



82-70C
PINSPO TTERS

INSTRUCTION AND SERVICE MANUAL

AMF BOWLING, INC.
Richmond, Virginia 23227

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MECHANICAL DESCRIPTION AND MACHINE FUNCTIONS

Section 1

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AMF AUTOMATIC PINSPOTTER GENERAL DESCRIPTION

The AMF Automatic Pinspotter has been designed to meet the rules and regulations of the game of Tenpins as established by the American Bowling Congress and has received official A.B.C. approval. It performs several types of functions according to the requirements of the game. Combinations of these functions are categorized into the following: First Ball, Second Ball, Strike and Foul Cycles. It employs two sets of standard tenpins. Any cycle in which a complete set of pins is placed upon the lane is called a frame cycle. The machine is equipped with a ball return which operates continuously and independent of the cycles of the machine.

In a normal first ball cycle where some pins are left standing, the sweep descends to guard position. After a time delay to allow wobbling pins to fall or stand, the table descends, grips the standing pins, then raises them to allow the sweep to remove the dead wood. The standing pins are then replaced on the exact spot where they were picked up. The sweep returns to its up position, and the machine is ready for second ball.

After a second ball is bowled the sweep again descends to guard position, there is a time delay, and then the sweep performs its function of clearing all wood from the deck. The table descends spotting a new set of pins, and after the sweep returns to its up position, the machine is again ready to receive a first ball.

When a strike is bowled, the machine begins its functions as in a normal first ball cycle. When the table descends and finds no pins standing, the machine receives the information which changes its functions to a strike cycle. The sweep will then clear the deck, and the table spots a new set of pins. The sweep then returns to its up position, and the machine is again ready to receive a first ball.

In the case of a first ball foul, all pins fallen or standing are swept from the lane and an entire new set is spotted. The machine then indicates that it is ready to receive a second ball. A second ball foul is the same as a normal second ball cycle.

NOMENCLATURE

The machine consists of nine principal assemblies which will be described in the order in which they handle first the ball, then the pins. They consist of the following:

1. The Cushion which stops the ball and provides the signal to start the cycle.
2. The Ball Lift which carries the ball from the machine high enough to permit a gravity return.
3. The Sweep which guards the machine from possible damage from additional balls and removes the dead wood from the lane when necessary.
4. The Carpet which carries the pins from the lane into the pin elevator wheel. It also guides the ball over to the kick-back so it can enter the ball lift.
5. The Pin Elevator wheel which carries the pins up and delivers them to the distributor.
6. The Distributor which takes the pins from the pin elevator wheel and delivers them to the bin.
7. The Bin, with a capacity of storing 20 pins, transfers the pins to the table as required.
8. The Table which performs a twofold function, that is:
 - (a) Ten spotting cups which spot the pins for first ball as needed.
 - (b) Ten respot cells which pick up the standing pins after first ball while the dead wood is swept from the lane.
9. The Electrical System which stores the signals and selects the cycles which the machine may be called upon to perform.

DETAILED MECHANICAL DESCRIPTION

1. The Cushion is made of a hardwood plank faced with sponge and buna rubber and a polyurethane cover. A curtain is firmly attached to the cushion and is carried upward at a forward angle to act as a pin deflector. The sponge, buna rubber, the cover and the lower edge of the curtain are attached to the hardwood plank by sixteen rubber rivets. A one inch hollow curtain rod supports the upper forward edge of the curtain. This rod, supported by the cross frame and the kickback, has a quick release for easy access to the pit. The cushion hinges on a shaft mounted on each kickback plate in rubber blocks which help to snub the cushion action. The initial cushion impact is largely absorbed by a hydraulic shock absorber connected between the cushion and machine frame. The push-pull action of the shock is used to actuate a switch, starting the cycle.
2. The Ball Lift is mounted between the metal kickbacks of two adjacent machines. An opening in the kickback plate permits the ball to enter the lift. A rudder sweeps back and forth between the kickback plates of each pair of machines, alternately blocking the ball opening on one machine, while it allows the ball from the adjacent machine to enter the lift. A second function of the rudder is to eject any stray pin that may enter the ball door opening. The lift proper consists of a moving belt and a track. When the ball enters the lift, the belt forces it against the track and it is rolled up to the return rails. Tension on the belt is maintained by applying an outward force to the upper and lower yokes which support the pulleys. The ball lift may be driven by either machine through an overrunning clutch on the driven pulley shaft. The ball lift and rudder is a continuously operated unit driven from the back-end motor.
3. The primary function of the Sweep is to remove the dead wood from the lane. It also serves as a guard and will prevent a ball from striking the table while it is spotting or respotting pins. The sweep is mounted on and propelled by two linkages which cause the sweep to move in a horizontal plane parallel to the pin deck. The linkages receive power from a gear reduction motor. The sweep may be run independently and its motion may be reversed through switches located at the rear of the machine. The sweep is suspended from the linkage on two nylon slide bars which permit the sweep to move upward in a vertical plane should it encounter a bowling pin in descending to the sweep position.
4. The carpet is an endless belt which carries the pins as they are swept from the pin deck, into the pin elevator wheel, where they are elevated to the distributor. The carpet is suspended by a self-centering type roller at the forward position and a straight roller at the rear position. All bearings at the ends of the rollers are mounted in rubber to further dampen the shock. A platform located inside the endless carpet and between the front and rear rollers, is mounted in rubber and serves to accept the rebound of the ball and weight of the pins. It also guides the ball to the opening for the ball return. The carpet is driven continuously from the back-end motor through a V-belt pulley system.
5. The pin elevator wheel, located at the extreme rear of the machine, is a large metal saucer with the center portion removed. Extending around the inside of the rim are seven pockets formed to accept the pins as they are fed from the carpet. A metal stamping of similar shape is mounted to the metal kickbacks and forms a guard for the wheel at the rear of the machine. This wheel guard also serves as the mounting for the Pin Elevator Wheel providing a four point bearing suspension. AV-belt engages a channel in the periphery of the elevator wheel and provides the drive from the rear-end motor. It runs continuously whenever the machine is turned on. When a pin enters a pocket in the elevator at the bottom of the pit, it is carried upward to the top of the arc and falls from the elevator into the orientor pan of the distributor.
6. The distributor, whose function it is to deliver the pins from the pin elevator to the bin assembly runs continuously and is driven by the back-end motor. It consists of several components. The orientor is a pan placed near the top of the pin elevator to catch and help orient the pins as they fall from the elevator pockets. The orientor is mounted on a trough whose function is to support the various pulleys and belts which move the pins. The rear of the trough is mounted on a yoke. The stem of the yoke rests in a bushing supported by the machine framework. This permits a pivoting action of the distributor assembly from the rear of the machine.

When a pin is dropped on the orientor pan it is carried forward, butt first, on the distributor belt until it is directed into a bin pocket.

As a pin rolls off the front of the distributor, it depresses a trip arm which disengages the cam gear allowing the cam to index and the distributor assembly moves to the next position. This continues in a predetermined sequence as long as there are pins available for distribution.

7. The Bin Assembly located at the top of the machine serves to store pins received from the distributor until required for spotting. The bin consists of a triangulation of ten pockets supported in a metal framework. When a pin is loaded into a pocket, it rests on top of two pin holders attached to the shuttle. Two sets of pins can be stored in the bin assembly until called for as in the case of a spotting cycle.
8. The Table performs its spotting and respotting functions by employing two component assemblies. The yoke assembly supports the ten spotting cups. Supporting the yoke assembly and located directly beneath it is the table assembly which houses the ten respot cell assemblies.

The table assembly consists of a triangular shaped aluminum die casting with ten fan shaped openings. In each opening is a respot cell assembly.

Each respot cell consists of a frame which supports two respot fingers which are activated by a yoke. The yoke receives its motion from a respot lever which is connected to a respot linkage. This linkage feeds back through a tie rod controlled by a cam driven by the table drive motor. When the table descends to respot height after the first ball the respot linkage is activated, and the fingers close on the neck of all standing bowling pins. The pins are then raised from the lane to allow the sweep to perform its function. When the table returns to respot height, the linkage is deactivated, and the fingers return to their normal spread position releasing the bowling pins.

The yoke assembly consists of an X shaped aluminum die casting with a base on the widest end. It carries four shafts supporting one, two, three and four spotting cups to provide the triangular pin pattern. The yoke assembly is hinged to the table assembly by four legs, two front and two rear. When spotting action is required the loaded shuttle assembly moves forward to drop a set of pins into the spotting cups. The table descends to spotting height and the spotting cups dip forward on their shafts permitting the cups to bring the pins down through the respot opening and to be placed in an upright position on the alley. The spotting cups and the table return to their normal positions.

The entire table is supported through two posts mounted on the table assembly die casting. The main table support arms are connected to the bottom of each post, while tie rods are connected to the top of the posts. This arrangement forms parallelogram supports on each side thereby maintaining the table parallel to the lane bed at all times. The table drive motor supplies power through a drive shaft, over travel lever and a torque tube weldment to the table support arms. The table drive is part of the front end assembly.

Manager's Control

Each machine is under the control of the Lane Manager by a conveniently located set of switches at the Manager's Desk. Each machine control switch is a three position switch: (I) Instruct-O-Mat, (B) Bowl, and Center the "OFF" position. Placing this switch in the "B" Bowl position, the machine will operate ready for bowling, providing the Master Line Switch, Machine Safety Switch and all other circuit breakers and control switches described later are in the "ON" position. Placing the Manager's Control Switch in the (I) Instruct-O-Mat position applies power to the ball return and pin loading assemblies only; the Sweep and Table become inoperative. Practice balls can now be rolled and the ball will be returned in the normal fashion. The machine will not go through its cycles until the switch is returned to the "B" Bowl position. When this switch is turned "OFF", 110 volt power is still supplied to the pinspotter chassis unless the Master Line Switch is turned "OFF" or the 110 volt supply plug is disconnected. This should be done when the building is left unattended.

PIN AND BALL INFORMATION

The AMF Automatic Pinspotter is designed to operate with the ABC approved tenpin.

If the pins develop splinters that protrude more than 1/8", or the pins split in any manner that would normally eliminate them for further use, the machine may not handle them satisfactorily.

The machine is designed to return standard size balls, with weights ranging from 6 lbs. to 16 lbs.

**PIN CHANGING PROCEDURE
WITH 20 PINS IN THE PINSPOTTER**

Less than full set of pins on the pin deck. If full set of pins on pin deck start with #2 below.

From The Front

1. Cycle machine to spot full set of pins on pin deck and store a full set in bin pockets.
2. Turn the machine safety switch "OFF."
3. Remove one set of pins from the pin deck.
4. Place one set of new wood in the pit.
5. Turn the machine safety switch "ON."
6. Push cycle button. (This operation sets up the second set of old wood and starts to load the new pins).
7. Again turn the machine safety switch "OFF."
8. Remove the second set of old wood from the pin deck.
9. Place the rest of the new wood in the pit.
10. Turn the machine "ON."
11. Push cycle button.

This last operation spots a set of pins on the lane and loads the second set into the bins. The machine is now ready to receive the first ball.

**From The Rear
Conditions as Listed Above**

1. Cycle machine as in #1 above.
2. Push the Sweep Run Switch to sweep all pins into the pit.
3. Turn the machine "OFF."
4. Remove the old pins from the pit area and replace with a new set.
5. Turn the machine "ON" and press cycle button. This will place the second old set of pins on the lane and start loading the new set in the bin.
6. When the new set of pins are all loaded in the bin, repeat steps 2, 3, 4 and then turn machine "ON" and press cycle button to complete pin changing.

ELECTRICAL DESCRIPTION AND MACHINE OPERATIONS

Section 2

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OPERATING INSTRUCTIONS, SAFETY FEATURES

LOCATION AND USE OF MACHINE CONTROL AND SAFETY SWITCHES

The AMF Automatic Pinspotter is controlled by a series of switches; the location, function and use of which are indicated herein. It must be kept in mind that the Pinspotter performs a series of mechanical motions and electrical actions each cycle and **that bodily injury may result should personnel enter the machine while the power is on. When working in the Pinspotter machine, it is recommended that the power also be turned off at adjacent machines.** The various switches to be discussed have been incorporated in the machine circuit to insure that the proprietor, or the maintenance man, has control at all times.

MACHINE CONTROL SWITCHES

Master Line Switch or Circuit Breaker Switch

This switch controls the power to a maximum of one machine and is located in the main feeder line. If master switch, it is located ahead of the fuse panel box. If circuit breaker switch, it is integral with the breaker. This switch should be "ON" for the machine to operate and turned "OFF" when bowling is finished or when the building is left unattended.

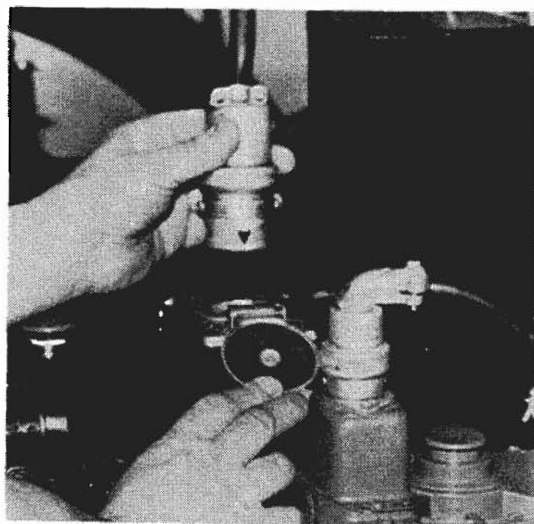
If the sparemaker computer, radaray foul detector, pit signal system, score projector, power ball check, and any other electrical equipment is not controlled by the Master Switch, the switches controlling this equipment should also be turned "OFF" when the building is left unattended.

The Masking Unit Switch is located on the front of the masking unit of each machine. It is provided so that a person entering the machine from the front may turn the power off. See note below. This switch must be "ON" to allow the machine to operate. It should be turned "OFF" when any cleaning of the machine or lane is to be done from the front. It should be noted that there is a 30 to 60 seconds time delay between the throw of the switch and the stopping of the machine to allow completion of pin loading, the ball clearing the ball exit system and returning to the ball return.

The Machine Control Panel (Back End Control Box) is located at the rear of the machine and contains several safety and control switches and buttons as follows:

A Machine Circuit Breaker is located in the upper left hand corner of the rear control panel. It is a protection device for the machine in case of an overload and stops all machine action. Turn off breaker when entering the machine from the rear. See note below.

NOTE: ALWAYS REMOVE THE POWER PLUG WHEN WORKING ON THE MACHINE OR BEFORE ENTERING ANY OPERATING PORTION OF THE MACHINE.



**Remove Power Plug
When Working on Machine.**

Pin Elevator, Sweep, and Table Motor Switches are provided to permit repair and maintenance work by allowing each unit to be turned off or on individually. They are to be kept in the "ON" position and should be turned off when a person enters the machine from the rear. **See note bottom page 2.2.**

Sweep Run Switch is also located on the machine control panel and is used to run the sweep motor.

Sweep Reverse Switch is provided to allow the sweep to be run back to the guard or zero position. This switch must be held down and the Sweep Run Switch operated in order for the described action to take place.

The First Ball Stepper Zero Button is used to return the control circuit to its ready for first or second ball condition.

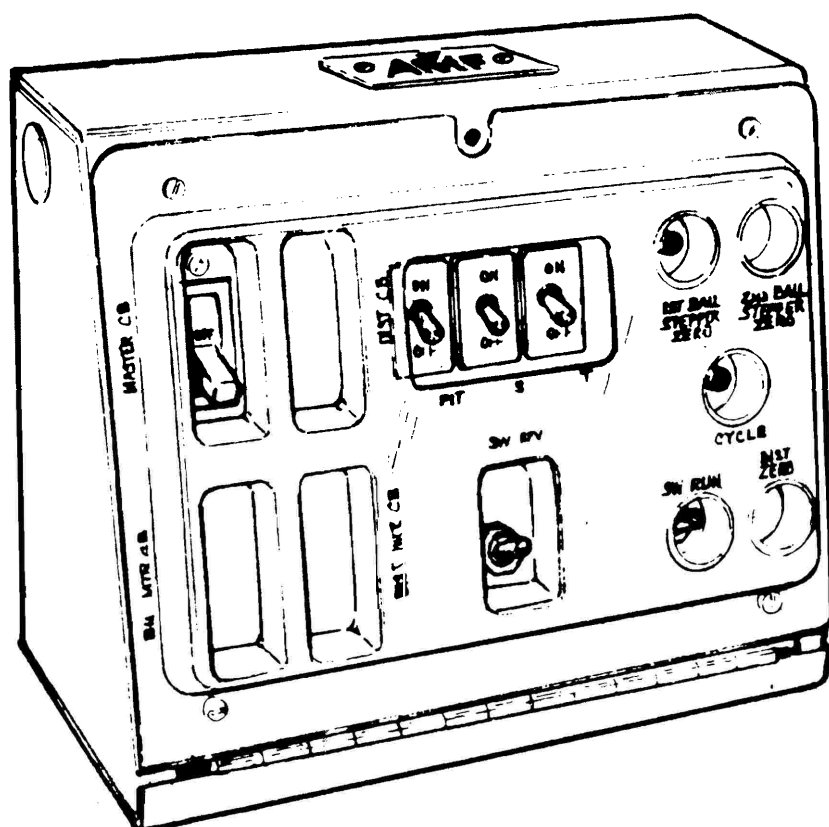
A Cycle Button is also provided on the Machine Control Panel. It is used to start the machine on either a first or second ball cycle depending upon the condition that the control circuit is in.

110 Volt Power Plug is located on top of the machine near the chassis. **This should be pulled out when a person enters an operating portion of the machine. This will disconnect all power to the pinspotter.**

The Stop Switch is the large red push button located to the left of the power plug on the front wireway of the machine. When depressed, this switch turns off the machine circuit breaker which is located in the rear control panel. The machine then becomes inoperative.

The Circuit Interrupt Switch (C.I.S.) located on the plug duct, is wired parallel to the stop switch. When plug duct cover is raised the (C.I.S.) turns off the machine circuit breaker in the rear control panel. The machine then becomes inoperative.

WARNING: ALTERATION OF WIRING FOR SAFETY DEVICES COULD RESULT IN IMPROPER OPERATION OF THE PINSPOTTER.



REAR CONTROL PANEL

GUARDS

Sheet Metal guards are installed on the side of the first and last machines in a row and wherever there is a space between groups of machines large enough for a person to enter.

A number of other sheet metal or plywood guards have been furnished and installed to protect personnel from accidental contact with moving parts. These should be kept in place at all times.

TENTH FRAME BUTTON

A push button, located convenient to the bowler, usually on the ball return is provided to cycle the machine when required. In the event pins are left standing after the bowler has completed his game, the tenth frame button must be operated to signal the machine to set up pins for the next bowler.

Example #1—If a bowler “spares” in the tenth frame, but fails to knock down all pins with the “extra ball,” the tenth frame button must be operated to set the machine for first ball for the next bowler.

Example #2—If a bowler “strikes” in the tenth frame, he is entitled to two additional balls. If his first “extra” ball is a strike but the second is not, the pins remaining on the lane must be removed before the machine is ready to receive the first ball of the next bowler. This is accomplished by use of the tenth frame button.

Example #3—(Without Accuscore) Less than a full set of pins spotted for first ball in a frame. The “tenth frame” button is pressed to cycle the machine, which will go thru a first ball cycle respotting the pins and lighting the 2nd ball light. Now the “tenth frame” button must be pressed again to cycle the machine thru a “2nd ball cycle” spotting a new set of pins and lighting the “1st ball” light.

Bowler may now proceed to bowl.

In open play, the machine can be recycled by throwing the ball instead of using the tenth frame button.

CAUTION

Do not operate the tenth frame button at any time other than as described above. Damage to the machine could result should the bowler be in the process of delivering the ball.

Enable respot only button—(Accuscore Installation Only) This button, located on Accuscore unit, is pressed to obtain a new set of pins whenever the first ball set is incomplete or a pin falls over.

The respot pins only button must be used to prevent the Accuscore from reading a false pinfall for first ball and advancing machine to “2nd ball” cycle.

MECHANICAL CYCLES OF THE MACHINE

MODEL 82-70

SOLID STATE CHASSIS

FIRST BALL CYCLE

The machine, as we will consider it, is now ready for the first ball with first ball light on, the sweep in the up position, the table at its extreme up position and the back end running which includes the carpet, distributor, ball lift, and elevator wheel. Ten pins are on the spot pattern on the pin deck and ten pins are stored, one per bin, in the ten bin locations; and the distributor is at the #1 bin position. The bowler rolls the ball, the ball is stopped by the cushion and works its way over to the ball exit and out into the ball lift. It is elevated by the ball lift to a height sufficient for a gravity return to the bowler. The start switch, S.S., will be actuated completing the cycle start circuit. The sweep will run to its down or guard position. Here it will rest until called upon to sweep pins. A time delay is set in motion and, at its conclusion, the table will start its first descent to detect pins. Ten respot cell switches indicate to the electrical system whether or not there are pins standing. If pins remain, they are mechanically gripped and raised to a height sufficient for the sweep to pass under them and clear the lane of dead wood. The pinicator registers the pins left standing. After sweeping the deck, the sweep will again come to rest at the forward position and become a machine guard to prevent damage from additional balls being bowled. The table continues upward through its "zero" position and starts another revolution, this time to respot the pins. As the table "zero" is approached for the second time, the sweep will raise and stop in its up position, and the table will stop at the end of its revolution. The first ball light is out and the second ball light is on.

SECOND BALL CYCLE

For the start of the second ball, the sweep is again at rest in its up position, the table is at zero, and the pin elevator wheel, distributor, ball lift and carpet are all running. This time, the pins previously knocked off the lane have been stored in the bins ready for delivery to the table. The ball is rolled and is stopped by the cushion. The S.S. start switch closes and starts the machine cycle. The sweep drops and the ball works its way over to the ball exit and is returned as in first ball cycle. A time delay is set in motion which delays the sweep before its run through. The sweep then performs its sweeping operation and returns to its forward guard position. At this time, the table receives its spotting signal and the spotting cups will swing downward to set up a complete set of pins as the table begins its revolution. As the table approaches the end of its revolution, the sweep will raise to its up position and the table will stop at zero. In the meantime, all of the pins that were carried into the pin elevator wheel at the beginning of the cycle are elevated to the distributor, oriented and carried out and stored in the bins where they will be used in the next frame. The second ball light is off and first ball light is on.

STRIKE CYCLE

In the strike cycle the machine components are all in the same condition as described previously when the machine was ready for first ball.

The ball is rolled and will be stopped by the cushion and removed as described previously. The start switch will be closed by the impact of the ball on the cushion. The sweep will drop to the guard position and the time delay is started as in First Ball Cycle. At the completion of the delay, the table will descend to feel for pins. When the table finds that there are no pins to be picked up the ten respot cell switches will not operate and the machine will override the normal cycle functions of first ball and proceed to second ball and spotting functions. The first ball light goes off and the strike light comes on. As the table proceeds toward the end of the first revolution, the sweep will clear all of the wood from the lane. If the table has received a full set of pins, it will then begin the second revolution or spotting cycle. By operating the spot solenoid, the table cups will be allowed to swing down to deposit the set of pins on the lane. During the spotting revolution, the electrical circuit is reset to first ball, the sweep will come to its up position, and the table will come to rest at "zero." The pins that were swept off the lane will be carried onto the carpet and fed to the pin elevator wheel, so that they can be distributed to the bins. The machine will be idling with the sweep up, the table up and the pin elevator wheel, carpet, distributor and ball lift all will be in motion. The strike light will be off and the first ball light will be on.

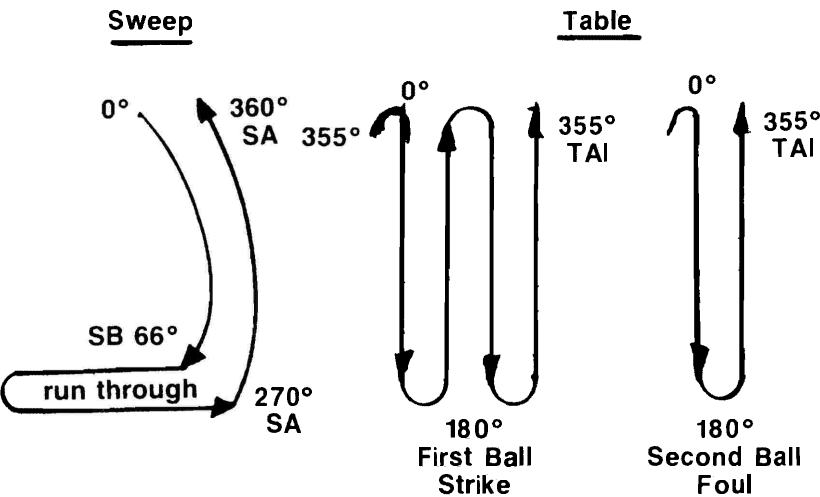
FIRST BALL FOUL CYCLE

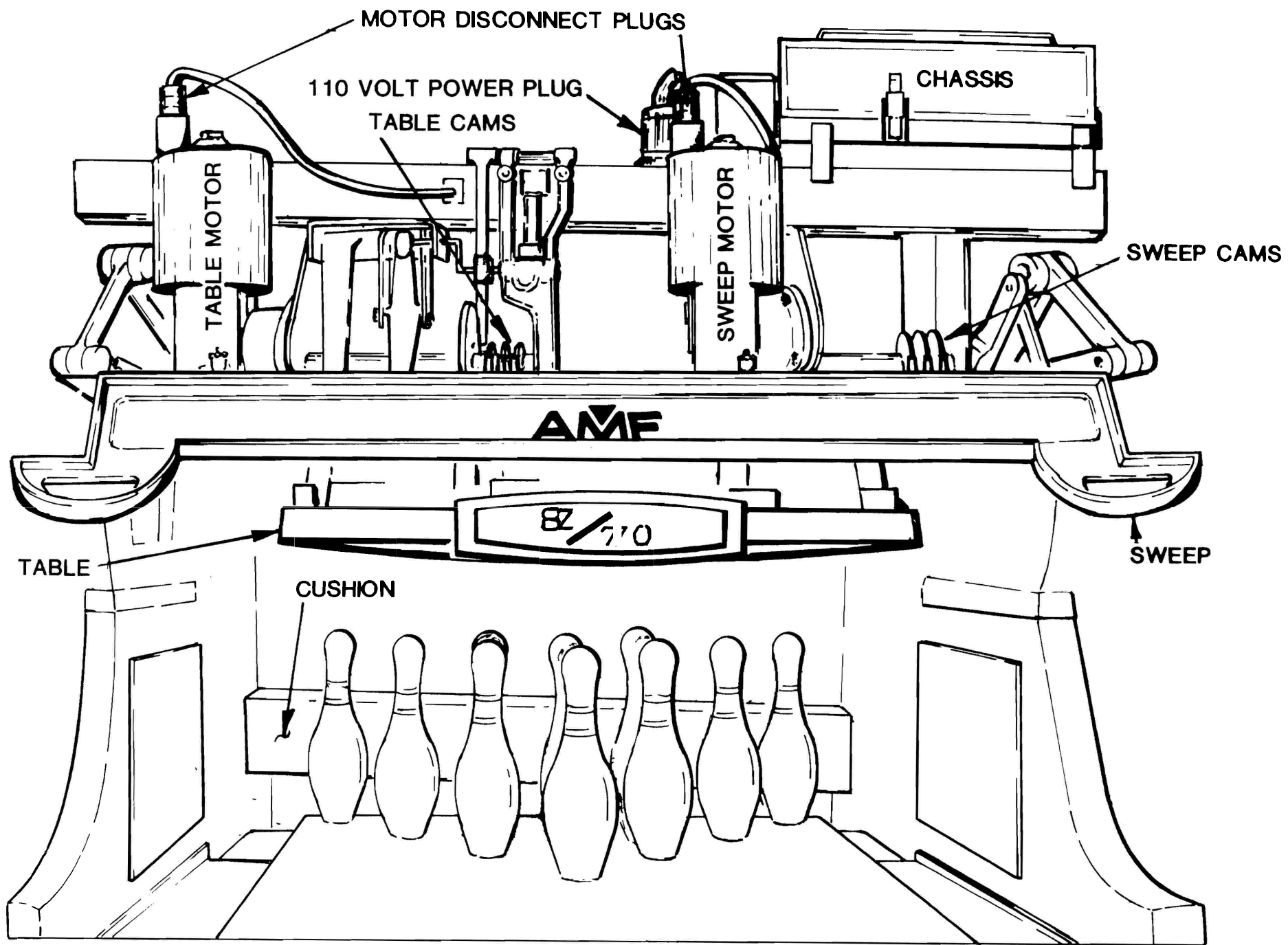
When the ball is rolled and the bowler commits a foul, the foul detector unit operates and prepares the machine for a foul cycle. The ball hitting the cushion will start the machine and it is returned as mentioned in first ball cycle. The sweep drops to the guard position and completes its sweeping operation stopping at the forward guard. The table, when full of pins, will begin its spotting operation. The table cups will swing down and deposit a full set of pins on the spot pattern on the lane. When the table nears the end of its travel, it will signal the sweep to begin its rise. The electrical system will remain ready for second ball with the second ball light on. The table will stop at zero and the sweep at its up position. The pins that were swept off the lane are carried into the pin elevator wheel and distributed to the various bin locations on the machine. In addition to taking over control of the machine, the foul detector unit energizes a foul light on the pindicator and rings a bell or buzzer.

SECOND BALL FOUL CYCLE

Should the bowler commit a foul when delivering his second ball, the machine will perform a normal second ball operation. The foul detector unit will operate the foul light and bell or buzzer.

TABLE AND SWEEP OPERATION





DETAILED ELECTRICAL DESCRIPTION 82-70 S/S CHASSIS

The electrical components of the machine are: Motors, Controllers, Transformers, Lights, Power Relays, Solenoids, Thermal Time Delay, Cam Switches, Switches and Protection Devices. These units will be described in that order.

1. **Motors**—The machine employs three motors of the capacitor induction type. They operate on 105-120 volts 60 cycle, single phase line. All motors have gear reducer units attached.

The Back End Motor runs continuously and supplies power to drive the pin elevator, the carpet, ball lift, and distributor. The carpet and ball lift shaft of the gear box rotate at 290 R.P.M. The next reduction is to 62 R.P.M. for the distributor drive shaft and the final reduction produces a speed of 48 R.P.M. for the pin elevator drive shaft. Opposite hand motors and gear reducers are required for opposite hand machines. The Back End Motor is designated as (B.E.).

The Table Motor is a fractional horsepower unit supplied with gear reducer and is operated intermittently as required. This shaft rotates at a speed of 12.1 R.P.M. The motor shaft is extended through the end cover so that the motor may be cranked by hand. The Table Motor is the same for either hand machine and is designated as (T). Table and sweep motors are interchangeable.

The Sweep Motor is also a fractional horsepower unit with gear reducer and operates intermittently. The drive shaft extends from the side of the gear box and revolves at 12.1 R.P.M. This motor is designated as (S).

A limited supply of combination (combo-table and sweep) motors were obtained with 14.5 R.P.M. output.

2. **Controllers, Transformers and Lights**, (Ref. Schematics 6730 and 9807) the machine uses three control relays to bring power to the above described motors. These are designated as B.E., T, and S, and they control the back end, table and sweep motors in that order. Transformer T2, located in the manager's control circuit, supplies power (24 V.A.C.) to the coil of (M) and the electrical counter when required. When 24 volts, alternating current (24 V.A.C.), is applied to the coil of (M) it is energized and its contacts supply power to the primary of the main transformer, T1. The 24 volt secondary of T1 supplies power to (T), and (S) relay coils when required.

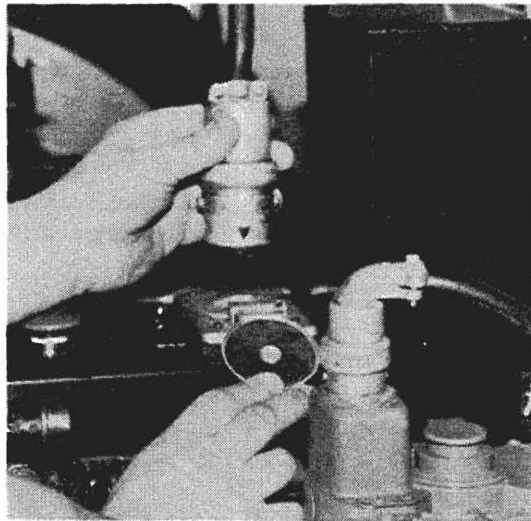
In the earlier S/S chassis, relays (BE) and M2 were controlled from T2, MP chassis have a T-3 and T-4 transformer to supply additional operating voltages. (Ref. schematic 9807)

3. **Cam Switches—Sweep Cam**—Associated with the sweep and coupled directly to the output shaft of the sweep drive motor are three cams designated as SA cam, SB cam, and SC cam which operate three switches designated as SA, SB, and SC respectively. The SA cam and switch determine the stopping position of the sweep in its normal zero or 360° position, and its stopping position at the completion of run through corresponding to 270° of rotation of the sweep motor shaft. The SB cam is used to determine the guard position of the sweep before sweep run through and corresponds to 66° of rotation of the sweep drive motor. The SC cam is used to indicate the position of the sweep when it is under the table which corresponds to 86° to 243° of rotation of the sweep drive motor. The SB cam and switch also initiates the spotting action of the table at its 186° position.

Table Cams—Associated with the table and connected directly to the output shaft and table motor there are also three cams designated TA1, TA2, and TB. The cams operate three switches, TA1, TA2, and TB. TA1 cam is used to stop the table in its zero position which is indicated as 355° on the drawing. TA2 is used to initiate sweep run through during a first ball or strike cycle. This is the 260° point of the cam. The TB cam defines the interference zone of the table with the sweep which is from 105° to 255°.

4. **Additional Switches**—The GP switch is the gripper protection switch and is actuated when all of the grippers are completely opened. The OS switch is the off limit or out of range switch and is actuated when the table engages a pin which has been moved beyond the normal respot range of the table. The start switch designated as SS is responsive to movement of the cushion caused by ball impact and is therefore used to control ball initiated cycles. Mounted on each of the gripper mechanisms in the table is a switch which forms actually an integral part of the gripper mechanism and is designated as GS 1 through GS 10 corresponding to the ten pins. These switches are closed by a pin which has been left standing when it is lifted by the table and are used to operate circuits which in turn indicate these pins left standing. The bin switch (BS) is located in the number 9 bin to permit spotting to take place only when bins are full.

5. **Protection Devices**—In addition to the circuit breaker used on the machine, the chassis contains three main fuses, or circuit breakers, (F1) or (CB1) which protects transformer (T1) PRI., (F2) or (CB2) which protects transformer (T2) PRI., (F3) or (CB3) protects T1 SEC. The back end, table, and sweep motors are protected by a manual reset Klixon thermal overload located on each motor. A Klixon overload (OLL) is also placed in the pindicator light circuit to protect the pindicator and ball path lights. This overload resets automatically. A second Klixon was added to the MP chassis. This is for ball cycle indication. CB4 was added to the MP chassis to protect T3.

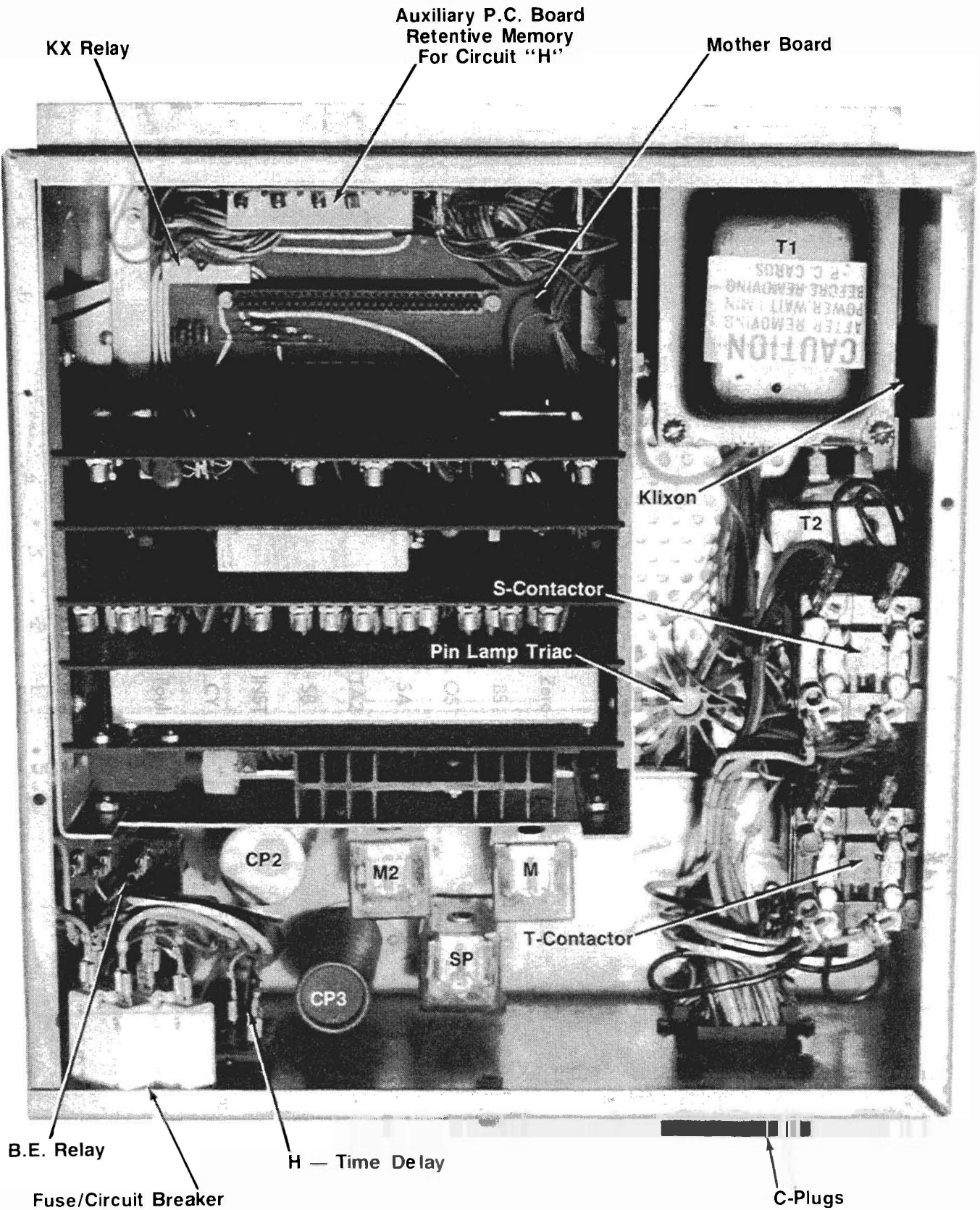


**Remove Power Plug
When Working on Machine.**

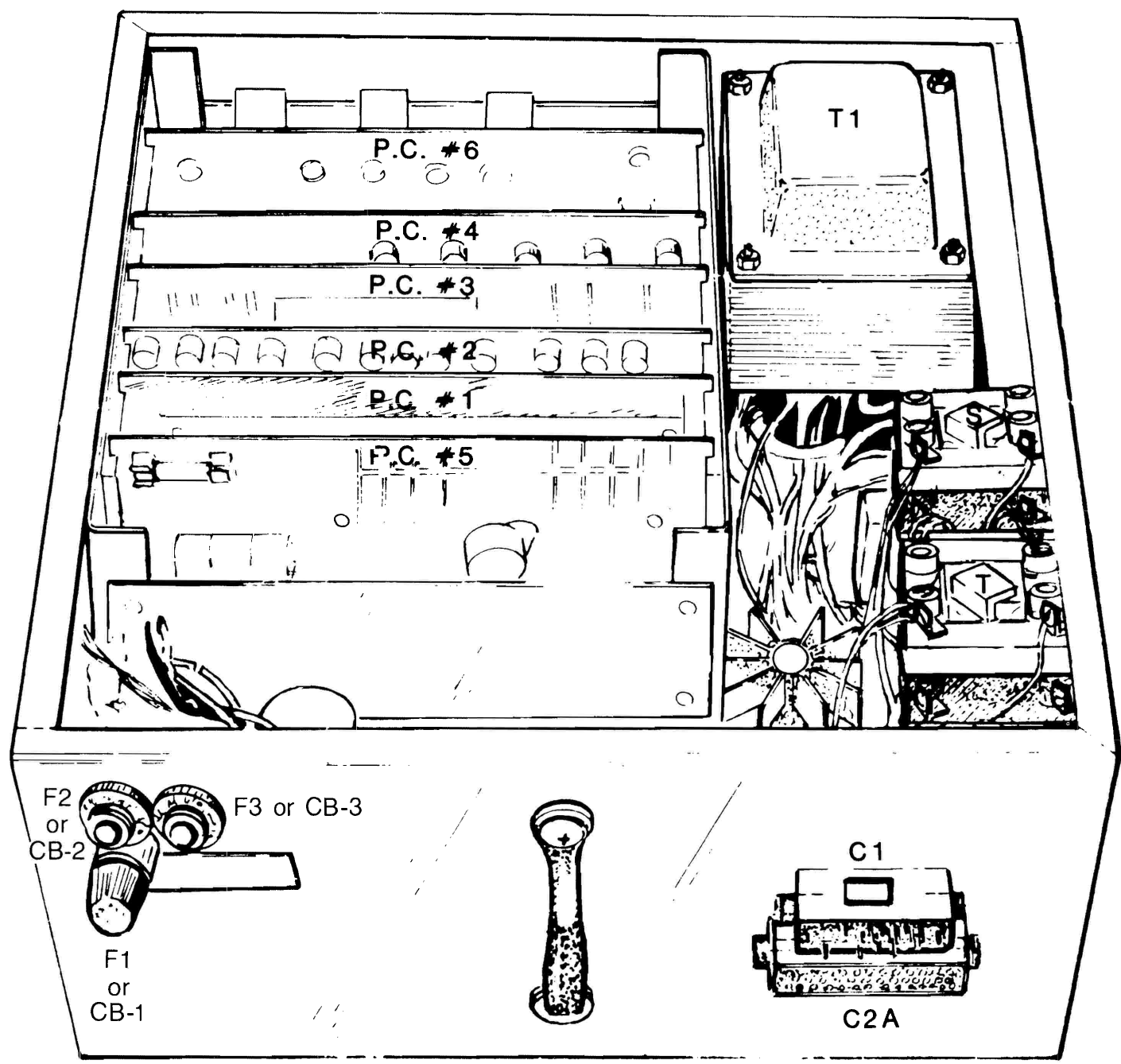
CHASSIS AND MACHINE COMPONENTS

	Circuit Symbol	Function
	BE	Back End Motor Relay
	S	Sweep Motor Relay Contactor
	T	Table Motor Relay Contactor
	F1 or CB-1	Fuse (Slo-Blo 3 amp) or Circuit Breaker (2 amp)
	F2 or CB-2	Fuse (Slo-Blo 3 amp) or Circuit Breaker (2 amp)
	F3 or CB-3	Fuse (Slo-Blo 3 amp) or Circuit Breaker (2 amp)
M/P Only	CB-4	Circuit Breaker (1 amp)
	C1	Connector Block, 34 Pin
	C2A	Connector Block, 50 Pin
	T1	Transformer, Main Power Supply
	T2	Transformer, Manager's Control Power Supply
M/P Only	{ T3 —Circuit Board Power T4 —MI and BE Power	
	M	Master On-Off Relay, Controlled by Manager Control Switch
M/P Only	M1 —Ball Return Relay	
	M2	Time Delay Relay, Initiated By M Relay—Sweep Reverse In M/P Chassis
	CP1	Capacitor
	CP2	Capacitor
	CP3	Capacitor
	H	Thermal Time Delay Unit } Not Used In M/P Chassis
	KX	
	SP	Spot Relay
	CSM-1	Sweep Motor Capacitor
	CSM-2	Sweep Motor Capacitor
	CTM-1	Table Motor Capacitor
	CTM-2	Table Motor Capacitor

REMOVE POWER BEFORE CIRCUIT BOARD

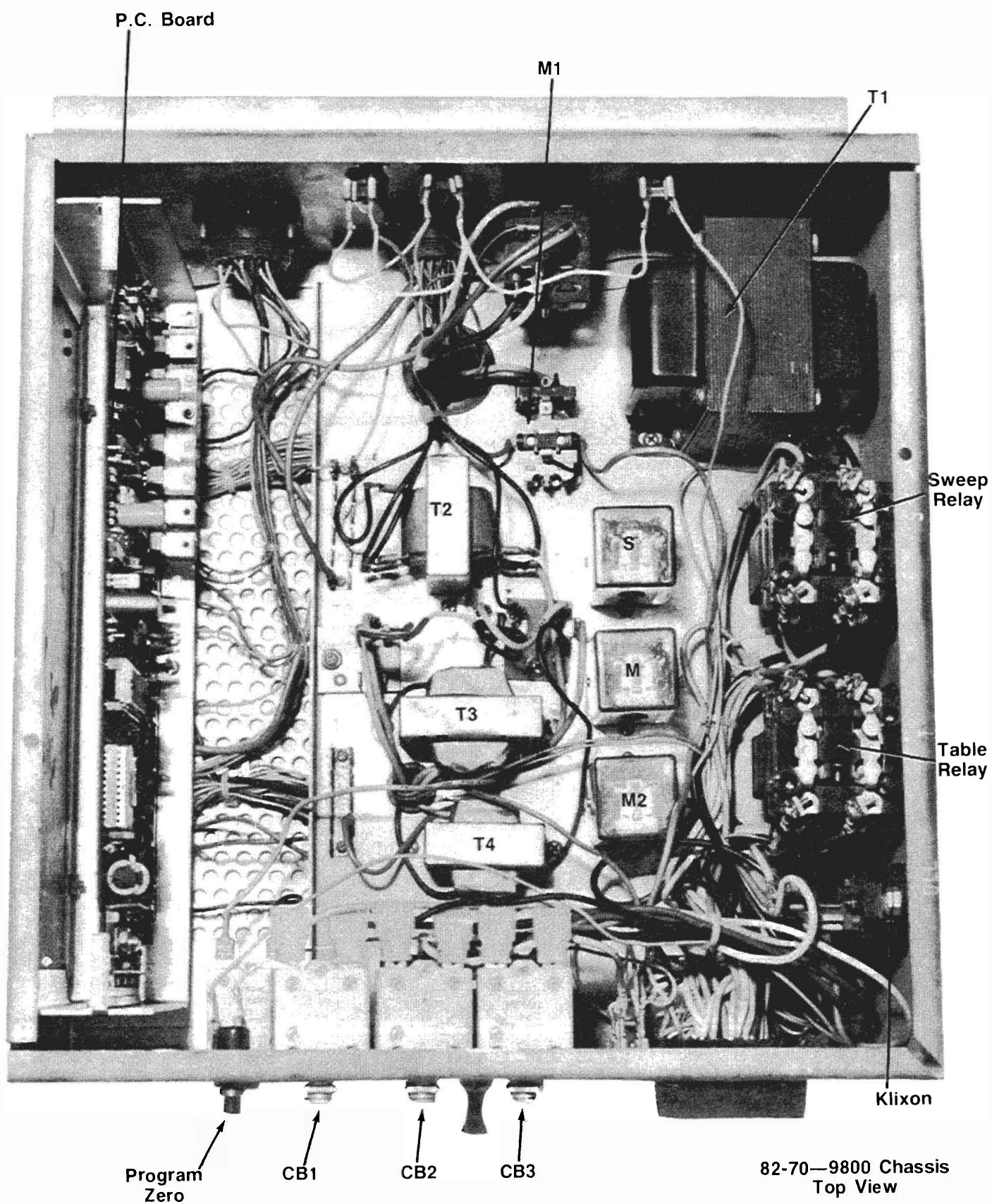


REMOVE POWER BEFORE CIRCUIT BOARD



82-70-6700 Chassis
Top View

REMOVE POWER BEFORE CIRCUIT BOARD



CHASSIS AND MACHINE COMPONENTS

Circuit Symbol	Function
CB	Master Circuit Breaker
SWBE	Switch—Back End Motor
S	Sweep Switch
T	Table Switch
SWSR	Switch, Sweep Reverse
SWS	Switch, Sweep Run
SS	Start Switch
GS 1-10	Gripper Switches (10)
MBD	Mother Board
PC1	Printed Circuit #1
PC2	Printed Circuit #2
PC3	Printed Circuit #3
PC4	Printed Circuit #4
PC5	Printed Circuit #5
PC6	Printed Circuit #6

Machine Pit Time Delay—When the manager's control is placed from the (B) Bowl position to the off position, the machine control system, with the exception of the back end motor, becomes inoperative. A time delay unit (H), located in the manager's control circuit, allows these units to operate approximately another 30 seconds to enable all of the pins in the pit to be delivered to the bin cups. (Machine pit time delay is built into the circuit board on M/P chassis.)

Counters—A low voltage electrical counter is provided for the manager's convenience so that he can determine the number of frame cycles bowled without having to go down to the machine to consult the official mechanical counter. This counter is located in the frame meter unit which also contains the manager's control switch. The unit is mounted at the manager's control desk.

A mechanical counter is used to record the official frame cycles of the machine. This counter is located on the rear framework of the machine.

Bowler's Pit Signal System—A low voltage signal system is provided for the establishment's convenience so that the bowler has a method of notifying the maintenance man that a machine has a malfunction. This system is both audio and visual through the use of a bell and lamp arrangement.

The bowler's push button is located on the ball return. The control box is mounted on the right rear side plate of the right hand machine. This box contains one low voltage control relay, a momentarily operated light switch, and a duplex 110 V.A.C. convenience receptacle.

PRINTED CIRCUIT BOARDS

Printed Circuit #1: Is the input card. This card processes the Pinspotter's cam information into usable control signals.

Printed Circuit #2: Interprets the input logic signals and provides a low power output command signal. This card is referred to as the Nor card.

Printed Circuit #3: Consists primarily of amplifier circuits. These circuits change low power command signals from PC #2 to signals of sufficient power levels to drive relay and contactor coils. Some of its outputs also drive mask lamps and gates of thyristors.

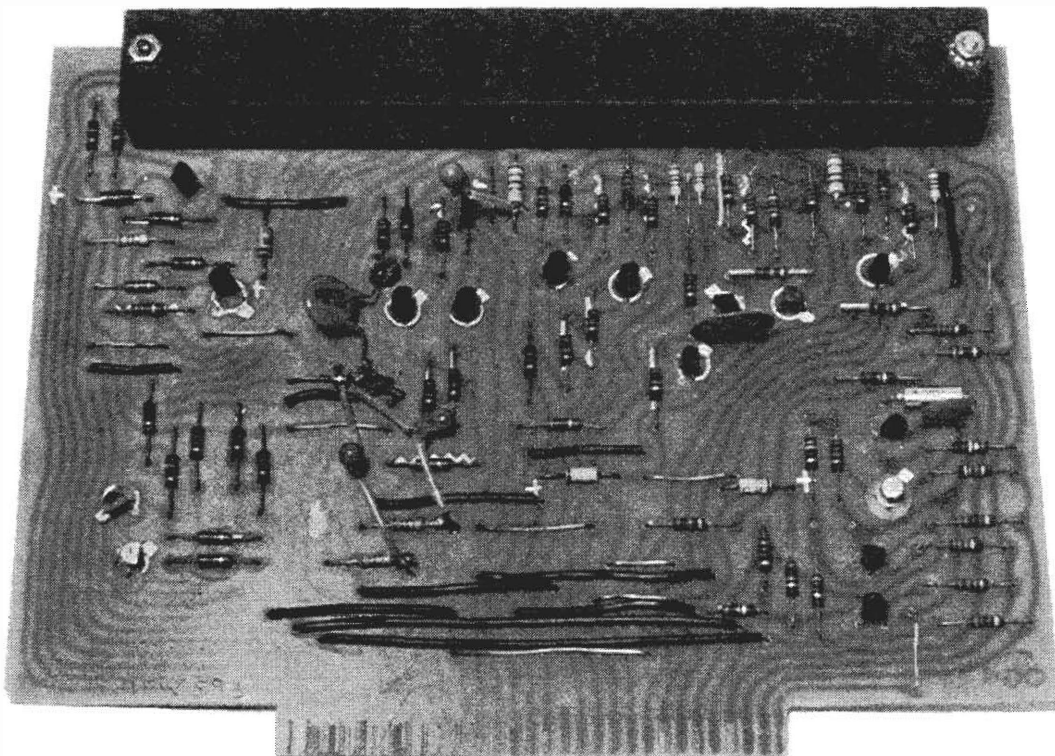
Printed Circuit #4: The basic function is to control the mask's pindicator and cycle function lamps.

Printed Circuit #5: This card provides two regulated power supplies for the transistorized circuits. The nominal voltages of these supplies are plus ten volts and minus 6.8 volts. This card also contains one input and one Nor circuit. This card is thus referred to as the power card.

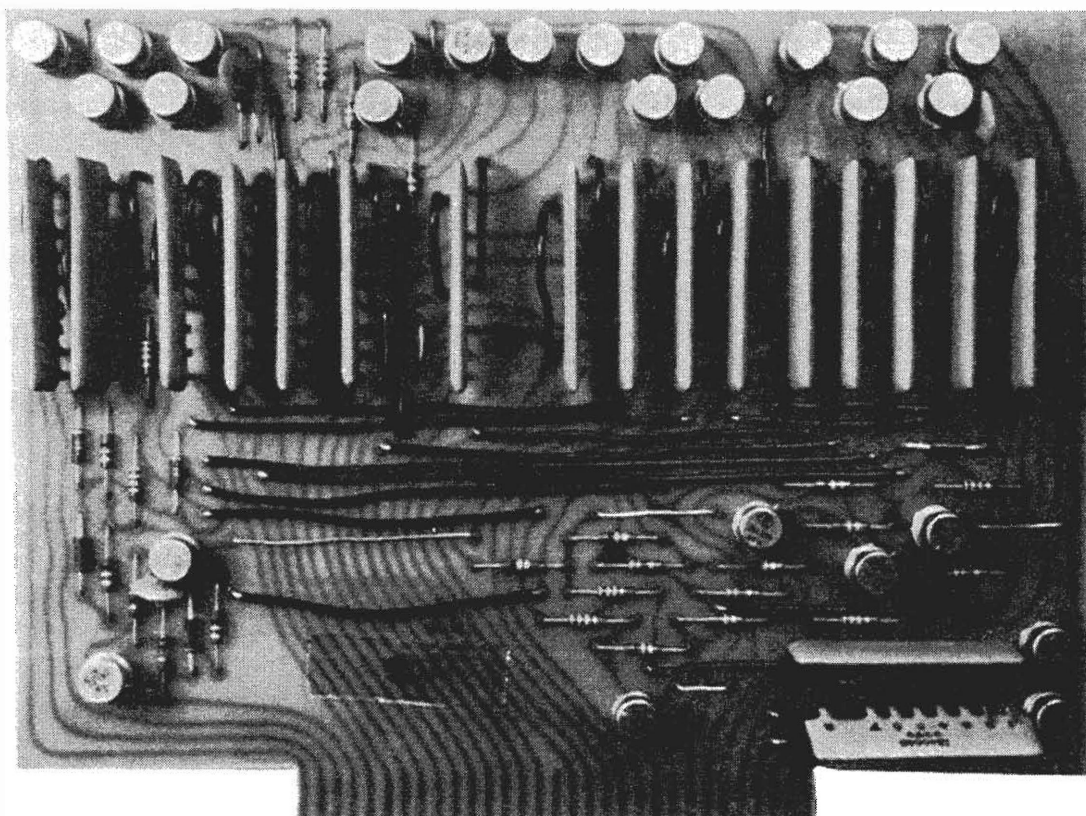
Printed Circuit #6: This card controls the sparemaker arrow lamps displayed on the Pinspotter's mask. It also has necessary circuitry for requesting computer to machine selection.

Auxiliary PC Board—Retentative memory. It remembers whether the machine was turned off before or after the time delay.

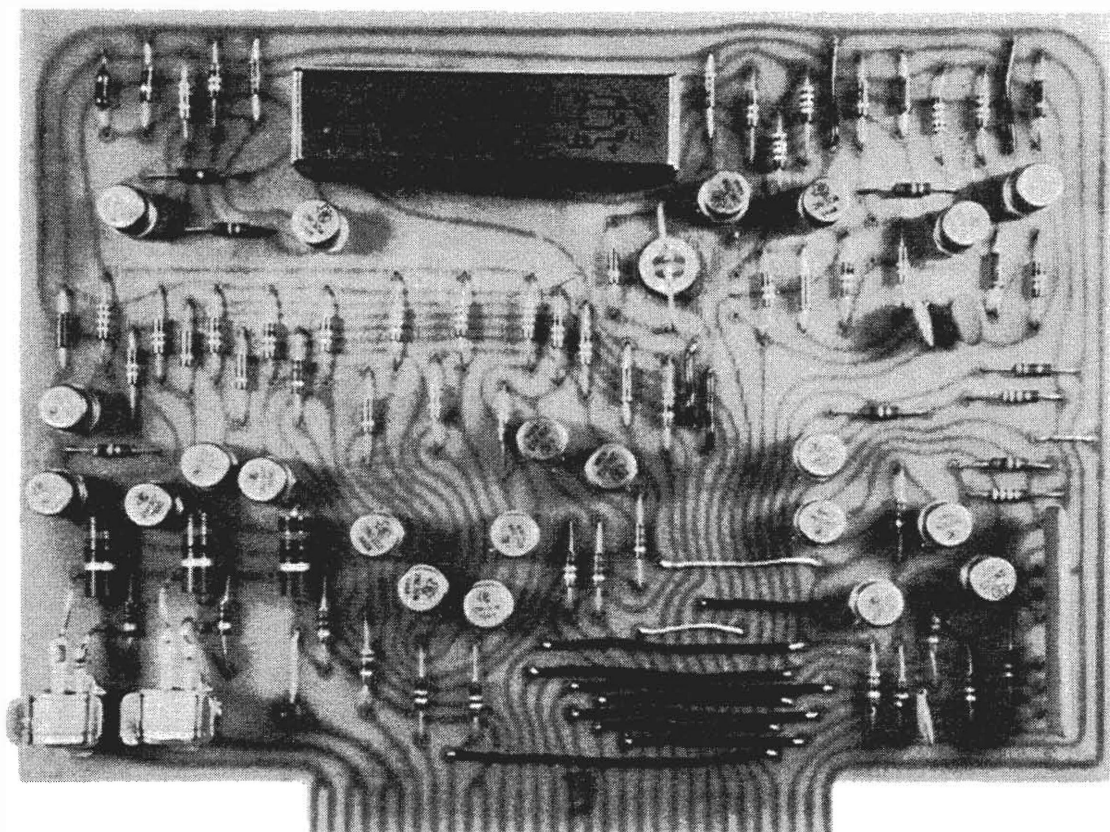
NOTE: (All of these functions are in one board in the MP chassis.)



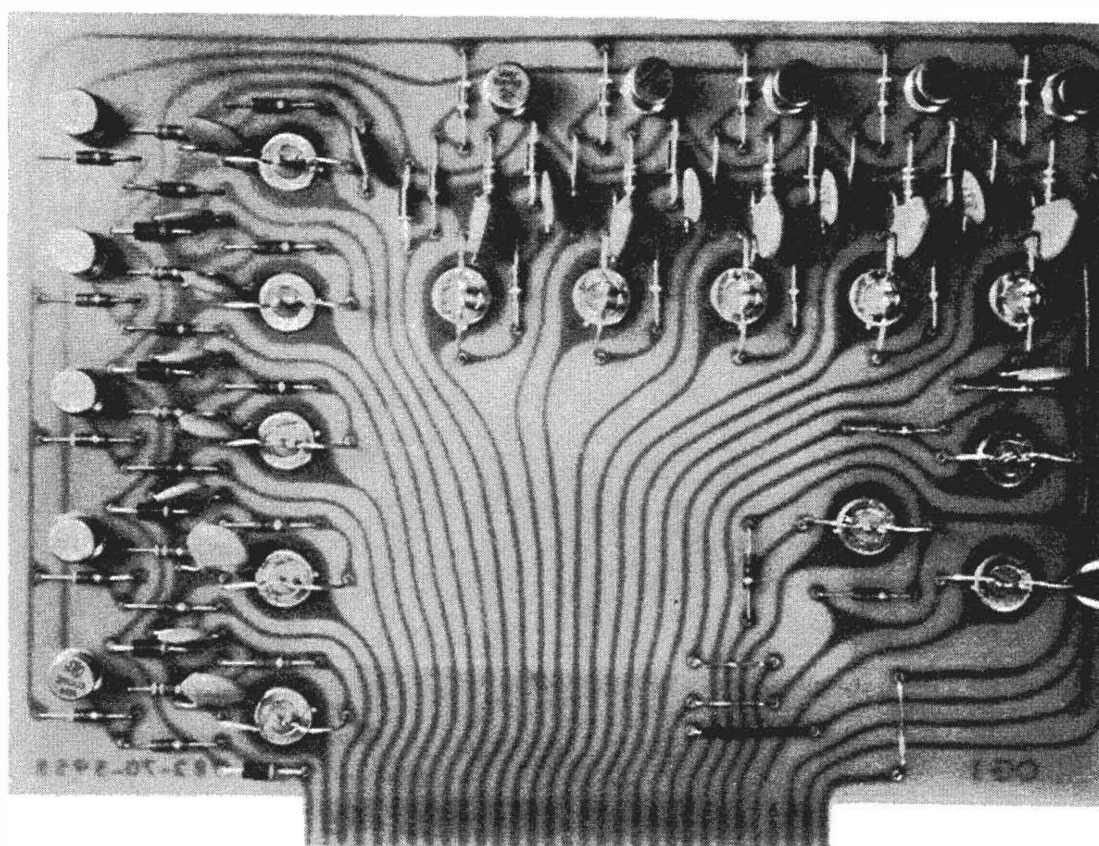
PRINTED CIRCUIT BOARD #1



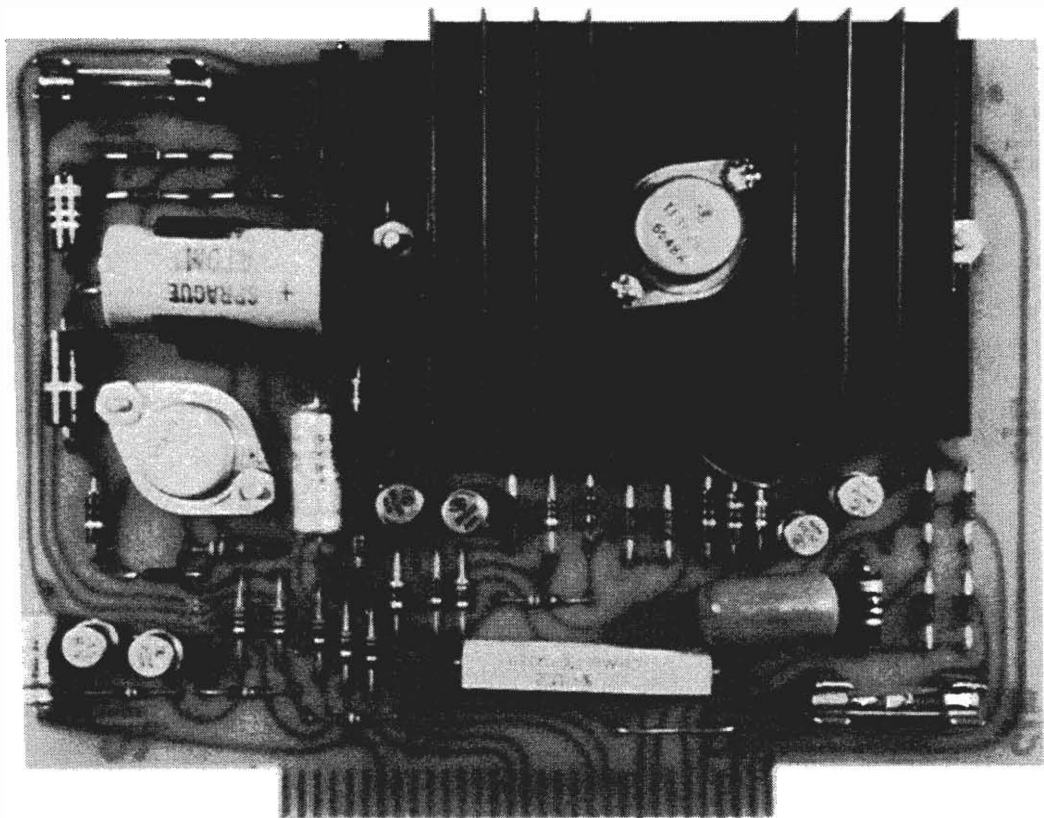
PRINTED CIRCUIT BOARD #2



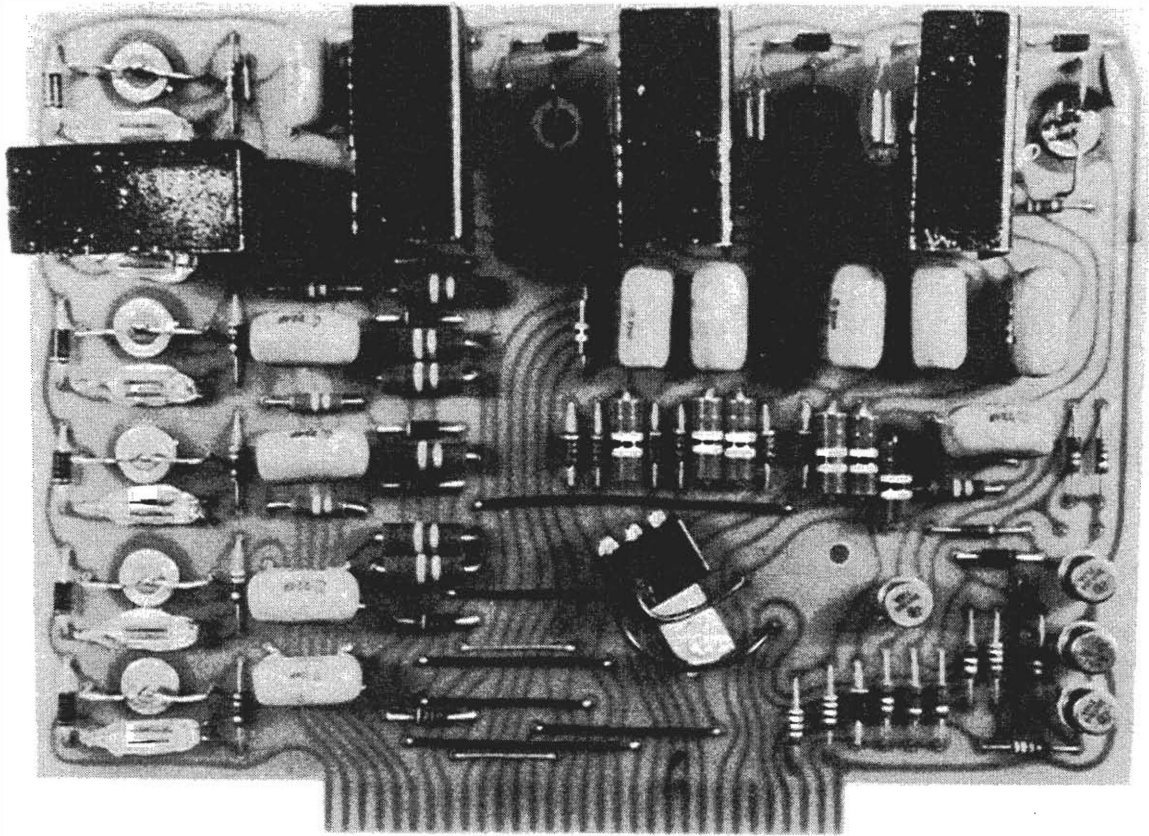
PRINTED CIRCUIT BOARD #3



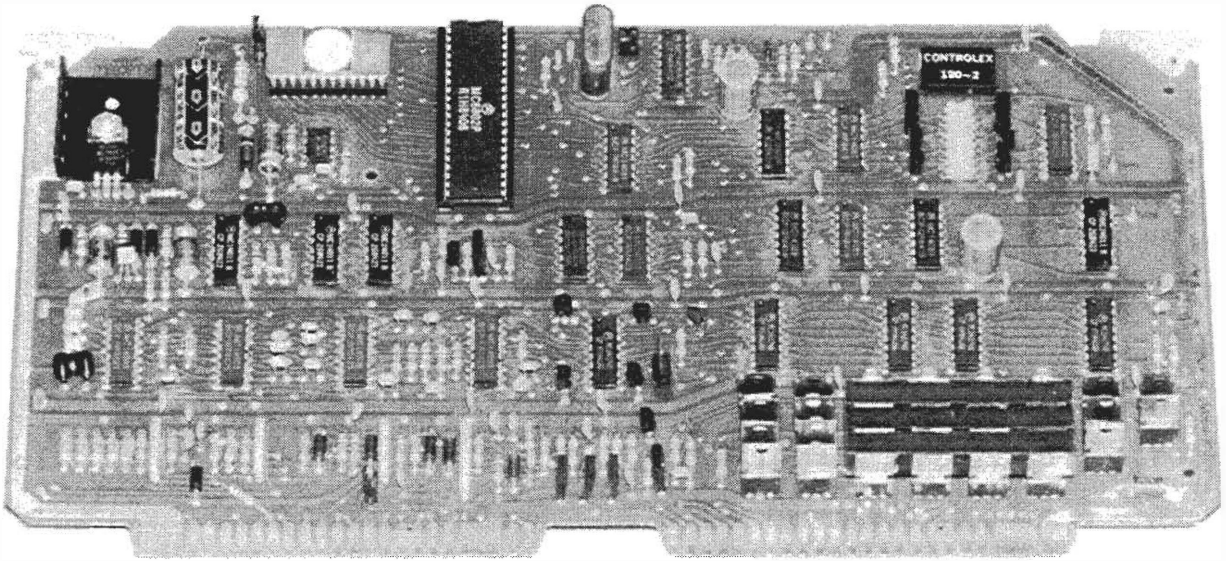
PRINTED CIRCUIT BOARD #4



PRINTED CIRCUIT BOARD #5

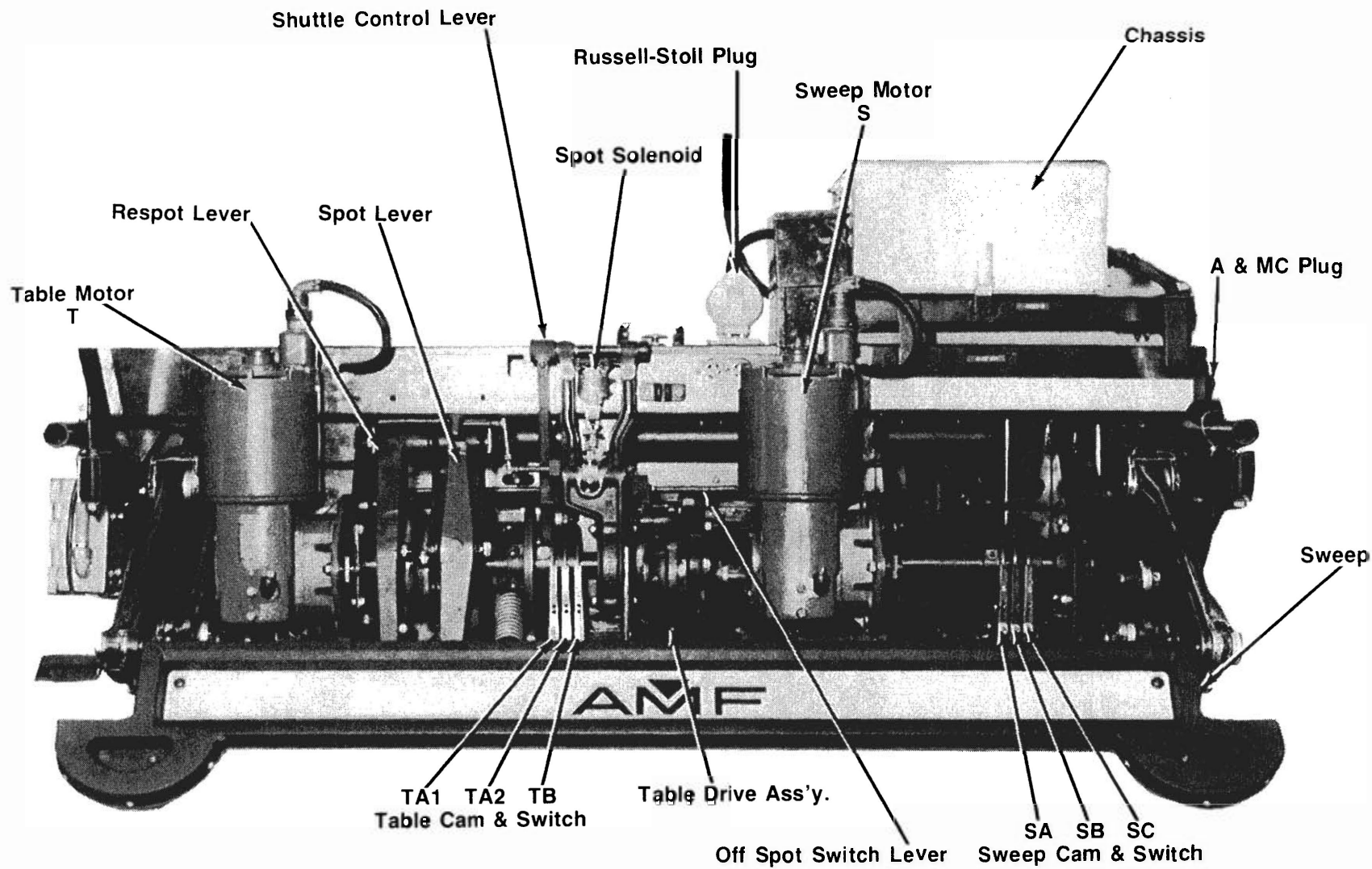


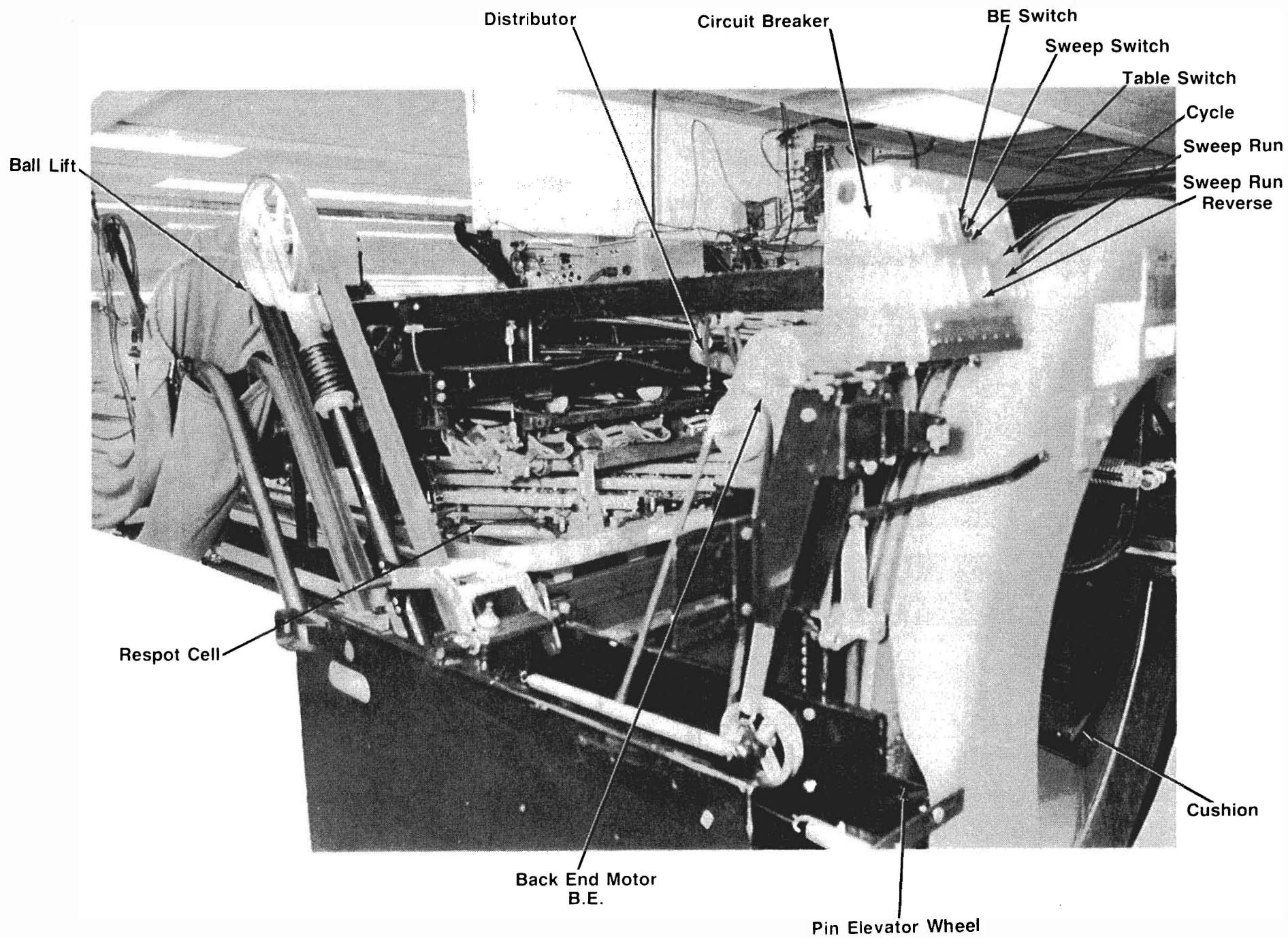
PRINTED CIRCUIT BOARD #6



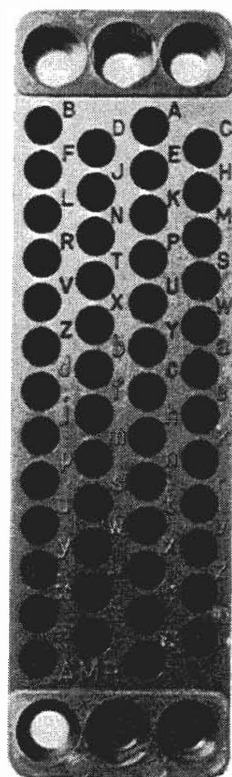
070 009 850 M/P Board

NOTES



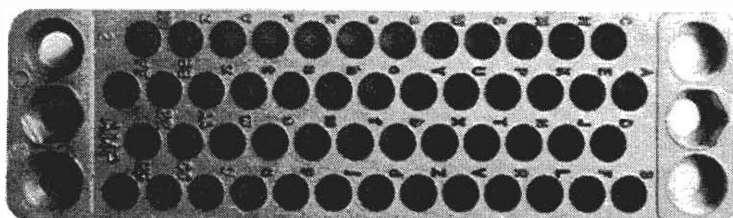


The following is a sketch of the 50 terminal plug showing the method of numbering.



Plug Terminal Numbers

Plug viewed from mating surface with the 13 terminal row to your left.



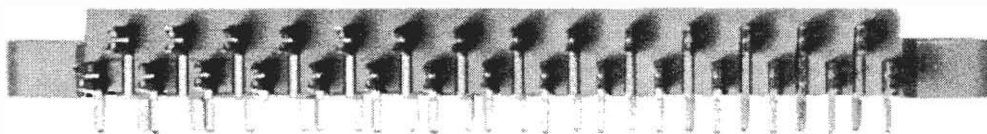
Receptacle Terminal Numbers

Receptacle viewed from mating surface with the 13 terminal row toward the bottom of the chassis.

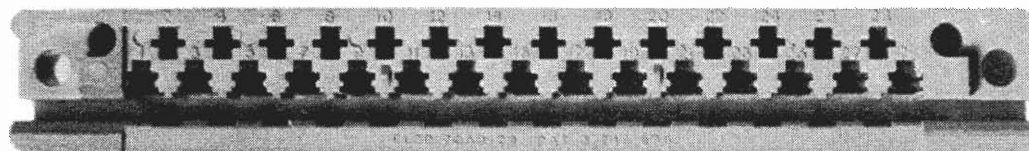
With the mating surface of the plug held vertically and facing you, and with the outside row of 13 terminals to your left, then the left column of 13 terminals is column 1. The next column to the right, having 12 terminals, is column 2, etc. Starting on column 1, the upper left hand point is pin 1. The next one below is pin 2, etc. The last point in column 1 is pin 13. This method of numbering has been incorporated for all 50 point AMP type "M" plugs and receptacles. The exact same method of numbering is incorporated for the receptacle as mounted in the machine chassis, except that the receptacle is viewed horizontally. In this manner, column 1 of the plug will mate with row 1 of the receptacle, with row 1 being the row toward the bottom of the chassis. Terminal 1 of each row of the receptacle will be the first pin to the right in each row.

The first digit of the number on the drawings indicates the row, the second digit or digits indicates the terminal. Thus, terminal 35 would mean row (or column) 3, terminal 5. Terminal 311 would mean row (or column) 3, terminal 11. Letters of the alphabet are also used at each terminal for further identification.

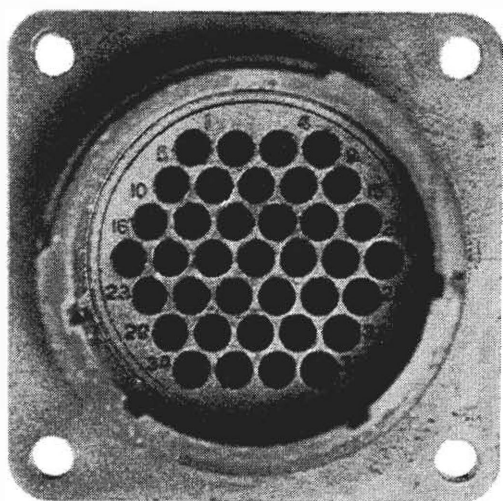
The 34 terminal plug and receptacle are read in a similar fashion. Row (or column) 1 contains 9 terminals; row 2, 8 terminals; row 3, 9 terminals; and row 4, 8 terminals.



