Code TR-201, indicates that during Run, the Infeed switch (TR-S1), was not blocked within timeout.

Initial Actions

- Check fuse F2 on Transformer.
- Make sure that the Infeed switch (TR-S1) is installed correctly.

Procedure

Enter the Service mode and select Infeed switch (TR-S1/S2/S3) in check switches. Activate, then deactivate, the TR-S1. **The Infeed switch (TR-S1) indicates :1 when the switch is activated and :0 when the switch is deactivated.**

Y **N**

Go to TR-016 fault code.

1. Make sure that the Exit guide bracket is installed as high as possible.
2. Make sure that nothing interferes with the paper path.

TR-202

Fault Code TR-202, indicates that at “initialization” or during Run, the Infeed switch (TR-S1), was blocked exceeding timeout.

Initial Actions

- Check fuse F2 on Transformer.
- Make sure that the Infeed switch (TR-S1) is installed correctly.

Procedure

Enter the Service mode and select Infeed switch (TR-S1/S2/S3) in check switches. Activate, then deactivate, the TR-S1. **The Infeed switch (TR-S1) indicates :1 when the sensor is activated and :0 when the switch is deactivated.**

Y **N**

Go to TR-016 fault code.

Make sure that nothing interferes with the paper path.

TR-203

Fault Code TR-203, indicates that during Run, the Outfeed sensor trimmer (TR-Q6), was not blocked within timeout.

Initial Actions

- Check fuse F2 on Transformer.
- Make sure that the Outfeed sensor trimmer (TR-Q6) is installed correctly.
- Ensure that the Outfeed sensor trimmer (TR-Q6) is clean.

Procedure

Enter the Service mode and select Outfeed sensor trimmer (TR-Q6) in check sensors. Block, then unblock, the TR-Q6 with a sheet of paper. **The Outfeed sensor trimmer (TR-Q6) sensor indicates :1 when the sensor is blocked and :0 when the sensor is not blocked.**

Y **N**

Go to TR-017 fault code.

Make sure that nothing interferes with the paper path.

TR-204

Fault Code TR-204, indicates that at “initialization” or during Run, the Outfeed sensor Trimmer (TR-Q6), was blocked exceeding timeout.

Initial Actions

- Check fuse F2 on Transformer.
- Make sure that the Outfeed sensor Trimmer (TR-Q6) is installed correctly.
- Ensure that the Outfeed sensor Trimmer (TR-Q6) is clean.

Procedure

Enter the Service mode and select Outfeed sensor Trimmer (TR-Q6) in check sensors. Block, then unblock, the TR-Q6 with a sheet of paper. **The Outfeed sensor Trimmer (TR-Q6) sensor indicates :1 when the sensor is blocked and :0 when the sensor is not blocked.**

Y **N**

Go to TR-017 fault code.

Make sure that nothing interferes with the paper path.

TR-401

Fault Code TR-401, indicates that the Trim bin is full, or that the Trim bin full sensor TR-Q8 is faulty.

Procedure

Is there something blocking the Trim bin full sensor TR-Q8?

