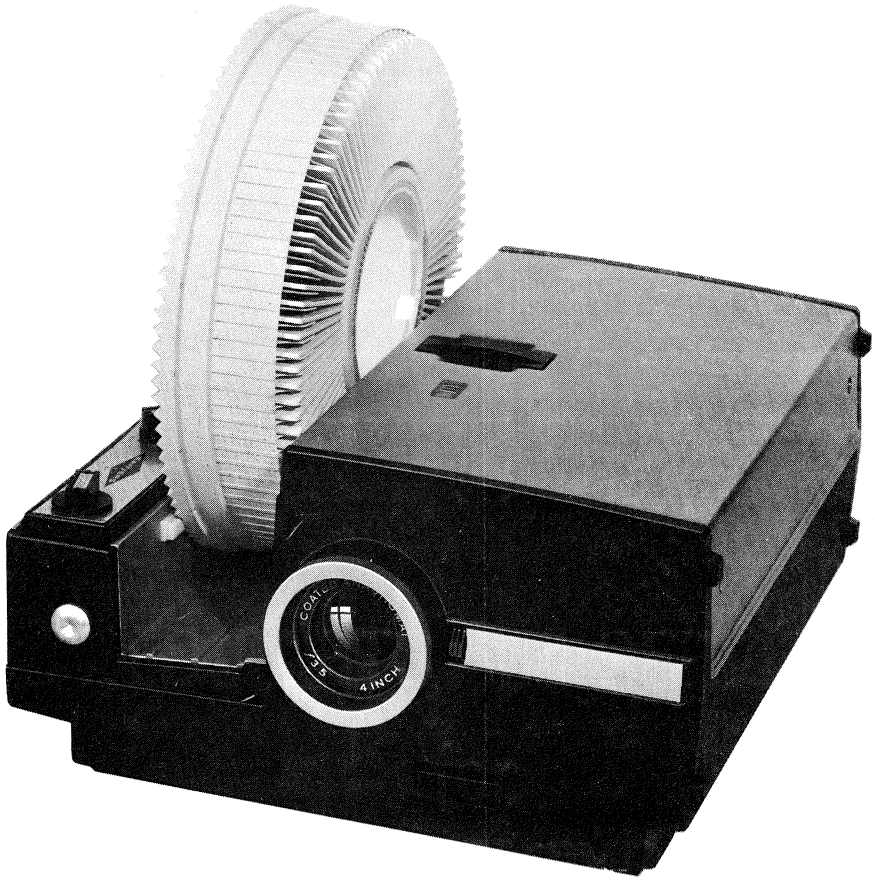
ILLUSTRATED PARTS and SERVICE MANUAL

for

ROTOMATIC® TYPE 2X2 SLIDE PROJECTORS

SAWYER'S 600, 700, 600A, 700A, 707Q, 707AQ,
WARDS 666, 777Q, 777AQ,
EATON OPTINA SUPERB



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SAWYER'S INC.
A SUBSIDIARY OF GENERAL ANILINE & FILM CORPORATION

AUGUST 1967
REVISION 1

INDEX

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REVISION 1

HOW TO USE THE ILLUSTRATED PARTS AND SERVICE MANUAL

This manual describes and illustrates instructions and parts needed for service of the particular model projectors mentioned in this book. It is divided into five alphabetical sections: A – General Information; B – Service Instructions; C – Trouble Shooting; D – Parts List and Exploded Views: and E – Wiring Diagrams.

USING THE INDEX AND LOCATING THE PROPER SECTION

The index is located following the front cover. Determine the appropriate section needed. Line up the black tab on the index page with a matching black tab further back in the book and open the book to this location. This should locate the exact area of the book desired.

USING THE PARTS LIST AND EXPLODED DRAWINGS:

The parts list is located in Section D and includes: Item number, model designation, parts description and part number. Locate the item number on the exploded view, select the proper column for the model desired (X marked in model column) and read across for description.

A complete parts price list is located in the back of the Service Manual which contains prices of service parts for all parts and Service Manuals. This Price List is in numerical order by part number. The correct list price can be obtained by first finding the part number in any of the parts and Service Manuals and then locating the same number in the Price List.

EXAMPLE:

Item	Model 600	Model 700	Model 707AQ	Part Name 1 2 3 4	Part No.	
1	X	X	X	Motor Assembly – Autofocus	371–509	
2	X	X	X	Motor – Focus	327–828	R3
3	X	–	X	Gear – Worm	327–206	

Indent numbers in the parts list heading are used to indicate assemblies and sub-parts of assemblies. Number 1 is the major assembly. Part descriptions which are indicated under 2, 3 or 4 are sub-parts of the major assembly shown above.

If the part description has a symbol (* †) be sure to read the footnote which will have important information affecting the specific part.

SUPPLEMENTS AND REVISIONS

Supplementary pages may be added to this manual at later dates and will be filed in the proper location by page number, revision number and date. Changes on these pages will be noted by use of "R" and the revision number (R3).

ORDERING PARTS

To order repair parts see section D and use the item numbers on the exploded views to locate the part in the parts list. Always order by part number and name, and order carefully in order to get the correct part for the model you are working on, assuring a match of color, parts and trim. Order replacement parts from SAWYER'S INC., Portland, Oregon 97207. All parts shipped f.o.b. Portland, Oregon.

SECTION A

GENERAL INFORMATION

Service information in this manual covers Sawyer's ROTOMATIC ® 2x2 Slide Projectors, Models 600, 700, 600A, 700A, 707Q, 707AQ, Wards 666, 777Q, 777AQ and Eaton Optina Superb. Before attempting repairs, please read the manual thoroughly. Use the exploded drawings as a repair and assembly guide. Most repairs may be made without disassembly Check the Trouble Shooting Chart before removing tray channel or end panels. In certain instances special drawings are included covering specific repairs. Such situations are indicated on the Trouble Shooting Chart.

DESCRIPTION

The ROTOMATIC ® 700 Slide Projector is the same as the model 600 with the addition of an automatic timing system. (Early models of the ROTOMATIC® 700 Projectors were supplied with an Electro-Mechanical timer. This unit is now discontinued, current Model 700 Projectors are fitted with a Thermo-Electric timing device. If the Electro-Mechanical timer becomes inoperable it may be replaced with a Thermo-Electric timer, as explained on page B6.)

The ROTOMATIC® 600A and 700A are the same as the 600 and 700 respectively with the addition of an automatic focusing system and the elimination of the focus button on the remote control unit.

The ROTOMATIC® 707Q is like the 700 but uses a quartz iodine lamp, has a editor, a room light outlet, and a cord-reel base. The 707AQ has in addition an automatic focusing system.

The Wards 666, 777Q, 777AQ, and Eaton Optina Superb are like the ROTOMATIC ® projectors, but with case and label changes.

PROJECTOR FEATURES

	TIMER	CORD REEL	ROOM LT	QUARTZ BULB	AUTO FOCUS	EDITOR
600						
700	●					
600A					●	
700A	●				●	
707Q	●	●	●	●		●
707AQ	●	●	●	●	●	●
Wards 666	●	●	●			
Wards 777Q	●	●	●	●		●
Wards 777AQ	●	●	●	●	●	●
Eaton Optina Superb	●	●	●	●	●	●

QUARTZ IODINE LAMPS

The quartz iodine lamp has a longer life and does not change color as it nears the end of lamp life. Lamp sockets are not the same as for DAK lamps. NOTE: Install quartz iodine lamps with the center supporting wire rearward, as shown in the illustration in the Parts List. CAUTION: NEVER TOUCH THE QUARTZ IODINE LAMP WITH THE FINGERS. Oil from the fingers will blacken the lamp and reduce the lamp life.

AUTOMATIC FOCUS SYSTEMS

For servicing automatic focus systems (600A, 700A, 707AQ, Wards 777AQ, Eaton Optina Superb) see the Automatic Focusing Service Manual, Sawyer's part No. 371-950-02.

OPERATING PRINCIPLES

A slide change cycle normally begins with the pusher arm in. When the pusher arm is pulled out, a tray is indexed into the next position. Pushing the pusher arm in transports a slide from the tray to the track guides and into projection position. The spring loaded shutter opens as the slide is transported into projection position.

To return the slide to the tray, the pusher arm is pulled out. The shutter closes as the slide is returned toward the tray and the slide ejector arm ejects the slide into the tray.

To load automatic or remote control cycling projectors, pull out pusher arm until it is fully extended. Place the tray into position in the channel and manually push a slide into position before operating the remote cycling mechanism. This insures proper alignment of slide and pusher arm and prevents slide jamming. Should changer arm fail to complete cycle for any reason, turn off power switch before attempting to clear jam.

Automatic and remote slide changing operate by cycle motor. The cycle begins when the cycle switch is energized by automatic timer or remote push button. The cycle motor engages the driving gears. A boss on the driving gear cam rides in a J-bar located on the end of the pusher arm. One rotation of the cam moves the pusher assembly through one cycle at which time a cam on the gear opens the cycle switch. During certain portions of the cycle the pin is not engaged in the J-bar allowing manual operation of the pusher assembly.

TRAY ADVANCE MECHANISM

As the pusher arm assembly is moved through a cycle, pins on the pusher arm trip forward or reverse pawl arms on the index plate mechanism. The pawl arm engages the pawls with the index gear, causing the gear to index the tray forward or backward depending on the position of the control knob.

On Remote Forward-Reverse models a solenoid moves the index plate into either the forward or reverse position. When the solenoid is energized by remote control, the action of the solenoid index mechanism linkage causes the index action to reverse the tray's direction. The solenoid plunger action is the same for either the reverse or forward position of the index plate mechanism.

FOCUSING

The lens is focused by means of a rack and gear assembly, manually or through a remote control unit. In remote control models the lens is gear driven by a focus motor through a clutch. The rack on the lens barrel is designed to cause the clutch to slip when the lens is extended or retracted to extreme position.

SECTION B

DISASSEMBLY INSTRUCTIONS

Many repairs may be made without complete disassembly. Check the Trouble Shooting Chart before proceeding.

To begin disassembly, pull off access cover A by lifting up on the cover at the rear of the projector.

To remove the TRAY CHANNEL, remove remote control B and manual focusing knob C. Take out six Phillips head screws D and E from the sides and bottom of the tray channel. Note that screws D are oval head and screws E are flat head. Pull out the pusher arm as far as possible. Loosen the tray channel by placing a screw driver on the ends of the channel as shown in Figure 1. Tap up gently, as indicated by the arrows, G, until the tray channel is loose. The tray may be lifted clear. To completely remove the tray channel from Model 700 type Projectors, it will be necessary to remove the timer knob and retainer nut from the timer mechanism.

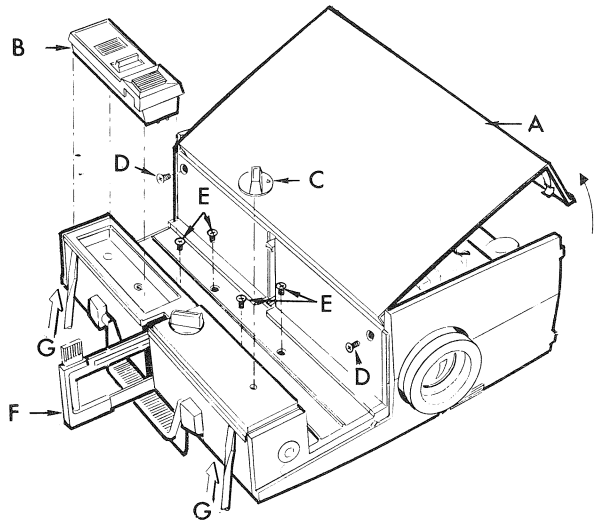


FIGURE 1 DISASSEMBLY OF PROJECTOR

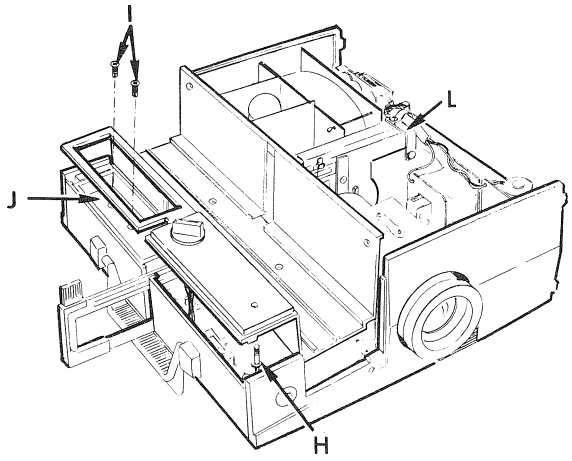


FIGURE 2 DISASSEMBLY OF PROJECTOR

The SLIDE TRANSPORT MECHANISM may now be removed. Disconnect and remove the index plate assembly. Remove the index gear assembly and pull the transport assembly from the projector.

Once the tray channel has been removed, the FRONT AND REAR MOLDED PANELS may also be removed. (The slide transport need not be removed.) Before taking off the rear panel it will be necessary to remove the two Phillips head screws I and pull the remote control assembly pocket J up and out. Be careful of the wiring leading to the control pocket. Loosen, do not remove, three screws K, Figure 3. Remove off/on switch knob and switch retaining nut. Pull off the back panel.

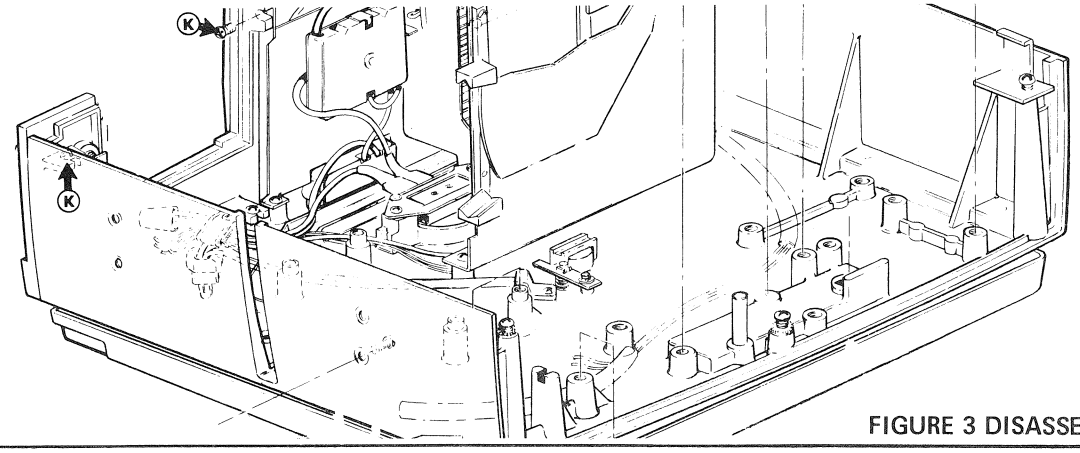


FIGURE 3 DISASSEMBLY OF PROJECTOR

Remove the projection lens before proceeding to remove the front molded panel. Again, loosen, do not remove, three screws, K, and pull off the front panel.

To remove or replace BLOWER WHEEL OR FAN MOTOR, proceed as follows. See Figure 4.

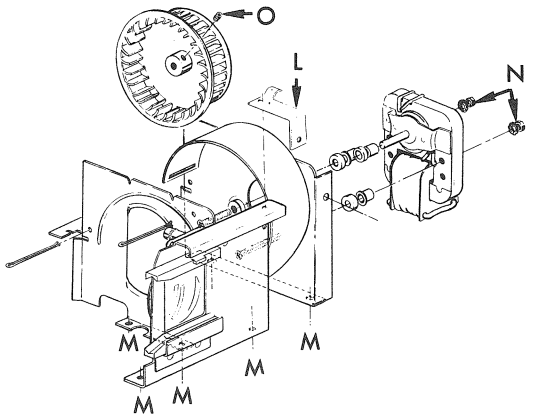


FIGURE 4 REMOVING FAN, MOTOR, AND APERTURE PLATE

Remove LAMP, LAMP CHIMNEY, CONDENSER LENS HOLDER and LENS. Pull the transport assembly to the out position. Remove anchor bracket L from the top of the aperture place and cycle motor bracket. Remove the six screws M that attach the blower and aperture assembly to the base and lift the assembly up and out of the projector. Disconnect all wires from the motor if it is to be replaced. Remove deflector from the scroll and lift up the scroll. It is not necessary to remove the cottor pins. Remove motor mounting nut N if motor is to be removed.

Loosen the Allen set screw O in the blower wheel and separate the blower wheel and the fan motor. The blower may now be lifted out through the top of the scroll housing.

When replacing the blower wheel on the motor shaft, allow at least 1/16" clearance from the end of the motor screws. When replacing the scroll, be sure that it is well seated in the grooves of both scroll plates.

To remove the OFF/ON SWITCH remove the lamp, lamp chimney and switch knob. Remove the two wires that are pushed into the top of the switch. To remove these wires, insert a pointed tool, such as a nail file, into the V-groove in the switch body and pull the wire out. Remove the lock nut and push the switch out of the end cap.

To remove the CYCLE MECHANISM remove the screw and nut that holds the anchor bracket L to the top of the aperture plate and remove the wire harness from under the bracket. Remove the wire nut from the ends of the white, black and red wires and pull the wires through the sleeving. Remove the two screws that hold the mechanism to the projector base and pull the assembly up and out of the projector.

To disassemble the REMOTE CONTROL assembly remove the two screws from the bottom of the unit. Turn the unit upsidedown and lift the body off the cover. (NOTE: The four L-shaped contact legs should have between 3/32's to 1/8" clearance between the tips of the blades and the center contact strip.

To remove the LENS DOOR ASSEMBLY first remove the lens barrel. Unhook the spring from the door. Slide the door to the closed position and push on the center of the door, through the lens barrel opening in the end of the molding. Push hard enough to bow the door sufficiently to pop it out of its tracks. After re-installing the door, check to be sure that it is absolutely free in its tracks. It may be necessary to bend the door in order to make it operate freely.

Removal procedures for the remaining assemblies are obvious and require no additional explanation. All reassembly procedures are, of course, the reversal of the removal sequence. Be sure, when replacing the tray channel, that the manual focusing shaft is properly aligned with the hole in the escutcheon plate and that the right angle gears of the manual focusing shaft are properly meshed.

REMOVING ROTOMATIC CORD REEL ASSEMBLY FROM THE PROJECTOR BASE

See Illustration, Figure 6.