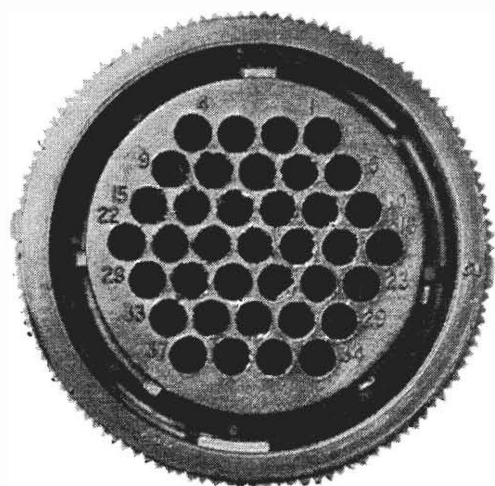
PM and BPP Elco Receptacle viewed from mating surface with the row of odd numbered terminals toward the bottom of the chassis.



PM and BPP Elco Plug viewed from mating surface with the plug held horizontally with the guide slot down.

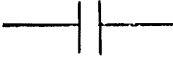
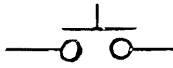
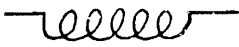
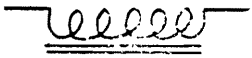
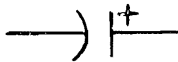
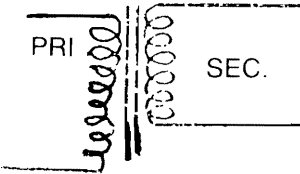


PM and BPP AMP Receptacle viewed from mating surface. The guide pins are in the bottom row. The numbers in the schematic indicated as E1 through E29 correspond to the same number on the AMP Receptacle.



PM and BPP AMP Plug viewed from mating surface with plug held so that the guide pins are in the bottom row.

BLUEPRINT SYMBOLS

Symbol	Description
	open contact of a switch or relay (off)
	closed contact of a switch or relay (on)
	push button switch (off)
	toggle type switch (off)
	coil of a relay or solenoid
	transformer
	heating element of a circuit breaker switch or klixon type overload
	resistor
	capacitor
	rectifier or diode
	ground or frame of machine
	ball path or pindicator lamps
	two wires crossing, no connection
	two wires crossing, connected
	transformer showing primary and secondary windings of a step-down transformer
	bridge rectifier

NOTES

ELECTRICAL CIRCUITS

Section 3

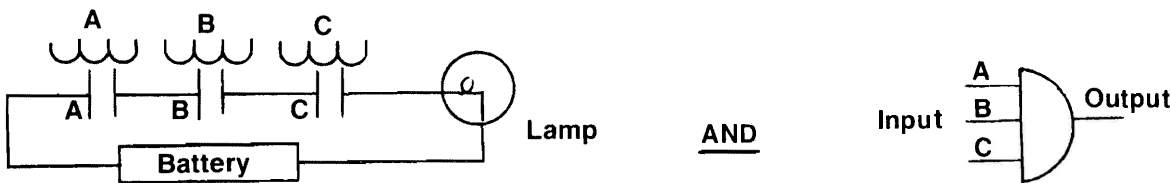
Page Reference

- 3.1 Solid State Chassis Theory (5 Board)
- 3.4 Blueprint Symbols (Solid State)
- 3.5 Logic Symbols and Rules
- 3.6 Sequence of Operation
- 3.10 Comments on Microprocessor Chassis (MP)

82-70 SOLID STATE CHASSIS THEORY AND DESCRIPTION

The 82-70 Solid State Chassis uses computer logic to illustrate pinspotter actions, reference drawing 82-70-6730. This drawing makes use of block diagrams to demonstrate the operation of the Pinspotters. Each block diagram contains one or more individual circuits which function when the machine switches operate. These circuits are identified as AND, NOT, NOR, OR-NOT, MEMORY, and TIME DELAY. Previous models utilized cam switches and relay contacts to perform machine functions. The similarity between relay contacts and Solid State devices are described below.

AND CIRCUITS

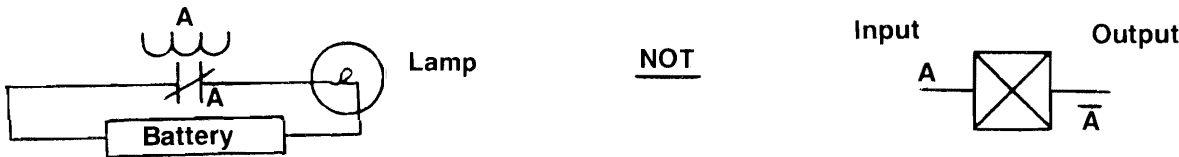


Relay coils A plus B plus C must be energized to close contacts A, B, and C to light lamp.

Inputs A plus B plus C must be energized to produce an output.

SUMMARY—The **AND** circuit produces an output only when every input is energized. Thus, in the circuit above, an output will occur only when the inputs A plus B plus C are energized. The absence or removal of any input signal will cancel the output.

NOT CIRCUITS

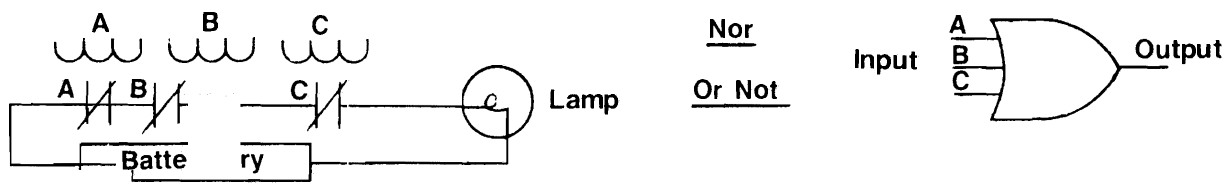


When relay coil A is energized, opening contacts A, lamp will go out.

Output will exist only when there is no input signal.

SUMMARY—The **NOT** is a function which produces an output only when the input is not energized. If an input signal exists at A, there will not be an output.

NOR CIRCUITS AND OR-NOT CIRCUITS



When relay coils A or B or C are energized, opening contacts A or B or C, lamp will go out.

An output will exist when A or B or C have not input signal.

SUMMARY—The NOR and OR-NOT are functions which produce an output only when the inputs are not energized. If a signal exists at A or B or C, there will not be an output.

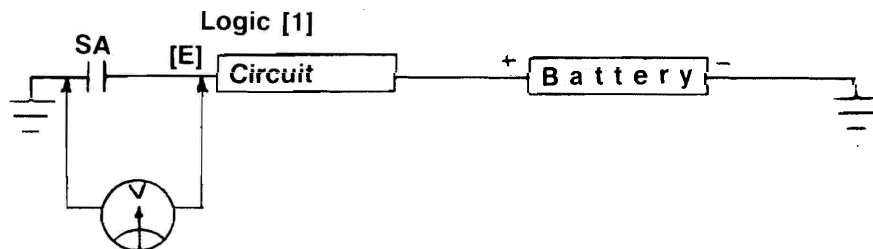
LOGIC

The logic used in the pinpointers is defined as Logic 0 and Logic 1. It can also be referred to as Logic 0 (no voltage) and Logic 1 (voltage present). In tracing circuits, letters are also used; thus, the letter E would indicate voltage and $\bar{E}$ no voltage.

Logic	or Symbol	Voltage Reading	Voltage
[0]	$\bar{E}$	.3 V Max. .01 V Min.	0 Voltage
[1]	E	5 V Min. 10 V Max.	Greater than 5 V.

Input Logic 0 No Signal
 Input Logic 1 Signal
 Output Logic 0 No Signal
 Output Logic 1 Signal

To further explain LOGIC, let's examine the circuit below.

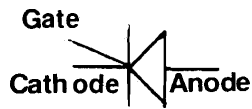


If a voltmeter were connected as shown, a voltage reading would be obtained across the switch SA. This voltage would be represented as Logic 1 or E or meaning voltage greater than 5 volts is present.

If the SA switch were closed and a reading again taken, the meter would read "0" voltage meaning Logic 0 or $\bar{E}$. Using these terms, we can then express signals or voltages being absent or present in a particular circuit.

82-70 SOLID STATE CHASSIS

Some symbols used in the 82-70 chassis are listed below.



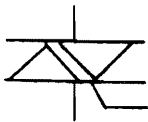
(SCR) silicon controlled rectifier gate must be positive in order to have current flow.



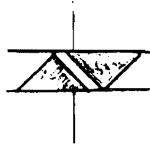
NE-23 Neon lamp.



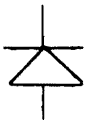
Photo cell, containing resistance, when light is applied to the cell the resistance is lowered permitting current to flow in the circuit.



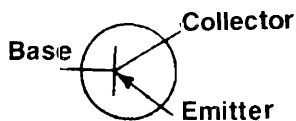
TRIAC-basically two diodes back to back, current flow in both directions, used in A.C. circuits.



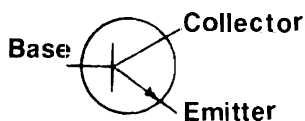
VARISTOR-kind of variable resistor, used across relay coils to reduce inductive kickback. The higher the voltage, the lower the resistance.



DIODE: Allows current to pass in one direction only.



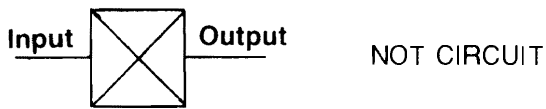
TRANSISTOR: (PNP) semiconductor, performing many vacuum tube functions such as current control and amplification.



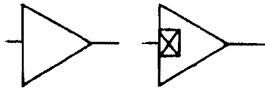
TRANSISTOR: (NPN)



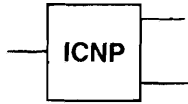
NOR
OR-NOT CIRCUIT



NOT CIRCUIT



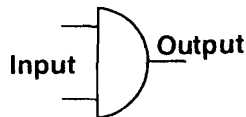
Amplifiers



Input Circuit



D.C. Input Circuit



AND CIRCUIT

LOGIC SYMBOLS AND RULES

Understanding transistor logic involves the learning of rules. These rules will be set forth with reference to block diagram 82-70-6730.

An input or output signal of 10 volts will be referred to as "Logic 1" and shall be written as either "1" or a letter such as B or C.

An input or output signal of 0 volts will be referred to as "Logic 0" and shall be written as either "0" or a letter such as $\bar{B}$ or $\bar{C}$.

All logic symbols on the block diagram 82-70-6730 are shown with the Pinspotter at first ball zero conditions with power applied.

AND symbol: This may be seen on the block diagram to the left of the gripper switches. It is shown as a semi-circle with its inputs on the straight line portion.

Rule: All inputs must be at logic 1 to have output at logic 1. Any one input at logic 0 will cause output to be logic 0.

NOT
OR-NOT Symbol: Not symbol may be seen on diagram shown at NOT-1. Nor symbol is shown at Nor 1.
NOR Or-Not is shown as Or-Not 11.

Rule: All inputs must be at logic 0 to have output at logic 1. Any one input at logic 1 will result in logic 0 output.

A NOT circuit may also be shown as a square with an "X" within it.

Amplifiers: Two type of amplifiers are used. Triangular symbols are shown on the block diagram.

Rule: A plain triangular symbol denotes an amplifier that requires a logic 1 input to turn it "on." A triangular symbol containing a box with an "X" denotes an amplifier that requires a logic 0 input to turn it "on."

Input Circuits: Shown on block diagram as squares. These may have one or more inputs and one or more outputs. These are represented as input circuits E, B, A, OS, M, C, and Zero.

Rule: Input circuits must have input switch contacts closed to ground to activate circuits and change output logics.

Memory Circuits: Shown as time delay, strike, foul, and ball cycle.

Rule: Once memory circuit is activated by proper inputs and outputs have changed, these outputs will remain changed without input presence until reset.

82-70 SOLID STATE SEQUENCE OF OPERATION (5 BOARD CHASSIS) UTILIZING 82-70-6730 BLOCK DIAGRAM

Initial Conditions:

Power is applied to the pinspotter, manager's control switch at "Bowl." First ball light on, sweep and table at zero positions with ten pins standing. Back end motor running, with nine pins in bins.

First Ball Cycle: When the start switch (SS) is momentarily closed by the impact of the bowling ball hitting the cushion, the output of input circuit E changes to a logic zero or $\bar{E}$. As Nor 1 will now have all inputs at logic 0, its output will be logic 1. In turn, both Not 1 and Nor 18 will have inputs of Logic 1. Not 1 will have an output of logic 0, holding E at zero, since the now open SS contacts will allow input circuit E to have an output of logic 1. Nor 18 output will now be logic 0. Since both inputs to Nor 19 are logic 0 (instructomat not applied, output logic 0), Nor 19 output will be logic 1. Now Or-Not 11 will have one input at logic 1 resulting in an output of 0, causing sweep amplifier to turn "on," completing the 24 volt circuit to the sweep contactor coil. Sweep will start its run to 66° guard position.

If instructomat was in use, instructomat input circuit would have produced a logic 1 to Nor 19, holding sweep at zero.

When sweep reaches 66° guard position, SB will close, causing input circuit B to invert its output signals ($\bar{B}$ now becomes logic 1, and B becomes logic 0). As the $\bar{B}$ input to Nor 1 is now logic 1, Nor 1 output will be 0. This in turn results in a logic 1 output from Not 1 and Nor 18. Now Nor 19 has at least one input at logic 1, and an output at logic 0. Or-Not 11 output becomes logic 1 since all of its inputs were at logic 0. This logic 1 will turn sweep amplifier "off," stopping sweep at 66°.

When SB caused input circuit B to invert its output signals, the B input signal to the time delay memory was changed to logic 0. Providing that the gripper protection switch is closed, all three inputs to the time delay memory circuit will be logic 0. With this condition, after a three second time delay, time delay memory will invert its output signals, $\bar{H}$ becoming logic 1, and H becoming 0.

Nor 9 will now have all four of its inputs at 0 resulting in an output of logic 1. Since Or-Not 15 will now have at least one input at logic 1, it will have an output of 0. This in turn causes the table amplifier to turn "on." Table starts its run down from zero.

The table continues its drive and the pin grippers close on the neck of any standing pins, closing the GS contacts to ground. This changes the And circuit output to logic 0 and in turn the Not (pin read) circuit output to logic 1. Since Nor 12 will now have one of its inputs at logic 1, Nor 12 output will remain at logic 0, blocking any strike cycle.

At 260° TA 2 closes inverting input circuit C outputs. $\bar{C}$ is now logic 1 and C is logic 0. Nor 2, having at least one input at logic 1, has its output at logic 0. Or-Not 4 now has both inputs at logic 0 resulting in a logic 1 output, turning on pin lamp control amplifier, completing 12 V.D.C. filtered circuit. KX relay coil is energized. Also, Nor 21, having all inputs at logic 0 (B at SB-66°, and C at TA 2-260°) has an output of logic 1 turning DC amplifier "on." The ground circuit through GS contacts plus the DC supply, allows transistors in thyristor amplifiers to turn "on," firing SCR circuits, completing pin lamp circuits to 12 V.C.D. filter supply. Pin information will also be supplied to computer through KX contacts.

Or-Not 20 now has all inputs at logic 0. Output, at logic 1, will signal machine call memory circuit which in turn signals computer that machine is ready for computer solution.

Simultaneously (TA 2-260°), Or-Not 4 supplies Nor 8 with a logic 1. In turn, Nor 8 output is at logic 0. Nor 3 now has all inputs at logic 0. (H from time delay, $\bar{A}$ unchanged, and logic 0 from Nor 8.) Nor 3 output is now at logic 1. Or-Not 11 output now changes to logic 0, turning sweep amplifier "on." Sweep will continue to run until SA contacts close at 270°. This inverts outputs from input circuit A. Nor 3 input $\bar{A}$ now becomes logic 1 changing Nor 3 output to logic 0. Or-Not 11 now has all inputs at logic 0 resulting in logic 1 output, turning "off" sweep amplifier. As sweep passes 186°, SB opens, resetting input circuit B to its initial condition. SC 86°-243° closing changes output L to logic 1, holding Nor 2 output at logic 0, maintaining 12 V.D.C. filtered circuit.

Table continues to run through TA1-185°-355° contacts or Nor 9 and Or-Not 15 circuits. When table reaches 185° of second revolution, TA1 will close changing input DC circuit G to logic 0. Nor 5 will now have both inputs at logic 0 since A changed to 0 at SA-270°. Nor 5 output will be logic 1 which will reset time delay memory circuit, resetting the H outputs to their zero conditions. Table continues through TA1-185°-355° N.C. contacts.

Since Nor 7 will have one input at logic 1, and an output of logic 0, Nor 6 will have both inputs at logic 0 (C at logic 0 from TA 2-260° closing), and an output of logic 1. Ball cycle memory will invert J outputs and retain this state after Nor 6 loses its logic 1 output. Output J, now at logic 0, turns "off" first ball light amplifier. Nor 17, with both inputs at logic 0 and output at logic 1 turns "on" second ball light amplifier.

With time delay memory reset, Nor 4 will now have all inputs at logic 0. Nor 4 output of logic 1 will cause Or-Not 11 output to be logic 0, turning "on" sweep amplifier. Sweep will start its return from 270° to 360°. At 360°, SA 270°-360° opens, resetting input circuit A to initial state, changing A input to Nor 4 to logic 1. Nor 4 output, now at logic 0 will cause Or-Not 11 output to change to logic 1 turning sweep amplifier "off" stopping sweep at 360°.

Table continues travel through TA1-185°-355° (electrical zero) and stops at zero position.

Second Ball Cycle: Initial conditions are same as first ball cycle **except** ball cycle memory outputs have been inverted. $\bar{J}$ is now logic 1, and J is logic 0.

Cycle start, sweep stop at 66° guard, and time delay are as discussed in first ball cycle. When sweep dropped to 66°, outputs B and $\bar{B}$ inverted. Nor 2 output changed to logic 1, cancelling pin lamp 12 V.D.C. through Or-Not 4 and amplifier.

After three second time delay, the time delay memory outputs H and $\bar{H}$ will invert. H is now at logic 0 and $\bar{H}$ at logic 1.

Nor 8 now has $\bar{J}$ input at logic 1 resulting in output logic 0 from Nor 8 to Nor 3. H, having changed to logic 0 after time delay, along with $\bar{A}$, and logic 0 input from Nor 8, causes Nor 3 to have logic 1 output. Now Or-Not 11 has one input at logic 1 and an output at logic 0. The sweep amplifier will turn "on" and the sweep will advance from its 66° guard position.

At 270°, SA will close, inverting outputs $\bar{A}$ and A. Nor 3 now has one input at logic 1, and an output at logic 0. Or-Not 11, with all inputs at logic 0 will turn off the sweep amplifier and sweep will stop at 270°.

After tenth pin is delivered to bin, BS contacts close causing input circuit M to have output of logic 0. Nor 10 will have all four inputs at logic 0, Nor 16 supplying a logic 0 since $\bar{J}$ input to Nor 16 is logic 1. Nor 10 output is now logic 1, turning "on" R amplifier to energize spot relay. Logic 1 from Nor 10 will cause Or-Not 15 to produce a logic 0, turning "on" table amplifier. Table will now go into spotting action.

As table passes 185°, TA 1 will again close, G will change to logic 0. Nor 5 will have both inputs at logic 0 (A changed at SA 270°), giving a Nor 5 output of logic 1 which resets time delay memory. Table continues its action through TA1—N.C. 185°-355°. Since the $\bar{H}$ input to Nor 4 is now logic 0 (time delay reset), input A is logic 0 (SA 270°) and $\bar{OS}$ is logic 0, Nor 4 output is now logic 1, resulting in Or-Not 11 output of logic 0. Sweep amplifier is turned "on," sweep rises to 360° where SA 270-360° opens, resetting A and $\bar{A}$. Nor 4 now has a logic 1 input, and a logic 0 output causing Or-Not 11 to have a logic 1 output, stopping the sweep at 360°.

As the table passes TA2-260°, the output C and $\bar{C}$ are inverted. Just prior to sweep stop at 360°, Nor 7 had an output of logic 0. Nor 6 inputs are both logic 0 as a result of C inversion, producing output at Nor 6 of logic 1. Ball cycle memory now is reset. First ball light is "on," second ball light "off." Table continues to 360°.

Strike Cycle:

All conditions are the same as first ball cycle except there are no pins standing on the pin deck.

Cycle start, sweep stop at 66°, guard and time delay are as discussed in first ball cycle. After 3 seconds time delay, H and $\bar{H}$ outputs invert, and table starts down through Nor 9, Or-Not 15 and table amplifier.

Since there are no pins standing, all gripper switches remain open, and circuit will have logic 1 output and Not (pin read) will have logic 0 output at 260° TA2 will close, inverting C and $\bar{C}$ outputs. Nor 12 will then have all inputs at logic 0 since B changed at SA-66°, C changed at TA2-260°, $\bar{OS}$ remained at logic 0, and Not (pin read) supplied a logic 0. Nor 12 now has an output at logic 1 supplying strike memory circuit. The strike memory has one input and a reset from Nor 13. The input, at logic 1, activates the SM and changes all four outputs to logic 1. One of these outputs turns the strike light "on," the next holds 2nd ball light "off" through Nor 17. The next output supplies Nor 7 with logic 1 changing Nor 7 output to logic 0. Finally, the X at logic 1 from SM gives Nor 9 one input at logic 0, holding the table at 360° for spotting preparation.

Simultaneously, as the table passed 260° , the C input to Nor 6 changed to logic 0, giving Nor 6 an output of logic 1, inverting J and $\bar{J}$, and turning "off" first ball light leaving only the strike light "on."

Also, as the table passed 260° , the $\bar{C}$ input to Nor 2 changed to logic 1. The resulting output from Nor 2, at logic 0 plus the logic 0 $\bar{OS}$ input to Or-Not 4, results in a logic 1 output from Or-Not 4. This in turn sets the Nor 8 output to logic 0. Since all inputs to Nor 3 are at logic 0, Nor 3 supplies Or-Not 11 with logic 1 and the Or-Not 11 output logic 0 turns on sweep amplifier. Sweep runs to 270° where output A and $\bar{A}$ are inverted stopping sweep through Nor 3.

Further table, spotting, and sweep action is as discussed in second ball cycle.

Strike memory is reset as Nor 13 receives both inputs at logic 0 when sweep and table reach zero positions.

Foul Cycle:

Bowler commits foul. Radaray relays signal to foul optical link which in turn inverts its two outputs to logic 0. One of these outputs turns "on" the foul light amplifier which turns "on" the foul indication light. The other output is sent as logic 0 to Nor 14.

The sweep down to 66° cycle is as discussed in first ball cycle. When the sweep reaches 66° the outputs B and $\bar{B}$ are inverted. Nor 14 now has all three inputs at logic 0 since the time delay has not changed $\bar{H}$.

Nor 14 will have a logic 1 output activating foul memory. Foul memory output is now logic 1.

After 3 seconds time delay, the logic 1 $\bar{F}$ will hold the table through Nor 9 since Nor 9 output will be logic 0 and Or-Not 15 output logic 1. Meanwhile, since the F input to Nor 8 is at logic 1, Nor 8 output will be logic 0. When H changes to logic 0, Nor 3 output now becomes logic 1 and sweep will run through to 270° ; A and $\bar{A}$ will invert stopping sweep through Nor 3.

Since Nor 16 will have a logic 1 input at $\bar{F}$ and a logic 0 output, Nor 10 will have all four inputs at logic 0 with the closing of the bin switch. Nor 10 output logic 1 will start table in stopping action.

Further table and sweep action is as discussed in second ball cycle. Ball cycle memory J outputs will invert turning "on" second ball light.

Foul optical link will be reset at termination of radaray cycle.

NOTES

COMMENTS ON MICROPROCESSOR (MP) CHASSIS

The 82-70 MP Chassis part #070-009-800, has been designed to directly replace our Solid State Chassis, part #070-007-750, and #070-006-700 with adaptor cables #070-007-758 or #070-007-669. It performs all the machine cycles with the inputs that were provided to the Solid State Chassis.

The MP Schematic, #070-009-807, as with our past schematics, includes machine and installation circuits with the chassis to illustrate all interconnections. The Microprocessor Board Logic is omitted, but all the connections made through its two receptacles are shown. The Logic diagram of the MP Board is equally as large as the total Pinspotter schematic, and would have been unwieldy, if combined with it. It is **not** recommended that any repair be attempted on the MP Board by **anyone** in the field. This is another reason its logic is not included.

The following is an explanation of the difference in operation between the MP Chassis and our conventional Solid State Chassis.

1. The most prominent difference in operation of the MP Chassis is its "Power Down" feature. For safety reasons, this feature has been designed in so that after any condition of loss of the 115 VAC power source, while the Manager's Control Switch is in the "Bowl" position, no machine movement will occur upon reapplying the power source, even if the machine had been in cycle at power down. This has been incorporated because of the possibility of someone using machine down time during power failure to perform machine maintenance, and ignoring safety signs by not removing plugs on the machine, and being in the machine when power is reapplied causing mechanical movement, particularly if "in cycle." With power reapplied, a person must go to the pinspotter, and operate the "First Ball Zero" push button switch. Before doing this, they must make sure that no one is in the machine.

Upon the power being reapplied, the Pit Light only will turn on. Upon depressing the "First Ball" switch, the Back End motor, and the mask lamps will turn on. This is referred to as "Manual Intervention." This condition exists anytime that a power failure occurs, the house Distribution Panel circuit breaker is turned off, the Pinspotter power feed Russell & Stoll plug is pulled, or the circuit breaker in the Back End Control Box is turned off. It does **not** exist if the Sweep, table or Pit switches in this box are turned off, at anytime, or, if the machine is turned off by the manager's control switch before "Power Down."

Once the zero switch has been depressed initially, and the program is running, then further depressing this zero switch will transfer the Pinspotter mask first/second ball lights back and forth each time it is depressed. With the back end motor running now, and the ability to transfer machine cycles, you have all the assurance that the program is running properly.

2. There is a push button on the side of the chassis labeled "Reset Program." This switch, as indicated, resets the program if the operator cannot accomplish this by zeroing the sweep and table, and performing another Manual Intervention. In order to reset the program, the table and the sweep must be in their electrical zero positions. That means the table and sweep cam switches must be in the condition of machine zero. There is a Sweep and Table push button provided on the side of the chassis for this purpose. These push buttons override all controls except the Back End and Interlock switches. Regardless of the logic control, these push button switches will energize the Sweep and Table connectors.

After locating the Sweep and Table in their zero position, the "Reset" switch is to be depressed. While it is depressed, the back end motor will turn off and the mask lights will turn off if they were on. Upon release of the switch, after a slight pause, these will return on. At this point the chassis should be ready for a cycle.

To prove machine's operation at this point, a cycle switch has also been incorporated on the chassis. It parallels the cushion switch.

3. When the machine is turned on by the Manager's Control Switch, and awaiting a cycle, the SA and TA1 cam switches will run the Sweep and Table as they have in the past with our solid state chassis. The Sweep will return itself to zero on the SA cam, and the table on the TA1 cam, as in the past. This condition does **not** exist during a machine cycle. If there is any kind of a problem which results in stopped motion of either the Sweep or Table during cycle, the program cannot be reset nor can the Sweep or Table be operated via the SA and TA1 Switches. For this reason, it was felt necessary to provide the Table and Sweep switches on the chassis as an override.

4. The MP Chassis has a built-in memory, not involving any mechanical device, or electrical power. It used "Core Memory" to accomplish this. If the machine is turned off in any manner during the cycle, when normal power is restored it is made operational if necessary with Manual Intervention. The Pinspotter will continue through the cycle it was in when turned off. This also holds true for the Table, Sweep, and Pit switches in the Back End control box.

It must always be remembered that Manual Intervention is not required after the Back End switches have been turned off and on for motion of the Pinspotter to continue.

5. The Manager's Control Switch performs the same functions as it did with a Solid State Chassis. It controls the machine as to whether it is off, in the conventional Bowl condition, or in Instruct-O-Mat.

In the Instruct-O-Mat operation, the machine will show a difference upon returning to Bowl. No matter whether the machine is in a first or second ball cycle, if it is placed in Instruct-O-Mat and then cycled via a ball being delivered, when it is returned to the Bowl position, it will go through a spotting cycle and return to its zero position awaiting a first ball cycle.

6. If the installation utilizing the MP Chassis has MagicScore Automatic Scoring, the MP chassis has been designed so that it may function in conjunction with the Acoustic Pin Sensor. A connecting cable is provided, as illustrated on installation drawing #218-001-710, which presents all pin information to the MP chassis from the Acoustic Pin Sensor. With this method of installation, the pin lamps that become energized on the mask are determined by the Acoustic Pin Sensor System. They still will not turn on until the table reaches 260° of its first ball cycle revolution, but which lamps turn on is controlled by the Acoustic Pin Sensor.

Along with the mask light controls, we now have the ability to act on a strike, 7 or 10 pick off only, or miss.

By the addition of a couple of wires in the front end wireway assembly, and an additional connection made through the C2A plug, conversion kit #070-011-330, we can incorporate a Sweep reverse action which may be used in relation to a strike, miss, or 7/10 pick off. The resultant cycles are as follows:

A. Strike

1. Sweep drops.
2. As soon as the APS System detects that a strike is valid, the time delay in the MP Chassis is bypassed and the Sweep will run through preparing for the Table spotting action.

B. Miss, or 7/10 pick off

1. Sweep drops.
2. As soon as the miss or 7/10 pick off is determined, the time delay is again bypassed, and the Sweep will reverse up to its zero position. The first ball light will turn off, and the second ball light will turn on.

7. When the pinspotter is turned off by the Manager's Control Switch, and the pinspotter is in a zero position, the machine pit light and mask lights will turn off immediately. The machine cannot be cycled. The back end motor and the control for the ball return will continue on for one minute before they turn off. The machine must be at zero for this one minute time out. If it is not, the back end motor and ball return will continue to run.
8. The MP Chassis single piece printed circuit board must be handled with care, as the boards of the MagicScore, MCC, and APS must also be. It should be handled by the edges, stored in conductive black bags, and stored carefully so as not to abuse or damage the components.
9. With the MP chassis installed in a house with our MagicScore Automatic Scoring, there is no need for our Respot Pins Only (RPO) box. The MP board has the RPO cycle programmed into it. The RPO switch, paralleled by the Back End Cycle switch, splice into the APS to MP chassis cable, as illustrated on installation print #218-001-710.

NOTES

SERVICE TOOLS

Section 4

Page Reference

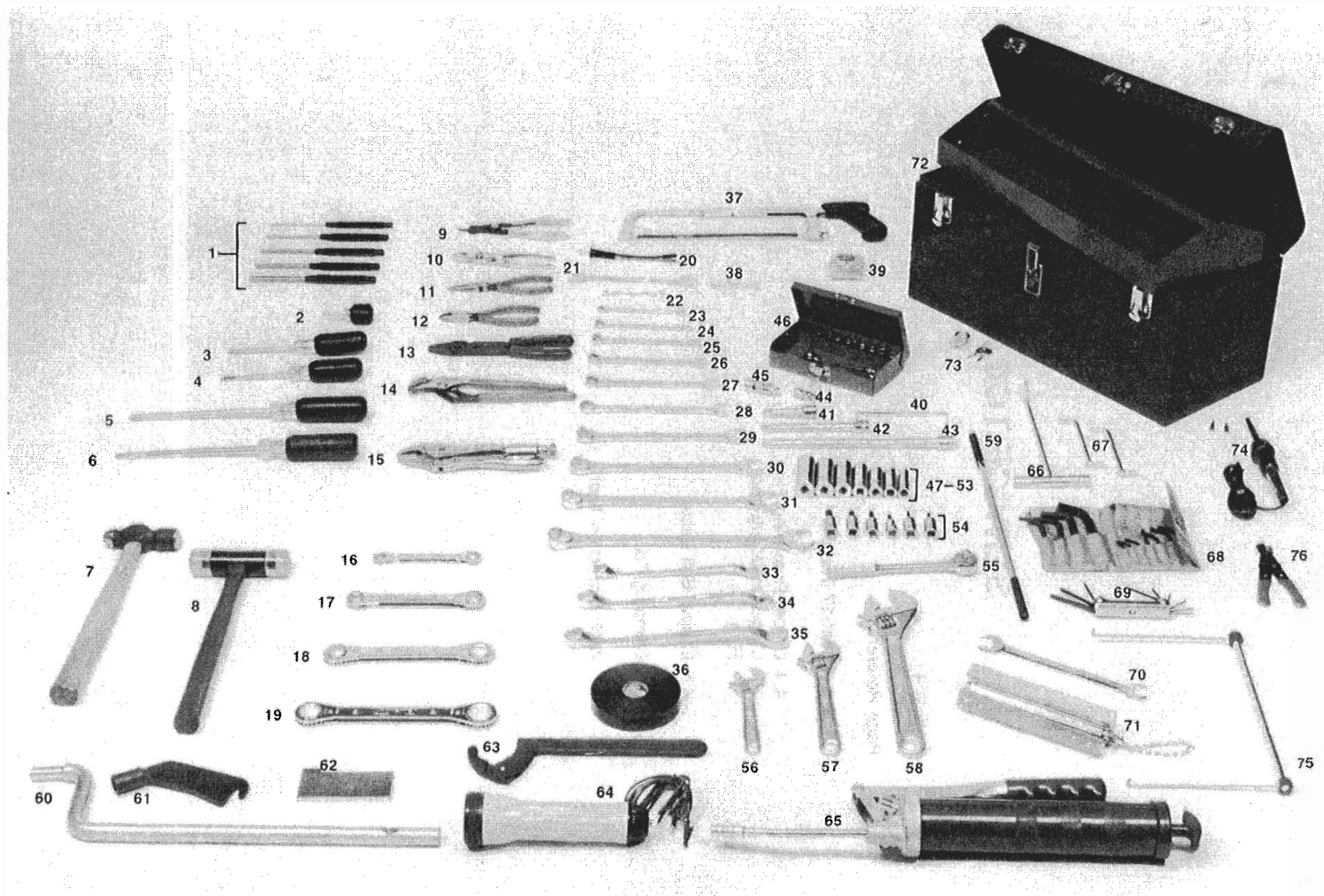
4.2 PSK-17 Tool Kit

4.4 Carpet Removing Pins
Carpet Installing Tool
Flag

4.5 Clipper Belt Lacer

4.6 Crimping Tool

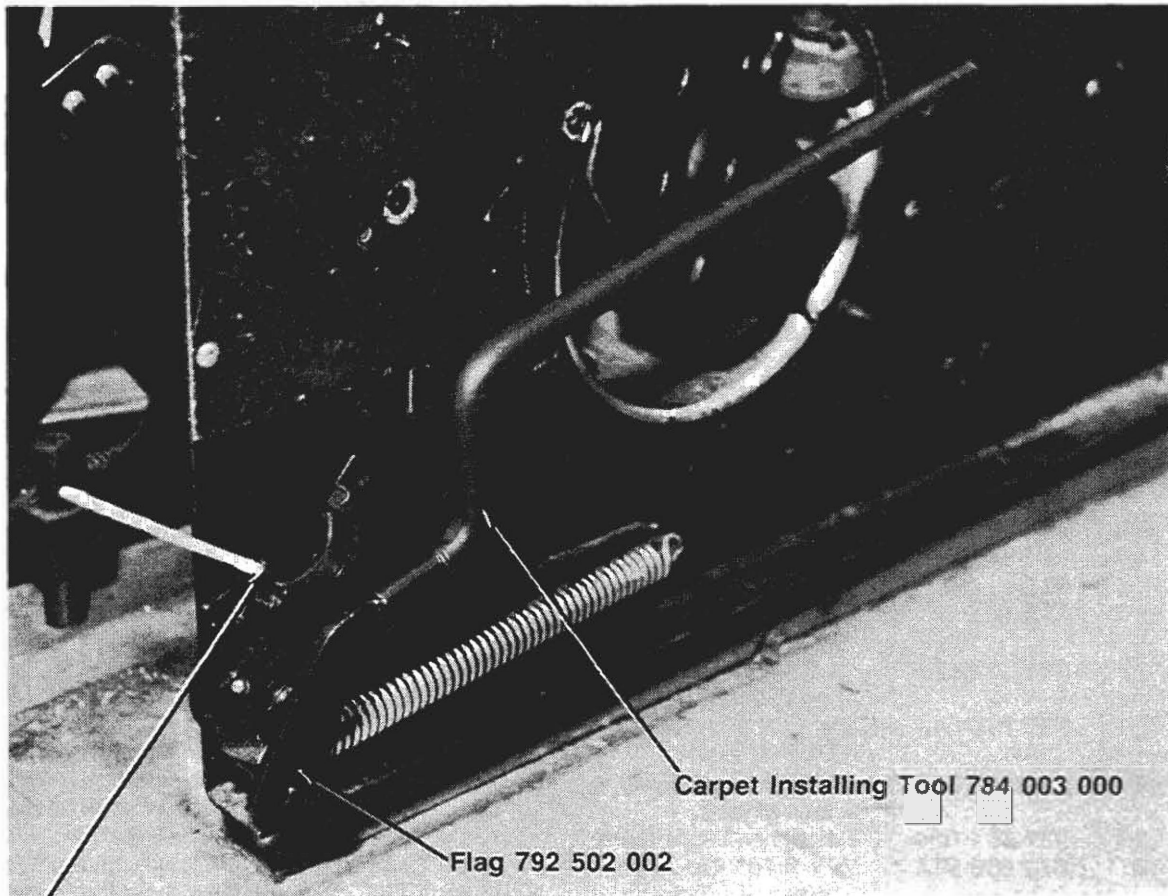
4.7 AMP Extraction Tool



PSK-17 PART NO. 784 528 052
AMF BOWLING PRODUCTS GROUP SERVICE TOOL KIT
Effective Machine Serial No. 95151
CONSISTS OF THE FOLLOWING

Item	Part No.	Description	Item	Part No.	Description
1	787 001 006	Drive Punch Set	34	793 507 029	Offset Box Wrench 9/16" x 5/8"
2	789 001 001	Screwdriver CR#2 x 1 1/4"	35	793 507 030	Offset Box Wrench 11/16" x 3/4"
3	789 001 002	Screwdriver CR#2 x 4"	36	724 001 011	Scotch, Electric Tape 3/4" x 36 Yd.
4	789 006 008	Screwdriver SL x 4"	37	788 504 004	Hacksaw
5	789 001 003	Screwdriver CR #4 x 8"	38	792 016 018	Level
6	789 006 009	Screwdriver SL x 8"	39	792 026 028	6' Steel Tape
7	783 501 001	Hammer—Ball Peen 16 oz.	40	030 002 748	Sweep Cam Gauge
8	783 502 002	Hammer—Plastic 16 oz.	41	789 502 003	Extension 3"
9	793 002 007	Snap Ring Pliers	42	789 502 004	Extension 5"
10	786 503 003	6" Gripping Pliers	43	782 501 001	Extension 11"
11	786 502 002	5" Needle Nose Pliers	44	789 512 028	Universal 1/4" Drive
12	786 504 004	6" Diagonal Cutters	45	789 512 029	Universal 3/8" Drive
13	792 009 010	Crimping Tool	46	789 511 027	Socket Set 1/4" Drive
14	786 501 001	Channellock Pliers	47	789 509 023	Deep Socket 13/16"
15	793 514 048	10" Vise Grip Wrench	48	789 509 022	Deep Socket 3/4"
16	793 510 041	3/8 x 7/16" Ratcheting Box Wrench	49	789 509 021	Deep Socket 11/16"
17	793 510 042	1/2 x 9/16" Ratcheting Box Wrench	50	789 509 020	Deep Socket 5/8"
18	793 510 043	5/8 x 11/16" Ratcheting Box Wrench	51	789 509 019	Deep Socket 9/16"
19	793 510 044	3/4 x 7/8" Ratcheting Box Wrench	52	789 509 030	Deep Socket 1/2"
20	791 004 004	Testlight—High Voltage	53	789 509 018	Deep Socket 7/16"
21	070 006 974	1/2 x 9/16" Open End Wrench—Thin	54	780 503 014	Allen Wrench Socket Set
22	793 509 036	1/4" Thin Wrench	55	789 505 008	Drive Ratchet 3/8"
23	793 506 021	Comb. Open End & Box Wrench 5/16"	56	793 501 001	6" Adjustable Wrench
24	793 506 022	Comb. Open End & Box Wrench 3/8"	57	793 501 002	8" Adjustable Wrench
25	793 506 023	Comb. Open End & Box Wrench 7/16"	58	793 501 003	12" Adjustable Wrench
26	793 506 024	Comb. Open End & Box Wrench 1/2"	59	792 018 020	Magnetic Pick-Up Tool
27	793 506 025	Comb. Open End & Box Wrench 9/16"	60	784 003 000	Handle, Carpet Tool
28	793 506 026	Comb. Open End & Box Wrench 5/8"	61	792 502 002	Flag, Carpet Tool
29	793 506 027	Comb. Open End & Box Wrench 11/16"	62	070 006 519	Gauge, Respot Cell
30	793 506 050	Comb. Open End & Box Wrench 3/4"	63	793 511 045	Spanner Wrench
31	793 505 019	Comb. Open End & Box Wrench 13/16"	64	791 003 003	HD Continuity Tester
32	793 505 020	Comb. Open End & Box Wrench 15/16"	65	785 005 005	Lube Gun—Alemite
33	793 507 028	Offset Box Wrench 7/16" x 1/2"	66	792 505 005	Spring Puller
			67	792 501 001	Carpet Removal Pins (2)
			68	793 503 017	SPS #2 Allen Wrench Set
			69	793 503 051	#91S Uni Key Set
			70	793 509 037	9/16 x 5/8" Open End Wrench
			71	030 003 542	Belt Lacer
			72	792 005 005	Tool Box
			73	714 501 001	Padlock
			74	790 006 009	Solder Iron—Ungar 42 Watt
			75	070 006 975	Circuit Board Puller
			76	792 029 031	Wire Stripper

SPECIAL TOOLS



Carpet Removing Pins 792 501 001

INSTRUCTIONS

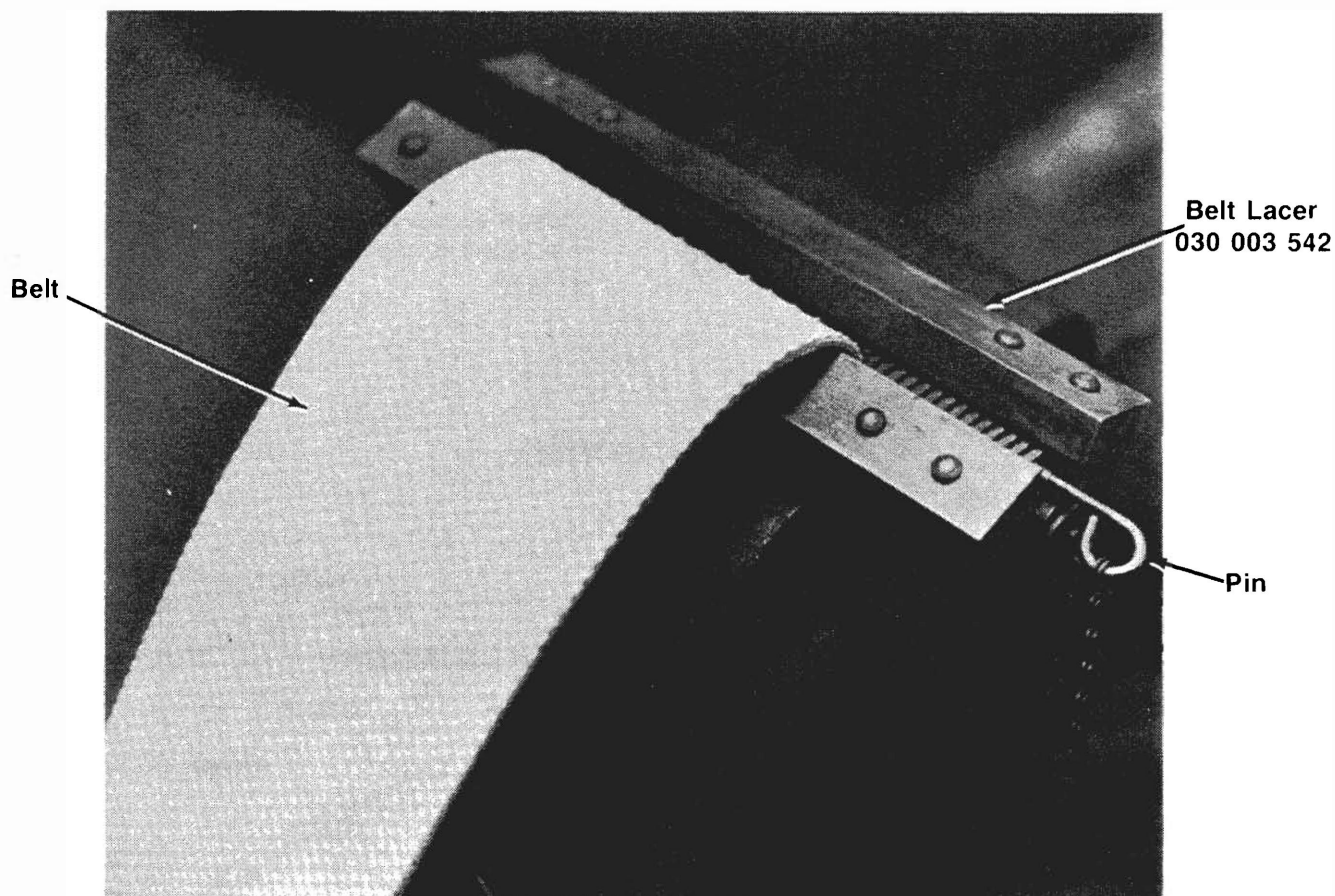
In order to remove the front roller, the tension on the carpet must first be released. Insert tool 784 003 000 between the roller and tail plank. Apply pressure towards the rear of the machine and insert carpet pin 792 501 001 into hole provided in side plate. Repeat the same procedure for the other side of the machine. The front roller can now be removed. In some instances, it may be necessary to position the roller flange as far as possible towards the opposite side of the machine in order to clear the bearing support assembly.

Because of the danger involved if the carpet removing pins were accidentally knocked out, it is advisable to remove the tension from the front roller bearing support while working in the pit. To do so, place flag 792 502 002 on carpet installing tool 784 003 000 on to bearing support assembly as shown in the above picture. Apply pressure toward the rear of the machine and remove carpet pin 792 501 001 from hole in side plate. Slowly release the tension on the bearing support assembly until it rests on the tail plank. **DO THIS PROCEDURE WITH CAUTION.** Repeat the same procedure for the other side of the machine.

Before the front roller can be replaced, the tension on the bearing support assembly must be engaged. Place flag on carpet installing tool on to bearing support assembly as shown in the above picture. Apply pressure toward the rear of the machine and insert carpet pin into hole provided in side plate. **KEEP FINGERS CLEAR.** (Carpet installing tool can be turned in flag while applying pressure in order to provide additional clearance.) Repeat the same procedure for the other side of the machine. The front roller can now be replaced. Grasp the roller flange on the top only and roll into support assembly. Apply pressure on front roller with carpet installing tool to remove pins.

SPECIAL TOOLS

Clipper Belt Lacer 030 003 542

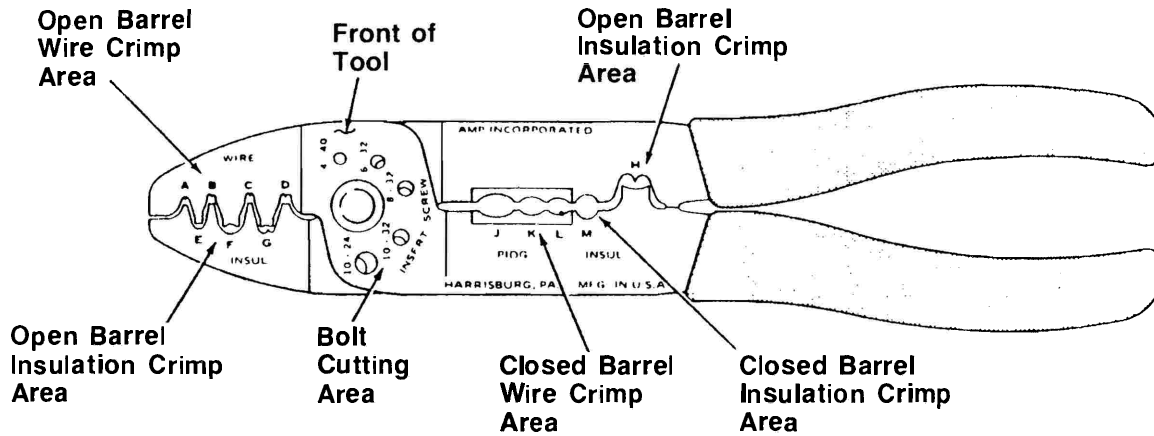


INSTRUCTIONS FOR USE

Clipper Belt Lacer 030 003 542

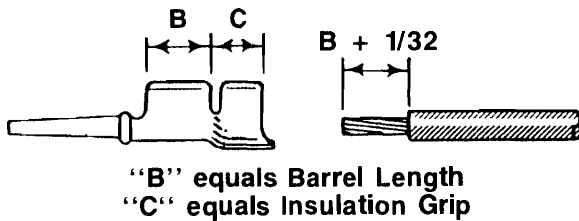
To shorten distributor belt the correct length, see instructions on page 5.42. Insert clipper belt lacer into vise as shown above. Position new clips into lacer, insert guide pin and remove the paper holder from the clips. Place the cut-off section of the belt into the lacer and tighten vise so that the clips are forced evenly into the belt. Remove from vise and install belt on distributor.

AMP Crimping Tool

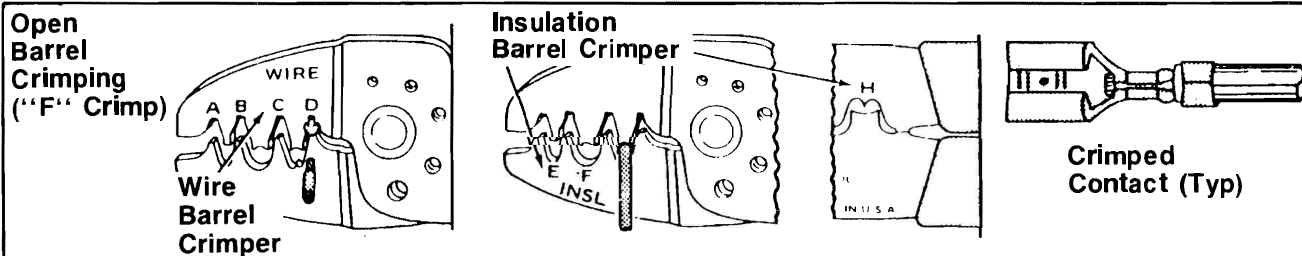
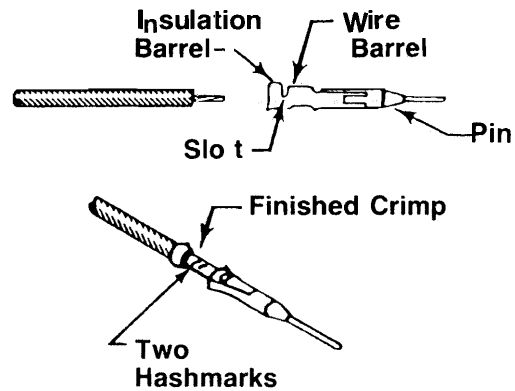


AMF Part 792 009 010

Wire Stripping



Stripping Length equals Barrel Length plus 1/32 inch.



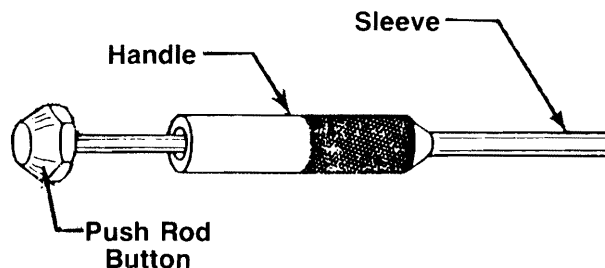
Wire Barrel—Position the contact in the best crimp area ("A, B, C, or D") with the wire barrel opening facing the letter as shown. Squeeze the tool handles just enough for the jaws to hold the contact in place. Insert a properly stripped wire into the wire barrel. Hold the wire in place and squeeze the tool handles to finish crimp.

Insulation Barrel—Position the contact and wire in the best insulation crimp area ("E, F, G, or H") with the insulation barrel opening facing the letter as shown. Hold the contact in place and squeeze the tool handles to finish crimp.

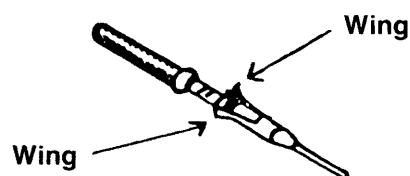
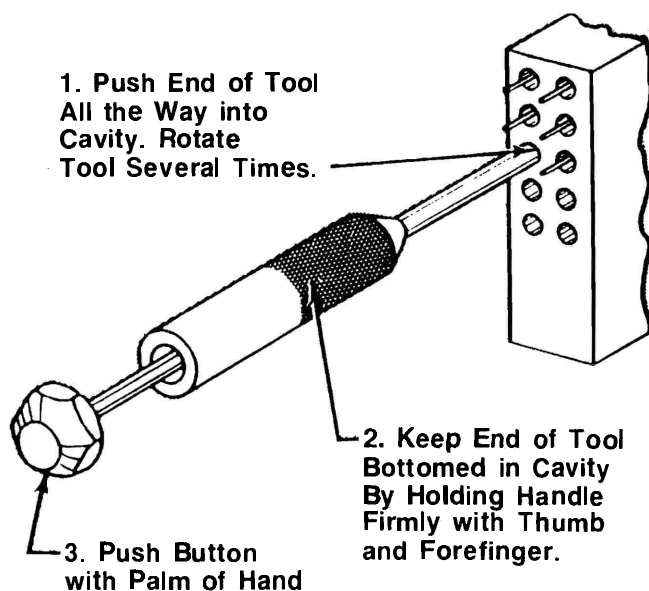
AMP SOCKET AND PIN EXTRACTION TOOL

EXTRACTION INSTRUCTIONS

- (a) Place end of tool (sleeve) over end of socket or pin as shown.
- (b) Push sleeve into insert cavity as far as it will go. Note that push rod button will "back out" of handle when tip of socket or pin is contacted.
- (c) Rotate handle several times.
- (d) Hold handle down firmly with thumb and forefinger and push button with palm of hand.
- (e) As button is pressed down, socket or pin will be ejected.



AMF Part 030 004 031



NOTE:

When a pin or socket is removed from a "M" type plug, it will be necessary to flare out the two wings (see above) with a fingernail. This action is necessary so the terminal seats properly and will not back out of the plug. Care should also be exercised so as not to damage the ring at the rear of the terminal. This must remain circular to allow correct alignment within the plug.

NOTES

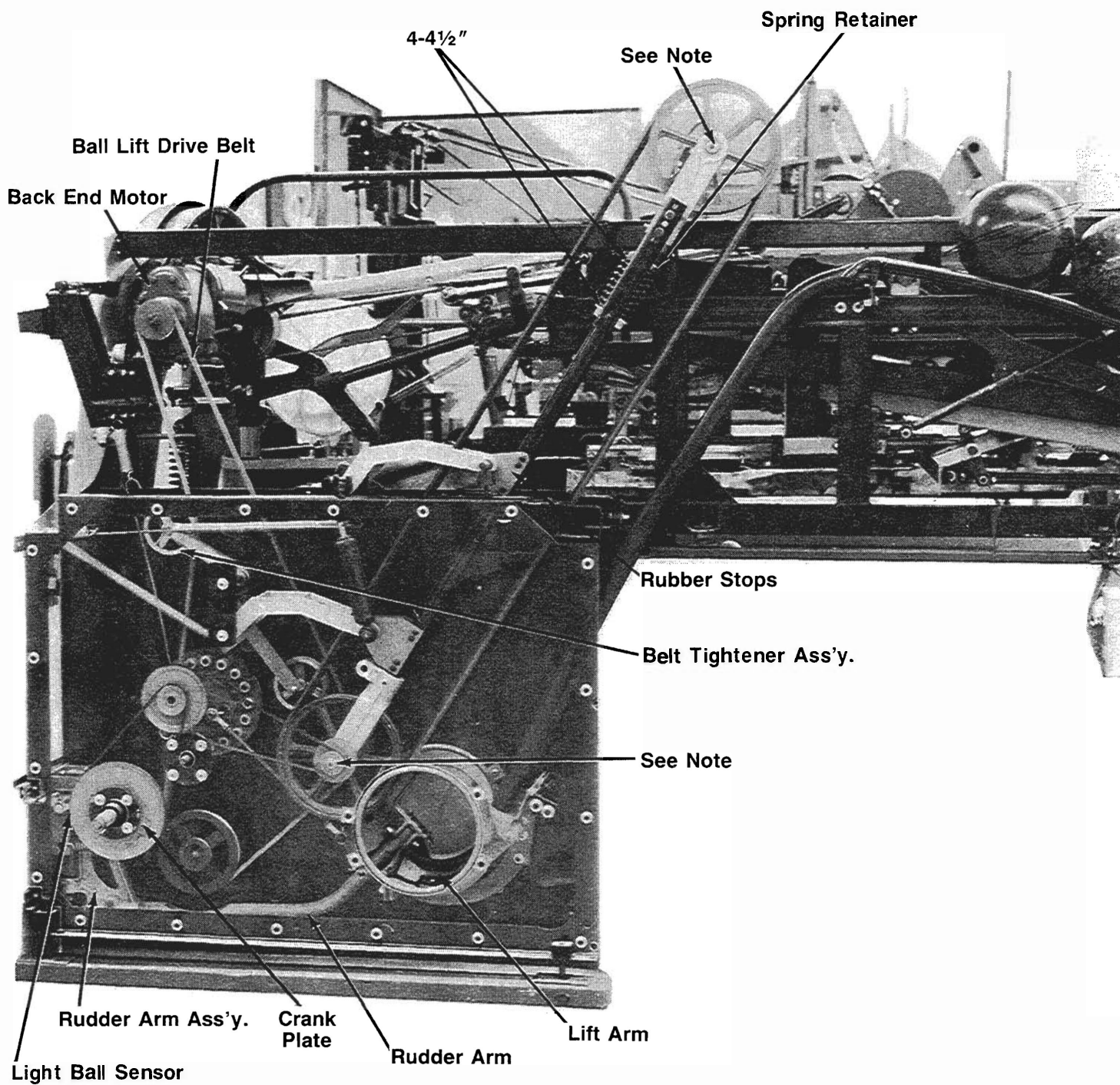
ADJUSTMENTS AND PROCEDURES

Section 5

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5.3	Ball Lift
5.27	Bin Switch
5.57	Carpet
5.54	Chassis
5.57	Cushion
5.37	Cushion Shock
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5.28	Off Spot Switch
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5.51	Pin Seating Rod
5.65	Preventive Maintenance
5.53	Printed Circuit Board
5.21	Respot Cells
5.26	Respot Cell Protection Switch
5.50	Shuttle
5.39	Spot and Respot Lever Springs
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5.58	Start Switch
5.18	Sweep Cams & Levers
5.20	Sweep Linkage
5.63	Sweep Rocker Arm
5.56	Sweep Motor
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5.29	Table cams & Levers
5.55	Table Motor
5.60	Table shaft Replacement
5.35	Table Repositioning
5.62	Table Torque tube replacement
5.38	Table Springs
5.40	Yoke

**Note: On Those Models with Flange Nuts
on Both Ends of Shafts, Torque to
725-750 Inch-Pounds
60.5-62.5 Foot-Pounds
8.36-8.64 M-Kg.
(Not Required With "D" Bore Shaft)**



BALL LIFT

**NOTE: Remove power plug from both machines
remove lift guard and back end guard.**

LIFT REMOVAL

1. Remove springs from belt tightener assembly.
2. Remove ball lift drive belts from lift, pulleys and rudder drive belt from tensioner (careful of spring tension).
3. Remove clamp studs from upper and lower ball lift shaft mountings.
4. Lift ball lift up out of brackets.
5. Inspect lift belt and drive belts.

LIFT REPAIR

1. Remove upper and lower link assemblies. Clean and lubricate shafts and bearings. Check shock absorber.
2. Reduce belt spring tension and remove belt.
3. Disassemble upper and lower shafts. Inspect, clean and lubricate one way clutches and bearings.
4. Inspect pulleys. Replace any worn parts in lift.
5. Reassemble lift. All set screws must be against flat side of shaft. Check one way clutches for direction of drive.
6. Adjust tension spring to 4 1/2" overall length (starting measurement).

LIFT REPLACEMENT

1. Position upper and lower lift shafts in brackets on kickbacks. (Drive belts must be in place around lower link before clamp studs are inserted.)
2. Insert and snug clamp studs. Lift must be in line with track weldment. Move lift left or right to obtain proper alignment. Use adjustable shaft plates to help alignment if needed. (see note 2) tighten clamp studs when alignment has been obtained.
3. Place a ball under lift and adjust shocks nuts or rubber bumpers, depending on the installation, so the bottom of the ball lift belt clears the ball by 1/4 inch with BBL and touches the ball with a kicker lift.
4. Check all belts for alignment and tension. align and adjust as needed.
5. Check lift operation. If the ball enters the exit but idles at the bottom, adjust lift downward. If the ball won't enter the lift, adjust the lift upward, or check kicker roller placement, belt tension, or lift arm adjustment.

BALL LIFT BELT TENSION

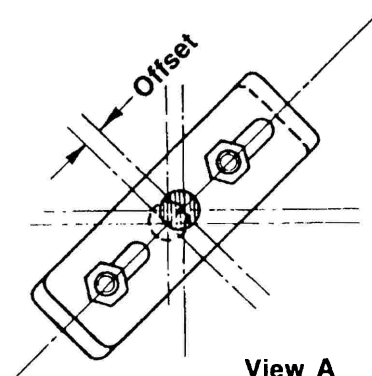
1. If the lift belt rubs against the tube assembly when the ball is being elevated, adjustment is necessary. The smaller the spring, the greater the belt tension. Rotate the spring retainer to compress spring between 4 1/2" and 4" overall length.

(NOTE 2) BBL & KICKER LIFT

Adjustable ball lift support shafts are provided to allow alignment of the ball lift to the track rails.

Adjustments is required when the shaft supports on the metal kickback assemblies are not aligned.

Alignment is achieved by turning plates on the support shaft assemblies till the plates are parallel to the direction of offset. (see view A)



STARTER PAD (KICKER LIFT ONLY)

1. Inspect rubber starter pad, shaft, bolt and flange bearing. Replace worn parts
2. Starter pad assembly should be centered and in line with track weldment.
3. Check track support weldment for loose bolts or being bent.
4. Rotate or replace track covers if worn or cracked

BALL EXIT

1. Check front and rear segment, filler pad rear, filler assembly front, pad and bumpers.
2. Check all bolts for tightness.

KICKER ASSEMBLY**Removal & Repair**

1. Remove springs from idler arm assemblies. Remove and inspect belts
2. Remove 3/8 nuts and washers from roller base.
3. Bring kicker assembly out back of machine. Remove rubber rollers.
4. Inspect, clean and lubricate all shafts and bearings. Replace worn parts.
5. Reassemble kicker. Replace rubber rollers, set screw must be against flat side of shaft.

REPLACEMENT

1. Inspect kicker support brackets. Tighten, straighten and align as needed.
2. Install kicker assembly between kickbacks on support brackets. Center kicker assembly between machines, kicker rollers should be between 1/16" and 3/16" from kickbacks. Replace nuts and washers.
3. Washers are used to move roller brackets in or out to accommodate different distance between machine. Move washers from between roller brackets to outside of brackets to move kicker roller away from kickback or from outside of brackets to between brackets to move kicker roller closer to kickback. Idler arm assembly washers should be moved the same as roller assembly washers. (see note1)

RUDDER ARM ASSEMBLY

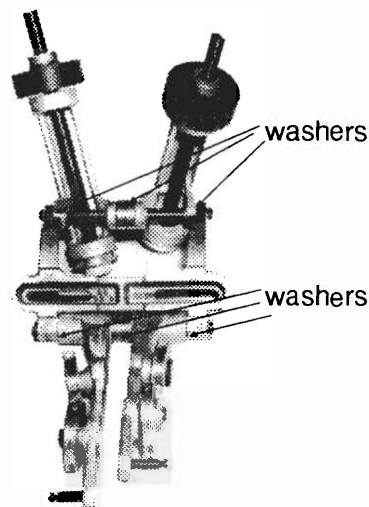
1. Check for free movement of rudder arm from one rubber bumper to the other. Center and align as necessary.
2. Inspect drive link and bearings. Check for special step washers at drive link bearings. Low side of washer toward bearing.
3. Adjust rudder drive crank plate so piston shaft moves 1/4" to 1/2" into or out of the body of drive link after rudder arm strikes bumper at kickback.

(NOTE 1) KICKER LIFT ONLY

Move washers from between roller brackets to outside of roller brackets to move kicker roller away from kickback.

Move washers from outside of roller brackets to between roller brackets to move kicker roller closer to kickbacks.

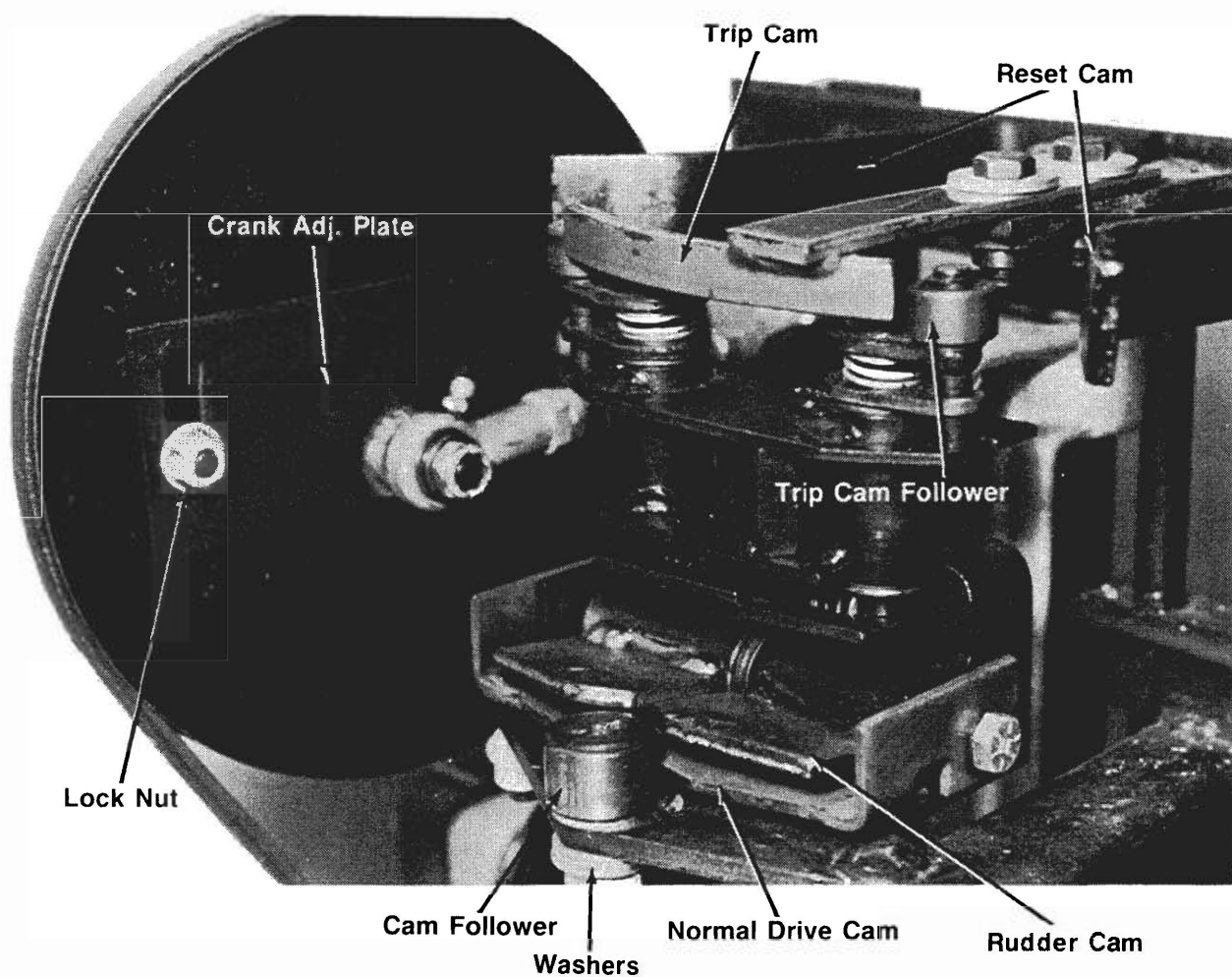
Idler arm assemble washer should be moved the same as roller assembly washers to assure belt alignment.



POSITIVE BALL LIFT ADJUSTMENTS

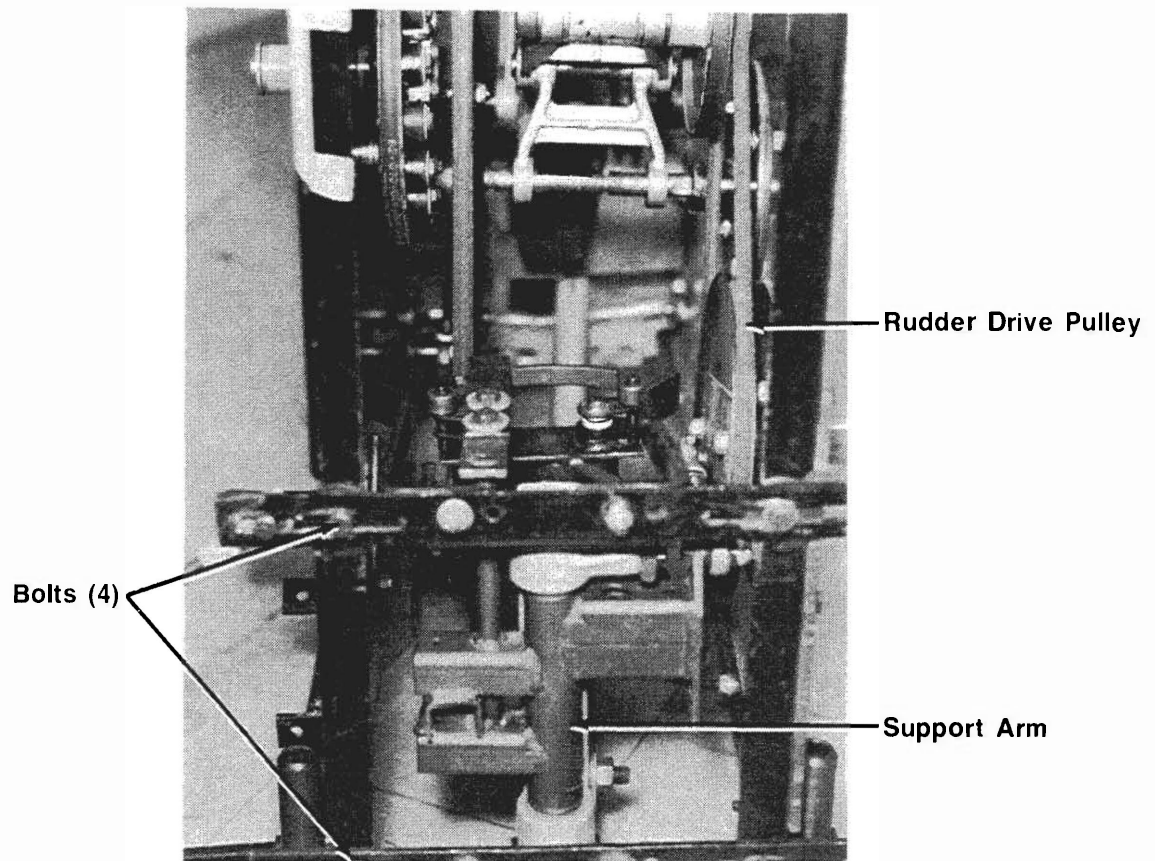
N O T E

1. Pull power plugs of the pair of machines to be adjusted.
2. All adjustments must be made in the proper sequence.
3. Do not skip any steps.
4. After making an adjustment, recheck before proceeding to the next step.

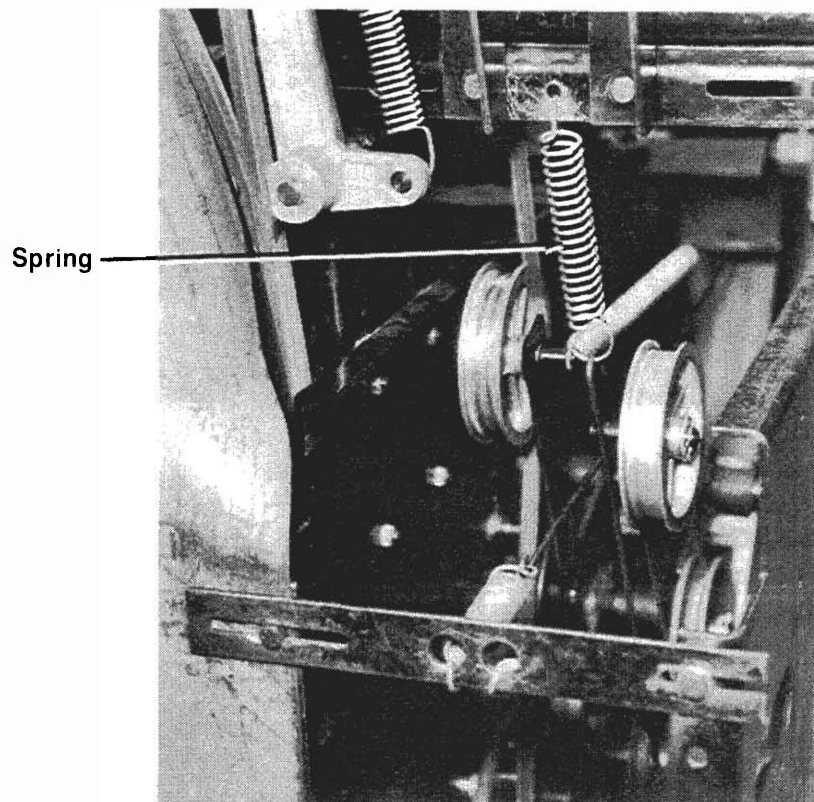


SENSOR ASSEMBLY

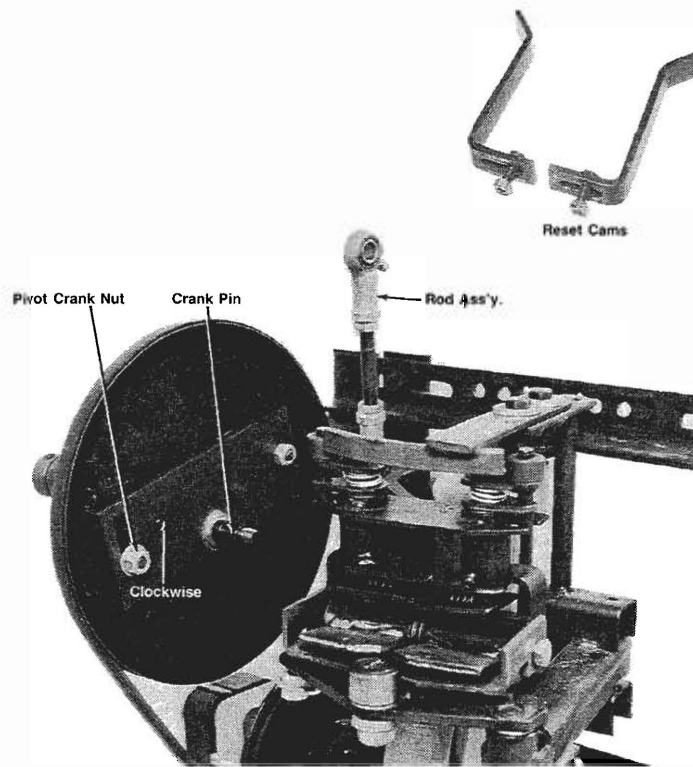
1. Cam follower roller must be low enough so it will slide under rudder cams when paddle movement is blocked, also high enough so rudder cams will lock behind it in the power drive position. Washers are provided so the height of the cam roller can be adjusted.



1. Ball lift sensor support arm should be centered between side plates. Measure with rule.
2. Loosen bolts and adjust if necessary.

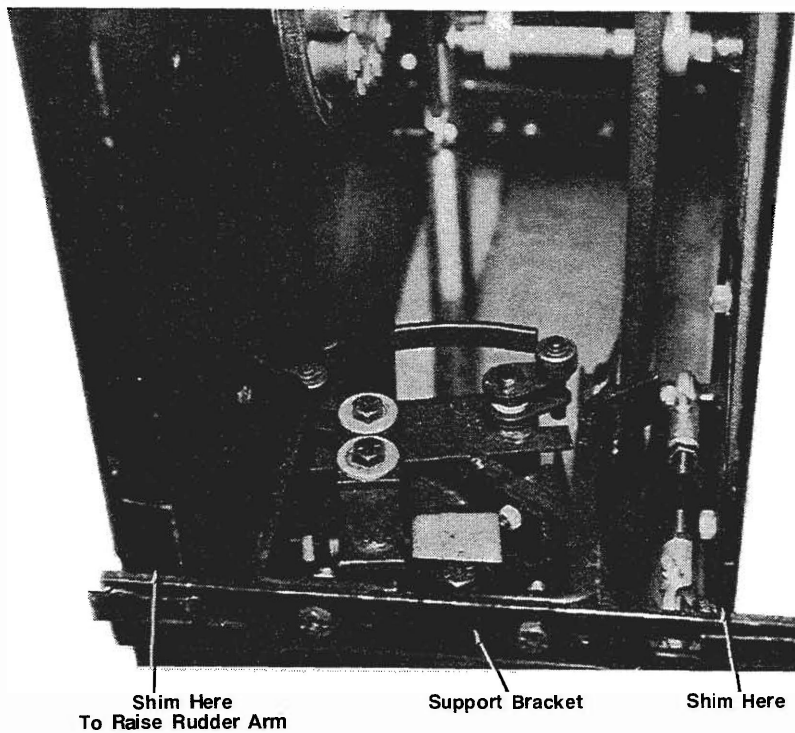


3. Remove spring from belt tensioner assembly and remove belt from rudder drive pulley.

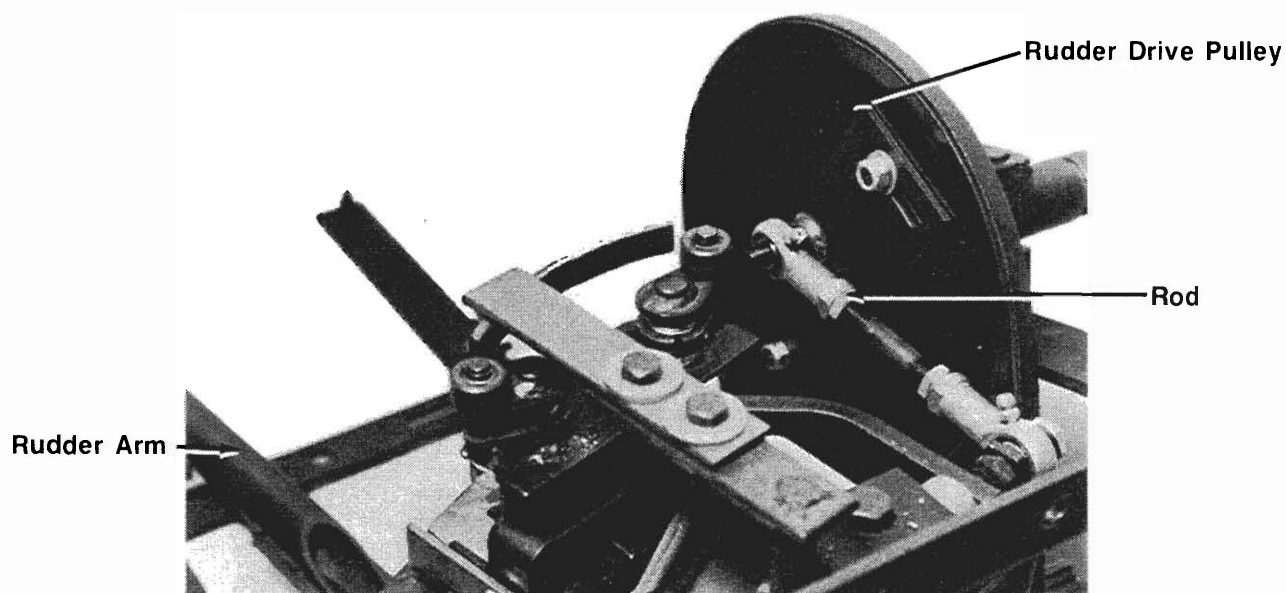


RUDDER AND SENSOR ADJUSTMENTS

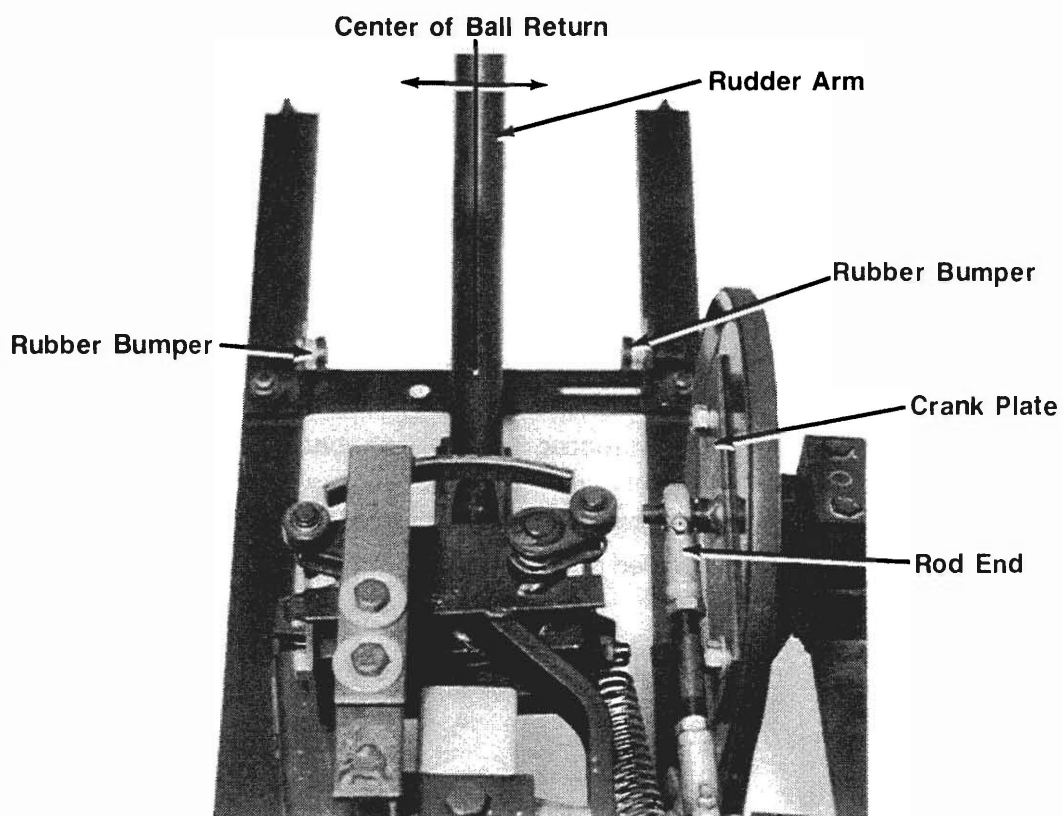
1. Remove retaining nut from crank pin and save.
2. Remove rod assembly from crank pin and swing out of the way so sensor assembly can be moved manually.
3. Remove both reset cams.
4. Loosen pivot crank nut and turn adjusting plate to full clockwise position, then snug lock nut. (Minimum rudder arm travel.)