Y **N**

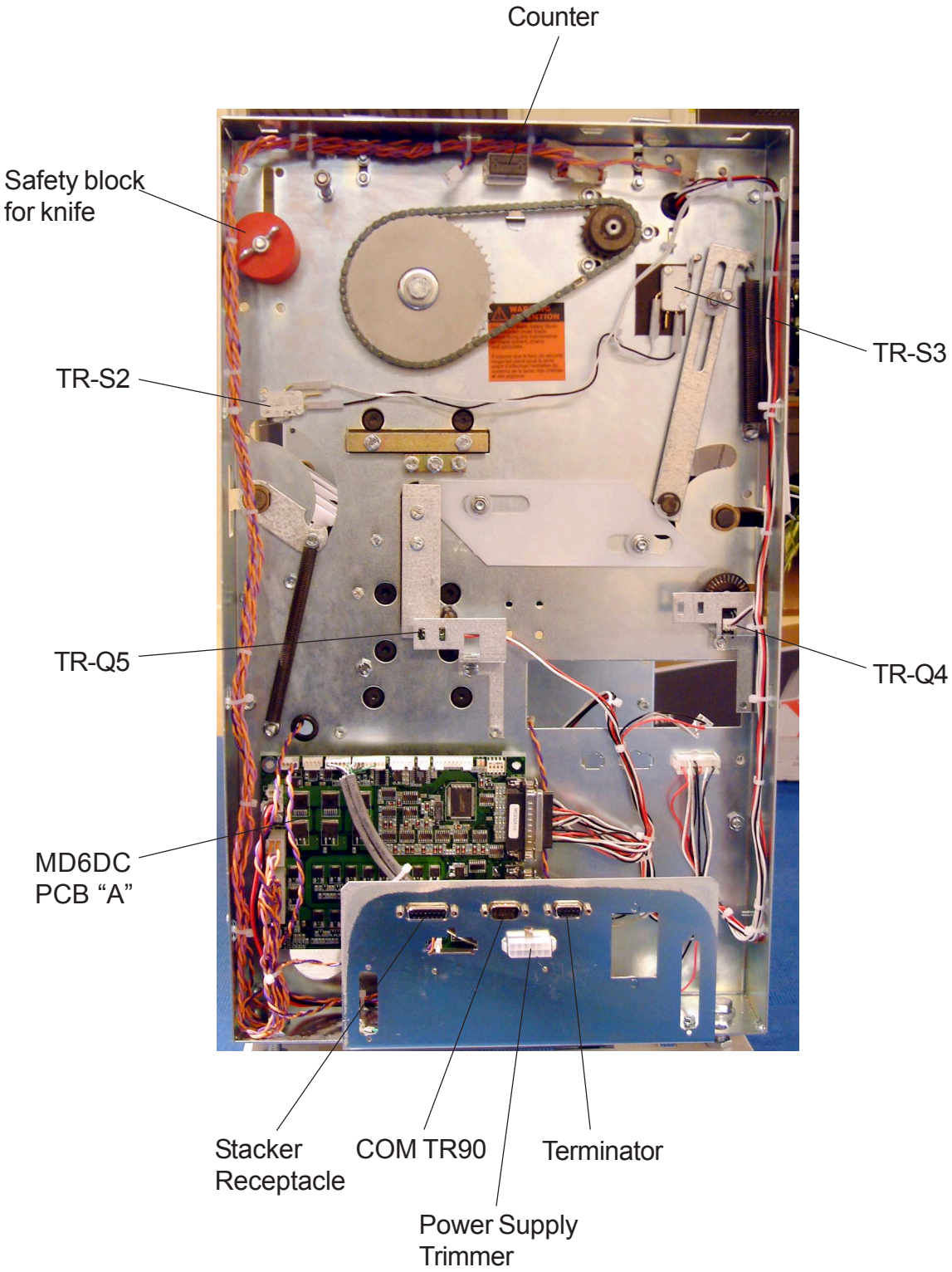
Go to TR-018 fault code.

Remove the object and empty the Trim bin.