Remove tray channel as previously explained.

Remove eight screws, 53, 60, 61, Figure 6 from inside the ROTOMATIC. 60 is near the interlock and also holds down the cord bushing, 228, Figure 5. With pliers, loosen the strain relief, 227, Figure 5, unfasten wire nuts, and push the power cord through the hole in the base casting. If you intend to dismantle the cord reel or install a new cord, take note now of the amount of cord extending from the strain relief, 50, to center of hub, 52. Stretched-tight dimension should be 19½ inches.

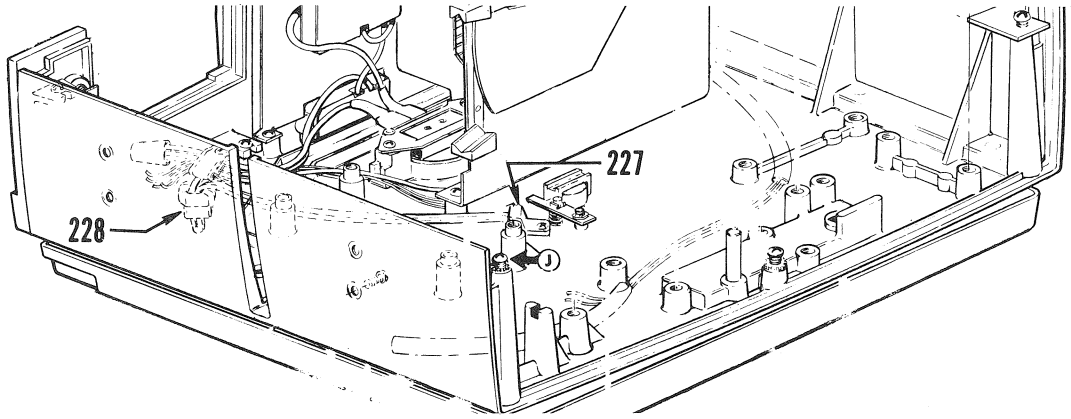


FIGURE 5 PROJECTOR BASE AND CORD REEL

DISASSEMBLING THE CORD REEL

Screws 51 and 60 hold the reel intact. 60 has already been removed. Use a jig, Tool No. 529-151-T1. The pilot pins are arranged to fit into the holes on the bottom of the Base Cover Assembly.

Hold down the Cord Reel, remove screw 51, lift out the plastic cord hub 52 while holding down the center of the metal reel hub, 47, being careful not to pull the cord so far as to dislocate the reel and spring assembly.
CAUTION: THE SPRING IS UNDER CONSIDERABLE TENSION AND WILL SNAP LOOSE IF THE REEL HUB, 46 OR 47, IS LIFTED AT THE CENTER.

Insert a flexible strip of metal, such as a table knife or metal ruler, between the cord reel flange and the spring, from the corner with the cord latch--lift out the cord latch to make room for the blade. The blade will need to go about half way to the center of the hub. Pressing down firmly on the blade, carefully lift up the cord reel hub. At a certain point, the inside end of the spring will loosen from the hub and snap outward, probably catching itself on one of the pins of the jig. Lift out the reel hub assembly, 45.

Maintaining pressure on the spring, carefully slip short bits of wire under the spring in three places and tie the wire, as though binding up a roll of garden hose, to keep the spring coiled, and lift the spring out, disengaging the outer hook of the spring from the base cover. Do not allow the outer end of the spring to escape before the wire keepers have been inserted and tied.

ASSEMBLY OF THE CORD REEL

Set the base cover on the jig board with the three pilot pins in the three holes. Set the spring in place, hooking the outer end in the slot on the base cover across from the cord latch (push down on hook to be sure it is down against the bottom) and the inner hook on one of the pilot pins. Be sure there are 19 2/3 turns to the spring counting across from outer hook to inner hook. Hold the spring down carefully and remove the keepers.

To replace the power cord, thread the stripped end of the cord through the hole in the reel hub and hook the strain relief as shown in illustration on page B4 . Wind the power cord on the reel in a counter-clockwise direction.

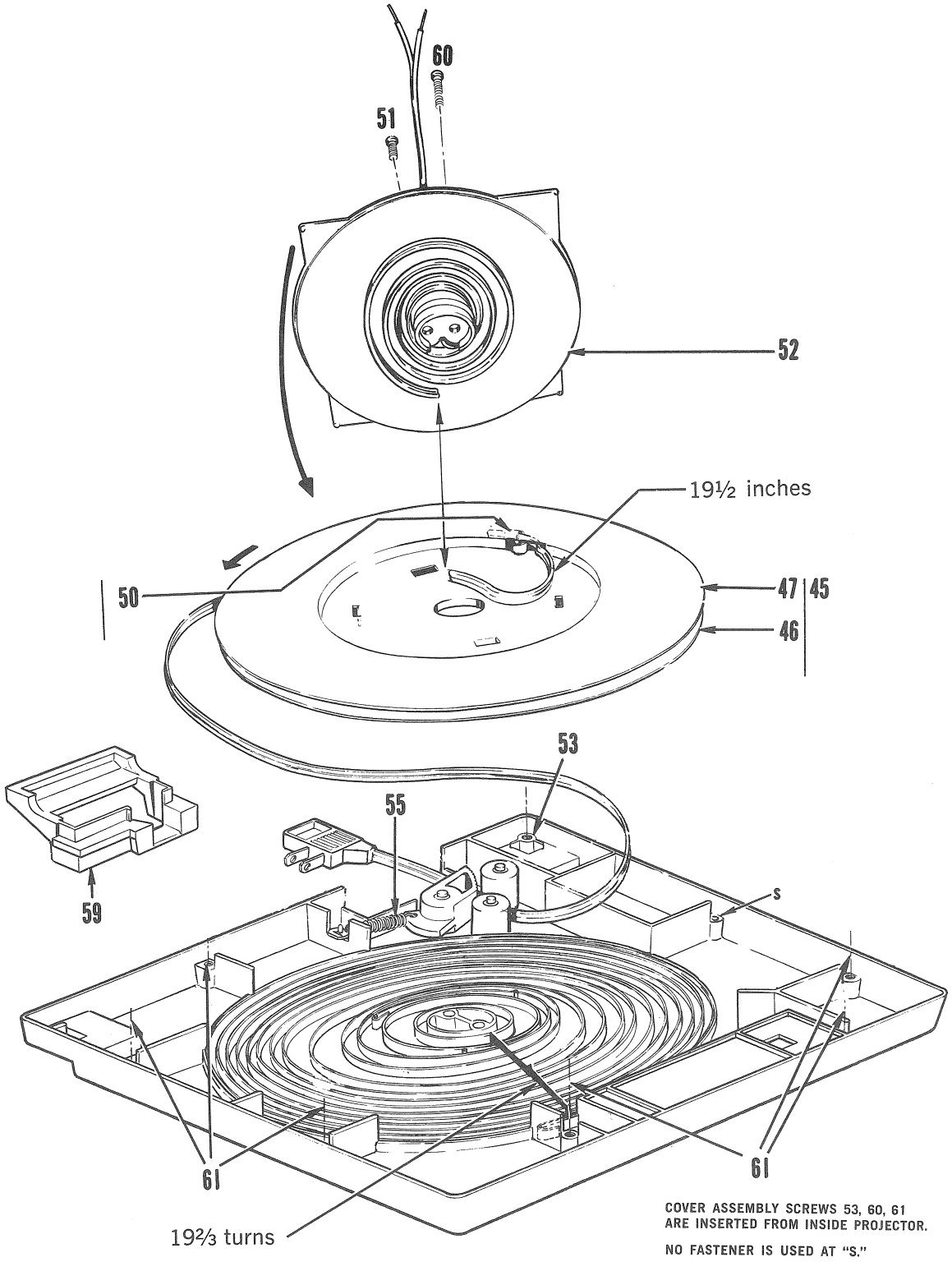


FIGURE 6 DISASSEMBLY OF ROTOMATIC CORD REEL

Thread the stripped end of the cord through the center hole of the plastic reel hub until you have 19½ inches of cord between the strain relief, 50, and the center of hub, 52 (stretched tight).

Place the reel assembly 45 in the base cover so driving tab is in line with inner hook end of the spring, which is caught on one of the pins of the jig. Later, when the jig is withdrawn, the hook will spring back and catch the driving tab. Let the plug end of the cord lie between the two rollers and out the latch opening.

Wind all of the 19½ inches of the power cord counter-clockwise around the center of the plastic hub in place on the metal reel. Rotate the plastic hub CLOCKWISE approximately ½ turn until mounting holes, 51 and 60, line up with holes in base.

NOTE: The power cord is on its edge as it leaves the strain relief and is coiled on the plastic reel hub. BE SURE NOT TO TWIST THE CORD WHEN PERFORMING THIS OPERATION.

Now check to see that all of the 19½ inches of cord is wound on plastic hub by turning hub COUNTER-CLOCKWISE until hub feels tight.

Replace screw 51 in the correct hole. Assemble the rollers and latch and set the latch "on". Lift the unit from the jig board to allow the spring to snap back and catch the drive tab on the base of the reel hub; pull the cord to check the tension, if there is no tension, the spring has failed to catch a drive tab and the assembly procedure must be repeated. Push cord through cord bushing, 59, and place bushing in cover.

Assemble the cover to the projector base, threading the stripped end of the cord through the grommet near the interlock and fastening screw through grommet and base casting into plastic hub. Fasten the screws, 61, 53 and 60, cramp the power cord into the strain relief, 227, insert into base casting, and fasten two wire nuts. Note that no fastener is used at S.

NOTE: Cord must be stretched tight against base and over pre-heater duct between grommet and strain relief.

REPAIR AND ADJUSTMENT PROCEDURES FOR THE ELECTRO-MECHANICAL TIMER

ROTOMATIC Model 700 Projectors, below serial #27921, have an Electro-Mechanical timing mechanism. Projectors with serial numbers above 27921 are equipped with an improved timing device, the Thermo-Electric timer.

The Electro-Mechanical timer is comprised of three major components: a wiring harness, the timing mechanism and the timer tap switch.

Before replacing any components on the timing mechanism, it may be possible to correct faulty timing or cycling of the projector by adjusting either the timer switch P or the ratchet spring Q, Figure 7. One adjustment of the entire timer switch can be accomplished by bending the tab of the bracket to which the switch is mounted. The switch blades can be adjusted by bending them in the required direction. Clean contact surfaces of the switch blades with Bond paper.

PROPER RATCHETING OF THE TIMER

Adjustment of the ratchet stop position for proper ratcheting and for quietest operation may be done by loosening the ratchet screw and sliding the ratchet spring in the proper direction then re-securing the screw.

The complete timer assembly may be removed by taking out the screw and nut R that fastens the timing assembly to the aperture plate. Lift the entire mechanism as far out of the projector as the wiring harness will permit.

Failure of the timer to operate properly may be due to a small amount of oil getting onto the rubber bushing S on the motor shaft and causing slippage. To remove this oil deposit, first lift timer lever to off position. Take a Q-Tip, approximately 3" long, and lightly soak the cotton with any solvent which will dissolve oil, such as lighter fluid, gasoline, cleaning fluid, etc. Insert the Q-Tip between the motor and fan housing, see Figure 7, passing under the gear train until the cotton tip contacts the rubber drive roller on the fan motor shaft. Turn the motor rotor with the fingers while moving cotton tipped stick to clean the entire surface. Clean plastic drive roller in a similar manner.

The fan motors of Model 700 Projectors, with a serial number below 4820, require additional cleaning. Remove the fan motor and blow out excess oil with compressed air. It is not necessary to dismantle the motor.

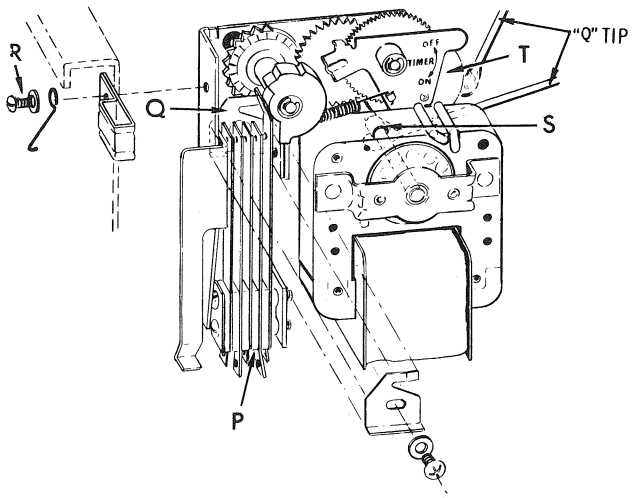


FIGURE 7 ELECTRO-MECHANICAL TIMER

If a timer tap switch is defective, replace the Mechanical Timer with a Thermo-Electric type. First, remove the tray channel and the defective switch. When the new switch is rewired and the circuits are checked, insert the switch stem into the proper place in the tray channel and loosely fasten in place with a retaining nut. Replace the tray channel in the projector and secure all the screws. Push the switch knob on the stem loosely and rotate the switch in the channel until a white triangle on the knob lines up with the "off" mark on the name plate. Hold the switch in this position and remove the knob. Tighten the lock nuts securely and replace the switch knob.

Remove the spring and washer from the old timer mounting screw. Replace the screw and tighten the nut to hold the motor mounting plate to the aperture plate. Discard the spring and washer.

Place the tray channel alongside the projector and solder the wires to the new Thermo-Electric timer as follows: (1) solder the black wire to the end solder terminal nearest the control knob; (2) solder the white wire to the center solder terminal; and (3) solder the red wire to the third solder terminal which is held to the timer by means of a screw-in nut.

Reassemble and check the projector in the usual manner.

REPLACEMENT OF THE ELECTRO-MECHANICAL TIMER WITH THE THERMO-ELECTRIC TIMER IN ROTOMATIC PROJECTORS

If, for any reason, the Electro-Mechanical timer is not repairable, it may be replaced with a Thermo-Electric timer. These additional parts will be required: one 435-806 name plate, one 392-501 Thermo-Electric timer assembly, one 7-½" red #20 stranded wire (Gavitt 112U or equivalent) and two wire nuts.

Remove the cover, lens, lamp cover and tray channel in the usual manner.

Free the tray channel from the projector by removing the nuts from the channel switch. Pry molded plastic name plate from the tray channel.

Assemble the new Thermo-Electric timer to tray channel using the lock washer and nut of the old timer switch. Glue the new plastic name plate (Part No. 375-492) to the tray channel using 3M cement DC 959. (Use Petroleum Skellysolv as a solvent if necessary to thin).

Remove the old Electro-Mechanical timer by removing the mounting screw and lifting the timer unit out of the projector. Cut the five wires which are soldered to the switch stack of the timer unit. Restrip the two black wires and join together with a wire nut. Restrip the red wire and join it with the previously cut 7-½" piece of red wire using a wire nut. Thread the red jumper wire through the insulating sleeve behind the fan motor, then strip and join with the other three red wires using existing wire nuts. Make certain both wire nuts are positioned so they will not interfere with the action of the pusher arm.

Cut the black, red and white wires from the timer selector switch and then pull the switch and the green and yellow wires from the projector.

NOTE: It may be necessary to relieve pressure on the plastic insulating sleeve before pulling the yellow and green wires from the projector. Remove the lamp and lamp chimney. Loosen the two Phillips head screws that anchor the scroll plate and the screw that anchors the shutter assembly to the projector base. Restrip the black, red and white wires. Remove the lower handle mounting screw. Insert the screw in the cable clamp (removed from the old timer mounting screw) and mount into lower handle mounting hole. Run the black, red and white wires through the cable clamp.

THERMO-ELECTRIC TIMER

The timer is a variable, stepless timer offering a timing cycle from approximately 5 seconds to 30 seconds. Timing is a function of control cam setting, deflection time of a heated bi-metal strip (not adjustable) and spacing of timer unit contacts.

When the timer is turned off and element is cool, the bi-metal strip rests upward against the plastic control cam "U", Figure 8, at one end and the heater current contact "T" is closed on the other. When the timer is turned on, current flows through the heating element "R" wound around the strip, causing it to bend downward from the cam until it touches the cycle motor contact, X.

Current flows via the bi-metal strip through the contact to the cycle motor, starting the cycle motor operation. (The cycle motor switch on the cycle motor will be open.) Just after the cycle motor starts rotating, the cam on the cycle motor gear will close the cycle motor switch and current will be drawn through that switch to the motor, which will make one revolution and stop when the cam opens the cycle switch again. Meanwhile, the bi-metal strip will have cooled sufficiently to lift from the contact, X. Once started by the timer unit, the cycling mechanism completes the (slide change) operation independent of the timer unit, except that IF THE BI-METAL STRIP DOES NOT COOL OFF QUICKLY TO DISENGAGE THE CYCLE CONTROL CONTACT "X", THE CYCLE MOTOR WILL CYCLE TWICE.

The over-center detent spring, S, gives snap action for fast make and break of heater contacts. Breaking the current allows the strip to cool, both ends move upward, and the cycle repeats.

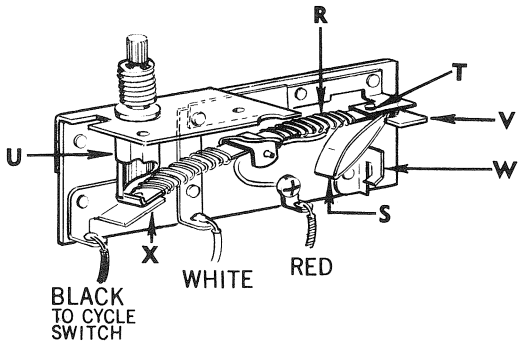


FIGURE 8 THERMO-ELECTRIC TIMER

ADJUSTING THE THERMO-ELECTRIC TIMER

See Figure 8.

Turn the projector off and allow to cool for several minutes. Remove 6 screws in tray channel and lift up to expose the timer. NOTE: When the projector is on, voltage on the timing unit heater is approximately 28V.

Check the cycle initiating switch on the motor, Figure 9, so that the contact spacing is .005 min. and .010 max.

To eliminate double cycling: set the timer control cam "U", Figure 8, to minimum setting and bend the heater contact tab "T" toward the contact on the bi-metal strip to make a faster sequence. All other adjustments have been factory preset. The over-center spring "S" must have a good snap action to work well; accidental bending of the tabs "V" or "W" may affect spring action.