1. Move sensor assembly back and forth so rudder arm touches rubber bumpers on each side plate. It should move freely with no interference.
2. If there is any interference it may be necessary to shim the rudder arm support bracket.
3. Sensor must swing freely and be centered between machines.



1. Place free end of rod assembly on crank pin (see above) and pivot sensor assembly by manually rotating the rudder drive pulley to observe travel of rudder arm.

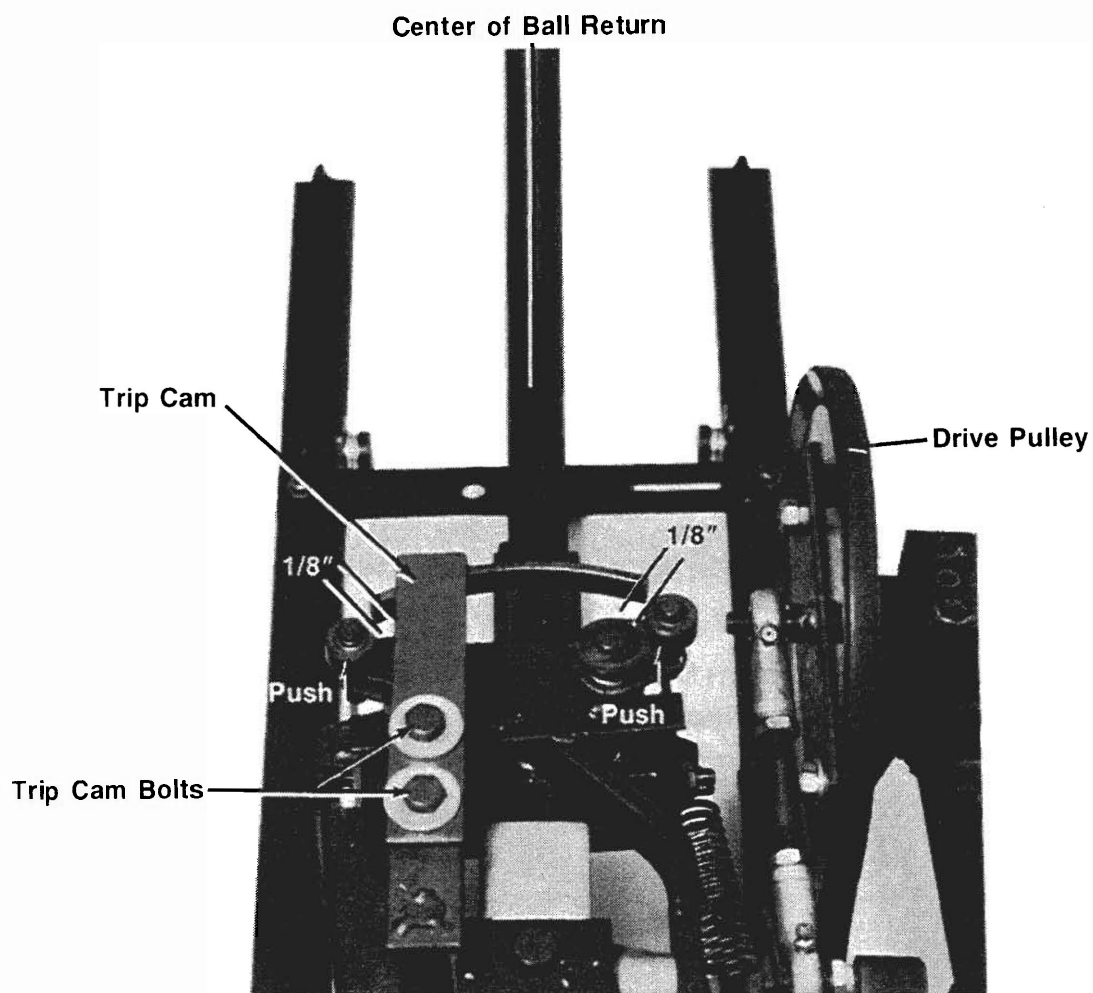


2. Adjust rod so rudder arm swings equally to the left and right of the center line position (see above). then install lock nut.

NOTE: To adjust to the left shorten the rod. To adjust to the right, lengthen the rod. Rod assembly has right hand thread on both ends, so rod end must be removed to make adjustment.

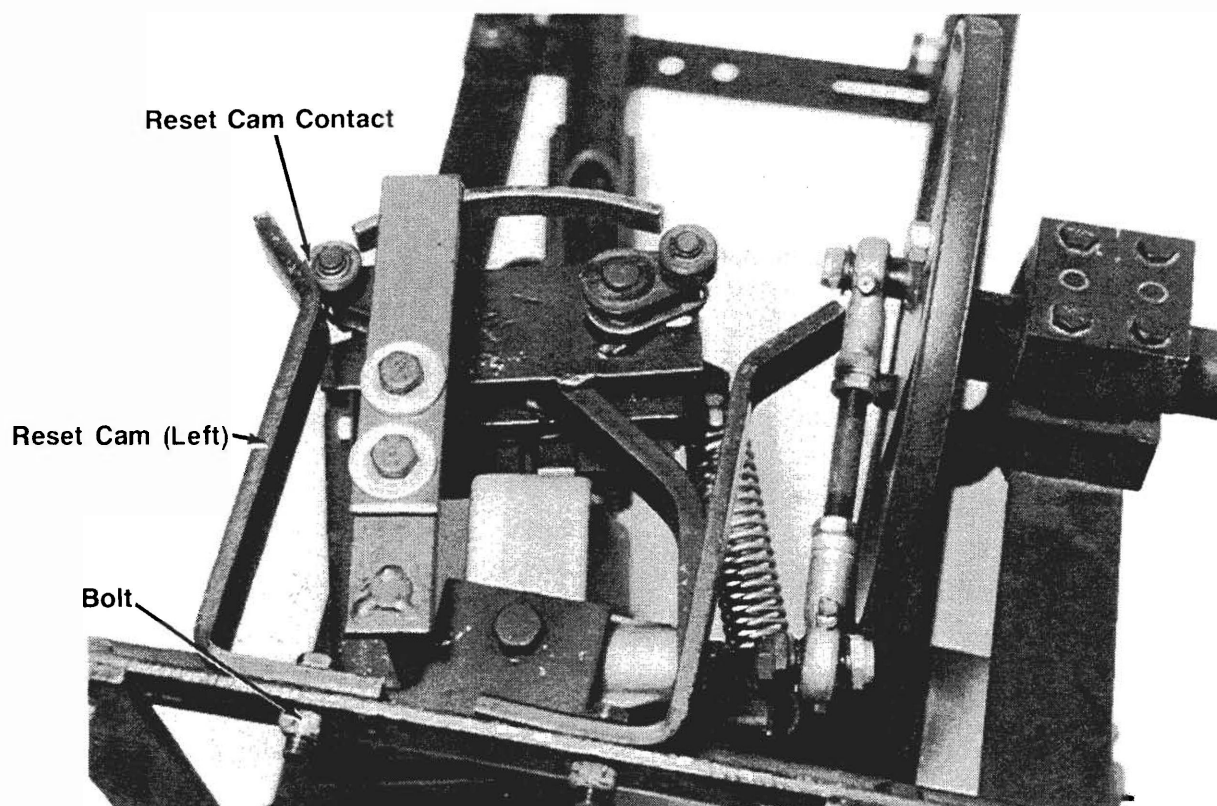
3. Loosen lock nut on crank plate and move plate in a counterclockwise manner until the rudder arm touches each bumper on the left and right side of the side plate with equal force without actuating trip cam follower. Tighten lock nut.

4. Rotate rudder drive pulley to recheck travel. If rudder hits one bumper and not the other, repeat step 2.



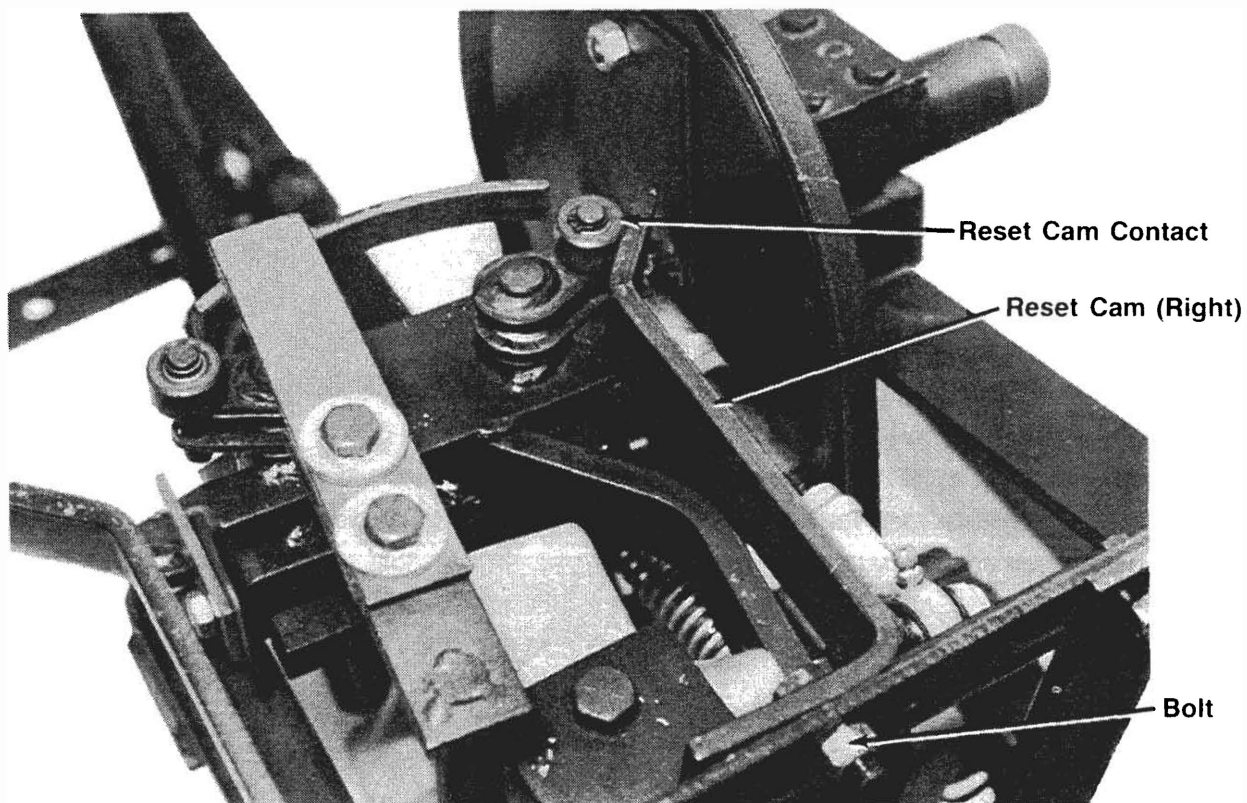
TRIP CAM AND RESET CAM ADJUSTMENT

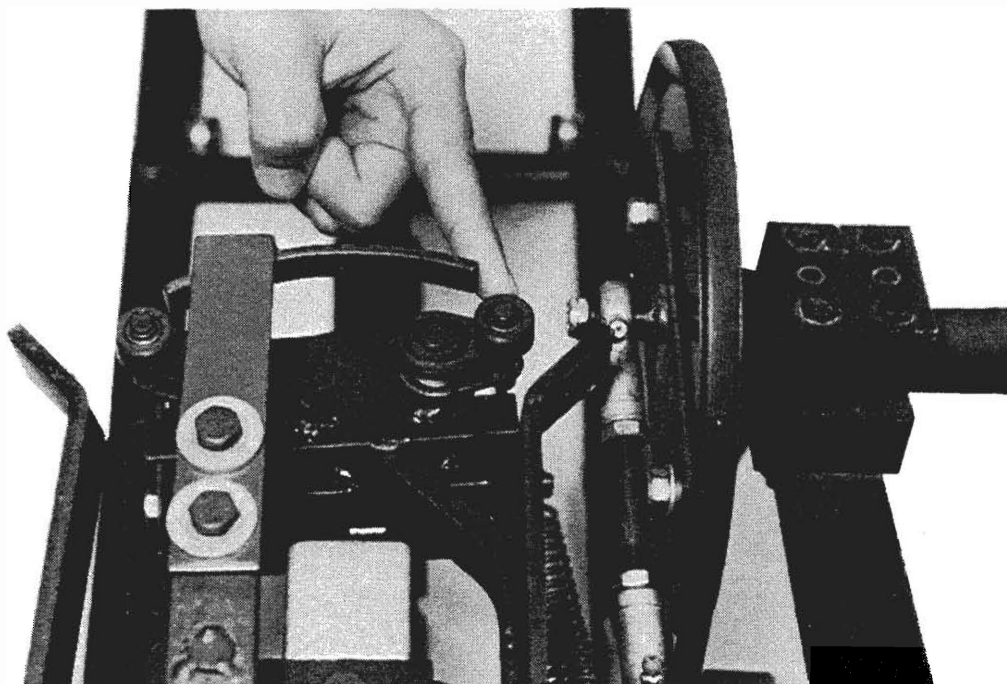
1. Turn drive pulley to place rudder in the center of its travel. (Center of ball lift.)
2. Push trip cam followers forward to the maximum position.
3. There should be a 1/8" gap on each side between the trip cam and rollers.
4. To adjust, if necessary, loosen trip cam bolts, reposition cam, then tighten bolts.
5. Recheck clearance after tightening.



RESET CAM

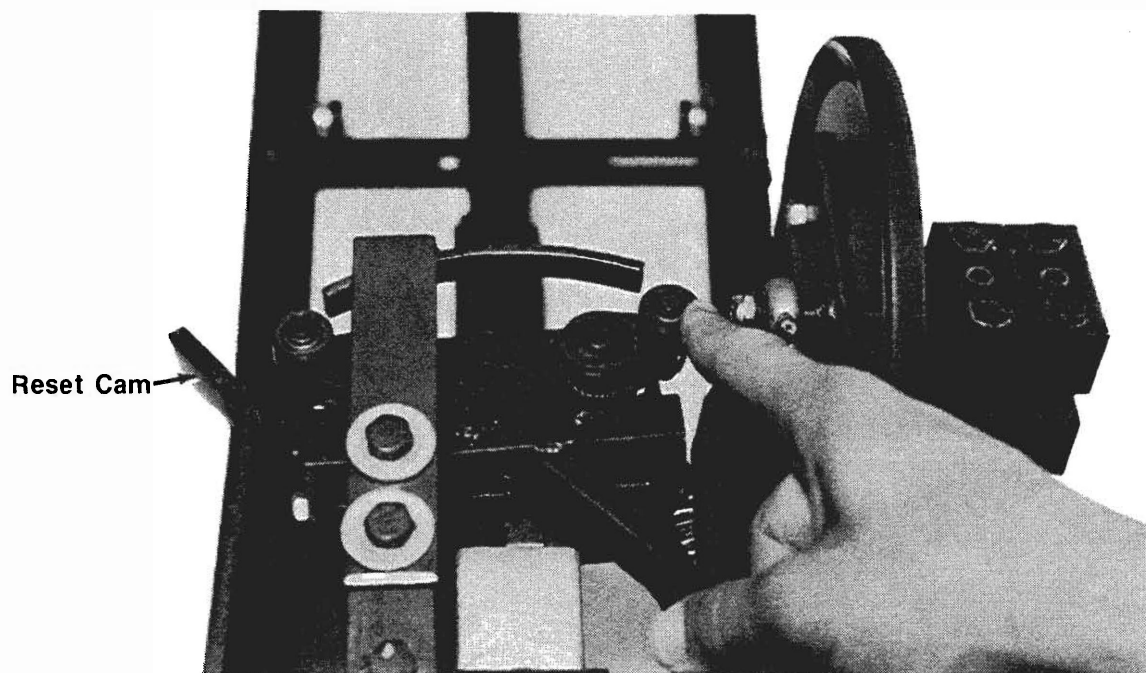
1. Turn drive pulley to place rudder arm to its furthest travel to strike bumper (left side) and hold this position.
2. Install reset cam and move angled surface to touch trip cam follower. Tighten bolt.
3. Repeat above steps 1 and 2 with other reset cam. (Right side below.)

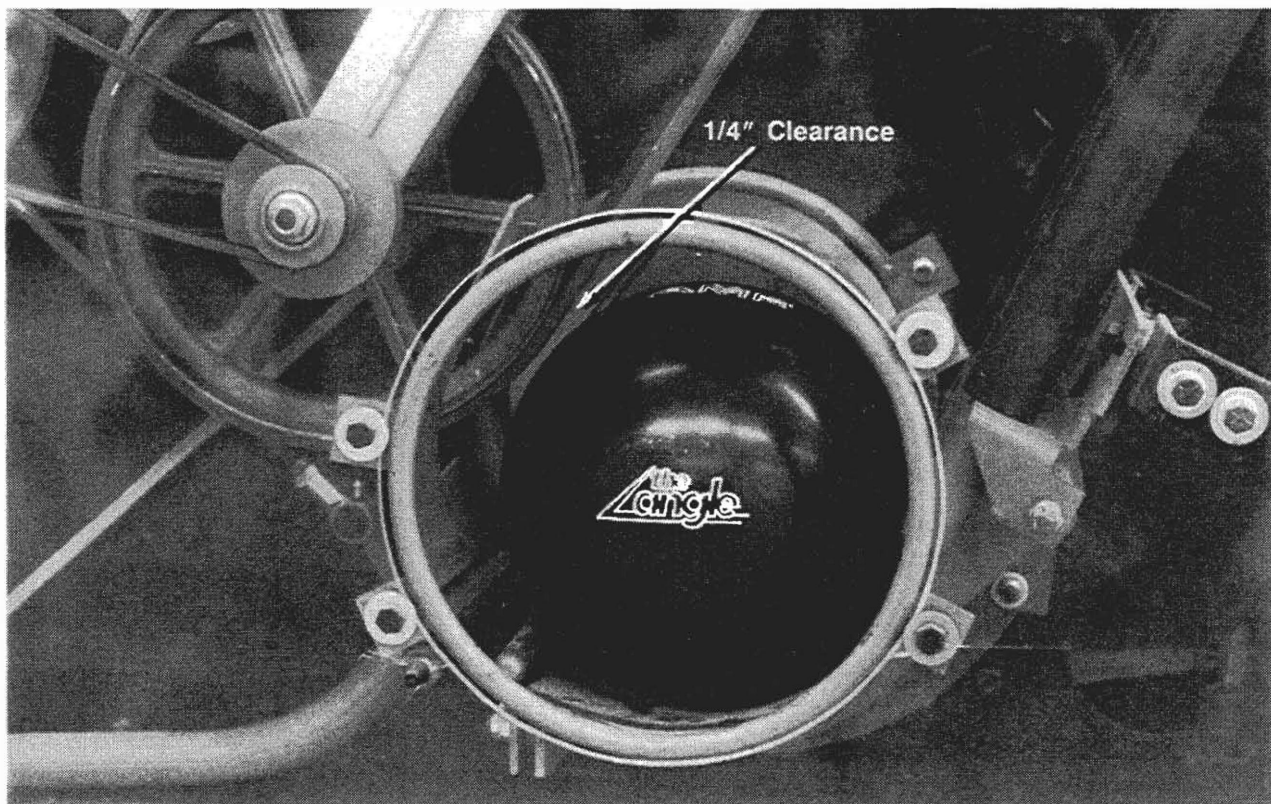




CHECKING RESET CAM

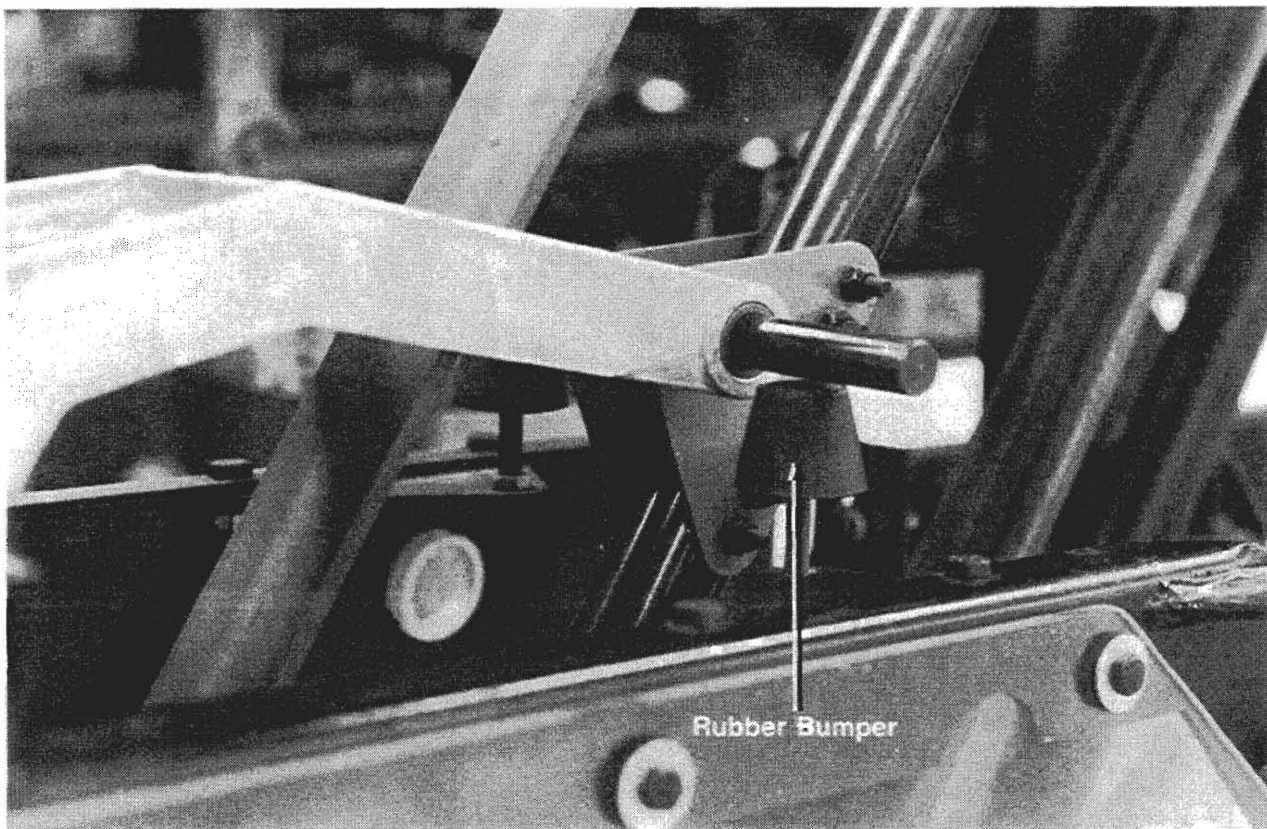
1. Manually rotate the rudder drive pulley.
2. While sensor is moving back and forth, move cam follower roller towards rear of machine.
3. Wait for roller to strike reset cam, returning it to its normal position (forward).
4. Manually push roller forward to check that reset cam returned to its forward position, if so, reset cam is properly adjusted. Check the other roller in the same manner.
5. Install belt on rudder drive pulley. Replace spring on belt tensioner.
6. **CAUTION:** Apply power to machine, back end switch (on), table and sweep switches (off).
7. Retest operation of rollers again as above. Use screwdriver or wood stick to actuate roller; if roller does not return to its forward position properly, **readjust reset cam again.**

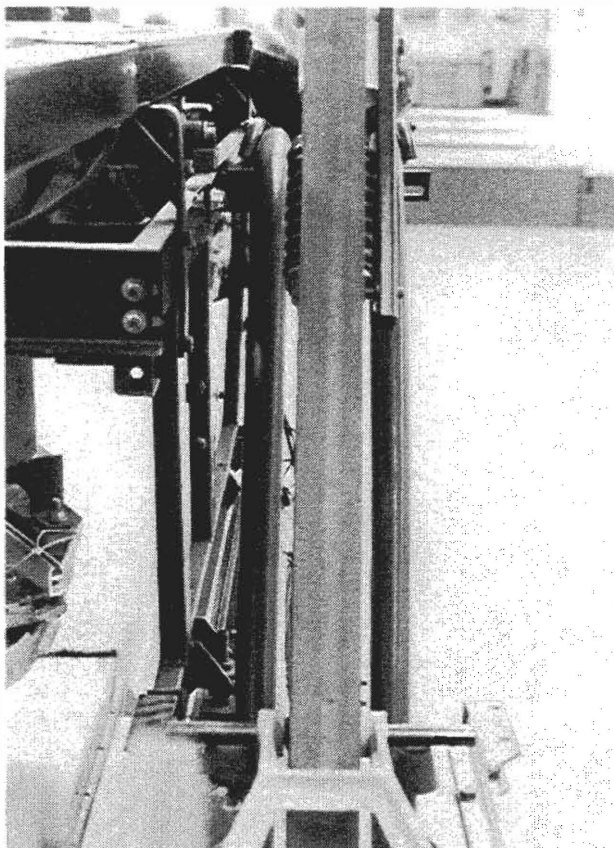




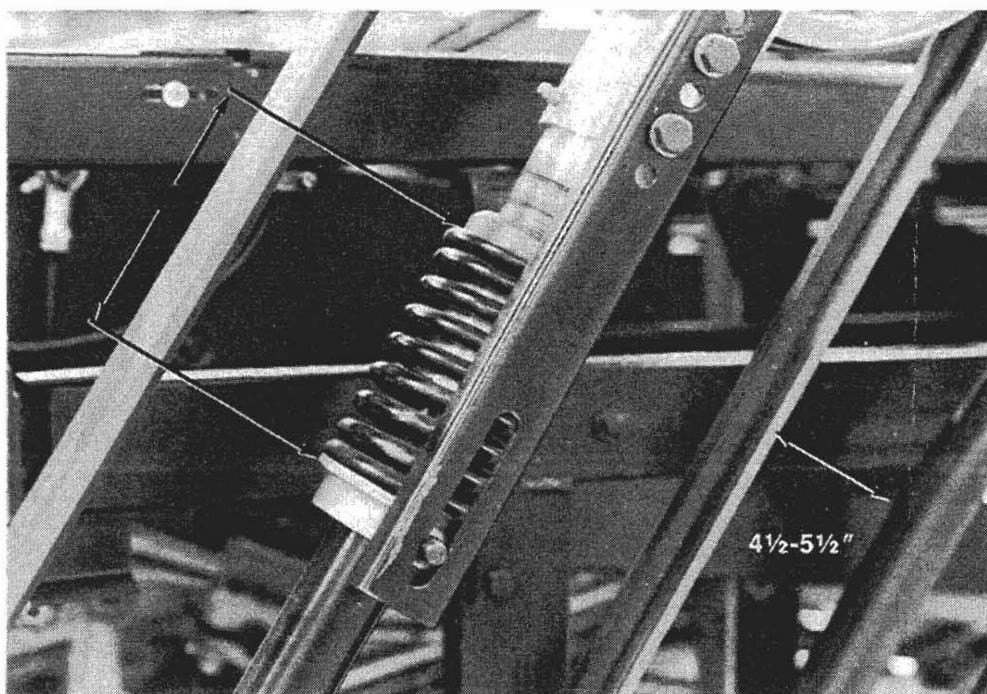
BALL LIFT ADJUSTMENT

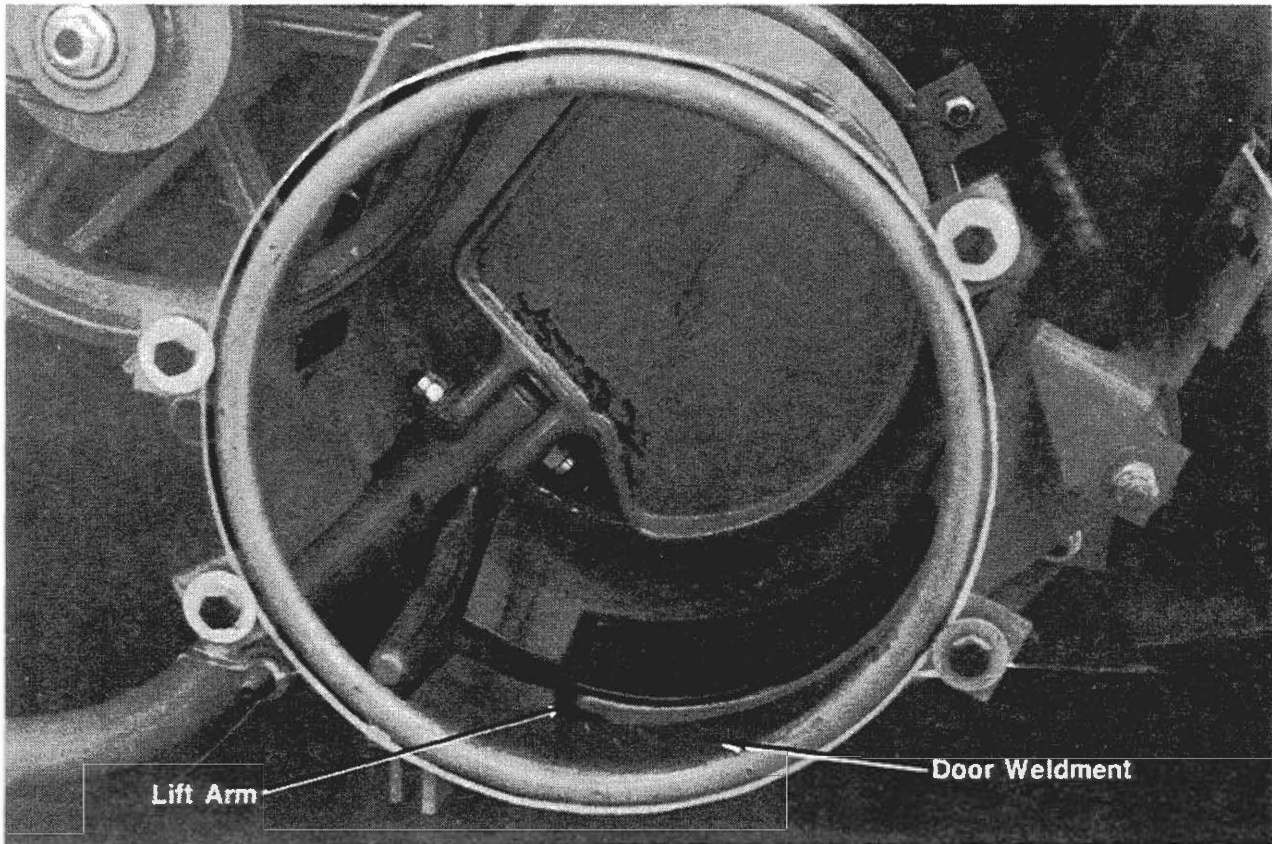
1. Place ball on lift arm assembly. Adjust rubber bumper to have 1/4" between ball and ball lift. (See photo below.)



**BALL LIFT ASSEMBLY**

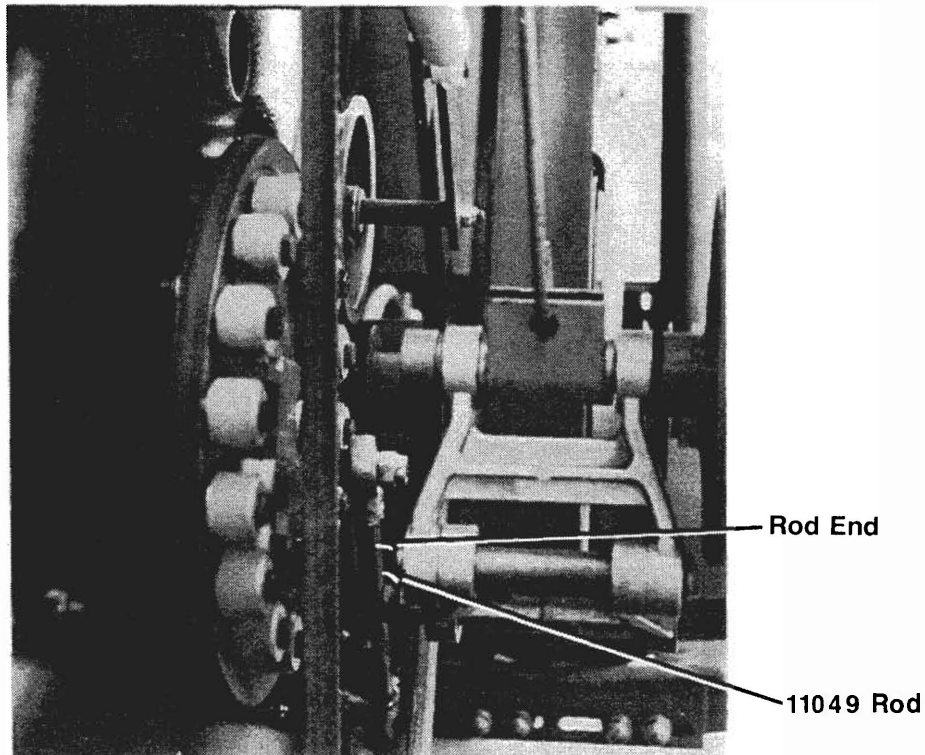
1. Ball lift assembly must be centered with return rails. (See above.)
2. The distance between the ball lift belt and return rails should be $4\frac{1}{2}$ - $5\frac{1}{2}$ inches.
3. Adjust rubber bumper to obtain this dimension. See photo below.
4. Lift belt tension spring should be compressed to 4" for proper tension on lift belt.

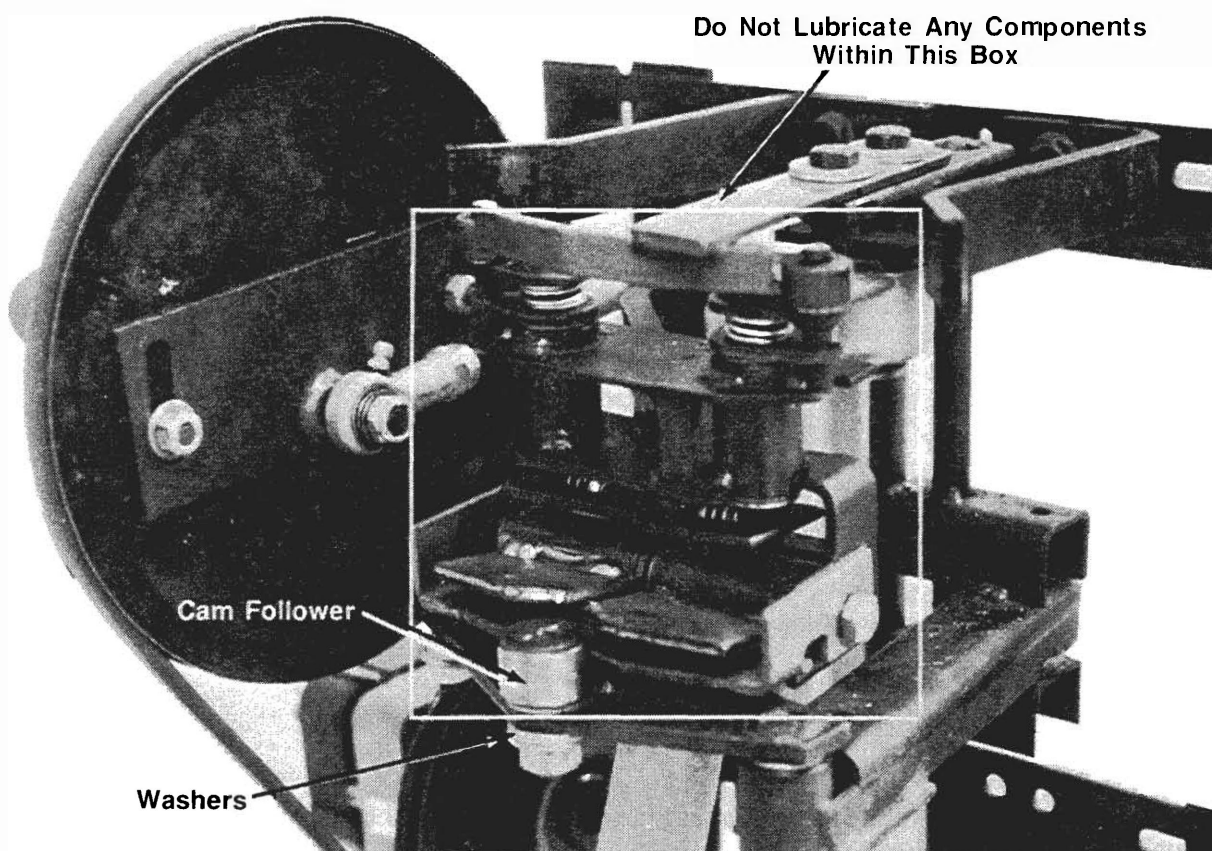




LIFT ARM ADJUSTMENT

Lift arm should be $\frac{1}{8}$ to $\frac{3}{16}$ inch above door weldment. The 11049 rod assembly controls this. Rod length should be approximately $15\frac{1}{2}$ inches. (11049 rod has right hand thread on both ends.) It must be disconnected at one end to make adjustments.





SENSOR ASSEMBLY

1. Cam follower roller must be low enough so it will slide under rudder cams when paddle movement is blocked, also high enough so rudder cams will lock behind it in the power drive position. Washers are provided so the height of the cam roller can be adjusted.
2. This completes the adjustments on the positive ball lift. Install guards on machine, apply power and observe operation as balls enter the ball lift.

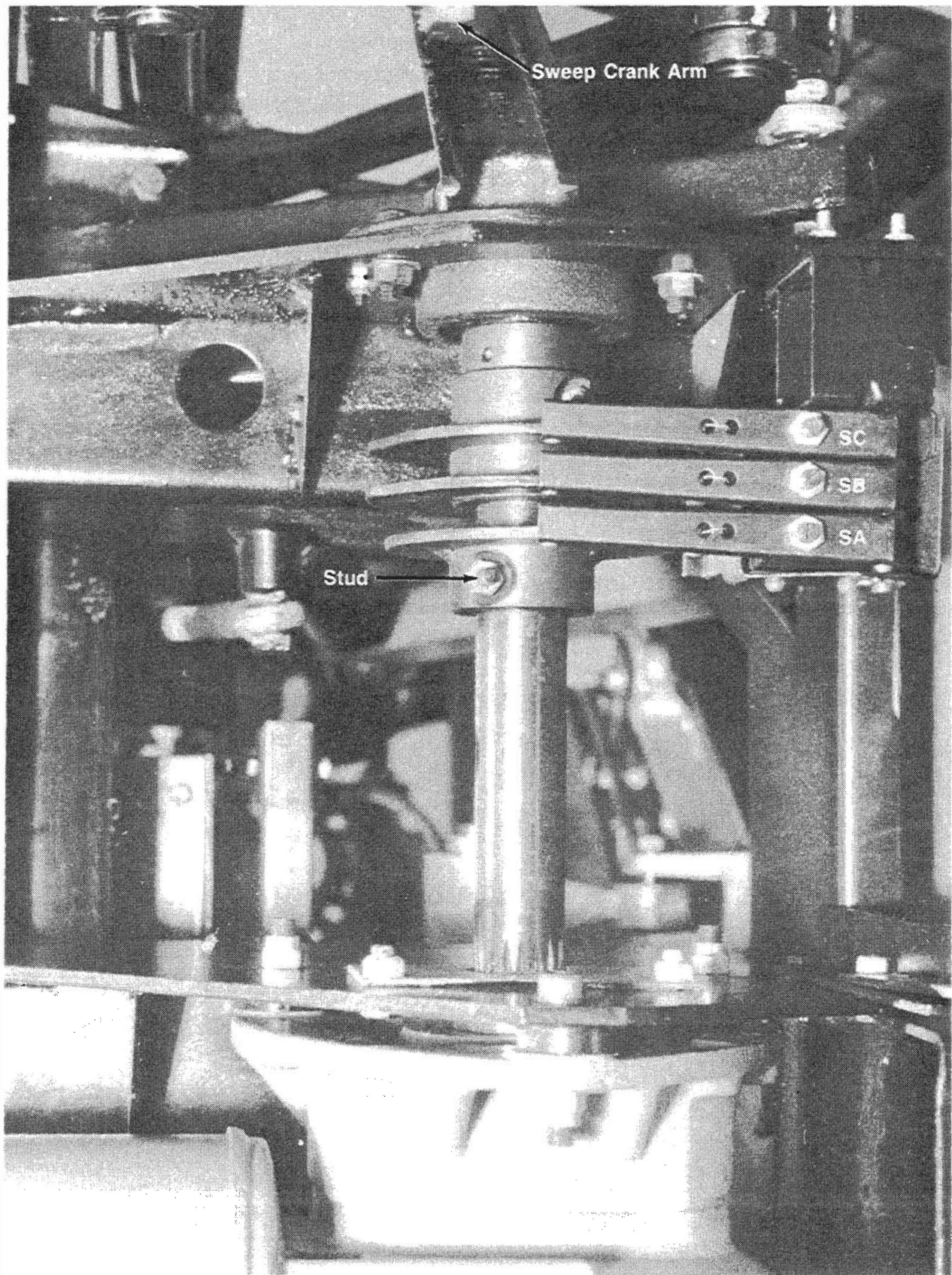
LUBRICATION

1. Lubricate ball lift and associated parts every three months, the location, amount, and type of lubricant is called out in the lubrication section of the service manual.

NOTE: Do not lubricate component parts of the trip cam and rudder cam assembly, outlined within square, see photo above. Friction is required in this area to allow the sensor to operate properly.

ELEVATOR WHEEL RING TUBE REPLACEMENT**(Refer to page 61 in parts section)****NOTE: Remove 115 Volt Power Plug**

1. Remove BE guard, pin elevator guard and elevator wheel belt guard.
2. Remove distributor and distributor support weldment. (5.43)
3. Remove hand rail and brace below BE motor.
4. The pin guide rail and bracket behind it must be removed.
5. Place wood blocking under the elevator wheel to support it. Put additional blocking under the wheel cover to support it also.
6. If rudder arm support brackets and spring strap are behind the elevator wheel cover, they must be removed.
7. Loosen one cap screw near the top of the wheel holding a pin holding bracket in place. Attach a length of mechanics wire to the screw and fasten the other end of the wire to the bin. This will help hold the wheel in place.
8. Remove the four bearing plates from the wheel cover. Inspect bearings and install new bearings to bearing plates as needed.
9. Carefully remove the remaining cap screws holding the wheel cover to the kickbacks. When bolts have been removed the wheel cover will be free and can be removed. Be careful not to spill the oil in the ring tube oiler reservoir.
10. After removing the wheel cover, you can remove the ring tube. Seven bolts attach the ring to the wheel.
11. Install new ring tube using a punch to align holes. Ring will go on in any position as holes are equally spaced. Lubricate inner surface of ring.
12. Install wheel cover. Replace bolts through guard into kickbacks and reattach rudder arm brackets and spring strap.
13. Replace bearing and bearing plates. Remove wood blocking. Remove wire from bin and pin bracket bolt. Tighten bolt.
14. Install distributor support weldment and replace distributor. (5.43)
15. Replace pin guide rail bracket and pin guide rail. Adjust after step 17. (5.41)
16. Install hand rail and brace below BE motor,
17. Replace all guards and fill ring weldment oil reservoir. (Way oil SAE #80) Check operation of wheel. Complete distributor and guide rail adjustments.



SWEEP CAM LEVERS AND CAMS OPERATION

The purpose of the sweep cams and levers is to control the sweep operation during the down (66° position), run through to 270° position, and up to zero position. Sweep should operate smoothly in all locations and should not rub the machine or lane bed. The cams and switches also control the timing of table movement and interlock protection (TB & SC).

SWEEP CAM LEVERS ADJUSTMENT

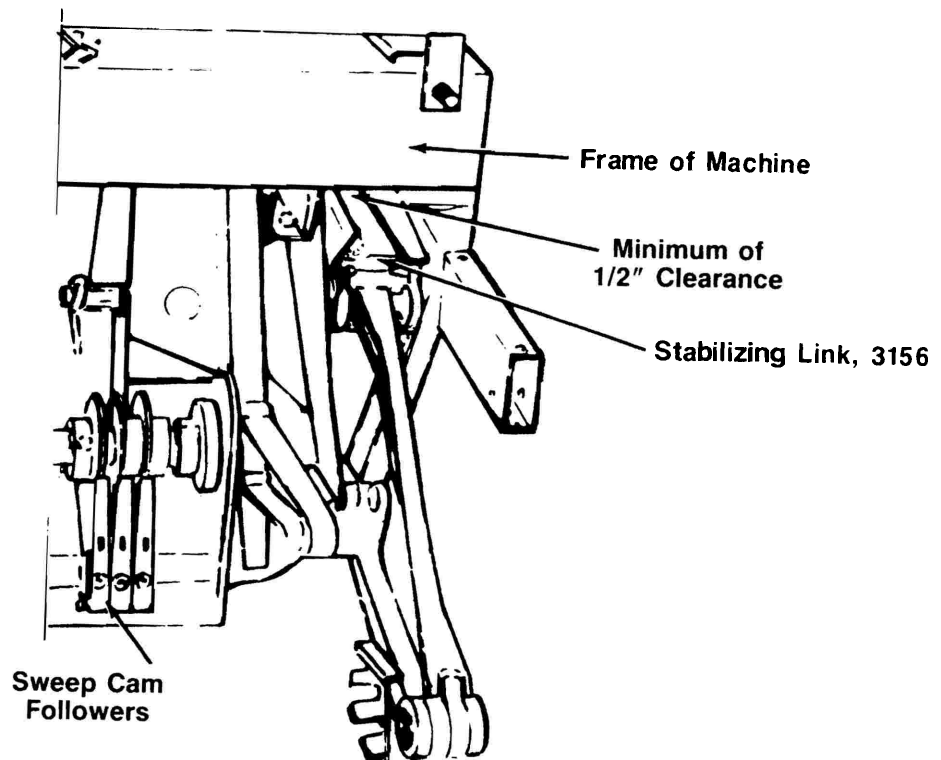
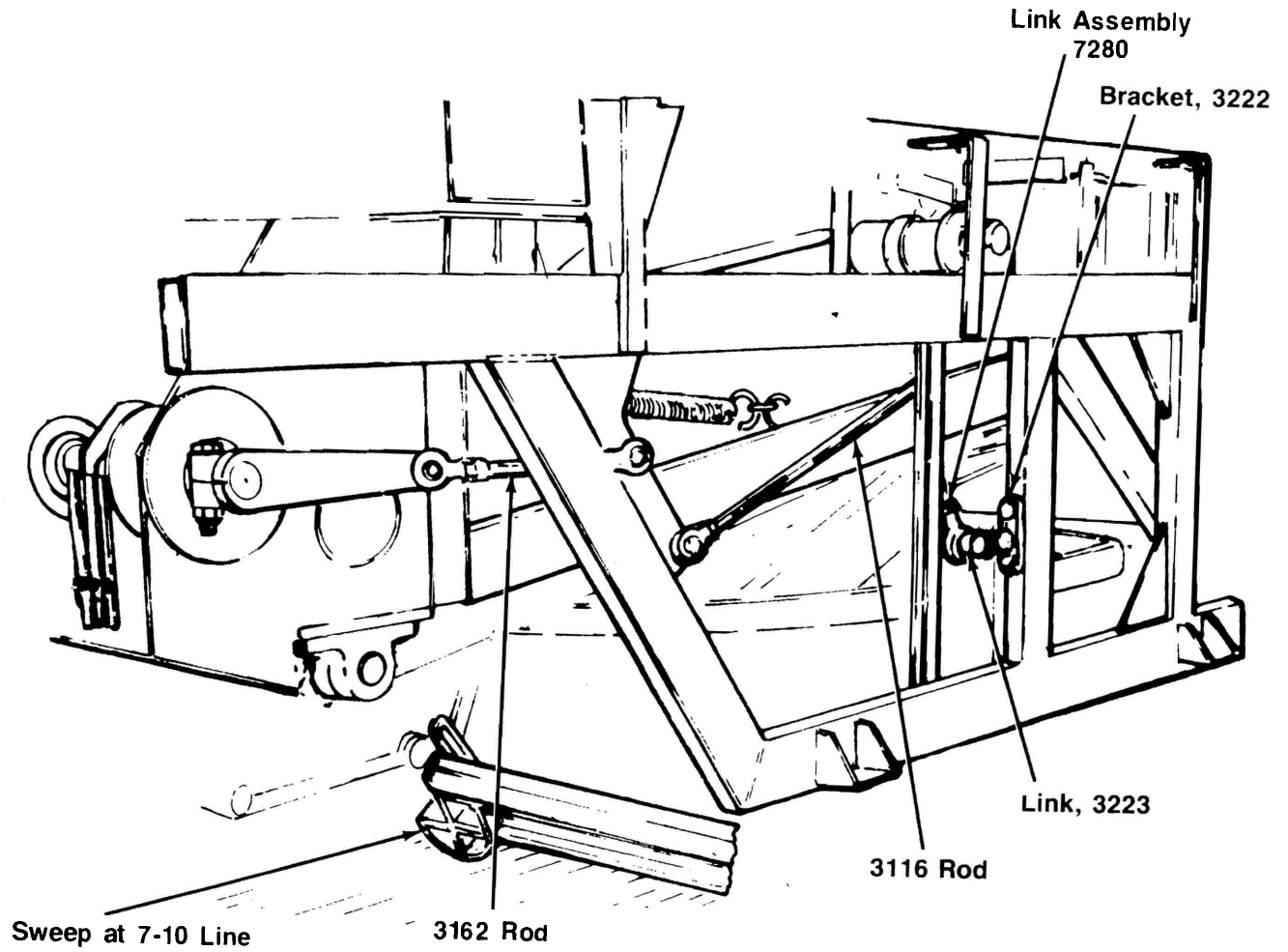
1. Crank or run sweep to put lever at lowest portion of sweep cam.
2. Insert gauge ST 2748 between lever and lowest portion of cam.
3. Small end (.136) of gauge should not actuate switch, but large end (.176) should actuate switch.
4. Loosen lock nut and adjust screw to obtain above conditions. Tighten lock nut.

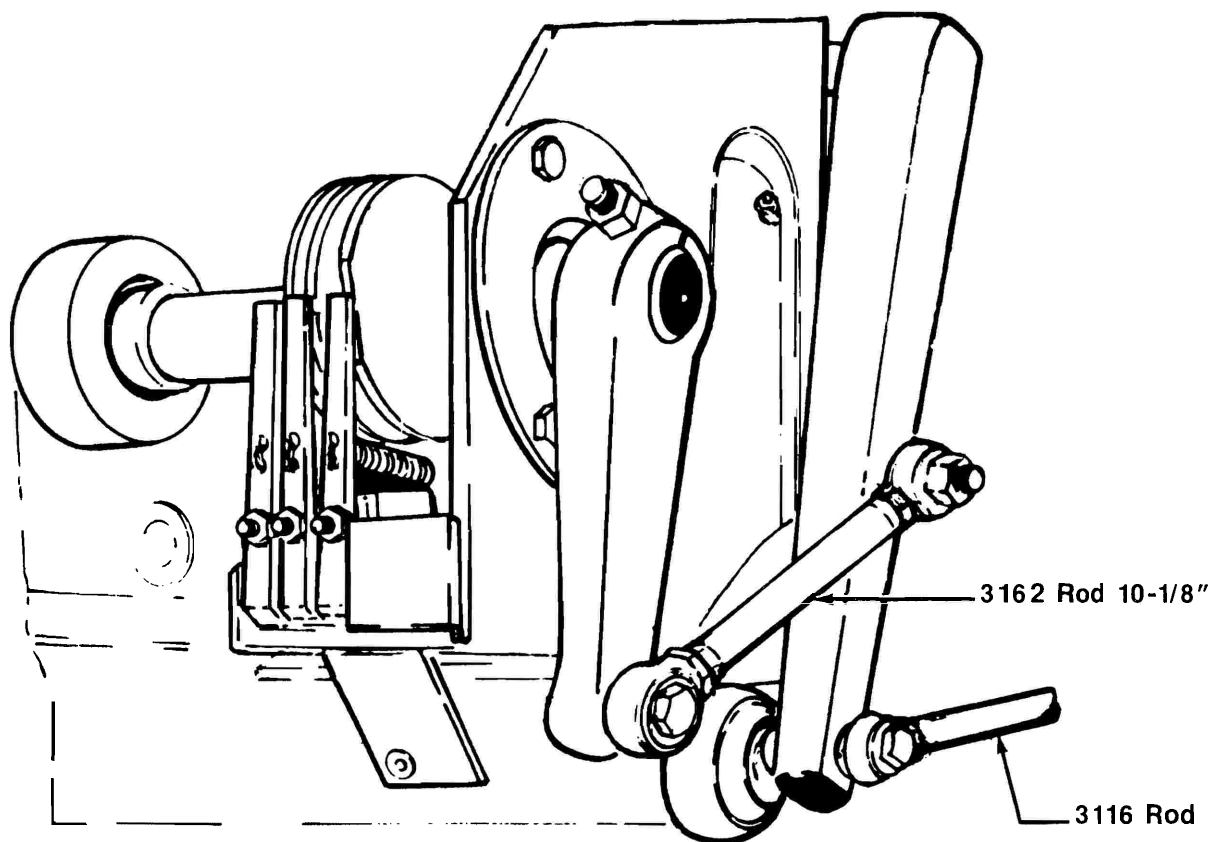
SWEEP CAM ADJUSTMENT

NOTE: After adjusting the sweep cam levers as described above, proceed as follows:

1. Crank the sweep to its highest position. (Zero)
2. Loosen the cam studs and position cams so the stud is parallel with pin deck. Tighten cam studs. This is the initial or approximate setting.
3. Run machine under power and note sweep down, sweep run, and sweep up positions. If sweep operates smoothly no further adjustment is necessary.
4. If adjustment is necessary, adjust SB cam so the sweep stops just before its bottom most position, 66 degrees. Adjust SA cam for sweep run thru so the sweep stops at 270 degrees. See note below.
5. Run machine and note operation of sweep. It may be necessary to readjust the lever of the table, sweep interlock cam SC (lever away from the cam) to obtain proper interlock operation. Correct sweep interlock is when the sweep sufficiently clears the #1 pin on run thru when the table is picking up and respotting pins.

NOTE: If sweep over runs at stopping positions, adjustment is made by turning cams in direction of rotation. If sweep stops short, turn cams in opposite direction of rotation.





SWEEP ADJUSTMENTS

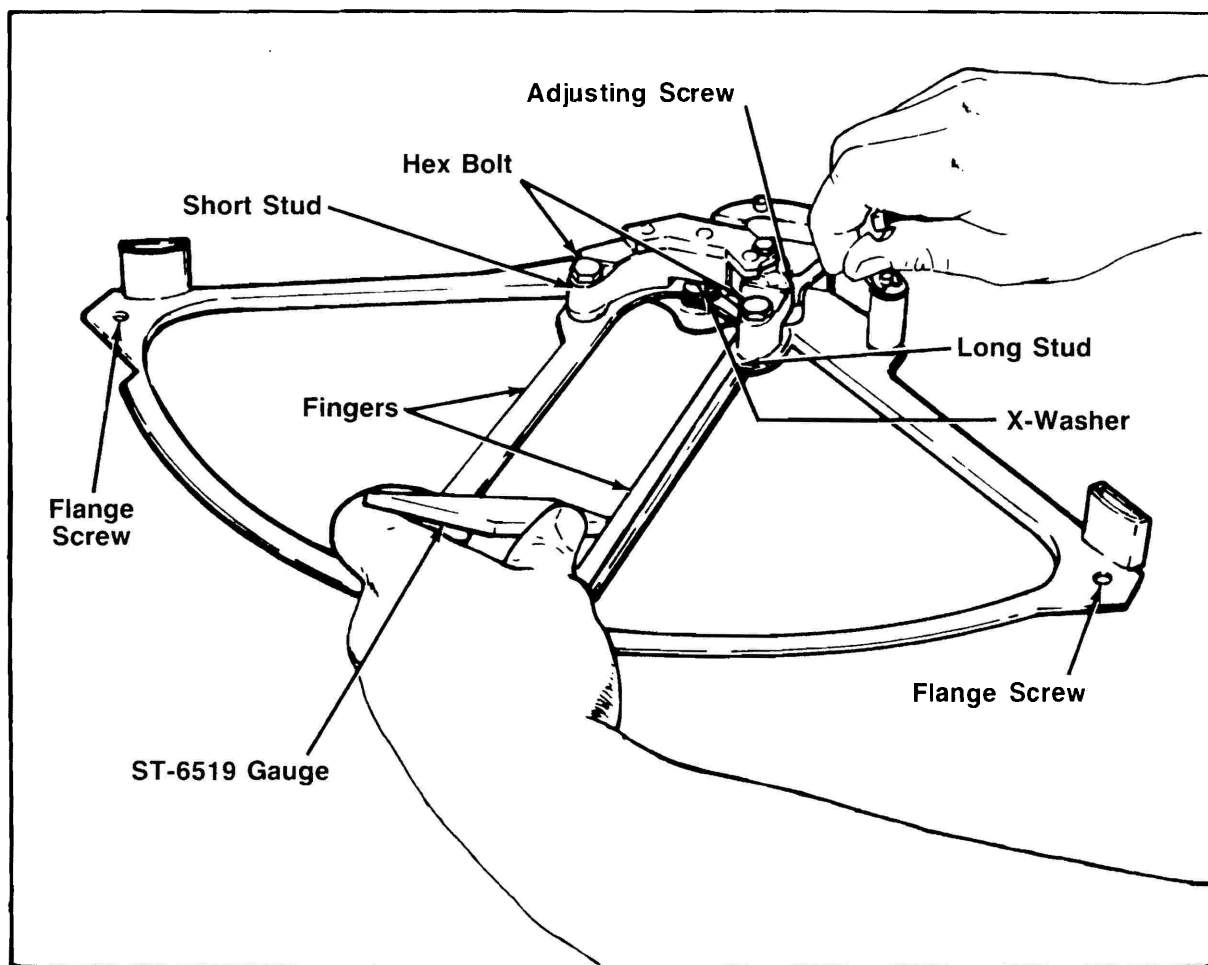
1. With sweep at zero, adjust short rod #3162 to obtain 10-1/8" center to center. Tighten lock nuts. The sweep travel is determined by the length of rod #3162. If this rod is too long, the sweep will collapse into the pit; if too short, it will hit the framework of the machine at zero position.
2. Adjust rod #3116 to obtain a minimum of 1/2" clearance between the stabilizing link #3156 and the frame of the machine. See NOTE below. See photo page 5.19.
3. Crank sweep to guard position. Sweep shield should clear channel by approximately 3/4". To increase clearance between sweep shield and channel, lengthen #3223 link; to decrease clearance, shorten link. The #3223 links should be at right angles to the side frame of the machine.
4. Crank sweep to #5 pin position. The sweep bar should clear the pin deck by approximately 1/4". If not, move bracket 3222 up to lower sweep or down to raise sweep.
5. Set a pin on each side of the pin deck as far back as possible. Continue cranking the sweep to its extreme back position. The sweep should just touch the pins so that under power, the sweep should knock the pins into the pit. If the sweep does not go back far enough, increase length of connecting rod 3162. Do not lengthen to maximum position. Under power, the sweep may collapse into the pit area. (The sweep bar does not necessarily have to be parallel to the tail plank when the sweep is cranked to its extreme back position.)
6. Crank sweep to zero position. Recheck step 2 above for clearance. Rod 3116 may have to be readjusted in order to have sufficient clearance and for the sweep to hang parallel to the pin deck.
7. Operate machine under power and note sweep operation. It may be necessary to repeat the sweep cam adjustments on page 5.18.

NOTE: Adjustments described in steps 2, 3, and 4 are made on both sides of the machine.

RESPOT CELLS AND ADJUSTMENTS OPERATION

When the table lowers to pick up pins as in first ball cycle, the fingers close on the standing pins, lock, and raise the pins high enough for the sweep to clear the lane of dead wood. The table then respots the pins. Adjustment of fingers must be 2"—see page 5.21. If the adjustment is less than this dimension, the finger assembly will not lock. If this dimension is greater than specified, the pin may slip through the fingers causing a malfunction.

The opening and closing of the cells is accomplished by means of the shifter link and pawl—see page 5.25. The shifter link is controlled by the respot tie rod and a cam attached to the table motor drive shaft.



RESPOT CELLS REMOVAL

1. The respot cell assembly may be removed from the table by removing the four flange screws, the carburetor type linkage, and the wire from the gripper switch.
2. Each finger can be replaced by removing the hex bolt and X-washer located at the pivot point. (Finger can be replaced when respot cell is mounted in the table.) When replacing fingers, the rear finger should be put over pivot point bushing first.

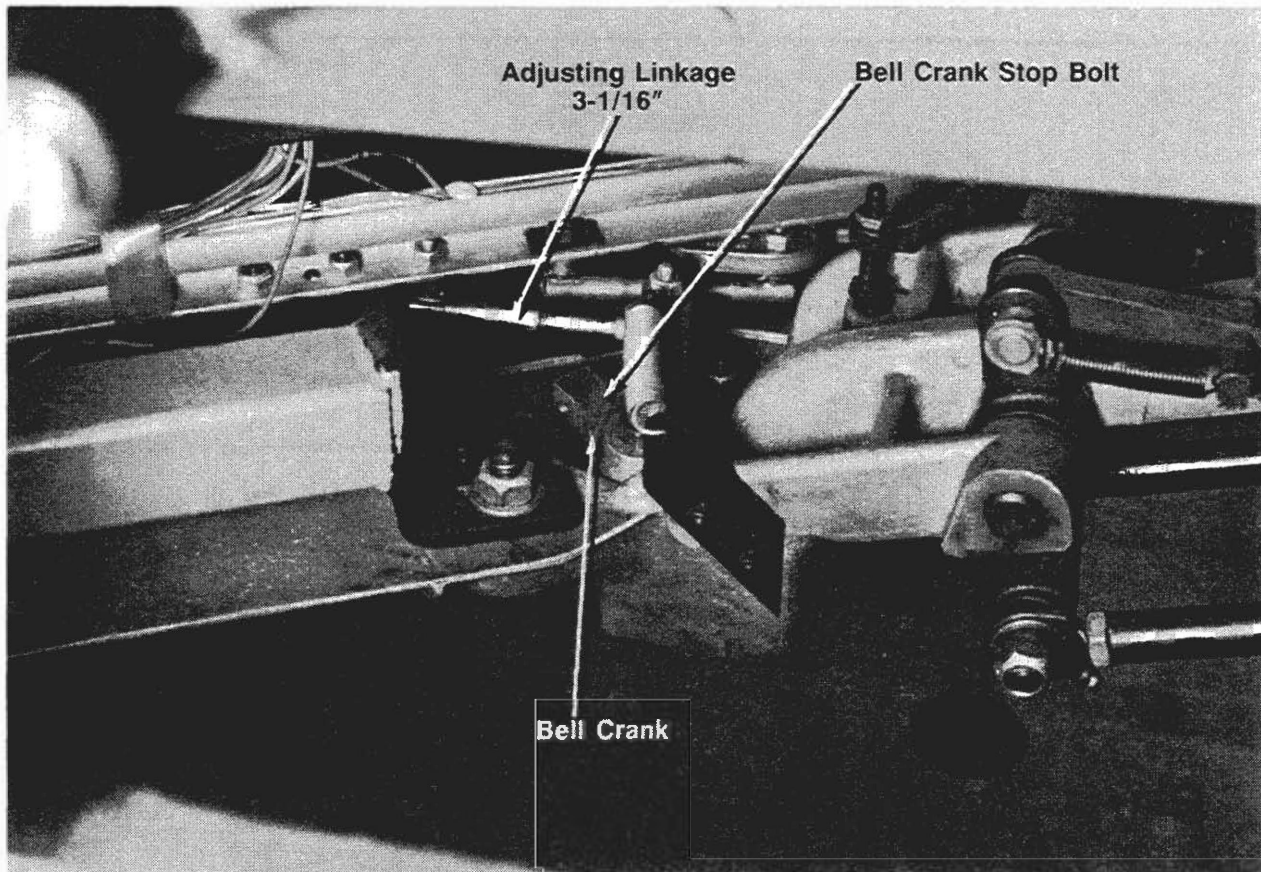
ADJUSTMENT—FOR EITHER DIE CAST FINGERS OR STEEL FINGERS

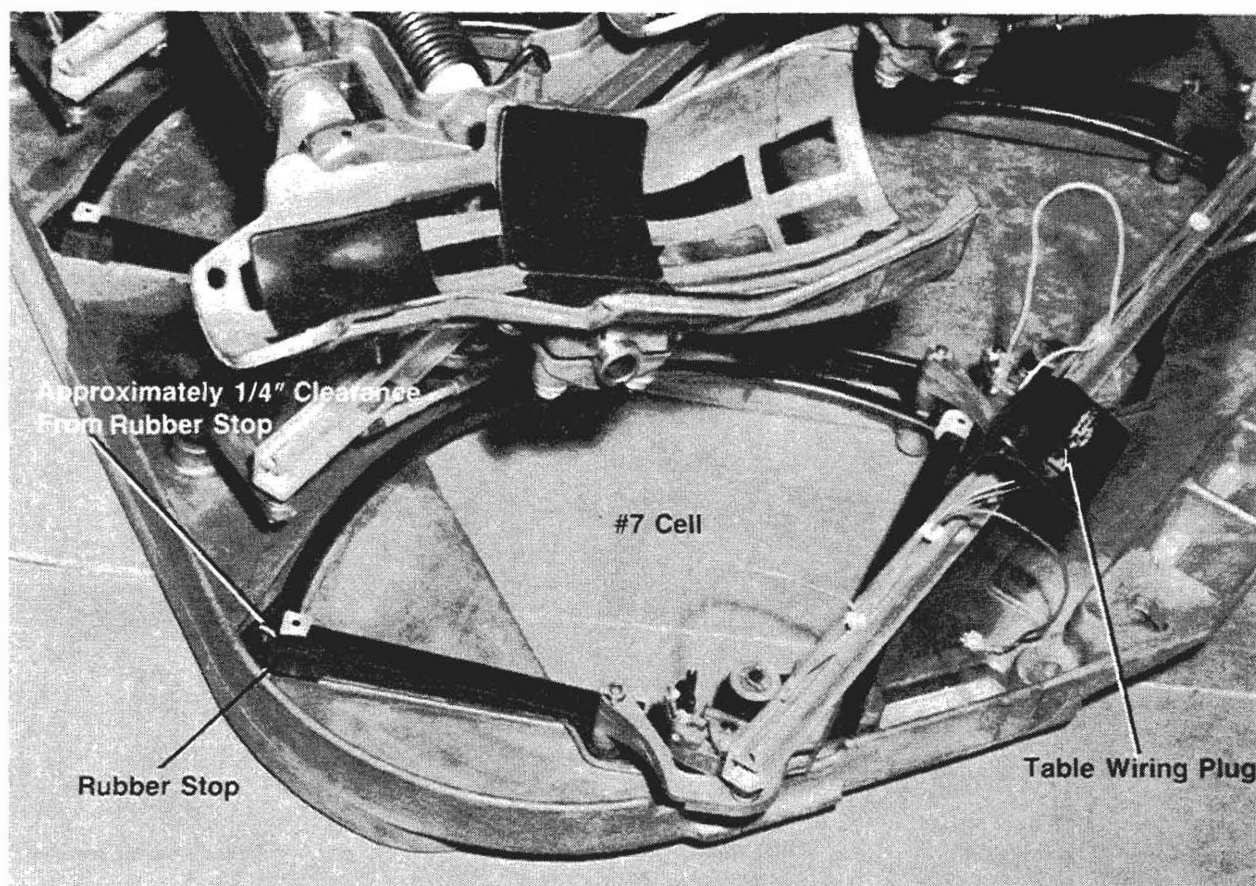
1. Move respot cell linkage to close cells as in respot condition. Using 1/4" open end wrench and ST-6519 gauge, adjust for a 2" width between fingers with spring at gripper switch compressed.

NOTE: This adjustment can be made with the respot cell in or out of the table.

RESPOT CELL BELL CRANK

To prevent binding and breakage of respot cells upon opening, a stop bolt, called the bell crank stop bolt, is provided. See picture below. This bolt takes the load from the fingers.





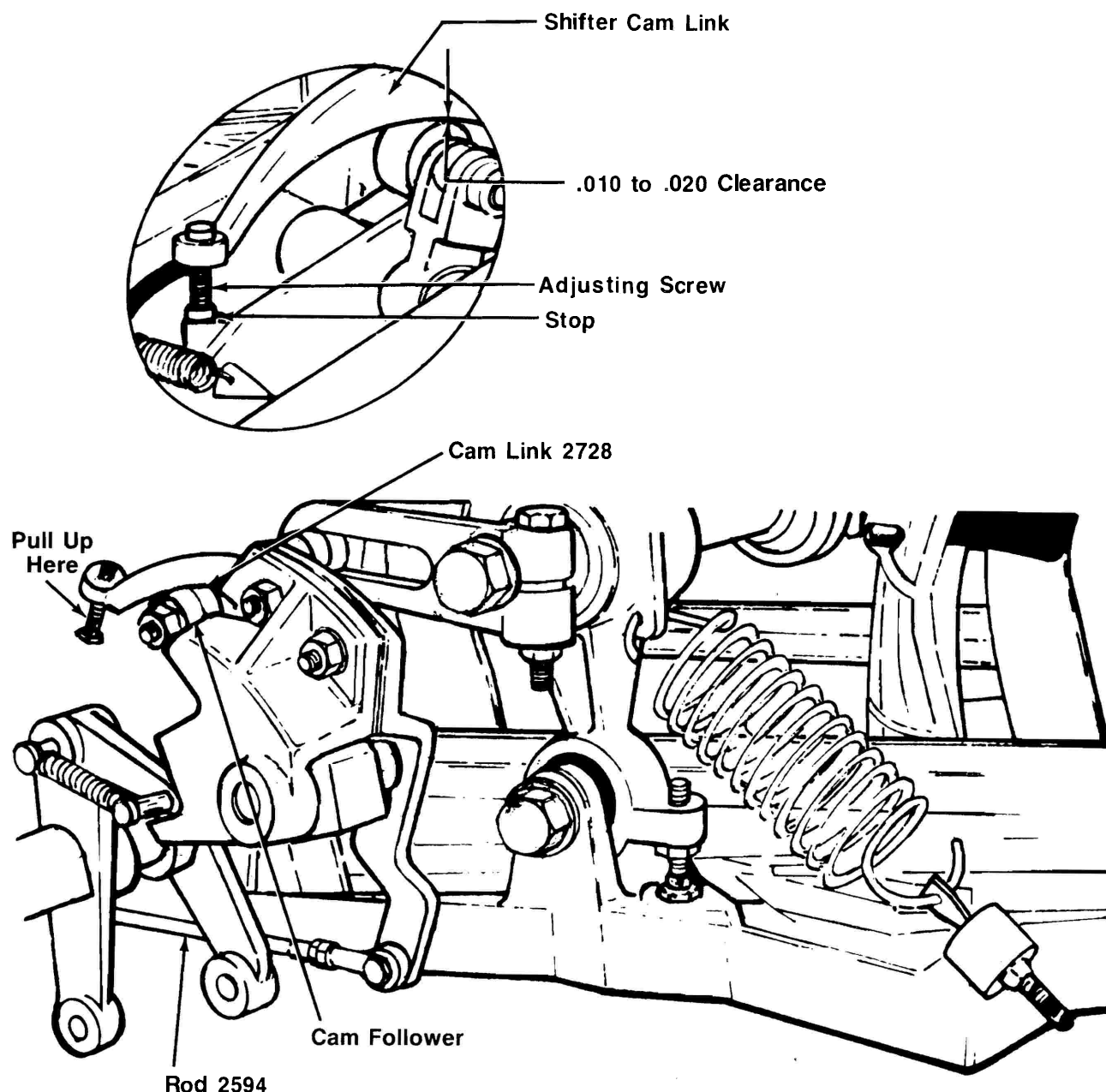
RESPOT CELL ADJUSTMENTS

NOTE—VERY IMPORTANT: The following pages of respot cell adjustments must be made in the sequence given.

1. Move respot linkage to close cells. Disconnect carburetor type linkage to all cells (number 7 cell is fixed). Make adjustment for 2" as described on page 5.21. Do not reconnect yet.
2. Adjust carburetor type drive linkage at bell crank to 3-1/16". See Note below.
3. Open #7 cell and adjust bell crank stop to obtain approximately 1/4" clearance from the rear finger to the rubber stop while holding the front finger against the stop.
4. Adjust and reconnect the connecting linkage of the remaining nine cells, one at a time, to obtain approximately 1/4" clearance from the rear finger to the rubber stop. Shifter cam link should be pulled up and held (as indicated in photo on page 5.24) while making and checking this adjustment. Open and close the respot cells after each cell is adjusted to see if adjustment holds.

NOTE: If there is a fixed drive link at the bell crank, there will be an adjustable link at the #7 cell. Adjust to 6-7/16".

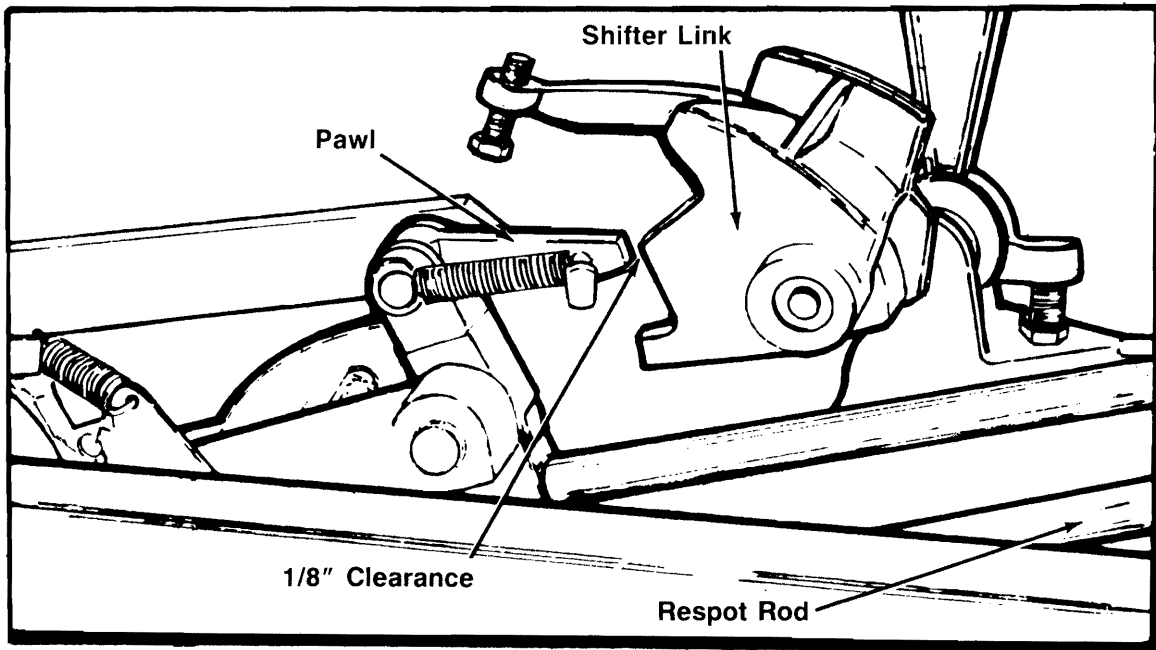
CONTINUE ON TO NEXT PAGE



RESPOT CELL ADJUSTMENTS—Continued

5. Slowly crank table into spotting action while checking clearance between the cam follower and the surface of the #2728 cam link. (If the clearance is such that the cam follower is difficult to turn, shorten #2594 control rod before cranking table any further down. Failure to do so will cause #2594 rod to bend as table is cranked down.) Stop table at 180° position.
6. Adjust #2594 control rod assembly so there is .010" to .020" clearance between the cam follower and the surface of the #2728 cam link. Pull up at end of cam link (see above picture) when checking clearance.
7. Crank table to 355° position. Close respot cells and adjust stop screw on end of shifter cam link to just clear the stop. From this point, **lengthen** screw stop about 4 turns to prevent force from being applied to the respot cell fingers, yet to allow respot cells to lock on pins.

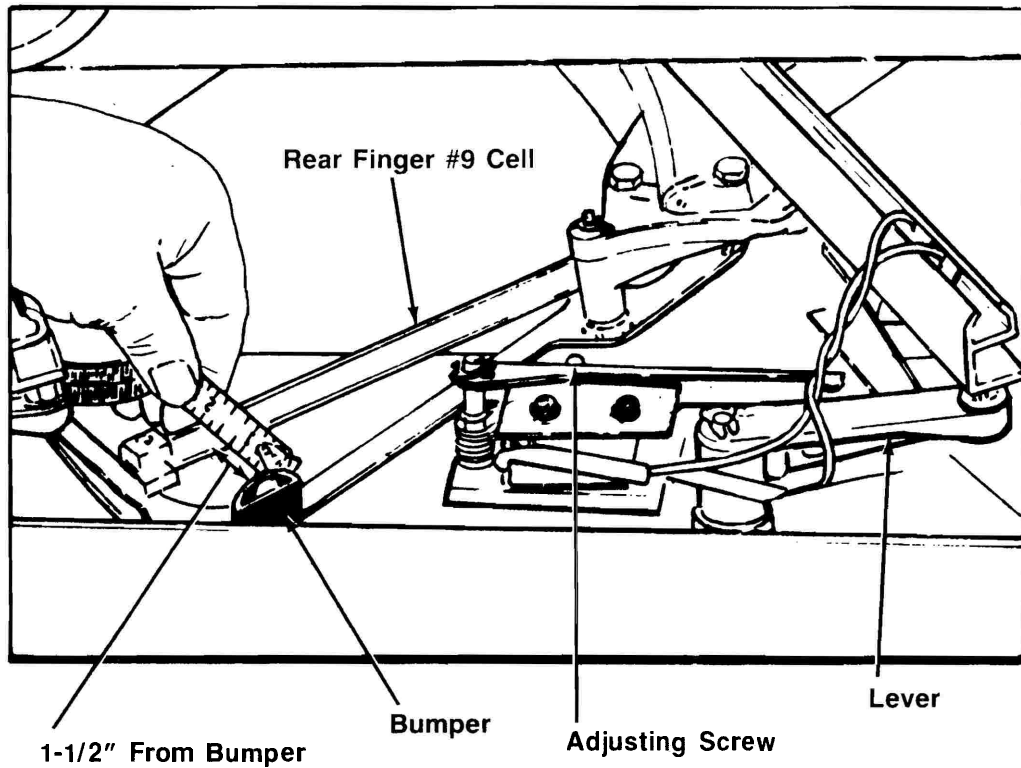
CONTINUE ON TO NEXT PAGE



RESPOT CELL ADJUSTMENTS—Continued

8. Close respot cells slightly so that the center high point of shifter cam link, Part #2724, is directly opposite the pawl, Part #2590. (See photo above.) Adjust the respot rod so that the pawl clears the center high point of the shifter cam link by 1/8".
9. Run table through several respot operations. Fingers should open and close smoothly and without binds. Recheck previous steps if necessary. If fingers do not lock on pins, a tight cell is indicated. Inspect all cells and adjust accordingly. See note below.
10. Check respot cell protection switch adjustment. See page 5.26.

NOTE: To avoid damage to the fingers on initial running of table, use only one pin until smooth operation is achieved; then test with complete set of pins.