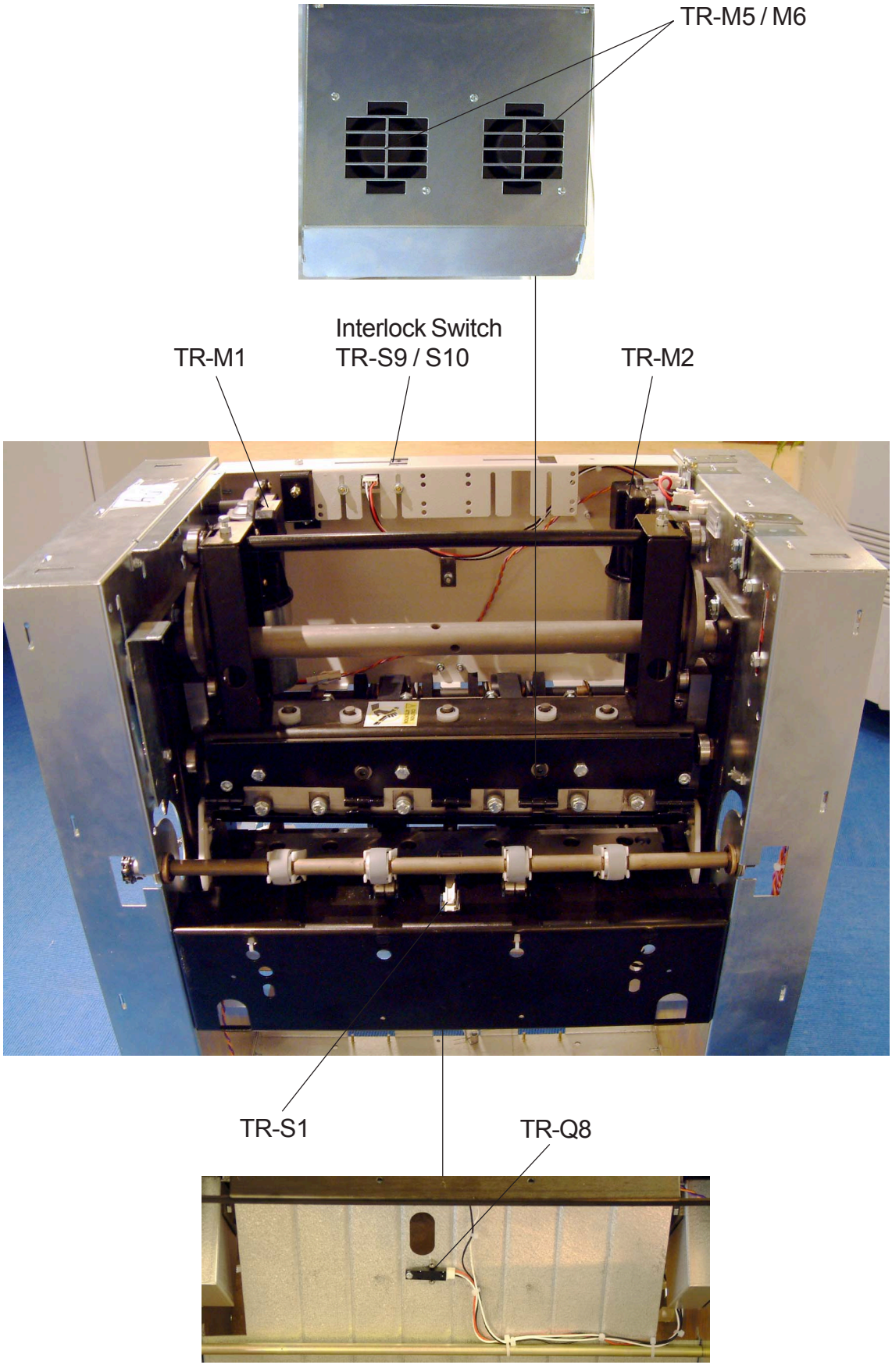
3. DETAILED SECTION DESCRIPTIONS

3.1 ELECTRICAL COMPONENT LIST

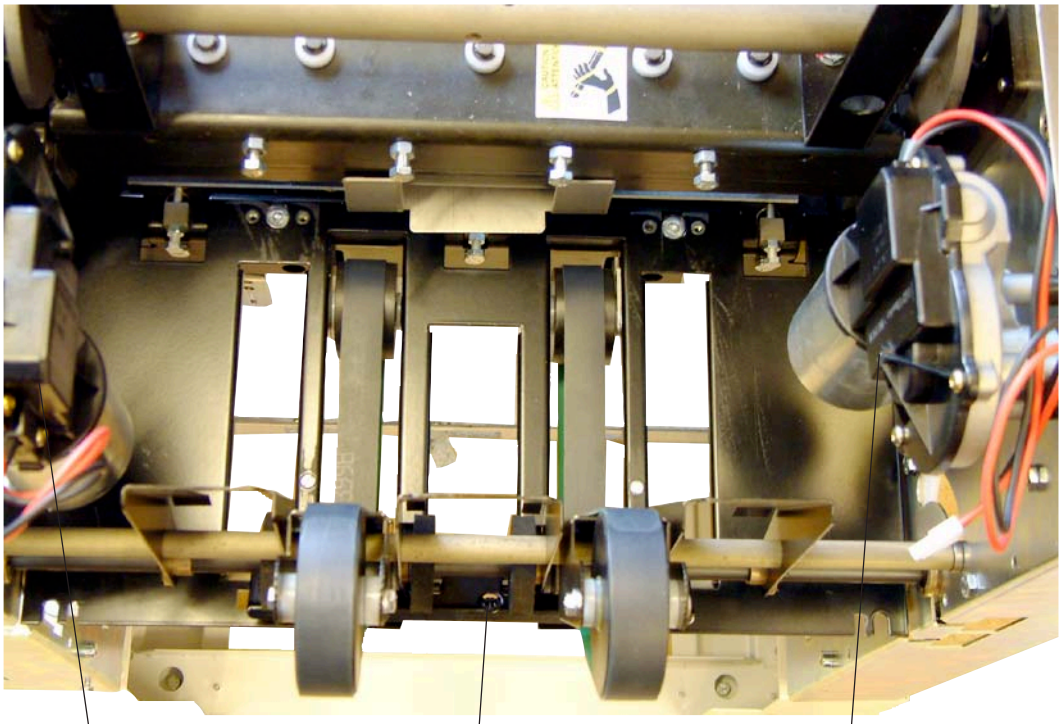
3.1.1 REAR VIEW



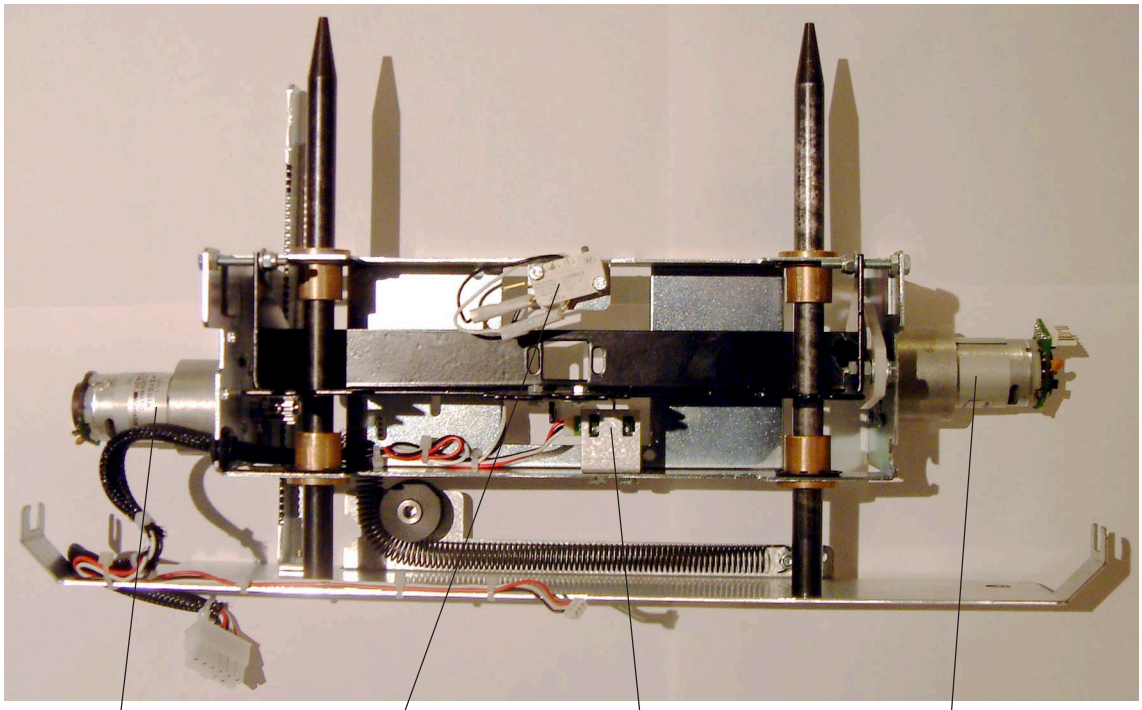
3.1.2 INFEED VIEW



3.1.3 OUTFEED VIEW

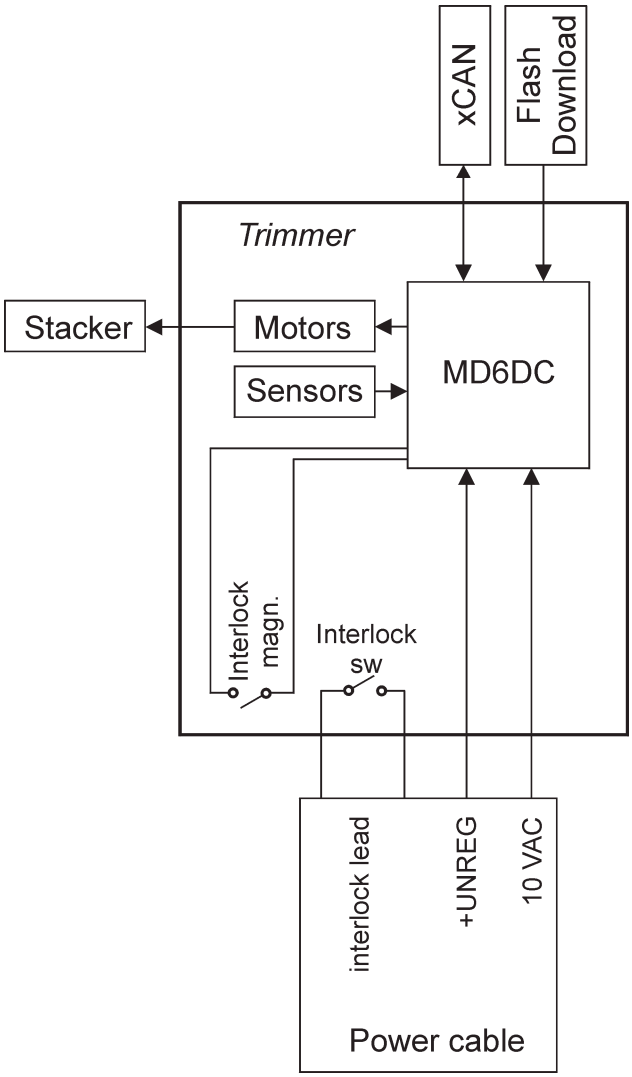


3.1.4 STOP CARRIAGE VIEW



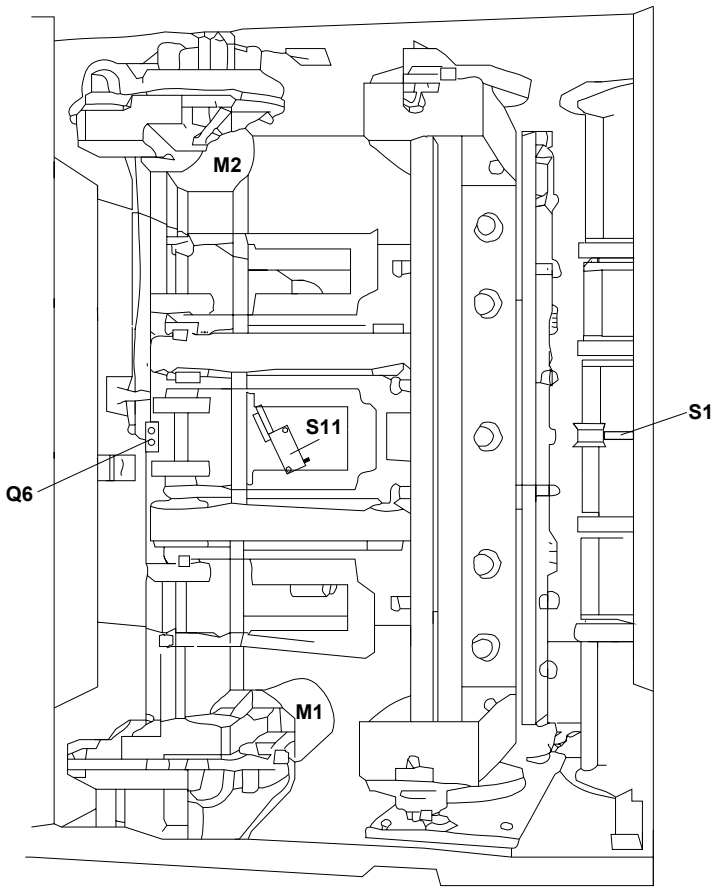
3.2 BOARD STRUCTURE

3.2.1 BLOCK DIAGRAM



3.3 TRIMMING PROCESS

3.3.1 PRINCIPLE OF OPERATION



Trimming

Booklet maker sends a start signal. The transport motor (TR-M1) starts and transports the booklet into the machine. The infeed switch (TR-S1) activates by the booklet. The booklet passes and deactivates the infeed switch (TR-S1). When the booklet hits the stop gate, the transport motor (TR-M1) stops. The timing is controlled by transport motor sensor (TR-Q4) and set by the paper size.
