VICON

NOTES	SHEET NO.	REV.	SEC.
SUPERSEDES INSTRUCTION MANUAL X433-1189	X433	893	1

INSTRUCTIONS FOR INSTALLATION AND OPERATION

MODEL V390APT WEATHERPROOF HEAVY-DUTY PAN-AND-TILT DRIVE

1. INTRODUCTION

The information in this instruction manual covers the installation, operation, and maintenance of the V390APT Pan-and-Tilt Drives. Throughout this manual, the term V390APT and V390APT-PP refers to both models unless stated otherwise.

This unit should be installed by a qualified technician using approved materials and wiring practices in conformance with national, state and local electrical codes.

Model V390APT Pan-and-Tilt Drive is a weatherproof, heavy-duty unit capable of operating with loads up to 80 pounds (36 kg). When mounted in an inverted position, it will operate with loads up to 75 pounds (34 kg). The heavy-duty motors are constructed with hardened-steel gears that never require lubrication. All-weather protection is provided by "O" rings and gasket seals with Teflon* wear surfaces. Solenoid operated brakes provide excellent operating stability with minimum coast. Counterbalanced tilt arms provide smooth, reliable tilt operation.

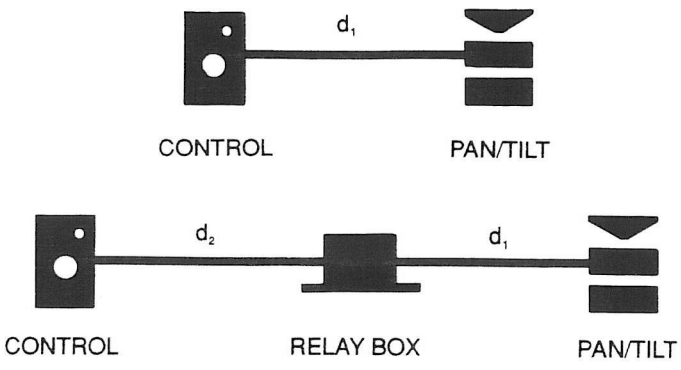

Figure 1
Operating Distances With and Without Relay Box

This 120 VAC unit may be operated directly by a control or by a combination of a control and a relay box when greater operating distances are required. Refer to Figure 1 and Table 1 for maximum operating distances. If a preset position option is required, use Model V129-8PP Preset Position Control or the VPS324™ or VPS1200 systems.

CAUTION: Mounting the unit outdoors in an inverted position voids the product warranty.

TABLE 1
MAXIMUM OPERATING DISTANCES

Control Model	Relay Box	Cable Size (AWG) Annealed Copper	Maximum Distance ft (m)*
V123APT	d_1	20	830 (250)
		18	1300 (400)
		16	2200 (670)
		14	3400 (1000)
V113APT or V113APT-B	V185R d_2*	22	6000 (1800)
		20	10,000 (3000)
		18	15,000 (4600)

Product specifications subject to change without notice.

Vicon part number 8006-8433-02-00

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VICON INDUSTRIES INC. 525 BROAD HOLLOW ROAD, MELVILLE, N.Y. 11747 TEL: (516) 293-2200 FAX: 516-293-2627
TOLL FREE: 1-800-645-9116 (OUTSIDE OF NEW YORK)

IMPORTANT SAFEGUARDS

GRAPHIC SYMBOL EXPLANATION

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the unit.

1. **Read Instructions-All** the safety and operating instructions should be read before the video product is operated.

2. Retain instructions - All the safety and operating instructions should be retained for future reference.

3. Heed Warnings - All warnings on the video product and in the operating instructions should be adhered to.

4. Follow Instructions-All operating and use instructions should be followed.

5. **Cleaning** - *Step a applies to equipment that can be disconnected from the CCTV system without seriously jeopardizing security. Step b applies to equipment that must operate continuously such as video switching equipment at military installations.*

a. Disconnect this video product from its power source before cleaning. Do not use caustic, abrasive, or aerosol cleaners. Use a damp cloth for cleaning.

b. Use a damp cloth to clean the equipment. Do not allow moisture or liquids to enter any vents. Do not use caustic, abrasive, or aerosol cleaners.

6. Attachments- Do not use attachments not recommended by Vicon as they may cause hazards.

7. Water and Moisture - Do not use this video product in any location where it may be exposed to water or moisture. This ***does not apply*** to ***outdoor camera housings, outdoor pan-and-tilt drives, and other equipment designed for direct*** exposure ***to outdoor*** environments.

B. **Accessories** - Do not place this video product on any unstable surface or table. The video product may fall, causing serious injury to a person and serious damage to the video product. Use only with a mounting accessory recommended by Vicon, or sold with the video product. Any mounting of the video product should follow Vicon's Instructions, and a mounting accessory recommended by Vicon should be used.

8. **Ventilation** - Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the video product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the video product on a rug or other similar surface. This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or Vicon's Instructions have been adhered to.

10. Power Sources - This video product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your installation site, consult your Vicon dealer or local power company. For video products intended to operate from battery power, or other sources, refer to the operating instructions.

11. Grounding - This applies to video products equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug only fits into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

12. Power-Cord Protection - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the video product.

13. Outdoor Cable Grounding - If an outside cable system is connected to the video product, be sure the cable system is grounded so as to providesome protection against voltage surgesand built-up static

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

charges. Section 810 of the National Electrical Code, ANSI/NFPA 70-1984, provides information with respect to proper grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode,

14. Lightning - For added protection for this video product when it in not used for long periods of time, disconnect it from its power source and from the cablesystem. This prevents damage to the video product due to lightning and power-line surges.

15. **Power Lines** - An outside cable system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside cable system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

16. Overloading - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

17. Object and Liquid Entry - Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short out parts that could result in a fire orelectric shock. Never spill liquid of any kind on the video product.

18. Servicing - Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19. Damage Requiring Service - Disconnect this video product from its power source and refer servicing to qualified service Personnel under the following conditions. ***Note that step c does not apply to outdoor camera*** housings, **outdoor pan-and-tilt drives and other** ***equipment*** specifically ***designed for direct exposure to outdoor environments.***

a. When the power-supply cord or plug is damaged.

b. If liquid has been spilled, or objects have fallen into the video product.

c. If the video product has been exposed to rain or water.

d. If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.

e. If the video product has been dropped or the cabinet has been damaged.

f. When the video product exhibits a distinct change in performance - this indicates a need for service.

20. Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by Vicon or that have the same characteristics as the on ginal part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

21. Safety **Check** - Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in proper operating condition,

2. INSTALLATION

2.1 Mounting the Unit

The V390APT will operate safely with loads up to 80 pounds (36 kg) mounted upright and 75 pounds (34 kg) when inverted. To perform properly, the unit must be securely fastened to a suitable surface and the camera or housing must be properly mounted and balanced on the unit. Normal mounting position for the unit is with its axis vertical, either upright or inverted.

CAUTION: Do not attach these units to drywall surfaces and do not install screws into the end grain of wood.

The pan-and-tilt has been assembled at the factory for upright mounting and should be mounted directly to a surface capable of supporting the combined weight of the pan-and-tilt and its accessories. The V390APT weighs 40 pounds (18 kg).

NOTE: If the unit is to be mounted in the inverted position, prepare the unit according to the instructions in section 2.2, Inverted Mounting.

When mounting directly to a horizontal or ceiling surface, use four fasteners. When mounting to wood, use screws long enough to penetrate at least 2 1/2 inches (6.4 cm). If mounting to a steel structure, drill four holes according to the mounting pattern shown in Figure 2. Screws should be long enough to accommodate lockwashers and nuts. In concrete, use lead anchors or expansion bolts with at least 150-pound (69 kg) pullout strength, installed according to manufacturer's instructions,

CAUTION: If installing the unit outdoors, use stainless steel hardware.

2.2 Inverted Mounting

CAUTION: To reduce the risk of fire or electric shock, always mount the pan-and-tilt in the upright position where rain or moisture is present.

The pan-and-tilt has been assembled for upright mounting. When it is necessary to mount the unit in the inverted position, it should be prepared as follows:

1. Ensure that the tilt drive is in the center position so that the camera mounting plate (Figure 3, Legend 4) is level.
2. The front of the drive unit is identified by a decal (see Figure 3). Facing the front of the unit, remove the three (3) 10-32 screws (Legend 1) on the right of the camera mounting plate.
3. Carefully pull the end support (Legend 2) away from the main housing, maintaining the opposite tilt arm in position.

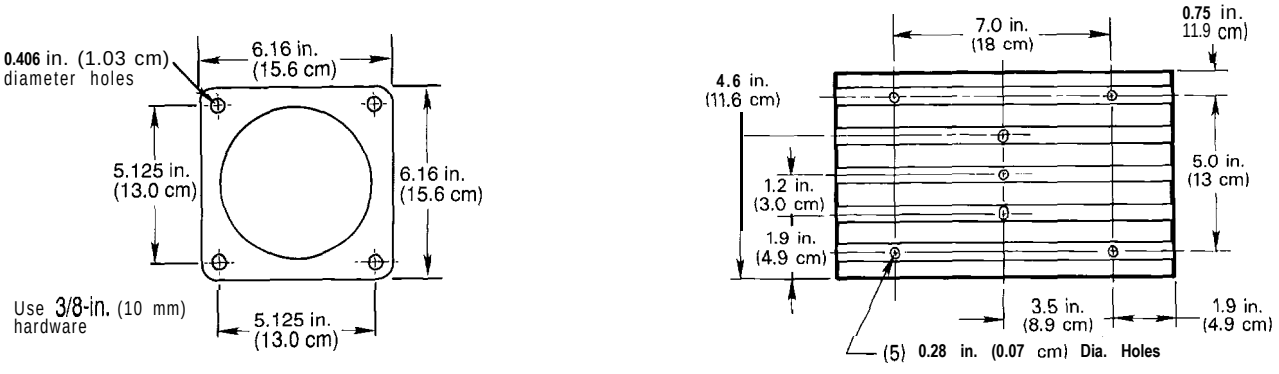


Figure 2
Mounting Hole Dimensions

4. Remove the two (2) counterbalance springs (Legend 3), noting the position of the springs of the grooved stop posts (Legend 5) for future reference.

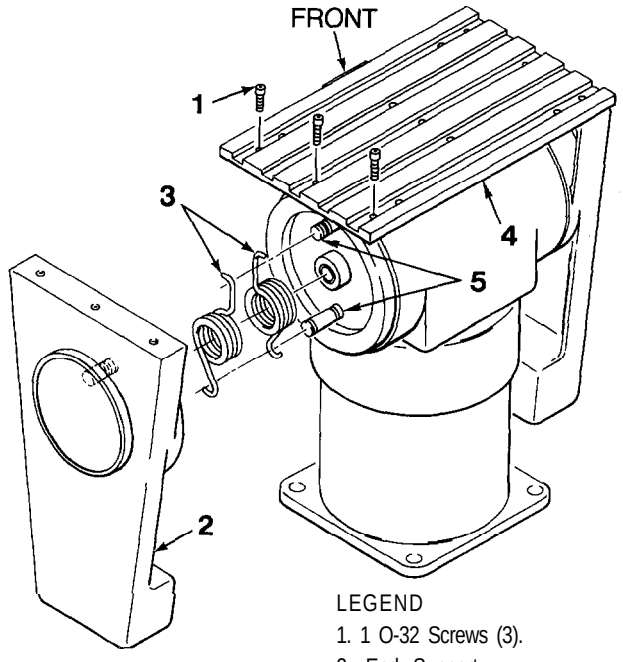
5. Replace the end support (Legend 2), holding the opposite tilt arm in position.

6. Replace the three (3) 10-32 screws (Legend 1).

When this unit is mounted in the inverted position, the up-down and left-right directions are reversed for manual operation. This must be corrected when wiring the cable between the control unit and the pan-and-tilt. Simply reverse the leads going to pins 2 and 3 and to pins 5 and 6, respectively, at one end of the cable.

NOTE: For inverted mounting with the VPP-1 Option, reverse the leads going to pins 10 and 12. (Refer to Figure 6, Wiring Diagram.)

If the unit is returned to upright mounting from an inverted position, rewire the leads to their original locations and replace the counterbalance springs (Legend 3) in the correct positions on the stop posts (Legend 5), following the procedure outlined in steps l-6.



LEGEND
1. 1 O-32 Screws (3).
2. End Support.
3. Counterbalance Springs (2).
4. Camera Mounting Plate.
5. stop Posts.

Figure 3
Removing Counterbalance Springs for Inverted Operation

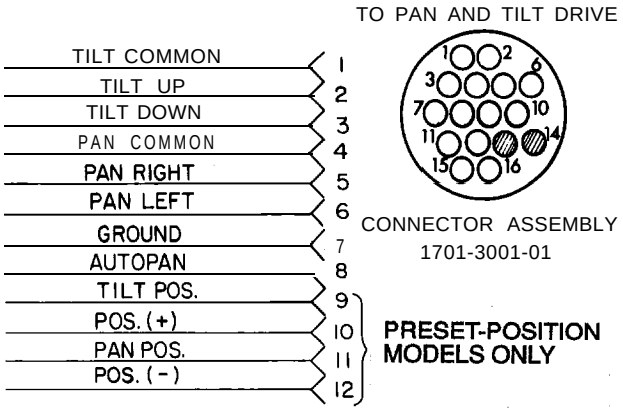
2.3 Mounting the Camera

Before mounting the camera to the pan-and-tilt drive, note the label FRONT on the top mounting plate. The camera should be mounted with the lens on this side.

