

MAC 2000 Wash

service manual



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Risk of electrical shock

Always disconnect the fixture from AC power before and while servicing.

Removal of any cover exposes connectors that carry lethal electric currents. While working on a fixture under power:

- Make sure the fixture is electrically grounded.
- Use a supply with ground-fault-interrupt protection.
- Never touch any connector that carries voltage.
- Be careful with tools that conduct electricity.

Risk of UV radiation and lamp explosion

Discharge lamps emit harmful ultraviolet (UV) light that can cause eye and skin burns through direct exposure. They also work under high pressure that occasionally causes

them to explode. To eliminate the risk of injury from the discharge lamp,

- Never operate the lamp with covers or lenses removed.
- Do not look directly into the light.

Electrostatic discharge

Printed circuit boards (PCBs), individual ICs, and Hall sensors can be damaged by electrostatic discharge (ESD). To avoid damaging these ESD sensitive parts:

- Ensure that you and your tools have the same potential (ground) as the fixture before and when handling any of the above components.
- Store PCBs in antistatic (electrically conducting) bags and store ICs in antistatic foam.
- Power off the fixture and allow capacitors do discharge before removing or inserting components on the PCB.

Inductive loads

Power off the MAC 2000 Wash before connecting or disconnecting step motors. Failure to do so can damage the motor drivers.

Threadlock

Threadlock is highly recommended on all machine screws except self-tapping (Taptite) screws to prevent loosening. Threadlock should be reapplied if the screws are removed.

Two types of threadlock are available from Martin. For set screws, use Loctite 290, P/N 37020002. For all other screws, use Loctite 243, P/N 37021002. Both come in 10 ml tubes.

Be careful to avoid getting any material on shafts or axles. A needle and syringe makes an idea application tool.

Long set screws: Start the screw and turn it until it contacts the shaft. Back the screw 2 turns, apply a small drop or 2 of Loctite 290 to the threads, and then tighten the screw as you normally would.

Short set screws: Back the set screw out of the adaptor until 2 threads stick out of the shaft. Apply a small drop or 2 of Loctite 290

to the threads, and then tighten the screw within 60 minutes.

Other metric screws: Apply a drop of Loctite 243 (blue) to 3 or 4 threads, or spread a thin stripe with a syringe, before starting the screw.

Self-tapping screws

The reuse of self-tapping “Taptite” screws is not recommended as these screws are designed to cut threads and can strip existing threads when reinserted. Change to metric hardware of the same size when reinstalling parts originally held with Taptites.

If installing a new part without threads, use new self-tapping screws. Do not use old taptites to cut new threads!

Lubrication

Silicone grease, P/N 37302002, “Silicon grease, clear, 100g”, is used, for example, to lubricate brass bushings inside of pulleys and between moving metal plates such as the motor bracket for color wheel 1 on the MAC 2000 Wash.

Slides are generally lubricated with the high viscosity silicone oil, P/N 37302005, “High viscosity silicone oil, 200 ml, in applicator bottle.”

Bearings are lubricated with P/N 37302004, “Silicone oil, 200 ml, in applicator bottle”.

Zoom module, remove

The color wheel module remains attached to the zoom module in this procedure.

1 Remove the top and bottom head covers and the front lens. Fully back out the thumbscrew for the lens retaining wire.

2 Unplug cables from the outside row of the left-side zoom module junction print. Unplug the unlabeled 2-pin connector from socket 38.

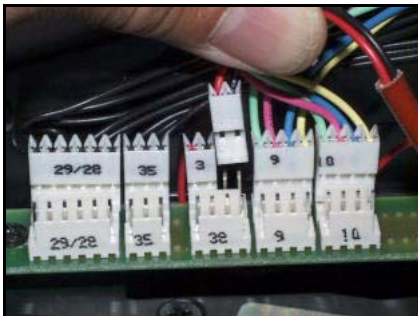


Fig. 1. Unplug left junction print

3 Unplug the wires from the outside row of the right-side zoom module junction print. Unplug connectors 42, 23, and the unlabeled 2-pin fan plug from the inside row.



Fig. 2. Unplug right junction print

4 Unplug the wires from the back row of the CMYC module junction print and the thermo-sensor, which is in front of the junction print.

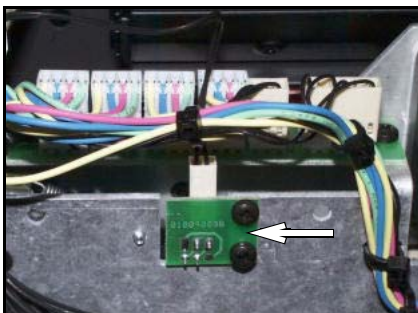


Fig. 3. CMYC thermo-sensor PCB

5 Unplug connector 16 from the dimmer junction print.

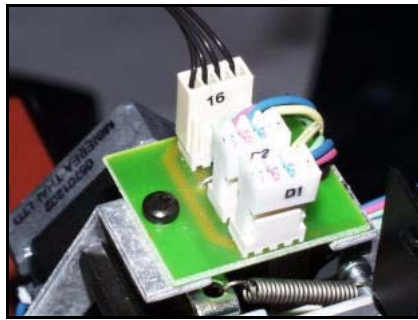


Fig. 4. Dimmer junction PCB

6 Remove the 4 zoom module fastening screws.

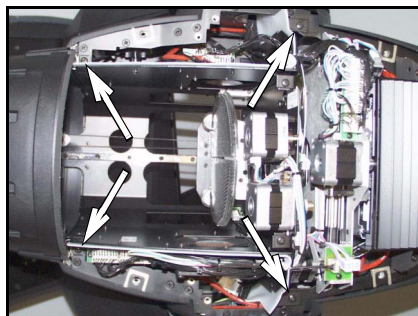


Fig. 5. Zoom module screws

7 Pull the zoom module (and attached color wheel module) up, out of the head.

Zoom module, install

1 Lock the head in the horizontal, top up position.

2 Place the ends of the wire bundles outside of the head, forward of the yoke.

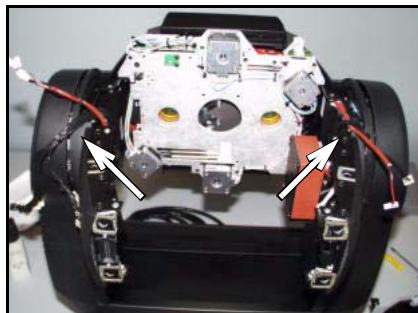


Fig. 6. Place wires forward of yoke

3 Lower the module into the chassis, working it past each "sticking point" in turn. Fasten.

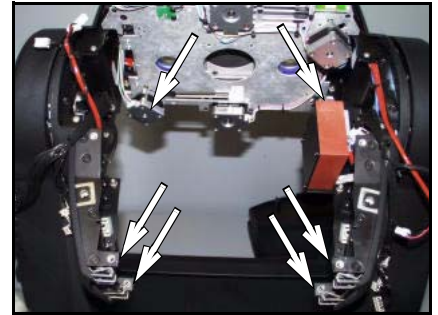


Fig. 7. "Sticking points"