TIMER TOLERANCE: Low range, 5 to 7 seconds, high range, 30 to 40 seconds.

Short circuiting of the timer for a length of time because of damage to the heating element wire insulation can cause failure of the secondary and primary winding of the fan motor. Check timer and replace if shorted.

SECTION C

TROUBLE	CAUSE	REPAIR
Unit cycles continuously.	Cycle points out of adjustment.	Adjust. Do not disassemble. See Figure 9. Remove access cover. Bend inner contact away from spring to increase tension.
	Rotor spring of cycle motor will not release.	Remove cycle motor. Remove rotor bearing bracket on cycle unit side of motor. Remove rubber washer and metal spring retaining washer, see Figure 10, from rotor Shaft. (You may find these washers adhering to grease in the bearing bracket). Discard the metal washer and reassemble the unit.
	Timer mechanism malfunction.	See Adjustment, Section B for detailed instructions on timer mechanism, repair and replacement.
Unit will not cycle	Remote malfunction.	Adjust tension on contact spring or replace entire unit.
	Cycle gear out of adjustment.	Do not disassemble. See Figure 9. Remove access cover. With 5/16" box wrench, loosen nut (about 2 turns) on motor mount of cycling unit. With wrench still in place, push down on nut. Turn on projector and press cycle button. Vary pressureon nutuntil unit cycles properly and tighten nut securely.
	Low voltage on power source to cycle unit. (Requires 28 volts, AC)	Check power source on fan motor. Replace fan motor if necessary. (See Disassembly, Section B for instructions on fan motor removal.)
	Remote malfunction.	Check rectifiers. Replace rectifiers or control.
	Open solder joints.	Check solder joints at cycle switch, touch with hot iron.
Unit jams- will not cycle properly.	Pusher out of alignment.	Align pusher in center of operating channel. If necessary, pull out pusher until top bar clears slide guides and bend top bar to align with center of channel.
Shutter not operating.	Shutter bent.	Straighten or replace. (Tray channel must be removed to take out pusher assembly.)
	Shutter Return spring.	Adjust spring tension.

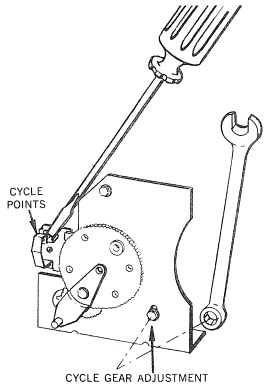


FIGURE 9 CYCLE GEAR ADJUSTMENT

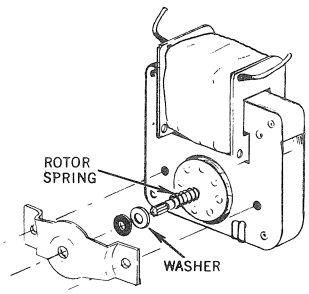


FIGURE 10 FREEING ROTOR SPRING

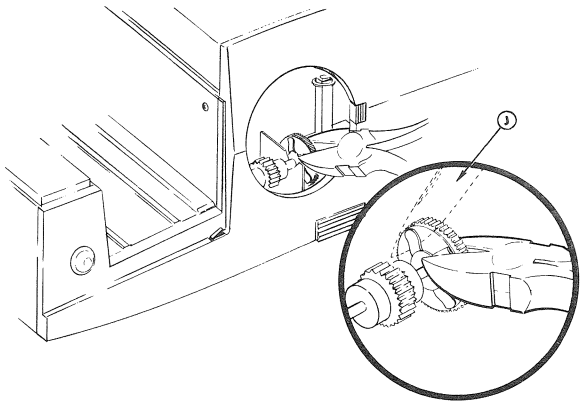


FIGURE 11 ADJUSTING CLUTCH

TROUBLE	CAUSE	REPAIR
Tray will index in only one direction.	Index mechanism - springs loose or broken.	Replace or reset yoke springs on index plate mechanism.
Noisy.	Faulty main cycle gear.	Replace (lubricate gears with #2 mobile grease).
	Fan hitting scroll.	Pry up scroll to provide clearance.
Will not elevate.	Tilt/release not holding.	Remove shaft and elevating foot. Roughen back side of elevating shaft to provide better purchase for elevator lock roller.
Overheating	Blower motor failure.	Replace.
		Check thermo-electric timer for short circuit which may have damaged fan motor windings.
	Fan binding	Replace.
	Loose motor mounting bolts.	Tighten, secure with Lockite.
		NOTE: Check air ducts and all plastic parts for heat damage. If excessive heat has broken condensers, be sure that all broken glass is removed from projector. Check the greased cycle gears carefully for shards of glass. A small bristle brush will aid in cleaning glass fragments.
Timer malfunction	Electro-Mechanical timer.	Adjust timer switch or ratchet spring see Figure 7.
	Oil on roller drive. NOTE: See instructions on repair mechanical timers.	Clean. See special instructions in Adjustment Section B.

TROUBLE	CAUSE	REPAIR
Timer malfunction.	Thermo-Electric timer.	(NOTE: See Adjustment Section B for repair and replacement of Thermo-Electric timers.
Lens door will not latch.	Spring bracket bent.	Straighten spring anchor bracket on lens door.
	Lens door bent.	Replace door. Remove lens. Unhook spring from door. Slide door to closed position and push on door through lens barrel opening in the end molding. Push hard enough to bow the door sufficiently to pop door out of tracks. Insert new door. If necessary, bend new door until it operates freely in tracks.
Poor focus.	Focusing clutch slips.	See Figure 11. Remove lens barrel. Tighten opposing clutch springs with diagonal cutters by crimping brass washers on either side of clutch gear. Hold cutters upside down.
	Focusing clutch drives lens past detent.	Insert knife blade J, Illustration 11, or similar instrument under clutch springs and loosen tension.
	Defective clutch.	Replace. Requires disassembly.
	Focus motor disengaged.	Re-align motor. Tighten securely.
	Focus motor defective. Worm gear defective.	Replace.
	Remote malfunction	Check rectifiers in remote assembly. Contact clearance of blade should be from 3/32" to 1/8". If malfunction still occurs, replace remote unit.
Cord sticks, or lock slips	Dirty or slippery cord.	Pull cord out, clean and wax lightly with Pledge or equivalent.
	Lock device malfunction.	Check that spring 55, Figure 6, is in place. Requires removing the cord reel assembly.
Light on screen when Editor is up	Swing shutter stuck.	Check for bent shutter, loose or unhooked spring.
Lens will not focus	Remote malfunction.	Check rectifiers. Replace rectifier or replace control.

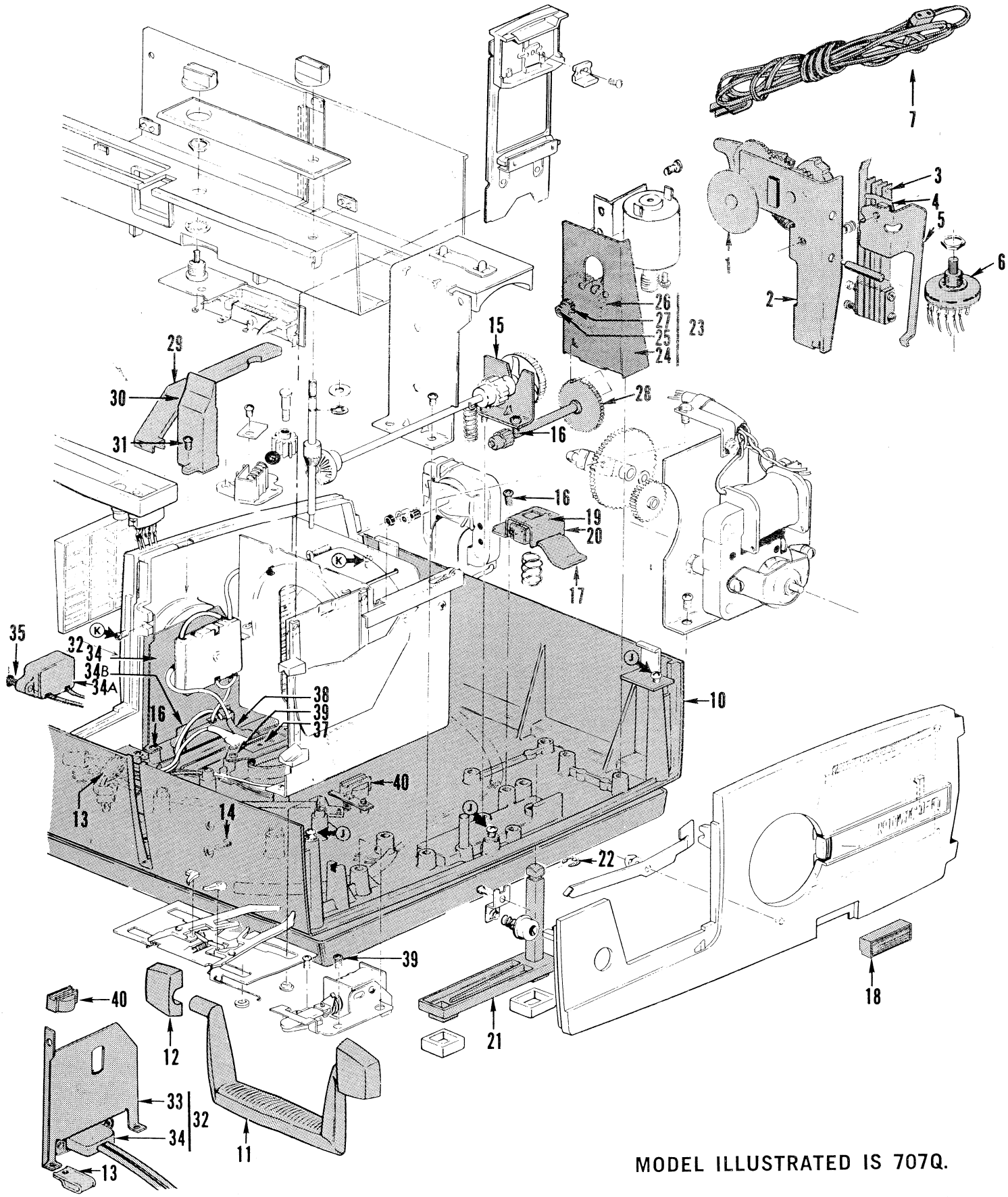
SECTION D

PARTS INDEX AND EXPLODED VIEW

INDEX

D

BASE ASSEMBLY AND ATTACHING PARTS



MODEL ILLUSTRATED IS 707Q.

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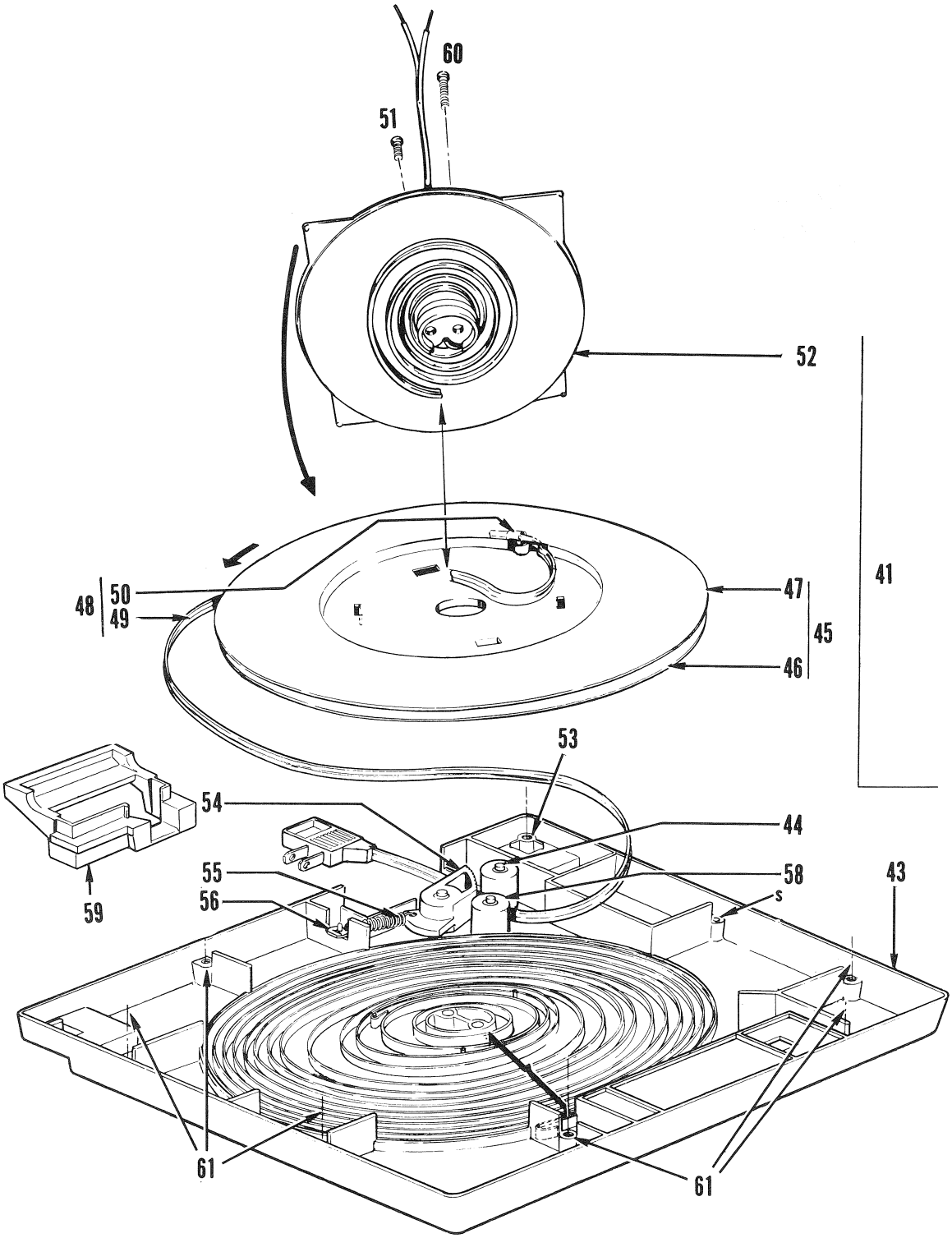
BASE ASSEMBLY AND ATTACHING PARTS

NOTE: For Autofocus Parts See Autofocus Parts and Service Manual.

Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.	
1	—	X	—	—	—	—	—	—	—	—	* Timer Unit Assy. - Electro-Mechanical	375-502	
2	—	X	—	—	—	—	—	—	—	—	* Arm Assy. - Roller	375-505	
3	—	X	—	—	—	—	—	—	—	—	* Switch-Timer	375-803	
4	—	X	—	—	—	—	—	—	—	—	* Spring - Ratchet	375-104	
5	—	X	—	—	—	—	—	—	—	—	* Lever Assembly	375-505	
6	—	X	—	—	—	—	—	—	—	—	* Switch-Tap	375-805	
7	X	X	—	—	—	—	—	—	—	—	Cord - Power	362-812	
10	X	X	—	—	X	—	—	—	—	—	Base Assemb y	362 553	
	—	—	—	—	—	—	X	—	—	—	Base Assembly	465-514	
	—	—	X	X	—	X	—	X	X	X	Base Assembly	435-502	
11	X	X	X	X	X	X	X	X	X	X	Handle - Carrying	362-424	
12	X	X	X	X	X	X	—	—	—	—	Lug - Handle	362-436	
	—	—	—	—	—	—	X	X	X	X	Lug - Handle	429-432	
13	—	X	X	X	X	X	X	X	X	X	Clamp - Cable	362-828	R2
14	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 8-32 x 3/8	501-114	
15	X	X	X	—	—	—	X	X	—	—	Bracket - Focus Shaft	362-127	
16	X	X	X	X	X	X	—	—	—	—	Screw - Self-Tap, 8-32 x 5/16	501-116	
17	X	X	X	X	X	X	X	X	X	X	Lever - Elevating Foot	362-129	
18	X	X	X	X	X	X	—	—	—	—	Knob - Elevating Foot	362-410	
	—	—	—	—	—	—	X	X	X	X	Knob - Elevating Foot	465-405	
19	X	X	X	X	X	X	X	X	X	X	Roller - Elevating Lock	362-202	
20	X	X	X	X	X	X	X	X	X	X	Bracket - Elevating Hold	362-128	
21	X	X	—	—	X	X	—	—	—	—	Foot and Shaft Assy. - Elevating	362-317	
	—	—	X	X	—	—	X	X	X	X	Foot and Shaft Assy. - Elevating	435-308	
22	X	X	X	X	X	X	X	X	X	X	Retainer	590-006	
23	X	X	X	X	X	X	X	X	X	X	Motor Bracket Assy.	362-575	R2
24	X	X	X	X	X	X	X	X	X	X	+Bracket - Motor	362-143	R2
25	X	X	X	X	X	X	X	X	X	X	Shaft	327-210	
26	X	X	X	X	X	X	X	X	X	X	Gear	327-411	
27	X	X	X	X	X	X	X	X	X	X	Pinion	327-412	
28	X	X	X	—	—	—	X	X	—	—	Gear Assy. - 2nd Reduction	327-506	
29	X	X	X	X	X	X	X	X	X	X	Cover - Preheater Duct	362-427	
30	X	X	X	X	X	X	X	X	X	X	Raiser - Preheater Duct	362-426	
31	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 6-32 x 3/8	501-118	
32	—	—	X	X	—	—	—	—	—	—	Bracket Assy. - Switch	435-504	
	X	X	—	—	X	X	—	—	—	-	Bracket Assy. - Switch	362-505	
	—	—	—	—	—	—	X	X	X	X	Bracket Assy. - Switch	465-503	
33	X	X	X	X	X	X	—	—	—	—	Bracket - Switch	362-133	
	—	—	—	—	—	—	X	X	X	X	Bracket - Switch	465-101	
34	—	—	X	X	—	—	X	X	X	X	Socket - Room Light	429-811	
34A	X	X	—	—	X	X	—	—	—	—	Plug	362-527	
34B	X	X	—	—	X	X	—	—	—	—	Cover - Plug	304-417	
35	X	X	X	—	—	—	—	—	—	—	Screw - Self-Tap, 5-40 x 7/32	501-205	
37	X	X	—	—	X	X	X	X	—	—	Socket - Lamp	304-816	
	—	—	X	X	—	—	—	—	X	X	Socket - Lamp	435-804	
38	X	X	—	—	X	X	X	X	—	—	Lead Assy.	362-506	
	X	X	—	—	X	X	—	—	—	—	Lead Assy.	362-507	
	—	—	X	X	—	—	—	—	X	X	Lead Assy.	362-506	
39	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap	501-103	
40	X	X	X	X	X	X	X	X	X	X	Guide - Pusher	362-408	