Three center mounting holes (Figure 5, Legend 5) are provided for mounting lighter cameras. To obtain optimum balance, the screw used to mount the camera can be placed in any one of the three positions on the camera mounting plate.

When mounting heavier camera/lens loads, best operation is obtained when the load is evenly balanced. With the camera and lens resting on a flat surface, place a pencil under the camera and move the camera until it balances on the pencil. The position of the pencil under the camera indicates the point which should be positioned at the center of the pan-and-tilt mounting plate. The outboard mounting holes (Legend 6) can be used to mount heavier cameras or enclosures.

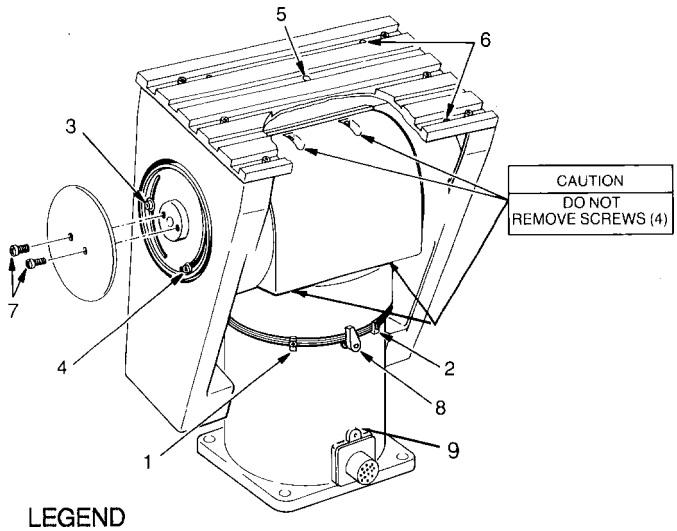
CAUTION: Do not mount *an autoiris lens on a autopan unit. Such use will cause excessive wear on the iris mechanism, as it constantly compensates for different light levels. For lens control connection instructions, refer to the manual that accompanies the lens control unit being used.*



NOTES:

1. Connector shown from wiring side.
2. Connector shown has Vicon assembly part number.
3. If pan-and-tilt drive is mounted in the inverted position, reverse the leads going to pins 2 and 3, and also 5 and 6, at one end of the cable.
4. For inverted mounting with the VPP-1 option, reverse the leads going to pins 10 and 12.
5. All pins are not used.

Figure 4
Cable Assembly Diagram



LEGEND

1. Left pan limit stop
2. Right pan limit stop
3. Up limit stop
4. Down limit stop
5. Center mounting holes
6. Outboard mounting holes
7. Left end plate screws (2)
8. Limit-switch actuator
9. Ground lug mounting holes

Figure 5
Limit Stop Adjustment

2.4 Connector Assembly

Assemble an interconnecting cable according to the following procedures. See Figure 4. The parts for the connector assembly are provided in the accessory kit. The kit includes a mating connector, contacts, a keying plug, a bushing, and a clamp.

NOTE: A silicone rubber sealant, or an equivalent sealant, must be applied in step 8. This sealant is not provided in the accessory hit.

1. Position the bushing so its lip sits inside the cable clamp.
2. Pull the interconnecting cable through the bushing/clamp assembly.
3. Strip back the cable jacket no more than one (1) inch (2.5 cm) and separate the individual conductors.
4. Prepare the individual conductors for soldering or crimping. If crimping, use AMP tool part number 90277-1, 90066, 90067, or an equivalent tool.

NOTE: The contact cannot be removed from a connector after it is inserted unless an AMP extraction tool, part number 305183 (or an equivalent extraction tool), is used to remove the contact.

5. After soldering or crimping the contacts, push them into the proper holes in the mating connector until they snap in place.
6. Screw the cable clamp onto the mating connector.
7. Connect the cable to the unit, and seat the connector by twisting the locking collar until it snaps into position. Check the unit for proper operation, after completing all other connections.
8. After verification of wiring and unit operation, remove the cable clamp. Then, use a silicone rubber sealant inside the cable clamp to seal the area where the cable, clamp, and bushing meet.

CAUTION: Most sealants require a curing period of at least 24 hours before full bonding is attained. Until the sealant is fully bonded, the unit cannot be considered to have an outdoor rating.

9. Again, screw the cable clamp onto the mating connector.
10. Connect the cable to the unit and seat the connector by twisting the locking collar until it snaps in place.

2.5 Grounding Connection

A ground lug and mounting screw are included in the accessory kit. Use the mounting hole located above the control cable connector to attach the lug. (Figure 5, Legend 9). Connect a No. 18 AWG ground wire to the nearest earth ground.

2.6 Adjusting the Limit Stops

After the cable is assembled and the unit connected, plug the control unit into a 120 VAC source and proceed as follows:

1. Loosen the two (2) pan limit stops (Figure 5, Legend 1 and 2).
2. Move the joystick to the RIGHT, rotating the pan head clockwise until the desired right pan limit is reached.
3. Locate the right pan limit stop (Legend 2) and move it until it contacts the limit-switch actuator (Legend 8). Move the stop a slight distance further to the deflect actuator until a "click" is heard, indicating deflection of the actuator and opening of the limit switch. Lock the stop in place.
4. Move the joystick to the LEFT to rotate the pan head to the desired left limit position. Adjust the left pan limit stop (Legend 1) in the same manner as the right pan limit stop.
5. With both limit stops in place, pan to both stop positions and recheck for exact trim of limit stops. Tighten both stops securely.
6. Looking at the front of the unit, remove the two (2) screws (Legend 7) from the left end plate. Remove the plate.
7. Loosen screws (Legend 3 and 4) and move the joystick UP to rotate the tilt drive to the desired up limit.
8. Move the up-limit stop (Legend 3) toward the bottom end of the slot until a "click' can be heard. Tighten screw.
9. Move the joystick DOWN to rotate the tilt drive to the desired down position,
10. Adjust the down-limit stop (Legend 4) in the same manner as the up-limit stop.
11. Lock the limit stops securely in place and check for exact trim of limit stops.
12. Replace the left end plate and screws.