4 Reconnect the wires to the left and right junction prints.

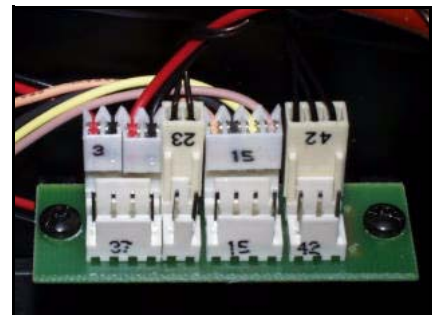


Fig. 8. Right junction connections

5 Plug connector 16 into the dimmer junction print. (Fig. 4.)

6 Insert the CMYC wire bundle into the slot in the zoom module. Connect the wires to the junction print. Secure the bundle under the flexible tie.

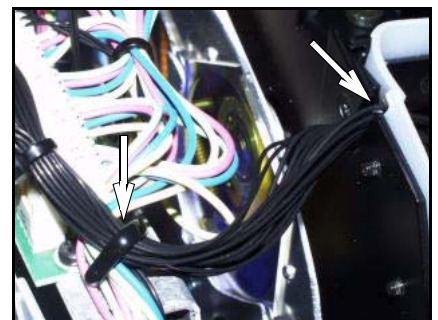


Fig. 9. CMYC wire bundle path

Zoom belt, replace

- 1 Remove the zoom module. (p. 2)
- 2 Remove the belt clamp screws.

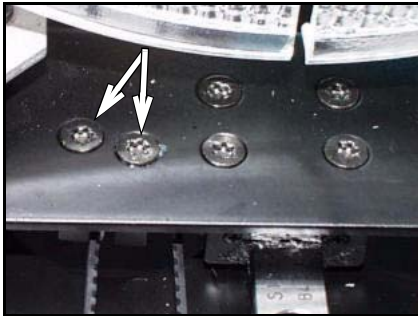


Fig. 10. Belt clamp screws

- 3 Loosen the set screws and remove the belt clamp from the belt.
- 4 Flip the module over and loosen the zoom motor screws. Push the motor in to loosen and remove the old belt.

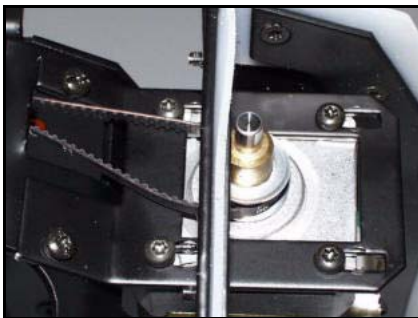


Fig. 11. Loosen the belt

- 5 Pull the belt tension pulley forward and loop the new belt over it as shown in Fig. 12.

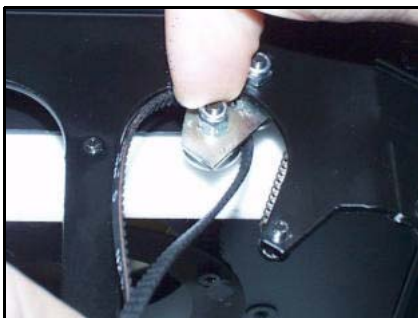


Fig. 12. Loop belt over tensioner

- 6 Lead the belt to the motor and loop it over the gear. Loop the other end of the belt over the front pulley.

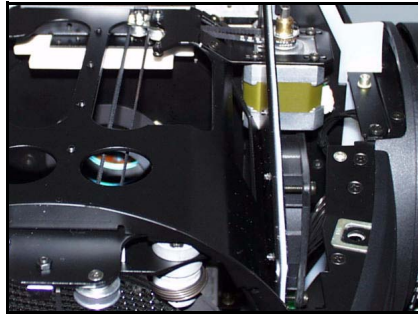


Fig. 13. Zoom belt

- 7 Tighten the belt by moving the zoom motor back until the tension pulley starts to move. Tighten the motor screws.

- 8 Place the belt clamp on the belt with the set screws inside the loop and the small bar between the belt and the screws. Tighten the set screws.

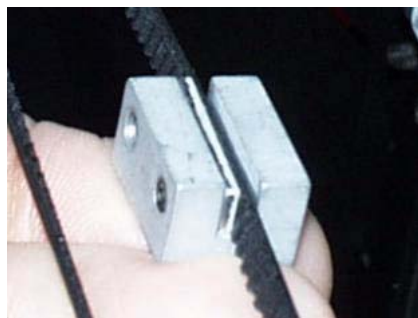


Fig. 14. Belt clamp

- 9 Fasten the belt clamp to the lens car.
- 10 Install the zoom module. (p. 2)

Zoom motor, replace

- 1 Remove the zoom module. (p. 2)
- 2 Unplug the motor wires and remove the motor screws. Loosen the bracket enough to remove the motor.



Fig. 15. Loosen bracket to remove motor

- 3 Transfer the gear to the new motor with 0.6 mm (0.025 in.) clearance between the motor and the gear. Tighten the set screw.



Fig. 16. 0.6 mm (0.025 in.)

- 4 Position the motor in the bracket with the socket facing out. Tighten the bracket screws. Start the motor screws but do not tighten.

- 5 Place the belt over the gear. Push the motor out to tighten the belt until the tension pulley just begins to move. Tighten the motor screws.

- 6 Plug in the motor wires.
- 7 Install the zoom module. (p. 2)

Zoom lens assembly, replace

When removing the zoom car, do not remove the slide from the rail.

- 1 Remove the zoom module. (p. 2)
- 2 Remove the belt clamp screws. (Fig. 10.)
- 3 Remove the 4 screws that fasten the zoom car to the zoom slide. *Do not remove the slide from the rail.*



Fig. 17. Do not remove slide from rail

- 4 Fasten the replacement zoom lens assembly to the slide.
- 5 Fasten the belt clamp.
- 6 Install the zoom module. (p. 2)

Zoom rail, replace

- 1 Remove the zoom lens assembly. (p. 3)
- 2 Separate the color wheel module from the zoom module. (p. 4)
- 3 Remove the white plastic plate at the back of the module.