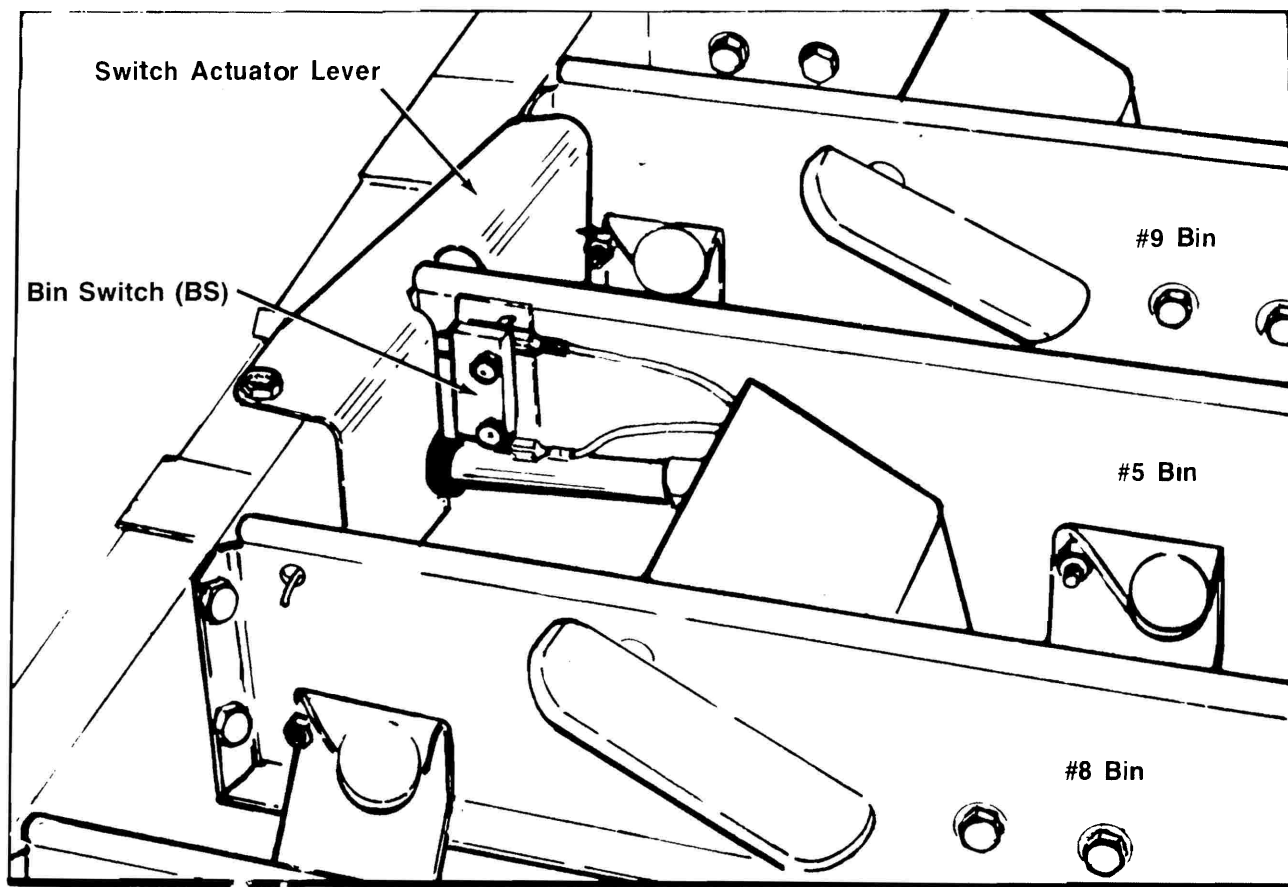


RESPOT CELL PROTECTION SWITCH

NOTE: The respot cell protection switch prevents the table from operating (feeling for pins) when the cells are not fully open.

ADJUSTMENT

1. With respot cells in open position, hold front finger of #9 cell to extreme forward position.
2. Move rear respot cell finger forward to a maximum of 1½" from the 2752 bumper. **Use cell linkage for movement. DO NOT PUSH FINGER.**
3. Loosen lock nut on switch lever and adjust screw until switch operates. Tighten lock nut.



BIN SWITCH

The bin switch (BS) is located in the bin framework between the #8 and #9 bin locations. When the 10th pin #9 is delivered to the bin assembly, it actuates the (BS) switch which sends a signal to the chassis indicating that 10 pins are ready for a spotting cycle. To test the switch, operate the lever several times. If the switch does not actuate, reposition the switch accordingly.

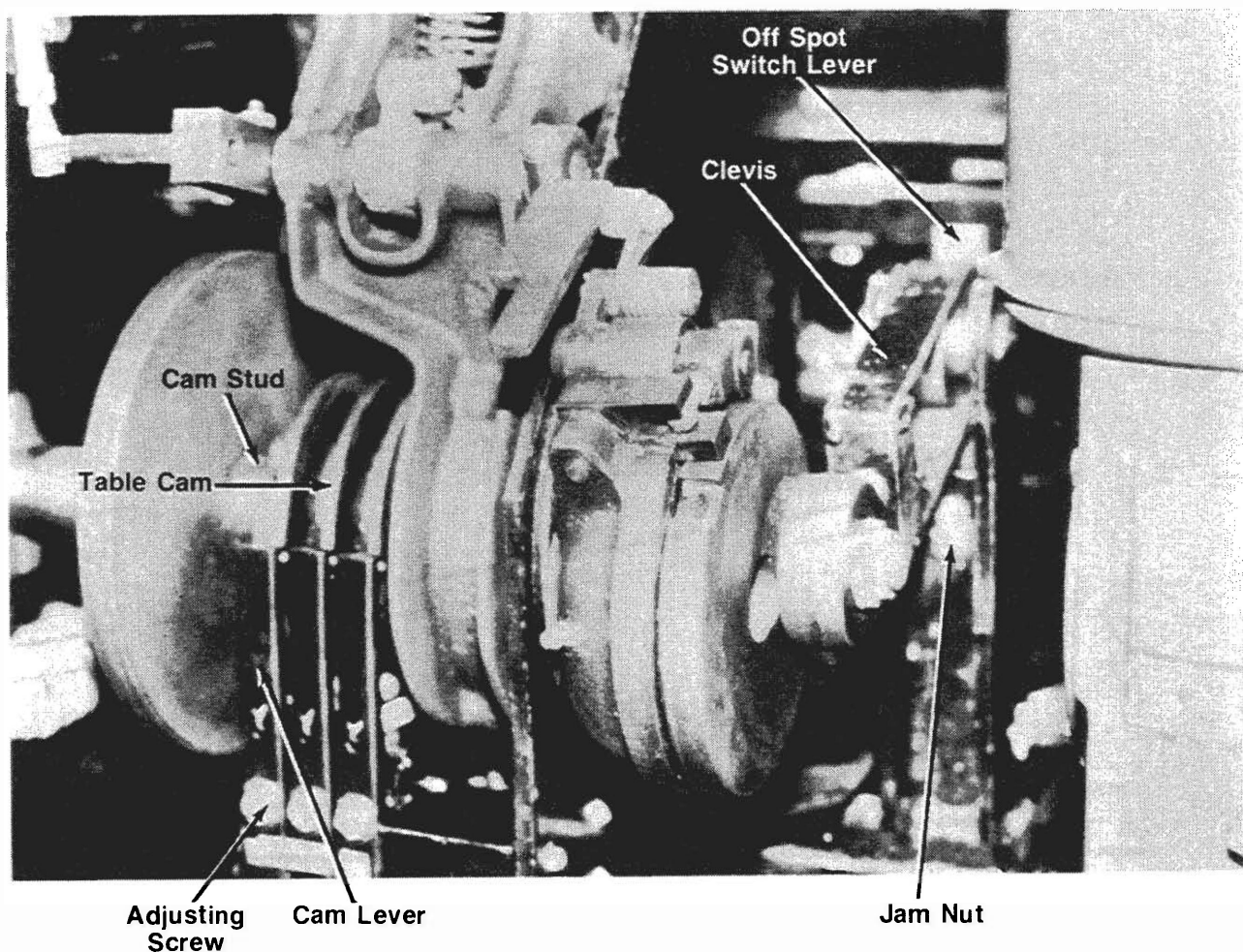


TABLE OFF-SPOT SWITCH OPERATION

If the table contacts an off-spot pin during a respot cycle, the clevis moves the off-spot switch lever which in turn closes the off-spot switch. This action converts the machine into 2nd ball cycle logic. All that is required then is to remove the dead wood, if any, open the respot cell fingers, and operate first the sweep reverse, then sweep run switch to bring the sweep to zero position.

ADJUSTMENT

1. Loosen adjusting screw jam nut.
2. Using gauge ST-2748, insert .176" end of gauge between lever and clevis and adjust screw for switch operation. When .136" end of gauge is inserted, switch should not actuate.
3. Hold screw and tighten jam nut.
4. To check above adjustment, cycle machine through 1st ball with a pin placed out of respot cell range. Sweep should drop to 66° guard position, table should contact pin and return to zero position, the 1st ball light should go off, and the 2nd ball light should come on.
5. Open the respot cell fingers and operate first the sweep reverse, then sweep run switch to bring the sweep to zero position.

TABLE LEVERS AND CAMS OPERATION

The table is controlled by cams, levers, and switches. The TA1 normally closed contact (N.C.) runs the table from 185° to 355°. The TA2 turns on the indicator lights and initiates the sweep run-through. TB, along with SC, are the interlock cams.

TABLE CAM LEVERS

NOTE: Some of the adjustments of the table require that the table be operated under power. When this is the case, the respot cells should be actuated manually to open grippers to prevent damage to the fingers.

ADJUSTMENT

1. Crank or run table to put switch cam lever at lowest portion of table cam.
2. Insert gauge ST-2748 between lever and lowest portion of cam.
3. Small end (.136") of gauge should not actuate switch, but large end (.176") should actuate switch.
4. Loosen switch lever jam nut and adjust screw to obtain above setting.
5. For proper operation, the levers must ride fully on the table cams.

TABLE CAM ADJUSTMENT

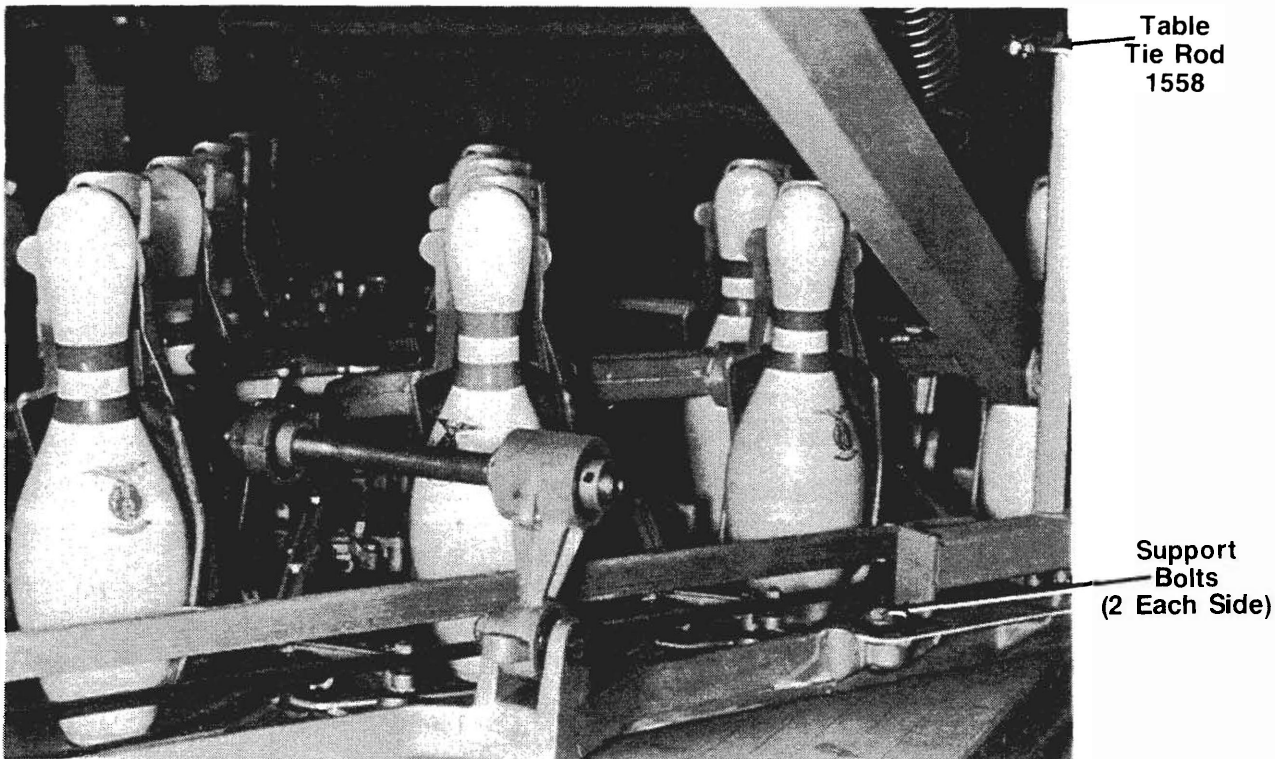
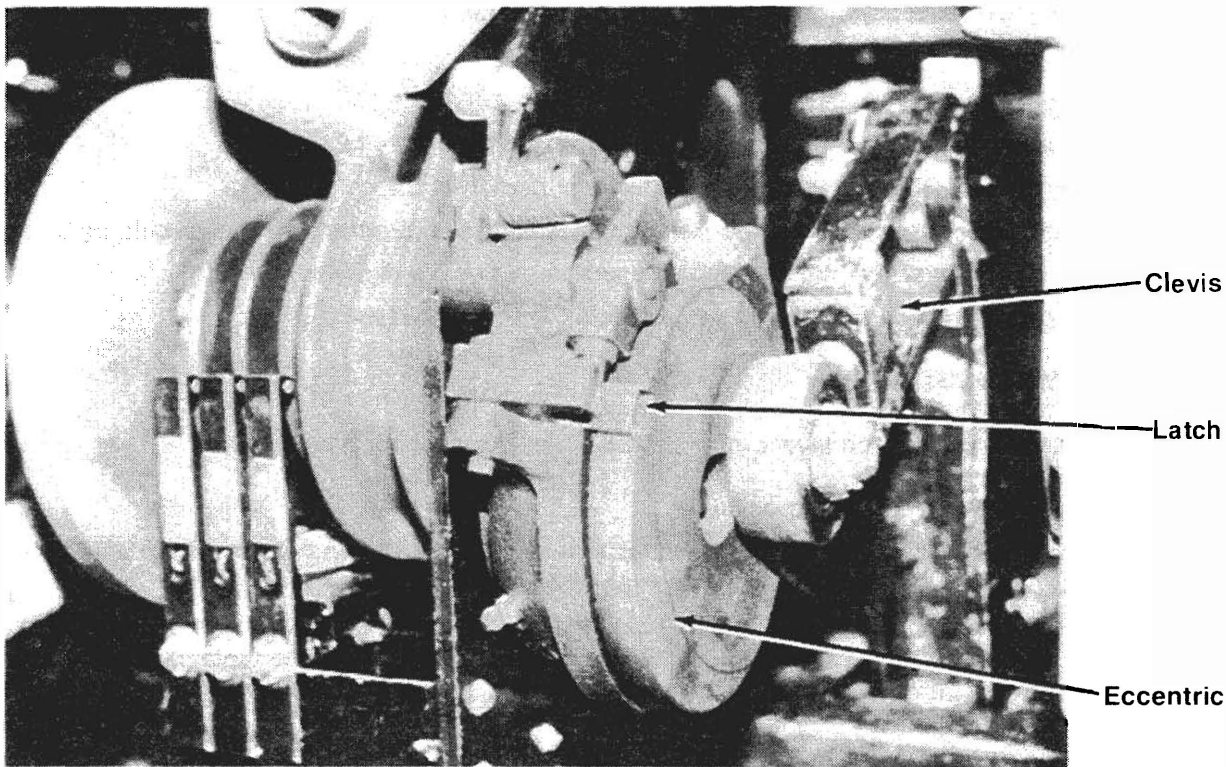
NOTE: The table cam switch levers must first be adjusted as described above.

1. Crank the table to its highest position.
2. Loosen cam stud and position cams so that the stud is parallel with the pin deck. (This is the approximate or starting cam setting position.) Tighten stud.
3. Run table under power and note the table stopping position at the end of a second ball cycle. Table should stop just before the zero position (355°). If it does not, move the table cam accordingly. If the table overruns, move the cam in the direction of rotation. If it runs short, move it in the opposite direction.

NOTE: "Table Zero" is the point at which the table has reached its highest operating position.

TABLE DRIVE ECCENTRIC OPERATION

The height of the table travel during spotting and respotting is controlled by the table drive eccentric. During a respot cycle, the eccentric latch is engaged in the eccentric and the table lowers to respot height. When the spotting solenoid is energized as in a spotting cycle, the latch is disengaged allowing the eccentric to operate. This permits the table to descend to the deck and spot a set of pins. The driving motion of the table is transmitted to the table torque weldment (which lowers the table) through the clevis and drive assembly.



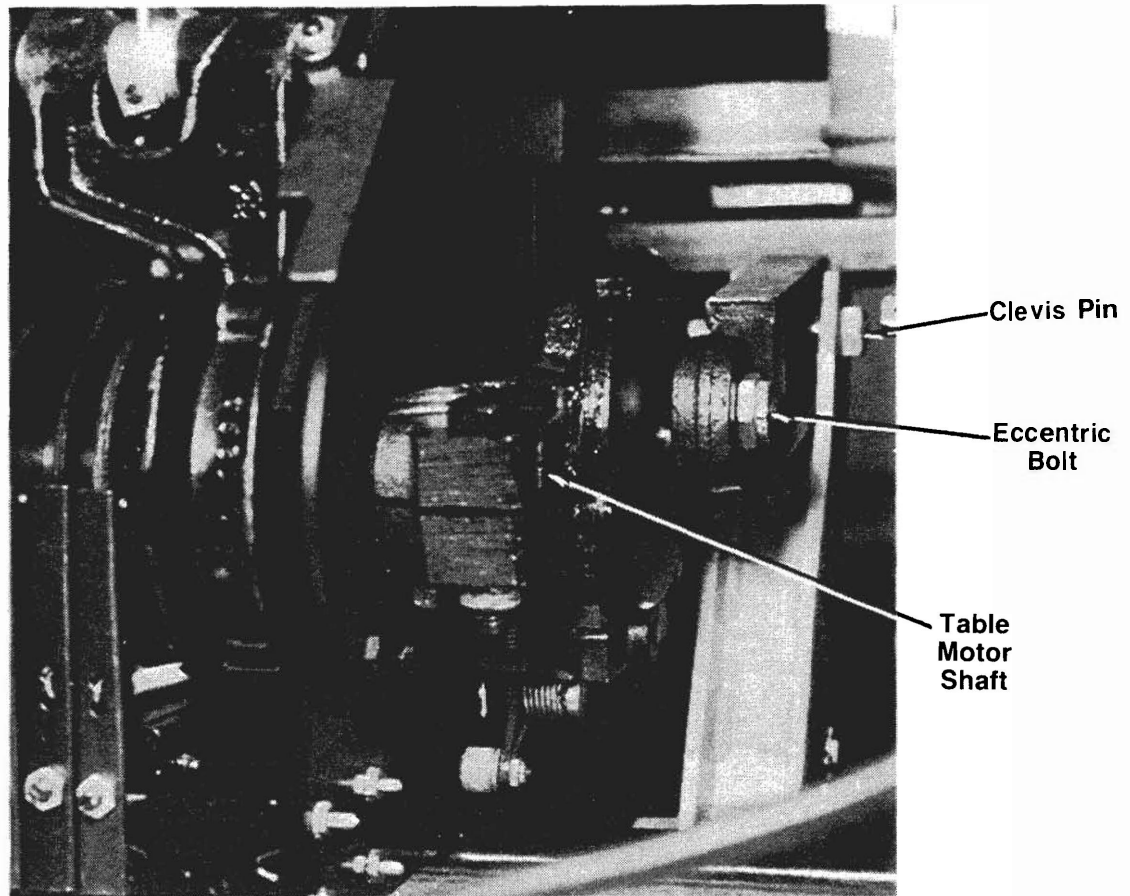


TABLE ADJUSTMENTS

To Correct Pins Wobbling or Falling During Spotting

NOTE: Adjustments **must** be made in the order given. Remove power plug and motor plugs.

1. Crank the table in normal direction of rotation (the cams will be turning toward you) so that the table will go into a spotting position. Stop when the bolt in the table drive eccentric, the clevis pin, and the table motor drive shaft are in line. (This is bottom dead center of table rotation.)
2. Check table cross level by comparing table to deck clearance at the four pin and six pin. Cross level may be corrected by using slotted washers as required between table and support weldment. Loosen only one support bolt at a time to prevent table from moving.

Check front to rear level by comparing table to deck clearance in front of the head pin and behind the five pin. Front to rear level is corrected by changing the length of the two 1558 tie rods. These two rods must be turned uniformly. Lengthening the rods raises the front of the table and lowers the rear, shortening the rods does the opposite. See page 5.30. (All levels are taken with respect to the pin deck.)

3. Adjust the table height for 5/16" clearance between bottom of table and the pin deck by lengthening or shortening the clevis. (1/2 turn of the clevis causes approximately 1/8" of table movement.) Shortening the clevis raises the table, lengthening the clevis lowers the table. Use ST-6519 gauge or 5/16" allen wrench as gauge. The clearance between the table and pin deck should not exceed 3/8" or be less than 1/4". Place a block of wood in between the table and pin deck in order to remove the clevis bolt.

CONTINUE WITH TABLE ADJUSTMENTS ON NEXT PAGE.

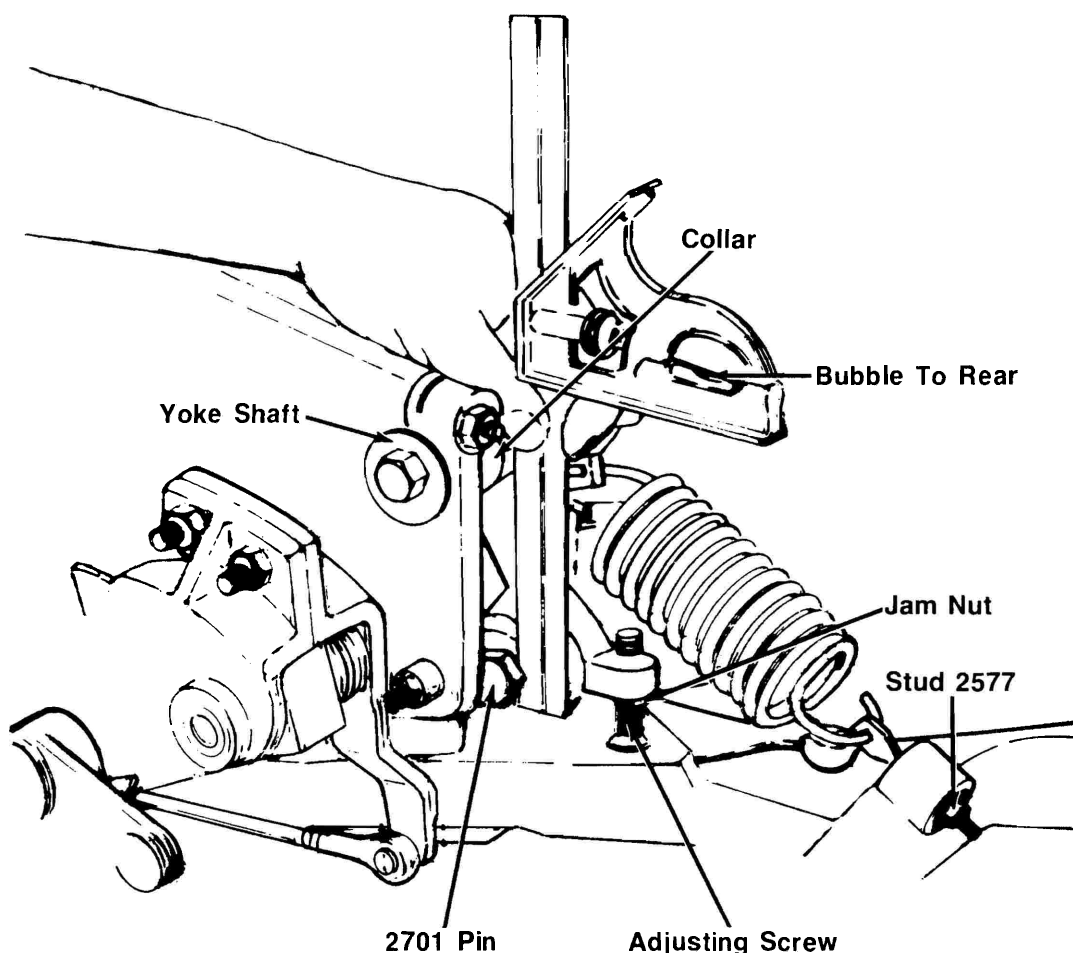


TABLE ADJUSTMENTS—Continued

4. Crank table motor in opposite direction of rotation (table cams will be turning away from you) until the table is approximately 6" off the pin deck. (This is about the 130° position.)
5. Loosen the collar on the front yoke shaft and slide collar away from yoke.
6. Using a combination level and square, hold square against front yoke shaft and #2701 pin. Loosen jam nut and adjust screw stop until combination square reads 1/2 bubble (with bubble toward rear of the machine).
7. Tighten jam nut and reposition and tighten collar.
8. The nut on stud #2577 is to be tightened all the way down to provide maximum spring tension. Continue with adjustment 9 on page 5.33.

NOTE: This adjustment is to provide the correct amount of toe-in required for good spotting action. The cup assembly is positioned for spotting by means of the large spring attached to the yoke. Too little toe-in will cause the pins to be spotted flat on the deck; too much toe-in could cause pins to fall over.

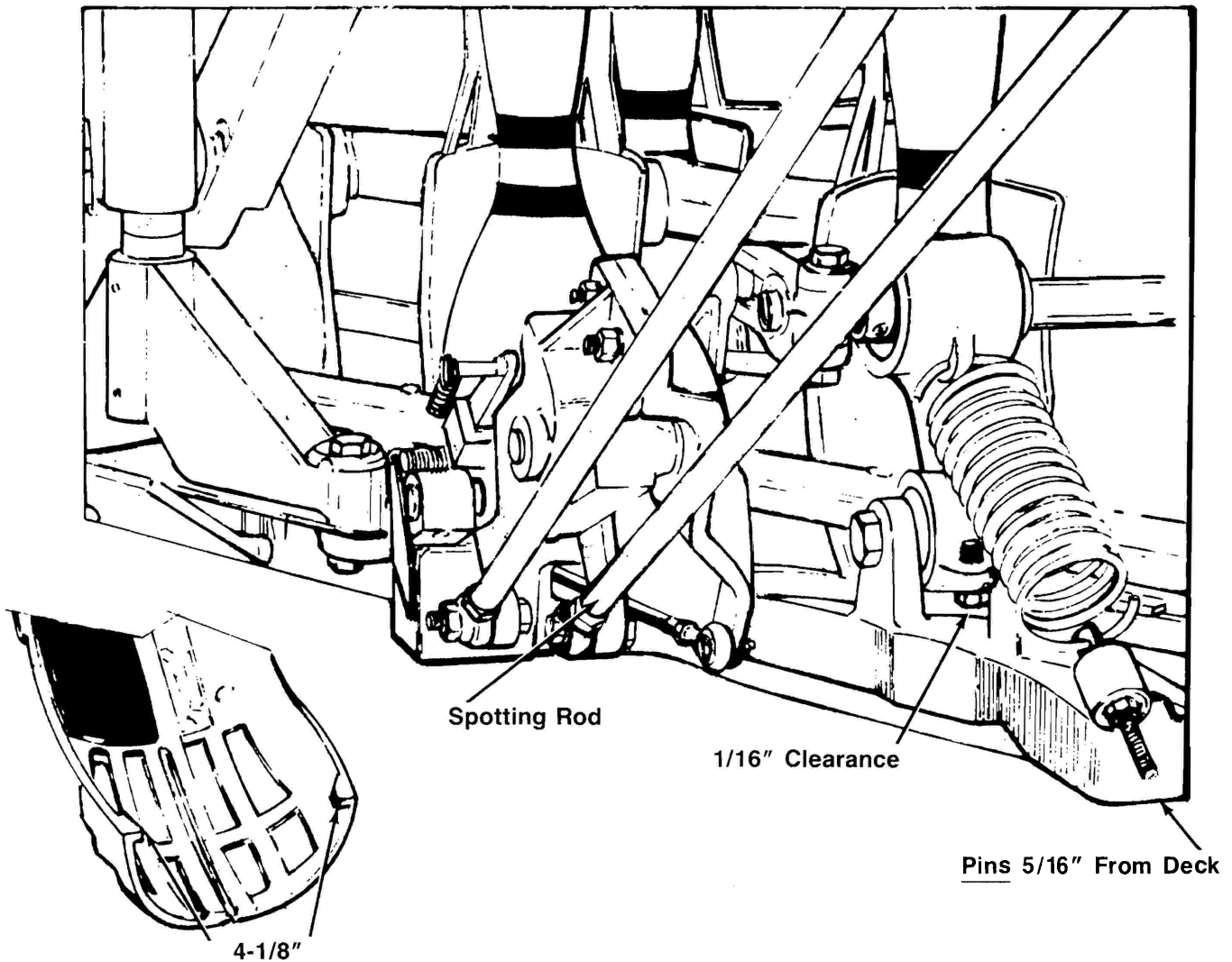
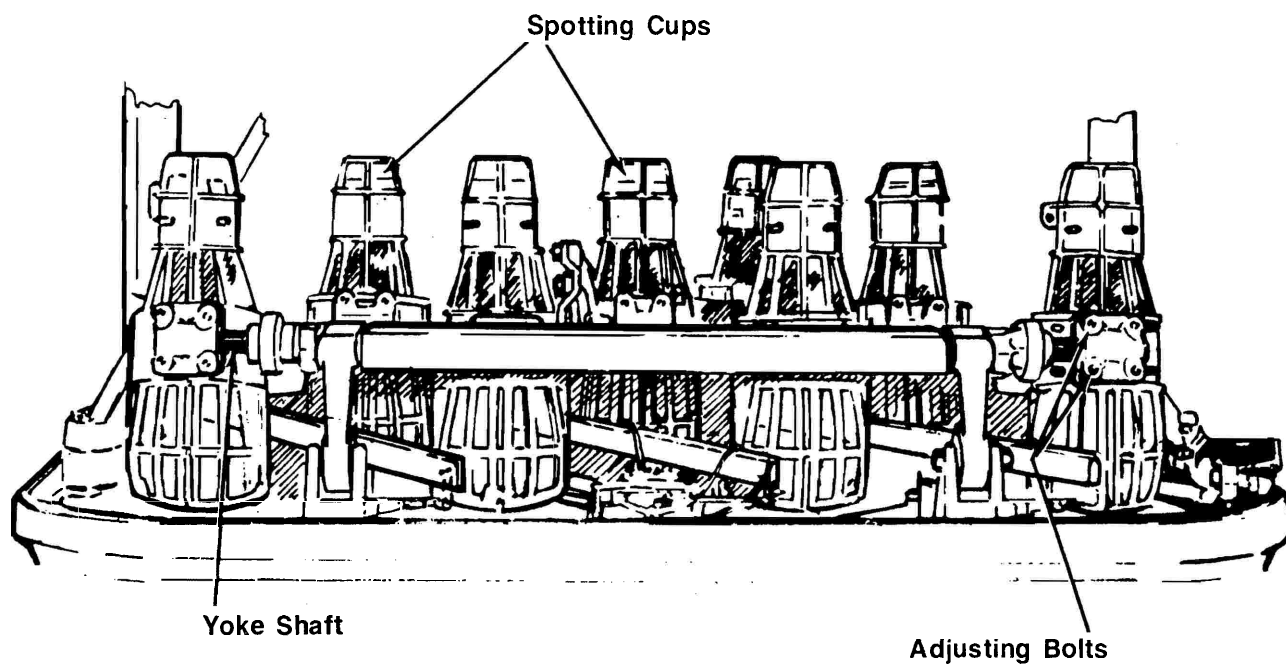


TABLE ADJUSTMENTS—Continued

9. Check the inside measurement at the forward tip of the spotting cups. The dimension should be 4-1/8". Adjust cup bolt accordingly.
10. Crank table motor in direction of rotation so that the pin bottoms are 5/16" from pin deck and are perpendicular to the deck. Adjust spotting rod until 1/16" clearance is obtained between the screw stop and adjusting screw. (This starts the yoke assembly to move away from the pins as they come in contact with the pin deck.)

NOTE: The table spotting rod transmits the motion from the spotting cam to the clevis. This permits the table spotting cups to travel in their arc down to the deck to spot pins. As the low portion of the table spotting cam is reached, the spot rod moves the yoke and cup assembly away from the pins, spotting them on the deck.

Continue with adjustment 11 on page 5.34.

**TABLE ADJUSTMENTS—Continued**

11. Adjust spotting cups to place pins on spot. If pins are too far forward, loosen the two top cup bolts and tighten the two lower bolts. If pins are too far back, loosen the two bottom cup bolts and tighten the two top bolts. If pin is to the left or right, loosen through bolts and slide cup on shaft.

CAUTION: The extreme adjustment of the cup must permit free movement of the cup.

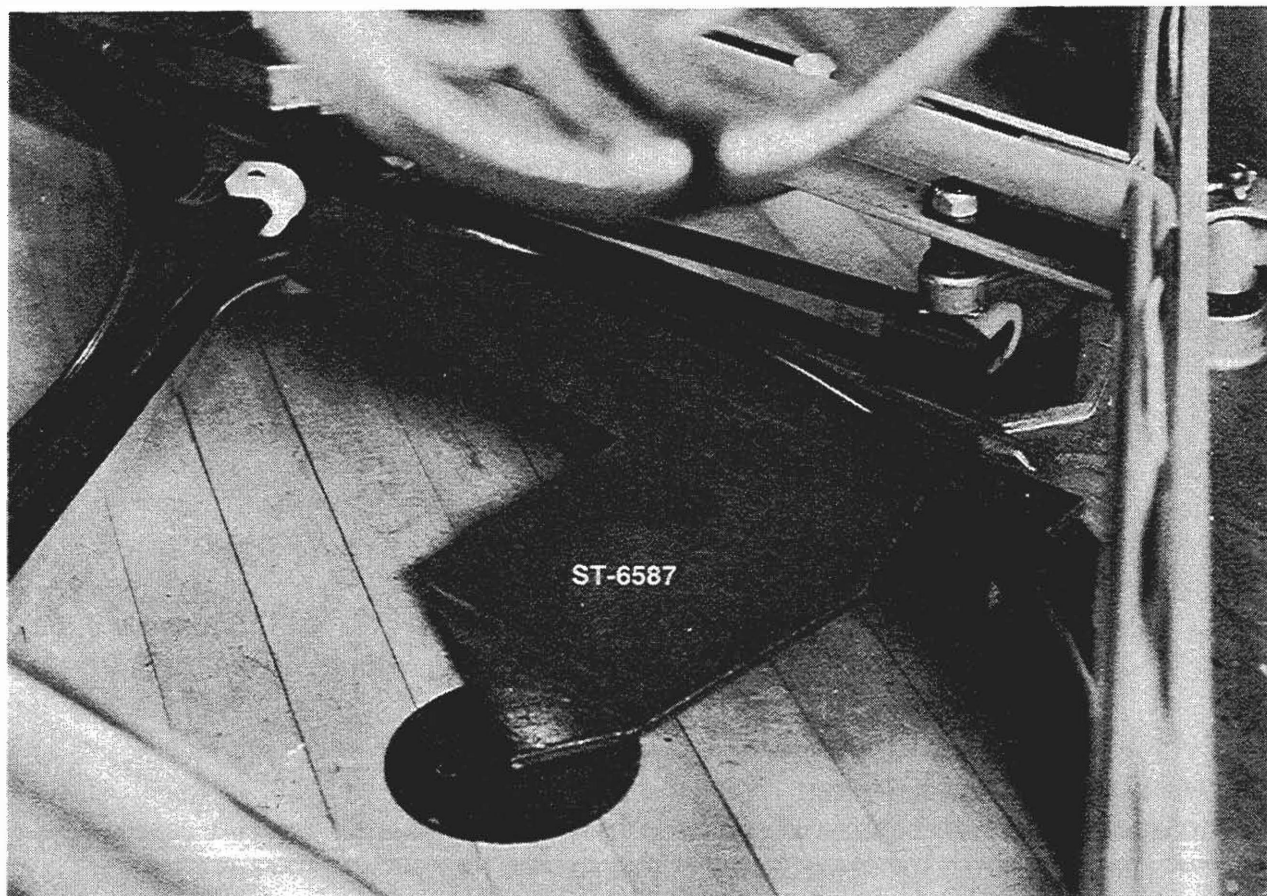
NOTE: If there is insufficient lateral movement to place pins on spot, the table should be repositioned. See page 5.35.

12. Run table and check for proper spotting of pins.

TABLE REPOSITIONING

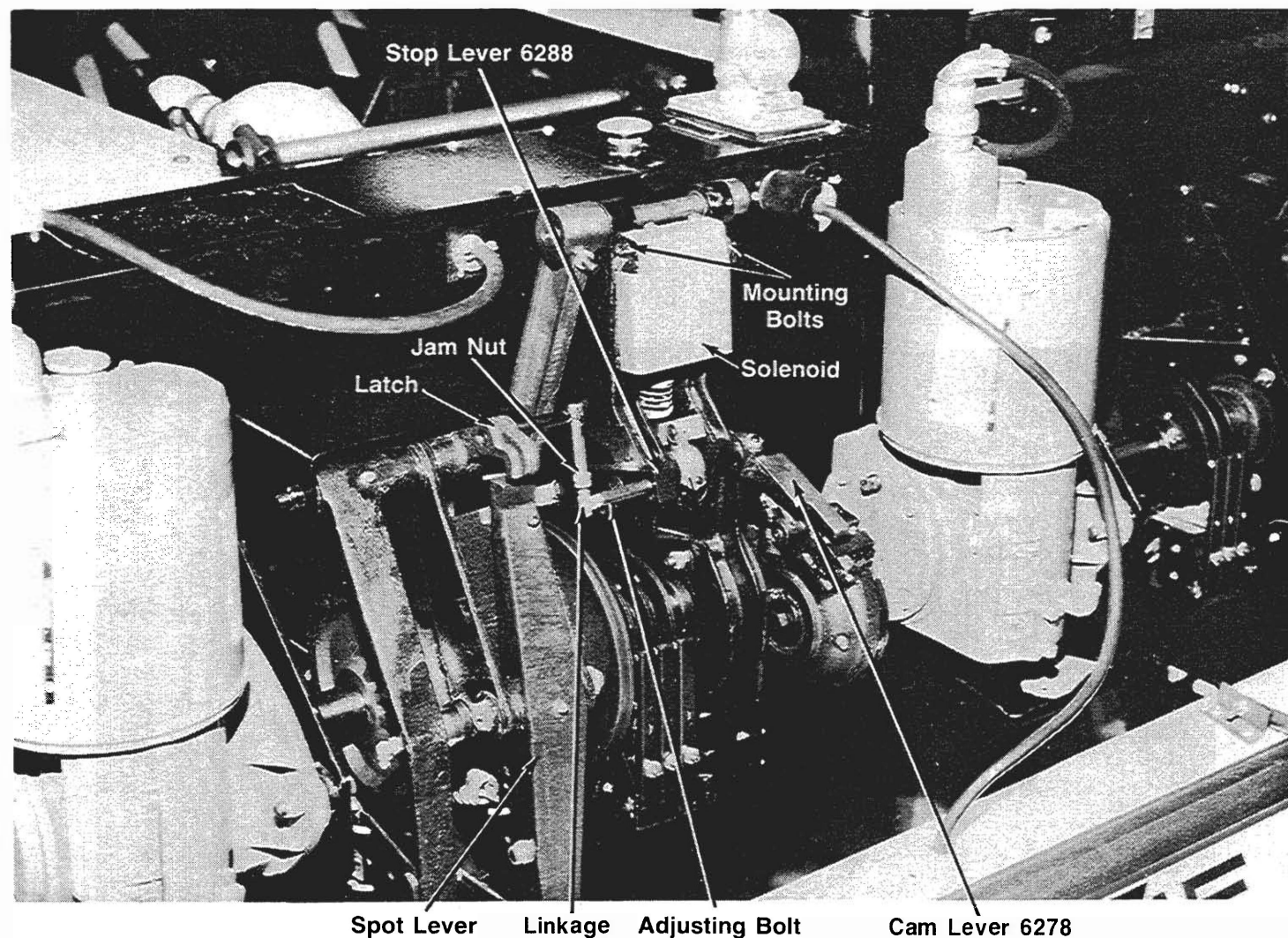
If the table must be repositioned, follow the steps listed below:

1. Crank table to mechanical zero position.
2. Remove both table counter-balance springs (Part #000 002 782).
3. Remove spot and respot rods. Crank table down to lowest point.
4. Place three 5/16" flat plates between table and deck.
5. Remove clevis pin following same procedure as indicated on page 5.31.
6. Mount Locating Tools 82-70-ST-6587 in the 1, 7, 10 cell brackets. See picture below. If the table is 5/16" from the pin deck, these tools should rest flat on the spots. Two locating tools may be used alternating between 1-7 and 1-10 spots.
7. Loosen the four bolts holding the table support assembly (Part #070 007 295 and #070 007 296) to the table (Part #070 002 684). Shift the table until Locating Tools point to the center of the 1, 7, 10 spots. See picture below.
8. Resecure table bolts, springs, spot and respot rods, and clevis pin. Remove 5/16" plates.



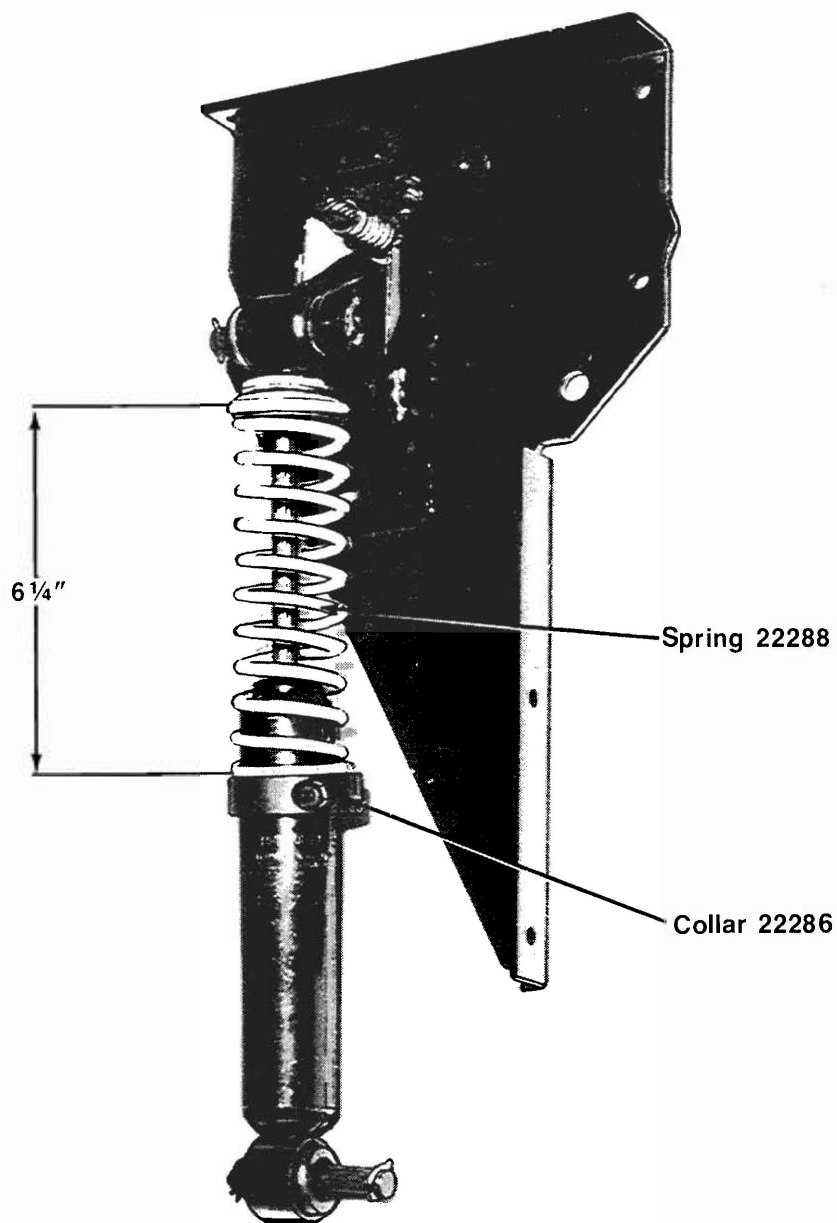
SPOTTING SOLENOID OPERATION

The spotting solenoid controls the operation of the table for spotting and respotting cycles. When the solenoid is energized, the cam lever unlocks the table drive mechanism. The shuttle stop is also disengaged at this time allowing the shuttle assembly to follow the contour of the cam transferring pins from the bin assembly to the spotting cups. In addition, the top end of the spotting lever is locked into position. This permits the spotting rod to follow the contour of the table spot cam. If the solenoid is de-energized, the spot lever is released which fixes the spotting cups in a horizontal position. The table drive assembly also remains locked.



SPOTTING SOLENOID ADJUSTMENTS

1. With the table at the electrical zero position (355°), the distance between the end of the stop lever (Part #6288) and the adjusting bolt should be .015". Adjust bolt to meet these conditions.
2. If the spotting solenoid is replaced, it should be positioned so when it is manually operated (as if it were energized) the cam lever (Part #6278) should be in a locked position. This rigidity is necessary to trip the spotting mechanism during a spotting cycle. Tighten the solenoid mounting bolts uniformly to obtain the above conditions.
3. With table at zero, insert large end of ST-2748 gauge between spot lever and latch. Adjust linkage to obtain .176 inch clearance.



CUSHION SHOCK ABSORBER ASSEMBLY ADJUSTMENT

NOTE: This adjustment can be made either with the shock absorber mounted in the machine or held in a vise. **CAUTION:** If the shock absorber is held in a vise, clamp shock on end only. DO NOT PLACE PISTON IN VISE.

1. Loosen collar lock screw.
2. Insert a thin open end wrench between the coils of the spring with the open end of the wrench over the piston shaft and against the piston.
3. Hold wrench against piston while turning the spring. When the dimension of $6\frac{1}{4}"$ is obtained, slide collar against spring, tighten lock nut, then remove wrench.

TABLE SPRINGS OPERATION

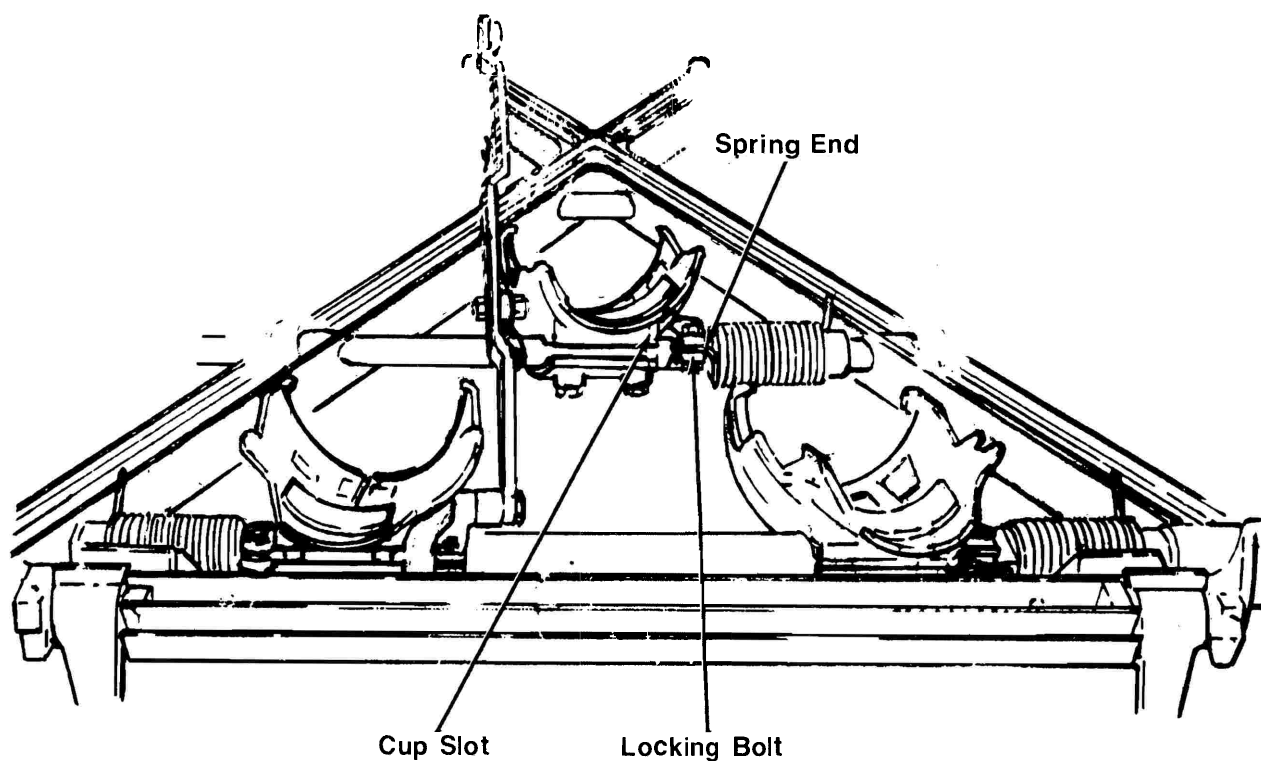
The table springs, located on the #3 and #4 yoke shafts, are used to stabilize the cup movement during the spotting operation. They also serve to hold the spotting cups horizontal during a respot cycle.

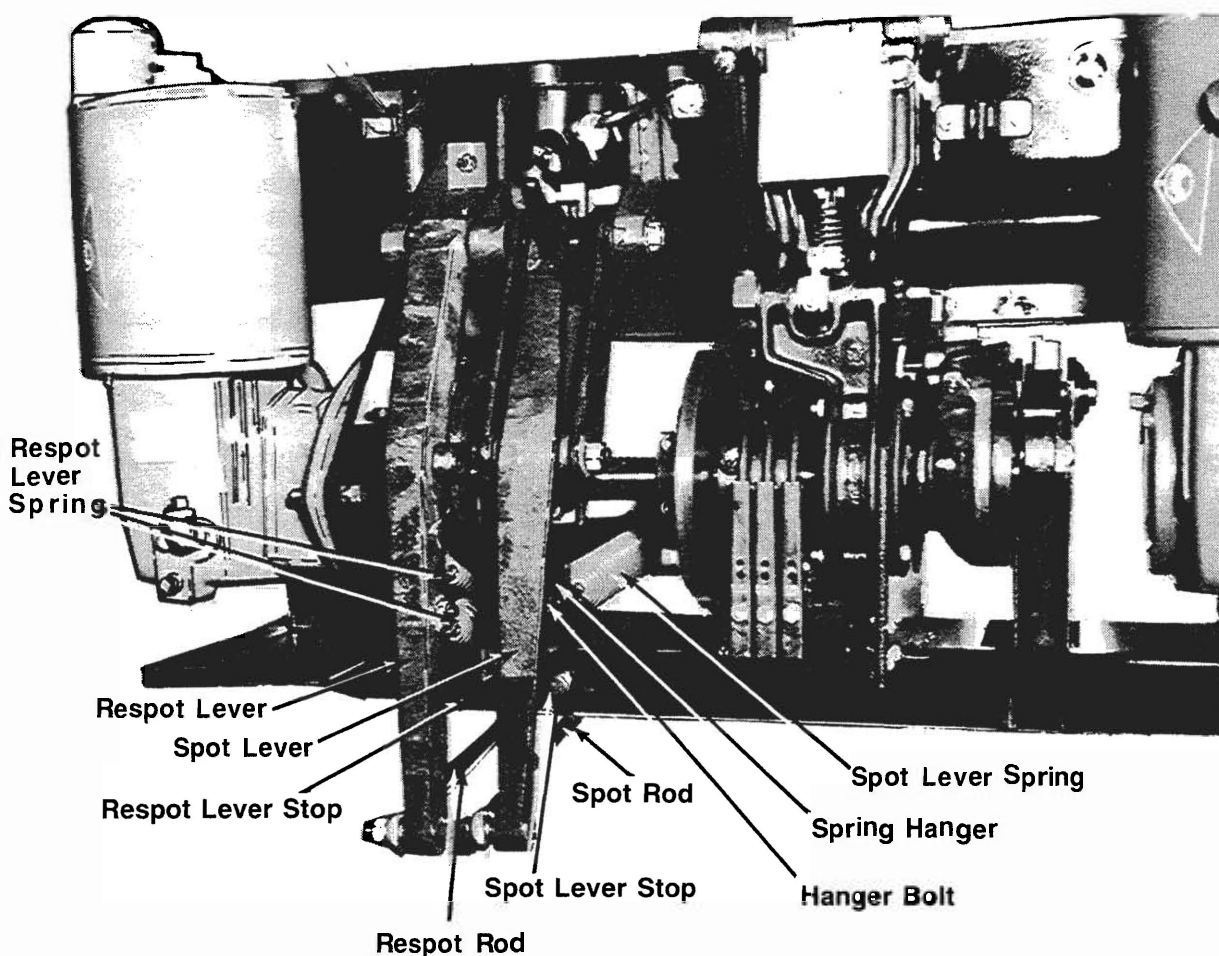
ADJUSTMENTS

With table in the zero position, loosen locking bolt and rotate spring retainer on table shaft so that spring end is in line with slot between cup and cup cap. This is the initial or approximate setting.

Run machine through several spotting operations and observe cup movement. Insufficient spring tension will cause unstable cup movement allowing the pins to wobble or fall when spotted. Too much spring tension will cause the cups to slam back after the pins have been spotted. Adjust accordingly.

NOTE: If springs have to be replaced, first remove yoke as described on page 5.40.





SPOT AND RESPOT LEVER SPRING REMOVAL OR REPLACEMENT

1. Clear deck of pins. Stop sweep at guard
2. Remove power plug.
3. Disconnect respot rod from respot lever.
4. Disconnect spot rod from spot lever. (careful of spring tension).
5. Remove table motor plug and insert crank.
6. Crank table motor until spot and respot lever cam followers are at lowest place on cams. This releases much of the spring tension.
7. Remove nut from spring hanger bolt. Insert spring puller through center hole of hanger, pull to remove remaining tension from hanger bolt, and move bolt and hanger away from lever until free from hole.
8. Two springs are used on the respot lever, one spring on the spot lever. Springs and hangers are identical.
9. When replacing springs and hangers, make certain the shoulder of the hanger bolt is inserted correctly so hanger turns free when bolt is tight.
10. Reconnect spot and respot rods and check machine operations.

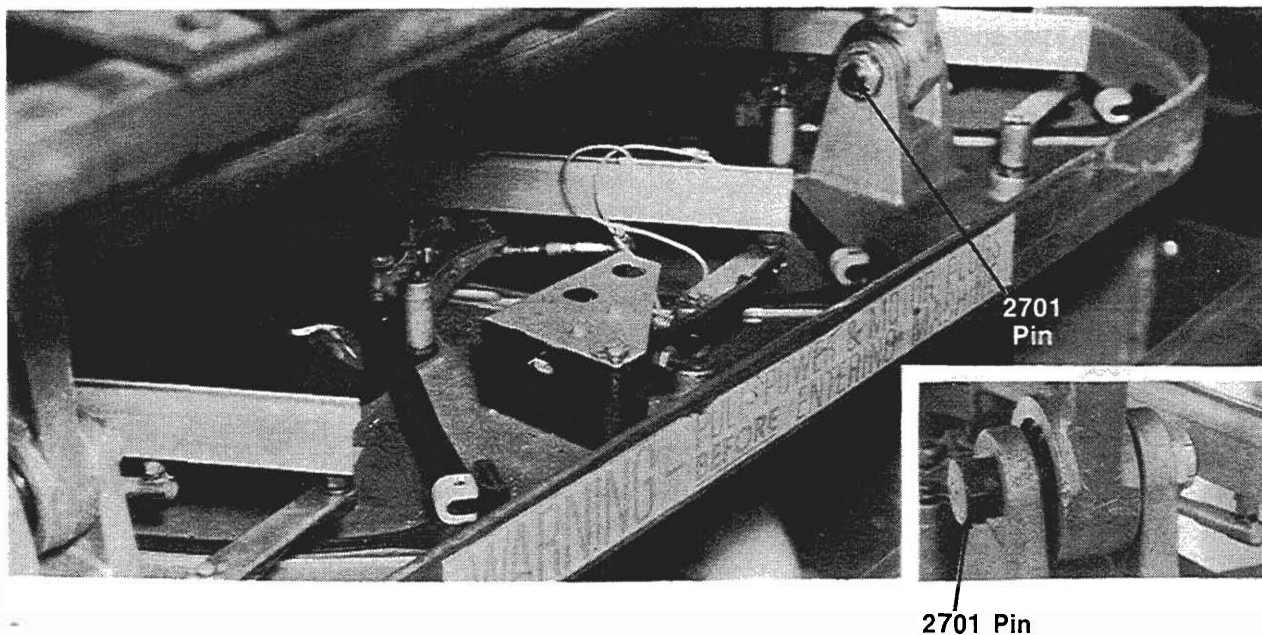
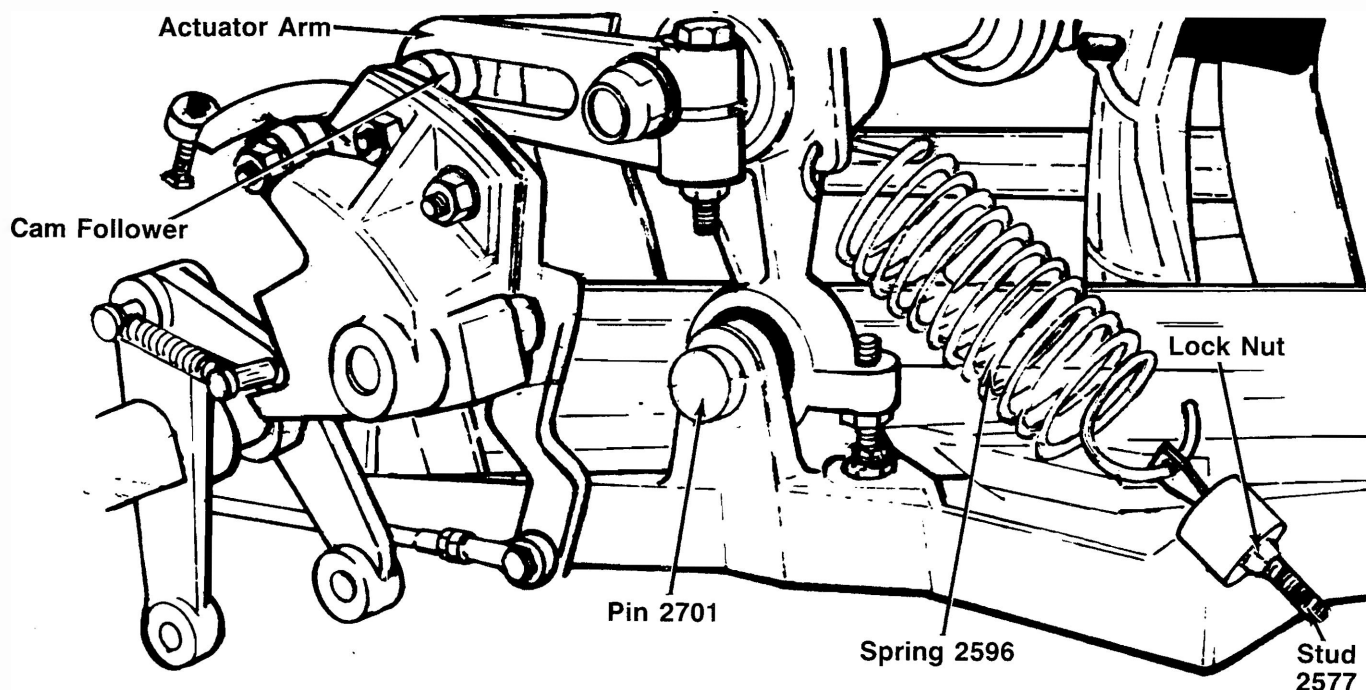
SPOT AND RESPOT LEVER STOP ADJUSTMENT

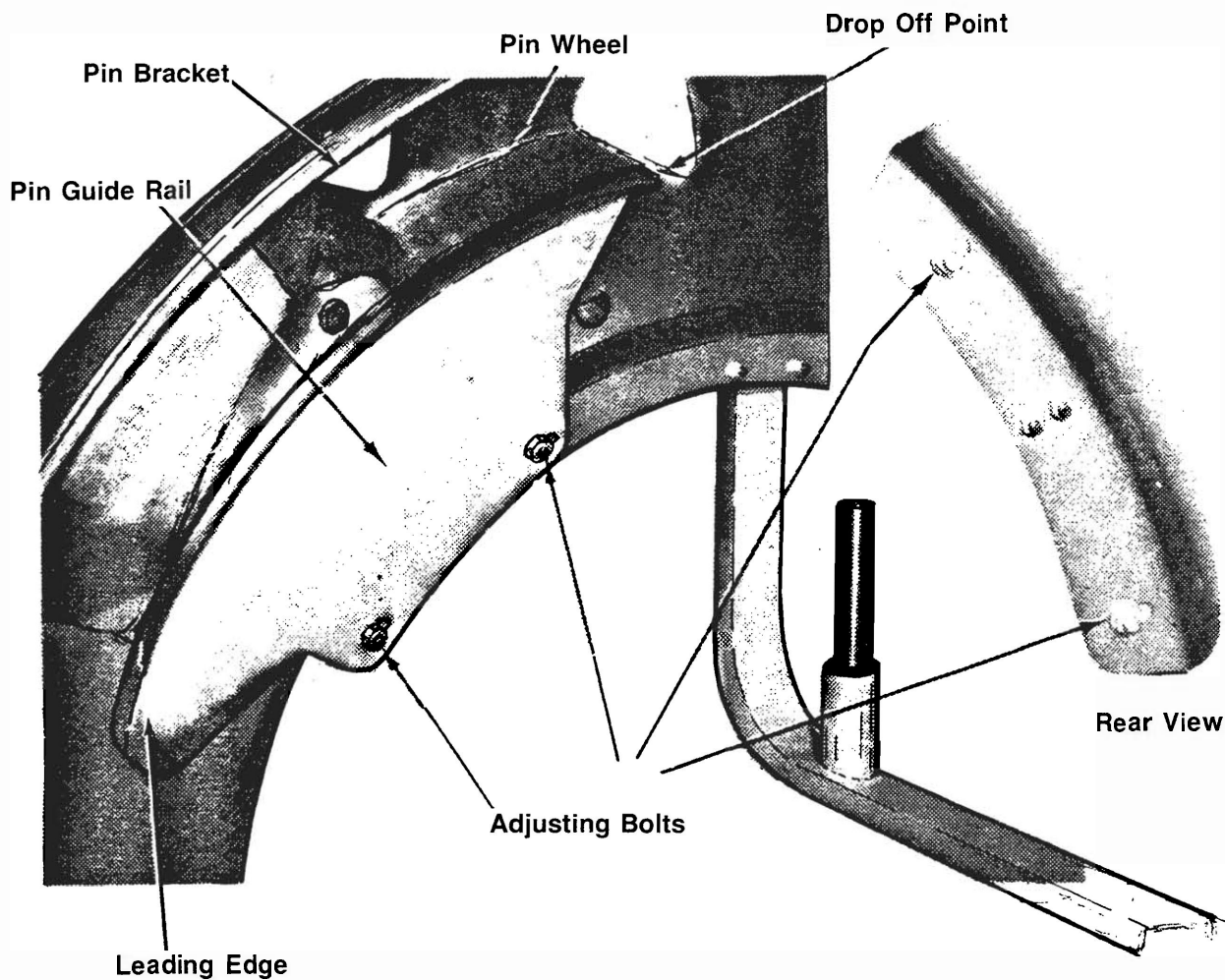
Turn the spot and respot lever stops in all the way. The stops will prevent damage to the spot and respot connecting rods in the event of a table malfunction. New machines may not have these stops.

YOKE ASSEMBLY REMOVAL

1. With table at zero position, disconnect spot and respot rods from spot and respot levers. See page 5.39.
2. Hold trip latch down on table drive eccentric and crank table down to 180°. Remove pins from spotting cups.
3. With the table in this position and the spotting cups horizontal to the deck, some of the tension is removed from spring 2596. Loosen lock nut on stud 2577. This will remove more tension from spring 2596. Before removing lock nut completely, hold tension on spring 2596 with spring puller. This will ease the removal of the lock nut and prevent from stripping the threads of the stud.
4. Remove the lock nuts from the pins (Part #2701) which join the yoke to the table in 4 places—2 in front and 2 in back.
5. Slide yoke to the right to free actuator arm from cam follower. The yoke can now be removed from the table.

NOTE: If the yoke is broken, it can be repaired with Yoke Repair Kit, Part #610 704 011. It is not necessary to remove the yoke from the table in order to make the repair.



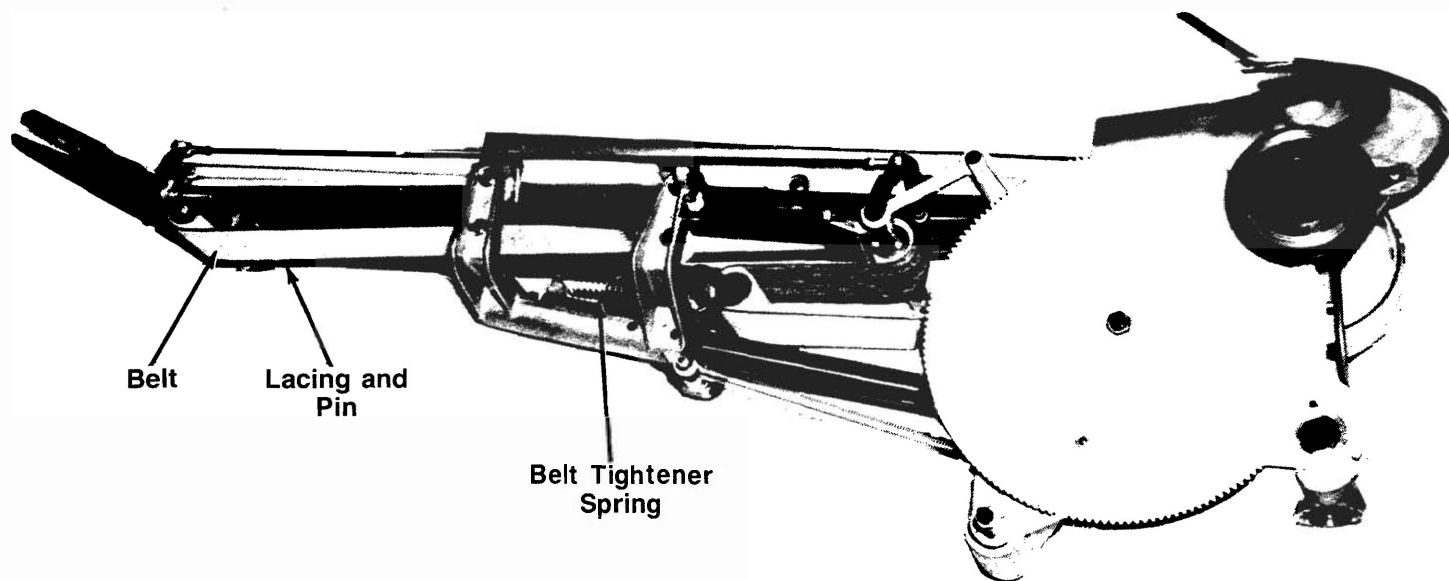


PIN GUIDE RAIL ADJUSTMENT

1. Position pin guide rail so adjusting bolts are centered in the slotted holes as shown. (Front and Rear)
2. Run machine and observe pins entering between pin wheel and leading edge of guide rail. Pins at this point should be held loosely so as not to jam the pin wheel.
3. Run machine and observe pins orienting to the distributor, (butt first and head first). Pins should drop onto center of distributor pan, and roll free of pin wheel. Adjust pin guide rail so pins are held securely but not tightly in pin wheel at drop off point.

DISTRIBUTOR OPERATION

The distributor transfers pins from the elevator wheel to the bin assembly. The large nylon gear serves a dual purpose. The outside of the gear contains a cam which moves the distributor to the various cup locations. The other side of the cam controls the telescoping action of the front portion of the distributor. Springs keep the cam followers against the cams. The distributor is driven through an adjustable clutch through its various positions.



DISTRIBUTOR BELT REMOVAL

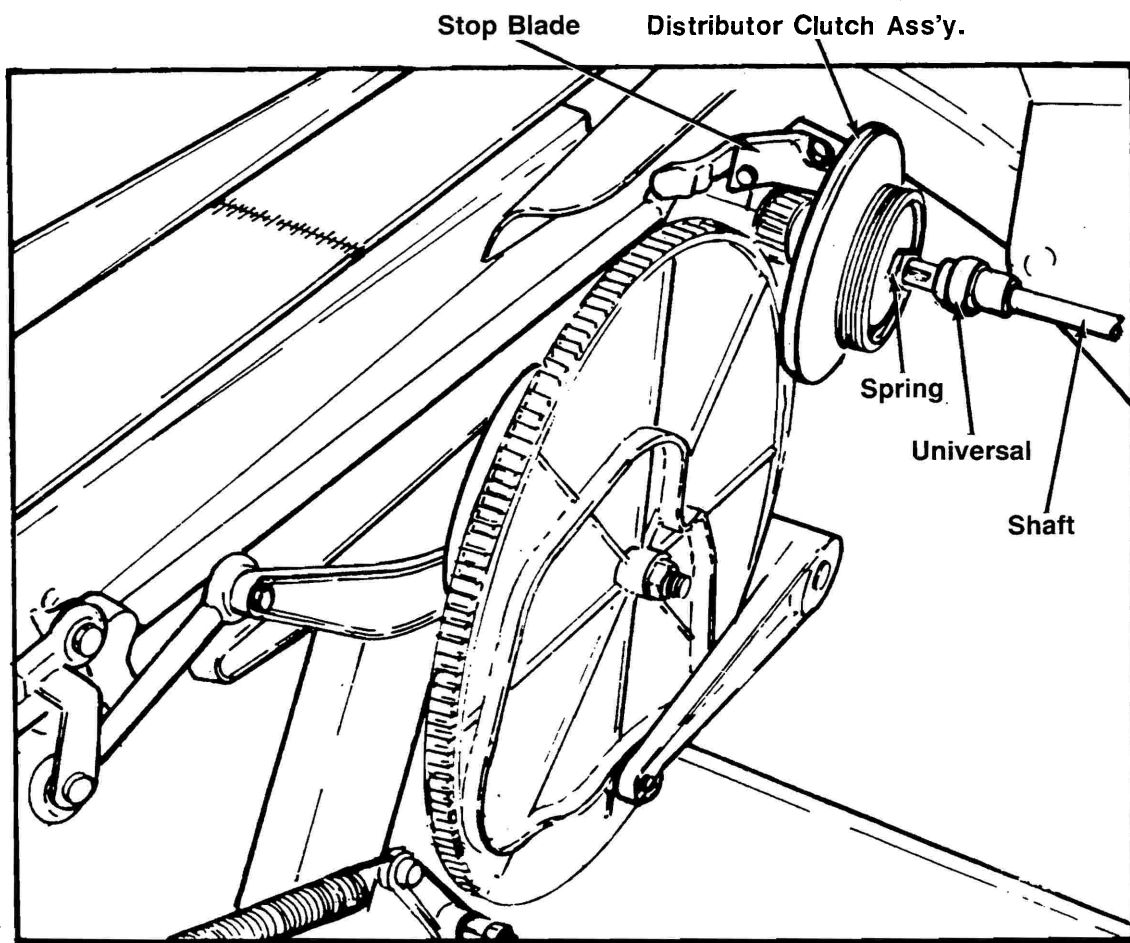
1. Remove belt tightener spring.
2. Locate belt lacing and remove belt pin. Distributor belt can now be pulled from the distributor. The approximate belt length is $116\frac{1}{4}" \pm \frac{1}{4}$.
3. To increase belt tension, cut off one end of belt. Spring length will increase one-half of the amount cut off belt. (If one inch is cut off belt, spring length will increase one-half inch.)
4. Use clipper belt lacer ST-3542 to install new clips on belt. See page 4.5 for use of belt lacer.

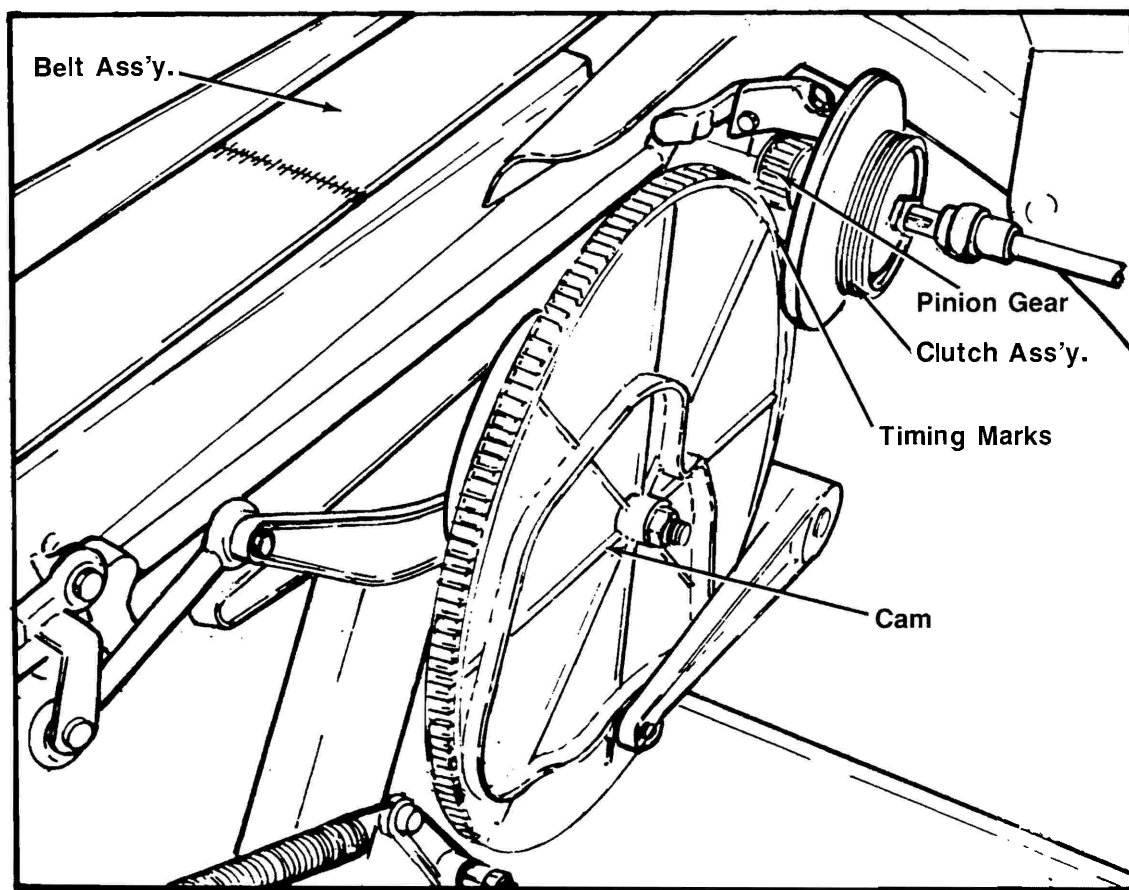
DISTRIBUTOR REMOVAL

1. Disconnect shaft and universal from distributor drive unit.
2. Remove springs from base of distributor. See page 5.46.
3. Make sure that elevator wheel is turned so that pin bracket is not directly above orientor pan of distributor. See page 5.41.
4. Lift distributor assembly upward out of support casting.

REPLACEMENT

1. Check level of distributor mounting bearing. This should be level in both directions. If adjustment is needed, loosen distributor bracket mounting bolts and position accordingly. Spacers are used between distributor bracket and machine weldment to insure distributor will clear bin assembly by at least $3/8$ ".
2. To replace distributor drive assembly, do above removal procedure in reverse order.
3. Check timing marks as indicated on page 5.44.
4. The clutch spring is to be set at one complete turn of the spring. The most difficult drive position is between the 6 and 10 pin feed positions. If the spring tension is not strong enough, the distributor will stall between the 6 and 10 positions. If too much tension is applied, it will cause stalling of the distributor or failure to index.
5. When the distributor is at the #1 bin position, the distance between the distributor orientor pan and the elevator wheel should be approximately $1/4$ ". If adjustment is necessary, loosen orientor pan attaching bolts and position accordingly.





DISTRIBUTOR CAM

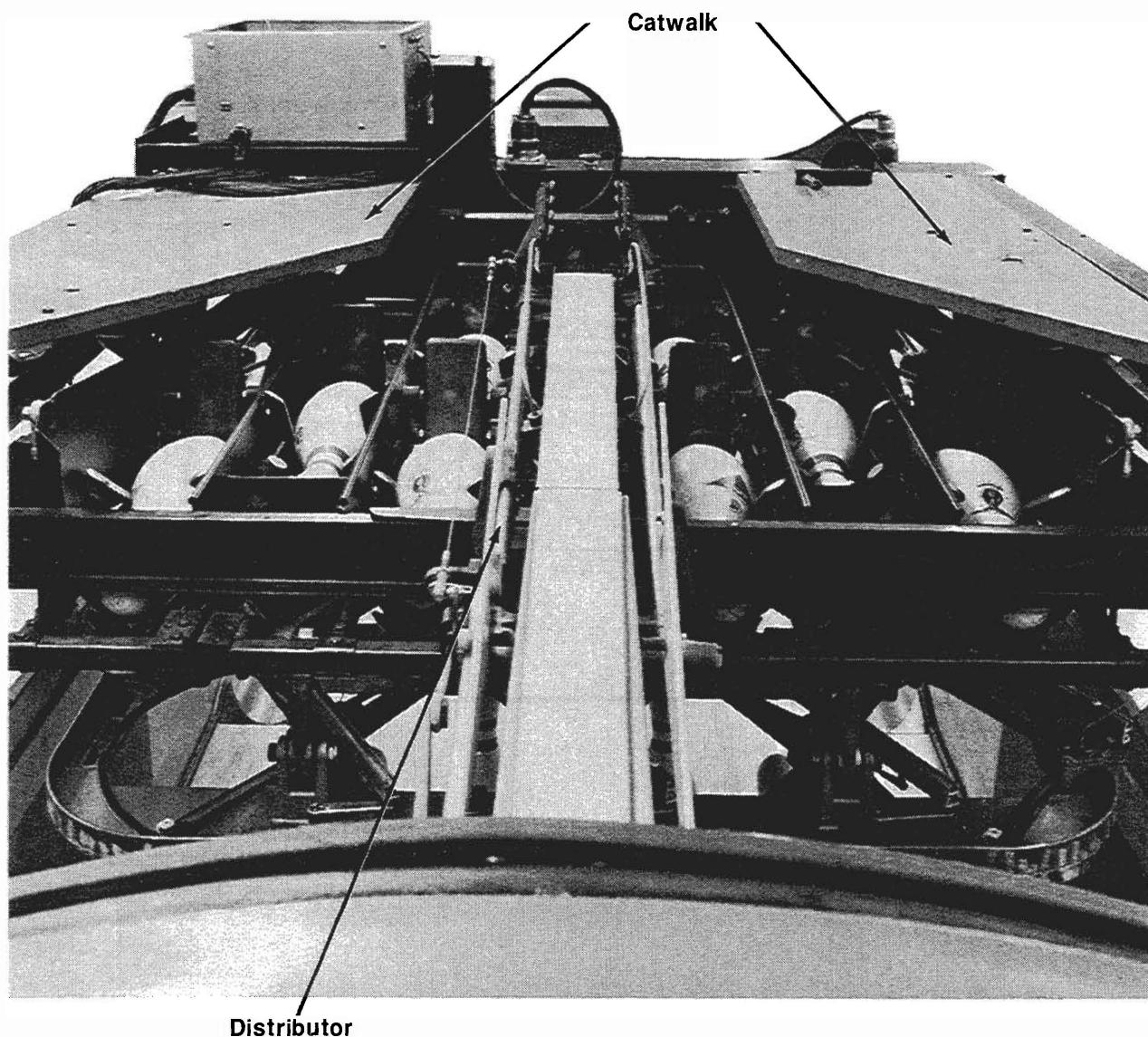
The cam has a bump on each side of its outer edge at the base of the valley between teeth. This locating mark and marked tooth of the pinion gear are to be matched for proper timing. The nylon cam is flexible and can be disengaged from the pinion gear by applying pressure towards the distributor where the gears mesh. The outer face of the large cam is marked for the feed position for each pin. The timing marks are in line only when the distributor is at the #1 bin position.

If the above conditions are not met, improper pin feed will result.

The inside of the cam controls the telescoping of the distributor.

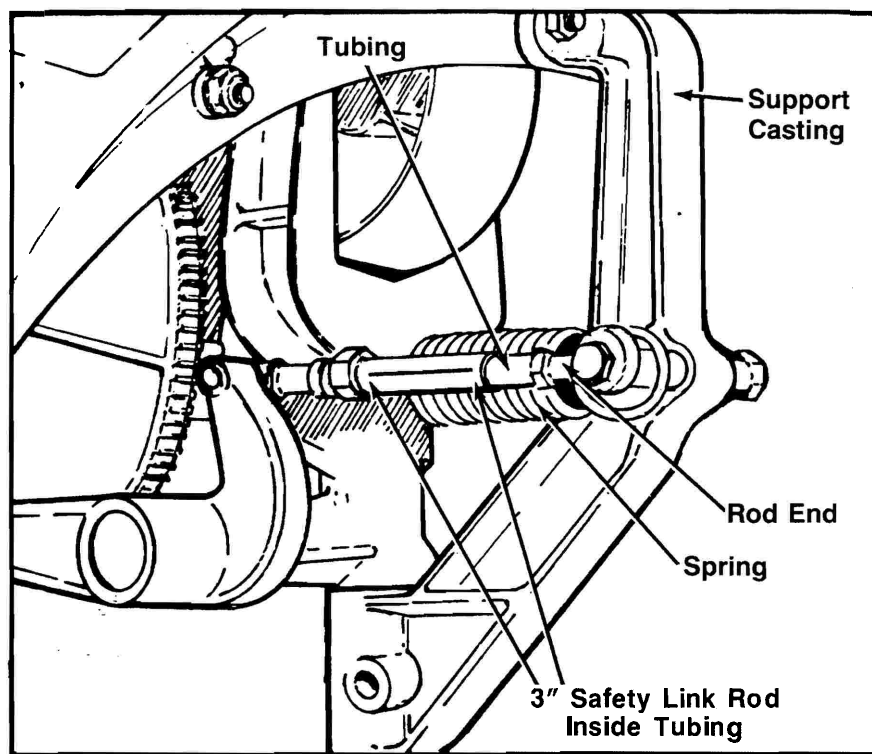
The outside of the cam controls the movement to various bin locations.