2.7 Preset Adjustments

CAUTION: *Vicon does not recommend use of the preset position option in units intended for autopan use. Such use will cause excesive wear to internal preset components and voids product warranty.*

If a unit equipped with a preset position option is disassembled, contact Vicon for reassembly and alignment instructions. Also see Figure 6 for preset wiring.

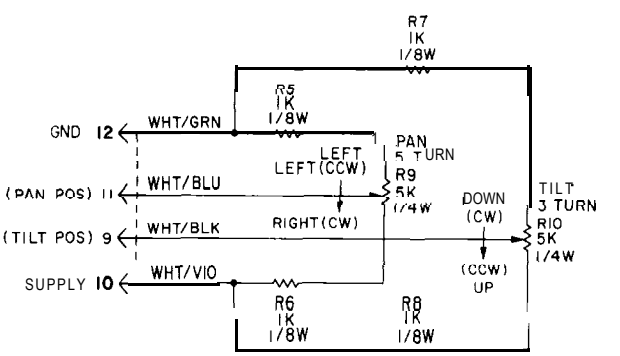


Figure 6
Preset Wiring Diagram

3. OPERATION

When the unit is wired to an appropriate control unit, movements along two axes are possible. "Pan" is a horizontal change in camera direction, moving the field of view to the left or right. "Tilt" is a vertical change in camera direction, raising or lowering the field of view.

1. Apply power to the control unit. The red pilot light should illuminate.
2. To pan or tilt camera, move the joystick up, down, left or right. The joystick control, when deflected diagonally, will also drive the pan-and-tilt functions simultaneously.
3. To set the V390APT unit for automatic pan operation, press the AUTGPAN switch. The unit will now pan continuously between the selected limits. If manual operation is desired, press the AUTGPAN switch again.

4. MAINTENANCE

The pan-and-tilt drive is factory lubricated for the life of the unit and no maintenance is required under normal operating conditions. The V390APT pan motor is impedance protected. The tilt drive motor is protected by a thermal overload switch. If the tilt drive fails to function after operating for an extended period, check that the pilot light on the control unit is on. If the pilot light is on, the thermal overload switch may have opened after continuous operation. In this case, the tilt drive will resume operation after cooling down. A fuse is also provided in the control unit to protect against a short circuit. If the pilot light in the control unit fails to illuminate, check the fuse. Replace with a Type 3AG fuse of the appropriate rating.

For further information, see the Schematic, Parts Location Diagram, and Exploded View Diagram in Figures 7, 8 and 9 and refer to the Replacement Parts Lists. The schematic is provided only for the use of a qualified technician working in an adequately equipped facility.

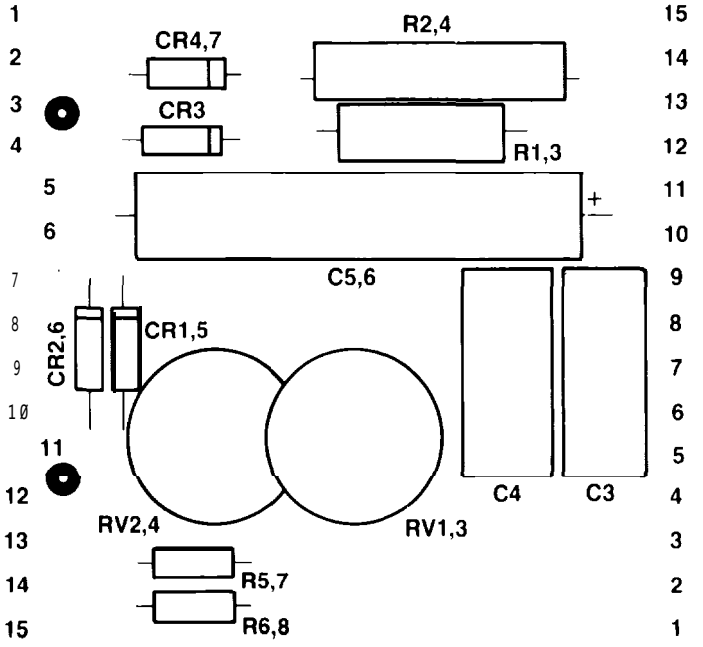


Figure 7
Parts Location Diagram V390APT

Shipping Instructions

Use the following procedure when returning a unit to the factory:

1. Call or write Vicon for a Return Authorization (R.A.) at one of the locations listed below. Record the name of the Vicon employee who issued the R.A.

   VICON INDUSTRIES INC.
   5'25 Broad Hollow Rd
   Melville, NY 11747
   516-293-2200 l-800-645-9116

   VICON INDUSTRIES INC.
   Western Regional Office
   3259 Walnut Ave.
   Long Beach, CA 90807
   310-595-4280 l-800-648-1832

   VICON INDUSTRIES INC.
   Southeastern Regional Office
   3010 Business Park Dr., Suite B
   Norcross, GA 30071
   4044494499 l-800-824-8479

2. Attach a sheet of paper to the unit with the following information:
   a. Name and address of the company returning the unit
   b. Name of the Vicon employee who issued the R.A
   c. R.A. number
   d. Brief description of the installation
   e. Complete description of the problem and circumstances under which it occurs
   f. Unit's original date of purchase, if still under warranty
3. Pack the unit carefully. Use the original shipping carton or its equivalent for maximum protection.
4. Mark the R.A. number on the outside of the carton on the shipping label.