Fig. 18. Zoom lens car stop

- 4 Unscrew and remove the zoom rail.
- 5 Starting with the third hole from the front, fasten the new zoom rail to the zoom module with 5 M3x6 panhead Torx screws, P/N 08050702.
- 6 Place the stand-off on the M3x12 panhead Torx screw and insert the screw through the first hole in the rail. Fasten with an M3 nut.

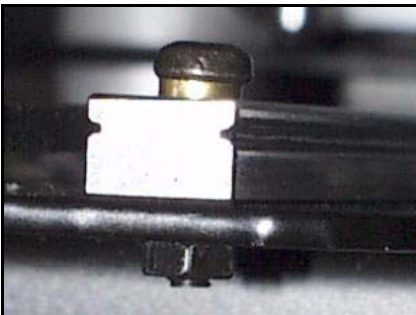


Fig. 19. Zoom slide stop

- 7 Install the zoom lens car stop. (Fig. 18.)
- 8 Install the color wheel module. (p. 6)
- 9 Install the zoom lens assembly. (p. 3)
- 10 Install the zoom module. (p. 2)

CMYC module, remove

- 1 Remove the zoom module. (p. 2)
- 2 Remove the module fastening screws: there are two on the top and two on the bottom.



Fig. 20. 1 of 4 CMYC module screws

- 3 Slide the module forward as far as it will go, then lift it out of the top of the head.

CMYC module, install

- 1 Lock the head in the horizontal, top up position.
- 2 Move the wire bundles forward and out of the way.
- 3 Orient the module with the junction print up and to the right. Lower the module into the chassis at an angle. Square the module with the flaps over the chassis and slide it back as far as it will go. Align the screw holes and fasten at the top and bottom.

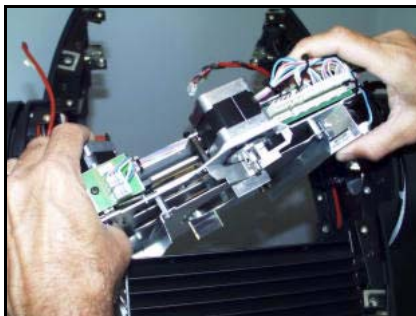


Fig. 21. Insert module at an angle

- 4 Install the zoom module. (p. 2)

Color wheel module, remove



Fig. 22. Color wheels 1 & 2

- 1 Remove the top head shell.
- 2 Disconnect plugs 28/29, 9, and 10 from the inside row of the left-side zoom module junction print. (Fig. 1.)
- 3 Remove the color module attachment screws and separate the color wheel module from the zoom module.

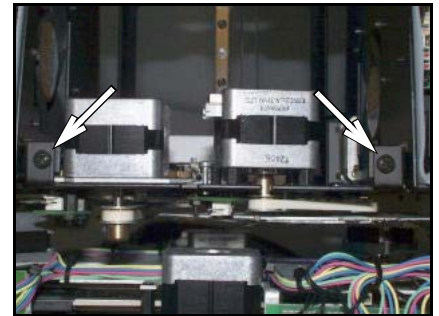


Fig. 23. Color module screws

Color wheel 1 belt, replace

- 1 Remove the top head shell.
- 2 Press the motor down to release belt tension. Remove the old belt and install a new one.

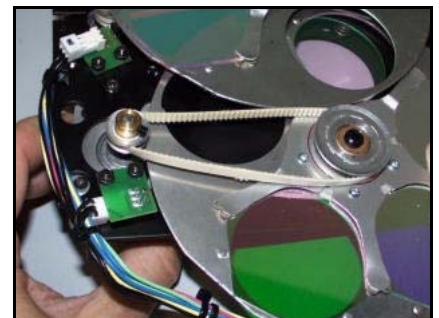


Fig. 24. Release belt tension

Color wheel 1 motor, replace

- 1 Remove the color wheel module. (p. 4)
- 2 Release belt tension and slip the belt off the motor gear. (Fig. 24.)
- 3 Remove the sensor print to access the screw underneath. Remove the screws that fasten the motor bracket to the module plate.

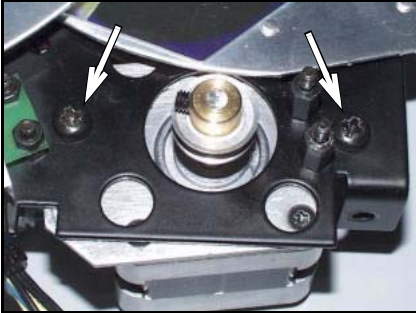


Fig. 25. Motor bracket screws

- 4 Unhook the spring from the motor bracket. (Fig. 28.)
- 5 Transfer the gear (or install a new one) to the shaft of the replacement motor with 10 mm clearance between the bottom of the gear and the face of the motor. Tighten the set-screw. (No further adjustment is required.)

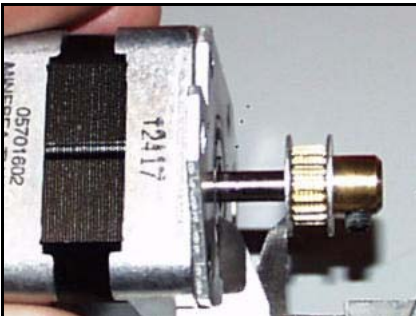


Fig. 26. 10 mm clearance

- 6 Transfer the mounting bracket to the new motor. Do not open the new motor!



Fig. 27. Motor and bracket

- 7 Apply a drop or two of silicone grease (P/N 37302002) to the motor bracket. Attach the bracket to the plate with metric screws and bushings.

- 8 Hook the tension spring onto the motor bracket and connect the motor wires.



Fig. 28. Color wheel 1 motor

- 9 Reinstall and connect the Hall sensor circuit board.
- 10 Reinstall the drive belt.
- 11 Install the color wheel module. (p. 6)

Color wheel 2 belt, replace

- 1 Remove the color wheel module. (p. 4)
- 2 Unscrew and remove the wheel.
- 3 Remove the old belt. Place the new belt over the motor gear and the axle.



Fig. 29. Color wheel 2 belt

- 4 Reinstall the color wheel and loop the belt onto the color wheel gear.
- 5 Place the open position over the tension pulley, pull the pulley in, and loop the belt over the pulley.
- 6 Install the color wheel module.