* Used Prior to Serial No. 27921.
\+ Use with Motor Assembly 327-526, R2

COVER AND CORD REEL ASSEMBLY



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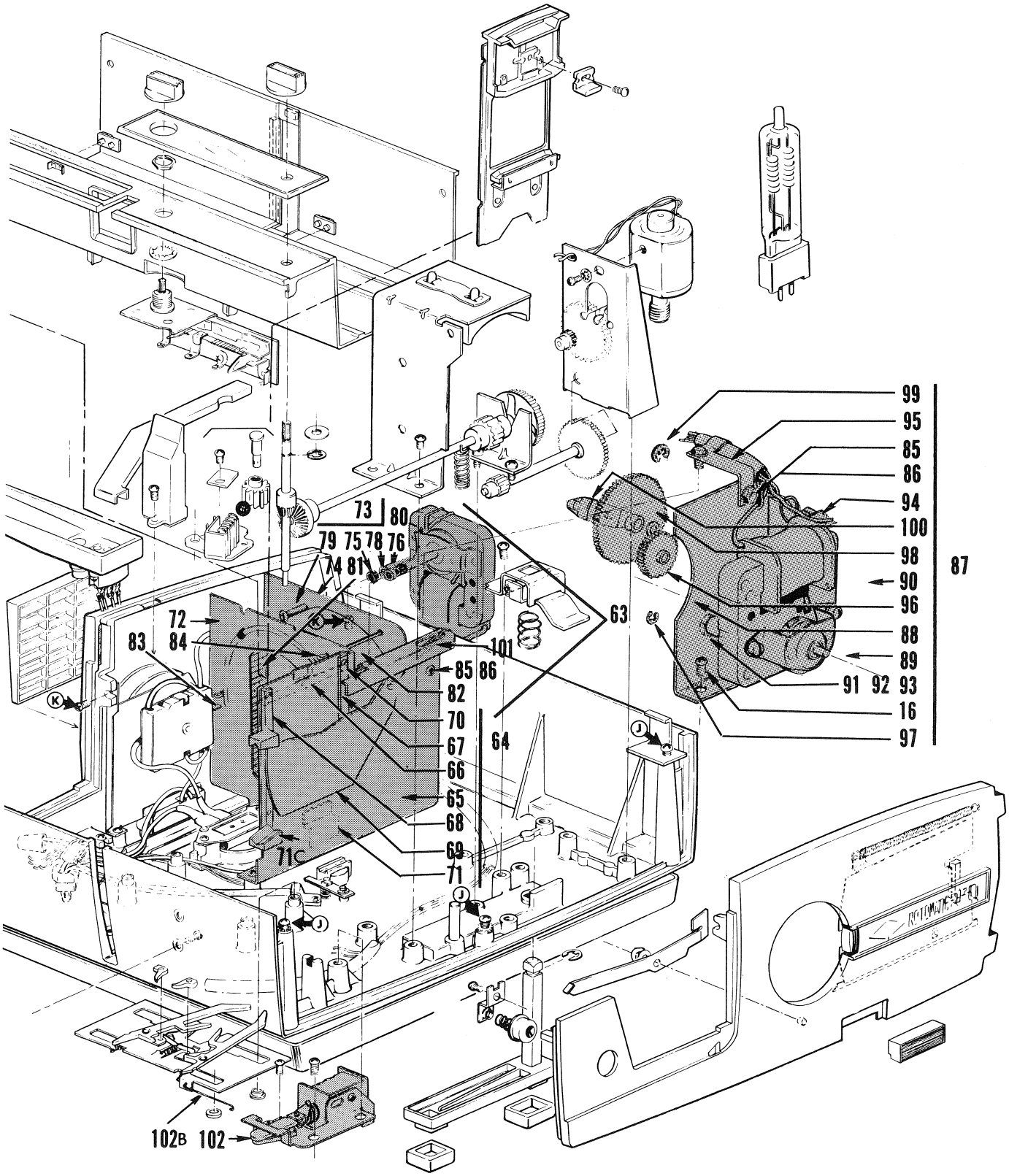
COVER AND CORD REEL ASSEMBLY

Index	Model										Part Name 1 2 3 4	Part No.
	600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA		
41	—	—	X	X	—	—	X	X	X	X	Cover and Cord Reel Assy. - Base	435-509
43	—	—	X	X	—	—	X	X	X	X	Cover - Base	435-403
44	—	—	X	X	—	—	X	X	X	X	Stud (3)	435-201
45	—	—	X	X	—	—	X	X	X	X	Reel Assy.	429-511
46	—	—	X	X	—	—	X	X	X	X	Reel	390-125
47	—	—	X	X	—	—	X	X	X	X	Flange - Reel	390-126
48	—	—	X	X	—	—	X	X	X	X	Cord Assy.	435-510
49	—	—	X	X	—	—	X	X	X	X	Cord - 115-120V	435-802
50	—	—	X	X	—	—	X	X	X	X	Strain Relief	390-124
51	—	—	X	X	—	—	X	X	X	X	Guard - Cable	390-146
52	—	—	X	X	—	—	X	X	X	X	Hub-Reel	435-404
53	—	—	X	X	—	—	X	X	X	X	Screw - Self-Tap, 8-18 x 3/8	501-236
54	—	—	X	X	—	—	X	X	X	X	Latch-Cord	435-401
55	—	—	X	X	—	—	X	X	X	X	Spring - Latch	435-601
56	—	—	X	X	—	—	X	X	X	X	Retainer	590-059
57	—	—	X	X	—	—	X	X	X	X	Insert - Base Cover	435-405
58	—	—	X	X	—	—	X	X	X	X	Roller - Cord	435-402
59	—	—	X	X	—	—	X	X	X	X	Bushing	435-407
60	—	—	X	X	—	—	X	X	X	X	Screw - Self-Tap, 8-18 x 7/8	501-241
61	—	—	X	X	—	—	X	X	X	X	Screw - Self-Tap, 8-18 x 11/16	501-240

APERTURE, BLOWER AND CYCLE MECHANISM



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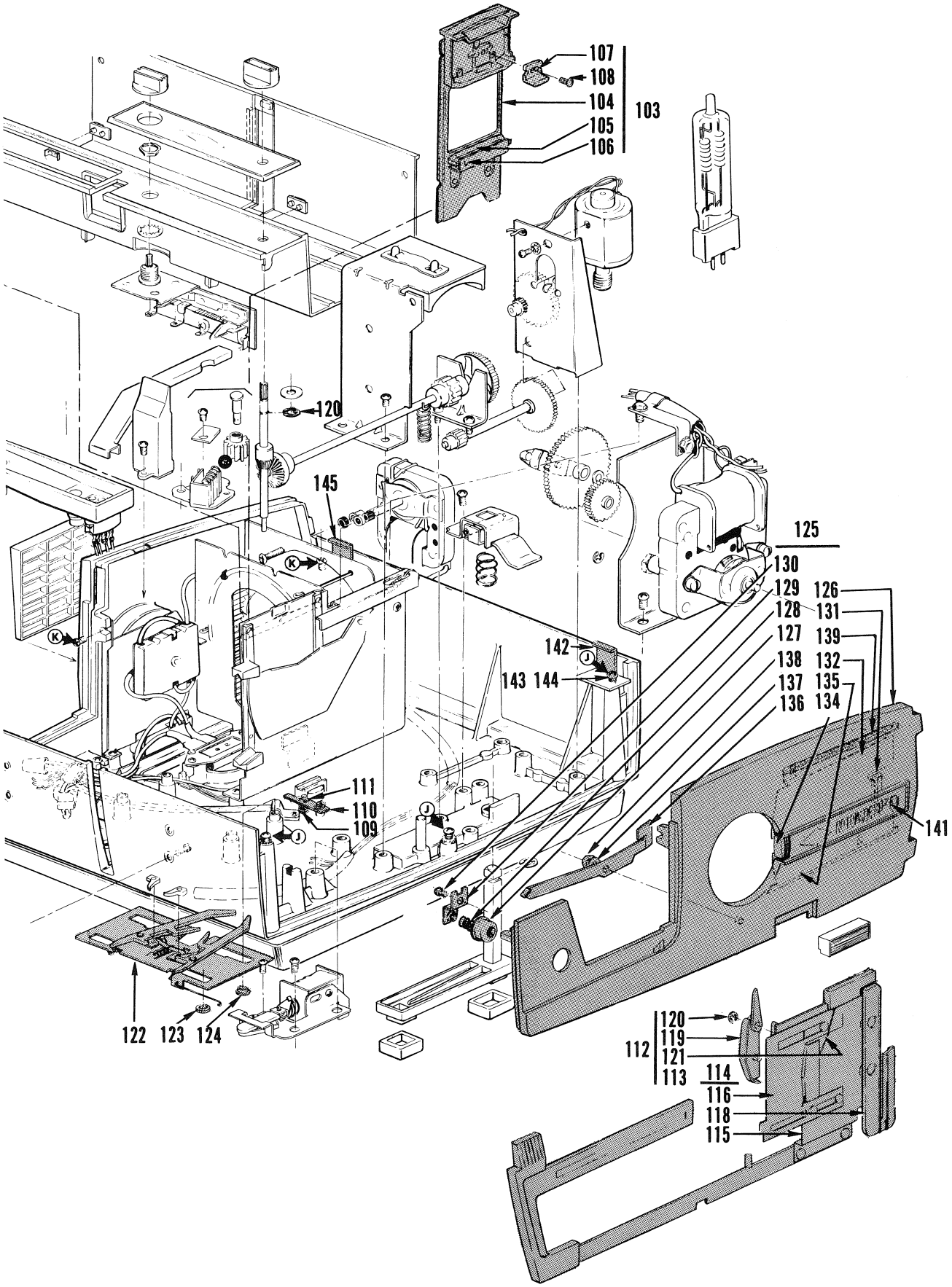
APERTURE, BLOWER AND CYCLE MECHANISM

Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.	
63	X	X	—	—	—	—	—	—	—	—	Aperture and Blower Assy.	362-566	
	—	—	—	—	X	X	—	—	—	—	Aperture and Blower Assy.	362-563	R1
	—	—	X	—	—	—	X	X	—	—	Aperture and Blower Assy.	435-505	
	—	—	—	X	—	—	—	—	X	X	Aperture and Blower Assy.	371-539	R1
64	X	X	—	—	—	—	—	—	—	—	Aperture Assy.	375-528	
	—	—	—	—	X	X	—	—	—	—	Aperture Assy.	362-528	
	—	—	X	—	—	—	X	X	—	—	Aperture Assy.	435-506	
	—	—	—	X	—	—	—	—	X	X	Aperture Assy.	371-533	
65	X	X	—	—	X	X	—	—	—	—	Plate - Aperture	304-106	
	—	—	X	X	—	—	X	X	X	X	Plate - Aperture	435-103	
66	—	—	X	X	—	—	X	X	X	X	Spring - Detent Bar	390-123	
67	—	—	X	X	—	—	X	X	X	X	Retainer Strip - L.H.	390-420	
68	—	—	X	X	—	—	X	X	X	X	Retainer Strip - R.H.	390-421	
69	—	—	X	—	—	—	X	X	—	—	Shutter - Swinging	390-114	
	—	—	—	X	—	—	—	—	X	X	Shutter - Swinging	371-531	
70	—	—	X	X	—	—	X	X	X	X	Ball	390-802	
71	X	X	—	—	X	X	—	—	—	—	Bracket - Condenser Holder	362-318	
	—	—	X	X	—	—	X	X	X	X	Bracket - Condenser Holder	435-102	
71B	X	X	—	—	X	X	—	—	—	—	Slide Track - Upper	304-404	
71C	X	X	—	—	X	X	—	—	—	—	Slide Track - Lower	304-405	
71D	X	X	X	—	X	X	X	—	—	—	Spring - Slide Track	304-601	
72	X	X	X	X	X	X	X	X	X	X	Plate - Scroll	362-100	
73	X	X	X	—	—	—	X	X	—	—	Fan Motor Assy.	435-512	
	—	—	—	X	X	X	—	—	X	X	Fan Motor Assy.	371-512	R1
74	X	X	X	X	X	X	X	X	X	X	Plate - Motor Mounting	362-101	
75	X	X	X	X	X	X	X	X	X	X	Grommet	304-807	
76	X	X	X	X	X	X	X	X	X	X	Spacer	327-214	
	—	—	—	X	X	X	—	—	X	X	Spacer, Grommet	327-218	
77	X	X	X	—	—	—	X	X	—	—	Support - Motor	362-830	
78	X	X	X	—	—	—	X	X	—	—	Washer	520-003	
	—	—	—	X	X	X	—	—	X	X	Washer	520-005	
79	X	X	X	—	—	—	X	X	—	—	Screw - 6-32 x 9/16	500-120	
	—	—	—	X	X	X	—	—	X	X	Screw - 6-32 x 1-5/8	500-099	
80	X	X	X	—	—	—	X	X	—	—	Fan Motor	390-817	
	—	—	—	—	X	X	—	—	X	X	Fan Motor and Fuse Assy.	371-541	R1
81	X	X	X	X	X	X	X	X	X	X	Blower	304-814	
82	X	X	X	X	X	X	X	X	X	X	Scroll	362-826	
	—	X	X	X	X	X	—	—	—	—	† Cover-Scroll	362-945	R1
83	X	X	X	X	X	X	X	X	X	X	Strip - Scroll Filler	362-827	
84	X	X	X	X	X	X	X	X	X	X	Cotter Pin - 1/16 x 1-3/4	591-013	
85	X	X	X	X	X	X	X	X	X	X	Screw - 6-24 x 5/16	500-002	
86	X	X	X	X	X	X	X	X	X	X	Nut - KEPS, 6-32	530-002	
87	X	X	X	X	X	X	X	X	X	X	Cycle Mechanism	362-510	
88	X	X	X	X	X	X	X	X	X	X	Mounting Assy. - Motor	362-530	
89	X	X	X	X	X	X	X	X	X	X	Cycle Motor	327-805	
90	X	X	X	X	X	X	X	X	X	X	Screw - Motor Mounting, 10-32 x 1/4	500-008	
91	X	X	X	X	X	X	X	X	X	X	Screw - Motor Mounting, 10-32 x 5/16	500-009	
92	X	X	X	X	X	X	X	X	X	X	Washer	520-005	
93	X	X	X	X	X	X	X	X	X	X	Lockwasher	521-003	
94	X	X	X	X	X	X	X	X	X	X	Switch Assy. - Cycle	325-508	
95	X	X	X	X	X	X	X	X	X	X	Bracket - Anchor	325-134	
96	X	X	X	X	X	X	X	X	X	X	Gear - Intermediate	325-414	
97	X	X	X	X	X	X	X	X	X	X	Retainer	590-002	
98	X	X	X	X	X	X	X	X	X	X	Gear - Drive	325-402	
99	X	X	X	X	X	X	X	X	X	X	Retainer	590-004	
100	X	X	X	X	X	X	X	X	X	X	Cam - Integral Pin	325-420	
101	—	—	X	X	—	—	—	X	X	X	Spring - Swinging Shutter	390-606	
102	X	X	X	X	X	X	X	X	X	X	Solenoid	362-511	
102B	X	X	X	X	X	X	X	X	X	X	Link - Wire	362-608	

† For Export Models Only. R1

EDITOR, TRANSPORT AND FRONT MOLDING ASSEMBLIES



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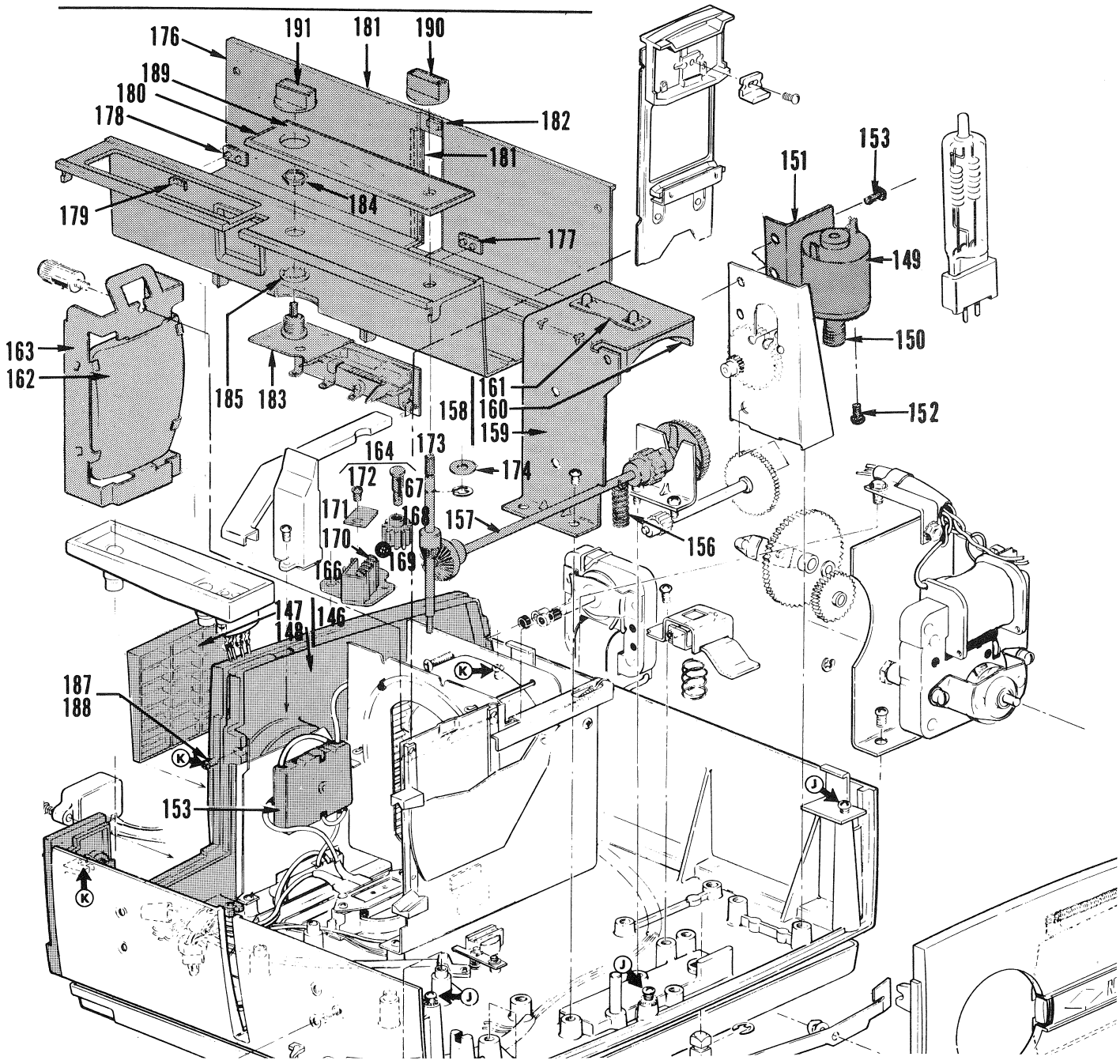
EDITOR, TRANSPORT AND FRONT MOLDING ASSEMBLIES

Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.	
103	—	—	X	X	—	—	—	X	X	X	Editor Assy. - Slide	435-507	
104	—	—	X	X	—	—	—	X	X	X	Plate - Slide Track	390-113	
105	—	—	X	X	—	—	—	X	X	X	Track - Lower	390-404	
106	—	—	X	X	—	—	—	X	X	X	Spring - Lower Track	304-601	
107	—	—	X	X	—	—	—	X	X	X	Lug - Ejector Trip	390-416	
108	—	—	X	X	—	—	—	X	X	X	Screw - Self- Tap, 6-20 x 3/8	501-220	
109	—	—	X	X	—	—	—	X	X	X	Spring - Interlock Bar	435-602	
110	—	—	X	X	—	—	—	X	X	X	Bar - Interlock	435-105	
111	—	—	X	X	—	—	—	X	X	X	Retainer	590-010	
112	X	X	X	X	X	X	X	X	X	X	Transport Assy.	435-511	
113	X	X	X	X	X	X	X	X	X	X	Pusher	435-320	
114	X	X	X	X	X	X	X	X	X	X	Shutter Assy.	399-517	
115	X	X	X	X	X	X	X	X	X	X	Plate - Shutter	399-104	
116	X	X	X	X	X	X	X	X	X	X	Shutter	304-126	
118	X	X	X	X	X	X	X	X	X	X	Cam-Slide Transport	325-419	
119	X	X	X	X	X	X	X	X	X	X	Ejector	304-407	
120	X	X	X	X	X	X	X	X	X	X	Retainer	590-005	
121	X	X	X	X	X	X	X	X	X	X	Spring - Shutter	390-608	
122	X	—	—	—	—	—	—	—	—	—	Plate Assy. - Index (Use 362-565)	362-518	
122	—	X	X	X	X	X	X	X	X	X	Plate Assy. - Index	362-565	
123	X	X	X	X	X	X	X	X	X	X	Washer - Index Plate	362-430	
124	X	X	X	X	X	X	X	X	X	X	Bushing - Index Plate	362-429	
125	X	X	X	X	X	X	—	—	—	—	Molding Assy. - Front	362-514	
	—	—	—	—	—	—	X	X	—	—	Molding Assy. - Front	465-504	R1
	—	—	—	—	—	—	—	—	X	—	Molding Assy. - Front	465-546	R1
	—	—	—	—	—	—	—	—	—	X	Molding Assy. - Front	465-545	R1
	X	X	X	X	X	X	—	—	—	—	† Molding Assy. - Front	406-514	
126	X	X	X	X	X	X	—	—	—	—	Molding - Front	362-400	
	—	—	—	—	—	—	X	X	—	—	Molding - Front	465-400	R1
	—	—	—	—	—	—	—	—	X	—	Molding - Front	465-410	R1
	—	—	—	—	—	—	—	—	—	X	Molding - Front	465-412	R1
	X	X	X	X	X	X	—	—	—	—	† Molding - Front	406-400	
127	X	X	X	X	X	X	X	X	X	X	Catch Button - Cover	362-435	
128	X	X	X	X	X	X	X	X	X	X	Spring - Cover Button	362-605	
129	X	X	X	X	X	X	X	X	X	X	Bracket - Button	362-122	
130	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 6-20 x 1/4	501-226	
131	X	X	X	X	X	X	X	X	X	X	Bumper - Lens Door	362-804	
132	X	X	X	X	X	X	—	—	—	—	Door Assy. - Lens	362-534	
	—	—	—	—	—	—	X	X	X	X	Door Assy. - Lens	465-505	R1
133	X	X	X	X	X	X	—	—	—	—	Door - Lens	362-102	
	—	—	—	—	—	—	X	X	X	X	Door - Lens	465-102	R1
134	X	X	X	X	X	X	—	—	—	—	Knob - Lens Door	362-409	
	—	—	—	—	—	—	X	X	X	X	Knob - Lens Door	465-407	R1
135	X	X	X	X	X	X	X	X	X	X	Retainer - Lens Door	362-112	
136	X	X	X	X	X	X	X	X	X	X	Catch - Lens Door	362-110	
137	X	X	X	X	X	X	X	X	X	X	Washer	520-002	
138	X	X	X	X	X	X	X	X	X	X	Retainer	590-031	
139	X	X	X	X	X	X	X	X	X	X	Spring - Door	362-606	
141	X	—	—	—	—	—	—	—	—	—	Name Plate - Front	362-840	
	—	X	—	—	—	—	—	—	—	—	Name Plate - Front	375-825	
	—	—	X	—	—	—	—	—	—	—	Name Plate - Front	435-807	
	—	—	—	X	X	X	—	—	—	—	Name Plate - Front	371-812	
	—	—	—	—	—	—	—	X	—	—	Name Plate - Front	465-807	R1
	—	—	—	—	—	—	X	—	—	—	Name Plate - Front	465-810	R1
	—	—	—	—	—	—	—	—	X	—	Name Plate - Front	465-817	R1
	—	—	—	—	—	—	—	—	—	X	Name Plate - Front	465-819	R1
142	X	X	X	X	X	X	—	—	—	—	Hook - Access Cover, R.H.	362-114	
143	X	X	X	X	X	X	—	—	—	—	Lockwasher	521-012	
144	X	X	X	X	X	X	—	—	—	—	Screw - Self-Tap, 8-32 x 1/2	501-115	
145	X	X	X	X	X	X	—	—	—	—	Hook - Access Cover, L.H.	362-115	

† For Canadian Projectors Only.

175 TRAY CHANNEL AND REAR MOLDING ASSEMBLIES



Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.	
146	X	X	X	X	X	X	—	—	—	—	Molding Assy. - Rear	362-515	
	—	—	—	—	—	—	X	X	X	—	Molding Assy. - Rear	465-506	R1
	—	—	—	—	—	—	—	—	—	X	Molding Assy. - Rear	465-543	R1
	X	X	X	—	X	X	—	—	—	—	† Molding Assy. - Rear	406-515	
147	X	X	X	X	X	X	—	—	—	—	Molding - Rear	362-501	
	—	—	—	—	—	—	X	X	X	X	Molding - Rear	465-401	R1
	X	X	X	—	X	X	—	—	—	—	† Molding - Rear	406-401	
148	X	X	X	X	X	X	—	—	—	—	Louvers	362-428	
	—	—	—	—	—	—	X	X	X	—	Louvers	465-404	R1
	—	—	—	—	—	—	—	—	—	X	Louvers	465-414	R1

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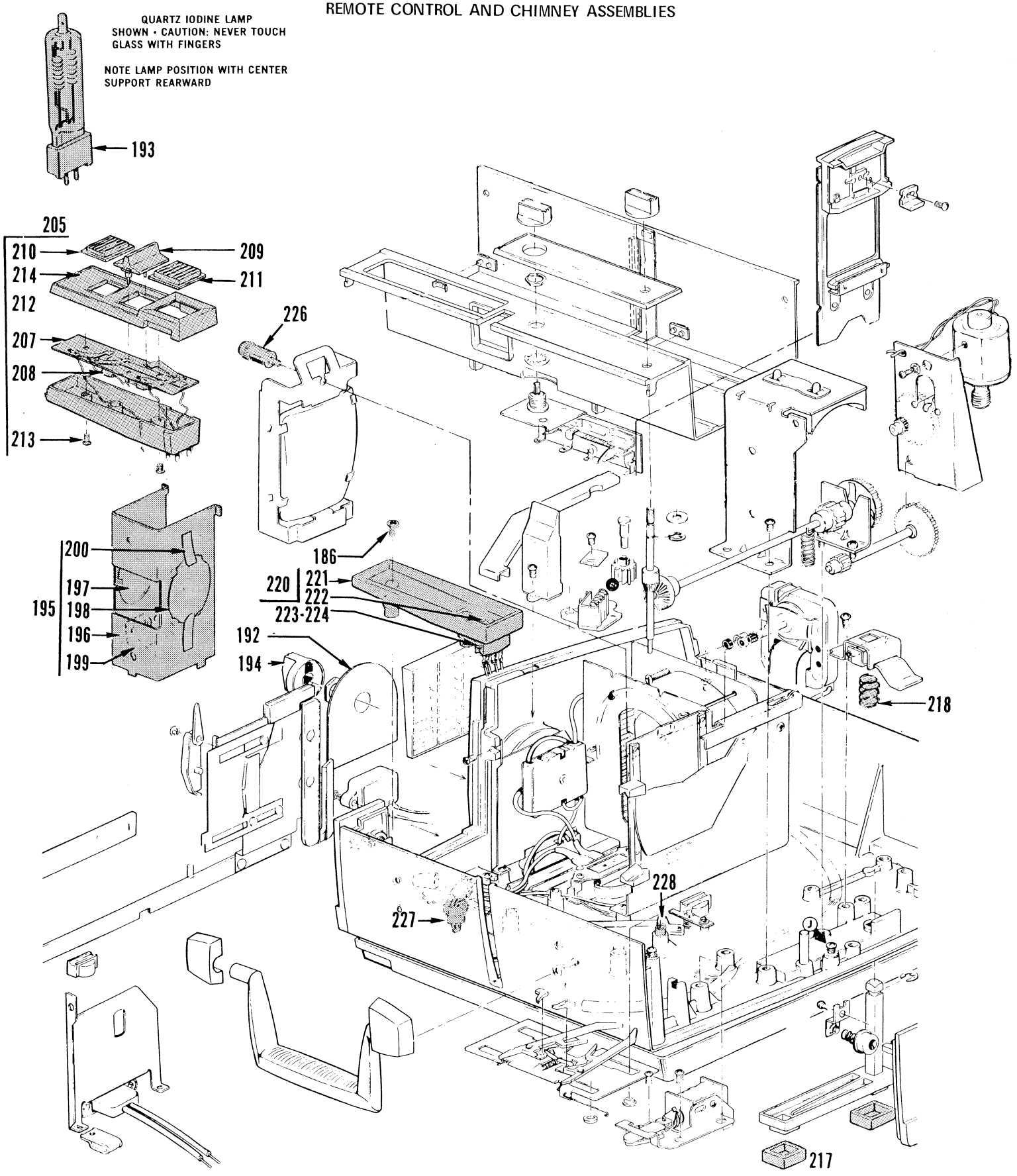
TRAY CHANNEL AND REAR MOLDING ASSEMBLIES

NOTE: FOR AUTO FOCUS PARTS SEE AUTO FOCUS PARTS AND SERVICE MANUAL.

Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.	
149	X	X	X	—	—	—	X	X	—	—	*Focus Motor	327-828	R2
	X	X	X	—	—	—	X	X	—	—	**Focus Motor Assy.	327-526	R2
	X	X	X	—	—	—	X	X	—	—	Focus Motor	327-855	R2
150	X	X	X	—	—	—	X	X	—	—	Gear - Worm	327-206	R2
151	X	X	X	—	—	—	X	X	—	—	Bracket - Focus Motor	327-140	R2
152	X	X	X	—	—	—	X	X	—	—	Screw - Motor Mount	500-111	R2
153	X	X	X	—	—	—	X	X	—	—	Screw - Bracket	501-128	R2
154	X	X	X	X	X	X	X	X	X	X	Switch - Off- On	362-806	R2
156	X	X	X	—	—	—	X	X	—	—	Spring - Focus	304-622	
157	X	X	X	—	—	—	X	X	—	—	Shaft Assy. - Focus	362-516	
158	X	X	X	—	—	—	X	X	—	—	Glide Assy. - Lens	362-517	
159	X	X	X	—	—	—	X	X	—	—	Bracket - Lens	362-109	
160	X	X	X	—	—	—	X	X	—	—	Glide - Lens	362-407	
161	X	X	X	—	—	—	X	X	—	—	Retainer	590-011	
162	—	—	X	X	—	—	—	X	X	X	Lens - Condenser	388-836	
	X	X	—	—	X	X	X	—	—	—	Lens - Condenser	304-813	
163	X	X	—	—	X	X	X	—	—	—	Holder - Lens Condenser	362-318	
	—	—	X	X	—	—	—	X	X	X	Holder - Lens Condenser	435-101	
164	X	X	X	X	X	X	X	X	X	X	Gear Assy. - Index	362-513	
165	X	X	X	X	X	X	X	X	X	X	Bracket and Stud Assy.	362-533	
166	X	X	X	X	X	X	X	X	X	X	Bracket	362-314	
167	X	X	X	X	X	X	X	X	X	X	Stud	362-206	
168	X	X	X	X	X	X	X	X	X	X	Gear - Index	304-401	
169	X	X	X	X	X	X	X	X	X	X	Ball - Detent	304-815	
170	X	X	X	X	X	X	X	X	X	X	Spring	325-619	
171	X	X	X	X	X	X	X	X	X	X	Retainer - Detent Ball	362-111	
172	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 6-32 x 1/4	501-101	
173	X	X	X	X	X	X	X	X	X	X	Focus Shaft Assy. - Vertical	362-519	
174	X	X	X	X	X	X	X	X	X	X	Washer - Fiber	520-031	
175	X	—	—	—	X	—	—	—	—	—	Channel Assy. - Tray	375-515	
	—	X	—	—	—	—	X	—	—	—	Channel Assy. - Tray	435-510	
	—	—	X	X	—	X	—	X	X	X	Channel Assy. - Tray	435-515	
176	X	X	X	X	X	X	X	X	X	X	Channel Tray	362-543	
177	X	X	X	X	X	X	X	X	X	X	Retainer - ROTOTRAY , R.H.	362-411	
178	X	X	X	X	X	X	X	X	X	X	Retainer - ROTOTRAY , L.H.	362-431	
179	X	X	X	X	X	X	X	X	X	X	Retainer	590-046	
180	X	X	X	X	X	X	X	X	X	X	Pad - Escutcheon Plate	435-408	
181	X	X	X	X	X	X	X	X	X	X	Shield - Light	362-815	
182	X	X	X	X	X	X	X	X	X	X	Bumper - Shutter	362-816	
183	—	X	X	X	—	X	X	X	X	X	Timer	392-501	
184	X	X	X	X	—	X	X	X	X	X	Nut	590-005	
185	X	X	X	X	—	X	X	X	X	X	Lockwasher	521-014	
186	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 6-32 x 9/16	501-112	
187	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 6-32 x 1/2	500-094	
188	X	X	X	—	X	X	X	X	—	—	Nut	530-002	
189	X	—	—	—	—	—	—	—	—	—	Name Plate - Escutcheon	435-808	
	—	X	X	—	—	—	—	—	—	—	Name Plate - Escutcheon	435-806	
	—	—	—	X	—	—	—	—	—	—	Name Plate - Escutcheon	371-845	
	X	—	—	—	X	—	—	—	—	—	Name Plate 600A - Escutcheon	362-857	
	—	X	—	—	—	X	—	—	—	—	Name Plate 700A - Escutcheon	375-851	
	—	—	—	—	—	—	—	X	—	—	Name Plate - Escutcheon	465-804	
	—	—	—	—	—	—	X	—	—	—	Name Plate - Escutcheon	465-811	
	—	—	—	—	—	—	—	—	X	—	Name Plate - Escutcheon	465-815	
	—	—	—	—	—	—	—	—	—	X	Name Plate - Escutcheon	465-820	
190	X	X	X	X	X	X	—	—	—	—	Knob Assy. - Focus	362-521	
	—	—	—	—	—	—	—	—	—	X	Knob Assy. - Focus	465-547	
	—	—	—	—	—	—	X	X	X	—	Knob Assy. - Focus	465-509	
191	—	X	X	X	—	X	—	—	—	—	Knob - Timer Switch	375-511	
	—	—	—	—	—	—	X	X	X	—	Knob-- Timer Switch	465-510	
	—	—	—	—	—	—	—	—	—	X	Knob - Timer Switch	465-548	

* No Longer Available. Use Focus Motor Assy. 327-526 R2
** Focus Motor Assy. Must Be Used with Bracket 362-575 Only. R2
† For Canadian Projector Only.