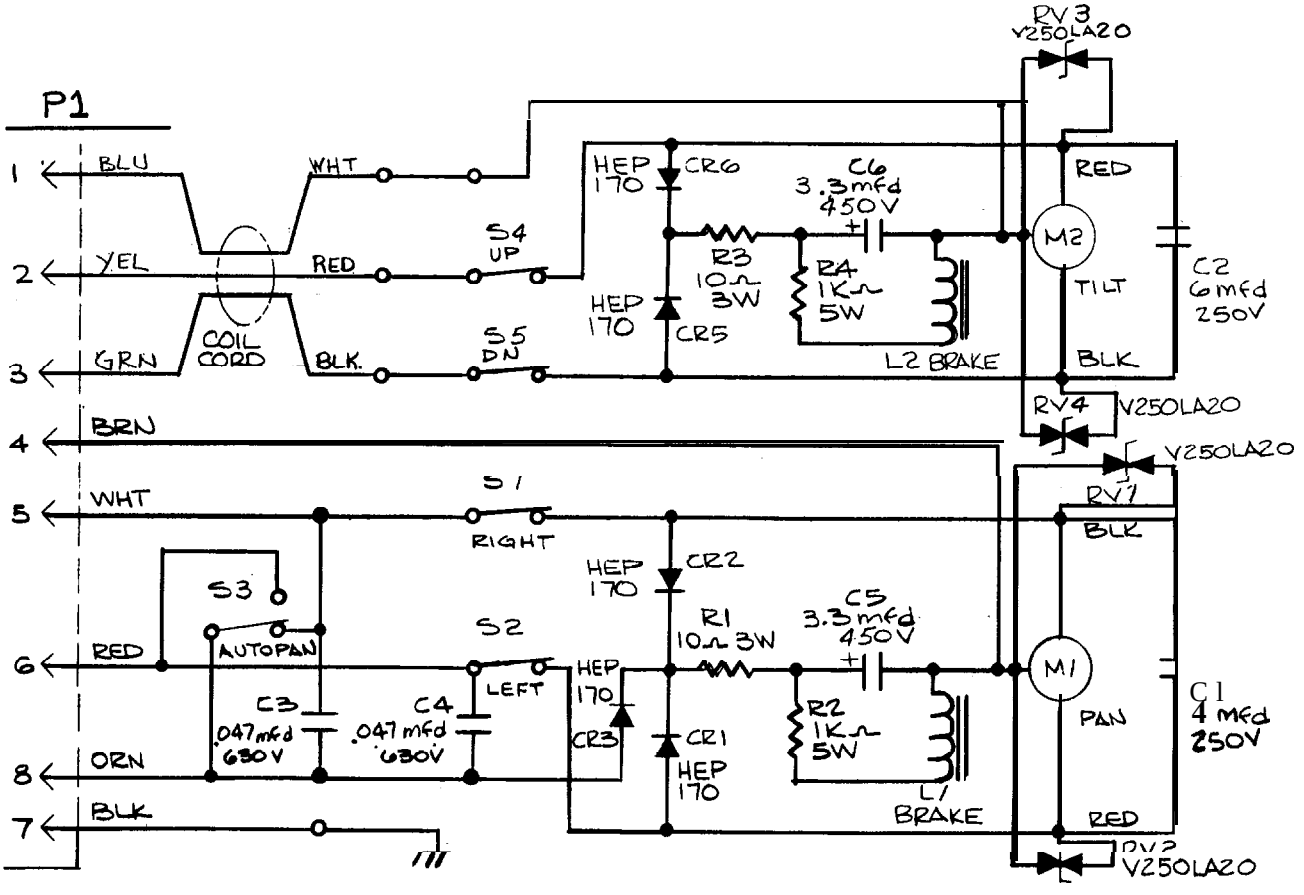


Figure 8
Schematic Diagram, V390APT

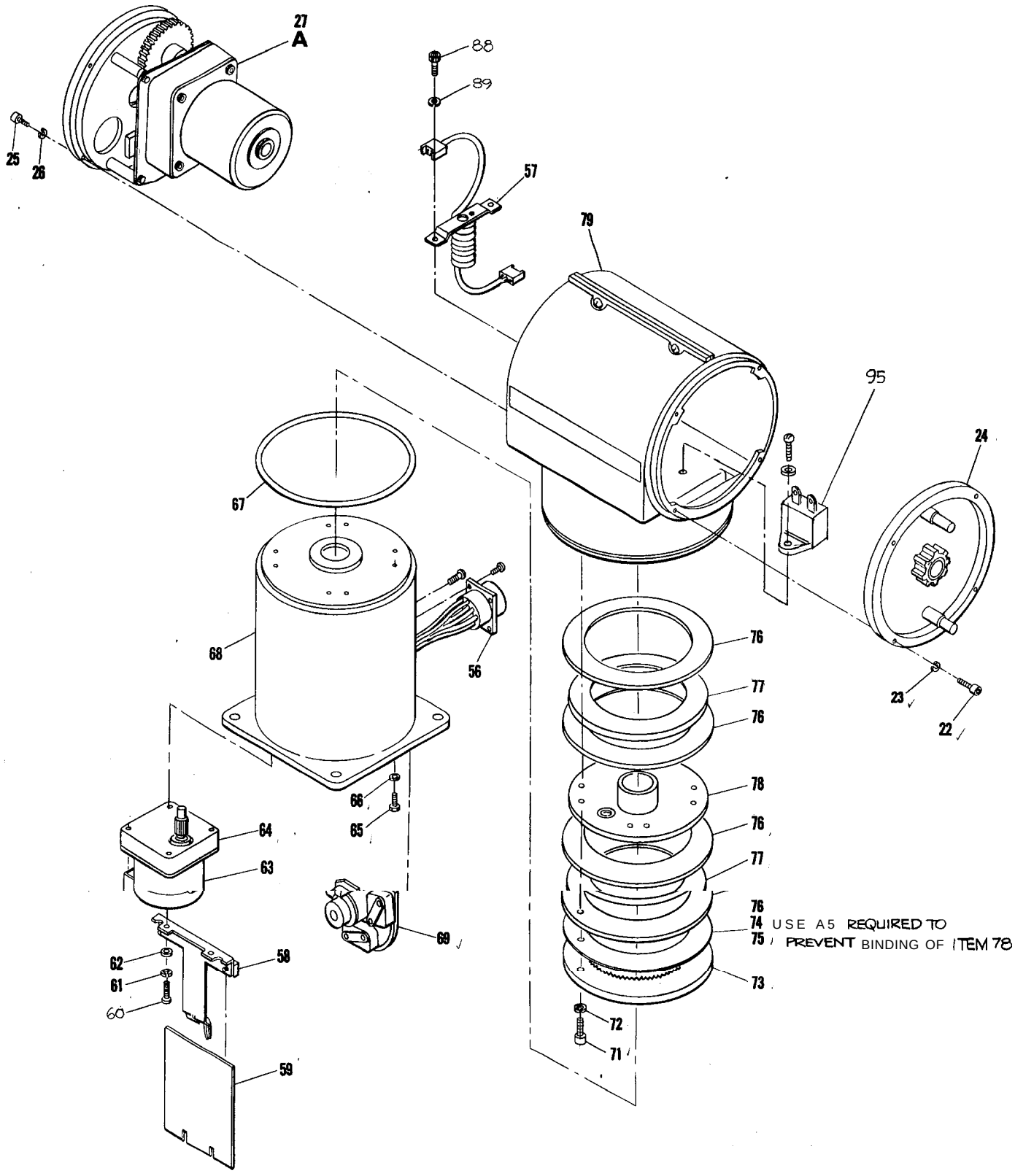


Figure 9
Exploded View