Color wheel 2 motor, replace

- 1 Remove the color wheel module.
- 2 Remove the belt from the tension pulley and motor gear.
- 3 Unscrew and unplug the old motor.
- 4 Transfer the standoffs to the replacement motor. Do not open the new motor!
- 5 Transfer the gear (or install a new one) to the shaft of the replacement motor with 1.1 mm clearance between the bottom of the gear and the face of the motor and tighten the set-screw. (No further adjustment is required.)
- 6 Place the motor on the plate with the socket towards the other motor. Fasten with 4 M3x6 mm countersunk screws. Plug in the wires.

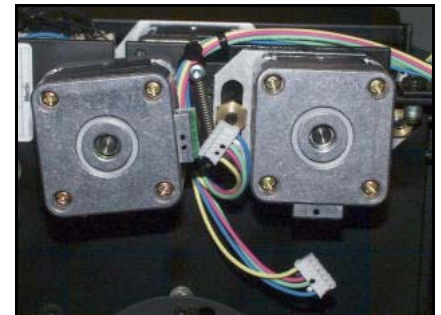


Fig. 30. Color wheel motors

- 7 Loop the belt over the motor gear and tension pulley. Verify that the wheel turns smoothly without binding.
- 8 Install the color wheel module. (p. 6)

Color wheels, adjust

The color wheels are magnetically indexed using a routine that does not require mechanical adjustment.

If the wheels are not centered in the optical path, the Hall sensor IC is probably bent out of position. The problem can be solved by entering a position offset in the calibration menu. In extreme cases it may be necessary to move the sensor IC.

Color wheel module, install

1 Insert the module in the head, making sure that the bottom flaps straddle the chassis plate. Fasten.

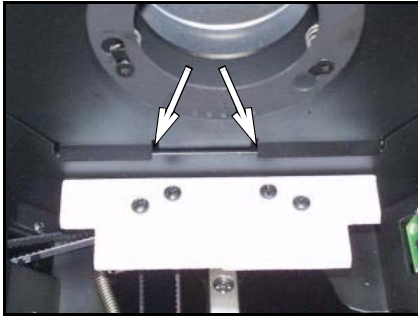


Fig. 31. Bottom flaps straddle plate

2 Connect plugs 28/29, 9, and 10 to the inside row of the left-side zoom module junction print. (Fig. 1.)

Head side covers, remove and install

1 Remove the screws that fasten the cover: each cover has two screws.

2 Pull front covers straight out to remove. The rear covers must be pulled out 1 cm at the back before pulling back.

3 When reinstalling the front covers, verify that the air filter lies flat.

4 When reinstalling the rear covers, it helps to tilt the head down.

Effect fans, replace

1 Remove the zoom module. (p. 2)

2 Unplug, unscrew, and remove the defective fan.

3 Install the replacement fan with the air-flow arrow pointing in. To avoid stripping the threads, use M4x30 metric screws (P/N 008070410) instead of the original tapites.

4 If replacing the left fan, connect the plug to the front 2 pins of socket 38. (Fig. 1.)

5 If replacing the right fan, connect the plug to the rear 2 pins of socket 37. (Fig. 8.)

6 Install the zoom module. (p. 2)

Left lamp fan, replace

1 Remove the zoom module (p. 2) and CMYC module (p. 4). Remove the left-rear side cover. (p. 6)

2 Cut the cable tie if required to access the lower fan screw. Remove the fan attachment screws.

3 Work the fan assembly free of the reflector housing.

4 Remove the metal heat shield and the ceramic insulation from the old fan.

5 Cut cable ties as required and free the fan cable. Remove the fan.

6 Prepare the new fan. Cut a piece of foil backing (P/N 33002002) to fit and apply it to the back of the fan. Place a 40 cm (16 in.) length of sleeve over the leads, cut the leads to length, and install a 2-pole plug.

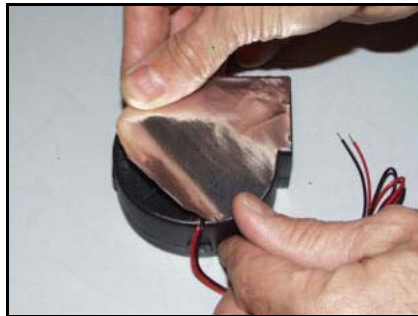


Fig. 32. Apply foil to fan

7 Install the insulation and heat shield on the foil-backed side of the prepared fan.



Fig. 33. Fan heat shield and insulation

8 Work the fan assembly back into place and fasten.

9 Lead the fan cable forward, through the holes in the side chassis. Slide the

cable insulation fully back to the fan and then retie the bundle above the starter.

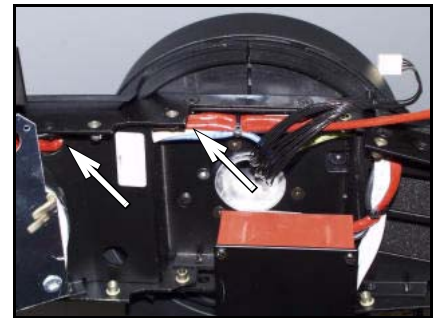


Fig. 34. Cable path

10 Replace the cable tie at the bottom fan screw. Keep the wires and thermo-switch clear of the fan to maintain maximum airflow.

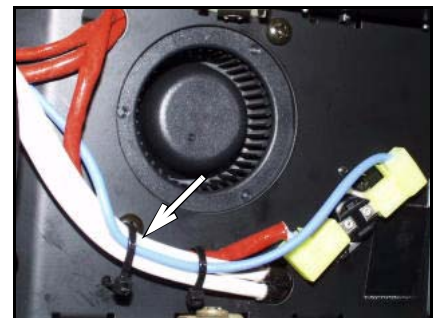


Fig. 35. Tie bundle at bottom screw

Right lamp fan, replace

1 Remove the zoom module (p. 2) and CMYC module (p. 4). Remove the front and rear covers from the right side of the head. (p. 6)

2 Remove the fan attachment screws.

3 Work the fan assembly free of the reflector housing. Though the fit is tight, it should not be necessary to loosen or remove the reflector housing.