Trim knife motor (TR-M2) starts moving the knife down. After a while when knife is about to cut the sheets, transport motor (TR-M1) is triggered by knife position sensor (TR-Q5) to reverse and helps knife motor (TR-M2) during the cutting stroke. About the time when the knife has cut through the sheets, the stop gate motor (TR-M3) moves the stop gate down and the transport motor (TR-M1) reverses again to transport the set out of the machine. The knife motor complete its cycle and stops at the trim knife home position sensor (TR-Q5).
The stacker motor (ST-M1) starts when the outfeed sensor (TR-Q6) activates and runs for a short while to separate the booklets on the stacker belt. When outfeed sensor (TR-Q6) activates, stop gate motor (TR-M3) moves the stop gate to up position and is stopped by stop gate home position sensor (TR-Q7) activates.

3.3.2 SIZE ADJUSTMENT

Initialization cycle

Main power is switched on
Length adjustment motor (TR-M4) motor starts. The motor (TR-M4) moves the stop gate to the smallest booklet size.
The motor (TR-M4) stops when length adjustment home position switch (TR-S11) is activated.
When the switch(TR-S11) is activated, a counter for the motor (TR-M4) starts and the motor (TR-M4) reverses.
The motor (TR-M4) runs until* length adjustment motor sensor (TR-Q12) has counted the preset amount of pulses set by the paper size and trim length. The stop gate is now in correct position corresponding to the paper size and trim length selected.

Changing paper size

New paper size and or trim length is selected on the UI.
Length adjustment motor (TR-M4) starts. The motor (TR-M4) runs in the direction towards the new paper size. Length adjustment motor sensor (TR-Q12) counts pulses from the previous paper size to the new paper size and stops motor (TR-M4) when correct amount of pulses are received*. Stop gate is now in correct position corresponding to the new paper size selected.

If paper jam occurs

If top cover is opened and closed:
Stop gate motor (TR-M3) moves the stop gate down. Length adjustment motor (TR-M4) moves the stop gate to the smallest booklet size.
The motor (TR-M4) stops when length adjustment home position switch (TR-S11) is activated. Transport motor (TR-M1) starts to purge sets out of the machine and stops after a while.
Length adjustment motor (TR-M4) reverses and start counting pulses from home position switch (TR-S11).
The motor (TR-M4) runs until* length adjustment motor sensor (TR-Q12) has counted the preset amount of pulses set by the paper size and trim length. The stop gate is now back in correct position corresponding to the paper size and trim length selected. Stop gate motor (TR-M3) moves the stop gate up and stops by stop gate home position sensor (TR-Q7).

** Length adjustment motor (TR-M4) actually passes the stop position slightly, reverses slightly pass the point and reverses again for the last time to stop at the exact position, to take out any play.*