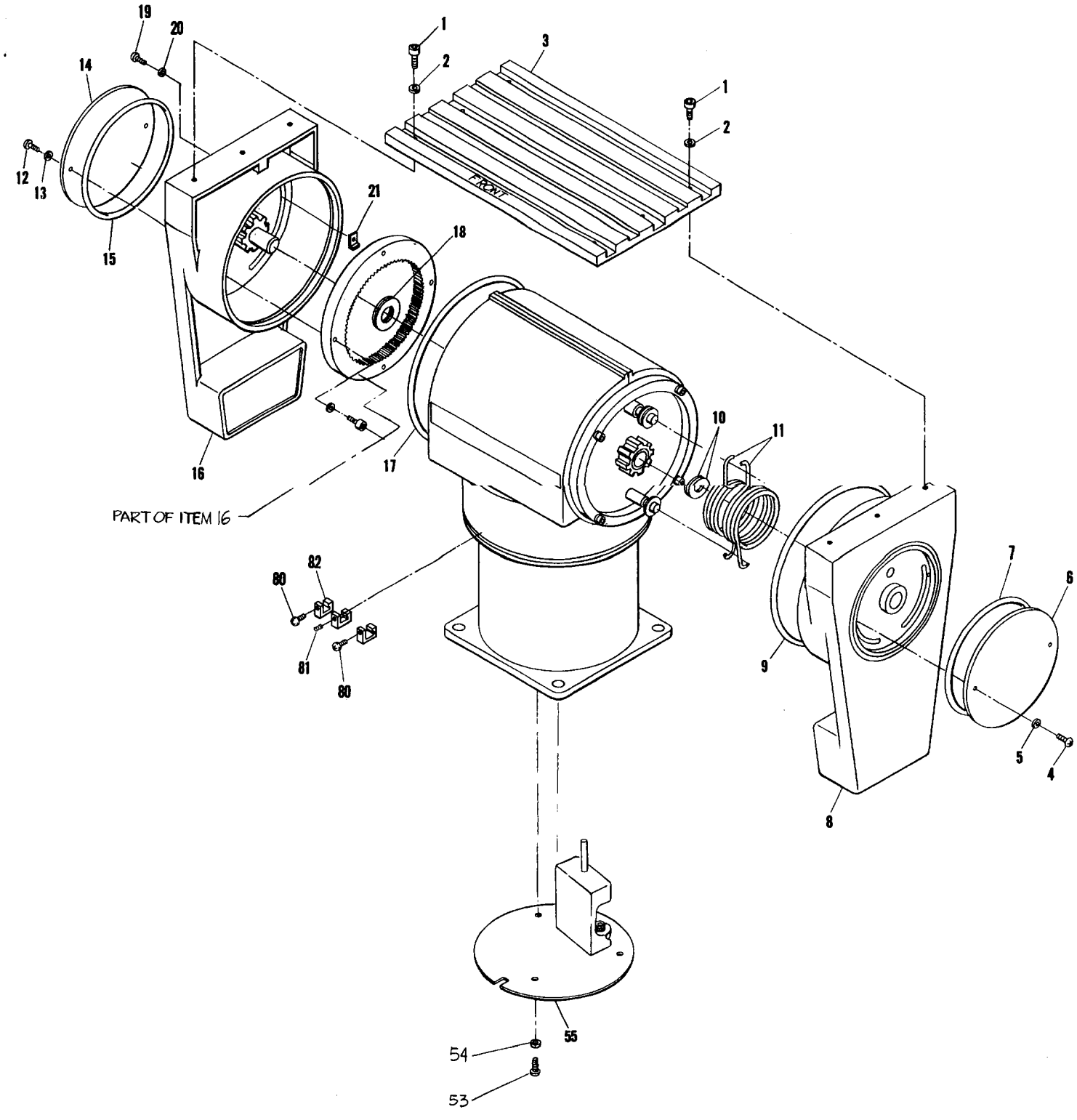


Figure 9
Exploded View (continued)

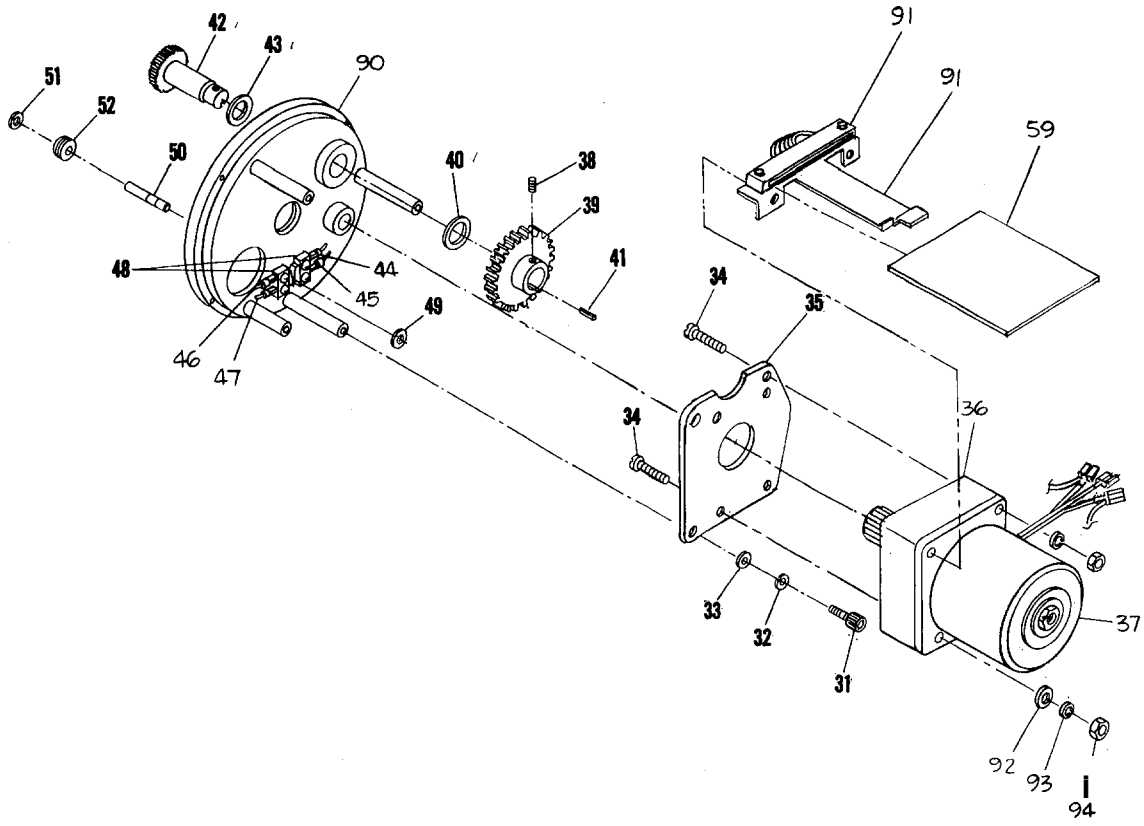


Figure 9
Exploded View (continued)