4 Unplug the thermo-switch.

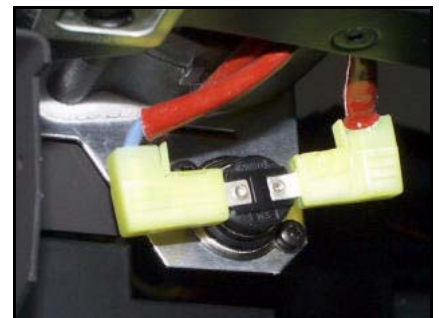


Fig. 36. Thermo-switch connections

5 Cut cable ties as required and remove the old fan cable. Remove the fan assembly from the head.

6 Prepare the new fan. Cut a piece of foil backing (P/N 33002002) to fit and apply it to the back of the fan. (Fig. 32.) Place a 40 cm (16 in.) length of sleeve over the leads, cut the leads to length, and install a 2-pole plug.

7 Remove the old fan from the heat shield and install the new fan.

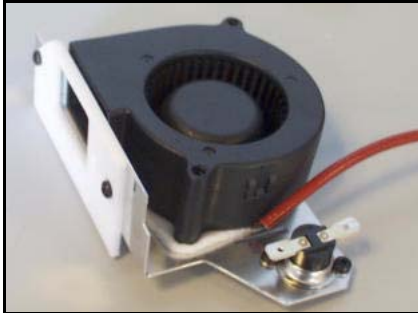


Fig. 37. Right lamp fan assembly

8 Lead the fan cable out through hole 1, in through hole 2, under the wire bundle, and out through hole 3 as shown in Fig. 38.

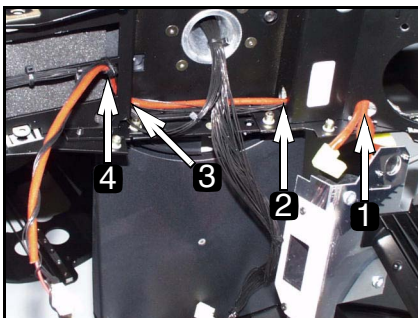


Fig. 38. Right fan cable path

9 Connect the thermo-switch leads.

10 Work the fan assembly into position, align the screw holes, and fasten.

11 Pull slack in the fan cable towards the front. Gather the fan cable together with the cables labeled '42' and '23' and tie at point 4 in Fig. 38. Wrap the black wires around the fan cable a few times to hold them together. Replace any other cable ties that you removed.

12 Verify that the openings in the plate around the fan are sealed with high-temperature polyester electrical tape.

13 Reassemble the head.

Heat filter assembly, remove & install

1 Remove the zoom module (p. 2) and CMYC module (p. 4).

2 Bend open the cable retention tabs and move the cables out of the way.



Fig. 39. Move wires out of way

3 Remove the four heat filter module screws and remove the module.

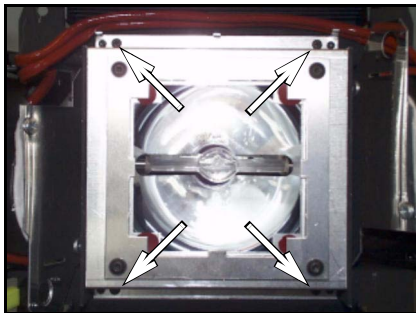


Fig. 40. Module attachment screws

4 Installation is the reverse.

Heat filter, replace

1 Remove the heat filter assembly. (p. 7)

2 Remove the damaged filter(s). Clean and degrease the metal plates with an alcohol cleaner.

3 Apply a dab of red, high temperature silicone adhesive about the size of a 1 mm ball on each corner of the heat

filter holder. Place the middle frame on the holder and align the screw holes.

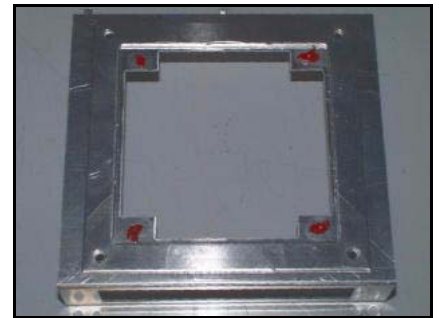


Fig. 41. Apply adhesive

4 Place the heat filter glass inside the middle frame with the coated side down (towards the lamp) and with the long edge parallel to the bent sides of the filter holder. (To find the coated side, hold the filter up to a source of light. When the coated side is up, the edges of the glass have a reddish tint. When the coated side is down, the edges have a more gray or black appearance.)

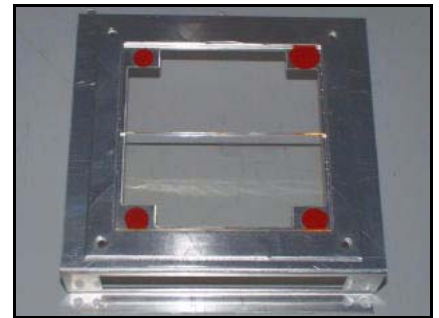


Fig. 42. Insert glass filters

5 Place the top frame over the glass and fasten with four screws (4.2x13 self-tap, Torx, black).

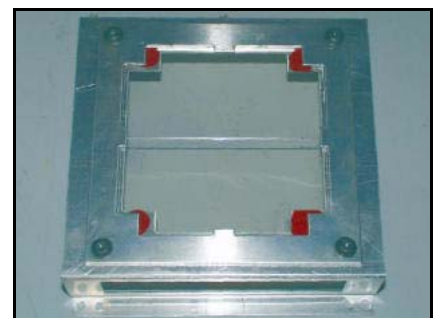


Fig. 43. Install top frame

6 Remove any excess glue that extends beyond the metal corners and clean the glass.

7 Reinstall the heat filter assembly. Allow the glue to harden for at least 12 hours before use.

Reflector, replace

- 1 Remove the heat filter assembly. (p. 7)
- 2 Remove the outer screws from the reflector spring clips, loosen the inner screws, and turn the clips away from the rim.



Fig. 44. Turn clips to free reflector

- 3 Remove the reflector and install the replacement, carefully aligning the opening with the lamp.
- 4 Secure the reflector with the spring clips. Tighten all 8 screws and verify that the reflector cannot turn.
- 5 Reassemble.

Starter, replace

- 1 Remove the zoom module (p. 2), CMYC module (p. 4), and the front and rear left-side head covers (p. 6).
- 2 Remove the lamp.
- 3 Turn the lamp in/out adjustment screw fully counterclockwise.



Fig. 45. Turn fully CCW

- 4 Pry the lamp socket assembly off the lamp access plate.



Fig. 46. Pry out the adjustment plate

- 5 Remove the starter wires from the lamp socket terminals.
- 6 Loosen the wire clamp at the base of the lamp access plate by removing one of the push-on fasteners.