REMOTE CONTROL AND CHIMNEY ASSEMBLIES



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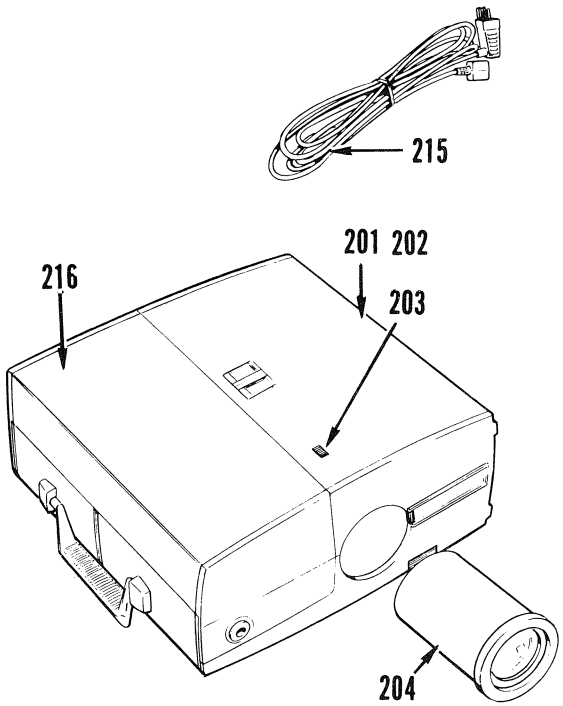
REMOTE CONTROL AND CHIMNEY ASSEMBLIES

Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.	
192	X	—	—	—	—	—	—	—	—	—	Plate - Specification	362-841	
	X	—	—	—	—	—	—	—	—	—	† Plate - Specification	406-803	
	—	X	—	—	—	—	—	—	—	—	Plate - Specification	375-827	
	—	X	—	—	—	—	—	—	—	—	† Plate - Specification	407-803	
	—	—	X	—	—	—	—	—	—	—	Plate - Specification	435-803	
	—	—	—	X	—	—	—	—	—	—	Plate - Specification	371-813	
	—	—	X	—	—	—	—	—	—	—	† Plate - Specification	435-803	
	—	—	—	—	X	—	—	—	—	—	Specification Plate 600A	362-850	
	—	—	—	—	X	—	—	—	—	—	† Specification Plate 600A	406-830	
	—	—	—	—	—	X	—	—	—	—	Specification Plate 700A	375-850	
	—	—	—	—	—	X	—	—	—	—	† Specification Plate 700A	407-830	
	—	—	—	—	—	—	—	X	—	—	Plate - Specification	465-801	R1
	—	—	—	—	—	—	X	—	—	—	Plate - Specification	465-812	R1
	—	—	—	—	—	—	—	—	X	—	Plate - Specification	465-814	R1
	—	—	—	—	—	—	—	—	—	X	Plate - Specification	465-821	R1
193	X	X	—	—	X	X	X	—	—	—	Lamp - 500 watt DAK	575-001	
	—	—	X	X	—	—	—	X	X	X	Lamp - Quartz Iodine	435-805	
194	X	X	X	X	X	X	—	—	—	—	Knob - Switch	362-522	
	—	—	—	—	—	—	X	X	X	—	Knob - Switch	465-511	R1
	—	—	—	—	—	—	—	—	—	X	Knob - Switch	465-549	R1
195	X	X	—	—	X	X	—	—	—	—	Chimney Assy.	329-505	
	—	—	X	X	—	—	—	X	X	X	Chimney Assy.	435-514	
	—	—	—	—	—	—	X	—	—	—	Chimney Assy.	362-544	R1
196	X	X	X	X	X	X	X	X	X	X	Chimney	304-140	
197	X	X	X	X	X	X	X	X	X	X	Reflector	329-101	
198	X	X	—	—	X	X	X	—	—	—	Lens - Heat Absorbing	304-844	
	—	—	X	X	—	—	—	X	X	X	Lens - Heat Absorbing	433-801	
199	—	—	X	X	—	—	—	X	X	X	Heat Shield	435-109	
200	X	X	X	X	X	X	X	X	X	X	Springs	304-604	
205	—	—	X	X	—	—	—	—	—	—	Label - Room Light	435-902	
206	X	X	X	—	—	—	X	X	—	—	Remote Control Assy.	362-525	
	—	—	—	X	X	X	—	—	X	X	Remote Control Assy.	371-507	
207	X	X	X	—	—	—	X	X	—	—	Board Assy. - Body	362-548	
	—	—	—	X	X	X	—	—	X	X	Board Assy. - Contact	435-522	
208	X	X	X	—	—	—	X	X	—	—	Rectifier	327-548	
209	X	X	X	—	—	—	X	X	—	—	Button - Focus	362-412	
210	X	X	X	X	X	X	X	X	X	X	Button - Forward-Reverse	362-413	
211	X	X	X	X	X	X	X	X	X	X	Button - Cycle	362-414	
212	X	X	X	X	X	X	X	X	X	X	Cover - Remote Control	371-408	
213	X	X	X	X	X	X	X	X	X	X	Screw - Self-Tap, 4-24 x 1/2	501-202	
214	X	X	X	—	—	—	X	X	—	—	Name Plate - Remote Control	362-824	
	—	—	—	X	X	X	—	—	X	—	Name Plate - Remote Control	371-844	
	—	—	—	—	—	—	—	—	—	X	Name Plate - Remote Control	465-824	R1
217	X	X	X	X	X	X	X	X	X	X	Foot	362-825	
218	X	X	X	X	X	X	X	X	X	X	Spring - Elevating Foot	362-601	
220	X	X	X	X	—	X	X	X	X	X	Socket Assy. - Pocket	362-540	
	—	—	—	—	X	—	—	—	—	—	Socket Assy. - Pocket	362-573	
221	X	X	X	X	X	X	X	X	X	X	Pocket Remote Control	362-406	
222	X	X	X	X	X	X	X	X	X	X	Socket	362-807	
223	X	X	X	X	X	X	X	X	X	X	Screw - 3-48 x 3/8	500-095	
224	X	X	X	X	X	X	X	X	X	X	Nut - 3-48	530-010	
226	X	X	—	—	X	X	X	X	—	—	Screw - Lens Holder	304-218	
227	X	X	X	X	X	X	X	X	X	X	Bushing - Strain Relief	429-827	
228	—	—	X	X	—	—	—	X	X	X	Bushing	435-407	

† For Canadian Projectors Only.

COVER ASSEMBLIES



Index	Model 600	700	707Q	707AQ	600A	700A	666	777Q	777AQ	EATON OPTINA	Part Name 1 2 3 4	Part No.
201	X	X	—	—	—	—	—	—	—	—	Cover Assy. - Access	362-523
	—	X	—	—	—	—	—	—	—	—	† Cover Assy. - Access	406-523
	—	—	X	—	—	—	—	—	—	—	Cover Assy. - Access	435-508
	—	—	X	—	—	—	—	—	—	—	† Cover Assy. - Access	435-521
	—	—	—	X	—	—	—	—	—	—	Cover Assy. - Access	435-531
	—	—	—	—	X	X	—	—	—	—	Cover Assy. - Access	362-571
	—	—	—	—	X	X	—	—	—	—	† Cover Assy. - Access	406-551
	—	—	—	X	—	—	—	—	—	—	† Cover Assy. - Access	435-541
	—	—	—	—	—	—	X	X	—	—	Cover Assy. - Access	465-512
	—	—	—	—	—	—	—	—	X	—	Cover Assy. - Access	465-531
	—	—	—	—	—	—	—	—	—	X	Cover Assy. - Access	465-541
202	—	—	—	—	—	—	X	X	X	X	Cover	465-318
	X	X	X	X	X	X	—	—	—	—	Cover	362-311
	—	—	—	—	—	—	X	—	—	—	Name Plate - Access Cover	465-513
	—	—	—	—	—	—	X	—	—	—	Name Plate - Access Cover	465-803
	—	—	—	—	—	—	—	—	X	—	Name Plate - Access Cover	465-818
	—	—	—	—	—	—	—	—	—	X	Name Plate - Access Cover	466-822
203	X	X	X	X	X	X	—	—	—	—	Clip - Access Cover	362-125
	—	—	—	X	X	X	—	—	X	X	Lens, Prismatic	371-407
204	X	X	X	X	X	X	X	X	X	X	Lens - Projection	362-551
215	X	X	X	X	X	X	X	X	X	X	Cable - Remote Control	362-811
216	X	X	X	X	X	X	—	—	—	—	Cover Assy. - Tray	435-516
	—	—	—	—	—	—	X	X	—	—	Cover Assy. - Tray	465-513
	—	—	—	—	—	—	—	—	X	X	Cover Assy. - Tray	465-517
	—	—	—	—	—	—	—	X	—	—	Plate-Front End	465-808
	—	—	—	—	—	—	—	—	X	X	Plate-Front End	465-816

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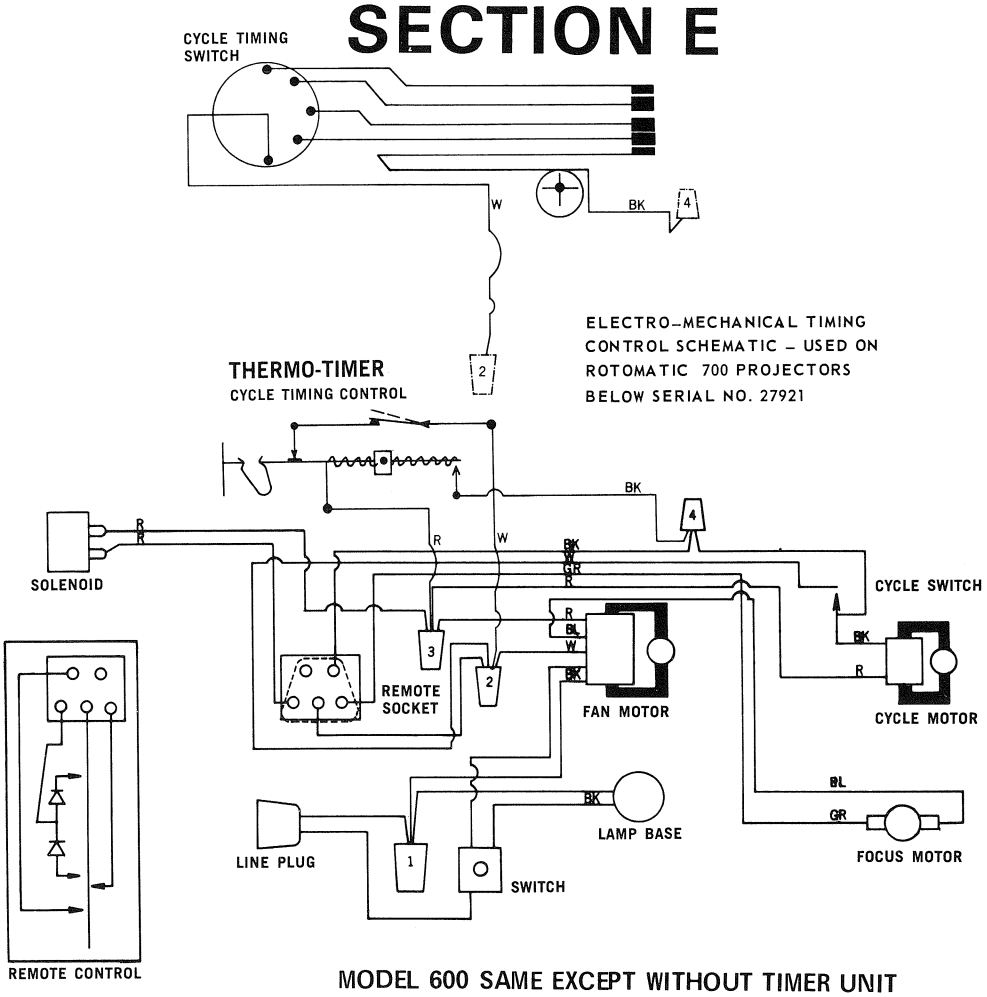
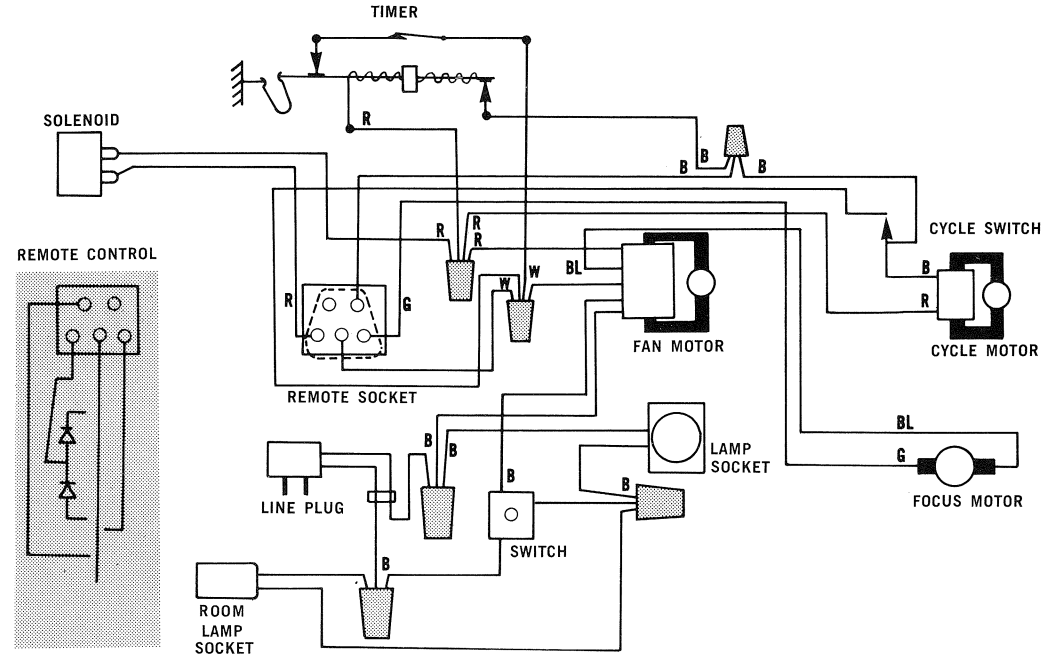
SECTION E



MODEL 600 SAME EXCEPT WITHOUT TIMER UNIT



FOR AUTOMATIC FOCUS WIRING DIAGRAMS SEE THE AUTOMATIC FOCUSING SERVICE MANUAL, 371-950-02

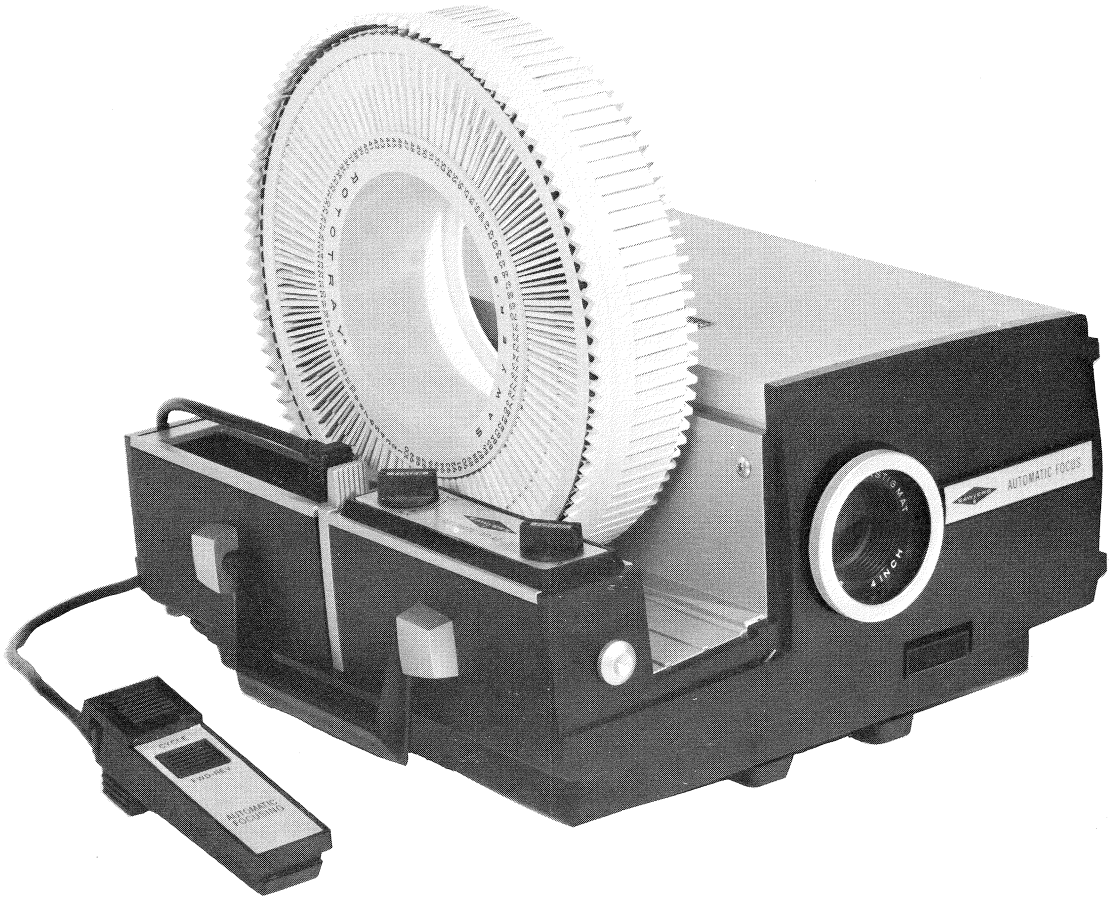
E

ROOM LIGHT

ILLUSTRATED PARTS and SERVICE MANUAL

for

AUTOMATIC FOCUSING SLIDE PROJECTORS



PART NO. 371-950-02

gaf SAWYER'S INC.

INDEX

MANUAL NO. _____ ISSUED TO _____ DATE _____

SAWYERS INC. PORTLAND, OREGON, PRINTED IN U.S.A.

gaf SAWYER'S INC.

A SUBSIDIARY OF GENERAL ANILINE & FILM CORPORATION

MARCH 1967

HOW TO USE THE ILLUSTRATED PARTS AND SERVICE MANUAL

This manual describes and illustrates instructions and parts needed for service of the particular model projectors mentioned in this book. It is divided into five alphabetical sections: A – General Information; B – Service Instructions; C – Trouble Shooting; D – Parts List and Exploded Views: and E – Wiring Diagrams.

USING THE INDEX AND LOCATING THE PROPER SECTION

The index is located following the front cover. Determine the appropriate section needed. Line up the black tab on the index page with a matching black tab further back in the book and open the book to this location. This should locate the exact area of the book desired.

USING THE PARTS LIST AND EXPLODED DRAWINGS:

The parts list is located in Section D and includes: Item number, model designation, parts description and part number. Locate the item number on the exploded view, select the proper column for the model desired (X marked in model column) and read across for description.

A complete parts price list is located in the back of the Service Manual which contains prices of service parts for all parts and Service Manuals. This Price List is in numerical order by part number. The correct list price can be obtained by first finding the part number in any of the parts and Service Manuals and then locating the same number in the Price List.