The pin feed sequence is 1, 3, 2, 4, 7, 8, 5, 6, 10, 9.



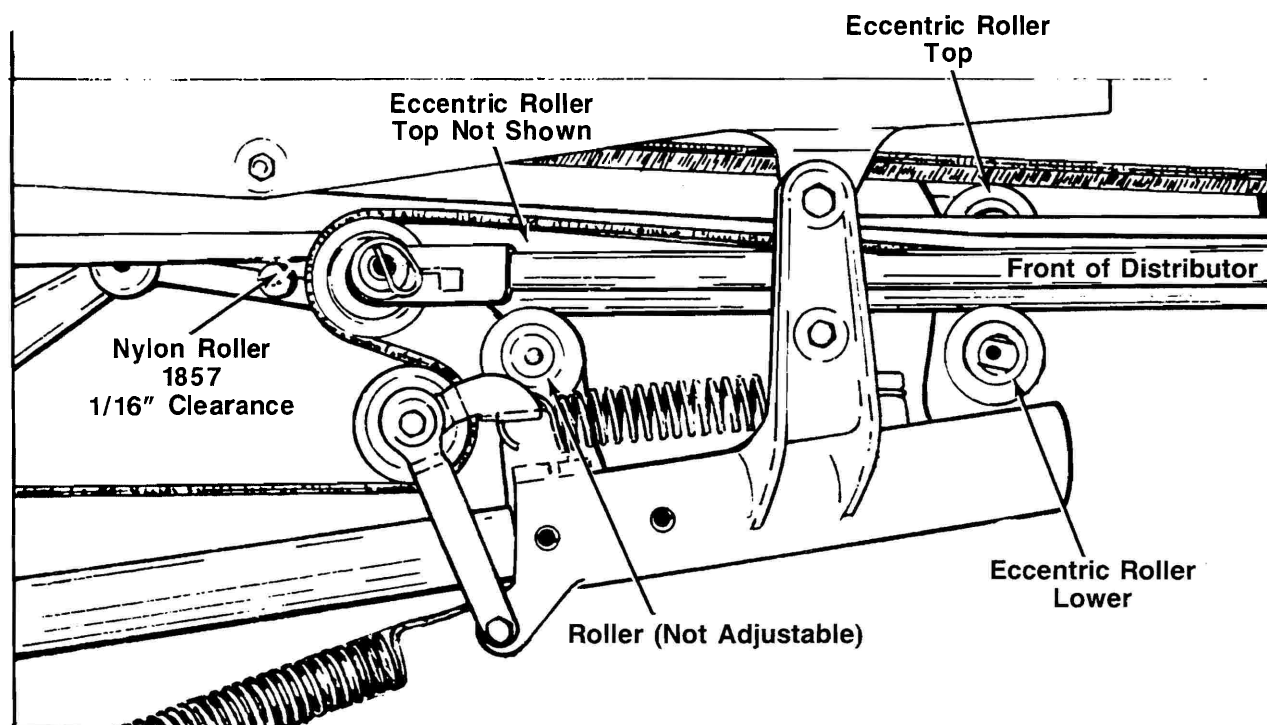
DISTRIBUTOR ADJUSTMENTS

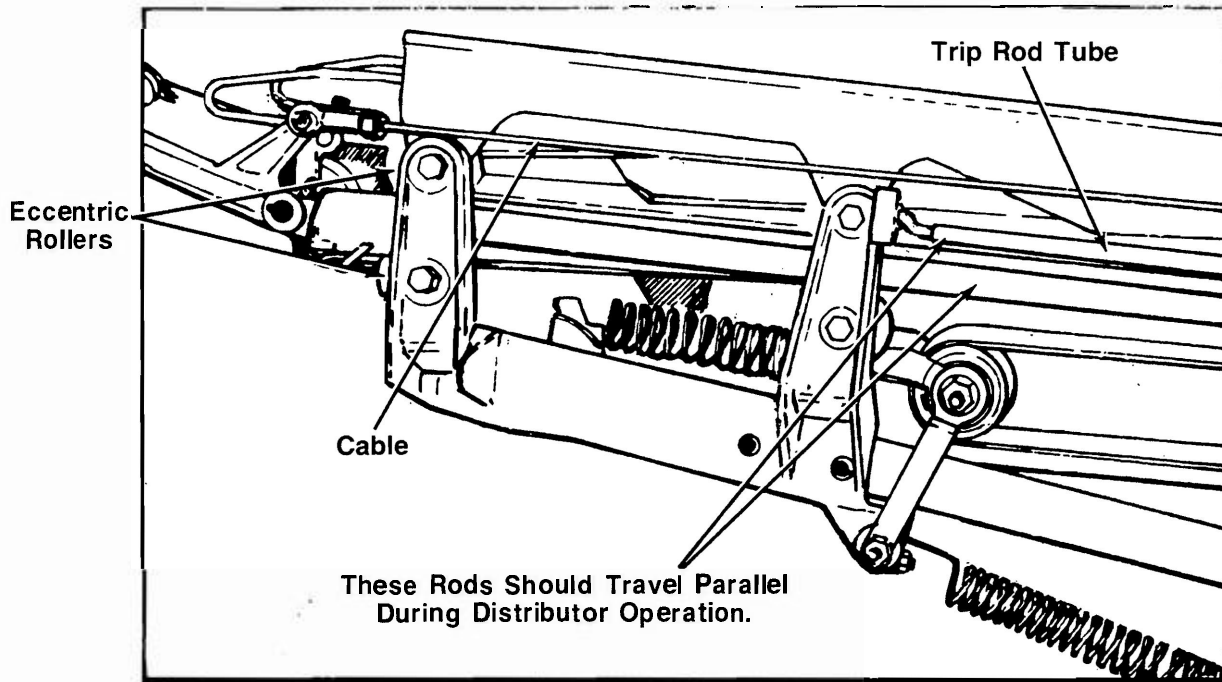
1. Index distributor trip arm assembly to position distributor at the #1 bin pocket.
2. Inspect nylon cam gear to assure that timing marks match with pinion gear. See page 5.44.
3. Distributor should be in line with the #1 and #5 bins. If distributor is not in line, loosen rod end and adjust tubing accordingly. See page 5.46.
4. Operate machine and note pin feed operation at the individual bin pockets. The tubing may have to be readjusted to obtain accurate feeding of pins.



DISTRIBUTOR ADJUSTMENTS

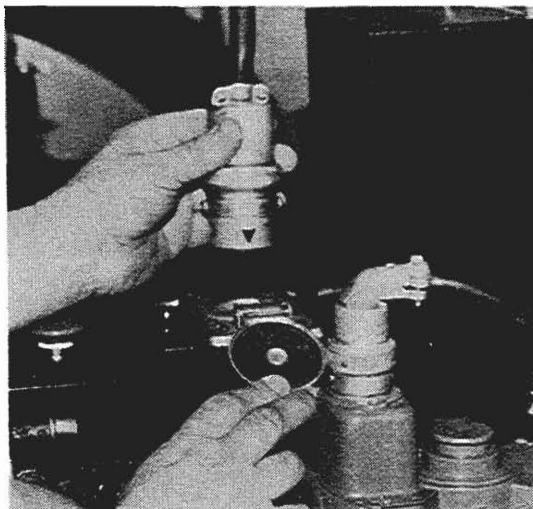
A safety link is provided to act as a distributor stop should the distributor be jarred out of position. The length of the safety link should not exceed 3" from the lock nut to the rod end to avoid bottoming in the mating tube. This dimension is set at the factory and need only be checked when replacing the link.





DISTRIBUTOR ROLLER ADJUSTMENTS

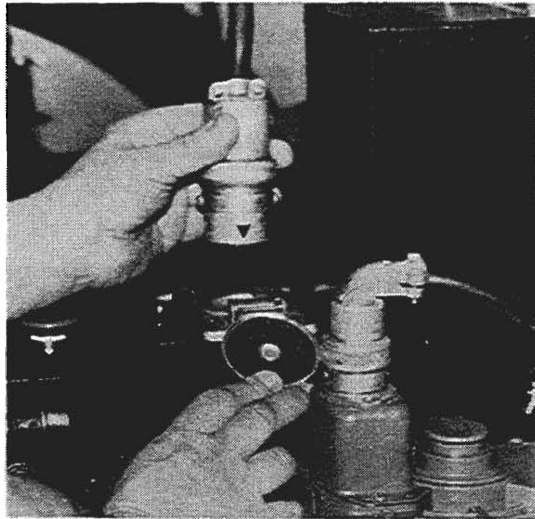
1. Starting with the distributor at the #1 bin position, telescope the distributor so that it is at its minimum length. See above picture.
2. Position front lower eccentric roller in its lowest position; that is, so that the distance between the roller and the carriage tube is at its maximum.
3. Bring the top rear eccentric roller down until there is a noticeable drag against the carriage tube when you turn the roller. (Too much drag could prevent the distributor from extending.)
4. Adjust the upper front eccentric roller until the trip rod tube and carriage tube are parallel to each other. See photo, page 5.46 and above photo.
5. Position the front lower eccentric roller up until it just makes contact with the carriage tube.
6. Adjust cable so that the clearance between the nylon rollers and the trip rod tube is equal. (This clearance will be about 1/16" in all positions of the distributor.) See photo, page 5.46.



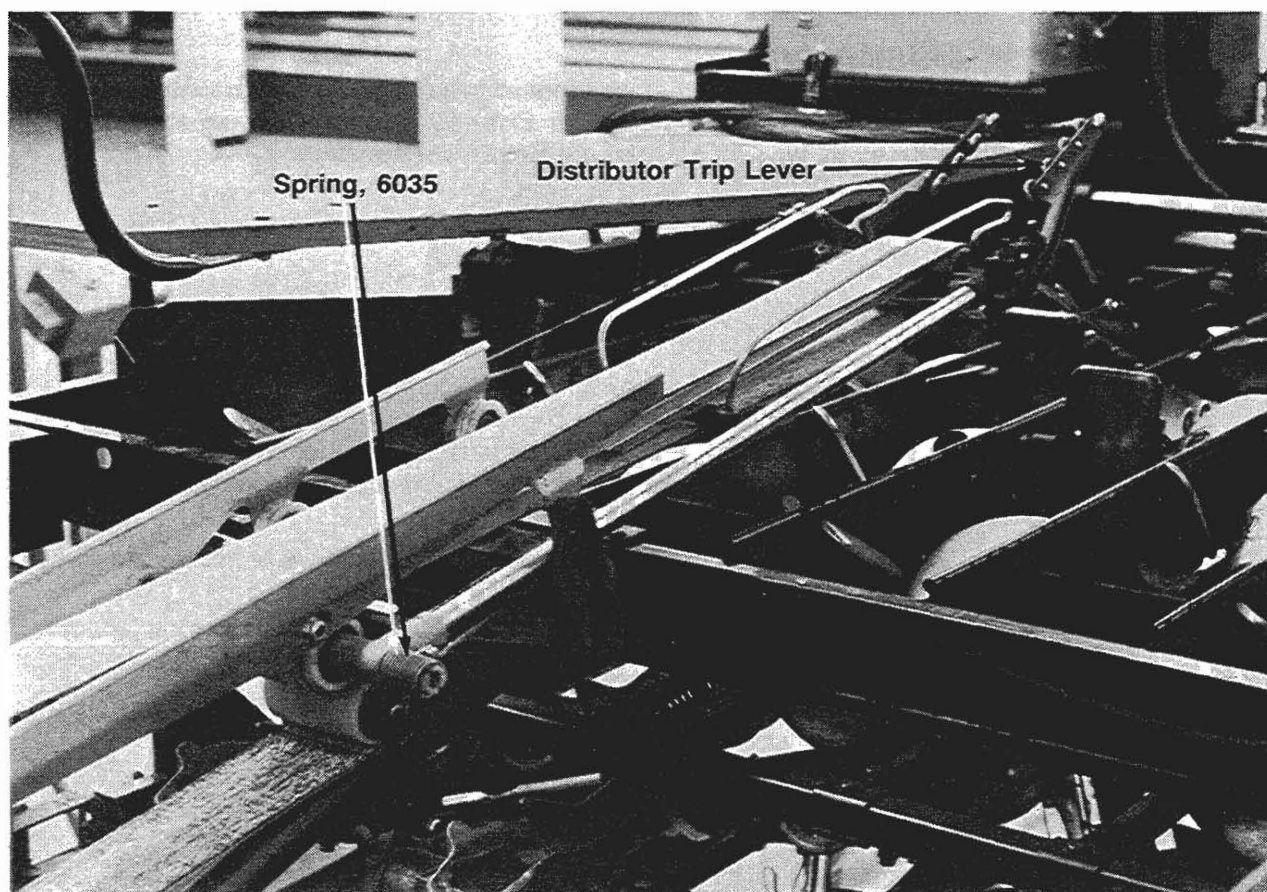
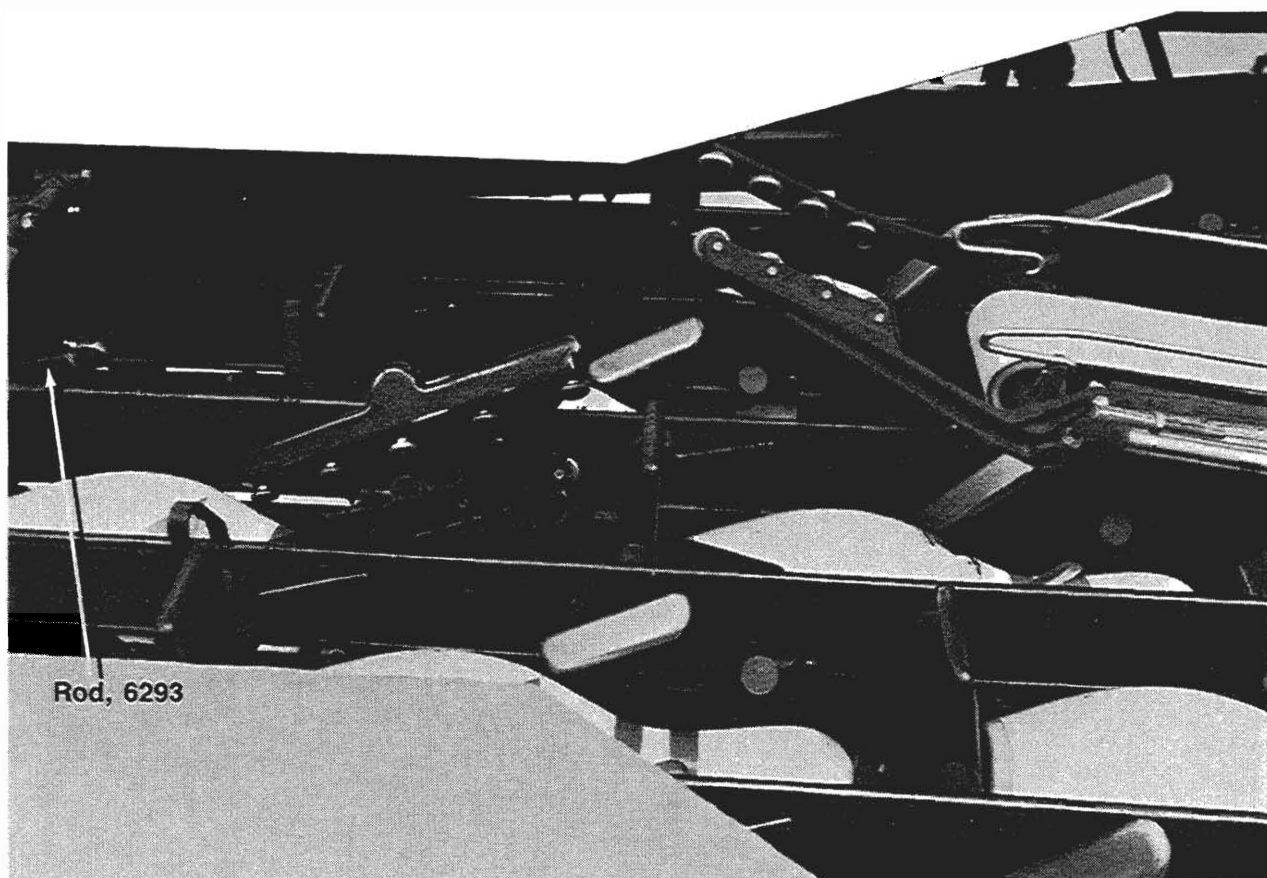
**Remove Power Plug
When Working on Machine.**

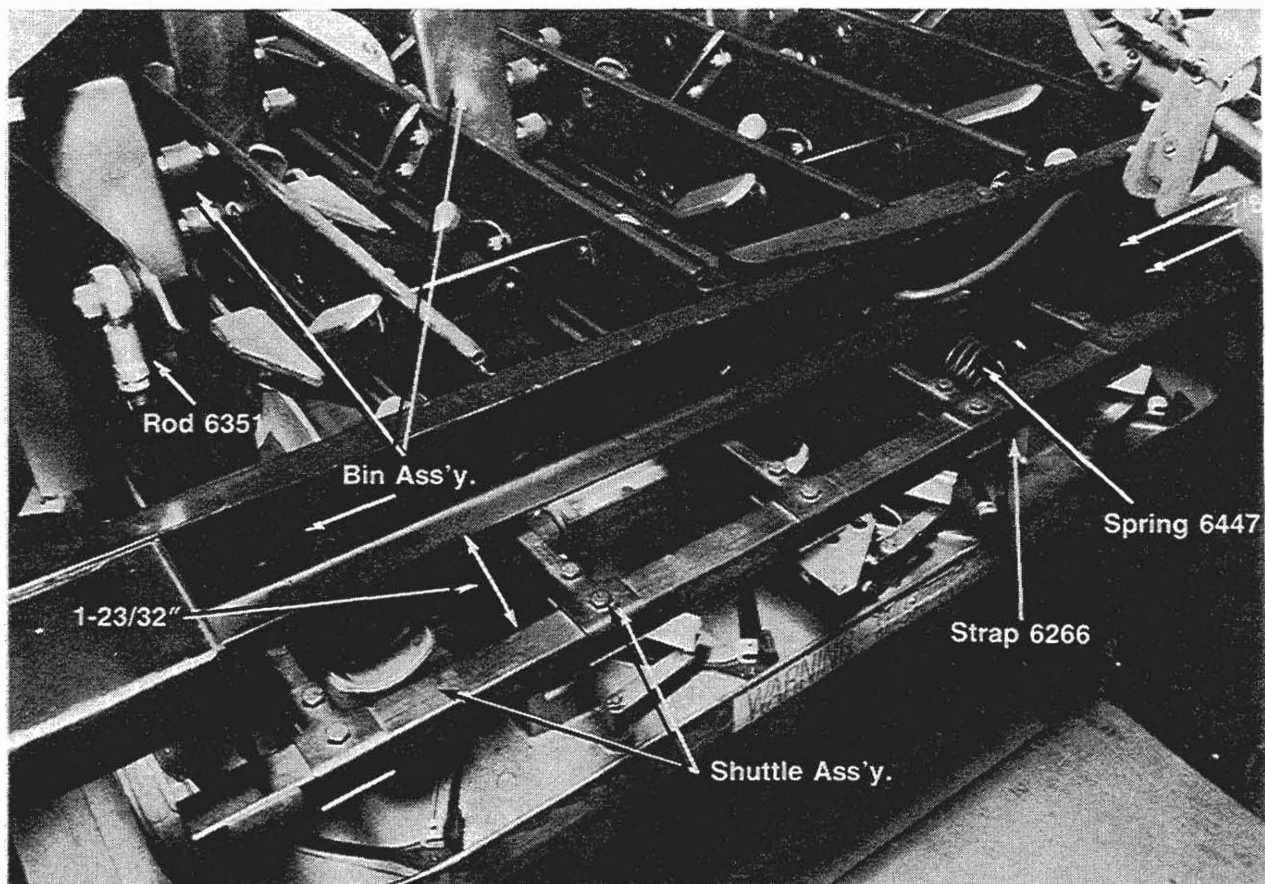
DISTRIBUTOR TRIP LEVER ADJUSTMENT

1. Operate trip lever, inspect for mechanical binds in lever and associated linkage.
2. The distributor trip lever assembly is spring loaded by means of spring, part #6035 located at the rear of tube #6004. This spring is factory set for 1/2 turn. See photo, page 5.49.



**Remove Power Plug
When Working on Machine.**





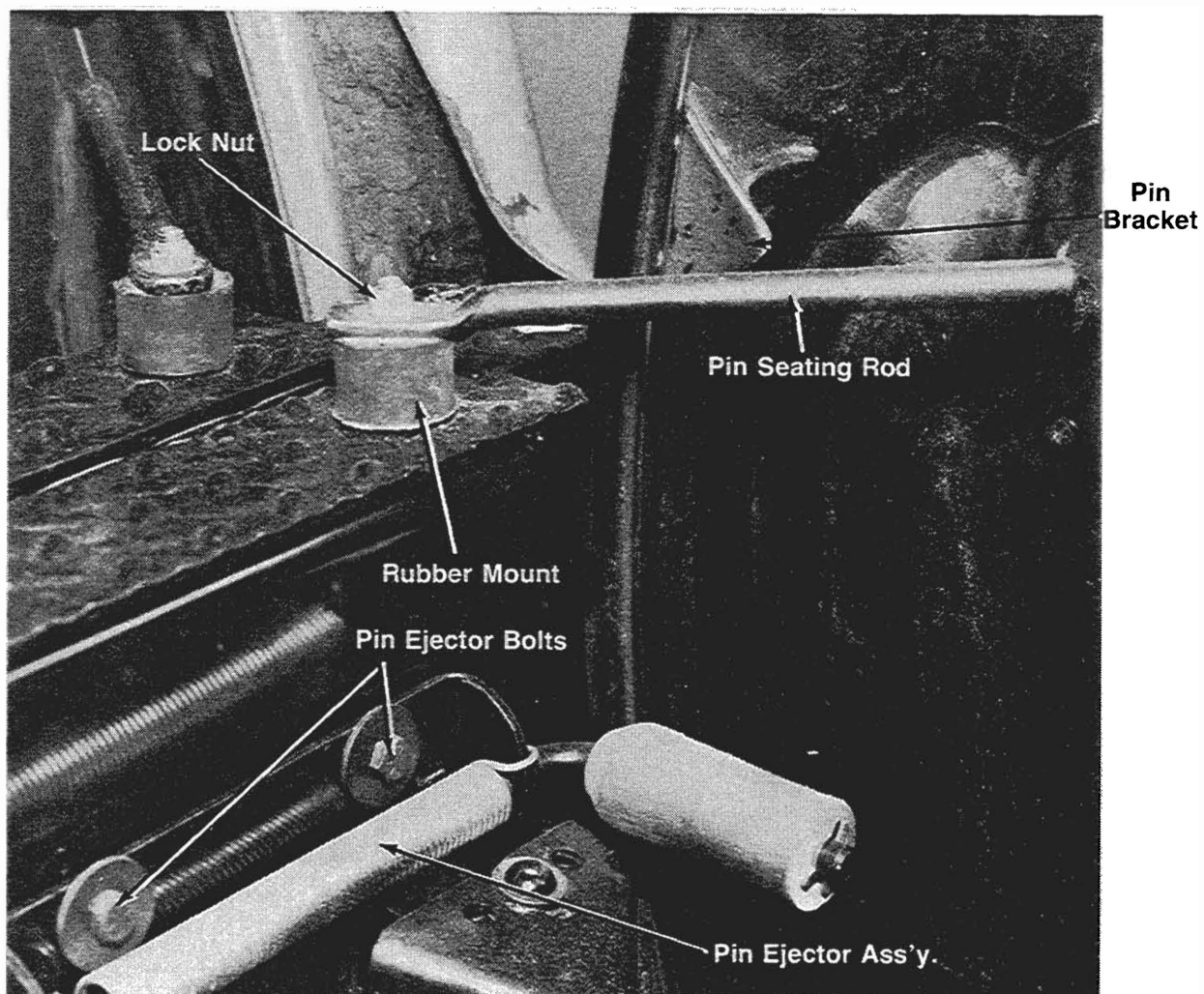
SHUTTLE AND BIN OPERATION

The shuttle holds the pins in the storage bin and drops them into the table spotting cups when required. The bin assembly should be centered over the spotting cups. Should it become necessary to reposition the bin, slots are provided at the rear corner support brackets for lateral movement.

ADJUSTMENT

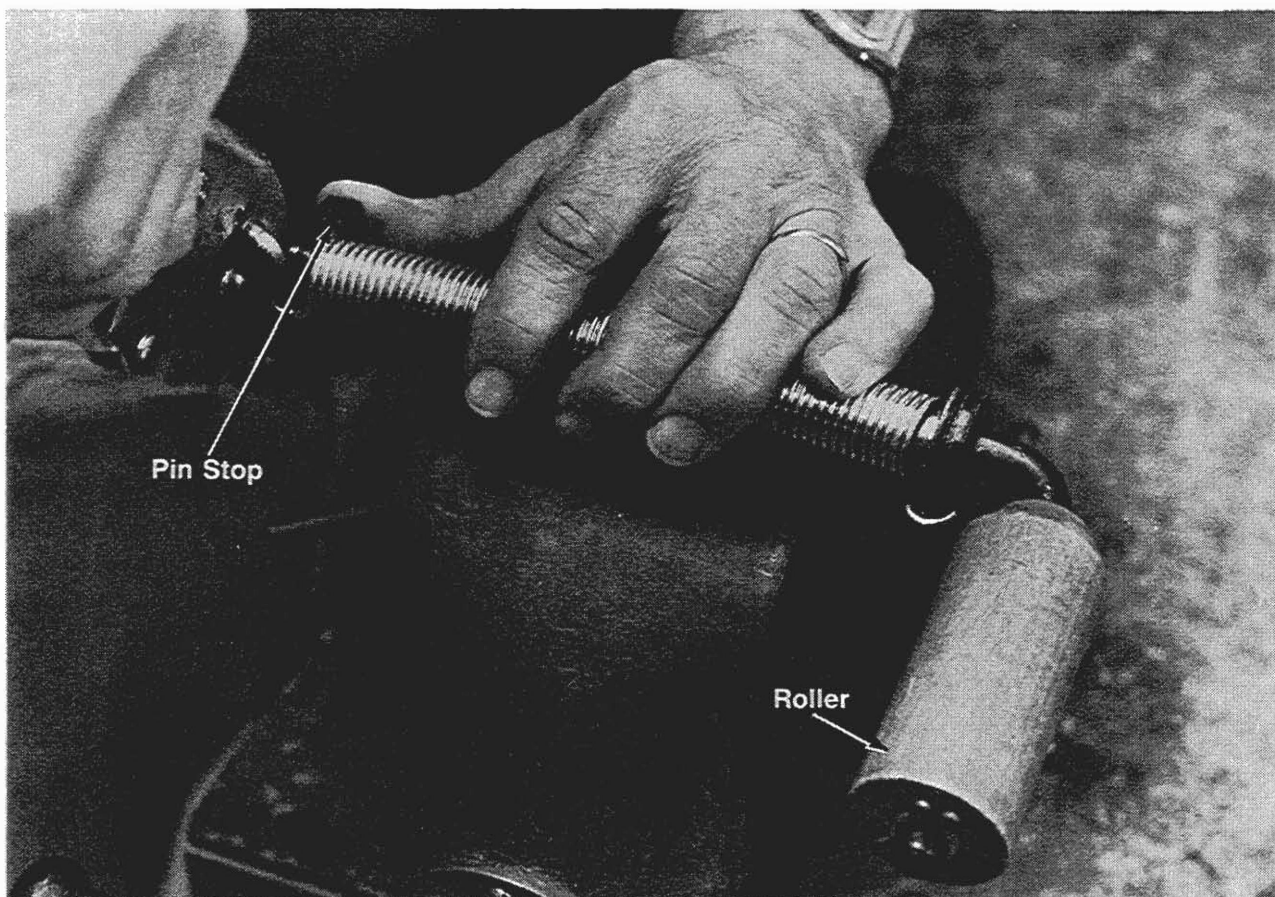
NOTE: Adjustments must be made with no pins in the bins.

1. There should be approximately $1\frac{23}{32}$ " between the back channel to the leading edge of the shuttle assembly measured at the center. To make this adjustment, loosen lock nut on connecting rod 6293 and adjust accordingly use guage ST 6519. See page 5.49.
2. The shuttle assembly should be centered directly under the bins. Adjustment is accomplished by re-positioning spring 6447 to another location on the spring strap 6266.
3. The distance from the rear frame of the bins to the shuttle assembly should be $\frac{7}{8}$ ". Adjust rod 6351 to obtain this dimension (each side).



PIN SEATING ROD ADJUSTMENT

Loosen lock nut and position rod so that it clears the Pin Bracket by approximately 1/2". Tighten lock nut.



PIN EJECTOR REMOVAL

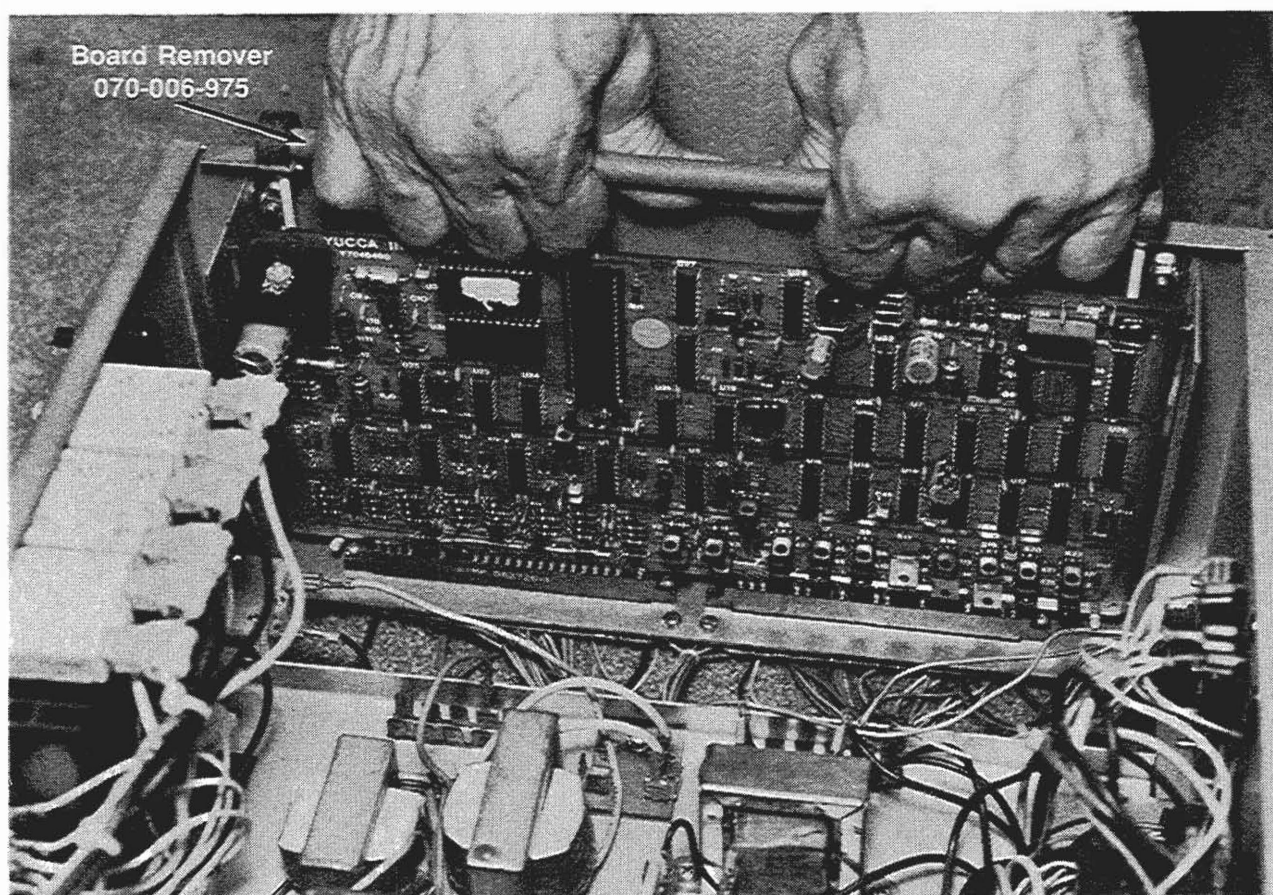
1. Loosen bolts and remove pin ejector ass'y. From side plate of machine. See photo page 5.51.

REPLACEMENT

1. Position pin ejector ass'y. in machine so that the leading edge of roller ass'y. is in line with the machine plow.
2. Tighten bolts.

ADJUSTMENT

1. Insert pin ejector ass'y. (Part 000 024 507 L.H. or 00 024 508 R.H.) in vise as shown in photo above.
2. Remove "X" washer and slide shaft out of bearing end.
3. Grasp end of spring with vise grip pliers and wind spring 1½ turns.
4. Maintaining tension on spring, position roller and shaft and install pin stop.
5. Release vise grip pliers and spring will fall into position.
6. Install "X" washer in groove provided on shaft.



PRINTED CIRCUIT BOARD REMOVAL

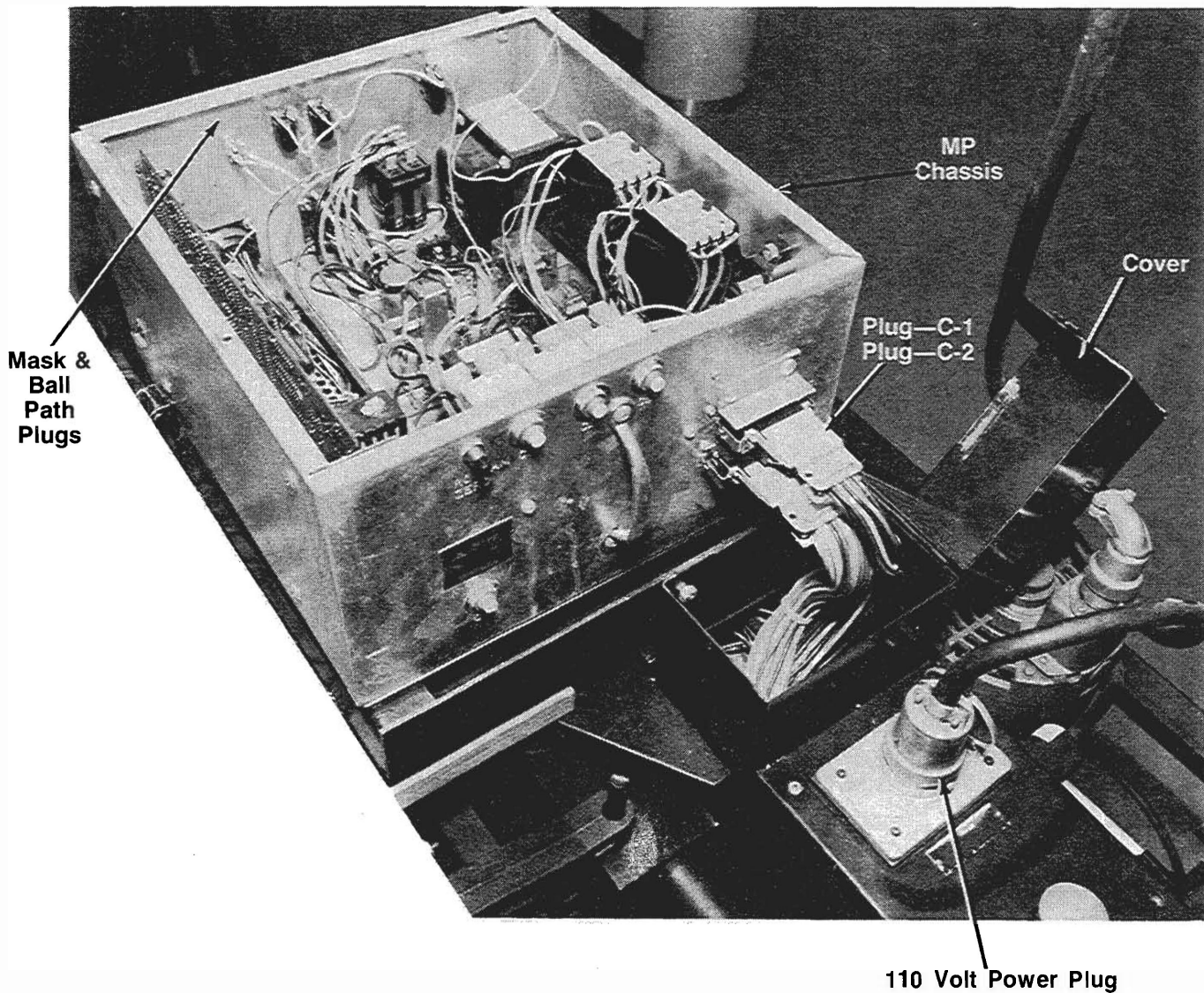
NOTE: Remove power and wait one minute before removing boards.

1. Insert board puller under board to be replaced as shown in the above picture. (Care should be exercised as puller may become caught in stray chassis wires.)
2. Apply an upward pressure using the thumbs as leverage, and ease the board out of the socket.
3. When inserting a new board, be sure the printed circuitry of the board mates with the contacts of the plug.

NOTE: Board removal tool not required with new M/P circuit boards.

CIRCUIT BOARD HANDLING PRECAUTIONS

1. **DO NOT** remove the circuit board while power is on.
2. **ALLOW** one minute capacitor discharge period after removing power before removing circuit board
3. **USE** a board removal tool if circuit board does not have card ejectors.
4. **WEAR** a grounding strap when working with microprocessor boards.
5. **DO NOT** handle boards with dirty hands.
6. **DO NOT** flex the circuit board, this could damage the foil.
7. **DO NOT** write on the boards, this could cause a short
8. **IF** you need to indicate a defective part or solder joint, use a piece of masking tape.
9. **EXAMINE** a suspected bad board for broken or loose components.
10. **USE** A pencil eraser to clean circuit board contacts where they mate with the terminal strip.
11. **RECHECK** a suspected bad board in another chassis before returning.
12. **KEEP** circuit boards in their protective container until they are to be installed in the chassis,
13. **STORE** spare boards in the box they are shipped in.



CHASSIS REPLACEMENT

1. Remove 110 volt power to the machine by pulling the power plug.
2. Release the camloc handles which hold the chassis to the frame of the machines.
3. Loosen the plug cover and disconnect the "C" and ball path plugs by firmly depressing the spring clips and pull outward.
4. Lift chassis out of position and replace with new one following the reverse order.
5. Apply power to the pinspotter and check operation for first ball, second ball, strike, and foul cycles.

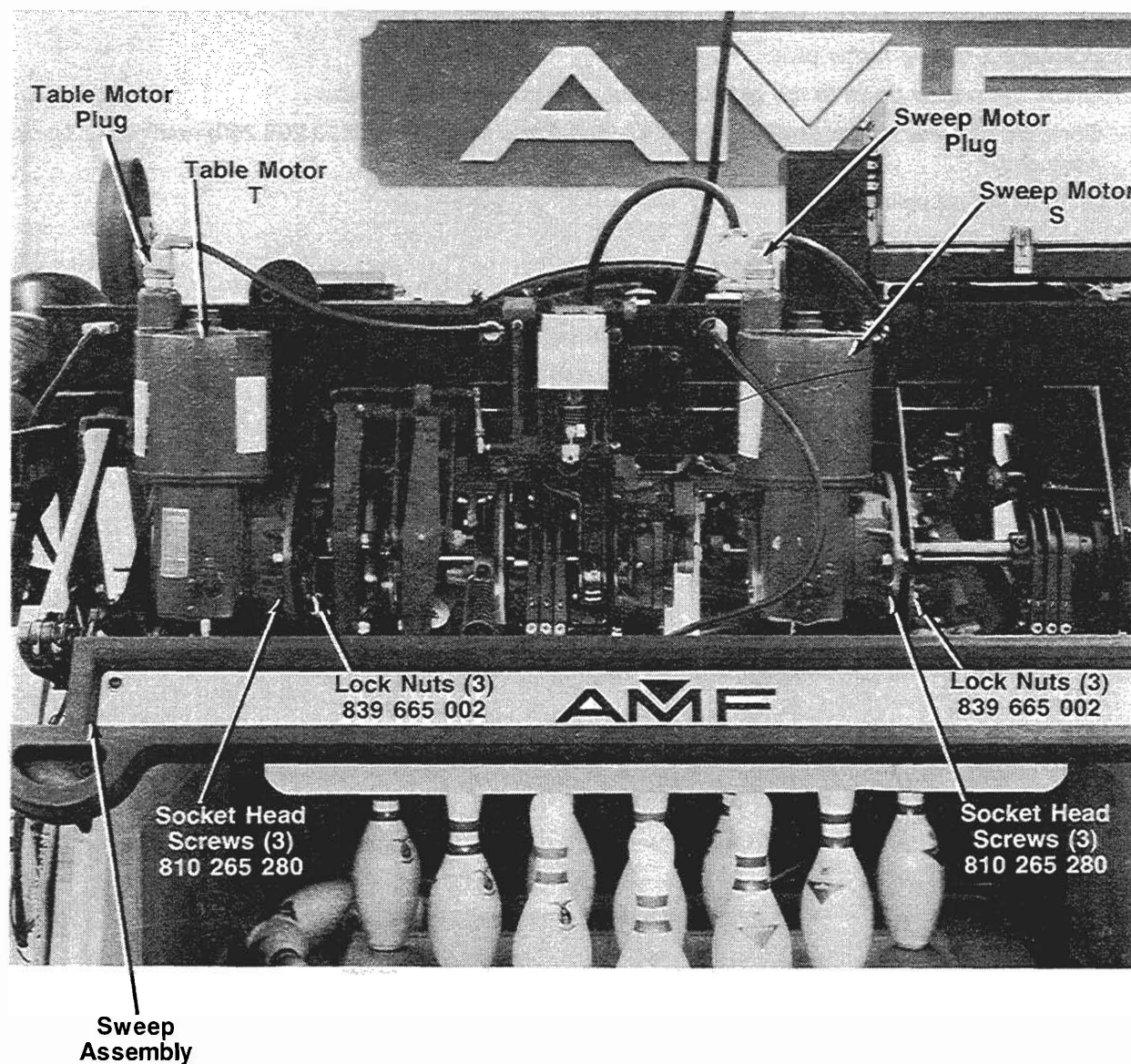


TABLE MOTOR REMOVAL

1. Disconnect table motor plug.
2. Crank table down in spotting position. Place a wooden block between the table and the pin deck.
3. Crank the sweep down to the guard position.
4. Remove the three lock nuts (Part #839 665 002) and screws (Part #810 265 280) holding motor on to drive shaft.
5. Slide motor off splined shaft.

REPLACEMENT

1. Spread a light coating of general purpose grease on splined motor drive shaft.
2. Slide motor onto shaft and install the three screws and lock nuts.
3. Connect table motor plug.
4. Run table and sweep to zero position.

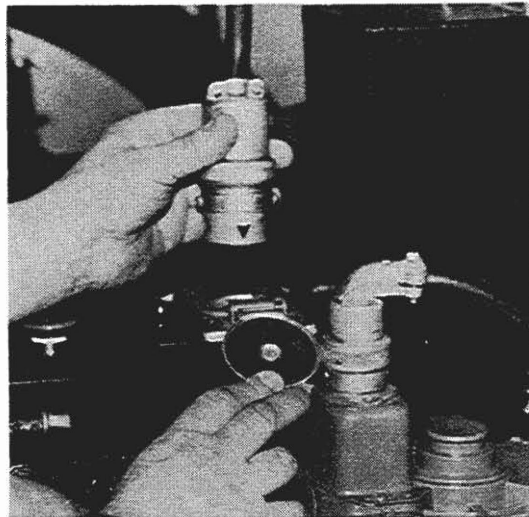
SWEEP MOTOR REMOVAL

1. Disconnect sweep motor plug.
2. Crank the sweep down to the guard position. See page 5.55 for photo.
3. Remove the three lock nuts (Part #839 665 002) and screws (Part #810 265 280) holding motor on to drive shaft.
4. Slide motor off splined shaft.

REPLACEMENT

1. Spread a light coating of general purpose grease on splined motor drive shaft.
2. Slide motor onto shaft and install the three screws and lock nuts.
3. Connect sweep motor plug.
4. Run sweep to zero position.

NOTE: Table and sweep motors are interchangeable.



**Remove Power Plug
When Working on Machine.**

CARPET REMOVAL PROCEDURE

NOTE: The adjacent machine must be turned off and not used while the carpet is being removed. The cushion may be removed to provide more working room.

1. Disconnect carpet and ball lift drive belts from carpet pulley drive assembly.
2. Remove paddle from rudder arm
3. The front roller must now be released from its bearing supports. See page 4.4 for instructions.
4. The front roller can now be removed by rolling it over the bounce plate and out the ball opening into the adjacent machine.
5. Unhook rear roller support from its bracket and tip rear roller from its bearing support.
6. Remove carpet drive pulley. (It may be necessary to slide rear roller out several inches in order to provide enough clearance to remove pulley.)
7. Remove four lock nuts holding bounce plate assembly to pit support brackets. Lift and slide bounce plate several inches toward the front of the pit.
8. The rear roller can now be removed by first freeing the roller drive shaft from the side plate, then roll it over the bounce plate and out the ball opening into the adjacent machine. **[NOTE: It may be possible to drop rear roller down and slide it under next machine through access holes in kickbacks.]**
9. Wrap carpet around bounce plate and remove carpet and bounce plate together from machine. **NOTE:** The carpet should be run in the direction of the arrow stamped on the carpet. If no arrow is visible, mark the direction of rotation before removing the carpet from the machine.

CARPET REPLACEMENT PROCEDURE

1. Note arrow on carpet. Place bounce plate between carpet with "V" shaped cut-out toward ball exit. Wrap carpet around bounce plate and place in pit slightly forward on pit support brackets. Do not fasten bounce plate down at this time.
2. Replace rear roller using opposite procedure from removal.
3. Place rear roller bearings in bearing supports. Hook up rear roller support bracket and drive pulley and belts.
4. Place bounce plate in proper position on pit brackets and tighten four lock nuts.
5. Replace front roller in pit, but do not position in bearing supports yet.
6. The front roller can now be positioned. See page 4.4 for instructions.
7. Replace paddle on rudder arm.

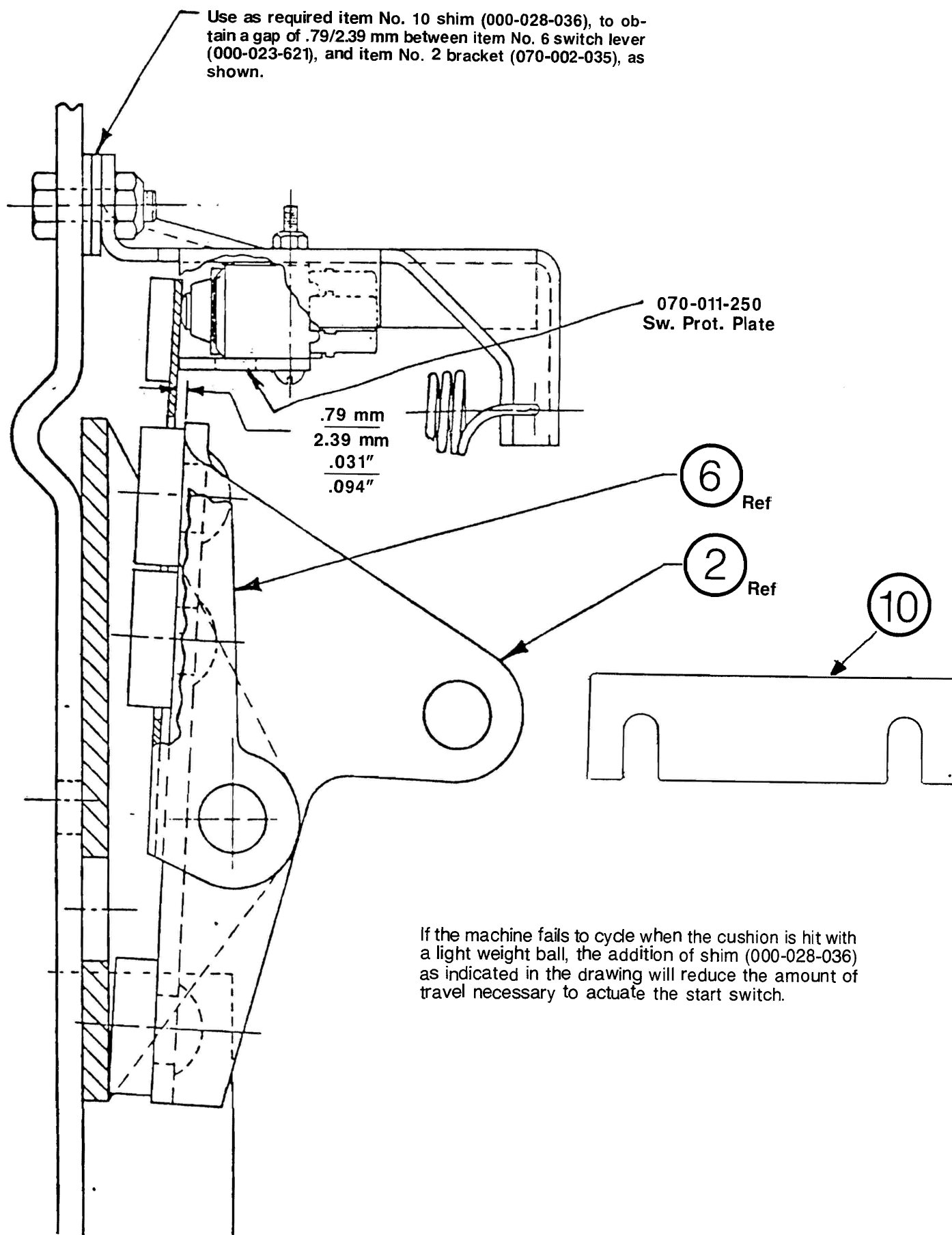
CUSHION REMOVAL

1. Unhook pin curtain.
2. Remove "X" washer 963 600 002 from pin 22821 and remove pin 22821 to release shock absorber from cushion assembly.
3. Remove three screws (Part #809 865 165) from Box 22788 holding mounting block. Remove from one side of machine only. [ball lift side if possible]
4. Wrap curtain around cushion and slide box and cushion assembly until cushion is free from mounting block on opposite side. Remove from machine.
5. To replace, reverse the above procedure.

NOTE: In order to replace a rubber rivet:

- a) Lubricate the raised portion of the stem of the rivet with liquid soap.
- b) Push rivet through cushion assembly until about 1" protrudes through the wooden plank.
- c) Use Carpet Installing Tool 784 003 000 and place the hole which is drilled in the tool over the end of the rubber rivet protruding through the wooden plank.
- d) Use a cranking motion to pull rivet through cushion.

ADJUSTMENT INSTRUCTION START SWITCH LEVER



SWEEP SHAFT REMOVAL AND REPLACEMENT
(Refer to page 15 in parts section)
NOTE: Remove power and motor plugs

REMOVAL

1. Loosen clamp stud, item 15, in SA and SB-SC cams. Tap studs to free cams, crank sweep to first guard.
2. Remove bolt, item 40, from 3162 rod at end of crank arm.
3. Locate set screw in locking collar of bearing, item 20, at right end of sweep shaft, loosen set screw, locate hole in collar-use punch and hammer to rotate collar freeing it from bearing race.
4. There may also be a bearing at motor end of shaft, it will have a locking collar that must be loosened. This bearing is no longer used. A shaft plate, item 32, has been used since serial number 114698. The bearing at motor end of shaft can be removed and shaft plate 070-006-765 used in its place.
5. Sweep shaft, item 29, can now be removed by pulling to right on crank arm, item 28.
6. Loosen bolt, item 39, in crank arm. Slide arm from shaft, remove key, item 30, from shaft.

REPLACEMENT

1. Insert key, item 30, into shaft. Key must fit tight. Slide crank arm, item 28, on shaft, over key until shaft is flush with outside edge of crank arm. Tighten bolt, item 39.
2. Slide shaft through bearing, item 20, about six inches. Slide bearing collar on shaft. (Eccentric side of collar toward bearing) install SB-SC cam, item 26, on shaft, than SA, item 27.
3. Spline end of shaft should be coated with grease. Slide shaft into motor. Spline end of shaft should extend approximately 1 11/16 inches to left of shaft plate.
4. Move bearing collar to right over bearing race, then rotate with punch and hammer until tight. Tighten set screw.
5. Reconnect 3162 rod to crank arm. Crank sweep through to make sure crank arm clears bearing retainer bolts and rocker shaft.
6. Adjust sweep cam levers and sweep cams per service manual page 5.18.

TABLE SHAFT REMOVAL AND REPLACEMENT
(Refer to page 15 in parts section)

REMOVAL

1. Turn off pin elevator switch, sweep pins into pit. Cycle pinspotter to place second set of pins on deck. Sweep pins into pin then stop sweep at guard and remove power plug, motor plug and pit light.
(Cover lane with cardboard or old carpet)
2. Disconnect spot rod from lever, item 10. (Be careful of spring tension) disconnect respot rod from lever. Loosen bolts in shuttle cam, item 12 loosen nut on table cam stud, item 15, and tap free cam assembly.
3. Crank table to 180 degrees in spotting action-support table on block of wood.
4. Remove shuttle spring.
5. Remove bolt, item 39, and bearing, item 22 from clevis.
6. Loosen clamp bolt through table drive assembly, item 21, slide assembly to right off shaft, item 7. Remove key, item 30 from shaft.
7. Remove spring, item 31 from spot and respot levers. (See page 5.39) tie levers up out of the way.
8. Move shuttle cam, item 12 to left then remove key from under cam.
9. Remove bolts, item #42 from cam switch assembly, item 13. Move Table cam assembly, item #14 to left with shuttle cam.
10. Locate and loosen set screw in bearing collar, item 20 at right end of shaft. (From bottom-up behind solenoid housing) locate hole in collar-use punch and hammer to rotate collar to free it from bearing race.
11. Move shaft, item 7 to right until left end is free of motor and shaft plate, item 32. Bring left end of shaft forward out of machine. The respot, spot, shuttle and table cams comes out with the shaft. (Note: if the machine has a bearing at the motor end of the table shaft, it may be necessary to remove the table motor and inboard bearing to gain clearance to free the shaft. This bearing is no longer used and may be replaced with shaft plate 070-006-765).
12. Measure distance from end of shaft to spot and respot cams, item 8 so cams can be accurately positioned on new shaft.

REPLACEMENT

1. Install key, item 30 in shaft, item 7 and position spot and respot cams, item 8 on shaft. Slide shuttle cam, item 12, table cams, item 14, and bearing lock collar on shaft. Coat spline end of shaft with grease.
2. Inspect bearing, item 20, then slide right end of shaft through bearing until left end of shaft can be installed through shaft plate into motor.
3. Slide shaft into motor until spot and respot cams line up with cam followers on spot and respot levers. Reconnect spot and respot lever springs. (5.39).
4. Move bearing lock collar over bearing and tighten with punch and hammer. Tighten set screw.
5. Install shuttle cam key and move shuttle cam into position. (Tighten bolts after table is at zero).
6. Install table drive assembly key and table drive assembly. Tighten clamp bolt. (Caution: do not push table drive assembly on shaft so far that it will strike bolts attaching bearing retainer, item 19).
7. Install bearing, item 22 and bolt, item 39, in over travel clevis, install shuttle spring then crank table to zero.
8. Reconnect spot and respot levers.
9. Reinstall cam switch assemble bolts. Position table cam behind cam levers. Adjust levers and cams. (5.29).
10. Install pit light, crank sweep to zero. Connect power to machine and check operation.

TABLE TORQUE TUBE ASSEMBLY REPLACEMENT**(Refer to pages 21, 39 & 43 in parts section)****NOTE: Remove Power Plug and Motor Plugs.****REPLACEMENT**

1. Store all pins in pit area. Obtain two 2 x 4's about 4 feet. Place on pin deck, one across the 7-10 line and the other over the 2 & 3 pin spots.
2. Disconnect the spot and respot rods, item 1 & 2 page 43, from levers. (be careful of spring tension).
3. Crank table to top dead center and disconnect counter balance springs, item 21 page 39, from weldment.
4. Crank table into spotting position. Stop at bottom dead center with table resting on 2 x 4's.
5. Remove bolt; item 34 page 21, from yoke weldment assembly. Disconnect off spot switch wires from switch, item 6 page 39, and remove cable clamp. If the table cable is attached to the torque tube weldment, remove cable clamps.
6. Remove bolts (early machines may have pins) item 26 page 39, that pass through the weldment and bushings on table supports. Watch for spacers item 15 & 16 page 39, between weldment and bushings.
7. While supporting the torque tube weldment (it can be secured to the box beam with mechanics wire) remove bolts from pillow block bearings, item 22 page 39, remove torque tube from machine.
8. Remove the off spot lever, spring, pin and adjusting screw, items 2, 3, 4 & 5 page 39, from the torque tube.
9. Install off spot lever, spring, pin and adjusting screw on replacement torque tube. Install bearings on torque tube. Position torque tube in machine (it can be held in place with mechanics wire) and bolt pillow block bearings to cross beam weldment.
10. Install bolts, item 26 page 39, through torque tube and table support bushings with spacers, item 15 & 16 page 39, in position.
11. Fasten table cable to torque tube. Attach off spot wires to switch and fasten cable clamp in position.
12. Install bolt, item 34 page 21, through torque tube and yoke assembly.
13. Crank table up to top dead center and reconnect the spot, respot rod and counter balance springs.
14. Adjust off spot switch (service manual page 5.28).
15. Proceed with table adjustments (service manual page 5.31).

REMOVAL OF SWEEP ROCKER ARM

1. Turn on machine - turn off back end motor - sweep pins into pit. Cycle machine spotting second set of pins and sweep pins into pit - stop sweep at guard. Run table to respot height and turn machine off.
2. Remove power plug - remove chassis and right and left cross beam covers, item 4 and 40 page 99 in parts section. Remove ball lift guard, item 4 and cover guard item 5 page 111 - pull distributor carriage to fully retracted position.
3. Remove four bolts item 53, 54 and 55 from chassis weldment item 48 page 11. Remove chassis weldment. Remove right and left hand platforms (catwalks) items 23 and 24 page 11. Hand rail bolts must be removed.
4. Unplug table cable from table and remove strain clamps - pull cable up out of the way.
5. Remove shuttle spring (070006447) - remove bolt from shuttle connecting rod, item 1 page 19, at bin lever, item 36 page 47, - loosen clamp stud, item 16 page 19, move shaft item 23 to right-bring the shuttle connecting rod, item 1 and the lever item 12, out the front of the machine together.
6. Remove cotter pins from item 18 and 19 page 11, bin support brackets, loosen bolts, item 27, holding bin support brackets to cross beam (very loose but do not remove bolts).
7. Install a 2" long 1/4 inch bolt at each rear corner of bin assembly at bin support, item 14 page 47. Bolt goes through bin support and machine frame-this will keep the bin from sliding off machine frame - holes are there for shipping.
8. Front of bin assembly must be raised high enough for brackets, item 33 page 47, to clear bin supports by 3 to 4 inches. Place a 5 foot long 2 x 4 under bin assembly over machine frame to hold bin up.
9. Remove nut from special bolt, item 10 page 55, disconnect connecting rod, item 2 - remove bolts, item 12, from both 3115 drive link connecting rods where they attach to rocker arm.
10. Remove bolts, item 57 page 55, from right and left pillow block bearing straps. Remove sweep rocker arm, remove bearings item 55, from rocker arm - remove special bolt item 10.

INSTALLATION OF SWEEP ROCKER ARM

1. Install special bolt, item 10 page 55, from inside to outside in top hole (right side of rocker arm). Install rocker arm bearing and pillow block on each of rocker arm.
2. Position rocker arm in machine, install and tighten pillow block bolts, item 57 page 55. Connect connecting rod, item 2 to special bolt, item 10. Reconnect both drive link rods 3115, item 13, to rocker arm with item 12. Tighten all bolts.
3. Remove 2 x 4 from under bin and lower bin until it rests in place on bin support brackets, items 18 and 19 page 11. Tighten bin support bolts, item 27 and install cotter pins in brackets. Remove both 1/4 inch bolts installed at rear corners of bin.
4. Route table cable in place and plug it in. Install strain clamps.
5. Replace shuttle connecting rod and lever, items 1 and 12 page 19. Slide shaft, item 23, into place and tighten clamp stud, item 16. Replace bolt where bin lever attaches to connecting rod and reconnect shuttle spring.
6. Replace both platforms (catwalks) tighten all bolts including hand rail bolts. Install chassis frame weldment and cross beam covers.
7. Install and connect chassis. Replace cover guard and ball lift guard. Check over all work.
8. Crank table to zero and check all sweep adjustments. Correct as necessary.
9. Install power plug, turn machine on. Turn back end motor on and check sweep operation and machine operation.

PREVENTATIVE MAINTENANCE

The AMF Pinspotter requires a minimum of preventative maintenance to provide economical trouble-free operation. To provide the Proprietor's maintenance man with a form to be used to record this operation, the AMF Weekly Preventative Maintenance Chart has been formulated. This form also provides for a tabulation of parts replaced during the preventative maintenance operation so that the spare parts inventory can readily be maintained.

Page Reference

- 5.66 AMF Preventative Maintenance Chart
- 5.67 AMF Pinspotters Preventative Maintenance Check
- 5.69 Machine Protection During Lane Refinishing
- 5.69 Machine and Lane Cleaning

AMF WEEKLY PREVENTATIVE MAINTENANCE CHART

The weekly preventative maintenance is performed by the Proprietor's maintenance man using the form shown on page 5.61. Each machine is given this check once a week. For an example, the maintenance man of a 16 Lane House would do 4 machines per day for 4 days a week. See chart below.

Using the front of the form, the maintenance man will check the various assemblies listed and perform the details for each assembly as listed on the reverse side. The legend provides an easy simplified method of recording the type of action completed if necessary. If parts are replaced, part number should be entered into the "Parts Replaced" column. This information will supply the establishment with a perpetual inventory and facilitate the ordering of spare parts.

Overall cleaning and lubrication will be performed as per specifications as stated in the AMF Service Manual.

TYPICAL MACHINE INSPECTION SCHEDULE														
DAY	Number of Machines													
	6	8	10	12	14	16	18	20	22	24	26	28	30	32
MON.	2	2	2	4	4	4	4	4	5	5	6	6	6	8
TUES.	2	2	2	4	4	4	4	4	5	5	5	6	6	6
WED.	2	2	2	4	4	4	4	4	4	5	5	6	6	6
THUR.		2	2		2	4	4	4	4	5	5	5	6	6
FRI.			2				2	4	4	4	5	5	6	6

AMF PINSPOTTERS PREVENTATIVE MAINTENANCE CHECK

[illegible]

**THE FOLLOWING MAJOR MACHINE ASSEMBLIES SHOULD BE
CHECKED FOR PERFORMANCE AND CONDITION OF COMPONENTS.**

1. Sweep

- A. Sweep Drive Linkage
- B. Sweep Stopping Positions
- C. Condition and Operation of Sweep Bars

2. Distributor

- A. Driving Gears
- B. Pin Delivery Positions
- C. Shafts and Bearings
- D. Drive Shaft and Universal
- E. Conveyor Belts

3. Carpet and Pit Area

- A. Front Roller Actuating Linkage
- B. Rear Roller and Drive Belt
- C. Rollers, Bearings and Supports
- D. Plows and Bounce Plate
- E. Condition of Carpet Belt

4. Ball Exit

- A. Ball Exit Casting Assembly
- B. Drive Belts
- C. Lift Tube Assembly

5. Ball Lift

- A. Belt
- B. Pulley Assemblies and Bearings
- C. Elevator Track
- D. Drive Belts—Clutches

6. Pin Elevator

- A. Pin Clamp Assembly
- B. Ring Tube and Bearings
- C. Pocket Inserts
- D. Drive Belt

7. Cushion

- A. Ball Impact Pad
- B. Screws and Fasteners
- C. Shock Absorbers
- D. Cushion Curtain—Facing
- E Hangers—Supports

8. Table

- A. Spotting Pattern
- B. Pin Cups
- C. Respot Cells & Mechanisms
- D. Drive—Supports—Linkage
- E. Electrical Wiring

9. Motor—Drive

- A. Lubrication Level

10. Pit Signal—Pindicator

- A. Pin Lights
- B. 1st and 2nd Ball
- C. Strike and Foul
- D. Signal Light—Bell—Reset

11. Counters—Frameter

- A. Mechanical Counter and Seals
- B. Remote Counters at Managers Desk

12. Bin and Shuttle Assembly

- A. Track Assembly
- B. Shock Mounts and Bumpers
- C. Pin Holders
- D. Tubes and Straps

MACHINE PROTECTION DURING LANE REFINISHING

During resurfacing or refinishing, dust particles and fumes from refinishing agent settle on operating parts of the machine and cause serious trouble after operation is resumed unless the following precautionary measures are observed.

REFINISHING

The purpose of this protection is to prevent the fumes from the refinishing agent from settling on exposed electrical contacts as the fumes will act as an insulator making the unit inoperative. Using masking tape or plastic wrap, seal all motor ventilating openings and cover and seal the chassis.

RESURFACING

In addition to the protection required for refinishing, it will be necessary to cover, with rag, common newspaper, or plastic, all open gearing, delicate assemblies, greased tracks, and operating surfaces to prevent the dust particles from clinging to these mechanisms ultimately causing mechanical binds. These points to be covered are back end solenoid and cam, right and left sweep drive gears and tracks, table spotting gear train, distributor head, and any other exposed parts that may have an oily or greasy surface.

After the resurfacing has been completed, all protection except on the motors and chassis, can be removed; and the entire machine must be wiped down with a damp cloth. After the refinishing process is completed **AND THE BUILDING IS FREE FROM ALL FUMES FROM THE REFINISHING AGENT**, the motor and chassis protection may be removed.

In order to permit the resurfacing machinery to extend further back into the pit area, the sweep assembly may be removed.

MACHINE AND LANE CLEANING

LANE CLEANING

For the daily lane cleaning, **the machine should be shut off** either at the machine safety switch on the masking unit or at the manager's control panel. The pins are then knocked into the pit with mop or broom. The lane is then ready for cleaning. After all the lanes have been cleaned, machines should be turned on and cycle buttons, or 10th frame switches, pressed in order to bring the machines ready for first ball.

If buffer or rotary brush is used, the hinged pindicator can be raised and propped in the "UP" position.

MACHINE CLEANING

The machine should be shut off and power plug removed before cleaning. The AMF Automatic Pinspotter must be kept clean at all times to give satisfactory service to the bowler. It is of utmost importance to start off with cleanliness and to maintain the cleaning schedule given below.

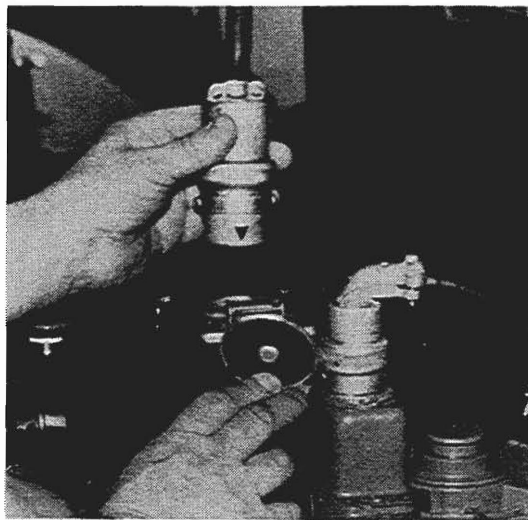
Every Two Weeks

1. Dust the complete machine.

Twice a Week

1. Wipe the following with a cloth dampened with Amflite pin cleaner: [or similar cleaner]
 - (a) Inside of pin elevator wheel,
 - (b) Inside of spotting cups and bins,
 - (c) Pit carpet,
 - (d) Pin curtain face,
 - (e) Distributor belts and orientor,
 - (f) Ball lift vertical track,
 - (g) Sheaves and V-Belt drives.

2. Check motor drip pans and clean as required.
3. Reverse or change ball wipe cloths.
4. Vacuum between kickback plates and bottom section of ball lifts.
5. Vacuum under pin elevator wheel and carpet.
6. Clean ball lift belt.



**Remove Power Plug
When Working on Machine.**

LUBRICATION

Section 6

Page Reference

- 6.2 Lubrication Symbols
- 6.2 Recommended Lubricants
- 6.3 Table and Sweep Motors
- 6.4 Front End Assembly
- 6.6 Table Drive
- 6.7 Sweep Drive Linkage
- 6.8 Table Respot Cells
- 6.9 Yoke Assembly
- 6.11 Distributor
- 6.13 Shuttle Assembly
- 6.14 Back End Motor and Drives
- 6.15 Ball Elevator
- 6.16 Belt Tensioner
- 6.17 Ratchet Drive
- 6.18 Rudder Drive Assembly
- 6.19 Track Rail Assembly
- 6.20 Pin Ejector—Cushion Shock Absorber
- 6.21 Front Roller

LUBRICATION

Lubrication is one of the most important items in the proper operation and maintenance of the Automatic Pinspotter.

Care must be taken to insure correct lubrication. Avoid excessive use of lubricants to prevent the possibility of transmitting it to the bowler.

The following pages indicate the points of lubrication, the correct lubricant and the frequency of lubrication for each part of the machines.

Before lubricating exposed parts or surfaces, it is important that the old lubricant first be removed.

LUBRICANT SYMBOLS



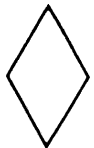
Items marked with this designation pertain to oiling. The lubricant should be an SAE #10 oil. The location, amount, and frequency of oiling is noted on each individual page.



Items marked with this designation pertain to greasing. The lubricant should be multi-purpose grease (Bearing Gard #2). The location and frequency of greasing is noted on each individual page.



Items marked with this designation pertain to the lubrication of the gear head motors used on table, sweep, and back end. The following page provides the recommended lubricants. The individual pages will provide the location and frequency to use.



The item marked with this designation applies to the recommended lubrication of the pin elevator wheel ring tube only. The following page provides the recommended lubricants. The individual pages will provide the location and frequency of use.

RECOMMENDED LUBRICATION OVERALL MACHINE LUBRICATION

AMF recommends the use of an SAE #10 motor oil for overall machine lubrication. This is obtainable locally at service stations or automobile supply stores.

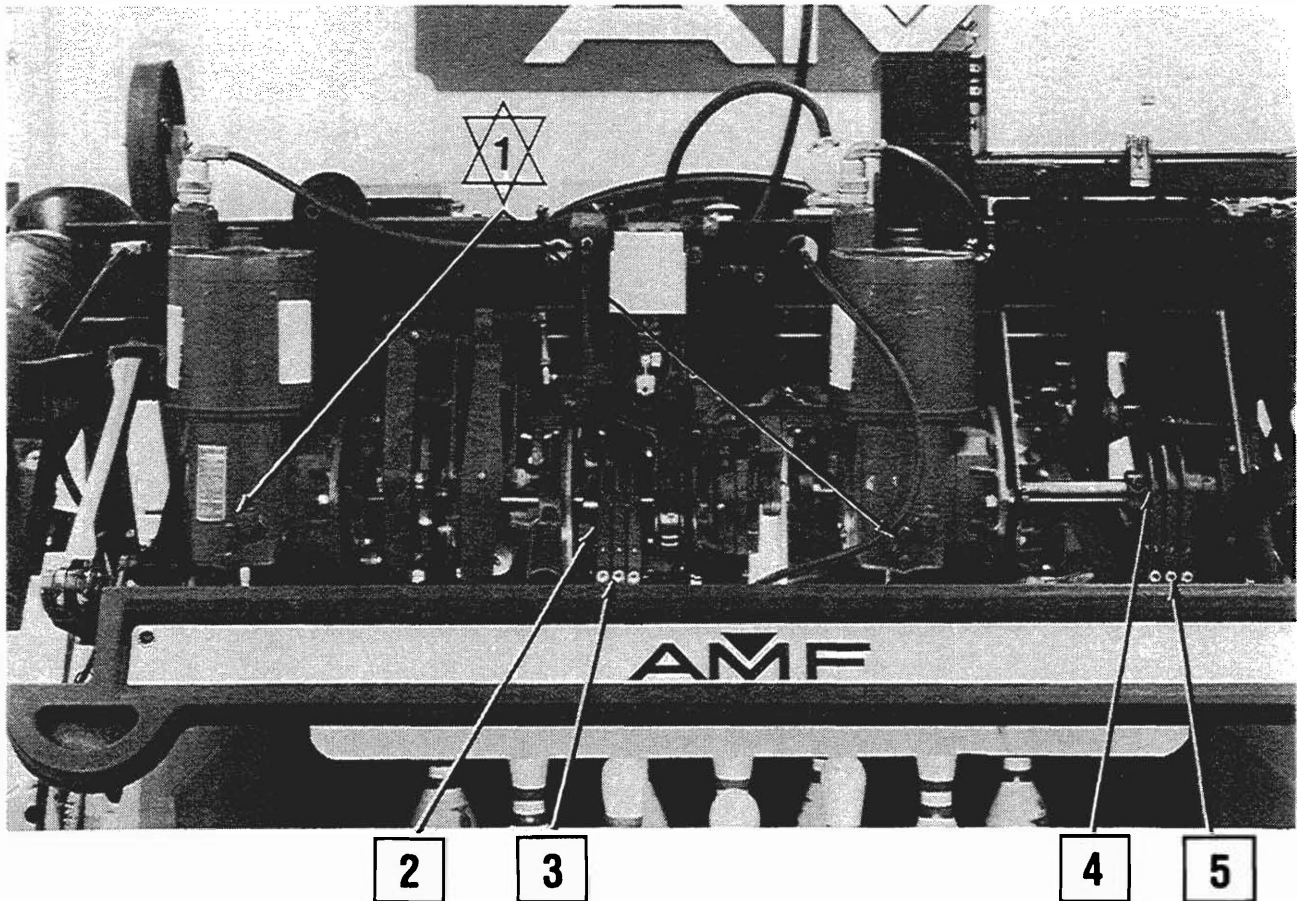
A special grease containing lithium is to be used for overall machine lubrication including the rod end bearings. Bearing Gard #2, a product of the Standard Oil Company of Ohio, is recommended and if not obtainable locally, may be ordered from AMF under part number 715 010 307 for a one pound tube or part number 715 010 407 for a one pound can. This grease is recommended for use on ball, needle, roller and rod end bearings.

A special oil known commercially as Way Oil, SAE #80, is recommended for lubricating the ring tube supporting the pin elevator wheel. The Way Oil is wick fed to the bearing surface of the ring tube and will adhere to the surface without dripping. If this oil is not obtainable locally it may be ordered from AMF under part number 715 021 006.

GEAR MOTOR LUBRICANTS

The table, sweep and back end gear motors are factory filled with J-156 oil, (HLP 680), a product of the Standard Oil Company of Ohio. This oil is also available from AMF under part number 715 020 906.

CAUTION: Do **not** use or add any other oil. Oils of different grades or different manufacturers are not compatible to one another and will not provide the desired 5-year service life of J-156 oil (HLP 680).



FRONT END ASSEMBLY



1. Check oil level of table and sweep motors once per year by removing oil level plug. Fill as required with J-156 (AMF Part No. 715 020 906).

2. Drain and refill once every five years. If oil has sludged or contamination, drain, flush with kerosene, rinse with J-156 and refill to level plug with J-156 (AMF part no. 715 020 906).



Table cam lever rollers (3 places) 1 drop #10 oil every 3 months.



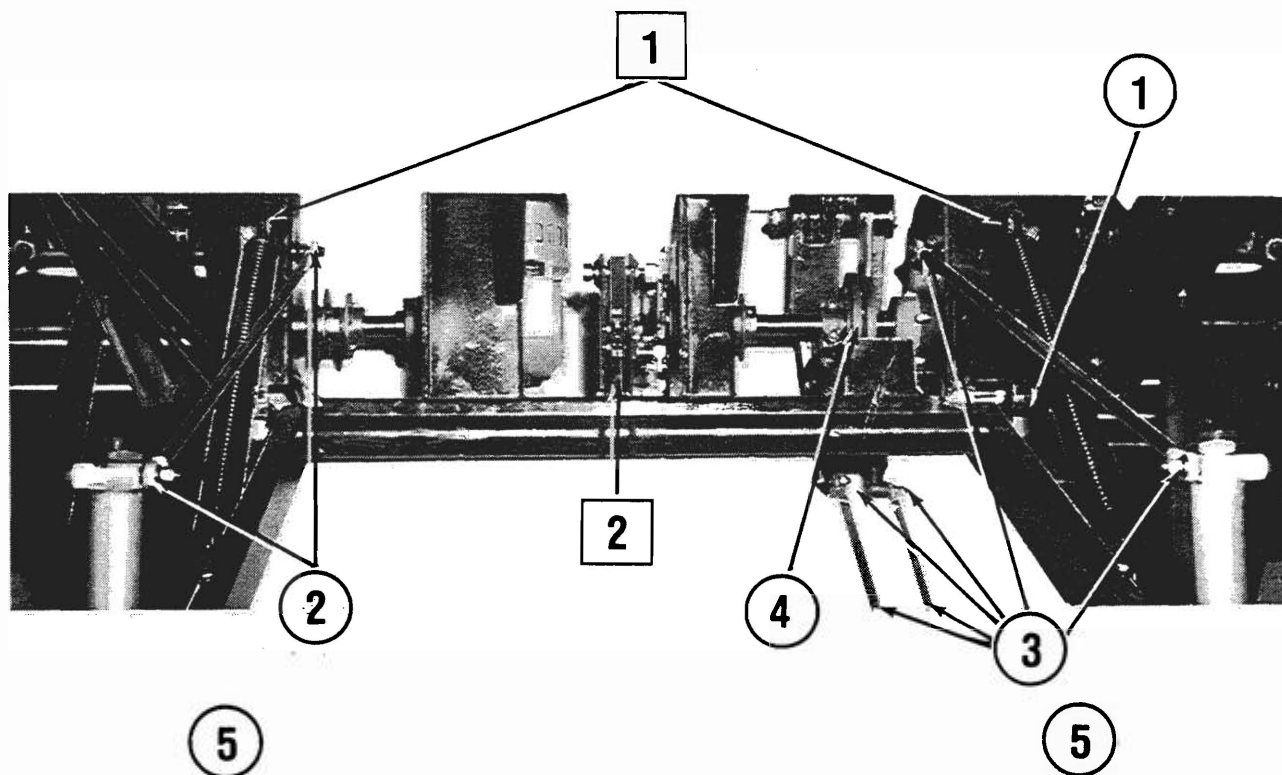
Table cam lever pivots (6 places) 1 drop #10 oil every 3 months.



Sweep cam lever rollers (3 places) 1 drop #10 oil every 3 months.

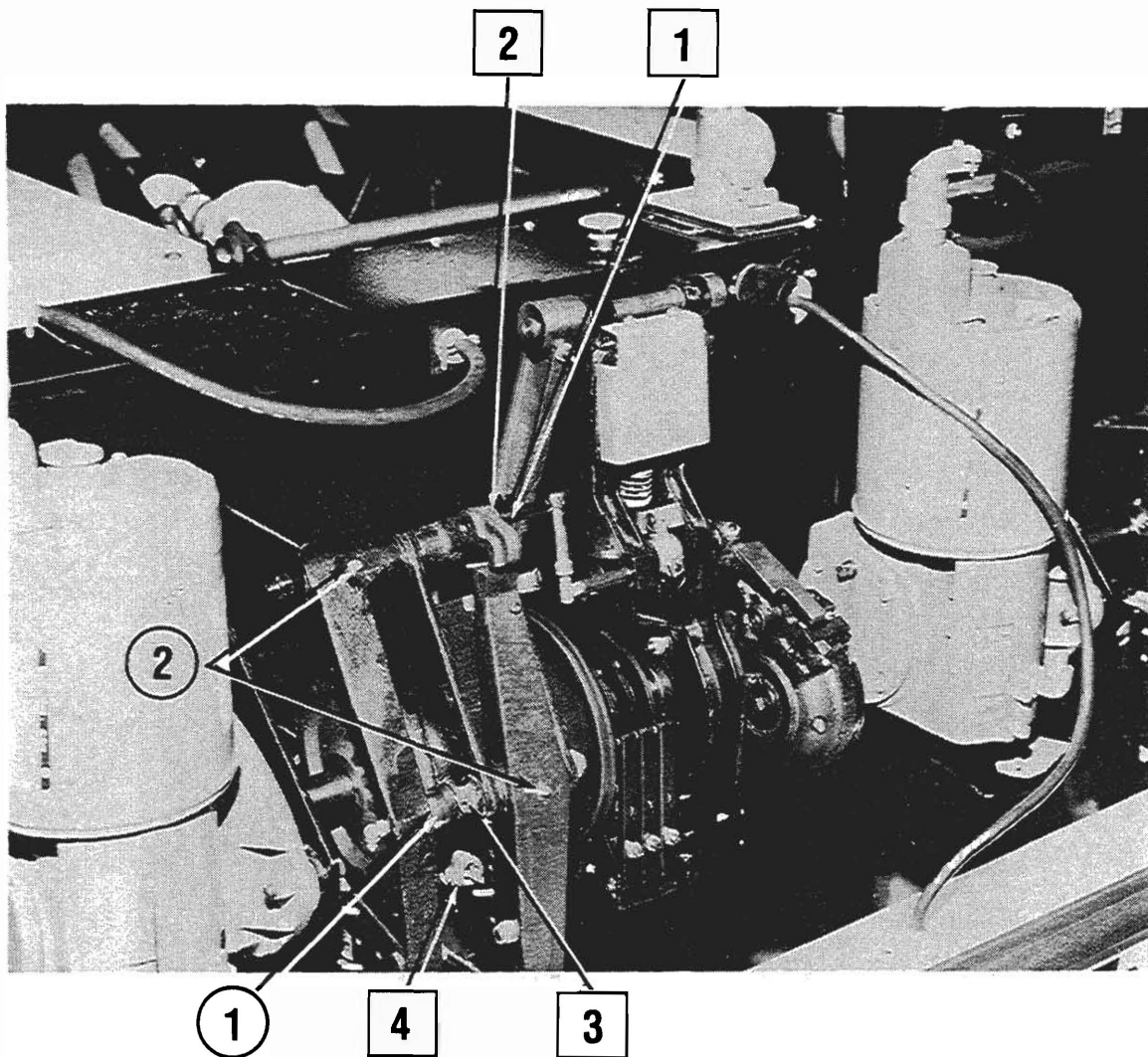


Sweep cam lever pivots (6 places) 1 drop #10 oil every 3 months.