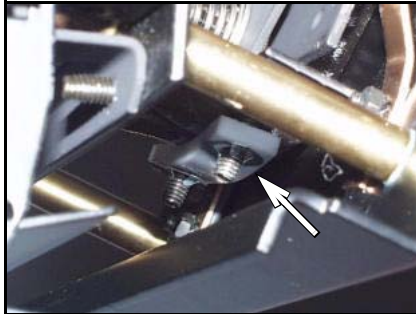


Fig. 47. Loosen the cable clamp

- 7 Pull the wires back to the starter, cutting cable ties as you go.
- 8 Unscrew, unplug, and remove the starter.

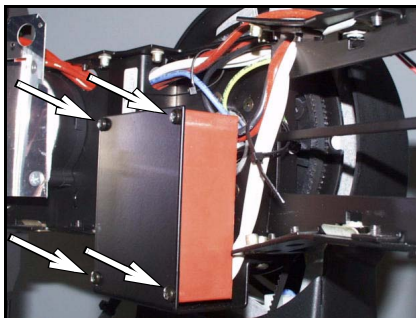


Fig. 48. Starter screws

- 9 Plug in the replacement starter and fasten it to the bracket with the lamp wires towards the front and bottom. Lead the wires up, through the hole in the top of the chassis, and towards the back as shown in Fig. 48.

- 10 Place a 30 cm (12 in.) length of 6 mm sleeve (P/N 15802007) on each lamp wire. Insert the lamp wires through the hole under the thermo-switch and

- pull them out at the back. Adjust the sleeve as shown in Fig. 49..

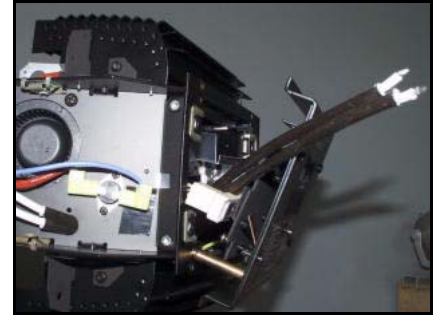


Fig. 49. Lamp wires with sleeve

- 11 Lead the wires up through the hole in the lamp access plate and then to either side. The lamp wires are not polarized.

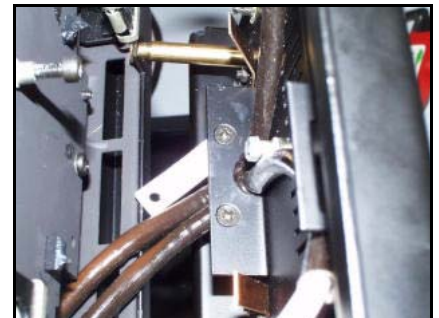


Fig. 50. Lamp wires at access plate

- 12 Connect the lamp wires to the lamp socket terminals. Make sure the connections are secure.

- 13 Snap the lamp socket and adjustment assembly back into place.

- 14 Gather the white lamp wires together with the black and blue starter wires and tie them to the chassis at point 1 in Fig. 51. Tie the wires that lead to the back at point 2.

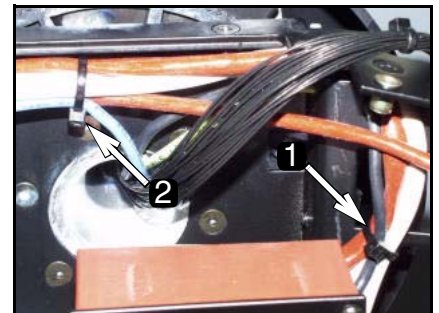


Fig. 51. Tie starter wires

- 15 Tie the wires under the left fan as shown in Fig. 52. Keep the wires and

thermo-switch clear of the fan to maintain maximum airflow.



Fig. 52. Cable ties at left fan

16 Adjust the wires for a neat lead at the lamp socket.

17 Place the cable clamp over both screws and secure with a push-on fastener. (Fig. 47.)

18 Reassemble the fixture and install the lamp.

19 Adjust the lamp as described in the user manual

Dimmer blades, replace & adjust

- 1** Remove the CMYC module. (p. 4)
- 2** Remove the heat shield on the back (lamp side) of the module.



Fig. 53. Heat shield

- 3** Remove the V-shaped plate over the top dimmer. (The top of the module is the side with the junction print.)

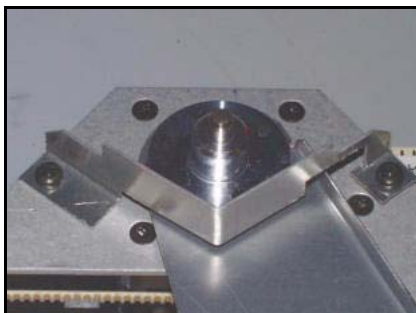


Fig. 54. V-plate over top dimmer

- 4** Loosen the shaft adaptor set screws and remove the dimmer blades.

- 5** Remove any nicks or burrs from the motor shaft with fine sandpaper.



Fig. 55. Remove burrs

- 6** Install a replacement dimmer blade on the top motor with a gap of 1.5 mm between the module plate and the

inside (black) face of the blade. Slightly tighten a set screw to hold the position.

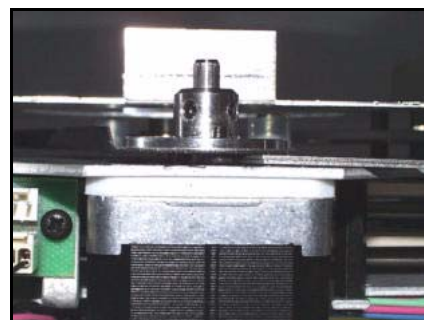


Fig. 56. Top blade spacing: 1.5 mm

- 7** Install a replacement dimmer blade on the bottom motor with a distance of 7 mm from the module plate to the outside face of the shaft adaptor. Slightly tighten a set screw to hold the position.

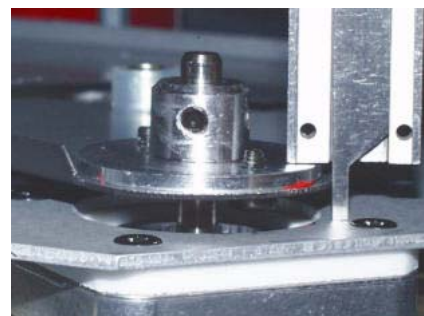


Fig. 57. Bottom blade spacing: 7 mm

- 8** Connect a 4-pole motor extension cable to dimmer junction PCB, and cable 16 in the head or the dimmer output on the PCB. Apply power and cancel pan/tilt reset from the control panel.