EXAMPLE:

	Model				
Item	600	700	707AQ	Part Name 1 2 3 4	Part No.
1	X	X	X	Motor Assembly – Autofocus	371–509
2	X	X	X	Motor – Focus	327–828 R3
3	X	–	X	Gear – Worm	327–206

Indent numbers in the parts list heading are used to indicate assemblies and sub-parts of assemblies. Number 1 is the major assembly. Part descriptions which are indicated under 2, 3 or 4 are sub-parts of the major assembly shown above.

If the part description has a symbol (* †) be sure to read the footnote which will have important information affecting the specific part.

SUPPLEMENTS AND REVISIONS

Supplementary pages may be added to this manual at later dates and will be filed in the proper location by page number, revision number and date. Changes on these pages will be noted by use of "R" and the revision number (R3).

ORDERING PARTS

To order repair parts see section D and use the item numbers on the exploded views to locate the part in the parts list. Always order by part number and name, and order carefully in order to get the correct part for the model you are working on, assuring a match of color, parts and trim. Order replacement parts from SAWYER'S INC., Portland, Oregon 97207. All parts shipped f.o.b. Portland, Oregon.

SECTION A

GENERAL INFORMATION

This book is to be used in conjunction with all slide projector parts books in which the automatic focus system is used and is to be inserted in your Service Manual binder following the ROTOMATIC®Manual Part No. 362-920. It covers only the automatic focusing mechanism.

All automatic focusing systems are identical and interchangeable, containing a fan motor with additional winding taps; a traveling lens bracket with circuit board; light bulb and sensor device; the elimination of the focus control button on the remote control; new covers incorporating the visible indicator window; new name plates; and special focus motors. The Nikkormat autofocus model does not have an adjustable condenser lens position.

AUTOMATIC FOCUSING PRINCIPLES

(See Figure 1) The automatic focusing system beams a spot of light from the bulb (1) on top of the lens bracket, against the slide. The bulb is run at a low voltage so as to be rich in infra-red. This light, reflected from the slide surface, is picked up by the electric eye sensor unit at the bottom of the bracket, (2), which has an infra-red filter. The output of the sensor is amplified by the circuit board and fed to the focus motor, which drives the movable portion of the lens bracket (3) back or forth via a cam (4), until a circuit balance is reached, that is, according to the distance from the slide surface as indicated by the position of the reflected light received. If the slide "pops" the position of the reflected spot on the sensor lens changes and the automatic focus mechanism will adjust the sensor lens position to center the spot of light in the lens, to maintain the distance to the slide, normally within .005". The focus system is capable of keeping the slide in finer focus than can be detected by the human eye.

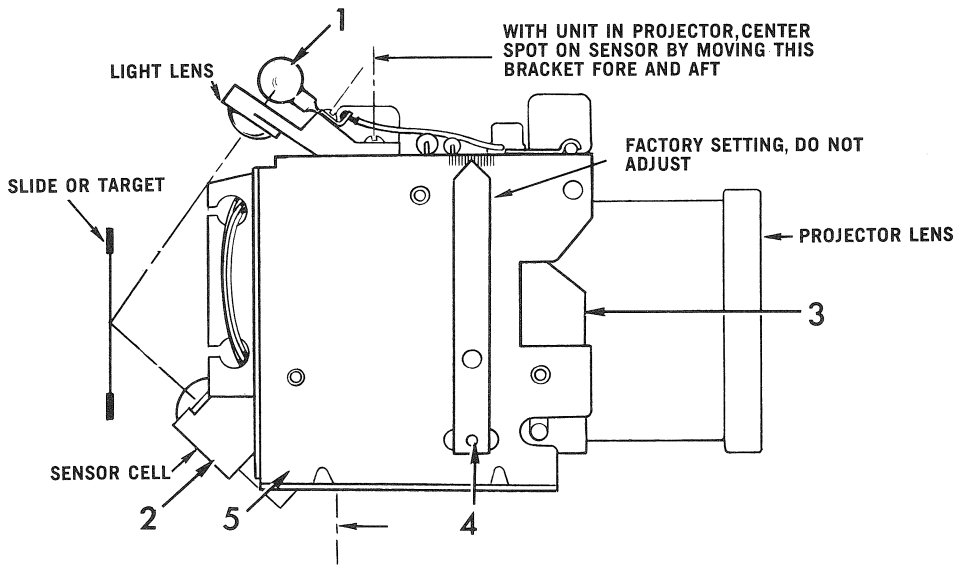


FIGURE 1

Notice that the system actually works in a "reverse" way; you do not focus the lens and have the focus maintained by the automatic focus, instead the automatic focus mechanism keeps the bracket at a fixed distance from the slide, and the projection lens is manually adjusted on the bracket to be in focus at this distance. Once manually adjusted, the projection lens and bracket track together. The focus motor moves only the bracket, (3), via the cam on (4) (total movement is approximately 3/16"). The manual focus knob moves the lens relative to the bracket, and once set, all following slides should be in focus indefinitely. The real purpose of the manual focus knob is to adjust for different lens-to-screen distances.

The sensor unit at the bottom of the lens bracket is a double unit with upper and lower cells. When the point of light reflected off the slide surface is in the center of the cell, both sides of the cell produce equal current and the focus motor is not driven. See Figure 3. If the slide "pops" toward the sensor, the light point will be reflected upward into the upper section of the sensor unit. The sensor output will be unbalanced and drive the focus motor toward the balance point, which is the center of the sensor, or in this case, away from the slide until the light point again reaches the center of the sensor. If the sensor loses the beam entirely, as could happen if the unit were improperly calibrated or if a slide were so warped as to throw the point of light off at a great angle, the unit would probably react to the remaining light coming from the slide, and seeing an equal amount of light with each part of the "eye" would react as though focused, that is, remain stable even though not focused. This and other conditions are covered in the Trouble Shooting section.

SECTION B

SERVICE INSTRUCTIONS

REMOVING THE AUTOFOCUS MECHANISM FROM THE PROJECTOR

Most service to the autofocus mechanism will not require removal from the projector. Replacing the entire unit, or the sensor cell, will require removal. To remove the autofocus mechanism, the tray channel must be removed, as explained in Basic Projector Manual. When replacing the automatic focus system, realign as explained in the following pages.

FUSED SYSTEMS

Nikkormat Autofocus models and some 707AQ models have in-line fuses, which will be found in protective sleeves near the motor.

ADJUSTMENT PROCEDURES FOR AUTOMATIC FOCUSING SYSTEM

(See Figure 2) The following is a factory adjustment procedure completed on each automatic focusing system before assembly to the support bracket (5). A complete automatic focusing assembly as received from the factory will already be adjusted, but on some occasions in service work it will be necessary to repeat this procedure.

NOTE: A few early projectors have slight differences in automatic focus systems parts which will affect the alignment and repair procedures as noted. These projectors will not have resistor R, Figure 3, on the printed circuit board, and the washer, (1), will be of a larger size. When replacing circuit boards use the later board and washer and adjust bracket pull to 70 to 120 grams, as explained below.

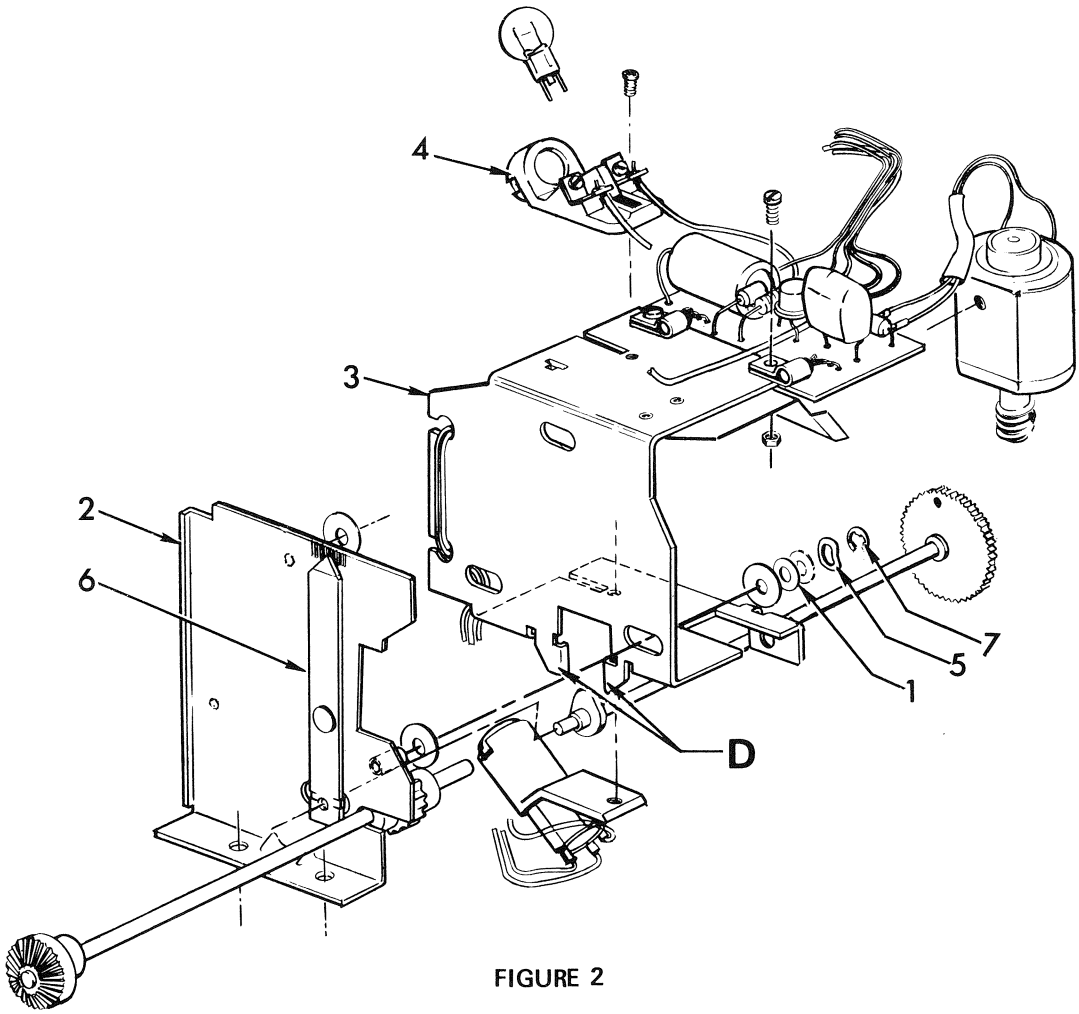


FIGURE 2

1. If available, the printed circuit board may be checked on SAWYER'S test jig for proper electric characteristics.

2. Before being placed in the projector, the lamp, bracket, and sensor assembly, not assembled to support bracket (2), are aligned in SAWYER'S test jig 371-503 as follows (see Figure 2): Place the lens bracket assembly, (3), in the fixture with the light bulb and socket, (4), center the spot of light in the dull finish target area in the fixture, which is substituting for a slide. Tighten 2 light clamp screws. Now change the target area to the polished area and adjust the sensor unit by loosening the sensor hold-down screw and sliding it back and forth till the spot of light is centered on the sensor lens. Now hook up a test focus motor to the amplifying unit (blue and green terminals of circuit board, Figure 3) and hook up input power to the unit. (Use a spare motor assembly as input power and hook up leads to all terminals on the circuit board.) With fine movements, slide the sensor unit back and forth to find the null, that is, until the focus motor does not move, or is so close to the null point that a slight up or down motion with the fingers on the sensor will change the direction of the focus motor. (Although the focus motor may not actually find a null point in this test, when the unit is in place in the projector the lens bracket friction is sufficient to dampen the movement. See Step 3.)

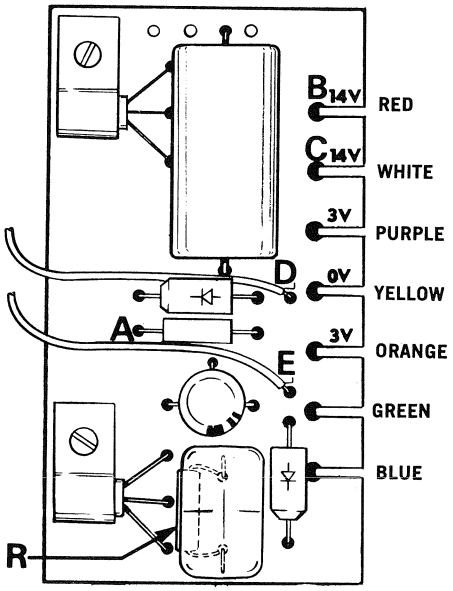


FIGURE 3

3. Now assemble the lens bracket (3), to the support bracket (2). After assembly the friction is measured for full forward and backward motion with a draw scale attached to the cam bearing surface on the bracket, point "D" in Figure 2. Friction should measure 70 to 120 grams (40 to 60 grams for early models) smoothly in each direction. This friction, determined by the spring washers (5), is an important dampening source for the servo loop.

4. Assemble the complete unit in the projector. Place a slide in the projection position and observe the automatic focus action. If the unit hunts too much defocus the lamp beam by pushing the lamp gently toward the lens with the finger. You can observe the spot on a standard slide during this adjustment. (A sharply focused spot on the center line of the sensor unit will actually lie between the two haves of the sensor unit, resulting in an unbalanced output from the sensor.) Defocus sufficiently to limit hunting to three total movements or less with a tray of warped slides. This means "normally warped" and we suggest alternating the direction of each slide. It is possible for a slide to be so warped that the focusing system will not react correctly. It is also possible that a slide normally warped will be in focus at the center but not the edges, or that a slide warped into an "S" shape may be in focus at some points but not all.

The lever-pointer (6) on the side of the support bracket, (2), is a factory adjustment for manufacturing tolerances and should not be adjusted in the field.

CHECKING FOR CENTER OF LIGHT SPOT ON SENSOR WITH PIECE OF PAPER

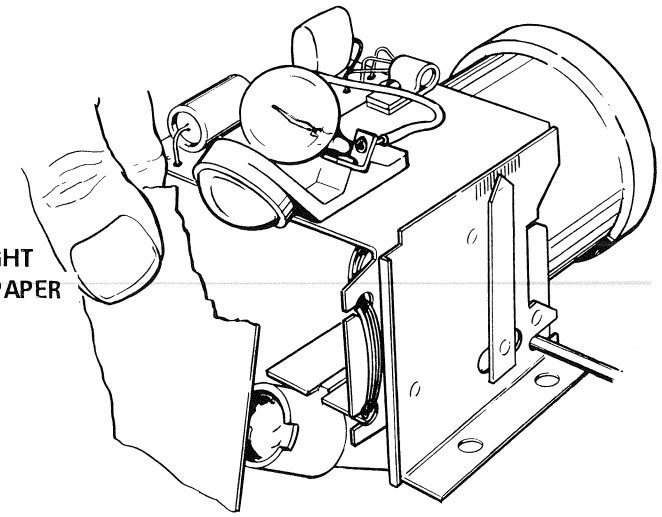


FIGURE 4

PROCEDURE FOR CHANGING TO SCR CIRCUIT BOARD AND SENSOR ASSEMBLY

1. Remove two mounting screws and wire connectors from circuit board.
2. Unsolder white/red, white/black and black wires from the source lamp. Remove white wire, sensor and printed circuit board as assembly
3. Install new sensor assembly 371-538 and new circuit board assembly 371-536 with mounting screws.
4. Black wires which were on the source lamp are now replaced with violet and orange wires and are soldered at positions shown in circuit board diagram. Figure 5.
5. Tape end of yellow wire which is no longer used and connect wire connectors on circuit board as shown in circuit board diagram. Figure 5.
6. TRIMMER ADJUSTMENT
   Adjust potentiometer on circuit board in the following manner. Using #0 point Phillips screw driver, small common point screw driver or special potentiometer adjusting tool, turn adjustment slot in potentiometer until image lamp appears to either brighten (or dim) with slight turn of the tool. At the point of adjustment where image lamp appears to brighten, turn adjustment tool an additional 6^{o} (in direction that maintains bright image lamp). Line voltage should be set at 125 vac for this adjustment. Be sure the adjustment is very short, as lengthy time can cause SCR to heat up and consequently not operate correctly (or not at all).

NOTE: After proper calibration is made no vibration will be felt at the worm gear on the focus motor when the when the unit is in the focused condition.