REPLACEMENT PARTS LIST
V390APT PAN-AND-TILT WITH AUTOPAN

Reference Designation	Part Number	Description
	1117-3314-02	PAN MOTOR AND CABLE ASSEMBLY.
–	1117-3354-02	TILT MOTOR AND GEAR ASSEMBLY, size 8.
	1117-3238-05	HOUSING ASSEMBLY.
	1117-3570-01	SUPPORT ASSEMBLY, drive end.
--	1117-3235-01	SUPPORT ASSEMBLY, spring end.
	1117-3243-03	PEDESTAL ASSEMBLY, with reverse switch.
	1117-3300-02	PEDESTAL PLATE ASSEMBLY.
	1117-3255-02	MOTOR AND BRAKE ASSEMBLY, size 8.
--	1117-3147-00	PCB ASSEMBLY.
	1117-3316-02	CABLE ASSEMBLY, pan.
--	1117-3267-02	GEARHEAD ASSEMBLY, 225:1, pan.
--	1117-3352-02	END-CAP ASSEMBLY, drive side.
	11 17-3320-02	TILT MOTOR AND PLATE ASSEMBLY.
	1117-3273-01	HOUSING AND BEARING ASSEMBLY.
--	1802-0053-01	CAPACITOR, included with motor
	1117-3312-01	CONNECTOR AND COIL CORD ASSEMBLY.
--	1117-3275-01	SWITCH AND CABLE ASSEMBLY, 24 V with autopan.
	1117-3286-01	CABLE ASSEMBLY, pedestal.
--	1802-0052-01	CAPACITOR, included with motor, 4 uf.
	1117-3251-02	MOTOR AND CLUTCH ASSEMBLY, pan.
	1117-3250-02	BRAKE ASSEMBLY, size 8.
	1117-3251-04	MOTOR AND CLUTCH ASSEMBLY, tilt.
	8000-9642-00	CONNECTOR PCB, female, 15-pin, mounting ears.
--	8000-9646-00	CONNECTOR, cable, male, Q-pin, AMP i-350235-9 (when exhausted i-64051 1).
	1117-3315-02	TILT MOTOR AND CABLE ASSEMBLY.
	1117-3353-02	GEARHEAD ASSEMBLY.
–	1117-3307-01	COIL CORD AND LUGS ASSEMBLY.
--	8000-9800-00	CONNECTOR CABLE, male. 6-pin, AMP I-640510-0.
	8000-9644-00	CONNECTOR PCB, female, 5-pin, AMP 640136-5.
	1136-2042-00	LIMIT SWITCH ASSEMBLY, with reversing switch.
	1117-3274-01	CABLE REVERSE SWITCH ASSEMBLY, 24 V.
	1806-5022-02	CONNECTOR PANEL, male, 16-pin, AMP 2060361.
	8000-9644-00	CONNECTOR PCB, female, B-pin, AMP 640136-5.
	8000-9736-00	CONNECTOR CABLE, female, B-pin, AMP I-350241-9 or 640520-o.
	1806-5024-02	CONNECTOR CABLE, female, 16-pin, AMP 20637-I.
--	1117-3318-02	MOTOR AND BASE ASSEMBLY.

Reference De&nation	Pert Number	Description
	1117-3319-02	MOTOR AND BASE ASSEMBLY, tilt.
	1117-3306-02	LEVER AND PLUNGER ASSEMBLY.
–	1117-3259-01	BRACKET ASSEMBLY, brake mount, size 8 motor.
--	1117-3255-04	MOTOR AND BRAKE ASSEMBLY, size 8, tilt.
--	1117-3147-00	PCB ASSEMBLY.
–	1117-3317-02	CABLE ASSEMBLY, tilt.
–	8000-9645-00	CONNECTOR CABLE, female, 9-pin, AMP I-640521-0.
--	1117-3305-02	MOTOR PREP ASSEMBLY, pan.
--	1117-3257-01	BRAKE LEVER ASSEMBLY, size 8, motor. 1
--	1117-3308-02	MOTOR PREP ASSEMBLY, tilt.
--	1117-3115-00	PAN POTENTIOMETER ASSEMBLY.
--	1117-3115-01	TILT POTENTIOMETER ASSEMBLY.
--	1117-5190-00	PLATE POTENTIOMETER.
--	1117-5353-00	SHAFT POTENTIOMETER, gear.
--	8002-7571-00	POTENTIOMETER, 5 kohm, 5 turn, servo mount, Spectrol model 535.
--	8002-8785-00	RESISTOR, 1 kohm, 1/8 W, 1%, RN55D.
--	8002-7572-00	POTENTIOMETER, 5 kohm, 3 turn, servo mount, Spectrol model 533.

REPLACEMENT PARTS LIST
PCB ASSEMBLY

Reference Designation	Part Number	Description
--	1117-5619-01	PCB, pan-and-tilt control.
R5, R6 or R7, R8	8002-8785-00	RESISTOR, 1 kohm, 1/8 W, 1%, RN55D.
RI or R3	8002-8695-00	RESISTOR, IO ohm, 3 w, 5%.
R2 or R4	8002-8761-01	RESISTOR, 1 kohm, 5 W.
RV1, RV2 or RV3, RV4	8004-9326-00	VARISTOR
CR3, CR1 &CR2 or CR5&CR6	1804-0001-02	DIODE, Hepro 170-RT.
c3, c4	1802-0033-01	CAPACITOR, 0.047 uf
C5	8000-8739-00	CAPACITOR, 3.3 uf
WI	8001-8161-00	JUMPER LEAD, 0.250 diameter, Gettigx L-2007-1 or Vestal V40-22.
	8004-7693-00	TAPE, polyester