Fig. 58. Cancel P/T reset

- 9** When the reset is complete, select UTIL>AdJ>HEAd>dIM>AdJ (dimmer adjustment position) from the menu.

Press each blade against its stop and tighten the set screws.

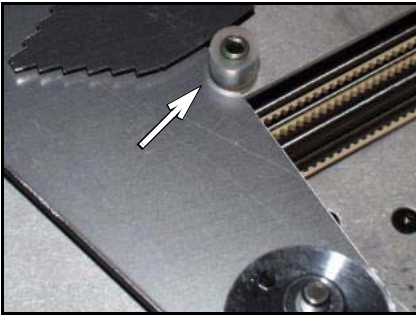


Fig. 59. Press blade against stop

- 10 Select STRO (strobe) from the menu and check dimmer movement.
- 11 Switch off the fixture and disconnect the motor extension cable.
- 12 Reinstall the V-shaped plate and the heat shield.
- 13 Reassemble.

Dimmer motor, replace

- 1 Remove the dimmer blade as described under "Dimmer blades, replace & adjust" on page 9.
- 2 Unplug and remove the motor.
- 3 Place the spacer on the face of the replacement motor and install with the plug oriented as shown. Connect.



Fig. 60. Dimmer motor orientation

- 4 Install and adjust the dimmer blade. (p. 9)

CMYC module, separate

- 1 Remove the CMYC module. (p. 4)
- 2 Remove the heat shield (Fig. 53.) and the V-plate over the top dimmer blade (Fig. 54.).
- 3 From the dimmer side of the module, remove the 8 screws that fasten the module plate to the stand-offs.

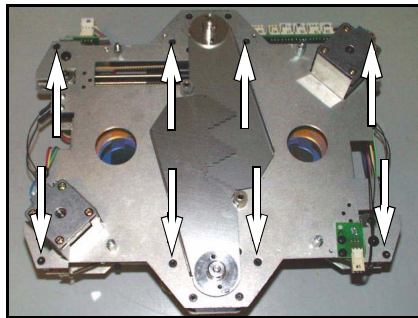


Fig. 61. Stand-off screws

- 4 Unplug the dimmer motors, the light sensor (41), the cyan and magenta motors, and the microswitches on the dimmer half of the module.



Fig. 62. Unplug light sensor

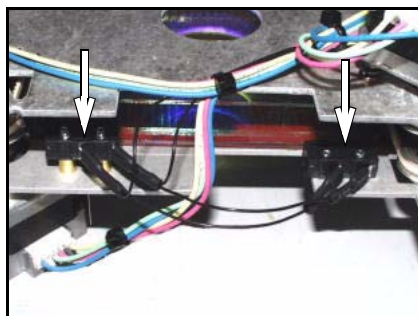


Fig. 63. Unplug microswitches

- 5 Separate the module into 2 parts.

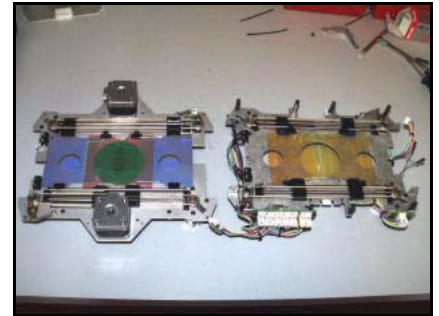


Fig. 64. Separate into 2 parts

- 6 Assembly is the reverse.

CMYC belts and flags, replace

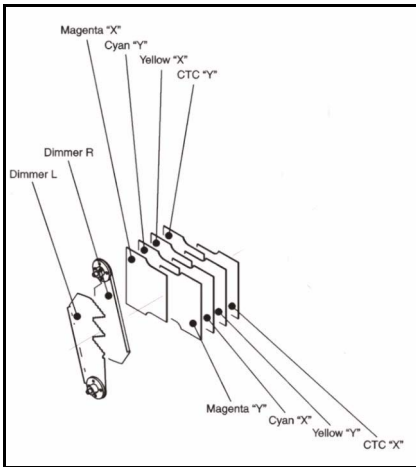


Fig. 65. Color flag order

- 1 Remove and separate the CMYC module. (p. 10)
- 2 Place the module half that needs servicing on a clean surface with the filters up.
- 3 Starting with the top set of filters (cyan or yellow), release tension and lift the belt off the pulleys.



Fig. 66. Remove belt

- 4 Gently pry the drive rail out of its clip on one end. Pull the rail lengthwise out of the other clip.

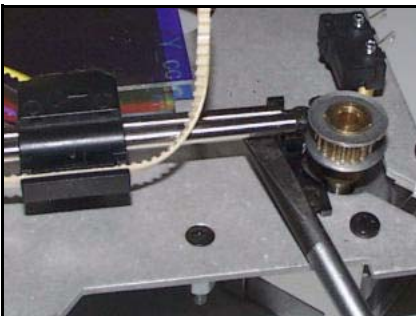


Fig. 67. Gently pry out drive rail

- 5 Lift the drive rail, filters, and belt out of the assembly.

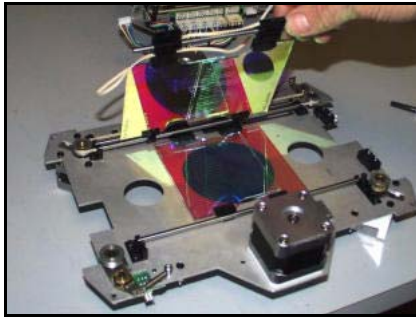


Fig. 68. Remove flags, rail, & belt

- 6 If you need to remove the bottom set of filters (magenta or CTC), first remove the idle rail for the top filters. Then repeat steps 3, 4, and 5 to remove the bottom filters.

- 7 If replacing the belt or filters, unlock and remove the belt clamp from each slide. Remove the belt.

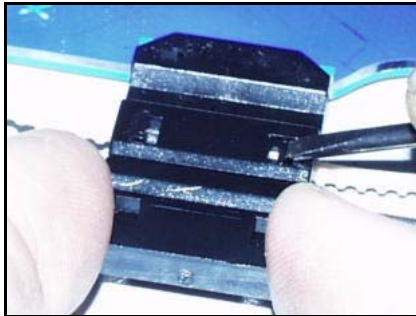


Fig. 69. Remove clamp from slide

- 8 Clean the rails and lubricate with a drop of high viscosity silicone oil.
- 9 Slide the flags onto the rail with the coated (text true) sides facing each other.
- 10 **Magenta and CTC only:** Clamp the belt to the *inside* slot of the *Y* slide.