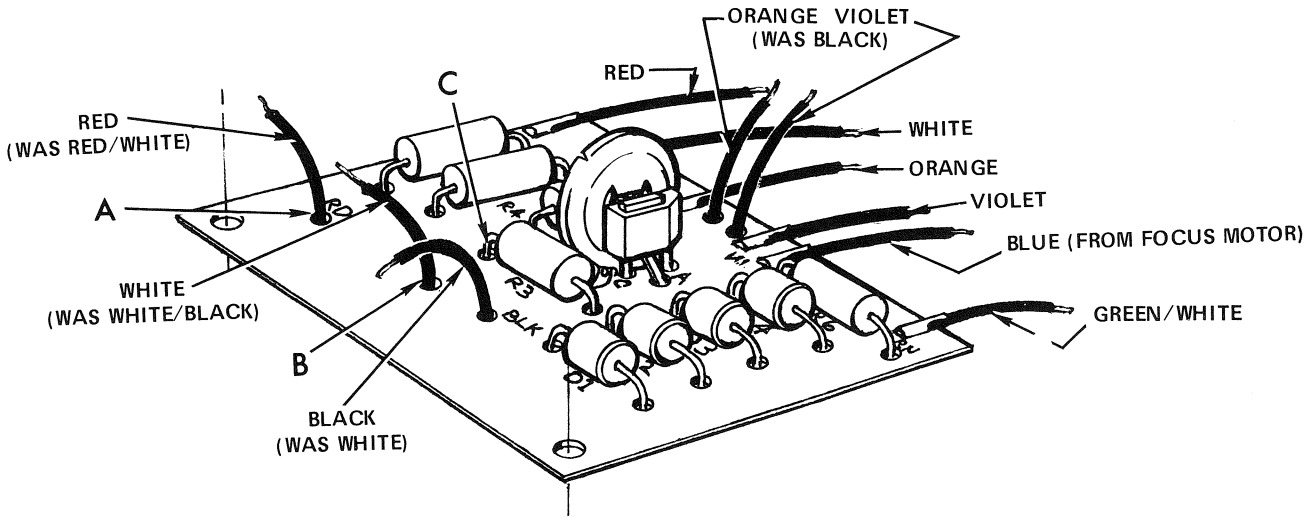


FIGURE 5

SECTION C

AUTOMATIC FOCUS TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
HUNTING, BACK AND FORTH MOVEMENT OF BRACKET AROUND FOCUS POSITION	Reflected light spot on sensor too sharp.	Defocus by pushing lamp toward lens slightly. See 4 under ADJUSTMENT PROCEDURES.
	Loss of friction in stud bearing on bracket.	Clean, and/or replace spring washers, 5, in three places. Check that retainers, 7, are in place Figure 2.
VERY UNEVEN DRIVE IN ONE OR BOTH DIRECTIONS	Uneven friction load.	See above, and 3 in ADJUSTMENT PROCEDURES.
	Particles in gears.	Check, clean as necessary.
HUNTING, ONE DIRECTION	Very wrinkled slides	Use other slides.
	Sensor cell bad.	Replace, realign. See information below.
	Dirty lens, on light or sensor.	Clean
	Complete misalignment of sensor-source units.	Remove from unit and realign, see ADJUSTMENT PROCEDURES.
NOTE: Some units will search with editor up or with projector lamp on but no slide in place.		
TWO STABLE POSITIONS, ONLY ONE IN FOCUS (Note: position with cam pointed up, or black dot on focus gear up, is true focus position.)	Light spot not centered in sensor unit.	Put a standard slide in projector. Cover one half the sensor lens, left or right, with scrap of paper as in Figure 4, unhook blue wire to terminal board and touch to orange wire to drive motor several revolutions. Observe to see if spot of light on paper travels even distance above and below center line. If not, stop motor with cam or black dot up. Loosen light bracket hold down screw and move back and forth until light spot is in center of sensor. Be sure, as in first item in this column, that spot is not too sharp.
NO AUTO FOCUS ACTION	Light does not work.	Touch new lamp to terminals, if it lights, replace. If not, check leads from motor.
	Mechanical damage, loose screws.	Inspect, repair.
	Focus motor bad.	Unhook focus motor and apply 4 volts D.C., or touch blue lead to orange terminal. If transformer is OK motor should run. If motor runs, proceed:

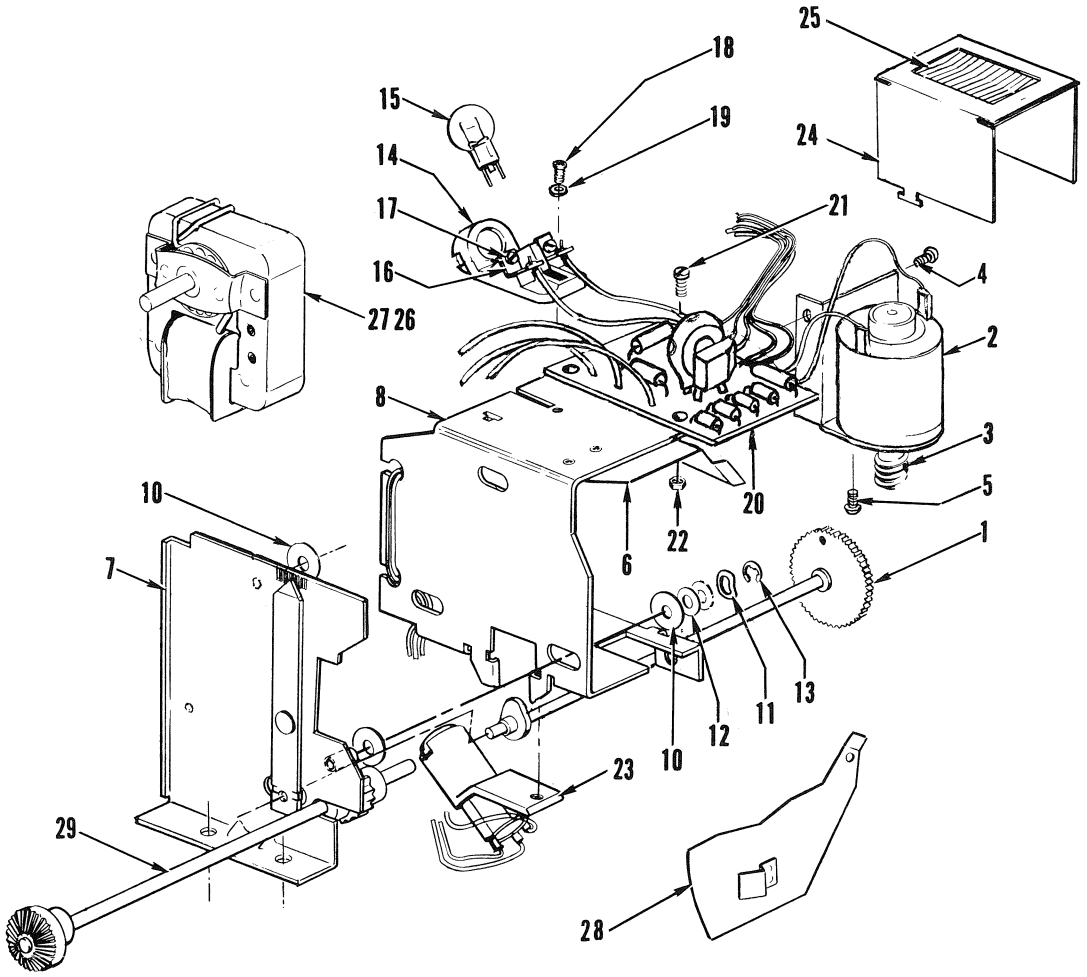
TROUBLE	CAUSE	REMEDY
		TRANSISTOR CIRCUIT GENERAL ELECTRONICS TEST. Place 1.5 K ohm resistor from end of resistor, point A in Figure 3, across to red terminal B, and then across from point A to white terminal C. This is a general systems test, except for the sensor cell (which the resistor substitutes for). If the motor operates in both tests sensor cell is probably bad, see test below. If motor does not run, test transformer, see test below. If cell and transformer are OK, check printed circuit board by substituting another board. **SCR CIRCUIT** GENERAL ELECTRONICS TEST (See Fig. 5) Place a 2.2 K ohm (1/2 W resistor) from either the red "A" or the white "B" input terminals to "C" on R3, the focus motor should now run continuously. The direction should reverse when the 2.2 K ohm resistor is alternated between the red "A" and the white "B" terminals. This is a quick test for the circuit board, focus motor and wiring. NOTE: Send defective printed circuit boards back to the Portland factory for rebuilding.
	Transformer (motor) bad.	Check for AC voltages at terminals as shown in Figure 3. Be sure line voltage to motor is OK. Check fuses.
	Sensor cell bad.	**TRANSISTOR CIRCUIT** If the above tests fail to reveal any malfunctions the sensor cell may be tested with an ohm meter WITH POWER TO PROJECTOR OFF, and light bulb removed. For early projectors (see note section B) slip wires off red and white terminals B and C, measure from point A to B and from A to C, then repeat with a bright light (flashlight) shining into cell lens. Dark measure should be approximately 15 K, depending on intensity of light. Both sides should be close to equal; unbalance will cause system malfunction. If there is still doubt, the bracket must be re-

C

TROUBLE	CAUSE	REMEDY
		moved from the unit, a new sensor cell installed, tested, adjusted and replaced. For LATER PROJECTORS, remove lamp bulb, pull off purple and orange wires, measure as above to points D and E (Figure 3). NOTE: When making above tests avoid having bright lights shine into the projector. **SRC CIRCUIT** (See Fig. 5) Most sensor cells fail due to opening of the center tap in the cell which sometimes is an intermittent condition. A test for this condition can be made by unsoldering the center black/white lead wire "B" from the circuit board and measuring for continuity with an ohmmeter. Flood the sensor with light from the projection system for this test. Resistance should be above 10 - 15 K ohms depending on conditions. Taping lightly on the sensor unit should not cause intermittent meter readings, if so replace the sensor.
SLIDE HUNTS, OR DEFOCUSES, WHEN EDITOR IS UP, AND WILL NOT REFOCUS.		Replace swinging shutter with part number 371-531, which has beam deflector fastened to face. Old shutter pivot must be drilled out and new pivot riveted in. Unit will probably have to be dismantled.

FINAL CHECK: Before releasing projector to the customer check out the operation of the automatic focusing systems with the covers in place and the machine warmed up.

SECTION D
PARTS INDEX AND EXPLODED VIEW



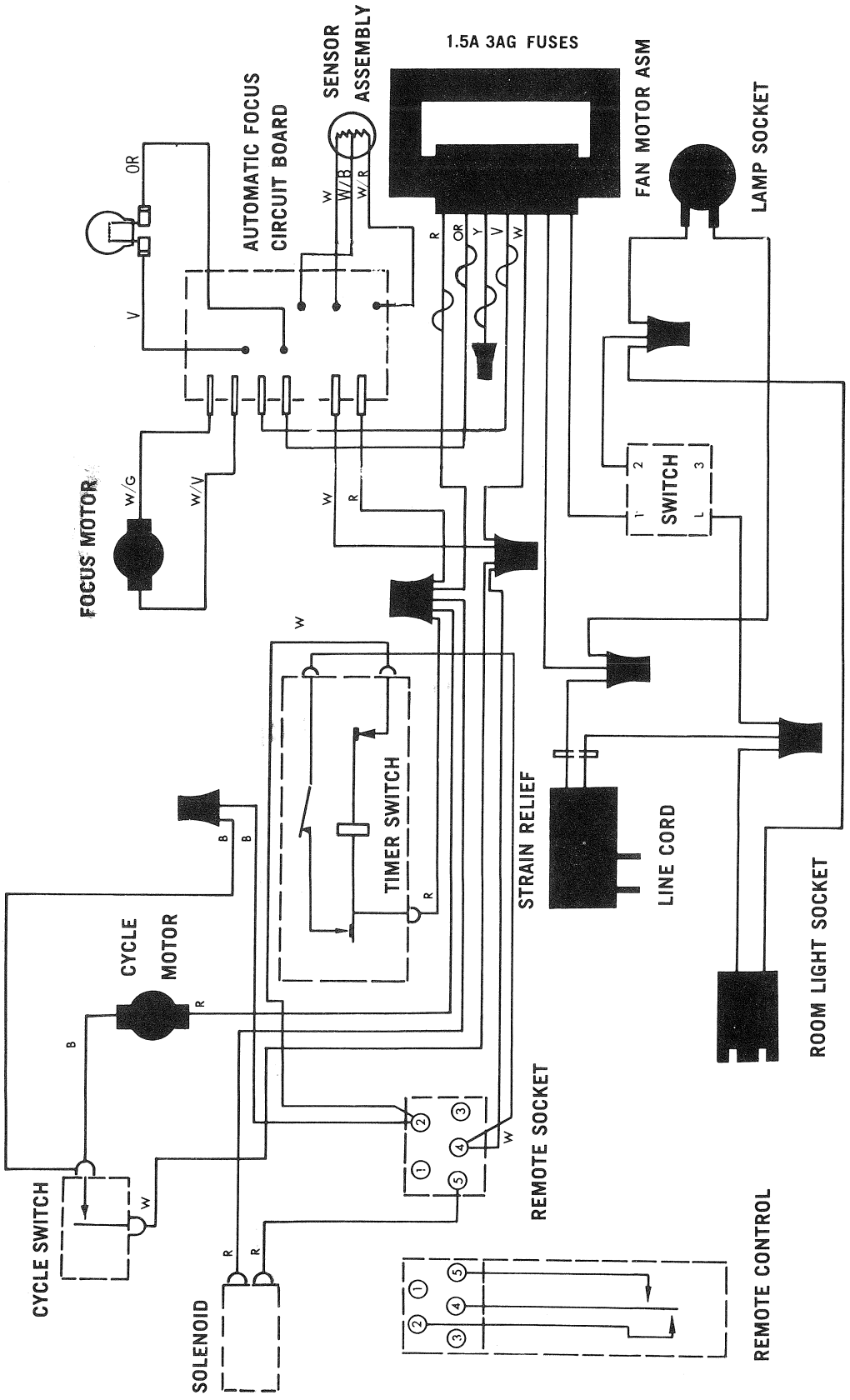
Item	Name 1 2 3 4	Part No.	
1	Shaft Assembly - Auto Focus	371-506	
2	*Motor Assembly - Focus	371-509	R2
	* *Motor Assembly – Focus	327-526	R2
	*Motor - Focus	327-828	R2
	Motor - Focus	327-855	R2
3	Gear - Worm	327-206	R2
	Setscrew	502-009	R2
4	Bracket - Focus Motor	327-140	R2
	Screw - Bracket	501-128	R2
5	Screw - Motor Mount	500-111	R2
6	Bracket Assembly – Lens	371–535	
	Glide Assembly – Lens	371–534	
7	Bracket – Fixed	371–502	
8	Bracket Assembly – Lens	371–102	
10	Washer – Delrin	520–058	
11	Washer – Spring	371–817	
12	Washer	520–066	
13	Retainer – E-Ring	590–005	

Item	Name 1 2 3 4	Part No.	
14	Lens Assembly	371–504	
15	Lamp	375–105	
16	Contact – Lamp	371–104	
17	Screw – 2-32 x 1/4	501–207	
18	Screw – 4-40 x 3/16	500–102	
19	Lockwasher	521–013	
20	Circuit Board Assembly	371–536	
21	Screw – 4-40 x 1/4	501-121	R2
23	Sensor Assembly	371–538	
24	Hood – Auto Focus Lamp	371–105	
25	Mask – Hood	371–814	
26	Motor Assembly – Fan	435–533	
	Motor Assembly – Fan w/Term. & Fuses	371–522	
27	Grommet	304–807	
28	Shutter – Swinging	371–531	
29	Shaft Assembly - Focus	371-505	R2
	Clamp - Cable } Wire Mount.	362-828	
	Screw - 8 32 x 3/8 } Not Illus.	501-114	

*No Longer Available. Use Focus Motor Assy. 327-526. R2
* *Focus Motor Assy. Must Be Used with Motor Mounting Bracket 362-575 Only. R2

SECTION E

WIRING DIAGRAM, NIKKORMAT AUTOFOCUS PROJECTOR



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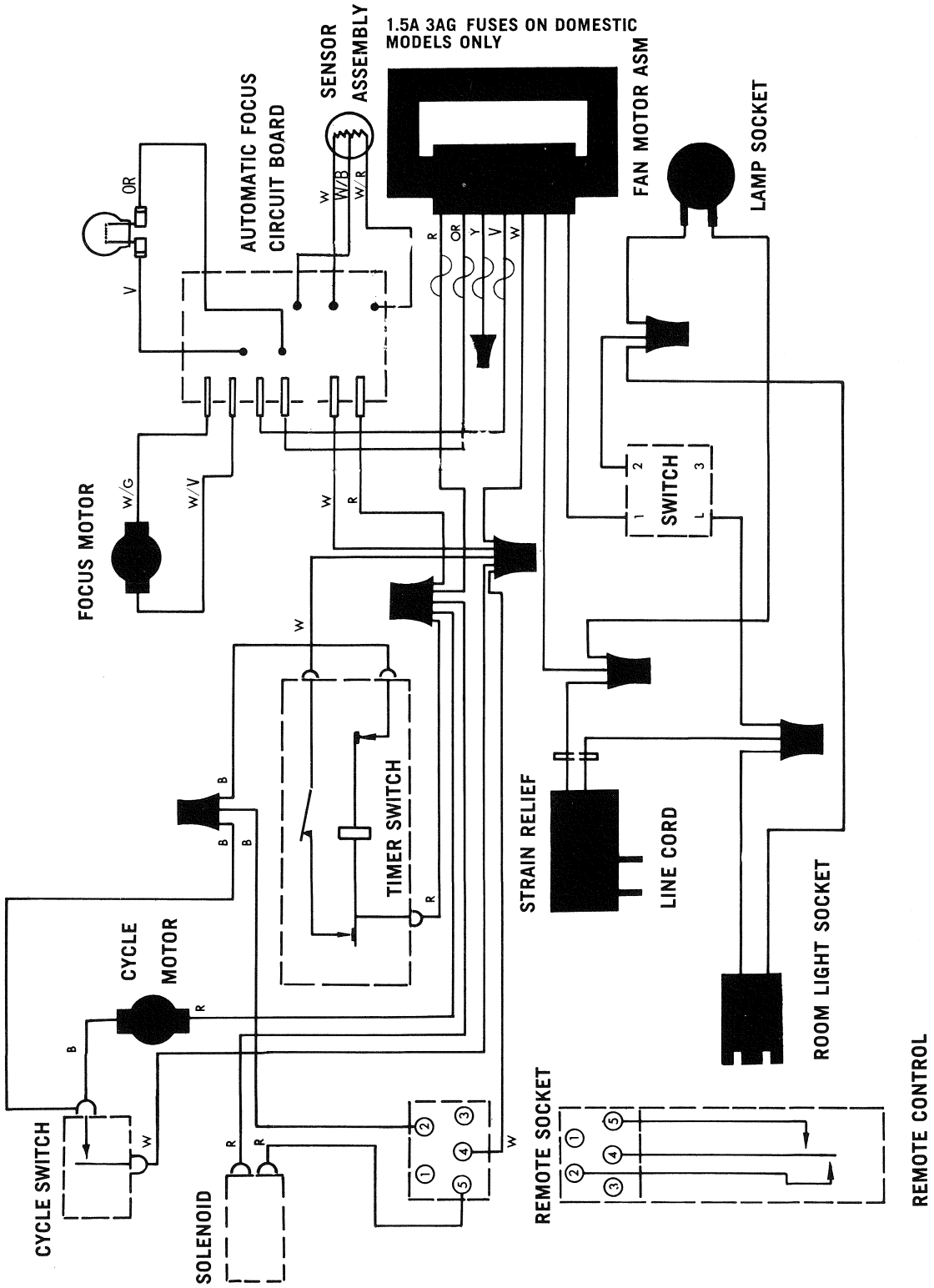
A SUBSIDIARY OF GENERAL ANILINE & FILM CORPORATION

WIRING DIAGRAM, ROTOMATIC 600A, 700A AND 707AQ PROJECTORS

ROTOMATIC 600A–700A ELECTRICAL SYSTEMS ARE THE SAME AS THE 707AQ EXCEPT FOR THE ELIMINATION OF ROOM LIGHT SOCKET, QUARTZ IODINE LAMP, AND ON THE 600A, THE ELIMINATION OF TIMER CONTROL CIRCUITS.



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