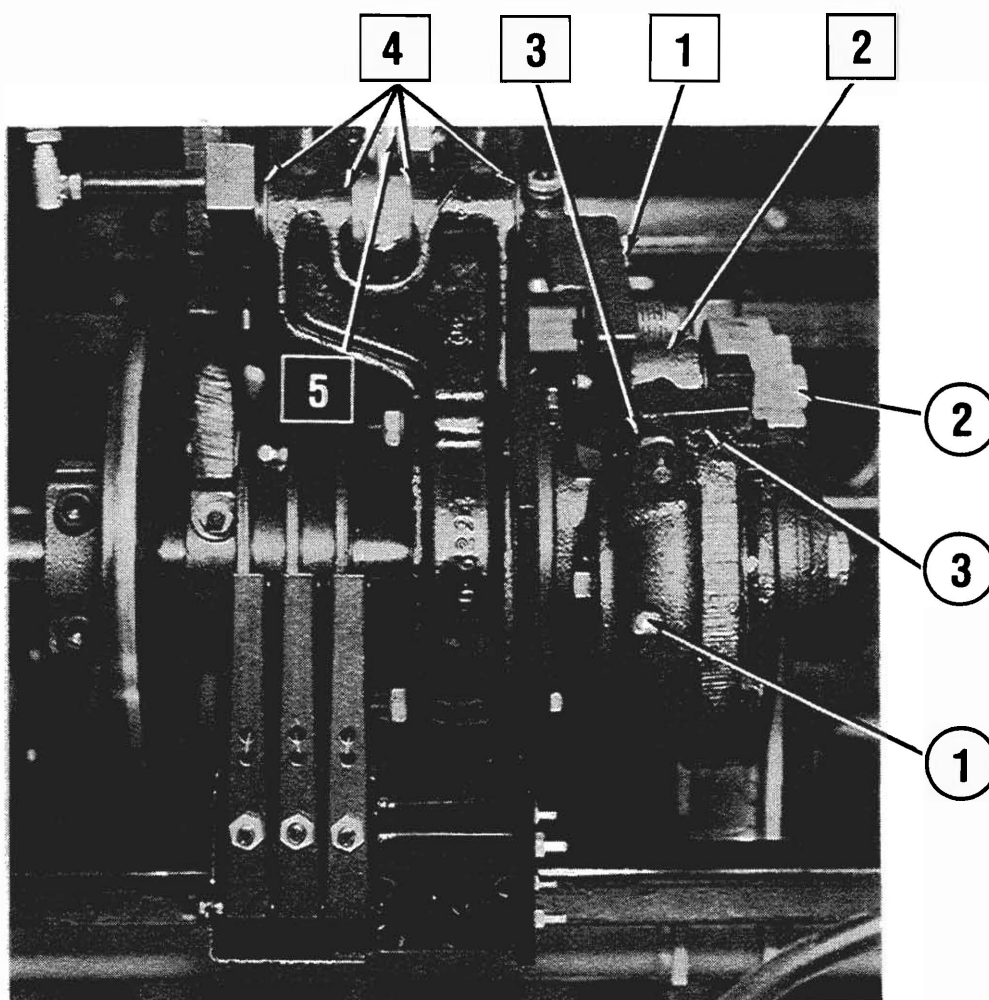
FRONT END ASSEMBLY

- 1** Spring roller bearing (2 places) 2 drops #10 oil every 3 months.
- 2** Over travel lever pivot (2 places) 1 drop #10 oil every 6 months.
- 1** Pillow blocks on torque tube weldment (2 places) every 3 months.
- 2** Table connecting rod ends (2 places) grease every 3 months.
- 3** Connecting rod ends (6 places) every 3 months.
- 4** Table spot and respot cams (2 places) apply light coating grease every month.
- 5** Spherical bushing in table support weldment (2 places) every 6 months (not shown).



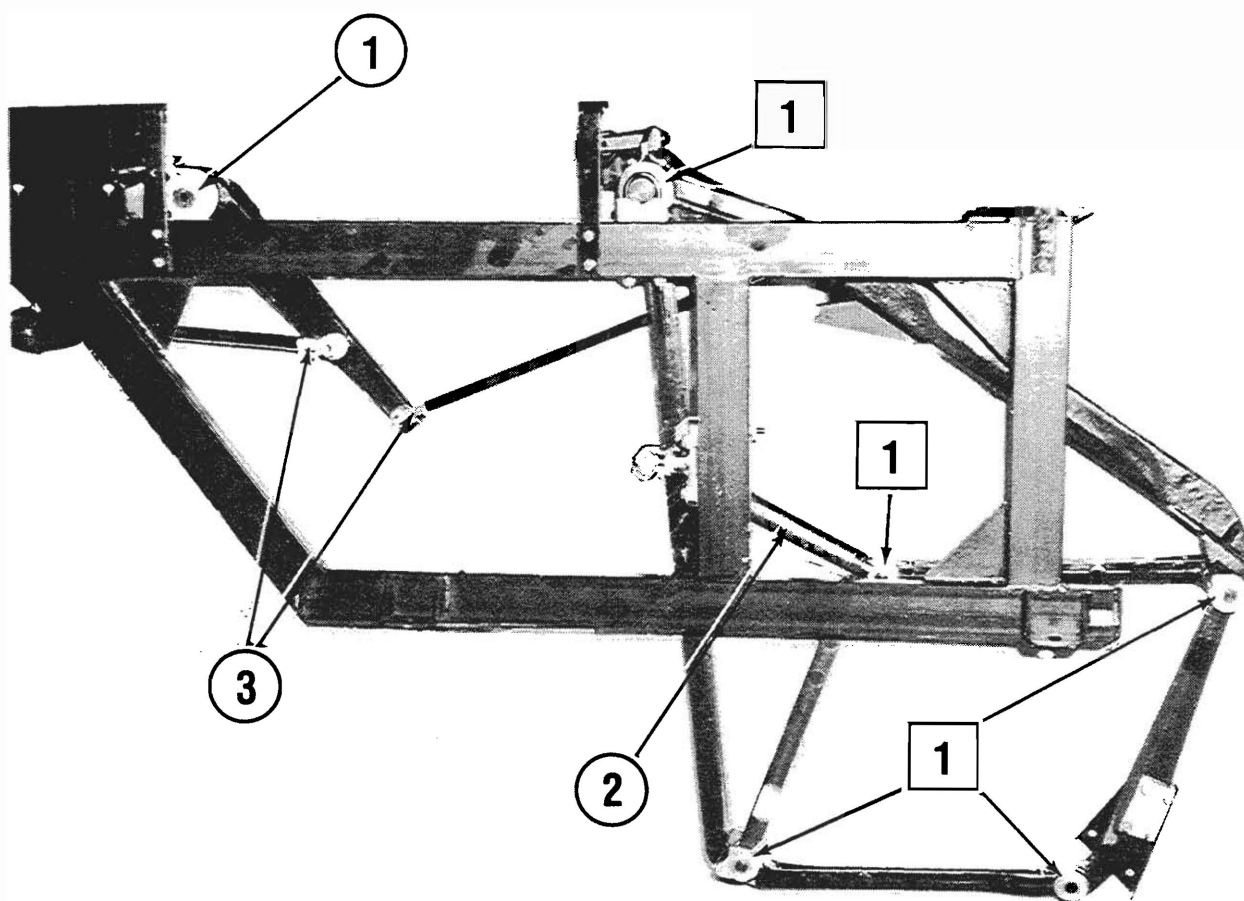
**FRONT END ASSEMBLY
TABLE TRAVEL CAM LEVERS**

- 1** Oilite bearing on pin (1 place) two drops #10 oil every month.
- 2** Oilite bearing at hook pivot (2 places) one drop #10 oil every month.
- 3** Oilite bearings at spot link arm (2 places) 2 drops #10 oil every month.
- 4** Spring mounting plate pivot bolt not shown (2 places) one drop #10 oil every month.
- 1** Grease fitting at cam follower bearings (2 places) apply grease once every month.
- 2** Grease fittings at spot and respot arm (2 places) every 3 months.



**FRONT END ASSEMBLY
TABLE DRIVE ASSEMBLY**

- | | |
|--|--|
| <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">1</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">2</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">3</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">4</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">5</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">1</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; width: 30px; text-align: center; margin-bottom: 10px;">2</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; width: 30px; text-align: center;">3</div> | <p>Oilite bearing in link at roller arm (3 places). One drop #10 oil every month.</p> <p>Oilite bearings in crank housing (2 places). One drop #10 oil every month.</p> <p>Oilite bearing in latch pivot (2 places). One drop #10 oil every month.</p> <p>Oilite bearing in link assembly (4 places). One drop #10 oil every month.</p> <p>Solenoid linkage (6 places) one drop #10 oil every month.</p> <p>Apply grease at crank housing grease fitting for roller bearings once each year.</p> <p>Apply light film of grease to inner surfaces of elongated link slot once every 6 months.</p> <p>Apply a light film of grease at the cam ball every 6 months.</p> |
|--|--|



FRONT END ASSEMBLY SWEEP DRIVE LINKAGES

1

Oilite bearings in sweep pantograph joints (40 places) at 10 joints, 4 drops #10 oil each place every month.

1

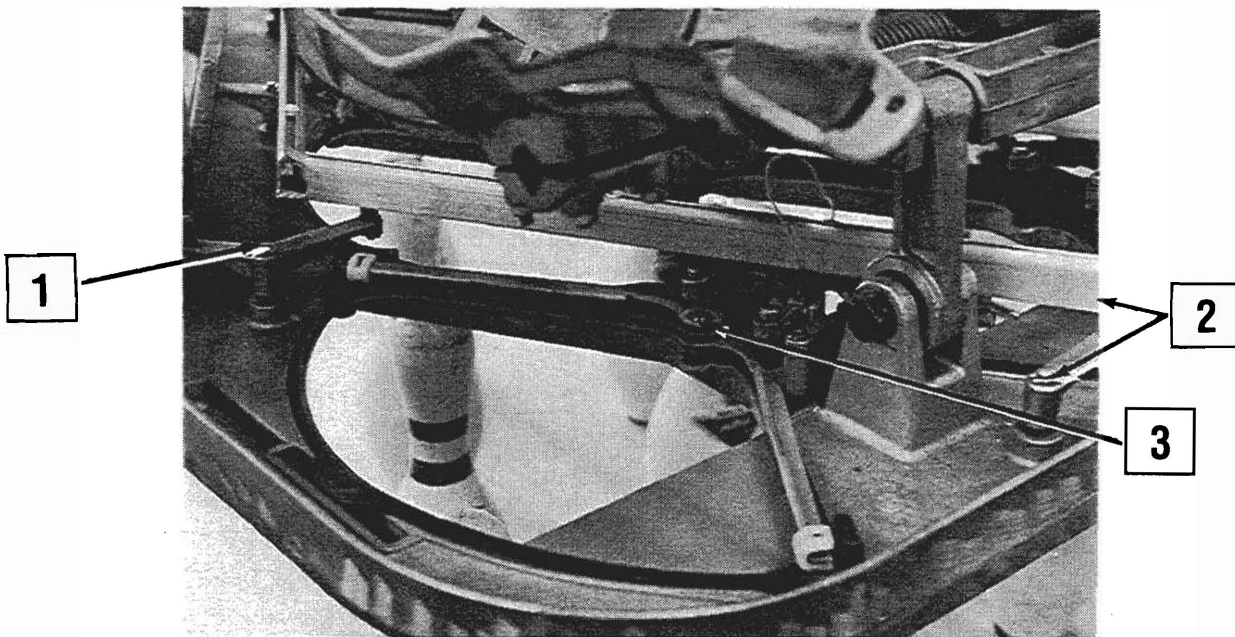
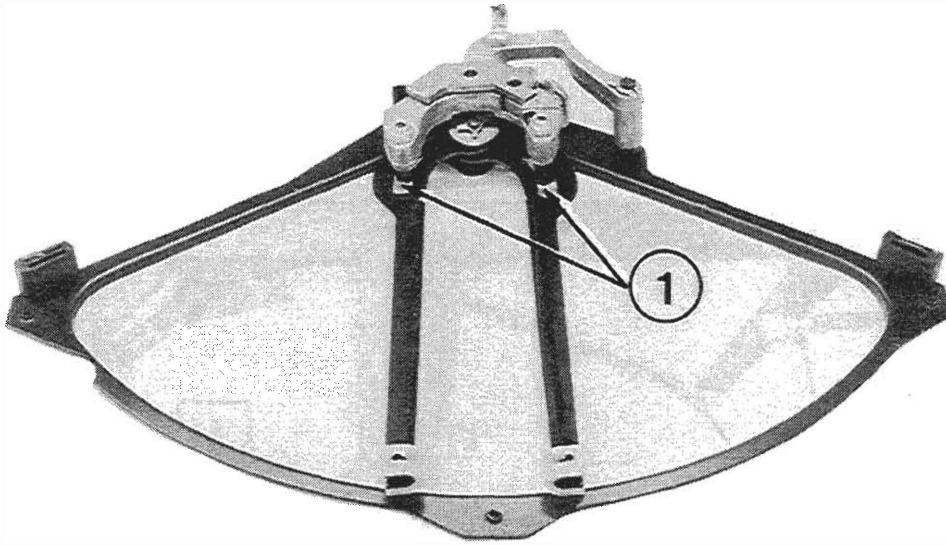
Pillow block bearings, sweep torque tube (2 places) grease every 3 months.

2

Grease in guide tube and rod ends every 3 months.

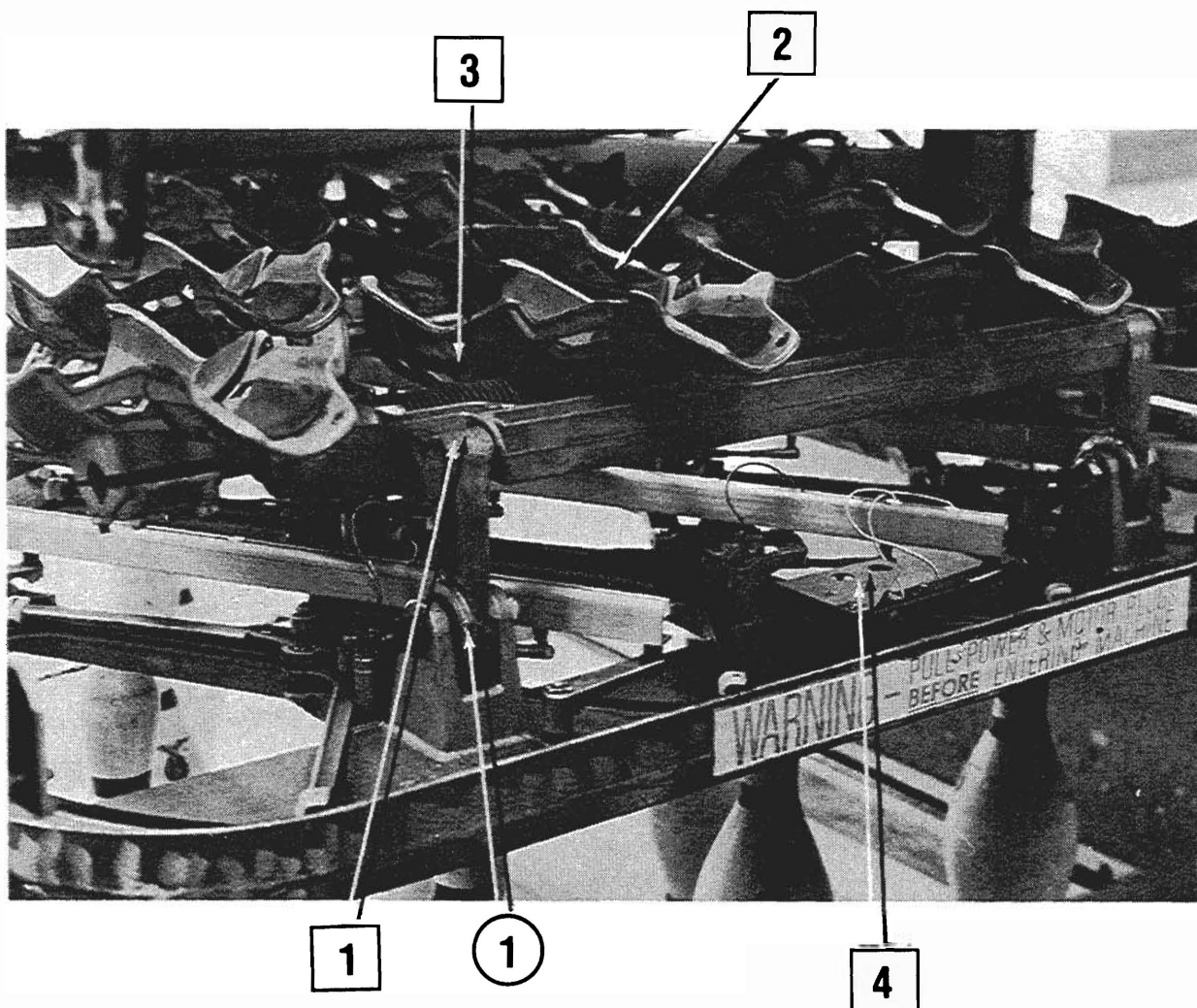
3

Sweep drive connecting rod ends (6 places) grease every 3 months.



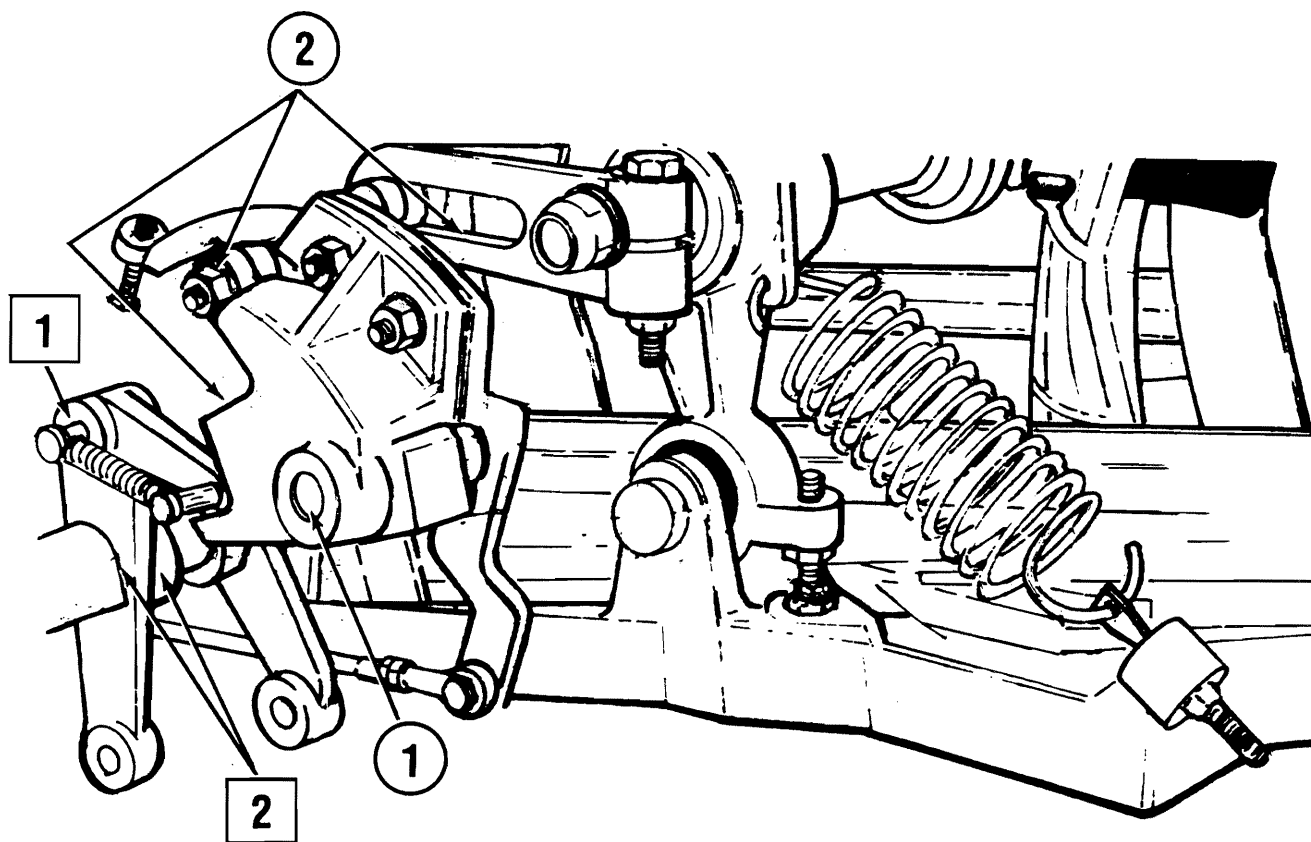
**FRONT END ASSEMBLY
TABLE RESPOT LINKAGES**

- 1** Bearings in (4) respot levers, one illustrated 4 places each lever, 2 drops #10 oil every 3 months.
- 2** Bearings in (3) respot cell levers, one illustrated 3 places each lever, 2 drops #10 oil every 3 months.
- 3** Bearings in respot cell fingers and connecting links 10 cells, 7 places each cell, 2 drops #10 oil every 3 months.
- 1** Stud long, stud short, 2 places, 10 cells light film grease every month.



YOKE ASSEMBLY

- 1** Upper table leg oilite bearings rear legs (4 places) 4 drops #10 oil every 3 months.
- 2** Spotting cup link, oilite bearings (4 places) two drops #10 oil every 3 months.
- 3** On springs of yoke shaft (3 places) 5 drops #10 oil between spring coils every 3 months.
- 4** Respot cell protection switch pivot and roller 4 places, 2 drops #10 oil every 3 months.
- 1** Spherical bearing, front and rear legs (4 places) re-pack with grease once every year.



**FRONT END ASSEMBLY
TABLE SHIFTER MECHANISM**

1

Oilite bearing in finger link (2 places) two drops #10 oil every 3 months.

2

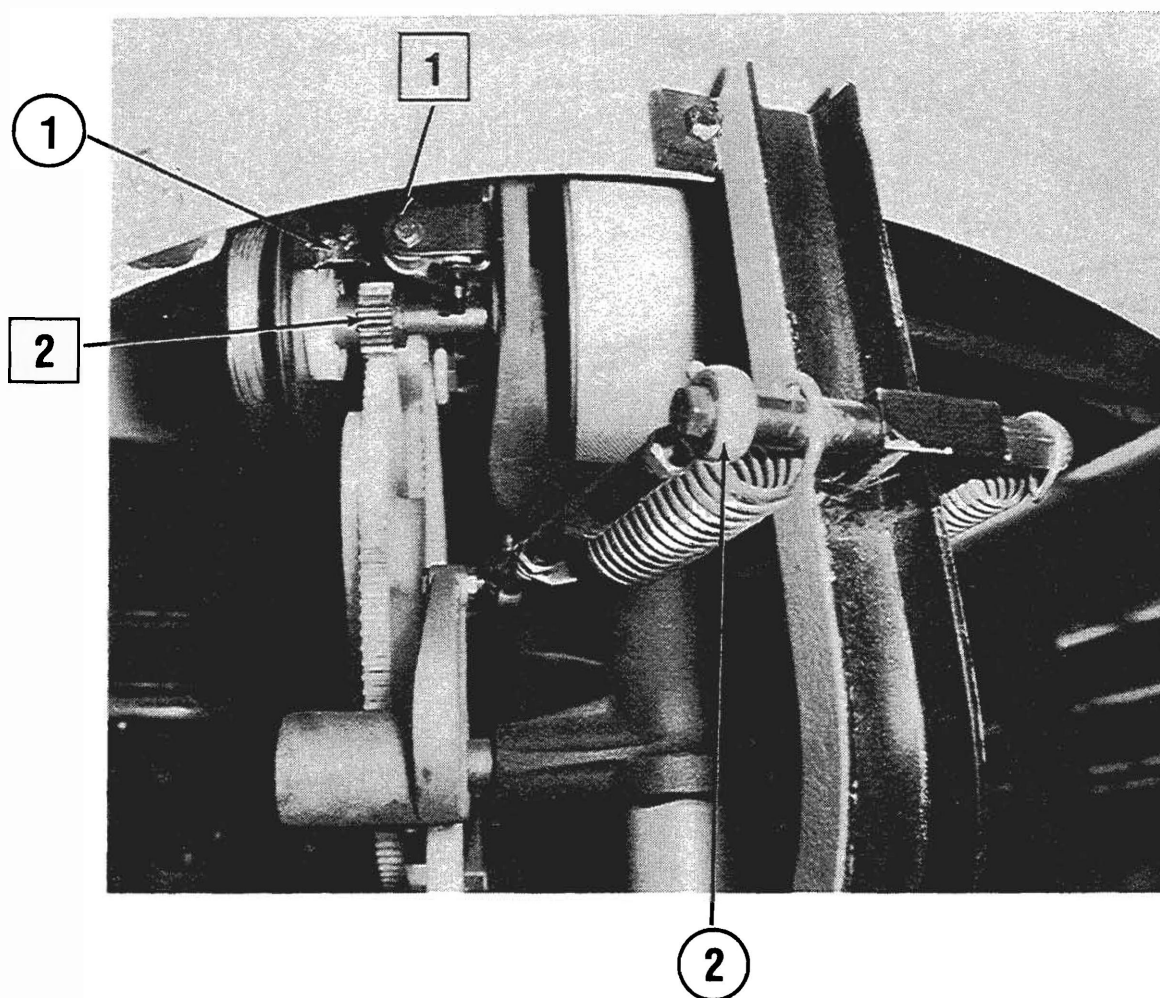
Oilite bearings in shifter link and finger lever assemblies (4 places) 2 drops #10 oil each place every 3 months.

1

Re-pack shifter link needle bearings (2 places) with grease once each year.

2

Apply light film of grease to the surfaces of shifter link and actuator arm (3 places) every 3 months.



DISTRIBUTOR DRIVE

1

Bearings in trip support castings (2 places) 2 drops #10 oil every 3 months.

2

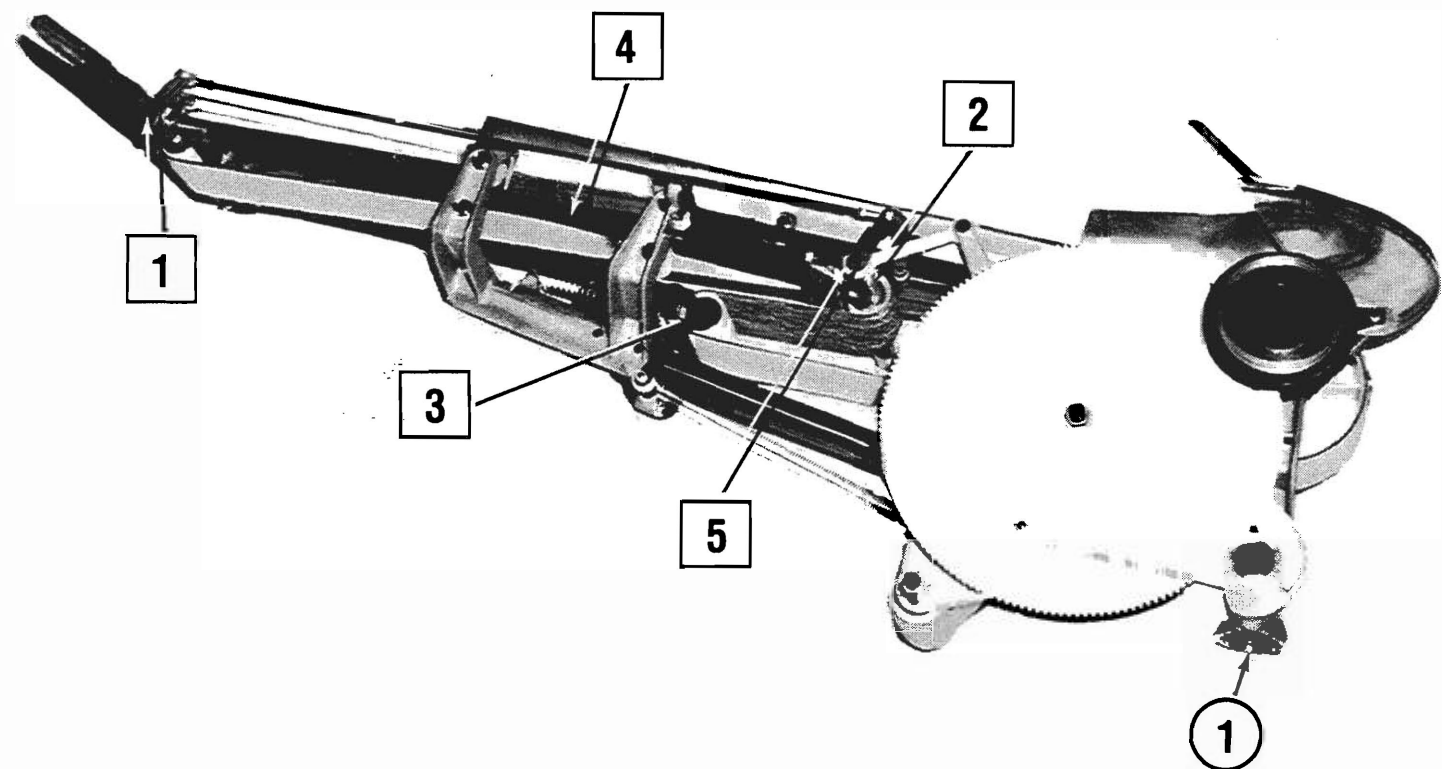
Bearing in drive pinion (1 place) 2 drops of #10 oil every month.

1

Surface of distributor stop blade (2 places) grease every month.

2

On tubing rod ends (2 places) grease every 3 months.



DISTRIBUTOR

- 1

 Trip lever, bearings (2 places) 2 drops #10 oil every 3 months.
- 2

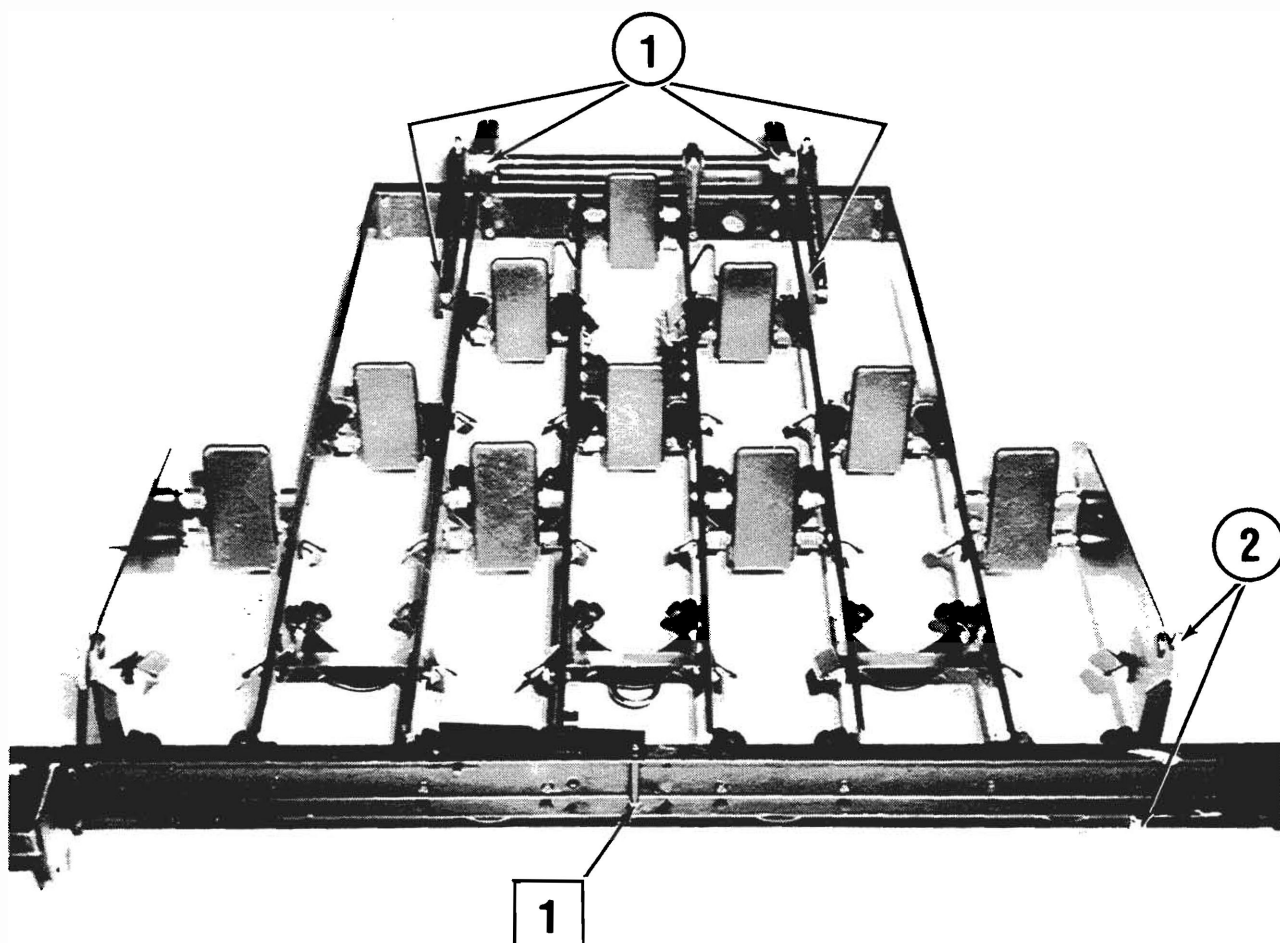
 Tube housing (2 places) 2 drops #10 oil every 3 months.
- 3

 Roller tracking bracket (4 places) 2 drops #10 oil every 3 months.
- 4

 On carriage tubes where it contacts nylon bearings (4 places) a light film of #10 oil every 3 months.
- 5

 Trip rocker arm shaft (2 places) 2 drops #10 oil every 3 months.
- 1

 Bearings in support casting (2 places) grease once a year.



SHUTTLE ASSEMBLY

1

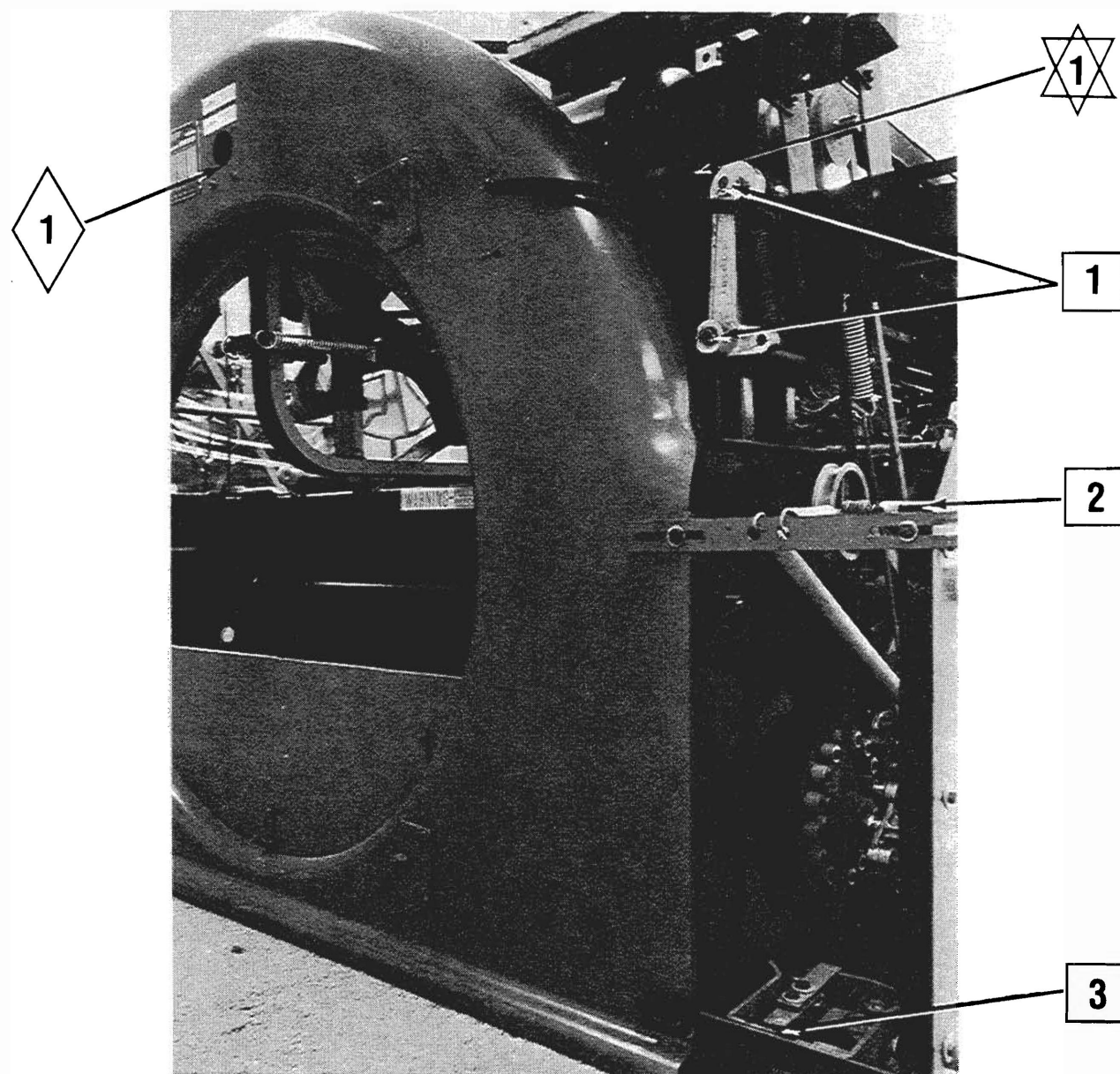
Oilites in bin switch bracket (2 places) 2 drops #10 oil every 6 months.

1

Grease fitting in front levers and shuttle connecting rods (4 places) every 6 months.

2

Grease fittings in rear shuttle connecting rods (4 places) every 6 months.



BACK END ASSEMBLY

1

Oilite bearings in belt tensioner arm (2 places at pivot and one at roller) 4 drops #10 oil every 3 months.

2

Oilite bearings in belt tensioner arms (4 places) 4 drops #10 oil every 3 months.

3

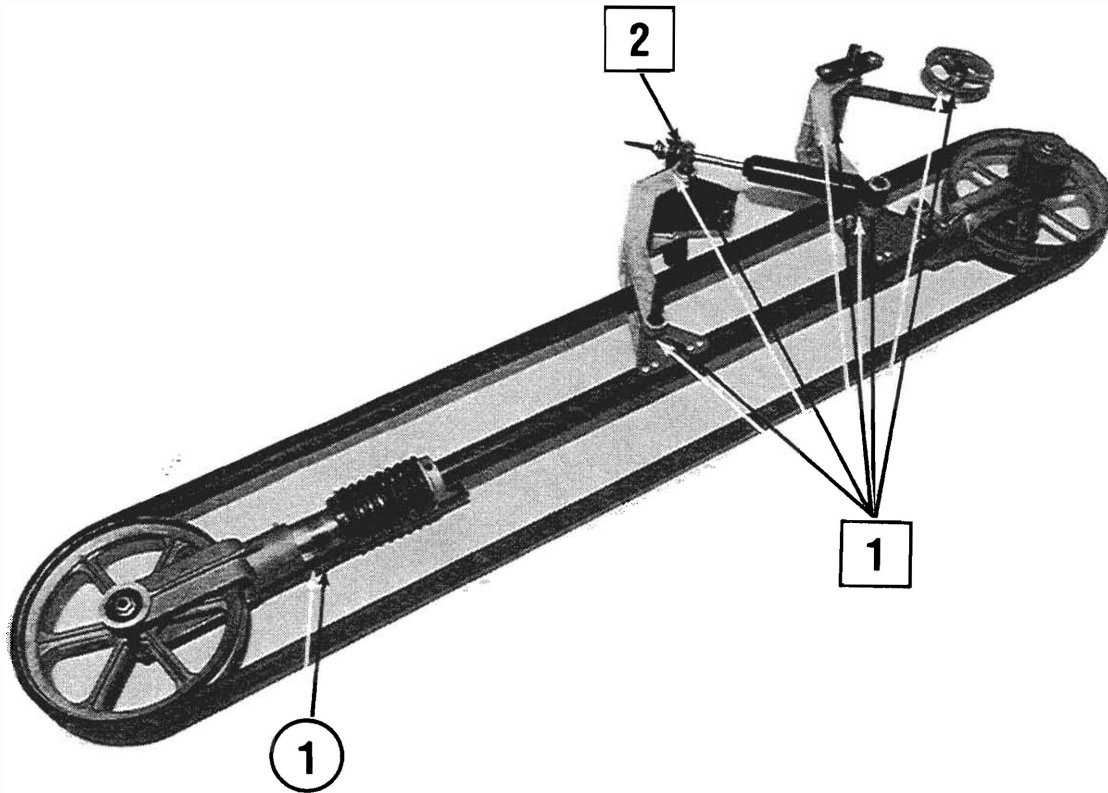
Oilite bearings in rudder arm pivots (2 places) 4 drops #10 oil every 3 months.

1

Check oil level of gear motor at level plug once per year. Fill as required with J-156 (AMF Part No. 715 020 906). Drain and refill every **five years**. (Refer to instructions table—sweep motors page 6.3).

1

Maintain oil level in ring tube oiler reservoir 3/8" below oiler top. Refill as required every year using SAE #80 Way Oil (AMF Part No. 715 021 006).



**BACK END ASSEMBLY
BALL ELEVATOR**

1

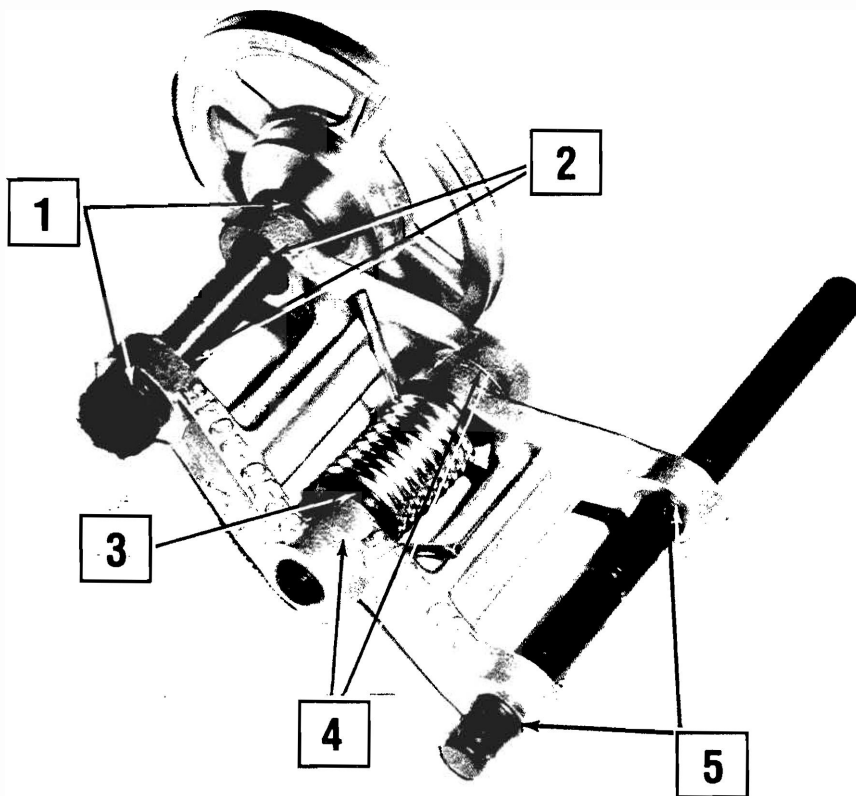
Oilite bearings in links (8 places) 2 drops #10 oil every 3 months.

2

Shock absorber bracket (2 places) 2 drops #10 oil every 3 months.

1

Grease fitting in upper yoke; grease (1 place) every 3 months.



BELT TENSIONER

1

Oilite thrust bearings at pulley shaft (2 places) 2 drops #10 oil every 3 months.

2

Oilite bearings at hanger arm pulley shaft (2 places) 4 drops #10 oil every 3 months.

3

Oilite bearing spring guide (1 place) 2 drops #10 oil every 3 months.

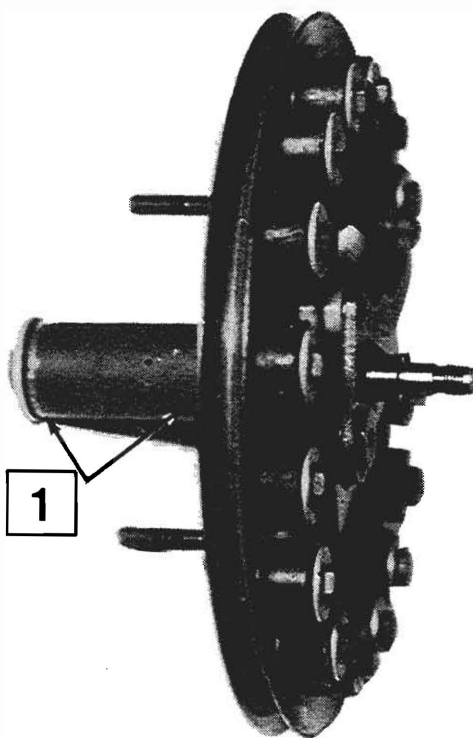
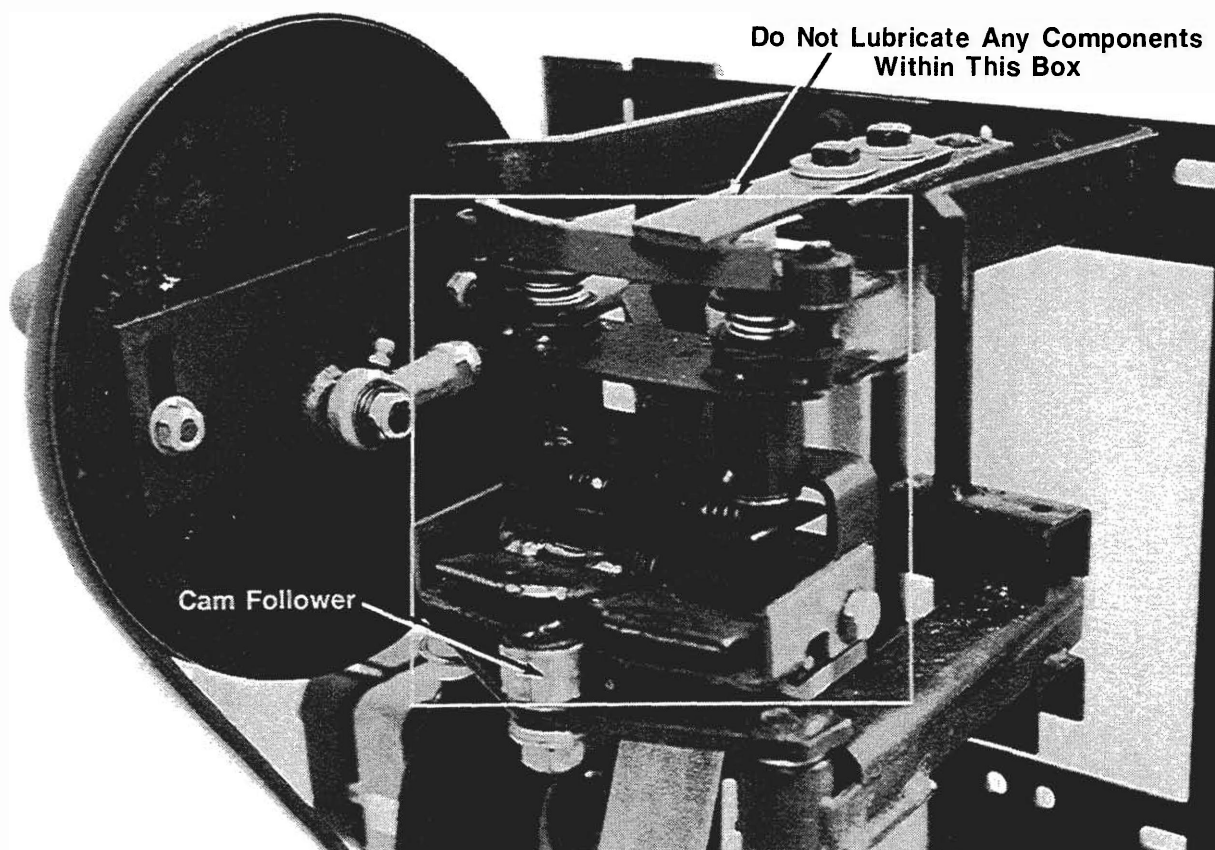
4

Oilite bearings at hanger arm spring shaft (2 places) 2 drops #10 oil every 3 months.

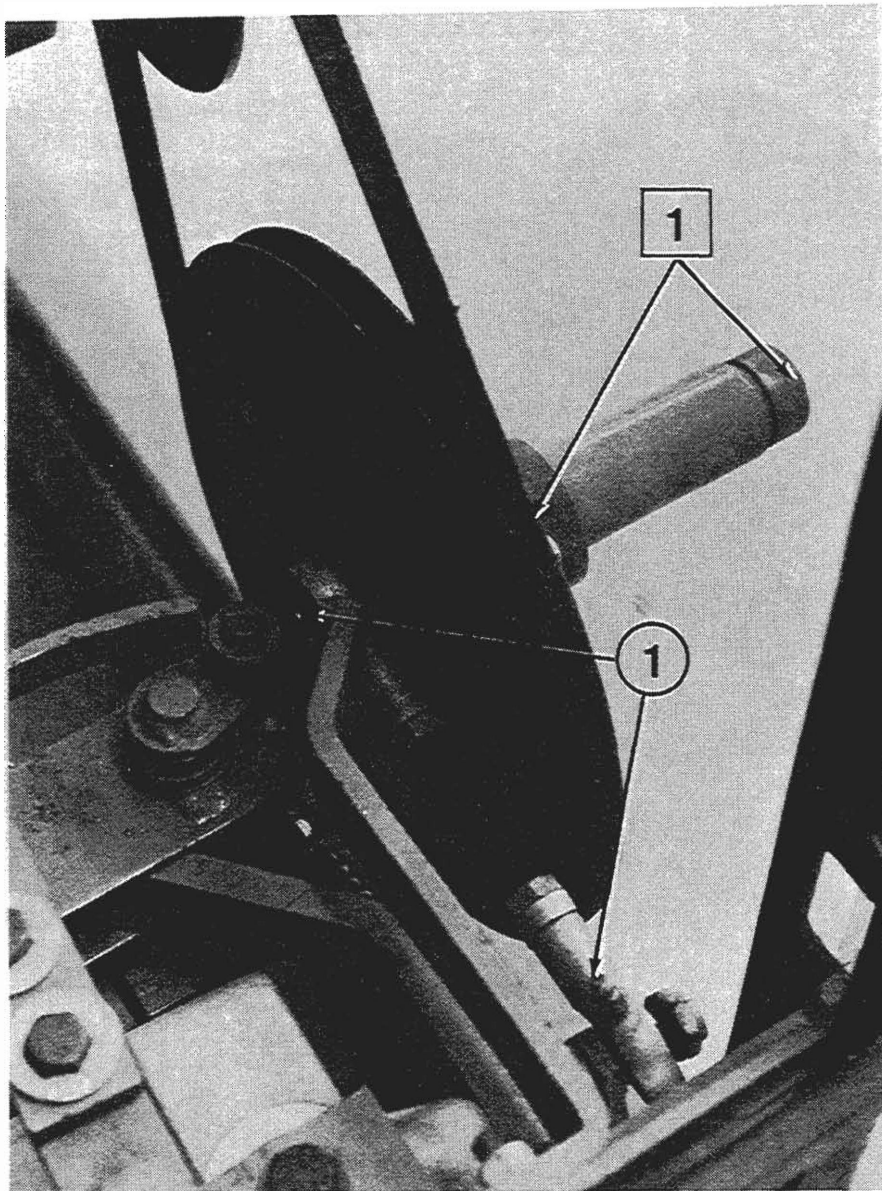
5

Oilite bearings at pivot shaft (2 places) 2 drops #10 oil every 3 months.

LIGHT BALL SENSOR

**1**

Flange bearings on ratchet wheel shaft (2 places) 2 drops #10 oil every 3 months.



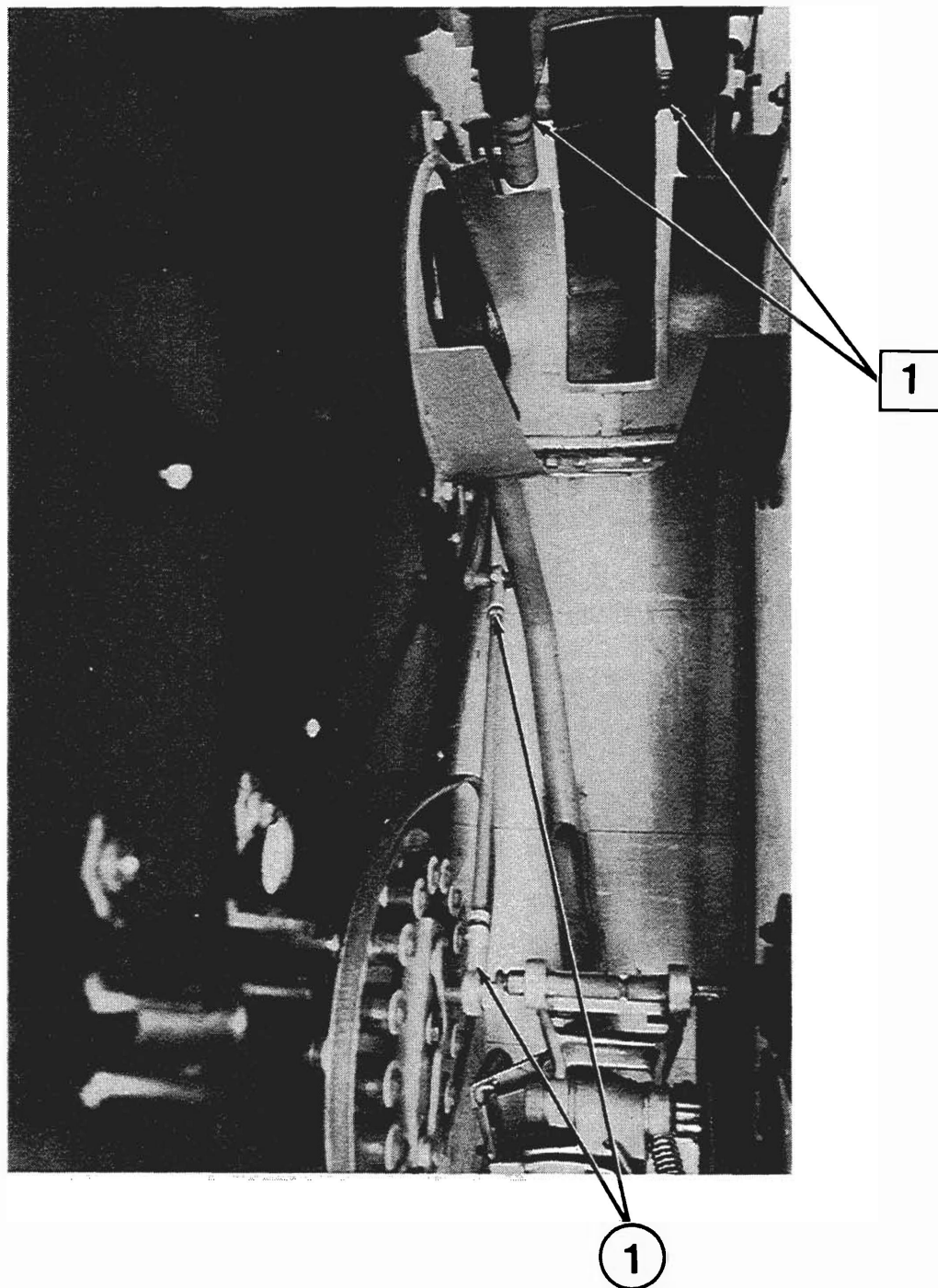
RUDDER DRIVE ASSEMBLY

1

Oilite bearings in shaft tube (2 places) 2 drops #10 oil every 3 months.

1

Apply grease at both rod ends every 3 months.



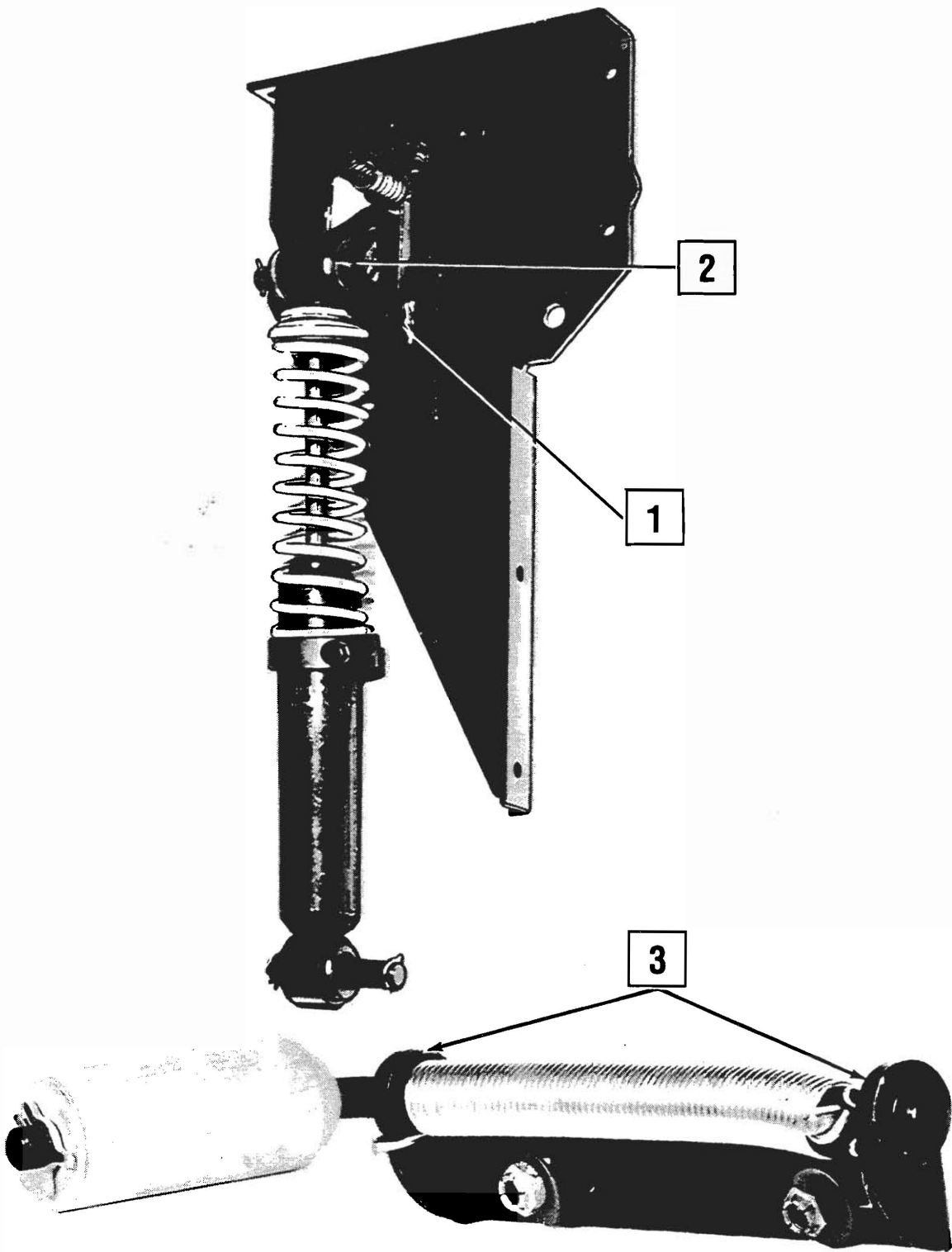
TRACK RAIL ASSEMBLY

1

Flange bearings on lift arm (2 places) #10 oil every 3 months.

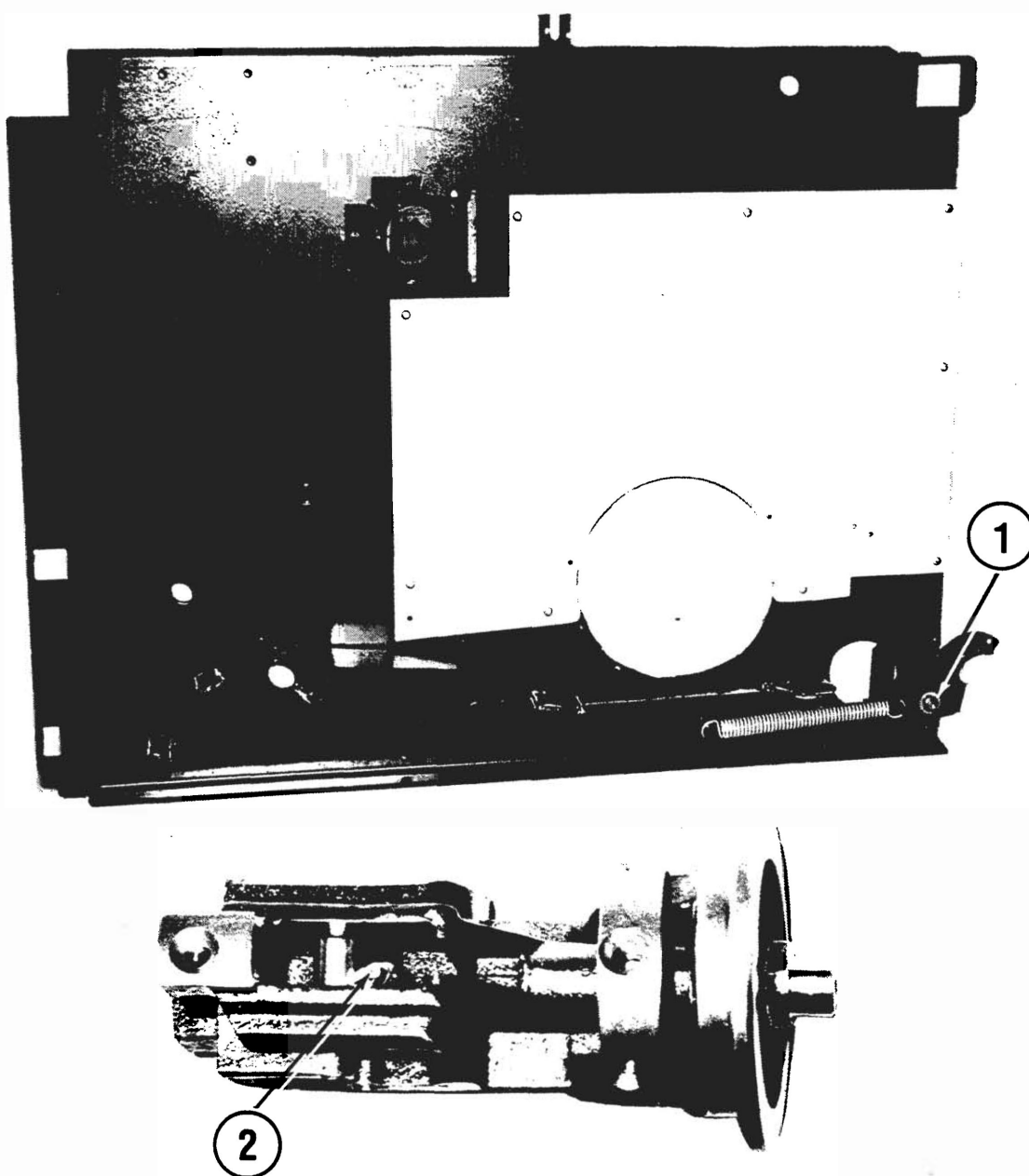
1

Apply grease at fittings (2 places) every 3 months.



BACK END ASSEMBLY

- | | |
|----------|--|
| 1 | Pivots of start switch lever and shock mounting bracket (2 places) 2 drops #10 oil every 3 months. |
| 2 | Pivot pin of shock absorber (2 places) 2 drops #10 oil every 3 months. |
| 3 | Oilite bearings in pin ejector assembly (2 places) 2 drops #10 oil every 3 months. |



BACK END ASSEMBLY

- 1** Grease fitting in front roller support brackets (2 places) left and right sides apply grease every 6 months.
- 2** Remove the front roller, apply grease through access hole to grease fitting (2 places) every six months.

PINSPOTTER LUBRICATION SCHEDULE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MOTORS	X											
CAM LEVERS/PIVOTS	X			X			X			X		
SPOT/RESPOT CAMS	X	X	X	X	X	X	X	X	X	X	X	X
TABLE SPHERICAL BUSHING	X			X			X			X		
TABLE CONN. RODS/BUSHINGS	X			X			X			X		
OVER TRAVEL LEVER	X						X					
OILITES IN SPOT/RESPOT LINK	X	X	X	X	X	X	X	X	X	X	X	X
SPOT/RESPOT ARM FITTINGS	X			X			X			X		
SOLENOID LINKAGE	X	X	X	X	X	X	X	X	X	X	X	X
TABLE DRIVE	X											
SWEEP PANTOGRAPH LINKS	X	X	X	X	X	X	X	X	X	X	X	X
SWEEP CONN. RODS/BEARINGS	X			X			X			X		
RESPOT CELLS	X			X			X			X		
YOKE ASSEMBLY	X			X			X			X		
YOKE SPHERICAL BEARINGS	X											
SHIFTER LINK	X											
RESPOT SHIFTER MECHANISM	X			X			X			X		
DISTRIBUTOR PINION/STOP BLADE	X	X	X	X	X	X	X	X	X	X	X	X
DISTRIBUTOR	X			X			X			X		
SHUTTLE ASSEMBLY	X											
BELT TENSIONER OILITES	X			X			X			X		
RING TUBE OILER	X											
BALL ELEVATOR	X			X			X			X		
RUDDER DRIVE	X			X			X			X		
TRACK RAIL ASSEMBLY	X			X			X			X		
START SWITCH PIVOTS	X			X			X			X		
PIN EJECTOR ASSEMBLY	X			X			X			X		
FRONT ROLLERS & SUPPORTS	X						X					

TROUBLE SHOOTING INDEX

Section 7

Page Reference

7.2 Table

7.4 Sweep

7.6 Distributor—Bin

7.7 Cushion—Pit Assembly

7.9 Chassis, General

7.11 Trouble Shooting Procedures

7.11 Burnishing Relay Contacts

7.12 Motor and Switch Tests

7.13 Motor Capacitors

TABLE TROUBLES

Trouble	Cause	Test—Remedy
Table will not feel for pins (1st ball light on)	Gripper protection switch out of adjustment or broken	Adjust, replace
	Respot cells in closed position	Open cells manually
	Defective time delay unit	Replace chassis
	Table connection plug loose or broken	Repair or replace
Respot cells will not pick up pins or drops pins	Respot rod out of adjustment.	Adjust rod check with gauge (ref. page 5.21) ST-6519
	Respot cells (one or more out of adjustment)	
	If one cell only—check condition of fingers and cell adjusting screw	Replace or adjust
	Cell linkage binding or broken	Repair or replace
No pindicator lights. 10 pins originally picked up by table and indicated on masking unit	Thermal overload operated (Bowler too slow in delivering ball)	Normal operation, lamps will light after load cools
	Triac defective	Replace triac
Table runs continuously	TA1 adjusting screw turned out too far	Check with gauge ST-2748, adjust. ref. page 5.29
Table stops before zero position	TA1 adjusting screw turned in too far	As above.
1st ball-sweep down, time delay, sweep runs and cleans off all pins and comes to guard. Table does not come down	TA2 adjusting screw turned out too far	As step before
1st ball-sweep down to guard position, table continues to run	TA2 adjusting screw turned in too far	Check with gauge, ST-2748, adjust ref. page 5.29
Pin light on, no pin in gripper	Wire off gripper and touching frame	Visual, repair or replace
	Circuit grounded	Use testing procedure for grounds
	Board defective	Replace board
Pin in gripper, no pindicator light on	Wire disconnected or broken on gripper switch	Visual, repair or replace
	Circuit open from gripper to chassis	Use testing procedure for opens
	Circuit open in chassis board	Replace and repair chassis board
	Defective triac	Replace triac
First ball, sweep starts toward pit, table starts up with pins in gripper, both stop, neither will run with SA or TA-1	TB adjusting screw out of adjustment	Check with gauge, ST-2748. Adjust ref. page 5.29

TABLE TROUBLES

Trouble	Cause	Test—Remedy
Pin fell over during spotting	Chipped or badly worn pin base	Visual, replace pin
	Excessive wear in spotting linkage	Visual, replace necessary parts
	Spotting cup loose	Visual, tighten
	Spotting cup bent out of shape	Visual, repair
	Spotting rod out of adjustment	See table adjustments
	Yoke out of adjustment	See table adjustments

SWEEP TROUBLES

Trouble	Cause	Test—Remedy
Sweep runs up, down, and starts through to clean off the deck a second time as the table spots pins. Table and sweep stop because of interlock	SA out of adjustment	Check with gauge ST-2748, adjust ref. page 5.18
Sweep overruns all stopping positions	Sweep cams not adjusted properly	Check with gauge ST-2748, adjust ref. page 5.18
Sweep motor overloads trip to off position	Defective capacitor	Replace capacitor
	Bind in sweep drive assembly	Inspect and repair
Sweep hits gutter at 66° guard position	Rubber bumper 7283 worn	Replace
	Guide tube or rod assembly out of adjustment	Adjust, ref. page 5.20
Continuous sweep run	SA adjusting screw turned out too far	Check with gauge ST-2748, ref. page 5.18
After cycle starts sweep runs continuously	SB adjusting screw turned in too far	As step before
1st ball—after time delay the table comes down, sweep starts, and stops under the table as it comes down to respot pins, table stops	SB adjusting screw turned in too far	Check with gauge ST-2748, ref. page 5.18
1st ball—sweep down, table down about half way and stops. Table and sweep will not move by lifting TA or SA	SC adjusting screw turned out too far	As above
Sweep arms hit frame of machine at zero position	Readjust sweep link arm to allow sweep to run back further	Run machine, observe operation. See sweep linkage adjustments
1st ball—table down and picks up standing pins, but does not respot them. Sweep remains at guard position (66°)	Off spot switch adjusting screw screwed out too far	Check with gauge ST-2748 ref. page 5.28
1st ball—table comes down on top of an off spot pin, thus not picking up the pins. Then sweep cleans off all pins both standing and down, table comes down, spots pins, table goes up, sweep up, strike light on	Off spot adjusting screw turned in too far. Wire off switch or binding against frame of machine	Inspect, repair or adjust as above
	Broken wire at off spot switch	
2nd ball or strike-table will not spot pins, bins loaded with pins but will not drop the pins into spotting cups	BS switch or lever defective	Depress switch manually

SWEEP TROUBLES

Trouble	Cause	Test—Remedy
1st ball cycle completed successfully but sweep runs through again. On 2nd ball sweep runs but does not stay at guard while pins are spotted.	SA adjusting screw turned in too far	Check with gauge ST-2748 ref. page 5.18
Sweep not stopping at correct position. A) Guard position B) Run through C) Zero	Sweep cam switches not adjusted properly	Check with gauge ST-2748, adjust. rotate cams to get correct stopping position. Ref. page 5.18
Sweep runs too far into pit area.	Sweep connecting rods out of adjustment. Sweep crank arm rod too long	See adjustment section. Ref. page 5.20
Sweep travel too short	Sweep connecting rods out of adjustment. Sweep crank arm too short	As above

DISTRIBUTOR-BIN TROUBLES

Trouble	Cause	Test—Remedy
Distributor will not feed pins at correct position	Distributor drive cam not matched with pinion gear	Check bumps on nylon gear with punch marks on pinion gear
	Distributor not centered properly	Run distributor to #1 bin and center using 6047 safety link for adjustment
Pins feed continuously at one distributor location	Distributor clutch out of adjustment	Check spring tension
	Distributor rollers out of adjustment	See adj. section dist. roller adj.
Head first pins delivered to bin pockets	Pins not orienting properly	
	A) Pin slow in orienting, putting 2 pins on distributor too close together	Check orientor pan (clean)
	B) Pin stuck in wheel	Oversized pin (replace)
	C) Dirty pins or elevator wheel	Clean pins and elevator wheel
	D) Pins not seated in elevator wheel pockets	Adjust pin seating rod
	E) Pin rail 6098 or 6099 loose or out of adjustment	Observe pin release and adjust rail as required, to hold pin in wheel securely and release pin at the center of the orienting pan at the #1 pin position
Distributor front end hits bin during pin feed	Front end hardware loose	Adjust and tighten
	Distributor support assembly #7357 too low	Place shims between support ass'y. and cross bar as required

CUSHION-PIT TROUBLES

Trouble	Cause	Test—Remedy
Ball idles at cushion	Cushion leather stretched	Cut off excess
	Rubber rivet interference	Replace broken rivet
	Bounce plate support bracket loose or broken	Repair or replace
Ball idles at exit, will not enter lift	Ball lift too low	Adjust bumpers
	Kicker assembly loose or too far away from side plate	Adjust kicker rollers to 1/16" from side plates
	Kicker belt slipping	Visual inspection for bind, broken or loose tension spring
	Ball exit assembly not centered between side plates	Adjust accordingly
	Rudder jammed	Adjust rudder
	Interference caused by bounce plate	Check mounting bolts and rubber dampener for tightness
	Bounce plate support bracket loose or broken	Repair or replace
Ball failed to start machine	Metal guide plate loose or bent	Visual—Repair or replace
	Start switch actuator return spring weak or broken	Actuate switch by hand. Replace spring
	Start (S.S.) switch faulty. Not closing when actuated	Continuity check. Replace switch
	Start (S.S.) switch bracket bent or broken	Visual inspection. Straighten or replace bracket
	Bind in shock absorber	Manual inspection. Repair or replace
Machine continues to cycle	Start switch actuator return spring weak or broken	Actuate switch by hand. Replace spring
	Start (S.S.) switch faulty, not opening after actuation	Continuity check. Replace switch
	Switch (S.S.) brackets bent or broken keeping switch closed	Visual inspection. Straighten or replace brackets
	Pin jam under cushion actuating start (S.S.) switch	Visual inspection. Release jam
	Shock absorber faulty	Manual inspection. Repair or replace
	(S.S.) switch, cycle button, 10th frame switch button shorted or faulty	Manual inspection. Repair or replace
	Ball lift clutch slipping clutch worn	Visual inspection. Replace necessary parts
Ball lift fails to elevate ball	Set screw loose on drive pulley	Tighten set screw

CUSHION-PIT TROUBLES

Trouble	Cause	Test—Remedy
Ball lift fails to elevate ball	Ball lift clutch broken	Visual inspection pulley rotates, but ball lift belt does not. Replace clutch.
	Ball lift belt tension low. Belt tension spring retainer nut too loose	Check length of belt compression spring (4603). Proper belt tension is maintained when spring length is 4" to 4½". Readjust when spring exceeds 4½"
	V drive belt slipping on pulleys	Visual inspection. Replace belt.
	A) "V" belt stretched or worn B) Belt tightener spring broken or stretched	Visual inspection. Replace spring
Back-end motor overload, trips to off position	Jam in pin area causing motor to overload	Visual inspection. Remove jam
	Carpet rollers out of position	Visual Inspection. Replace rollers
	Defective chassis	Substitution. Replace chassis
	Defective back-end motor	Substitution. Replace motor

CHASSIS TROUBLES—GENERAL

Trouble	Cause	Test—Remedy
Table and sweep time delay too long or too short	Time delay circuit defective	Replace P.C. board
Machine cannot be turned off	Relay M contacts arced together or faulty armature	Repair, clean, or replace relay
Machine pit time delay too long or too short		Replace P.C. board
Halo light inoperative	Light dirty. Loose or broken plug. Reflector not in position	Wipe with damp cloth. Repair or replace
Machine dead, (M) relay not energized	Masking switch in off position	Turn switch on
	One or more circuit breakers in off position	Turn breakers to on position
	CB-1 open	Visual, replace
	Managers control switch in off position	Visual, turn on
	Power plug disconnected	Insert plug
	No power to machine	Check master circuit breakers
No cycle start		Replace P.C. board
No sweep run		Replace P.C. board
No table run		Replace P.C. board
No foul cycle		Replace P.C. board

NOTES

TROUBLE SHOOTING PROCEDURES

USE OF THE CONTINUITY TESTER (Open Circuits). Item 64 in Tool Kit

NOTE: Do not use on live circuits. Disconnect all power on device to be tested.

To check continuity of any wire, disconnect one end. Connect one side of tester to one end of the wire suspected, and the other side of the tester to the end of the disconnected wire. If wire is good, tester should light. If wire is open, tester will not light.

USE OF CONTINUITY TESTER (Shorts)

To check for a short between two wires, disconnect both ends of the wires suspected. Connect tester across the two wires. If tester lights, wires are shorted. If tester does not light, wires are OK.

USE OF CONTINUITY TESTER (Grounds)

To check for possible ground, disconnect both ends of the wire suspected. Connect one side of the tester to the conduit or frame of machine and the other side of the tester to one end of the wire being tested. If wire is grounded, tester should light. If wire is not grounded, tester will not light.

USE OF VOLTAGE TESTER Item 20 in Tool Kit

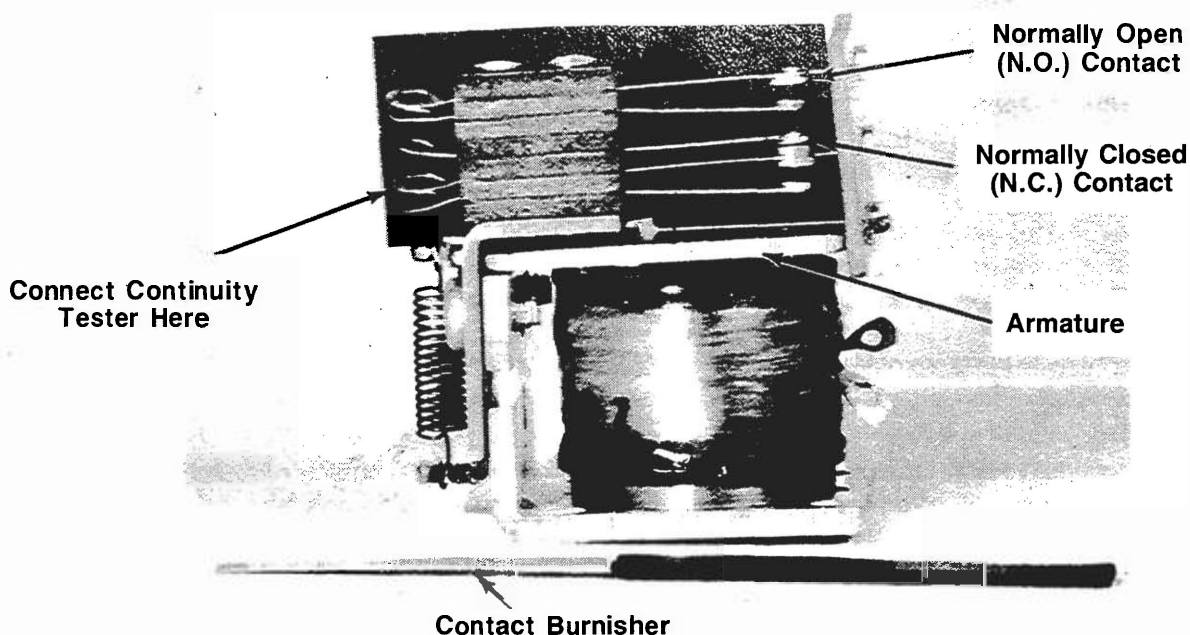
NOTE: For use on alternating or direct current. (AC or DC) 80 to 600 volts. All power to the machine or device to be tested should be turned on. Caution should be used when testing live circuits.

To check for voltage, connect tester in parallel or across line on device to be tested. Neon bulb will glow if voltage is present. when checking across 220 volts, neon bulb will be twice as bright as when checking 110 volts. Tester cannot be used on circuits below 80 volts.

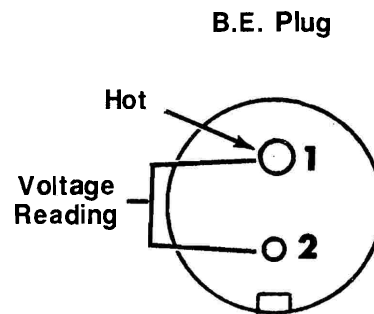
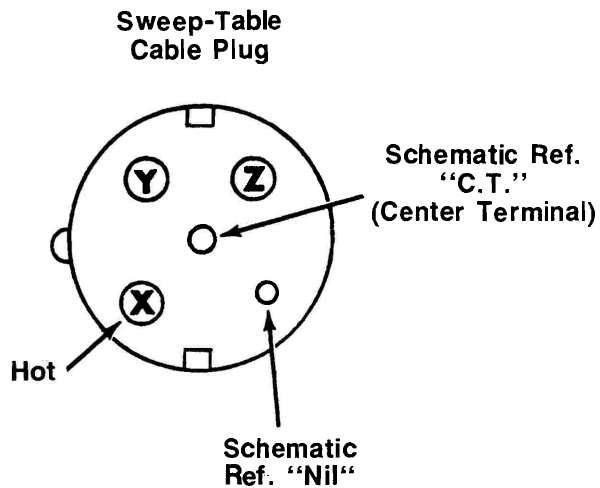
INSTRUCTIONS FOR USING RELAY CONTACT BURNISHER

1. Insert the burnishing tool between the two contacts to be cleaned, keeping the tool parallel with the contacts.
2. Slide the tool back and forth to obtain a smooth clean contact.
3. If normally open contacts are to be cleaned, it will be necessary to apply a slight amount of pressure to the armature to bring both contacts of the relay in contact with the burnishing tool.