REPLACEMENT PARTS LIST
Refer to Exploded View

Reference Designation	Part Number	Description
1	8003-7281-00-00	SCR 1 O-32 x 1/2 SOC HD CAP SS
2	8005-8230-00-00	WASHER LOCK IO SS SPL
3	1117-5011-01-00	TOP PLATE (1905-5001-00)
4	8003-8060-00-00	SCR 6-32 x 5/8 PAN HD PR SS
5	8004-7472-00-00	SWITCH 67042-506 4 POS LT MOM S
6	2001-3045-01-00	ASSY SCREEN DISC END SUPPORT
7	8002-6248-02-00	O-RING 3.975 ID x.210 PARKER 2-345C147-70 OR 2-345C873-70 NEOPRENE C366-55
8	1117-3235-01-I 1	SUPPORT ASSY SPRING END
9	8002-6248-01-00	O-RING 5-1/8 ID x .210 2354 PARKER
10	1117-5061-00-00	WASHER THRUST
11	1117-5016-00-06	SPRING COUNTER BALANCE V300 SERIES SAND/DIE
12	8003-8060-00-00	SCR 6-32 x 5/8 PAN HD PR SS
13	8004-7472-00-00	SWITCH 67042-506 4POS LT MOM S
14	2001-3045-01-00	ASSY SCREEN DISC END SUPPORT
15	8002-6248-02-00	O-RING 3.975 ID x .210 PARKER 2-345C147-70 OR 2-345C873-70
16	1117-3234-01-15	SUPPORT ASSY DRIVE END
18	1117-5061-00-00	WASHER THRUST
19	8003-811 O-00-00	SCR
20	8005-6140-00-00,	WASHER FLAT 8 3/8 x 042 CAD
21	1117-5536-01-00	STOP TILT
22	8003-7270-00-00	SCR 1 O-32 x 3/4 SOC HD CAP SS
23	8005-6230-00-00	WASHER LOCK IO SS SPL
24	1117-3253-01-02	END CAP SUB ASSY - SPRING SIDE
25	8003-7270-00-00	SCR 1 O-32 x 3/4 SOC HD CAP SS
26	8005-6230-00-00	WASHER LOCK IO SS SPL
27	1117-3354-02-06	TILT MOTOR & GEAR ASSY SIZE 8 115V
31	8003-7240-00-00	SCR 8-32 x 5/8 SOC HD CAP SS
32	8004-9950-00-00	WASHER LOCK 8 CAD SPL
33	8004-9850-00-00	WASHER FLAT 190 x 438 x 046 SS PHOENIX SS-11 79
34	8003-7828-00-00	SCR 1 O-32 x 2 PAN HD PR CAD
35	1117-5430-00-00	PLATE LONG MOTOR V380PT
36	1117-3353-02-06	GEARHEAD ASSY
37	1117-3255-04-04	MOTOR & BRAKE ASSY SIZE 8 115V TILT
38	8002-9932-00-00	SCR SET SIC 8-32 x 1/4 CONE CAD
39	1117-5428-00-01	SPUR GEAR
40	1117-557403-00	SHIM (.010)
41	8001-8322-00-00	KEY 1/8x 3/8 HARDENED RC40-50 213 WOODRUFF

Reference Designation	Part Number	Description
42	1117-5573-01-05	PINION TILT
43	1117-557403-00	SHIM (.010)
44	5413-1281-94-00	WIRE 13 CONTACT F LUG F 22GA VW1 YEL
45	5413-558-I -94-00	WIRE 13 FASTON F FASTON F 22GA VW1 WHT/YEL
46	5409-1281-55-00	WIRE 9 FASTON F CONTACT F 22GA VW1 GRN
47	5410-5581-95-00	WIRE 10 FASTON F FASTON F 22GA VW1 WHT/GRN
48	8004-632400-00	SWITCH 111 SM601-H4 SUBMIN MICRO
49	8002-9310-00-00	RING RET 5133-I 8H WALDES
50	1117-5028-00-04	ROD SWITCH
51	8001-7980-00-00	GROMMET 3/16D x 1/2D GRV 1/16x 3/8D MILLER 217
52	8001-7980-00-00	GROMMET 3/16D x 1/2D GRV 1/16 x 3/8D MILLER 217
53	8003-8625-00-00	SCR 4-40 x 5/16 PAN HD PR SS
54	8005-6144-00-00	WASHER FLAT .143 x .044. SS PHX
55	1117-3300-02-04	PEDESTAL PLATE ASSY
56	1117-3286-01-05	CABLE ASSY PEDESTAL
57	1117-3312-01-02	CONNECTOR & COIL ASSY V390
58	1117-3316-02-01	CABLE ASSY PAN 115V
59	1117-3147-00-14	ASSY PCB
60	8003-7836-00-00	SCR 10 32 x 2 1/4 SOC HD CAP
61	8005-6230-00-00	WASHER LOCK 10 SS SPL
62	8005-6144-00-00	WASHER FLAT .143 x .044. SS PHX
63	1117-3255-02-07	MOTOR & BRAKE ASSY SIZE 8 115V PAN
64	1117-3267-02-06	GEARHEAD ASSY 225:1 PAN
65	8003-7270-00-00	SCR 10-32 x 3/4 SOC HD CAP SS
66	8005-6230-00-00	WASHER LOCK 10 SS SPL
67	8002-6248-01-00	O-RING 5-1/8ID x .210 2-354 PARKER
68	1117-5810-01 -00	PEDESTAL (1117-5480-01)
69	1117-3275-01-00	ASSY SWITCH & CABLE 24V W//AP
71	8003-7240-00-00	SCR 8-32 x 5/8 SOC HD CAP SS
72	8004-9950-00-00	WASHER LOCK 8 CAD SPL
73	1117-5505-01-03	GEAR INTERNAL 24P 90T
74	1117-5037-02-01	SHIM (.005)
75	1117-5037-03-01	SHIM (.010)
76	1117-5094-00-03	BEARING RACE
77	8000-7290-00-00	BEARING THRUST NTA-6074 TORR
78	1117-3554-01-00	ASSY BEARING PLATE & IDLER GEAR V390 & V330 DIECAST SERVICE
79	1117-3522-01-02	SUB ASSY HOUSING
80	8003-8110-00-00	SCR 6-32 x 7/16 PAN HD PR SS
81	8002-9871-00-00	SCR SET SOC 6-32x3/8 CONE SS

Reference Designation	Part Number	Description
82	1117-5519-01-01	STOP PAN (1221-5154-01-00)
88	8003-7162-00-00	SCR 6-32 x 7/16 SOC HD CAP CAD
86	1117-5519-01-01	STOP PAN (12221-5154-01-00)
87	8002-9871-00-00	SCR SET SO 6-32 x 3/8 CONE SS
88	1117-5010-01-00	PEDESTAL (1117-5488-01)
89	8005-6110-00-00	WASHER LOCK 6 CAD SPL
90	1117-3351-01-04	ASSY SUB END CAP (DRIVE SIDE) V353 V355
90	1117-3281-01-01	MOTOR PLATE
91	1117-3317-02-01	CABLE ASSY TILT 115V
92	8004-9870-00-00	WASHER FLAT 10 1/2 x 048 CAD
93	8004-9860-00-00	WASHER LOCK 10 CAD SPL
94	8002-6220-00-00	NUT 1 O-32 HEX ST CAD
95	1802-0053-01-00	CAPAC INCL W/MOTOR 6MF)