Lay the flag pair on the rails with the Y filter on top. Skip to step 12.

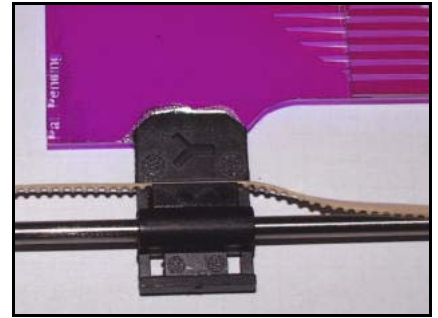


Fig. 70. Clamp belt to inside of Y slide

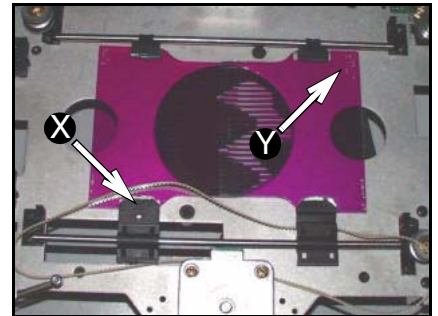


Fig. 71. Y filter on top

- 11 **Cyan and yellow only:** Clamp the belt to the *inside* slot of the *X* slide. Position the flag pair in the module with the X filter on top. Skip to step 13.

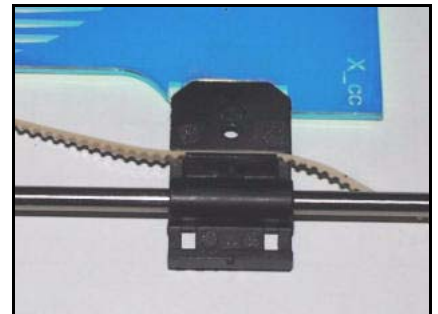


Fig. 72. Clamp to inside of X slide

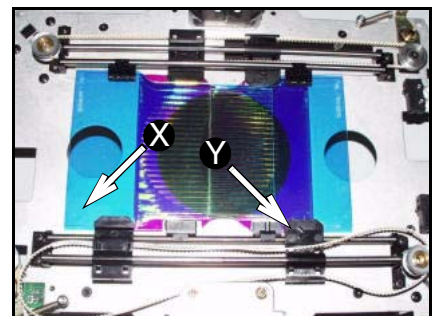


Fig. 73. X filter on top

- 12 Install the idle rail for the top flag set.

- 13 Arrange the belt and make sure the ends are outside the rail clips. Center the rail on the clips and snap it into the

clips on each end. Work the belt onto the pulleys.

14 Set the filters an equal distance from the clip using any convenient spacer.

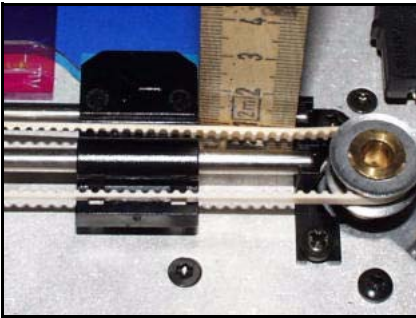
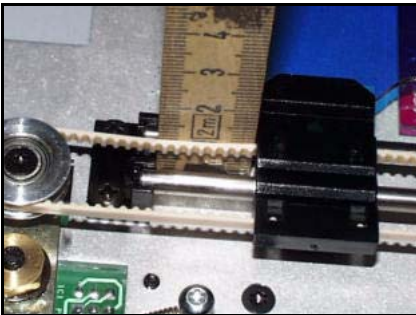


Fig. 74. Equal distance



15 Clamp the belt in the **outside** slot of the slide for the bottom filter.

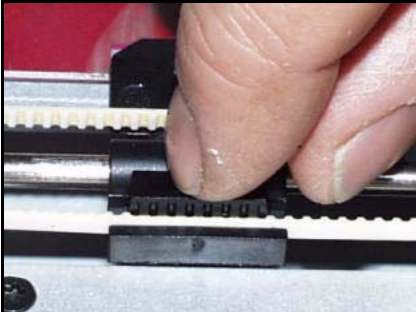


Fig. 75. Clamp belt in outside slot

16 Verify that the flags slide smoothly in opposite directions and that the bottom flag engages the microswitch. If the flag does not fully engage the switch, remove the clamp from the bottom slide, move the filter 1 tooth closer to the microswitch, and re-clamp.



Fig. 76. Flag must engage microswitch

17 Reassemble and install the module.

CMYC motors, replace

- 1 Remove and separate the CMYC module. (p. 10)
- 2 Unplug and remove the old motor.
- 3 Measure the position of the gear along the motor shaft. Transfer the gear to the replacement motor or install a new one.
- 4 If replacing the cyan or magenta motors, place the motor heat shield under the module plate.
- 5 Orient the motor as shown with 3 springs between the motor and the plate. Fasten.
- 6 Reassemble the fixture.

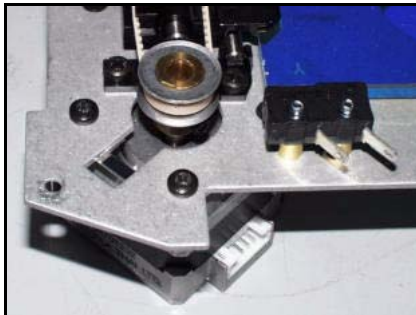


Fig. 78. Cyan motor

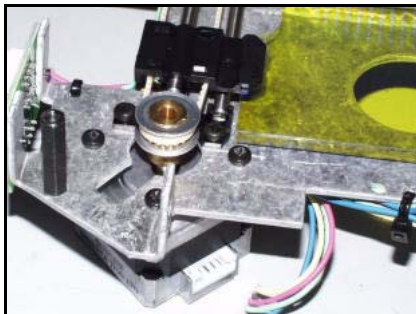


Fig. 79. Yellow motor



Fig. 80. CTC motor

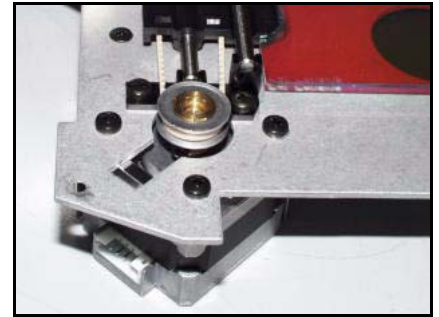


Fig. 77. Magenta motor



Fig. 81. Flag motor suspension