NOTE: The burnishing tool will work best if kept free from dirt, grease or oil. It should not be touched with the fingers. After using, it should be stored in its carrying case.



TESTING MOTOR PLUGS



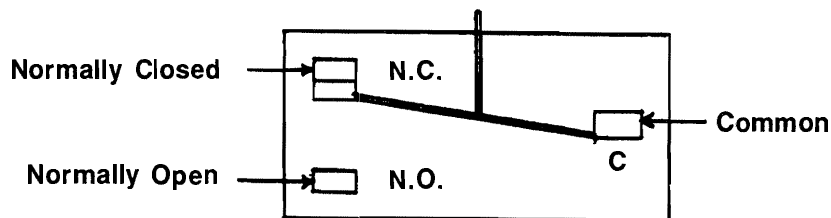
Voltage Tests With Power On

		Between
X	and	Nil
X	and	Z
X	and	Y (Sweep Reverse)
1	and	2

Continuity Tests With Power Off

		Between
X	and	Z (300 ohms)
Y	and	C.T.
Z	and	Nil

TESTING MICRO SWITCHES USING CONTINUITY TESTER



NOTE: To make this test on machine, remove wire connected to common terminal of switch.

1. Connect continuity tester across common (C) and normally closed (N.C.) contacts of switch. Tester should light. Depress plunger on switch several times to check mechanical action. Tester light should go on and off.
2. Connect continuity tester across common (C) and normally open (N.O.) contacts of switch. Tester should not light. Depress plunger on switch several times. Tester light should go on and off.

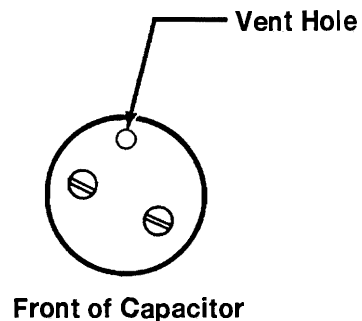
MOTOR CAPACITORS

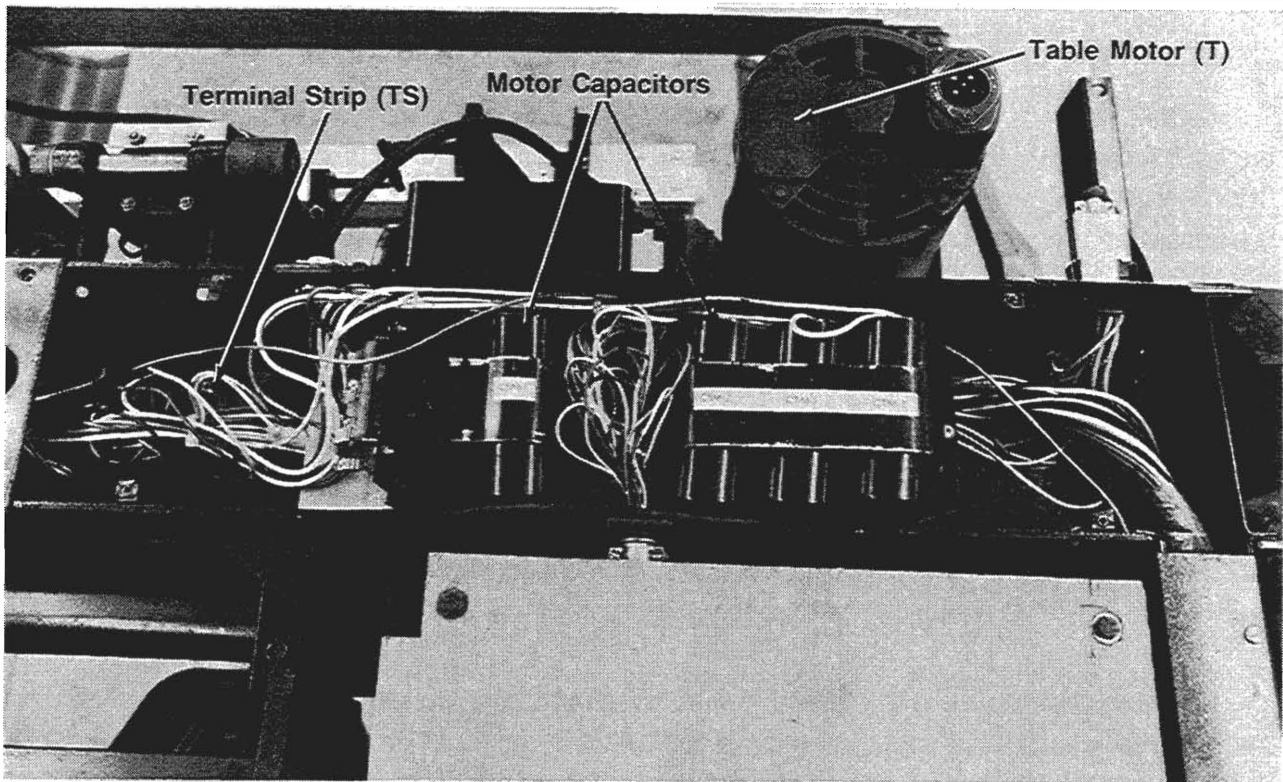
Two capacitors are used in the starting and electrical breaking circuits of the table and sweep motors. Only one capacitor is used in the starting circuit of the back end motor. The back end motor does not have a breaking circuit. Occasionally a capacitor may fail, resulting in an inoperative motor. If a capacitor opens internally, the motor will not start. The motor will hum, get hot and the klixon will trip. If a capacitor shorts internally, the motor will run but may start with a strange sound. With a shorted capacitor, electrical braking will not work and the motor will coast (drift) to a stop.

Burnt or loose connections may cause coasting or failure to run and the trouble could be intermittent. Trouble areas include relay contacts, CI plug, motor plug and the centrifugal switch in the motor. If the centrifugal switch is open, the motor will not start. The motor just hums, gets hot and trips the klixon. If the centrifugal switch fails to open when the motor runs, once again the motor gets hot. Also one or both capacitors may explode.

An ohmmeter can be used to determine if a capacitor is good, open or shorted. Capacitors store an electrical charge and could be in a charged state in the machine. Before handling a capacitor, remove the power plug (Russell Stoll), lift the cover from the wireway behind the table motor and short across the terminals of the capacitors. An insulated screwdriver can be used to do this. If a capacitor is charged, this will discharge it. However, it is unlikely you will find a charged capacitor in the pinspotter. The capacitors are identified as CTM for capacitor table motor and CSM for capacitor sweep motor. The back end motor capacitor is mounted on the BE motor stator.

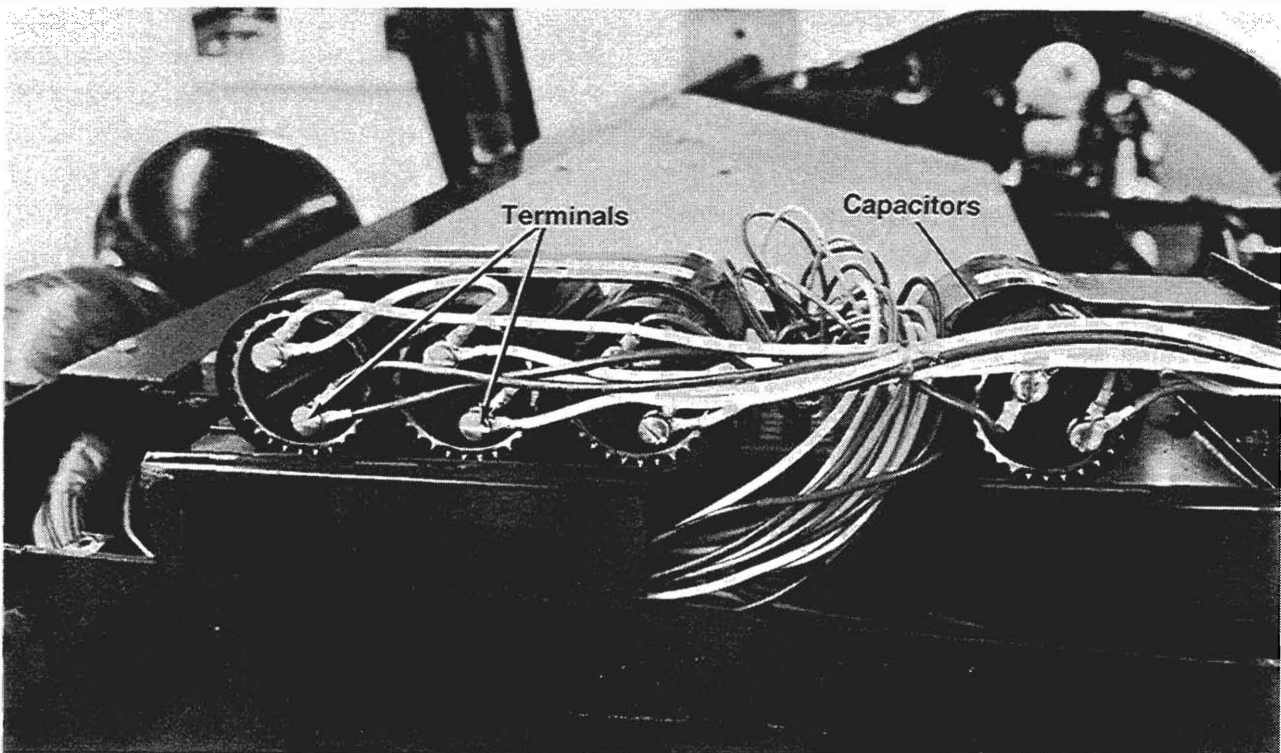
To test a capacitor, after making certain it is discharged, remove the connections from one capacitor terminal. Using the highest resistance scale of an ohmmeter, connect the meter leads to the two capacitor terminals and leave them connected for approximately one minute. The battery in the meter will charge the capacitor. A resistance reading of 50,000 ohms or more indicates a good capacitor. If the meter reads zero ohms, a shorted capacitor is indicated. No reading at all (infinite) indicates an open capacitor. After testing a capacitor it should be discharged by shorting across its terminals. When replacing a capacitor, it should be installed with the vent plug at the top (12 o'clock position). Capacitor terminal screws must be tight. The resistors to the right of the capacitors in the wireway are used to discharge the capacitors.





MOTOR CAPACITORS

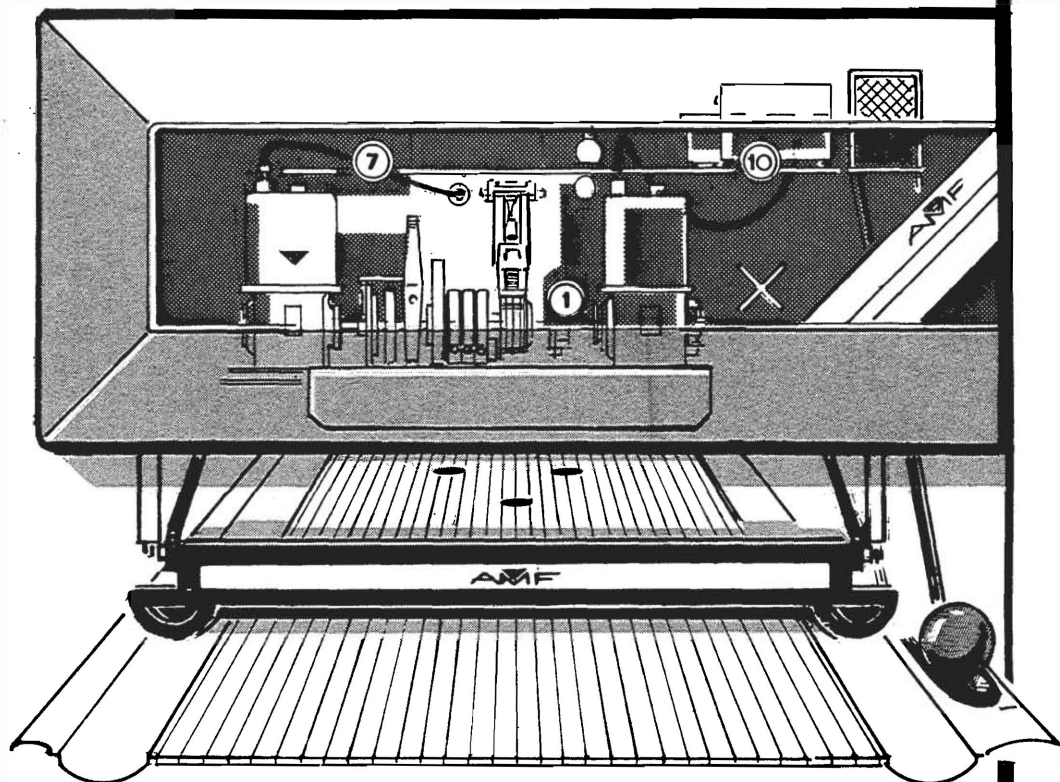
Occasionally a capacitor may fail resulting in an inoperative motor. To test a capacitor, remove the connections from one terminal (see photo below) and take a resistance reading. Connect the meter and wait approximately one minute for the capacitor to charge up. A reading of 50,000 Ohms or more indicates a good capacitor, zero Ohms (short), no reading (open).



AMF

82-70C

AUTOMATIC PINSPOTTER



SOLID STATE
& MP CHASSIS

PARTS LIST

EFFECTIVE
SERIAL NO. 99193

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1. PRICES

All prices quoted are FOB Shelby, Ohio U.S.A.
Add 5% to the FOB Value of the Order for F.A.S. Port of Ex-
port, U.S.A. Added to this price will be normal shipping
charges, (Ocean Freight/Forwarding/Consul Fees/Insur-
ance).
Listed prices are for each individual unit and do not reflect
the minimum order quantity extended price.

2. MINIMUM ORDER VALUE

The minimum order value (except for emergency require-
ments ordered by cable or telex) is \$50.00 F.A.S. made up of
spare parts only.

3. ORDERING QUANTITY

Each listed item specifies a minimum ordering quantity.
Order in these quantities or multiples thereof. Order quan-
tities which do not conform to the listed minimums will be
automatically increased to the next highest minimum or its
multiple.

4. REBUILT AND USED PARTS

Spare part numbers with the first two digits reading 52 or 62
are only available as rebuilt and the price list reflects an
allowance already given from new price. AMF reserves the
right to further substitute rebuilt parts for new in other than
the 52 and 62 series numbers, if circumstances demand. In
those cases, 25% discount will apply to the appropriate list
price of the new part. Spare part numbers with first two
digits 53 and 63 are available as used parts and are priced
accordingly.

5. ELECTRICAL SPECIFICATIONS

It is imperative that 115 volt 50 cycle and 220 volt 50 cycle
parts be ordered by the appropriate part number for the
electrical specifications required. AMF will not be responsi-
ble for the shipment of unuseable electrical parts ordered
under a part number for other than the electrical specifica-
tions required.

MOD V MASK ASS'Y MECH PARTS

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 011 447	Mod V Mask Ass'y. - Universal	49	948 745 082	Washer, Flat
2	070 011 463	Hanger Bracket (Outer)	50	809 849 325	Screw, Hx. Hd. 1/4"-20 X 2" Lg.
3	814 649 160	Screw, Hex Washer Hd. 1/4"-20 X 1" LG	51	948 753 102	Washer, Plain
4	724 505 020	Tube Clamp - 2 Req'd. (2 Addit Req'd per each filler unit)	52	844 049 002	Nut, Stover 1/4"-20
5	823 138 122	Screw, Rnd. Hd. T.F. 10 x3/4-2 Req'd (2 Addit. each filler unit)	53	070 011 537	Screen Perferated Metal
6	000 028 176	Adjusting Bracket	54	070 001 536	Screen, Perferated Metal(Switch Cutout)
7	809 865 205	Screw, Hx. Hd. Cap 3/8-16X 1 1/2 Lg.	55	770 011 010	Ty-Rap
8	948 868 162	Washer, Flat	56	808 540 081	Screw Button 10-32 X 1 1/2" Lg.
9	844 065 002	Nut, Stover 3/8"-16	57	070 011 646	Bracket Ass'y. (Substitute)
10	744 102 006	Clamp, Rod, Self Tightening 1/2" nom.	58	070 005 713	Push On Fasteners (View H)
11	070 005 791	Support Rod, R.H.	59	716 002 011	Nail - 4D (View H)
12	000 025 037	Insert	60	070 005 701	Numeral #1 (View H)
13	809 850 125	Screw, Hx. Hd. Cap - 1/4"-28 X 3/4"Lg.	61	070 005 702	Numeral #2 (View H)
14	835 550 002	Nut, Hx. Jam 1/4"-28	62	070 005 703	Numeral #3 (View H)
15	070 005 681	Support Rod, L.G.	63	070 005 704	Numeral #4 (View H)
16	000 021 797	Mask Support Brace (Diagonal) (3req'd. 1st pr. 2 req'd. each add. pr.)	64	070 005 705	Numeral #5 (View H)
17	809 865 525	Screw, Hx. Hd. Cap 3/8-16 X 3/4" Lg.	65	070 005 706	Numeral #6 & 9 (View H)
18	070 011 711	Support Rod	66	070 005 707	Numeral #7 (View H)
19	610 707 024	P.C. Board, Sparemaker (Use with C-23, Elco, MPU Chassis & 3000)	67	070 005 708	Numeral #8 (View H)
20	610 707 023	P.C. Board, Pindicator (Use with C-23, Elco, MPU Chassis & 3000)	68	070 005 709	Numeral #0 (View H)
21	070 011 509	Sequencer Bd (Sparemaker Only)	69	759 512 061	Mask, Start Switch (View G)
22	070 011 455	Reflector	70	070 011 728	Gas Spring
23	070 011 454	Parchment	71	939 757 320	Ball Stud, 5/16"-18 (View F)
24	808 640 161	Screw, Button Hd. Lon Lok #10-32 X 1"	72	948 761 112	Washer, Plain 11/32"ID- 11/16OD X 1/16TH. (View F)
25	070 011 598	Standoff, Male-Female #10-32	73	843 157 002	Nut, Keps 5/16"-18 (View F)
26	843 140 002	Nut, Keps #10-32	74	751 001 032	Bulb (GE #904) (View E)
27	070 011 669	Mask Harness Ass'y. - Sparemaker Lts. 82-70 A & B	75	751 001 031	Bulb (GE #194) (View E)
27a	070 011 668	Mask Harness Ass'y. - Pindicator Lts. 82-70 A & B	76	757 001 015	Socket Lamp (Elicon #1441) (View E)
28	070 011 510	Mask Harness Ass'y. - Pindicator & Sparemaker Lts-82-70, C-23, MP	77	760 005 146	Terminal 18Ga. (View A)
29	070 011 511	Mask Harness Ass'y. - Pindicator & Sparemaker Lts.-ELCO	78	010 100 106	Wire, 18A 300V - Black (View A)
30	940 372 000	Tubing, Expando 1/2" Blk (5"-9" Req'd)	79	000 029 093	Sheild, 1 PC, Long-180° (View B)
31	746 008 095	P.C. Board Edge Connector (AMP 583617-1 1 each Bd. Ass'y.)	80	000 029 013	Clip, Spring-Locking (View B)
32	746 007 105	Connector, In-Line Splice	81	000 025 144	Block, Male - 34 Position (View B)
33	760 017 044	Terminal, Faston (Straight)	82	000 028 441	Socket Guide, Female (View B)
34	218 003 141	Start Switch (Machine Zero) Kit. (70-C-ELCO & C-23 ONLY)	83	000 028 442	Pin Guide, Male (View B)
35	070 011 706	See page 4 for switch Kit Req'd for each Mach.	84	000 025 076	Pin, .062 Series (#18-16Ga.) (View B)
36	070 011 709	Set Screw Collar Brk't.	85	812 621 082	Screw, Rd. Hd. 4-40 x 1/2" Lg.
37	804 557 350	V Brace Assembly	86	951 020 000	Washer, LK. Split #4
38	951 156 002	"U" Bolt Assembly 5/16 Thd.	87	834 821 000	Nut, Hex 4-40
39	070 011 729	Lock Washer-Spring, 5/16	88	753 800 001	Plug, Keying - AMP #200821-1 (View C)
40	070 011 491	Gas Spring Ass'y.	89	746 006 029	Clamp, AMP #206138-1 (View C)
41	070 011 504	Filler Ass'y. (Standard) (See Note As Req'd)	90	754 013 717	Plug, AMP #206150-1 (View C)
42	070 011 607	Bumper Channel	91	000 025 077	Socket, (View C)
43	070 011 607	Grnd. Wire Ass'y.-Chassis Int. (Not Shown) See Note Pg. 3	92	818 221 102	Socket, (View C)
44	809 849 165	Screw Hx. Hd. Cap. 1/4"-20 X 1" Lg.	93	843 121 002	Screw, Sems Rnd. CR11-Ext. LW #4-40 X 5/8"Lg.
45	070 011 539	Accent Stripe/Logo (R.H.)	94	843 121 002	Nut, Keps Ext LW #4-40 (View D)
46	070 011 540	Accent Stripe (L.H.)	95	000 020 203	Handle, Connector (View D)
47	070 005 790	Hanger Bracket	96	000 029 532	Insert, Elco (View D)
48	070 011 596	Hanger Bracket - Center	97	000 025 886	Receptical, 29 Position (View D)
2	070 011 688	Jumper Ass'y - Int. Chassis (Not Shown) See Note 4 Pg. 3	98	760 003 110	Contact, Straight (View D)
			99	760 015 020	Terminal, Spade Flange (View D)
			100	610 707 028	P.C. Board, Sparemaker; used with 70-1 & B Machine
			101	610 707 027	P.C. Board, Pindicator, Used with 70-A & B Machine
			102	070 011 608	Cable Ass'y. - Mod V Start Switch (View D) (70C-Elco&C-23 Only)
			103	000 025 490	Clip, Retainer (Detail A)
			104	818 233 082	Screw, Ph. Hd. - Rd. Hd., 8-32 X 1/2 (Detail A)
			105	843 133 002	Nut, Keps Ext. L.W., 8-32 (Detail A)
				070 ST009 834	Alignment Fixture

AMF Incorporated

MOD V MASK ASS'Y
MECH. PARTS-70 INST

AMF

TRADE MARK

Rev 5-83

INSTALLATION PROCEDURE

(ELECTRICAL)

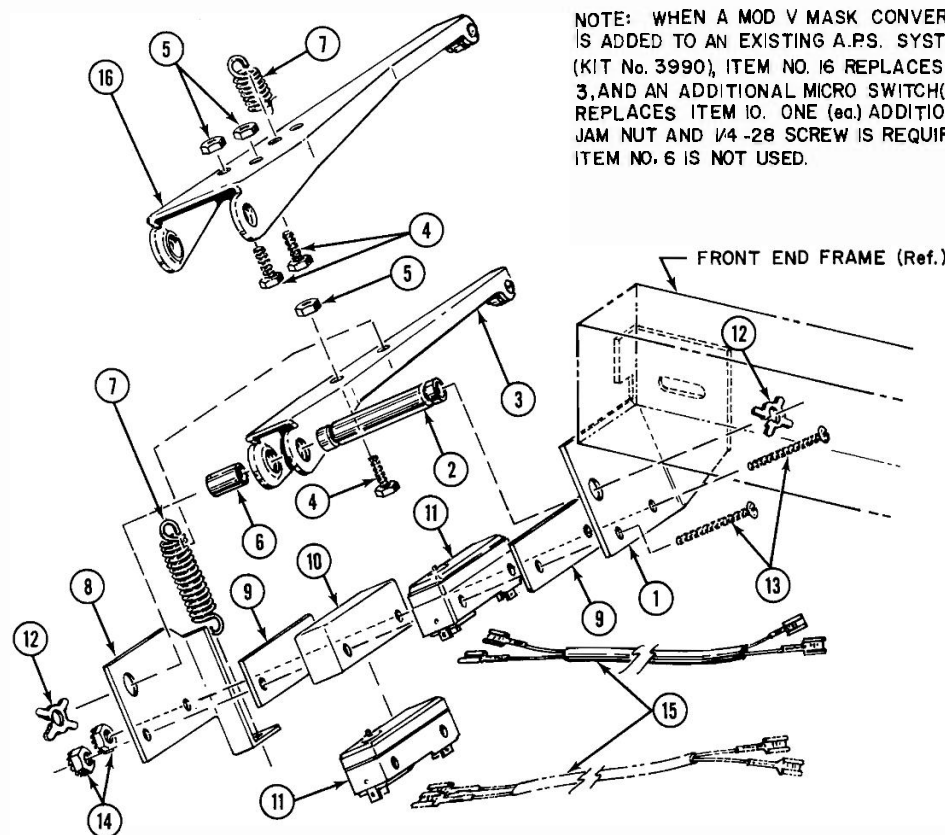
MOD V MASK P.C. BOARDS WITH M.P., SOLID STATE, AND 3000 CHASSIS

- A. Plug the Mask Cable Edge Connector (item 2) into P.C. Board (item 1). Attach so that the 2 (two) short wires with in-line splice connectors are to your left when facing the back of the board. Pin A to "A" marked on the board.
- B. Ty-rop the Mask Cable to the mask support pipe (ref. item 55a on reverse page). Allow a sufficient cable service loop to facilitate lowering the Mask. Dress and ty-rop the Mask Cable to the mask support brace (item 16, reverse page).
- C. M.P., C-23, and 3000 Chassis ONLY. Check the connector on the chassis labeled "Mask", or P.M., for a ground wire in connector pin location 33. If there is no grnd. wire, install the 12" green wire included in kit no. 610-703-973 or 3975, in that location. Attach the other end of the wire to a ground inside the Chassis. Elco Chassis ONLY. Loosen the screw directly above the connector on the Chassis labeled "P.M." and secure the green ground wire under the screw.
- D. Plug the Mask Cable Chassis Connector into the chassis receptacle labeled "P.M." or "Mask".
- E. Attach the 2 (12'-0" lg./black) wires from the Edge Connector to the Mask Switch, located near the top center of the mask. Use vertically aligned terminals for the connections (see View G, item 33, 69, and 78 reverse page).
- F. When a chassis is to be updated from a pindicator to sparemaker, the conversion should be made at this time. Use ROM P.C. Bd. No. 6 Kit 225-001-001 for 7750 chassis (C-23 plug), or Kit 225-001-002 for 6700 chassis (Elco plug). Installation instructions are included with the kits.
- G. C-23 and Elco chassis only. Install the sweep switch, per kit instructions, being careful to adjust the setting for maximum swing. Kit no. 3991 is used on all existing A.P.S. systems, and on Mod V masks without A.P.S. that have Elco or C-23 (solid state) chassis only. Kit no. 3390 is used when a Mod V mask is added to an existing A.P.S. system. See the reverse page (items 32, 33, 34, & 90) for set-up and location. Refer to the illustrated parts breakdown (this page) for parts and assembly req'm'ts.
- 1) Connect the 2 conductor switch cables (item 15/p.n. 070-011-608) to the common and normally open terminals on the switch. Connect the opposite cable ends to the in-line splice connectors on the short (red and brown) wires leading from the Mask Cable P.C. Bd. Edge Connector.
 - 2) Ty-rop the switch cables to the mask cable, and cut the wire jumper (labeled "J.I.") next to the mask connector.
 - 3) The M.P. and 3000 chassis do not require switch cable connections made to the Edge Connector (red and brown) wires, as they serve no function in this installation.
- H. Elco and C-23 chassis with an existing Magic Score system require the connection of the two (2) wires marked 2B to the small terminal board located on the lower right side of the circuit card.
- J. Install the second P.C. Board. Repeat steps A thru H.

INSTALLATION CONT:

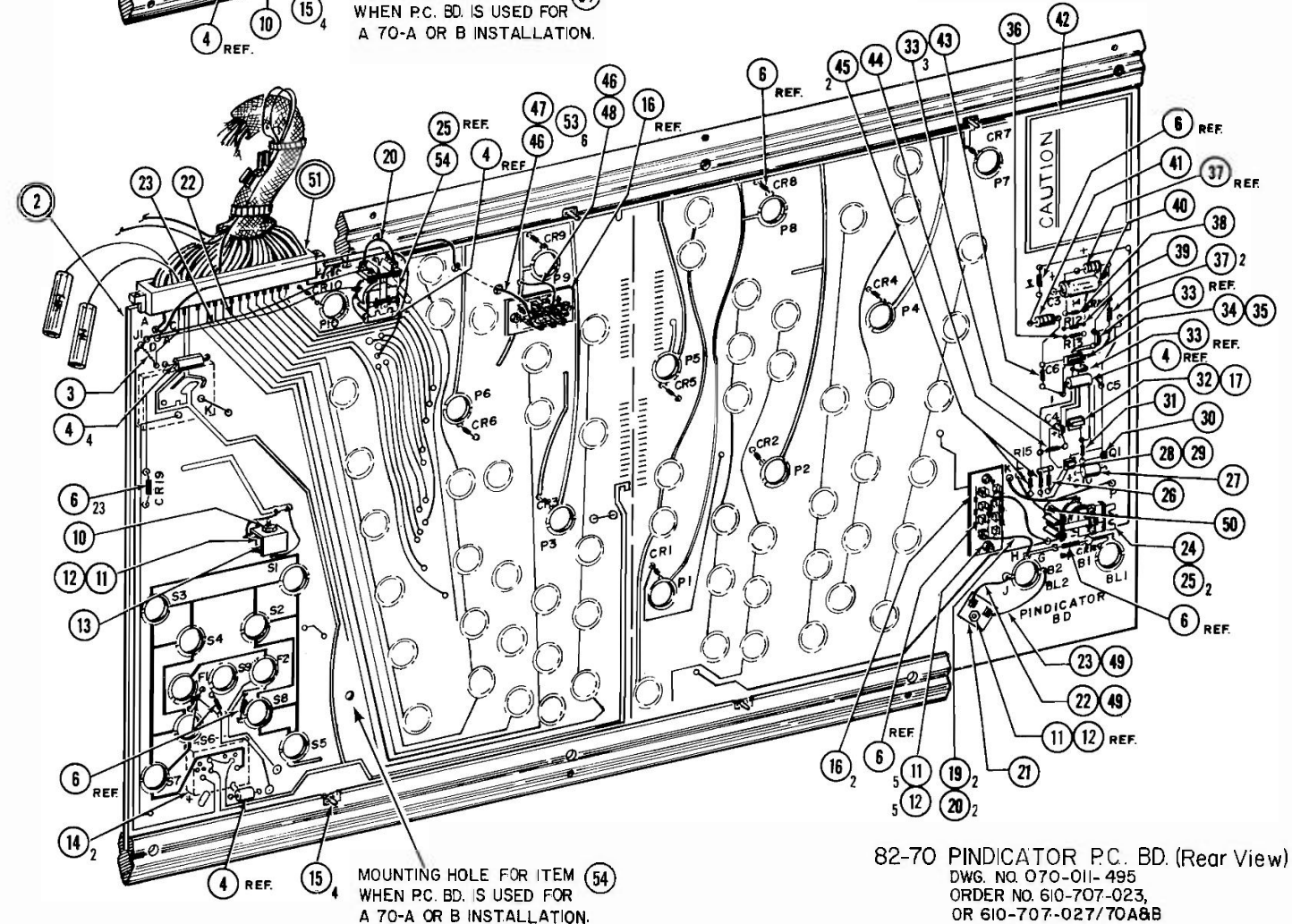
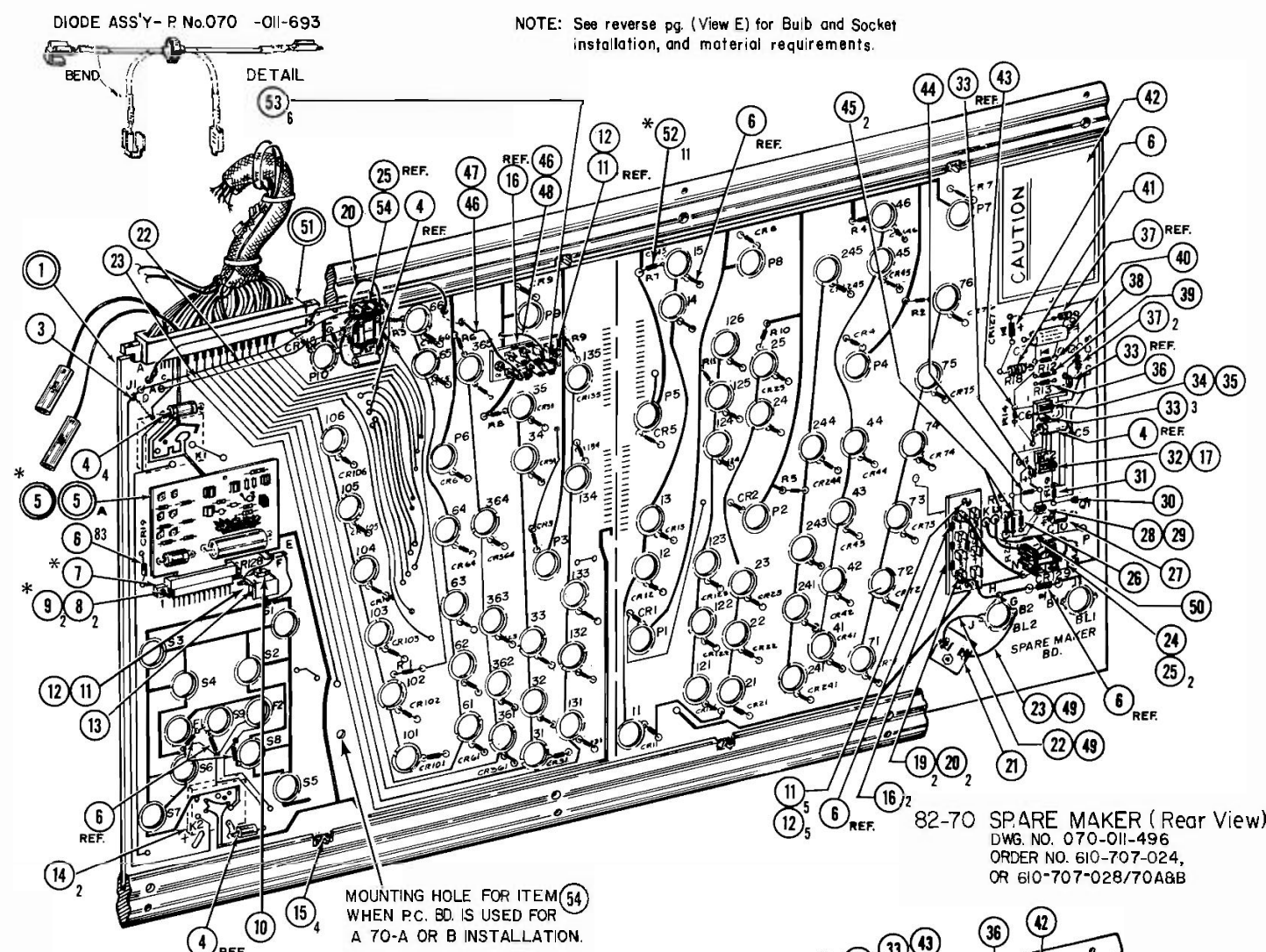
- K. Turn on the Mask Switch. Turn on the Pinspotters per normal procedure. The strike "X" may, or may not flash. Cycle the machine to the 1ST ball.
- L. Measure the voltage across the Pin 5 lamp (center) with a D.C. voltmeter. The reading should be between 9 and 10 volts. Adjust to required voltage by moving the red wire on the diode board (top center-left of mask P.C. board) to another terminal. The higher the terminal number the higher the voltage. If necessary, repeat until the voltage reading is correct.
- M. Measure the voltage across the 1ST ball lamp (lower right) with a D.C. voltmeter. The reading should be between 9 and 10 volts. Adjust to correct voltage by moving the wire with the smaller number terminal on the small diode board (item 16) to another terminal. The higher the terminal number the higher the voltage.

— INSTALLATION COMPLETE —



SWEEP START SWITCH ASS'Y.

Item	Part No.	Description	Item	Part No.	Description
1	218-002-063	BRACKET, LARGE MT'G.	9	000-021-575	INSULATOR
2	218-001-998	PIN	10	000-021-574	SWITCH BLANK
3	000-021-645	LEVER ASS'Y, SINGLE	11	000-026-042	SWITCH, MICRO
4	000-021-714	SCREW, 1/4"-28 x 7/8" Lg.	12	963-200-002	X-WASHER
5	835-550-002	NUT, JAM 1/4"-28 HEX	13	812-827-282	SCREW, 6-32 x 3/4" Lg.
6	070-006-694	SPACER	14	843-121-002	NUT, KEP W/Ext. Lk. WSHR 632
7	000-024-657	SPRING	15	070-011-608	CABLE ASS'Y, 6'-0" Lg.
8	218-001-988	BRACKET, SMALL MTG.	16	000-021-713	LEVER ASS'Y, DBL.



MOD V MASK 070 P. C. BOARD PARTS

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	610 707 024	Sparemaker P.C. Bd. (70-SS, C-23, MP, 82-30-3000)	27	743 000 126	Capacitor, 1 Uf at 25VDC
1a	610, 707 028	P.C. Board Assy Sparemaker 70 A & B Machine Only - See Page G & H	28	757 006 017	I.C. Socket, 6 Pin Dip
2	610 707 023	Pindicator P.C. Bd. (70-SS, C23, MP 82-30-3000)	29	750 603 046	Opto-Isolator 4N 25
2a	610 707 027	P.C. Board Assy Pindicator 70 A & B Machine - See Page G & H	30	070 007 312	Transistor, NPN 2N 5449
3	010 100 209	Wire, 18Ga. Vinal Coated (.08) White	31	916 330 435	Resistor 4.3K ½W.
4	000 026 837	Capacitor, 50 Uf at 50 VDC	32	750 613 063	I.C. 7476 (Flip-Flop)
*5	070 011 509	Sequencer P.C. Board 70-SS, C23, MP 82-3000	33	743 000 027	Capacitor .01 Uf 25 VDC
5a	070 011 664	Sequencer P.C. Board - 70 A & B See Page G & H	34	750 618 064	I.C. 566 Timer
6	748 004 041	Diode, IN4004 (83 Req'd Sparemaker/23 Req'd Pind.)	35	757 006 008	I.C. Socket 14 Pin Dip
*7	746 008 103	Connector, 58354 2Y	36	916 330 364	Resistor 36K ½W.
*8	818 221 122	Screw, Pn. Hd./Phil. 4-40 X 3/4"Lg.	37	743 000 105	Capacitor 10 Uf VDC
*9	843 121 002	Nut, Hex-Kep, 4-40	38	748 001 036	Diode, Zener 5.1 V-1W
10	748 001 035	Diode, IN 1200A	39	916 330 914	Resistor 91K ½W.
11	843 133 002	Nut, 8-32 Keps	40	070 005 954	Capacitor, 250 Uf 25 VDC
12	812 833 082	Screw, Pn. Hd./Phil., 8-32 X ½" Lg.	41	916 632 401	Resistor 240 Ohm 2 W.
13	070 005 668	Heat Sink	42	070 011 601	Decal, Caution
14	755 507 008	Relay, T10E2 Y4 12	43	916 330 684	Resistor, 68K ½W
15	760 012 111	Terminal Pin 350491-1	44	916 330 104	Resistor, 10K ½W
16	000 021 368	Terminal Board	45	916 330 475	Resistor, 4.7K ½W.
17	757 006 009	I.C. Socket (16 Pin D.I.P.)	46	760 017 035	Terminal, Faston, 18-14 Ga.
18			47	010 100 202	Wire #18 Red-600V
19	760 017 044	Terminal-Faston #18-22 Ga.	48	010 100 200	Wire #18 Black-600V
20	010 100 309	Wire #22 White, 300V	49	760 006 042	Terminal, Flag
21	000 021 217	Terminal Bd.	50	010 100 305	Wire, #22 Green, 300V
22	010 100 304	Wire, #22 yellow-300V	*51	746 008 095	P.C. Board Edge Connector (AMP 583617-1)
23	010 100 306	Wire, #22 Blue-300V	52	916 336 801	Resistor R-1 Thru 11 680 Ohm ½W.
24	755 507 011	Relay 1 Form C 12V	53	070 011 693	Diode Assy.
25	843 127 002	Nut, Kep #6-32	54	755 507 010	Relay 2 Form C 12 V
26	916 332 201	Resistor 220 Ohm ½W.			

*Indicates Sparemaker Only

UNIVERSAL MOD IV MASK ASSY.

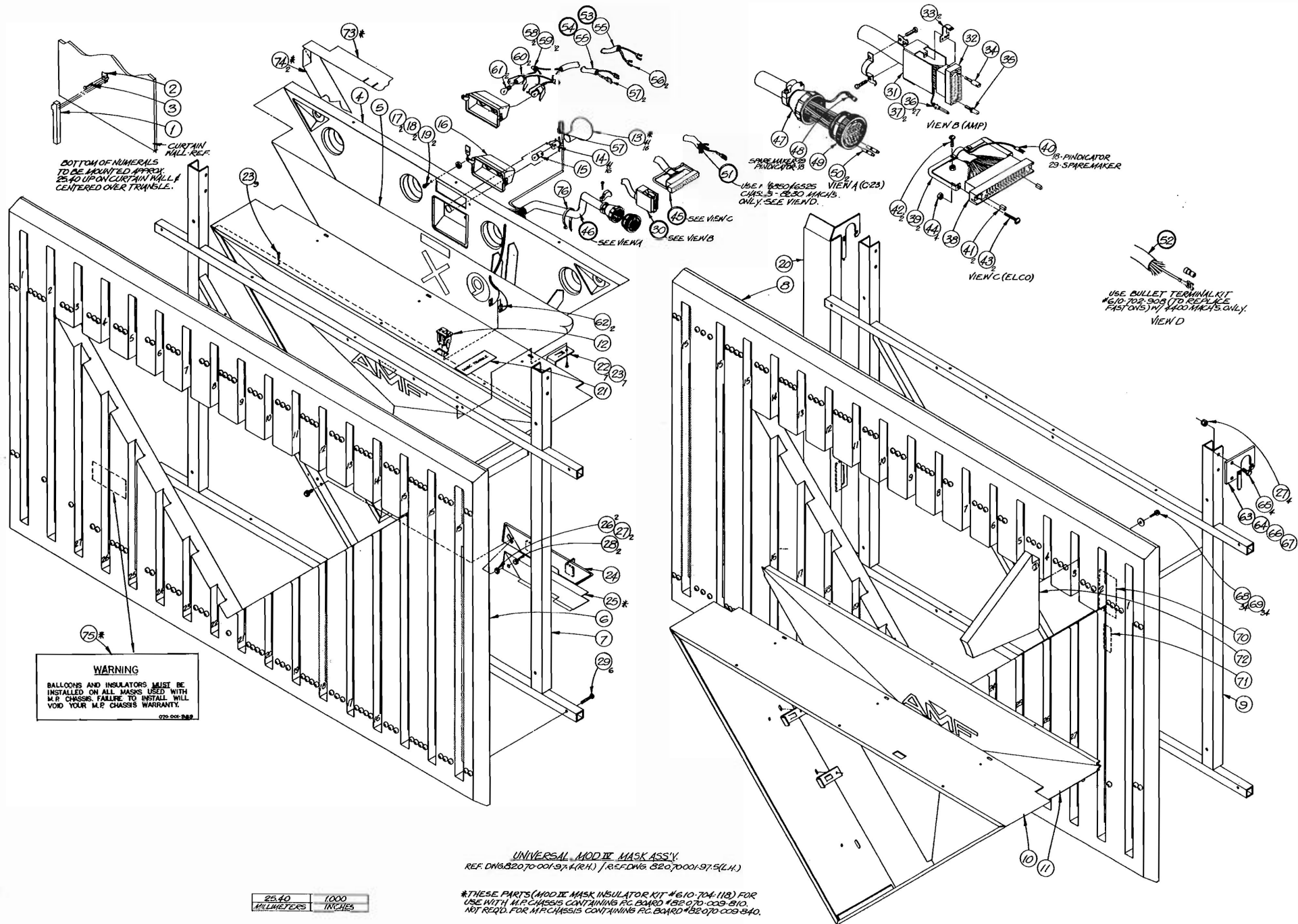
Ref. Dwg. 070-001-974 (R.H.)/Ref. Dwg. 070-001-975 (L.H.)

9

ITEM	PART NUMBER	DESCRIPTION
1-	070-005-701	Lane Number 1
1A-	070-005-702	Lane Number 2
1B-	070-005-703	Lane Number 3
1C-	070-005-704	Lane Number 4
1D-	070-005-705	Lane Number 5
1E-	070-005-706	Lane Number 6 & 9
1F-	070-005-707	Lane Number 7
1G-	070-005-708	Lane Number 8
1H-	070-005-709	Lane Number 0
2-	070-005-713	Fastener, Push-On
3-	716-002-001	Nail, Sinkers - Coated - 4D
4-	070-007-501	Plate, Triangle Mtg. - Ball Path Ind.
5-	070-005-789	Parchment, Triangle - Plndicator
5A-	070-005-718	Parchment, Triangle - Sparemaker
6-	070-007-788	Assy Plate, Fin Mtg. - R.H.
7-	070-007-427	Weldment, Frame - R.H. Mask
8-	070-007-787	Assy Plate, Fin Mtg. - L.H.
9-	070-007-483	Weldment, Frame - L.H. Mask
10-	070-007-585	Frame, Triangle
11-	070-007-671	Triangle, Perforated - Blue
11A-	070-007-672	Triangle, Perforated - Green
11B-	070-007-673	Triangle, Perforated - Charcoal
11C-	070-007-709	Triangle, Perforated - Red
12-	000-026-037	Switch, Toggle
*13-	070-011-328	Cover, Balloon - Mask Lamp
14-	070-007-563	Socket, Lamp
15-	000-027-731	Lamp
16-	030-007-753	Box, Foul Light
17-	070-002-818	Washer, Rubber
18-	822-932-122	Screw, Pan HD - Type "AB" - #8 x ¾
19-	724-511-060	Nut, Tinnerman - #C9223-82
20-	070-007-698	Filler, Mask - Standard
20A-	070-007-699	Filler, Mask - Small (15" to 21")
20B-	070-007-701	Filler, Mask - Med. (21 ½" to 27 ½")
20C-	070-007-702	Filler, Mask - Lg. (28" to 34")
21-	000-027-828	Decal, Magic Triangle
22-	070-011-020	Bracket, Mtg.
23-	823-332-082	Screw, RD HD - Type "AB" - #8 x ½
24-	070-007-613	Weldment, Angle Brace
*25-	070-011-338	Protector, Angle Brace
26-	809-849-125	Screw, Hex HD - ¼-20 x ¾
27-	844-049-002	Nut, Lock - ¼-20
28-	832-049-000	Nut, Nylon - ¼-20
29-	812-840-242	Screw, SL RD HD Mach. #10-32 x 1 ½
Electro-Mechanical Chassis		
30-	070-006-485	Assy, Mask Harness-Pin & Sparemaker Lights
30A-	070-006-470	Assy, Mask Harness-Pin Lights Only
31--	000-025-089	Shield - (1) Pc. Long - 180°
32--	000-025-144	Block - Male - 34 Position
33--	000-029-013	Clip, Spring - Locking
34--	000-028-441	Socket Guide, Female
35--	000-028-442	Pin Guide, Male
36--	000-028-448	Pin - .062 Series (#24-20 GA.)
37--	000-025-076	Pin - .062 Series (#18-16 GA.)

ITEM	PART NUMBER	DESCRIPTION
Elco S/S Chassis		
45-	070-007-564	Assy, Mask Harness-Pin & Sparemaker Lights
45A-	070-007-565	Assy, Mask Harness-Pin Lights Only
38--	000-025-886	Receptacle - 29 Position
39--	000-020-203	Handle - Connector
40--	000-020-204	Contact - Straight
41--	000-029-532	Insert - Elco
42--	818-221-062	Screw, Sems-RD HD CR11-EXT LW #4-40 x ¾" Lg.
43--	818-221-102	Screw, Sems-RD HD CR11-EXT LW #4-40 x ¾" Lg.
44--	843-121-002	Nut, Kep - EXT LW - #4-40
C-23 S/S Chassis		
46-	070-007-664	Assy, Mask Harness-Pin & Sparemaker Lights
46A-	070-007-665	Assy, Mask Harness-Pin Lights Only
47--	746-006-029	Clamp - AMP #206138-1
48--	000-028-445	Socket - AMP #42981-2
49--	754-013-717	Plug - AMP #206150-1
50--	753-800-001	Plug, Keying - AMP #200821-1
30 Machine Only		
51-	030-008-484	Assy, Mask Harness-Pin & Sparemaker Lights
52-	030-008-479	Assy, Mask Harness-Pin Lights Only
53-	070-005-932	Cable Assy, Foul Light
55--	906-318-021	Cord, "SO" - 2 Cond. - 18 GA. - 600 Volts
56--	760-015-033	Terminal - Spade - AMP
58--	742-502-002	Insulator, Splice - Buchanan
59--	742-503-004	Cap, Splice - Buchanan
60--	000-027-751	Socket - Lamp - Foul - 110 Volts
61--	751-000-106	Lamp - Foul - 120 Volts
54-	070-005-936	Cable Assy, Foul Light
55--	906-318-021	Cord, "SO" - 2 Cond. - 18 GA. - 600 Volts
57--	760-017-035	Terminal, Straight, AMP
58--	742-502-002	Insulator, Splice - Buchanan
59--	742-503-004	Cap, Splice - Buchanan
60--	000-027-751	Socket - Lamp - Foul - 110 Volts
61--	751-000-106	Lamp - Foul - 120 Volts
62-	760-006-042	Terminal, Flag - AMP
63-	070-005-790	Bracket, Hanger
64-	000-025-490	Clip, Retainer
65-	809-849-085	Screw, Hex HD Cap - Gr. 8-¼-20 x ½
66-	818-233-082	Screw, Sems-PH RD HD-EXT LW-#8-32 x ½
67-	843-133-002	Nut, Kep - Ext. LW - #8-32
68-	824-538-162	Screw, Hex Wash. HD - Type "AB", #10 x 1"
69-	953-838-142	Washer, Plain-#10 x ¾ OD x ⅛ Thick
70-	000-025-373	Decal, Magic Triangle
71-	000-025-369	Decal, Pinvisor
72-	070-007-680	Kit, Fin - Mod IV - Blue & Lime
72A-	070-007-681	Kit, Fin - Mod IV - Red & Blue
72B-	070-007-711	Kit, Fin - Mod IV - Charcoal & Blue
*73-	070-011-335	Protector, Top
*74-	070-011-336	Protector, Side
*75-	070-001-989	Decal, "Warning"
76-	770-011-010	Ty-rap - 14"

*These parts (Mod IV Mask Insulator Kit #610-704-118) for use with MP Chassis containing PC Board #070-009-810.
Not required for MP Chassis containing PC Board #070-009-840.



UNIVERSAL MOD IV MASK

One Pair Universal Masks Contains:

PART NUMBER	COLOR	1 RIGHT HAND	& 1 LEFT HAND
610-705-241	MOD IV BLUE	610-705-251	610-705-261
610-705-242	MOD IV RED	610-705-252	610-705-262
610-705-243	MOD IV CHARCOAL	610-705-253	610-705-263
610-705-244	MOD IV GREEN	610-705-254	610-705-264

One "Kit 3" required with each mask listed above for a complete mask assembly.

"KIT 3" — HARNESS AND TRIANGLE ASSEMBLY KITS

82-30 Machines

610-702-909	Pindicator - see view "D", page 7
610-702-910	Sparemaker - see view "D", page 7
610-702-908	Bullet Terminal Kit "4400" machines only

82-70 Machines

Electromechanical Chassis Type 5100- 6460 (A & B Mach.)

610-703-911	Sparemaker - see view "B", page 7
610-703-914	Pindicator - see view "B", page 7

Solid State Chassis 6700 (C Mach.)

610-703-912	Sparemaker (Elco connector) - see view "C", page 7
610-703-913	Pindicator (Elco connector) - see view "C", page 7

7750 Chassis (C Mach.)

610-707-019	Pindicator (C-23 connector) - see view "A", page 7
610-707-020	Sparemaker (C-23 connector) - see view "A", page 7

"MP" Chassis - 9800

610-707-021	Pindicator - see view "A", page 7
610-707-022	Sparemaker - see view "A", page 7

NOTE: Harness and Triangle Kits listed above include Harness Assy., Triangle Mtg. Plate, Parchment, Lamps, Hardware and instructions for installing same.

FINS

When ordering fins, give part number, position number and color of mask triangle.

Part Number	Position Number	Part Number	Position Number
610-70-6010	1	610-70-6024	9
610-70-6011	2	610-70-6025	21
610-70-6012	3	610-70-6026	10
610-70-6013	27	610-70-6027	20
610-70-6014	4	610-70-6028	11
610-70-6015	26	610-70-6029	19
610-70-6016	5	610-70-6030	12
610-70-6017	25	610-70-6031	18
610-70-6018	6	610-70-6032	13
610-70-6019	24	610-70-6033	17
610-70-6020	7	610-70-6034	14
610-70-6021	23	610-70-6035	16
610-70-6022	8	610-70-6036	15
610-70-6023	22		

PINSPOTTER DETAIL PARTS LISTS

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FRAME ASSEMBLY, FRONT END R.H.

Reference Drawings - 070-006-439

070-006-400, 070-006-469

070-011-000 and 070-006-000

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-006-399	Cross Beam Weldment	34	070-007-843	Long Uni-Strut
2	070-006-433	Side Frame (R.H.)	35	070-007-844	Short Uni-Strut (Ball Return Side)
3	070-006-438	Side Frame (L.H.)	36	810-556-320	Screw, Hex Hd. Lag ($\frac{5}{16}$ x 2" LG)
4	070-001-653	Stop Bracket Weldment	37	948-761-112	Flat Washer ($\frac{11}{16}$ O.D. x $\frac{11}{32}$ I.D. x $\frac{1}{16}$ THK)
5	809-865-205	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 1 $\frac{1}{2}$ LG.)	38	000-021-527	"U" Bolt
6	835-565-002	Nut, Hex Jam ($\frac{3}{8}$ -16)	39	000-021-528	Saddle
7	809-865-165	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 1" LG.)	40	070-008-126	Clamp Bar
8	844-065-002	Nut, Hex Lock ($\frac{3}{8}$ -16)	41	844-057-002	Hex Lock Nut ($\frac{5}{16}$ -18)
9	070-006-308	Grommet	42*	070-011-165	Pin-Spring Roller
10	070-001-817	Platform Angle Support	43	070-001-668	Roller, Spring
11	809-849-285	Screw, Hex Hd. Cap ($\frac{1}{4}$ -20 x 1 $\frac{3}{4}$ LG.)	44*	945-867-242	Washer, Special (1 $\frac{1}{2}$ O.D. x .406 I.D. x .048 THK)
12	844-049-002	Nut, Hex Lock ($\frac{1}{4}$ -20)	45*	963-400-002	"X" Washer (9000-12)
13	070-006-405	Platform Angle Support	46	000-026-201	Swivel Bracket
14	809-865-325	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 2 LG.)	47	070-005-451	Mounting Plate, Chassis
15	948-767-132	Flat Washer ($\frac{13}{16}$ O.D. x $\frac{13}{32}$ I.D. x $\frac{1}{16}$ Thk)	48	070-005-365	Frame Weldment, Control Chassis
16	070-006-442	Frame Brace Weldment L.H.	49	070-006-432	Spacer, Short
17	070-006-490	Platform Support Weldment	50	070-001-822	Support, Chassis Weldment
18	070-006-413	Bracket Weldment (Bin Support-LH)	51	000-028-495	Latch, Camloc
19	070-006-411	Bracket Weldment (Bin Support-RH)	52	938-523-030	Rivet, Pop ($\frac{1}{8}$ Dia. x 187 Grip)
20	070-001-819	Front Platform Support Weldment (Ball Return Side)	53	809-849-405	Screw, Hex Hd. Cap ($\frac{1}{4}$ -20 x 2 $\frac{1}{2}$ LG)
21	070-006-414	Rear Platform Support Weldment (Ball Return Side)	54	809-849-125	Screw, Hex Hd. Cap ($\frac{1}{4}$ -20 x $\frac{3}{4}$ LG)
22	070-006-441	Frame Brace Weldment R.H.	55	809-857-125	Screw, Hex Hd. Cap ($\frac{5}{16}$ -18 x $\frac{3}{4}$ LG)
23	070-006-425	RH Platform (R.H. Machine)	56	809-865-285	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 1 $\frac{3}{4}$ LG)
24	070-006-426	LH Platform (R.H. Machine)	57	070-004-654	Support Angle
25	948-753-102	Flat Washer ($\frac{5}{8}$ O.D. x $\frac{9}{32}$ I.D. x $\frac{1}{16}$ THK)	58	070-005-614	Decal "Pull Power"
26	700-107-076	Loctite - Thread - Loc	59**	070-007-761	Hanger, Spot & Respot Spring (Field Conversion)
27	809-865-125	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x $\frac{3}{4}$ LG)	60	008-100-413	Adhesive, Gasket EC1300
28	835-573-002	Nut, Hex Jam ($\frac{1}{2}$ -13)	61	070-011-219	Stabilizer Rod
29	070-007-509	Nut, Elevating	62	835-557-002	Nut, Hex Jam ($\frac{5}{16}$ -18)
30	000-021-787	Washer, Thick	63	809-865-525	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 3 $\frac{1}{4}$ LG)
31	070-007-510	Screw, Elevating			
32	853-500-001	Nut, Uni-Strut P3010 ($\frac{1}{2}$ -13)			
33	000-021-786	Bearing Plate			

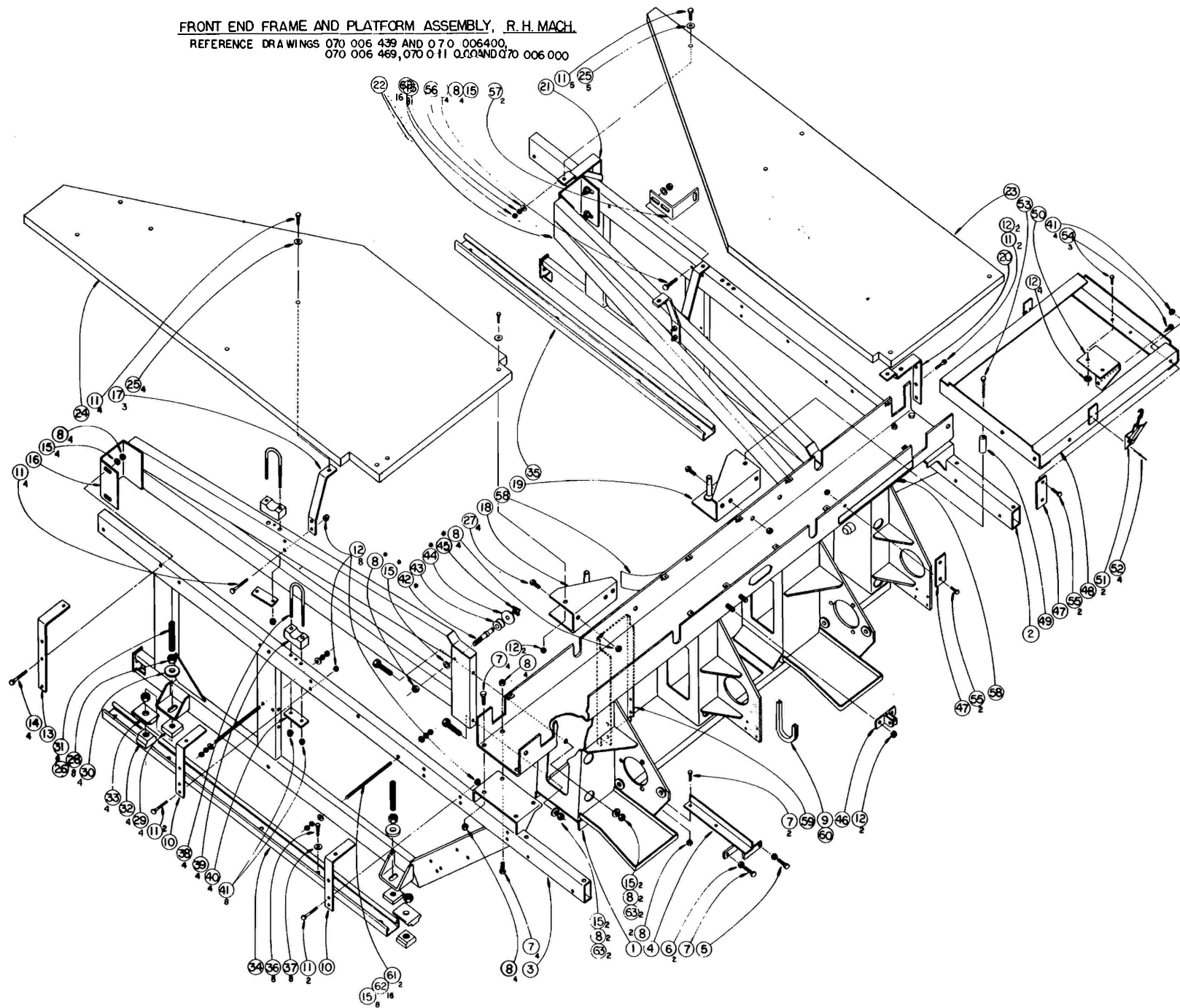
**Indicates Field Replacement Item

*Indicates Field Replacement Item - See Kit Part No. 610-704-103

(Contains 2 each of Items 42, 8, 15, 44, 45)

FRONT END FRAME AND PLATFORM ASSEMBLY, R.H. MACH.

REFERENCE DRAWINGS 070 006 439 AND 070 006 400,
070 006 469, 070 011 020 AND 070 006 000



FRAME ASSEMBLY, FRONT END L.H.

Reference Drawings - 070-006-440
070-006-644, 070-006-468, 070-011-000
and 070-007-000

ITEM	PART NUMBER	DESCRIPTION
1	070-006-399	Cross Beam Weldment
2	070-006-434	Side Frame (RH)
3	070-006-438	Side Frame (LH)
4	070-001-653	Stop Bracket Weldment
5	809-865-205	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 1 $\frac{1}{4}$ LG.)
6	835-565-002	Nut, Hex Jam ($\frac{3}{8}$ -16)
7	809-865-165	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 1" LG.)
8	844-065-002	Nut, Hex Lock ($\frac{3}{8}$ -16)
9	070-006-308	Grommet
10	070-001-817	Platform Angle Support
11	809-849-285	Screw, Hex Hd. Cap ($\frac{1}{4}$ -20 x 1 $\frac{3}{4}$ LG.)
12	844-049-002	Nut, Hex Lock ($\frac{1}{4}$ -20)
13	070-006-405	Platform Angle Support
14	809-865-325	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 2 LG.)
15	948-767-132	Flat Washer ($\frac{1}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK)
16	070-006-442	Frame Brace Weldment L.H.
17	070-006-490	Platform Support Weldment
18	070-006-413	Bracket Weldment (Bin Support-LH)
19	070-006-411	Bracket Weldment (Bin Support-RH)
20	070-001-819	Front Platform Support Weldment (Ball Return Side)
21	070-006-414	Rear Platform Support Weldment (Ball Return Side)
22	070-006-441	Frame Brace Weldment R.H.
23	070-006-425	LH Platform (L.H. Machine)
24	070-006-426	RH Platform (L.H. Machine)
25	948-753-102	Flat Washer ($\frac{5}{8}$ O.D. x $\frac{9}{32}$ I.D. x $\frac{1}{16}$ THK)
26	700-107-076	Loctite - Thread-Loc
27	809-865-125	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x $\frac{3}{4}$ LG)
28	835-573-002	Nut, Hex Jam ($\frac{1}{2}$ -13)
29	070-007-509	Nut, Elevating
30	000-021-787	Washer, Thick
31	070-007-510	Screw, Elevating
32	853-500-001	Nut, Uni-Strut P 3010 ($\frac{1}{2}$ -13)

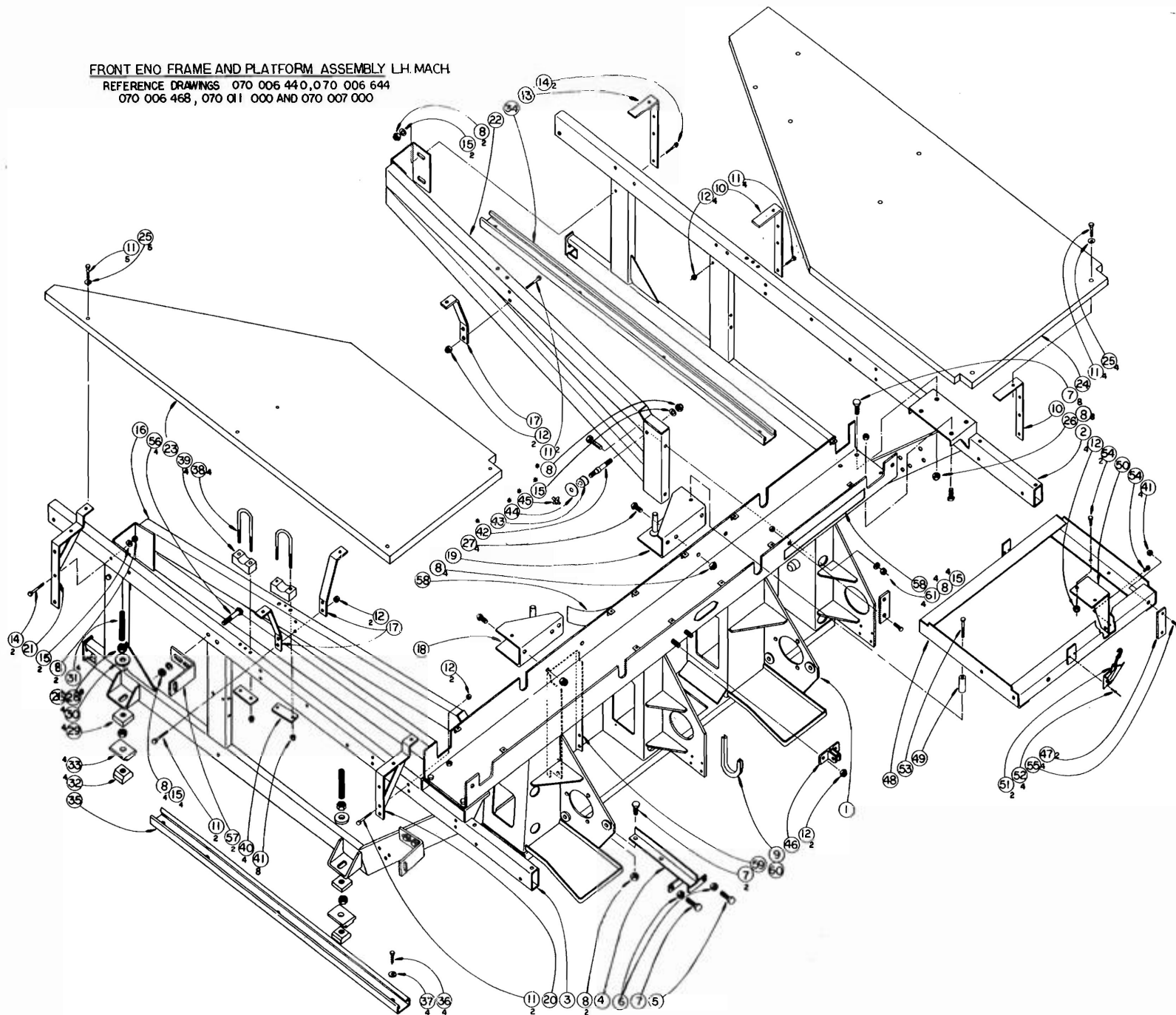
ITEM	PART NUMBER	DESCRIPTION
33	000-021-786	Bearing Plate
34	070-007-843	Long Uni-Strut
35	070-007-844	Short Uni-Strut (Ball Return Side)
36	810-556-320	Screw, Hex Hd. Lag ($\frac{5}{16}$ x 2" LG)
37	948-761-112	Flat Washer ($\frac{1}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK)
38	000-021-527	"U" Bolt
39	000-021-528	Saddle
40	070-008-126	Clamp Bar
41	844-057-002	Hex Lock Nut ($\frac{5}{16}$ -18)
42	070-011-165	Pin-Spring Roller
43	070-001-668	Roller, Spring
44*	945-867-242	Washer, Special (1 $\frac{1}{2}$ O.D. x .406 I.D. x .048 THK)
45*	963-400-002	"X" Washer (9000-12)
46	000-026-201	Swivel Bracket
47	070-005-451	Mounting Plate, Chassis
48	070-005-365	Frame Weldment, Control Chassis
49	070-006-432	Spacer, Short
50	070-001-822	Support, Chassis Weldment
51	000-028-495	Latch, Camloc
52	938-523-030	Rivet, Pop ($\frac{1}{8}$ Dia. x 187 Grip)
53	809-849-405	Screw, Hex Hd. Cap ($\frac{1}{4}$ -20 x 2 $\frac{1}{2}$ LG)
54	809-849-125	Screw, Hex Hd. Cap ($\frac{1}{4}$ -20 x $\frac{3}{4}$ LG)
55	809-857-125	Screw, Hex Hd. Cap ($\frac{5}{16}$ -18 x $\frac{3}{4}$ LG)
56	809-865-285	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 1 $\frac{3}{4}$ LG)
57	070-004-654	Support Angle
58	070-005-614	Decal "Pull Power
59**	070-007-761	Hanger, Spot & Respot Spring (Field Conversion)
60	008-100-413	Adhesive, Gasket EC1300
61	809-865-525	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 3 $\frac{1}{4}$ LG)

**Indicates Field Replacement Item

*Indicates Field Replacement Item - See Kit Part No. 610-704-103
(Contains 2 each of items 42, 8, 15, 44, 45)

FRONT END FRAME AND PLATFORM ASSEMBLY L.H. MACH

REFERENCE DRAWINGS 070 006 440, 070 006 644
070 006 468, 070 011 000 AND 070 007 000



FRONT END DRIVE ASSEMBLY

Ref. Drwgs. 070 006 400 and 070 006 644

ITEM	PART NUMBER	DESCRIPTION
NEW MOTORS (WITH ONE YEAR WARRANTY)		
1	610-704-052	West. Motor and Recp't. Ass'y. (12.1 RPM) 115V-60Hz
1a	070-007-690	National Motor and Recp't. Ass'y. (12.1 RPM) 115-60Hz
MOTOR EXCHANGE PROGRAM		
CUSTOMER RETURNS TO AMF		AMF SHIPS TO CUSTOMER
1b	530 701 702	G.E. Motor and Recp't. Ass'y. USED (12.1 RPM) 115V-60Hz
1c	530 705 657	G.E. Motor and Recp't. Ass'y. USED (14.5 RPM) 115V-60Hz
1d	630 704 052	West. Motor & Recp't. Ass'y. USED (12.1 RPM) 115V-60Hz
1e	530 707 690	Nat'l Motor & Recp't. Ass'y. USED (12.1 RPM) 115V-60Hz

INTERNATIONAL DIVISION MOTORS		
1f	070 006 219	West. Motor & Recp't. Ass'y. NEW (12.1 RPM) 115/230V-50Hz
1g	070 007 689	Nat'l Motor & Recp't. Ass'y. New (12.1 RPM) 115V-50Hz.

MOTOR EXCHANGE PROGRAM

International Division Customers Contact Your Area AMF INCORPORATED Service Depot For Part Numbers And Details Of Exchange Program.

ITEM	PART NUMBER	DESCRIPTION
2	785-501-655	West. Housing and Receptacle Ass'y Part of Items 1b, 1c
2b	785-501-656	G.E. Housing and Receptacle Ass'y, Part of Items 1d, 1e
3	000-025-590	Housing (Part of Items 1, 1b, 1c, and 1d)
3a	785-502-053	Receptacle Mount (Part of Items 1a & 1e)
4	000-027-655	Male Receptacle-5 Prong (Part of 1 thru 1e)
5	823-127-062	Screw, Phil Rd. Hd. Type A 6-32 x $\frac{3}{8}$ (Part of Item 2)
5a	785-502-202	Screw Phil Rd. Hd. 3MM-5MM x 10MM Lg., (Used with item 3a)
6	828-127-062	Screw Slotted Rd. Hd. Type D 6-32 x $\frac{3}{8}$
7	070-001-700	Shaft, Table Drive
8	070-001-910	Cam (Spot & Re-spot)
9	070-001-562	Cap, Cam Hub
10	070-006-499	Assembly, Spot & Re-Spot Link- See Page 19 For Details

ITEM	PART NUMBER	DESCRIPTION
11	070-006-407	Cap, Cam Hub
12	070-006-427	Cam, Shuttle
13	070-006-420	Assembly, Table Cam Switch & Lever- See Page 95 For Details
14	070-006-417	Cam Weldment, Table
15	070-001-664	Clamp Stud
16	070-006-493	Ball Joint Assembly
17	070-006-495	Assembly, Solenoid Operated Shuttle- See Page 19 For Details
18	000-021-744	Assembly, Self Aligning Bearing
19	000-021-683	Retainer, Bearing
20	000-021-905	Bearing (W/Locking Collar)
21	070-001-927	Assembly, Table Drive- See Page 21 For Details
22	190-001-490	Bearing, Table Drive
23	070-007-310	Bushing
24	070-007-311	Sleeve
25	070-006-452	Assembly-Sweep Cam Switch & Lever- See Page 95 For Details
26	070-006-449	Cam Weldment, Sweep
27	070-006-450	Cam Weldment, Sweep
28	000-023-139	Crank Arm
29	070-001-699	Shaft, Sweep
30	907-000-900	Key, Hi-Pro #910
31	070-001-707	Spring, Extension
32	070-006-765	Shaft Plate
33	070-006-310	Spacer
34	810-265-240	Screw, Soc. Hd. Cap ($\frac{3}{8}$ -16 x 1½ Lg.)
35	810-265-280	Screw, Soc. Hd. Cap ($\frac{3}{8}$ -16 x 1¾ Lg.)
36	809-857-125	Screw, Hex Hd. Cap ($\frac{5}{16}$ -18 x ¾ Lg.)
37	809-857-405	Screw, Hex Hd. Cap ($\frac{5}{16}$ -18 x 2½ Lg.)
38	809-865-645	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 x 4 Lg.)
39	809-873-405	Screw, Hex Hd. Cap (½-13 x 2½ Lg.)
40	070-003-243	Screw, Sweep Drive
41	809-857-165	Screw, Hex Hd. Cap ($\frac{5}{16}$ -18 x 1" Lg.)
42	818-239-122	Screw, Rd. Hd. Sems (#10-24 x ¾ Lg.)
43	844-057-002	Nut, Hex Lock, Stover ($\frac{5}{16}$ -18)
44	844-065-002	Nut, Hex Lock-Stover ($\frac{3}{8}$ -16)
45	835-549-002	Nut, Hex (¼-20)
46	844-073-002	Nut, Hex Lock, Stover (½-13)
47	840-039-002	Nut, Flex-Loc (#10-24)
48	948-761-112	Washer, Plain ($\frac{11}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ Thk.)
49	710-501-004	Lubrication Fitting
50	880-239-140	Shoulder Screw (¼-Dia. x ¼ Lg., #10-24)
51	843-139-002	Nut, Keps Ext. Lkwshr (#10-24)

FRONT END DRIVE ASSEMBLY

REFERENCE DRAWINGS 070 006 400
070 006 644

1E 1D 1C 1B 1A 1
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

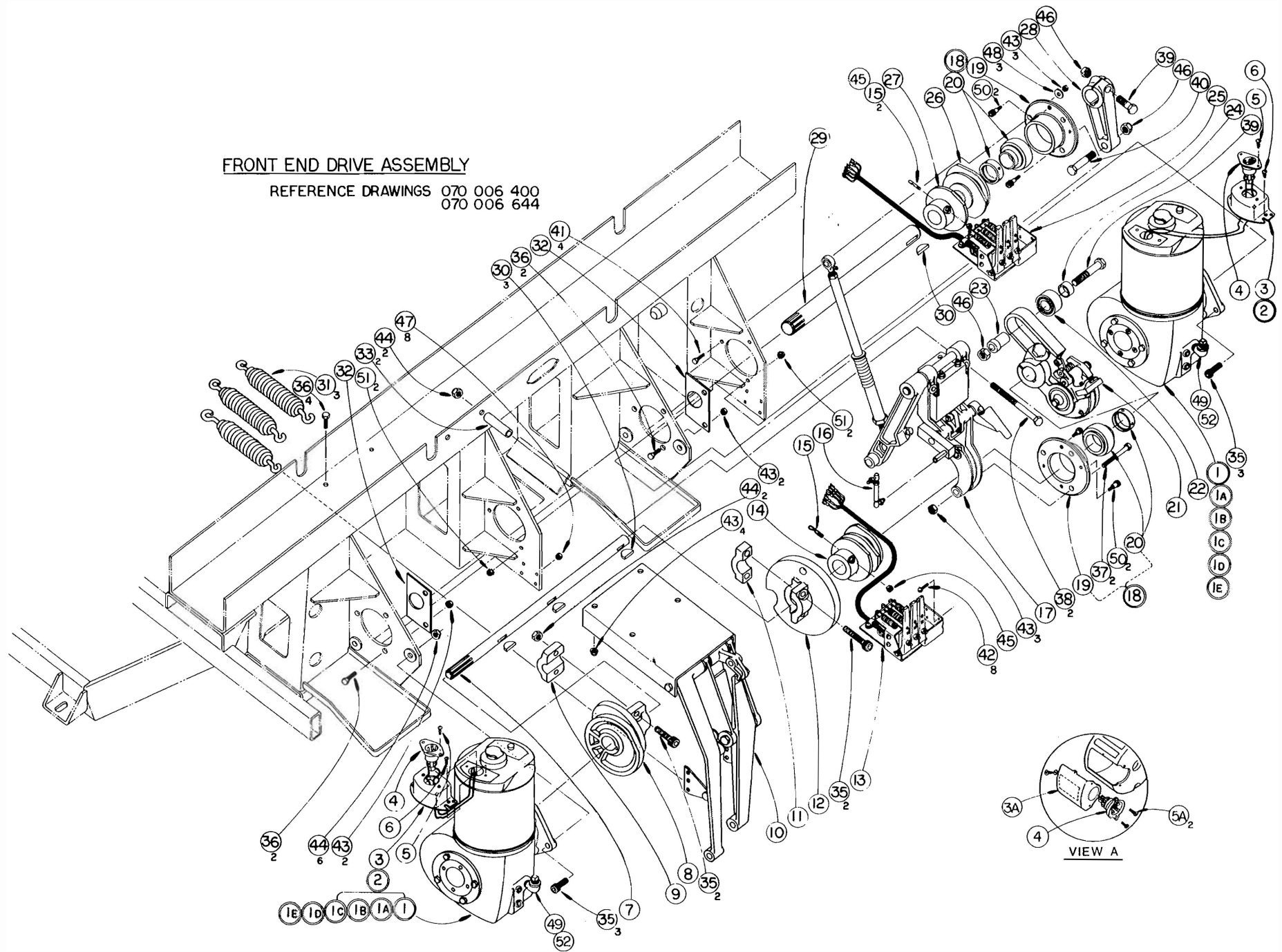
VIEW A

FRONT END DRIVE ASSEMBLY

REFERENCE DRAWINGS 070 006 400
070 006 644

1E 1D 1C 1B 1A 1
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

VIEW A

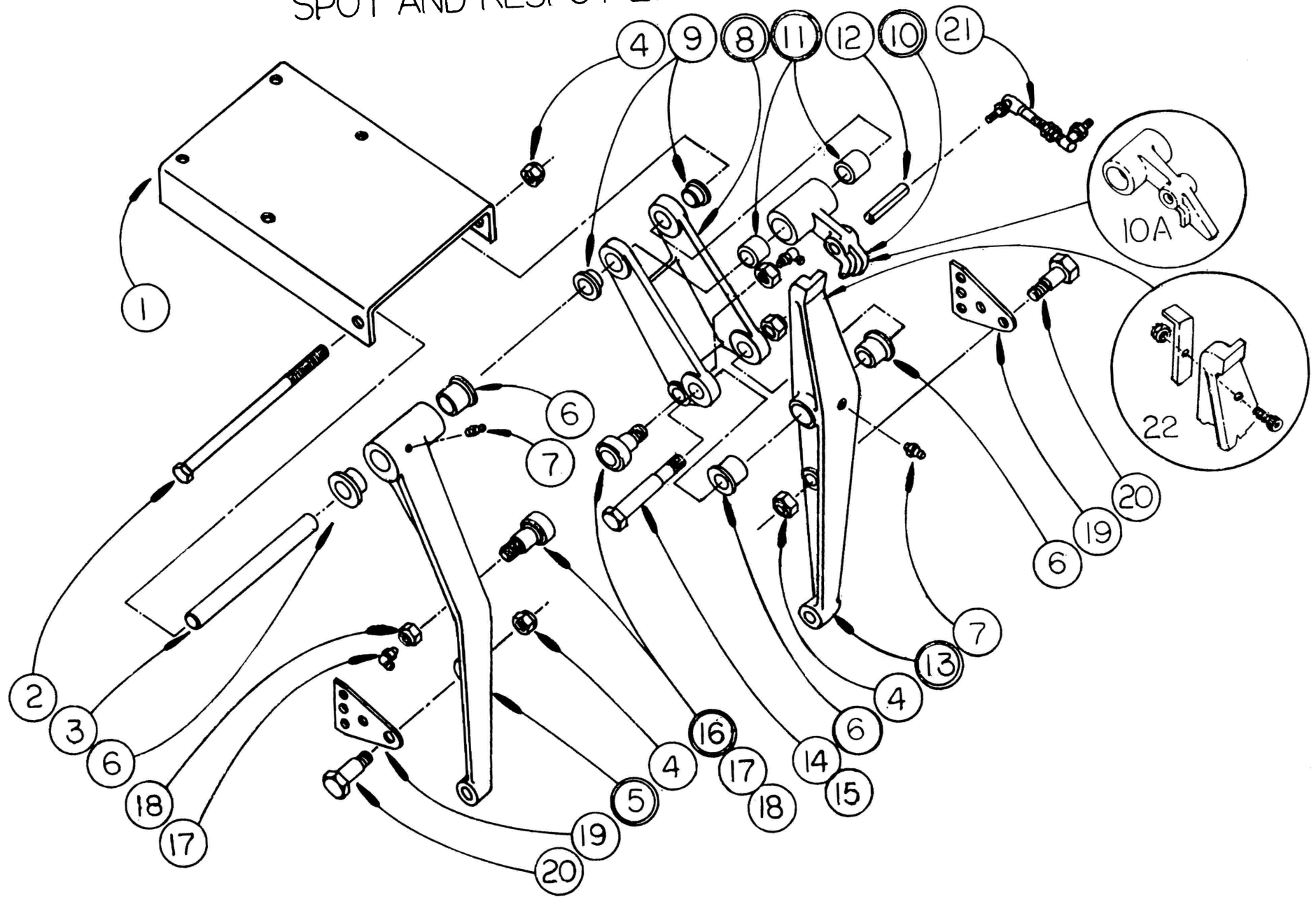


Spot and Respot Link Assembly

Ref. Dwgs. 070 006 499

ITEM	PART NUMBER	DESCRIPTION
1	070 006 478	Bracket
2	070 006 496	Hex Hd. Cap Screw $\frac{3}{8}$ -16 x 7"
3	070 006 457	Spotting Arm Shaft
4	839 665 002	Hex Lock Nut Stover $\frac{3}{8}$ -16
5	070 006 492	Respot Arm Link Assy.
6	070 001 919	Flanged Bearing
7	710 501 009	Alemite Fitting Straight #3006
8	070 001 605	Upper Spotting Link Assy.
9	070 002 691	Bushing Flanged
10	070 006 455	Latch Assy. Spotting Arm Assy.
10a	070 001 997	Alternate Latch Assy.
11	900 110 141	Bearing Sleeve
12	913 464 360	Roll Pin $\frac{3}{8}$ Dia. x 2 $\frac{1}{4}$ " Lg.
13	070 006 481	Spotting Arm Link Assy.
14	070 001 585	Spot Link Pin
15	844 073 002	Hex Lock Nut Stover $\frac{1}{2}$ -13
16	610 704 002	Cam Follower Assy.
17	710 501 012	Alemite Fitting 90° #B1911
18	844 070 002	Hex Lock Nut Stover $\frac{7}{16}$ -20
19	070 001 751	Spring Hanger
20	070 001 587	Spring Hanger Pin
21	070 006 493	Ball Joint Assy.
22	610 704 127	Dit - Latch Assy. override for use on pinspotters with M.P. Chassis & 070-006-445 Latch Assy.

SPOT AND RESPOT LINK ASSEMBLY



SHUTTLE OPERATOR AND SOLENOID ASSEMBLY

Ref. Dwgs. 070 006 495

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-006-293	Connecting Rod Assembly	*35b	834-527-002	Nut, Hex 6-32 (Not Shown)
2	070-006-297	Long Tube			(Used With Item 35)
3	070-006-296	Washer - Spring	*35c	700-107-170	Adhesive - Locktite #601 $\frac{1}{2}$ oz.
4	070-006-306	Spring			(N.S.) (Used With Item 35)
5	070-006-304	Rod Assembly	36	843-133-002	Keps Nut Ext. Washers 8-32
6	070-006-299	Tube Assembly	37	070-006-279	Guard
7	070-006-302	Tube Plug	38	839-533-002	Nut Flex-Loc 8-32
8	835-566-002	Nut Hex Jam $\frac{3}{8}$ -24	39	000-021-442	Rubber Washer
9	070-006-046	Rod End	40	814-333-122	Hex Hd. Mach. Screw
9a	710-502-010	Lubricator Fitting			8-32 x $\frac{3}{4}$
10	809-865-205	Hx. Hd. Cap Scr. $\frac{3}{8}$ -16 x 1 $\frac{1}{4}$	41	813-933-162	Hex Hd. Mach. Screw
11	840-065-002	Nut Flex Loc $\frac{3}{8}$ -16			8-32 x 1
12	070-006-295	Lever	**42	070-006-726	Solenoid 60Hz. ($\frac{1}{4}$ Dia.
13	610-704-002	Cam Follower Ass'y. Lub. W/Sohio 78 Grease or Equiv.	**42a	070-006-727	Plunger Hole)
14	710-501-012	Alemite Fitting			Solenoid 50Hz. ($\frac{1}{4}$ Dia.
15	835-570-002	Nut Hex Jam $\frac{7}{16}$ -20	43	070-006-277	Plunger Hole)
16	070-006-284	Clamp Stud	44	070-006-276	Washer
17	834-557-002	Hex Nut $\frac{5}{16}$ -18	45	070-006-724	Spring
18	835-565-002	Hex Jam Nut $\frac{3}{8}$ -16			Spring Link (Outside)
19	809-865-165	Hex Hd. Cap Screw $\frac{3}{8}$ -16 x 1"	*45a	070-006-281	With $\frac{1}{4}$ " Hole
20	070-006-294	Bracket Casting			Spring Link (Outside)
21	701-416-058	Flange Bearing	***46	070-006-282	With $\frac{5}{32}$ Hole
22	900-210-161	Flange Bearing	47	913-448-120	Spring Link (Center)
23	070-006-286	Shaft	48	610-704-015	Roll Pin $\frac{1}{4}$ x $\frac{3}{4}$
24	000-021-423	Collar (With Set Screw)			Kit Link Replacement
25	807-357-040	Soc. Set Scr. Knurled Cup Point $\frac{3}{8}$ -18 x $\frac{1}{4}$	49	070-008-135	(Items 49 & 52)
26	070-006-289	Shaft Headed (Inserts Thru its 20, 52, and 48)	49a	070-006-291	Link Ass'y. (Link with
27	070-006-285	Shaft			items 50, 51, and 53)
28	070-006-278	Cam Link	50	900-204-121	Cast Link Ass'y. (For
29	070-006-116	Clamp Stud	51	913-415-100	replacement order item 48)
30	835-549-002	Hex Jam Nut $\frac{1}{4}$ -20	52	070-008-133	Flanged Bearing
31	907-000-200	Key Hi-Pro #404	53	070-006-287	Roll Pin
32	070-006-484	Stop Lever Assembly	54	070-001-774	Spacer
32a	070-006-456	Stop Lever (Used To Convert "A" To "B" Mach.)	55	070-002-653	Pin
33	913-464-400	Roll Pin $\frac{3}{8}$ Dia. x 2 $\frac{1}{2}$ Lg.	56	963-200-002	Link Assembly
**34	000-026-027	Solenoid 60Hz. (Not Shown)	57	070-006-307	Bushing
		($\frac{5}{32}$ " Dia. Plunger Hole)			X Washer 9000-8
**34a	000-027-873	Solenoid 50Hz. (Not Shown)	58	070-001-777	Link Assembly
		($\frac{5}{32}$ " Dia. Plunger Hole)	59	913-415-100	(Link with items 58 and 59)
*35	000-028-391	Shoulder Scr. (Not Shown)	60	070-006-142	Pin
		(Used with Item 34 or 34a)	61	070-006-280	Roll Pin ($\frac{3}{32}$ Dia. x $\frac{5}{8}$ Lg.)
*35a	957-000-002	Shakeproof Lock Washer (N. S.) Used W/Item 35)			Rubber Bumper
			62	070-006-283	Spring Clip (Mt'd. to Item 20
					(Cst'g.) when Ass'y. is
					installed)
					Spring

* Used prior to serial #110172 these parts used only with item #34 or 34A. Solenoids with $\frac{5}{32}$ Dia. plunger hole. Apply locktite item #35C to item #35B (Nut) at assembly.

** Mount solenoids so that stroke is vertical in all directions, within $\pm \frac{1}{64}$ inch.

*** If replacing item #34 or 34a solenoid with items #42 and 47 or #42a and 47 cut $\frac{1}{16}$ inch off top of item #46 to bring overall length to 2 $\frac{3}{16}$ inch.
(Check length of item #46 before cutting)

SHUTTLE OPERATOR & SOLENOID ASSEMBLY

REF. DWG. 070 006 495

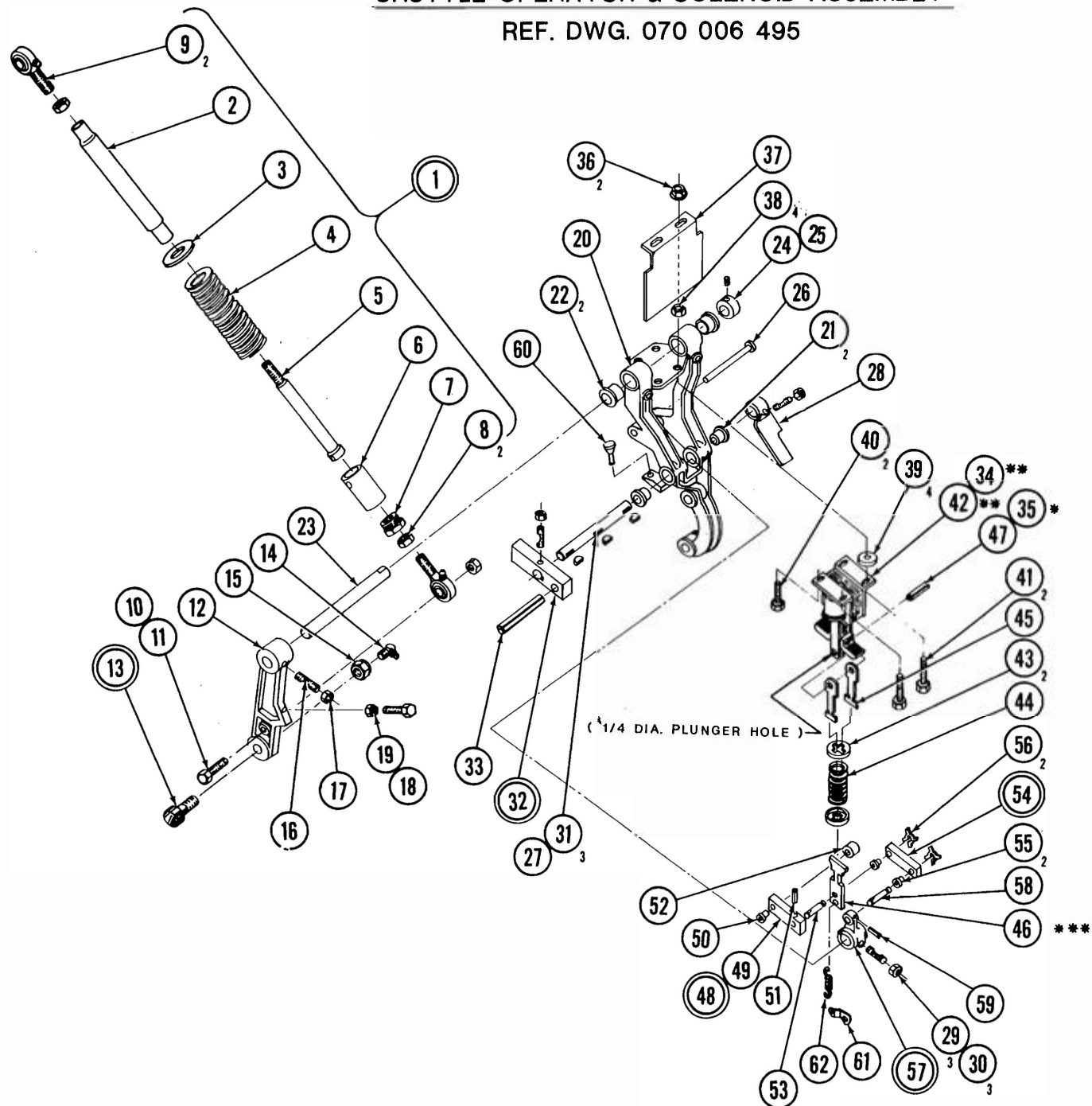


TABLE DRIVE ASSEMBLY

070-001-840 Items 1 Thru 33 Inclusive

070-001-927 Items 1 Thru 46 Inclusive

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-002-778	Assembly, Crank Housing & Cup	22	070-001-861	Link And Hub Assembly
2	070-001-889	Housing, Crank (Table Drive)	23	070-002-652	Bushing
3	070-002-777	Cup, Roller Bearing	24	070-001-932	Pin
4	070-002-780	Cup, Roller Bearing	24b	070-001-863	Pin (Hex Shoulder)
5	900-205-053	Flange Bearing	25	070-001-931	Spring
6	070-002-779	Assembly, Eccentric & Cone	25a	070-001-844	Spring (Used With 24b)
7	070-001-877	Eccentric	26	070-001-857	Roller
8	070-002-776	Cone, Roller Bearing	27	880-139-120	Shoulder Screw (1/4 x 3/8 Shoulder, #10-24 Thr'd.)
9	070-002-824	Cone And Seal	28	963-300-002	"X" Washer (#9000-10)
10	070-006-729	Disc, Spring	29	912-137-200	Groove Pin (3/8 x 1 1/4 - Type 2)
10a	070-002-835	Washer (Not Shown)	30	839-539-002	Nut, Flex-Loc (#10-24)
11	809-870-285	Screw, Hex Hd. Cap (7/16-20 x 1 3/4)	31	913-423-120	Roll Pin, ESNA (1/8 x 3/4)
11a	809-870-325	Screw, Hex Hd. Cap (7/16-20 x 2)	32	913-415-120	Roll Pin, ESNA (3/32 Dia. x 3/4 Lg.)
12	070-001-894	Pivot Pin	33	840-070-002	Nut, Flex Lock (7/16-20 N.F.)
13	070-001-917	Spring	NOTE: The Following Parts ARE NOT INCLUDED In 070-001-840 Table Drive Assembly, These Parts ARE INCLUDED In 070-001-927 Table Drive Assembly.		
14	710-501-004	Grease Fitting (Alemite #1641)	34	809-873-405	Screw, Hex Hd. Cap (1/2-13 x 2 1/2 Lg.)
15	070-001-893	Assembly Cam Ball	35	070-007-755	Yoke Weld Assembly
16	070-008-321	Arm, Latch Assembly (1/8 Hole For Roll Pin)	36	070-001-849	Washer (Spc'l.)
16a	070-005-613	Arm, Latch Assembly (3/32 Hole For Roll Pin)	37	844-073-002	Nut, Hex Lock (Stover 1/2-13)
17	070-001-898	Assembly, Latch	38	000-021-880	Rod End Assembly
18	900-104-071	Bushing	39	919-000-600	Retaining Ring (N5000-137)
19	070-008-322	Link (1/8 Dia. Hole For Roll Pin)	40	000-021-879	Rod End
19a	070-001-933	Link (3/32 Dia. Hole For Roll Pin)	41	000-021-878	Spacer
19b	070-001-922	Link (Hex Hole For 1863 Pin Item 24b)	42	000-021-881	Bearing, Ball
20	070-008-325	Pin (1/8 Holes For Roll Pin)	43	840-182-002	Nut, Flex-Loc, Thin (1/8-18)
20a	070-001-866	Pin (3/32 Holes For Roll Pin)	44	070-007-310	Bushing
21	070-007-250	Link Assembly	45	070-007-311	Sleeve
			46	190-001-490	Bearing, Ball With Double Seals

TABLE DRIVE ASSEMBLY

REF 070 001 927 ITEMS 1 THRU 46 INCLUSIVE
070 001 840 ITEMS 1 THRU 33 INCLUSIVE

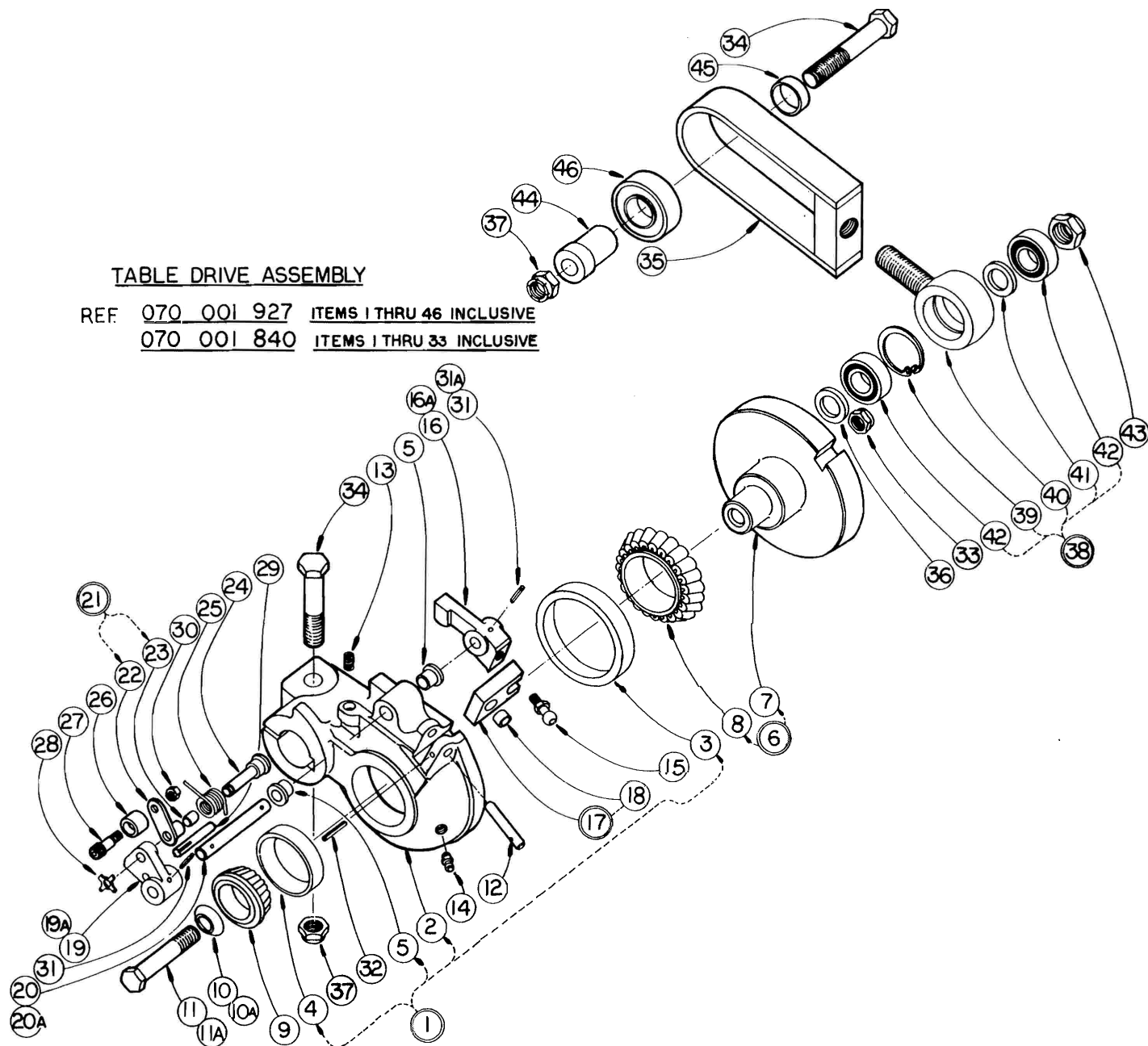


TABLE DRIVE ASSEMBLY

Ref. Dwg. 070-001-840 Rev. H

Effective To Serial No. 95151

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-001-842	Crank Housing Ass'y. (Items 2 & 3)	29a	070-001-915	Washer Retainer
2	070-001-841	Housing	30	913-423-140	Roll Pin $\frac{1}{8}$ x $\frac{7}{16}$
3	900-205-053	Flange Bearing	31	818-233-062	Screw Phil Rd. Hd. Sems 8-32 x $\frac{3}{8}$
4	070-001-843	Eccentric Bolt	32		
5	070-001-844	Spring, Actuator	33	710-501-004	Grease Fitting (Alemite #1641)
6	070-001-845	Spring	34	809-874-365	Screw Hex Hd, $\frac{1}{2}$ -20 x $2\frac{1}{2}$
7	070-001-857	Roller	34a	809-873-405	Screw Hex Hd., $\frac{1}{2}$ -13 x $2\frac{1}{2}$
8	070-001-861	Link And Hub Ass'y.	35	844-074-002	Nut, Stover Lock $\frac{1}{4}$ -20
9	070-001-862	Link (Hex Hole In Smaller Boss)	35a	844-073-002	Nut, Stover Lock $\frac{1}{2}$ -13
10	070-001-863	Pin (Hex Shoulder)	36	070-001-877	Eccentric
11	070-001-866	Pin ($\frac{3}{32}$ Dia. Holes)	37	070-001-849	Washer
12	070-002-652	Bushing	38	840-070-002	Nut Flex Loc $\frac{7}{16}$ -20
13	912-137-200	Groove Pin $\frac{3}{16}$ x $1\frac{1}{4}$ " Type 2	39	000-021-880	Rod End Ass'y. (Items 40, 41, 42, 43)
14	880-139-120	Shoulder Screw $\frac{1}{4}$ x $\frac{3}{8}$ x 10-24	40	919-000-600	Retaining Ring (N5000-137)
15	838-939-002	Nut, ESNA 10-24	41	000-021-879	Rod End
16	913-415-120	Roll Pin $\frac{3}{32}$ x $\frac{3}{4}$	42	000-021-878	Spacer
17	070-001-868	Latch Block And Arm Ass'y.	43	000-021-881	Bearing, Ball
18	070-001-865	Block, Latch	44	840-182-002	Nut, Flex-loc, $\frac{5}{8}$ -18
19	070-001-867	Arm, Latch	45	835-582-002	Nut - Hex Jam, $\frac{5}{8}$ -18
20	913-423-120	Roll Pin $\frac{1}{8}$ x $\frac{3}{4}$	46	070-001-848	Link
21			47	070-001-870	Screw, Soc. Hd. Shoulder
22	070-002-735	Bearing Assembly (Items 23 and 24)	48	844-081-002	Nut Stover $\frac{5}{8}$ -11
23	070-002-780	Cup, Bearing	49	070-006-722	Yoke Weldment
24	070-002-824	Cone & Seal, Bearing	50	070-007-310	Bushing
25	070-002-739	Bearing Ass'y. (Items 26 & 27)	51	070-007-311	Sleeve
26	070-002-776	Cup, Bearing	52	070-006-721	Bushing
27	070-002-777	Cone, Bearing	53	190-001-490	Bearing
28	070-001-836	Shield	54	809-873-525	Screw - Hex Hd. Cap SAE #8
29	070-002-835	Washer Retainer	55	844-073-002	Locknut

TABLE DRIVE ASSEMBLY

REF. DWG. 070-001-840 REV. H

Effective to serial no. 95151

NOTE: Items 26 and 36 may be purchased
as an assembly - specify part
no. 070-002-779.

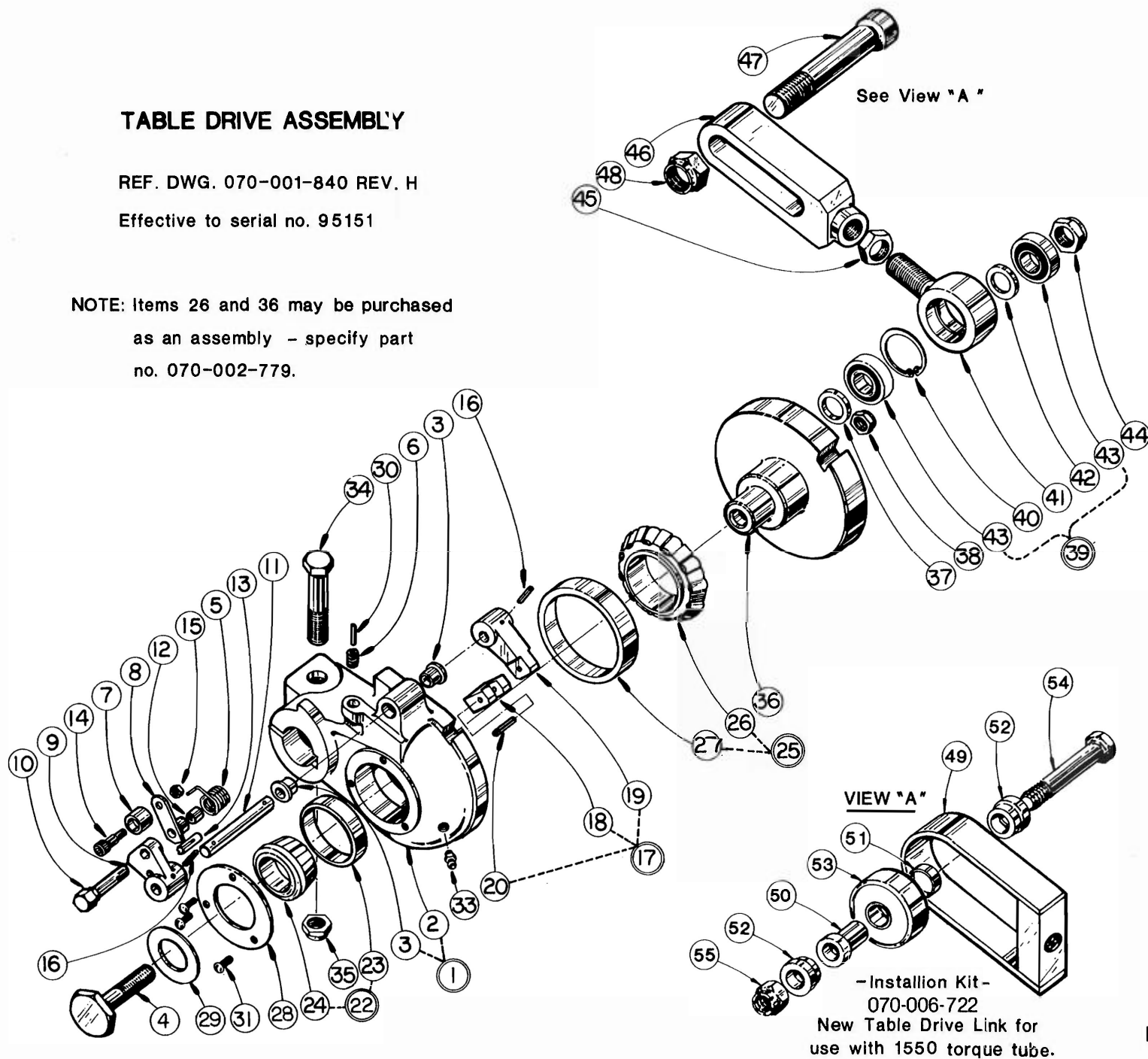
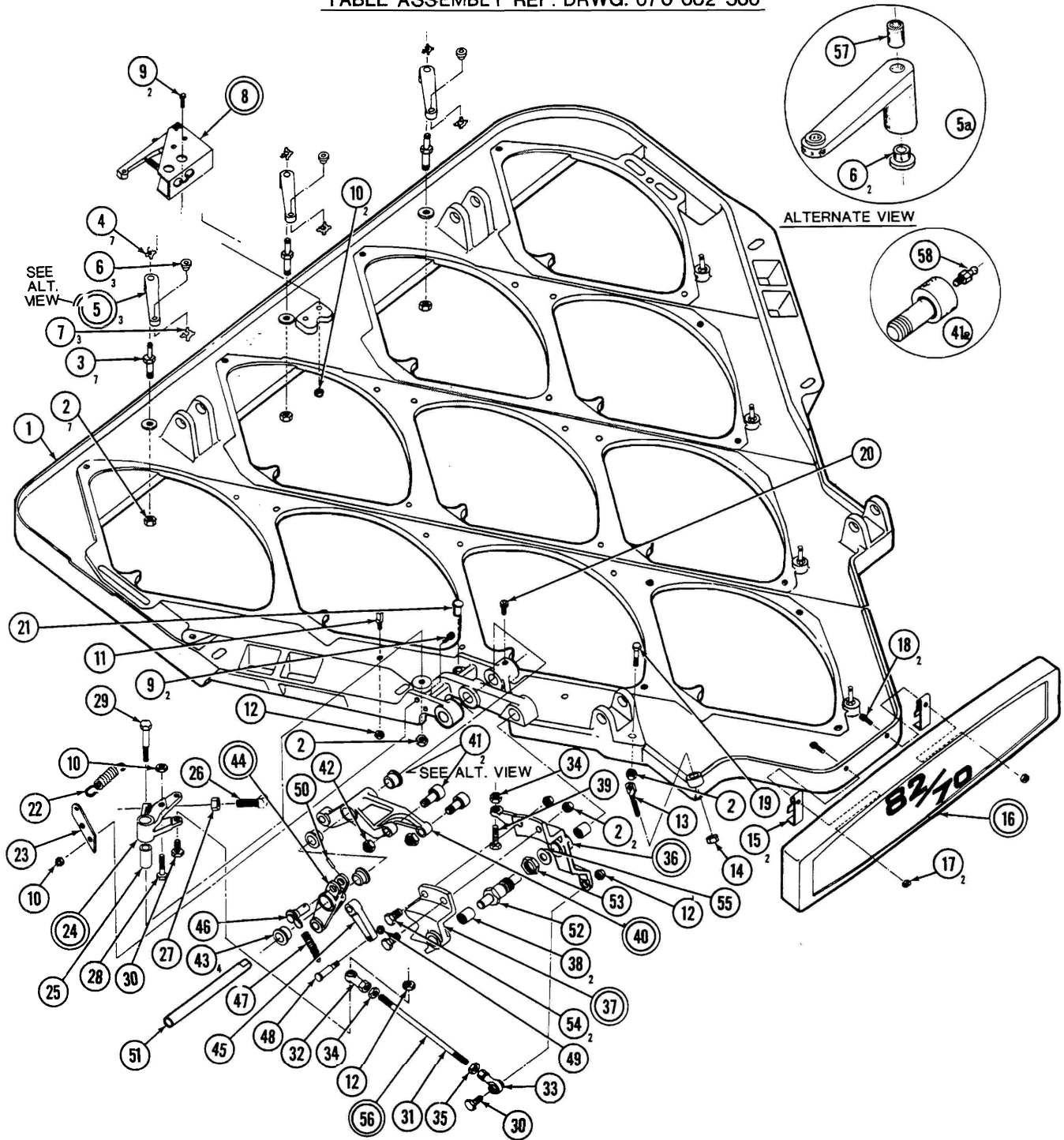


TABLE ASSEMBLY
Reference Drawing 070-002-50

ITEM	PART NUMBER	DESCRIPTION
1	070-002-684	Table Casting
2	839-665-002	Nut FlexLoc $\frac{3}{8}$ -16
3	070-007-616	Pin ($\frac{5}{16}$ Dia.)
3a	070-002-681	Pin ($\frac{1}{4}$ Dia.)
4	963-400-002	X-Washer 9000-12
5	070-007-622	Lever Respot Ass'y. (Lever with Flange Bushing)
5a	070-002-680	Lever Respot Ass'y. (Lever with Flange and Sleeve Bushings)
6	070-002-653	Bushing
7	963-200-002	X-Washer 9000-8
8	070-006-697	Switch Ass'y. (See Page 27)
8a	070-007-111	Switch Ass'y. (See Page 27)
9	810-239-120	Soc. Hd. Cap. Screw 10-24 x $\frac{3}{4}$ LG.
10	839-539-002	Nut FlexLoc 10-24
11	070-002-702	Stop. Respot
12	844-049-002	Lock Nut, Stover $\frac{1}{4}$ -20
13	070-002-577	Stud
14	844-057-002	Locknut, Stover $\frac{5}{16}$ -18
15	070-002-821	Clip - Emblem Mtg. (Optional)
16	070-002-830	Numeral Ass'y. (Optional Domestic)
16a	070-007-473	Numeral Ass'y. (Optional International)
16b	070-007-508	Numeral Ass'y. (Optional International)
17	839-533-002	Locknut FlexLoc 8-32
18	810-233-080	Soc. Hd. Cap Screw 8-32 x $\frac{1}{2}$
19	809-865-125	Hex Hd Bolt $\frac{3}{8}$ -16 x1
20	807-357-060	Soc. Set Screw K.N. Cup Pt. $\frac{5}{16}$ -18 x $\frac{3}{8}$
21	000-022-580	Pin Stop
22	070-002-732	Spring
23	070-002-734	Bracket
24	070-002-583	Link Ass'y. Actuating (Link, Bushing, Set Screw Nut)
25	070-002-715	Bushing
26	806-249-160	Set Screw Sq. Hd. Cup Pt.
27	835-549-002	Jam Nut $\frac{1}{4}$ -20
28	070-002-733	Screw
29	070-002-584	Pin, Bell Crank
30	809-849-165	Screw, Hex Hd Cap $\frac{1}{4}$ -20 x 1 LG.
31	070-002-581	Tie Rod
32	000-022-738	$\frac{1}{4}$ Rod End Brg (R.H. THD)
33	000-022-737	$\frac{1}{4}$ Rod End Brg (L.H. THD)
34	835-550-002	Nut Hex Jam $\frac{1}{4}$ -28
35	835-650-002	Nut Hex Jam $\frac{1}{4}$ -28 L.H.
36	070-002-728	Cam Link Brg. Ass'y.
37	070-002-727	Link and Bearing Ass'y.
38	070-002-781	Needle Bearing
39	070-001-871	Screw Hex Hd. Cap
40	070-002-578	Lever Ass'y. Spot (Lever With Bushing, Item 43)
41	070-002-816	Cam Follower and Grease Fitting
42	840-066-002	Nut Flex - $\frac{3}{8}$ -24-Thin
43	070-002-745	Bushing
44	070-002-579	Finger - Lever Ass'y.
45	070-002-590	Finger Link
46	070-001-804	Pivot Weldment
47	070-001-807	Spring
48	070-002-592	Pin
49	843-140-002	Nut, Kep 10-32
50	913-423-160	Roll Pin-ESNA $\frac{1}{8}$ Dia. x 1
51	070-002-585	Shaft
52	070-002-726	Shaft
53	840-600-002	Nut FlexLoc $\frac{7}{8}$ -14
54	809-865-205	Hex Hd. Cap Screw $\frac{3}{8}$ -16-1 $\frac{1}{4}$
55	701-316-041	Thrust Bearing Oilite
56	070-002-594	Tie Rod Ass'y. (Rod with Rod ends)
57	070-002-652	Bushing - Sleeve
58	710-501-009	Alomite Fitting (#3006)
59	070-002-596	Spring (Not Shown) Used With Item 13

TABLE ASSEMBLY REF. DRWG. 070 002 500



SWITCH ASS'Y. TABLE ASS'Y.

(C-82-070-006-697)

ITEM	PART NUMBER	DESCRIPTION
1	070-006-695	Bracket - Switch Ass'y.
2	000-021-645	Switch Lever Ass'y.
3	000-026-042	Micro Switch
4	070-006-693	Shaft
5	070-006-694	Spacer
6	000-022-296	Insulator
7	000-024-657	Spring
8	963-200-002	Washer - "X" 9000-8
9	000-021-714	Adjusting Screw
10	835-550-002	Jam Nut 1/4-28
11	818-227-162	Sems Screw Rd. Hd. CR11 Ex. LW. (#6-32 x 1" LG)
12	839-527-002	FlexLoc Nut #6032 #21FA-6-32

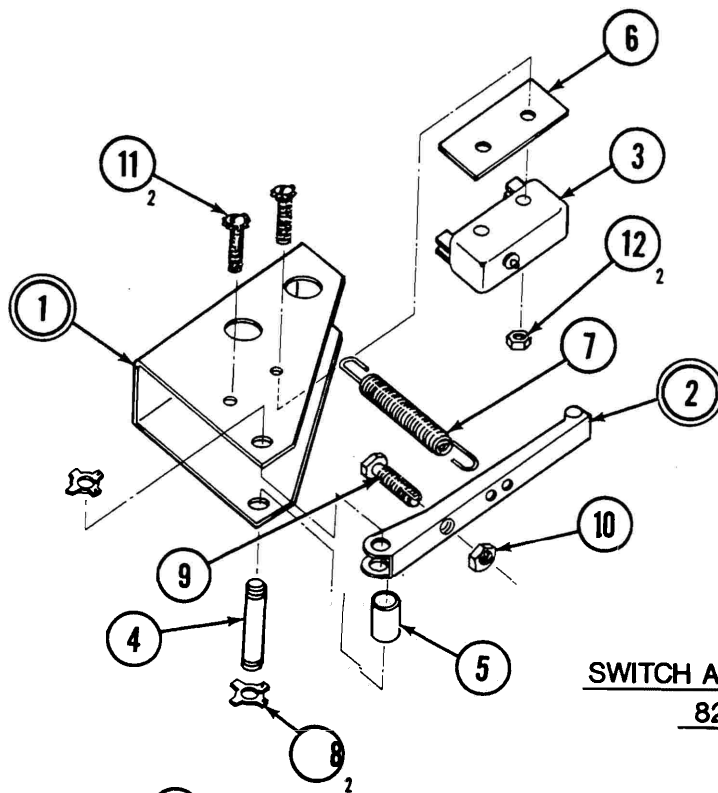
Switch Ass'y. Table Ass'y.

82-070-007-111

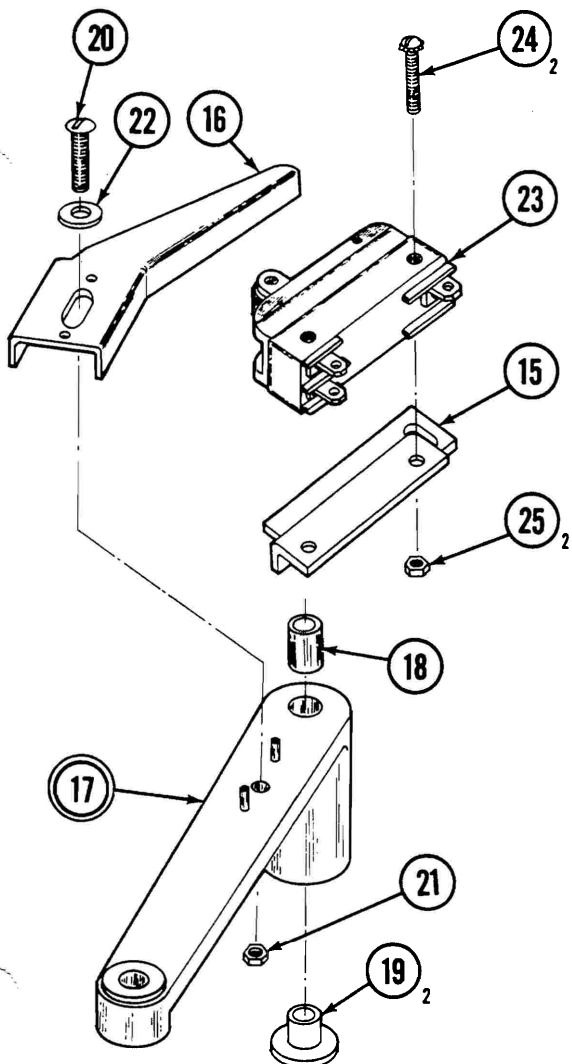
13	070-002-763	Pin & Bracket Weldment
14	070-002-762	Spring

Switch & Lever Ass'y. **(70A Mach. To Ser. #93200)**

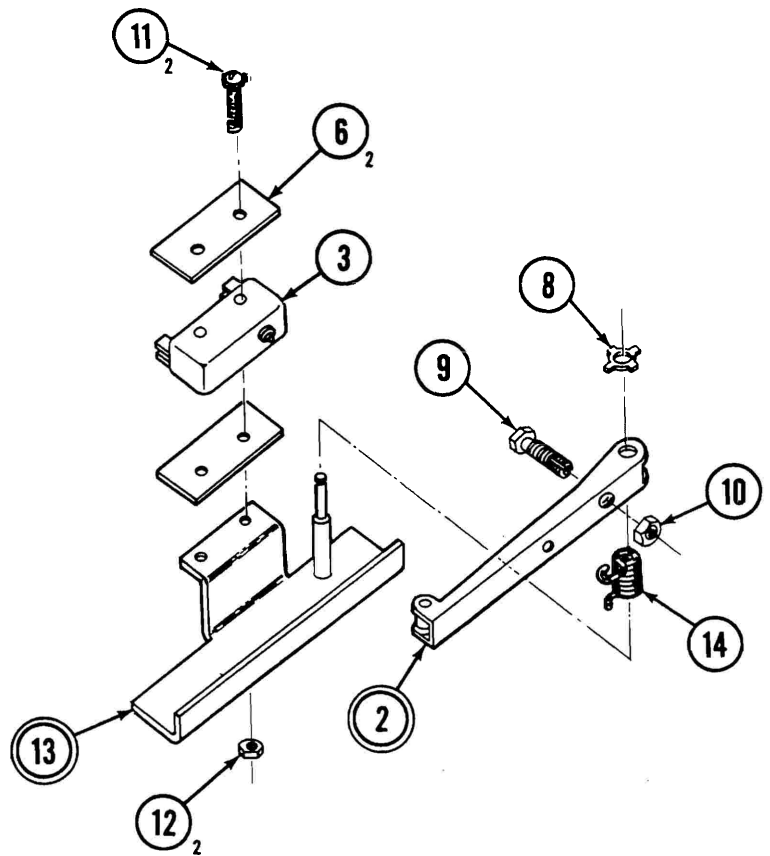
15	070-002-713	Bracket
16	070-002-714	Actuator
17	070-002-758	Lever and Bushing Ass'y.
18	070-002-652	Bushing
19	070-002-653	Bushing
20	808-640-141	Screw 10-32 x 7/8
21	843-140-002	Keps Nut 10-32
22	948-745-082	Flat Washer
23	000-026-247	Micro Switch
24	813-727-162	Screw Phil Pan Hd. 6-32 x 1
25	838-727-002	Nut ESNA 6-32



SWITCH ASSEMBLY TABLE ASSEMBLY
82-070-006-697



SWITCH & LEVER ASSEMBLY
(70 A MACHINE TO SERIAL # 93200)



SWITCH ASSEMBLY TABLE ASSEMBLY
82-070-007-111

TABLE WIREWAY ASS'Y.**82-070-006-675**

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-007-623	Lever Respot Ass'y. (Lever, w/items 2)	21	843-821-000	4-40 Hex Brass Nut
1a	070-002-678	Lever Respot Ass'y. (Lever, with items 2 and 3)	22	070-002-814	Link Ass'y.
2	070-002-653	Bushing Flanged Respot Lever	23	730-036-025	Clip (Silver)
3	070-002-652	Bushing Sleeve (Used in items 1a & 38)	23a	730-035-025	Clip (Brown)
4	963-200-002	X-Washer 9000-8	24	730-023-015	Shell - Cup Ass'y.
5	844-049-002	1/4-20 Stover Nut	25	730-020-012	Rod - Clip Ass'y.
6	070-002-671	Link Respot Conn.	26	730-027-019	Stud
7	070-006-669	Link	27	070-002-815	Spacer Bushing
7a	070-002-767	Link	28	724-507-002	Tinnerman Nut
8	070-002-768	Link	*29	070-005-602	Table Cable Ass'y.
9	070-002-769	Link	30	000-028-442	Guide Pin
10	070-002-770	Link	31	000-028-441	Guide Socket
11	070-002-766	Link - Wireway	32	070-002-582	Rear Drive Link Ass'y.
12	070-002-774	Pin	33	900-205-053	Flanged Bearing
13	070-002-771	Plate	34	070-002-619	Pin Actuator Shaft
14	070-002-772	Pin	*35	070-002-674	Plate
15	070-006-308	Grommet 2" Long Section	36	812-039-162	Flat Hd Slotted Screw 10-24 x 1
16	070-002-773	Grommet	37	839-539-002	10-24 FlexLoc Nut
17	770-008-009	Poly SpiRap 5"	38	070-002-708	Lever Ass'y. Respot
18	070-002-538	Bracket	39	070-002-813	Respot Link
19	000-025-556	Locking Spring Catch	40	000-026-865	Washer
20	813-949-082	Hex. Hd. Screw 1/4-20 x 1/2	41	770-013-013	Strap Panduit SST-2-B
			42	000-025-079	Block-Male 14 Pin
			43	760-011-197	Pin-Wire Terminal

*If Replacement Needed Order 610-704-010

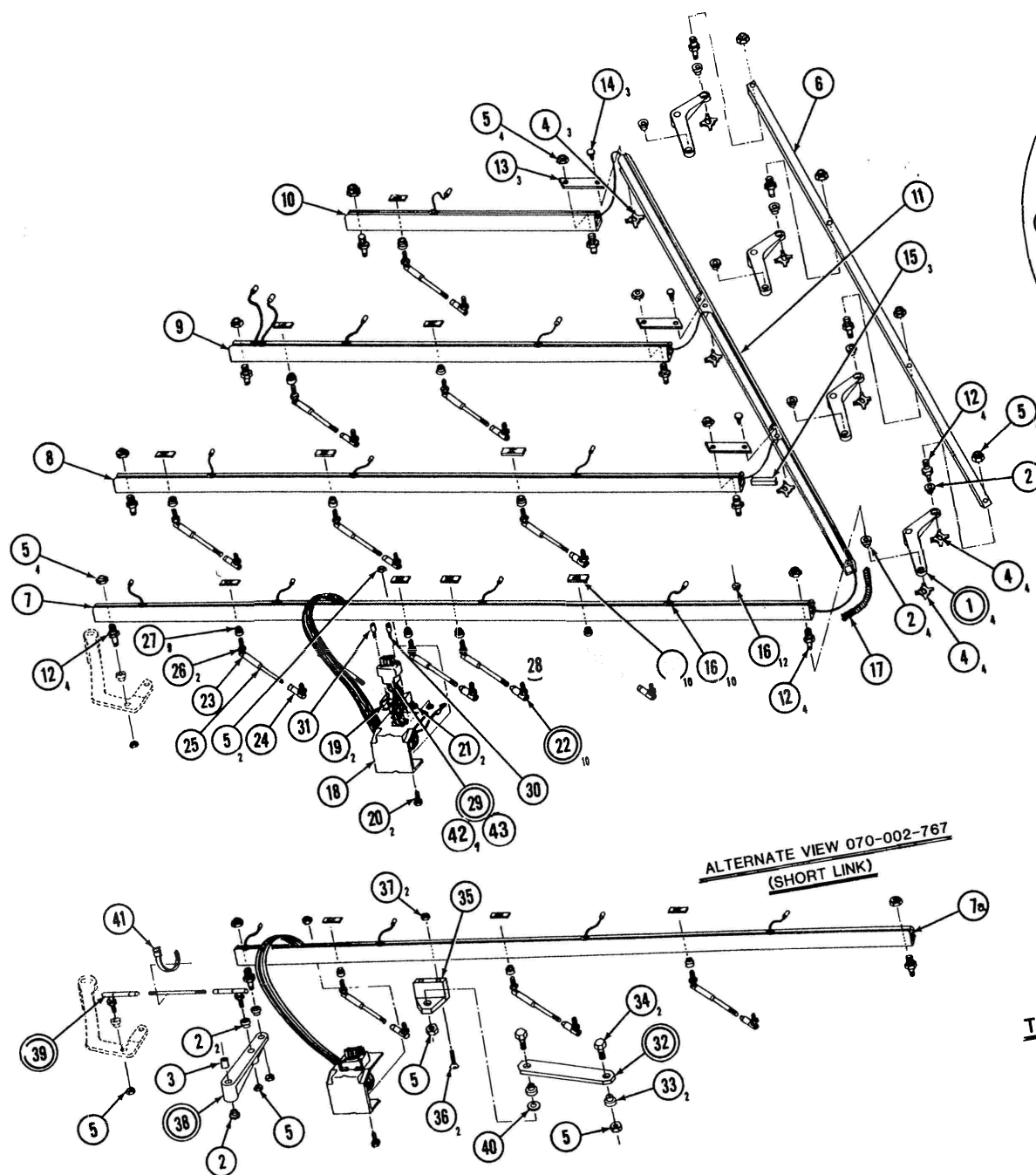


TABLE-WIREWAY ASSEMBLY

82-070-006-675

Rev 5-83

CELL ASSEMBLY - RESPOT

070-007-200

070-006-674

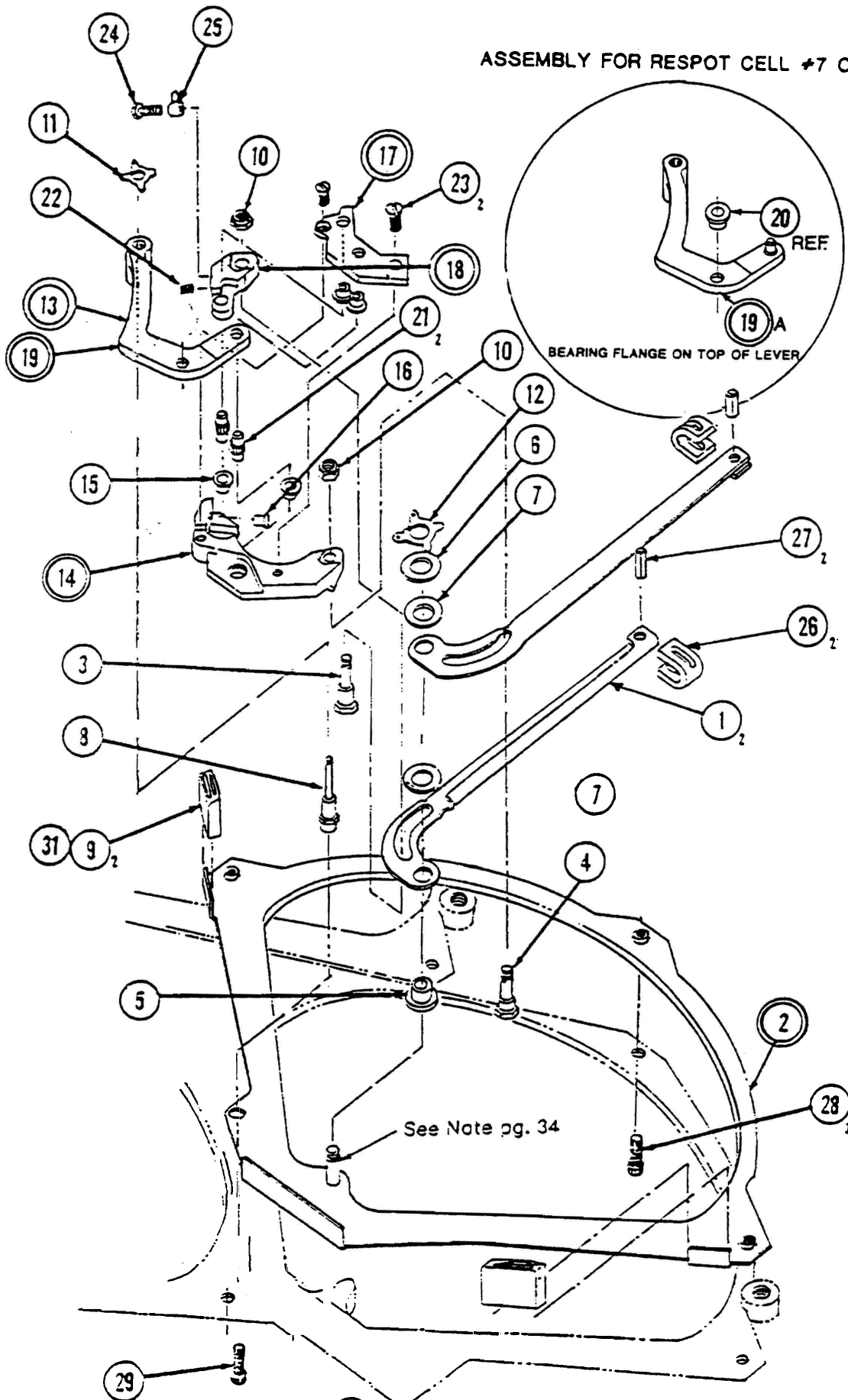
ITEM	PART NUMBER	DESCRIPTION
1	070-007-261	Finger Ass'y. (Finger with items 26 & 27)
2	070-002-792	Frame Respot Weld
3	070-007-194	Stud-Long
4	070-007-195	Stud-Short
5	070-007-196	Bushing
6	070-007-192	Washer
7	070-007-193	Spacer
*8	070-007-617	Stud-Pivot ($\frac{5}{16}$ Dia Shaft)
8a	070-002-654	Stud-Pivot ($\frac{1}{4}$ -Dia Shaft)
**9	070-002-752	Bumper Extrusion
10	844-049-002	Stover Locknut $\frac{1}{4}$ -20 Auto Gr. C.
11	963-400-002	X Washer 9000-12
12	963-200-002	X Washer 9000-8
13	070-007-619	Respot Yoke Ass'y. (With items 14, 17, 18, 19, 22 and 23.)
13a	070-007-621	Respot Yoke Ass'y. for Respot Cell 7 only (With items 19a, 22 & 23)
14	070-002-629	Yoke, Arm Ass'y. (With Item 16)
15	070-002-630	Bushing Yoke
16	933-623-050	Rivet - Yoke
17	070-002-644	Plate - Ass'y. (With Item 15)
18	070-002-646	Arm Ass'y. Respot Yoke (With items 21, 24, and 25)
19	070-007-618	Lever Ass'y. (9 cells) (With item 20 underside and 21)
19a	070-007-620	Lever Ass'y. #7 cell (With item 20 above and 21)
20	070-002-653	Bushing
21	070-002-645	Shaft
22	070-002-649	Spring Yoke Arm
23	070-002-750	Screw
24	070-002-632	Screw, Stop
25	070-002-570	Insert, Ass'y.
26	070-007-197	Insert
27	913-437-100	Spring Pin $\frac{3}{16}$ Dia. x $\frac{5}{8}$ Lg.
28	808-640-141	Screw Soc. Hd. Cap #10-32 x $\frac{7}{8}$
29	808-640-121	Screw Soc. Hd. Cap #10-32 x $\frac{3}{4}$
30	070-007-200	Respot Cell Ass'y. Complete (For Cells 1 thru 6 and 8 thru 10)
31	070-006-674	Respot Cell Ass'y. Complete (For #7 Cell Only)
32	008-100-413	3M Adhesive (EC1300)

*With Item #8 No Bushings Used In Boss Of Item 19.

With Item 8a Bushings Are Used In Boss of Item 19. 070-002-653 Flange Bushing and 070-002-652 Sleeve Bushing.

**Cement Item #9 to Item #2 With Item #32.

ASSEMBLY FOR RESPOT CELL #7 ONLY



30 070-007-200 RESPOT CELL ASSEMBLY

31 070-006-674 RESPOT CELL NO. 7 ASSEMBLY (REV. B)

RESPOT CELL NUMBER 7 ASSEMBLIES

Reference Drwgs. 070-006-674 (REV A)
070-007-199

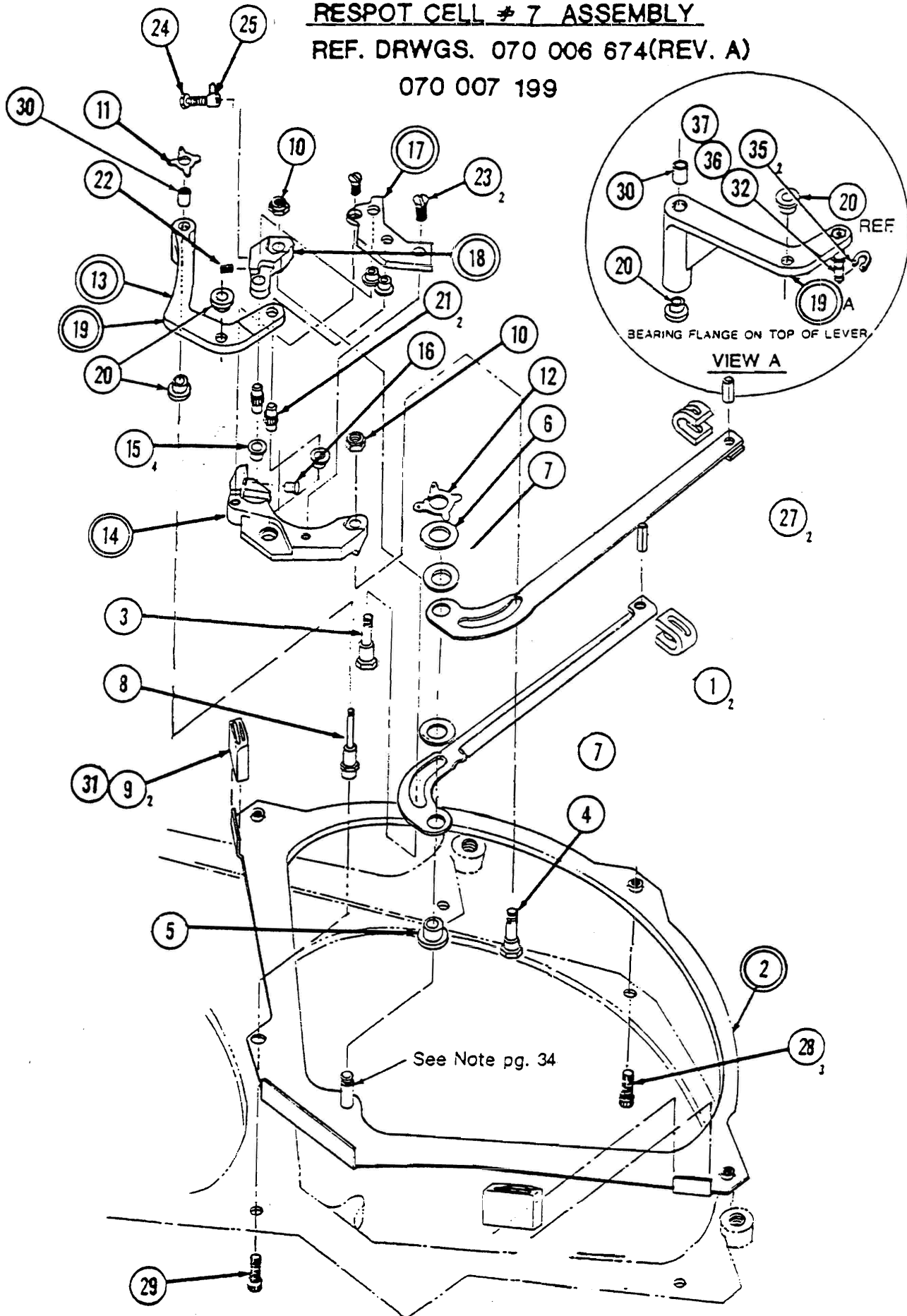
ITEM	PART NUMBER	DESCRIPTION
1	070-007-261	Finger Assembly
* 2	070-002-655	Frame Assembly (With Items 8a, 9 and 31)
* 2a	070-002-686	Frame Assembly (With ITEMS 8, 9, and 31)
3	070-007-194	Stud - Long
4	070-007-195	Stud - Short
5	070-007-196	Bushing
6	070-007-192	Washer
7	070-007-193	Spacer
8	070-002-685	Stud - Pivot (1/4" Dia. With Shoulder)
8a	070-002-654	Stud - Pivot (1/4" Dia.)
* 9	070-002-752	Bumper Extrusion
10	844-049-002	Stover Locknut 1/4-20
11	963-100-002	'X' Washer 9000-6
12	963-200-002	'X' Washer 9000-8
13	070-006-677	Respot Yoke Assembly (With items 14, 17, 18, 19, 22, 23)
13a	070-002-642	Yoke Ass'y. (With Items 14, 17, 18, 19a, 22 and 23)
14	070-002-629	Yoke, Assembly (With items 15 and 16)
15	070-002-630	Bushing
16	933-623-050	Rivit
17	070-002-644	Plate - Yoke (With item 15)
18	070-002-646	Arm Respot Yoke (With items 21, 24 and 25)
19	070-006-673	Lever Respot Arm (With items 20, 21, and 30)
19a	610-704-026	Kit Lever Respot Arm (View A) (With items 20, 30, 32, and 36)
20	070-002-653	Bushing
21	070-002-645	Shaft
22	070-002-649	Spring
23	070-002-750	Screw
24	070-002-632	Screw Stop
25	070-002-570	Insert, Assembly
26	070-007-197	Insert
27	913-437-100	Spring Pin 3/16 Dia. x 5/8 Lg.
28	808-640-141	Screw Soc. Hd. Cap #10-32 x 7/8
29	808-640-121	Screw Soc. Hd. Cap #10-32 x 3/4
30	070-002-652	Bushing - Sleeve
*31	008-100-413	Adhesive (E C 1300)
32	070-008-154	Pin
33	070-006-674	Respot Cell Assembly Complete #7 Cell (Used with 070-006-669 Long Wireway Link)
34	070-007-199	Respot Cell Assembly Complete #7 Cell (Used with 070-002-767 Short Wireway Link)
35	919-010-200	Tru-Arc Retaining Ring
36	835-558-002	Hex Jam Nut 5/16-24 NC
37	070-002-531	Washer - Respot

*CEMENT ITEM #9 TO ITEM #2 WITH ITEM #31.

RESPOT CELL # 7 ASSEMBLY

REF. DRWGS. 070 006 674(REV. A)

070 007 199



RESPOT CELL ASSEMBLY

(Die Cast Fingers)

Ref. Dwgs. 070-002-660

Ref. Dwgs. 070-002-661 No. 7 Cell

ITEM	PART NUMBER	DESCRIPTION
*1	070-002-638	Finger L.H.
*2	070-002-822	Finger R.H.
3	070-002-636	Bushing
4	070-002-648	Insert
5	070-002-792	Frame
6	070-002-654	Pivot Shaft
6a	070-002-685	Pivot Shaft No. 7 Cell Only
7	070-002-752	Bumper
**8	008-100-413	EC 1300 Adhesive
9	070-002-686	Frame Assembly No. 7 Cell (With Items 5, 6a, 7 and 8)
10	070-002-628	Stud
11	070-002-631	Roller
12	070-002-531	Washer
13	844-049-002	Stover Locknut 1/4-20
14	963-200-002	'X' Washer 9000-8
15	963-100-002	'X' Washer 9000-6
16	070-002-647	Respot Yoke Assembly (With items #17, 20, 21, 22, 26)
16a	070-002-642	Respot Yoke Assembly #7 Cell (With Items #17, 20, 21, 22a, 26)
17	070-002-629	Yoke Arm Ass'y. (With Items #18 and 19)
18	070-002-630	Bushing
19	933-623-050	Rivet
20	070-002-644	Plate Ass'y. (With Item #18)
21	070-002-646	Arm Ass'y. Respot Yoke (With Items 25, 27, and 28)
22	070-002-633	Lever Ass'y. (9 Cells) (With Items #23, 24 and 25)
22a	610-704-026	Kit-Lever Ass'y. (#7 Cell Only) With Item 12, 23, 24, 32, 33 and 34)
23	070-002-653	Bushing
24	070-002-652	Sleeve Bushing
25	070-002-645	Shaft
26	070-002-649	Spring
27	070-002-632	Screw Stop
28	070-002-570	Insert
29	070-002-750	Screw
30	808-640-141	Screw Soc. Hd. Cap #10-32 x 7/8
31	808-640-121	Screw Soc. Hd. Cap #10-32 x 3/4
32	919-010-200	Tru-Arc Retaining Ring
33	835-558-002	Hex Jam Nut 5/16-24
34	070-008-154	Pin

*Order 610-704-001 if fingers need replacement. 1 kit per cell

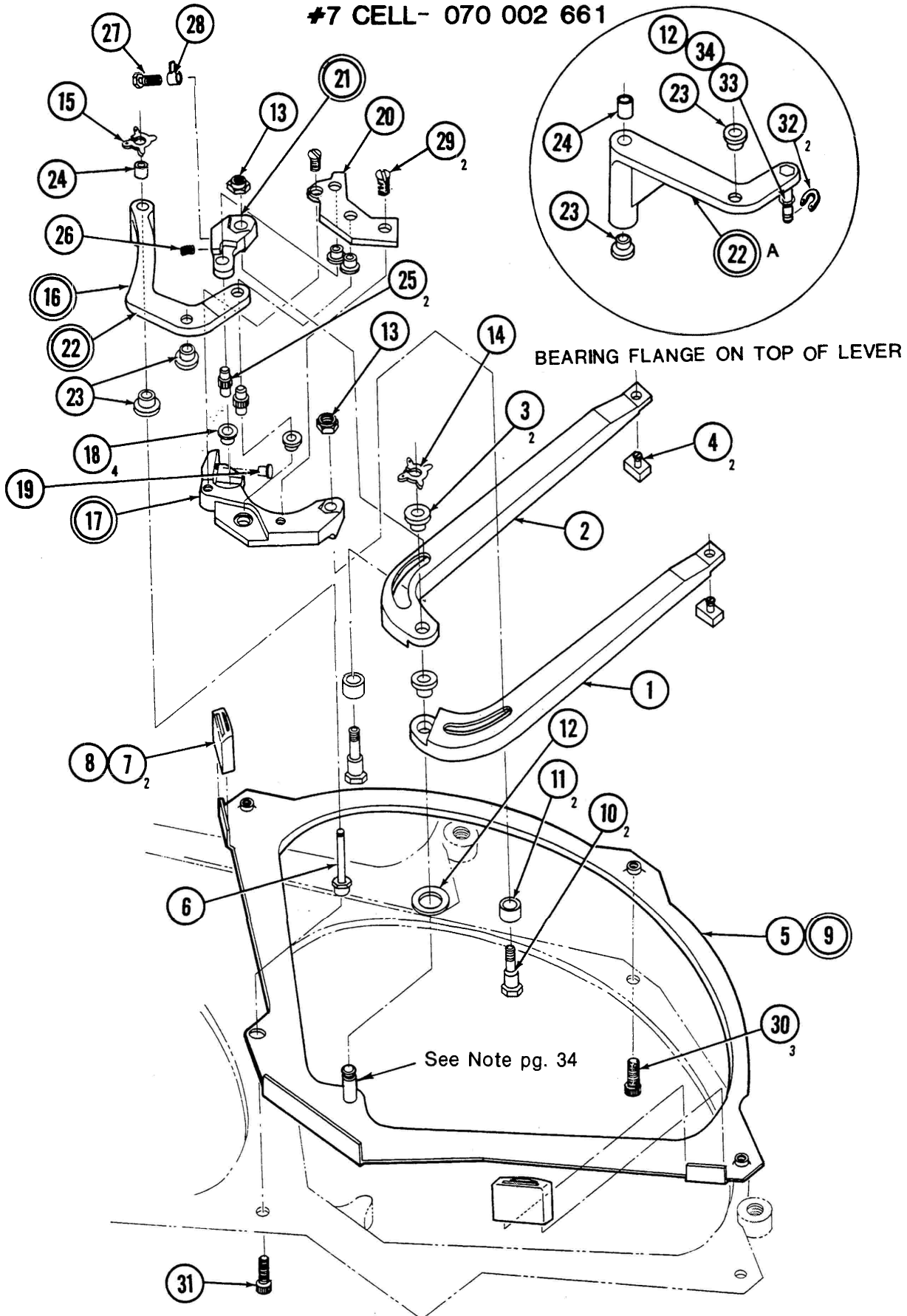
**Cement Item #7 to Item #5 With Item #8.

Note: For Weld Stud Replacement on Respot Cell Frame: Use
Stud #070 002 650 and 1/4-20 Flex Lock Nut #840 049 002

RESPOT CELL ASSEMBLY (DIE - CAST FINGERS)

REF. DRWGS. 070 002 660

#7 CELL- 070 002 661



YOKE AND SPOTTING CUP ASS'Y.

070-002-600

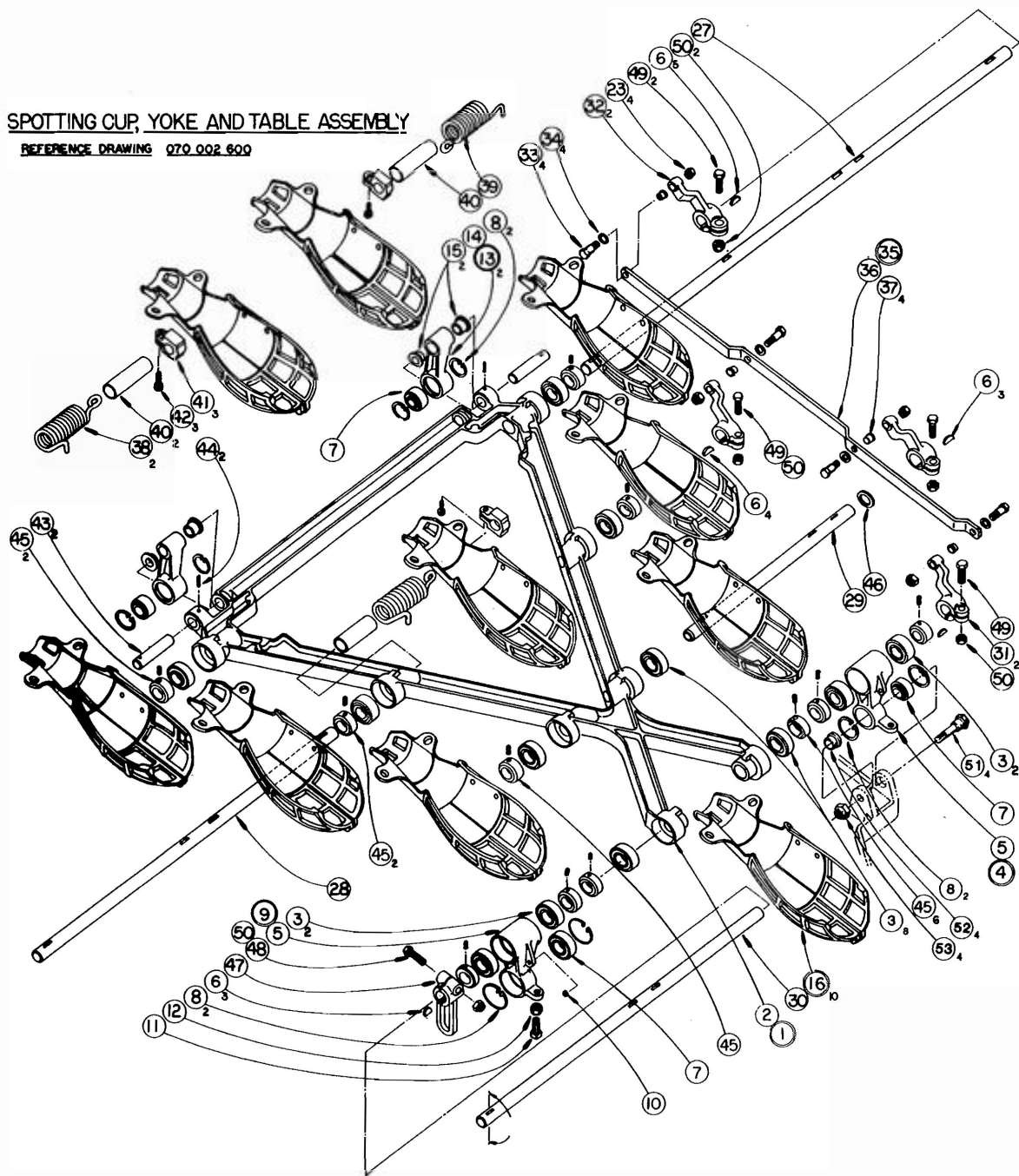
ITEM	PART NUMBER	DESCRIPTION
1	070-002-623	Yoke and Bearing Ass'y.
*2	070-002-683	Yoke
3	190-001-490	Bearing
4	070-002-663	Front Leg Ass'y. R.H. (W/Items 3,5,7,8)
5	070-002-667	Leg
6	907-000-600	Key - "Hi-Pro" #706
7	070-002-698	Bushing - Spherical
8	919-000-700	Retaining Ring (N-5000-156)
9	070-002-664	Front Leg Ass'y. L.H. (With Items 3, 5, 7, 8, 10, 11, 12)
10	724-517-107	Ring Compression (Tinn. C 2122-025)
11	806-265-240	Set Screw Sq. Hd. Cup Point $\frac{3}{8}$ -16 x 1 $\frac{1}{2}$ LG.
12	835-565-002	Jam Nut Cad PL $\frac{3}{8}$ -16 N.C.
13	070-002-665	Rear Leg Ass'y. (W/Items 7, 8, 14, 15)
14	070-002-666	Leg - Rear
15	000-023-114	Flanged Bushing
16	070-002-808	Spotting Cup Ass'y.
17	070-002-809	Spotting Cup
18	070-002-784	Liner
19	070-002-798	Retainer
20	070-002-787	"U" Bolt
21	070-002-818	Washer
22	810-249-200	Screw Soc. Hd. Cap. $\frac{1}{4}$ -20 x 1 $\frac{1}{4}$
23	844-049-002	Stover Lock Nut $\frac{1}{4}$ -20
24	839-057-002	Nut ESNA $\frac{5}{16}$ -18
25	948-761-112	Washer, Pln. 1 $\frac{1}{8}$ O.D. x 1 $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK.

ITEM	PART NUMBER	DESCRIPTION
26	070-002-788	Cap
27	070-002-618	Shaft #4
28	070-002-617	Shaft #3
29	070-002-616	Shaft #2
30	070-002-615	Shaft #1
31	070-002-602	Lever - Inner
32	070-002-603	Lever - Outer
33	070-002-723	Pin
34	701-310-036	Thrust Bearing
35	070-002-612	Tie Link Ass'y.
36	070-002-611	Link
37	900-205-053	Flange Bearing
38	070-002-688	Spring R.H.
39	070-002-689	Spring L.H.
40	070-002-719	Spring Sleeve
41	070-002-608	Collar Spring
42	810-258-160	Screw Soc. Hd. Cap $\frac{5}{16}$ -24 x 1
43	070-002-609	Pin
44	913-437-240	Roll Pin .187 x 1 $\frac{1}{2}$
45	000-025-549	Collar With Set Screw
46	070-002-620	Spacer
47	070-002-624	Arm-Actuator
48	809-865-365	Screw-Hex Hd. Cap $\frac{3}{8}$ -16 x 2 $\frac{1}{4}$
49	809-865-245	Screw-Hex Hd. Cap $\frac{3}{8}$ -16 x 1 $\frac{1}{2}$
50	839-665-002	Stover Locknut $\frac{3}{8}$ -16
51	070-002-701	Stud
52	070-002-573	Spacer
53	840-381-002	Nut $\frac{5}{8}$ -11 Flex Lock

* For Yoke (Cracked) Repair Kit Order 610-704-011.

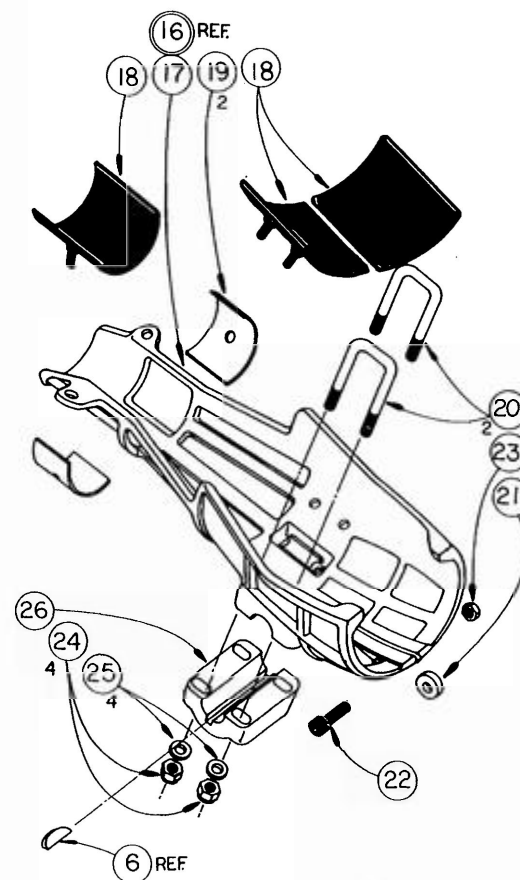
SPOTTING CUP, YOKE AND TABLE ASSEMBLY

REFERENCE DRAWING 070 002 600



SPOTTING CUP ASSEMBLY

070 002 808



Rev5-83

TABLE TORQUE TUBE ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1.	070-001-770	Lever Assembly - Table Arm Over Travel	20.	770-011-010	Ty-Rap (14.19" LG.)
2.	070-001-852	Lever	21.	000-022-782	Spring
3.	070-001-853	Spring	22.	000-022-811	Pillow Block (Bearing & Stampings)
4.	070-001-854	Screw (Special)	23.	710-501-009	Lubrication Fitting (Alemite #3006)
5.	070-001-591	Pin	24.	070-001-668	Roller, Spring
6.	000-026-042	Switch Micro	25.	945-867-242	Washer (1.50 O.D. x 406 I.D. x .050 THK.)
7.	818-227-202	Screw, Sems Rd. Hd. (#6-32 x 1-1/4 LG.)	26.	809-881-640	Screw, Hex Hd. Cap (5/8-11 x 4" LG.)
8.	843-127-002	Nut, Keps (#6-32)	27.	809-865-245	Screw, Hex Hd. Cap (3/8-16 x 1-1/2 LG.)
9.	839-549-002	Nut, Flexloc (1/4-20 NC)	28.	809-869-325	Screw, Hex Hd. Cap (7/16-14 x 2 LG.)
10.	963-400-002	"X" Washer (9000-12)	29.	840-065-002	Nut, Flex-Loc (3/8-16)
11.	070-006-718	Torque Tube Weldment	30.	844-069-002	Nut, Lock (Stover 7/16-14)
12.	070-007-296	Table Support Weldment (L.H.)	31.	949-100-002	Washer (59/64 O.D. x 15/32 I.D. x 1/16 THK.)
13.	070-007-295	Table Support Weldment (R.H.)	32.	809-869-245	Screw Hex Hd. Cap (7/16 14 NC x 1-1/2)
14.	070-007-303	Spacer (7/16 I.D.)			
15.	070-007-302	Spacer (5/8 I.D.)			
16.	070-007-752	Spacer			
17.	070-002-698	Bushing, Spherical			
18.	919-000-700	Retaining Ring			
19.	070-008-182	Bearing Block			

Reference Drawings: 070-006-400
Reference Drawings: 070-006-644
Reference Drawings: 070-006-719

TABLE TORQUE TUBE ASSEMBLY

REFERENCE DRAWINGS: 070 006 40 0, 070 006 644 AND
070 006 719

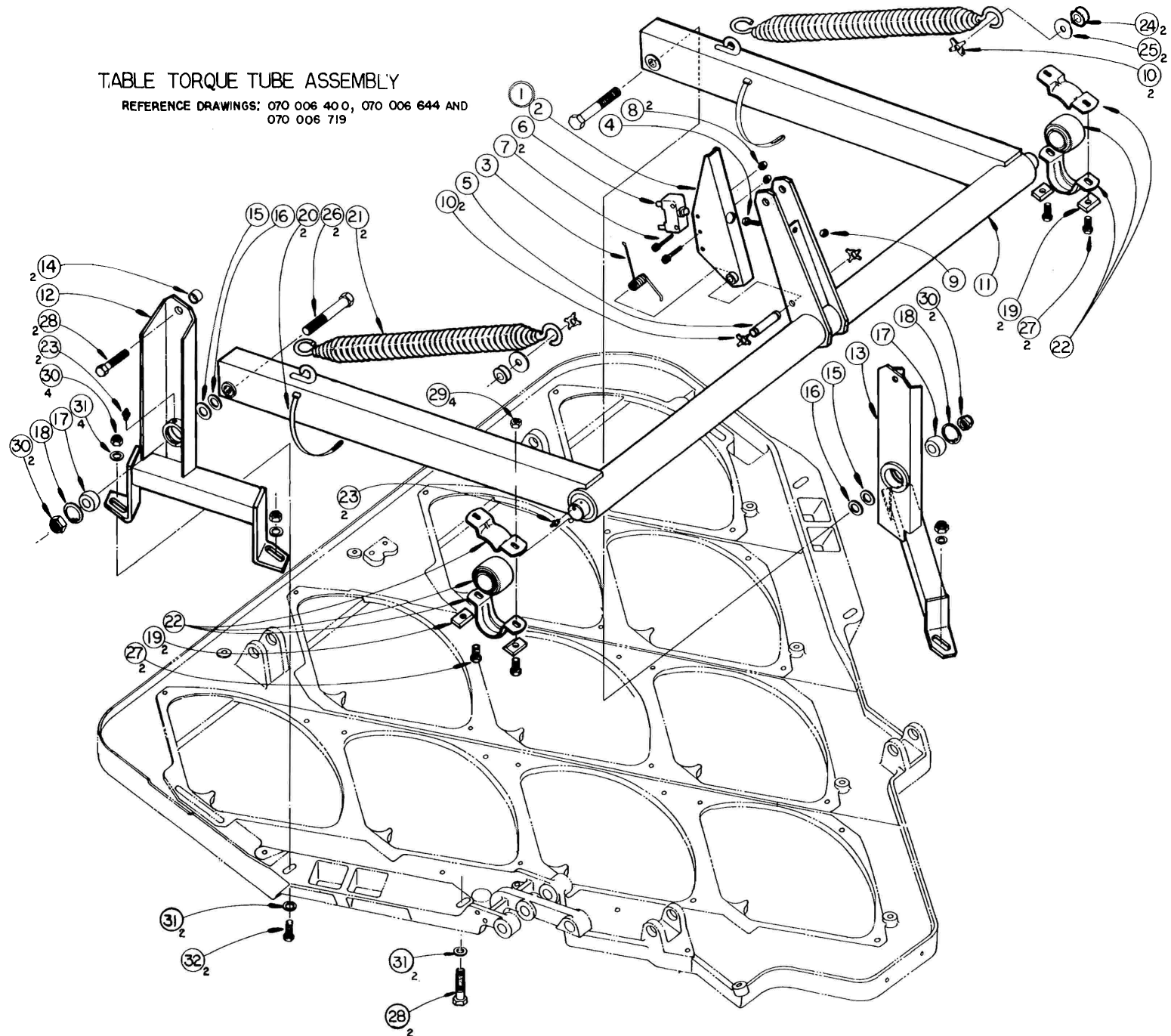


TABLE TORQUE TUBE ASSEMBLY

Reference Drawings: 070-006-400

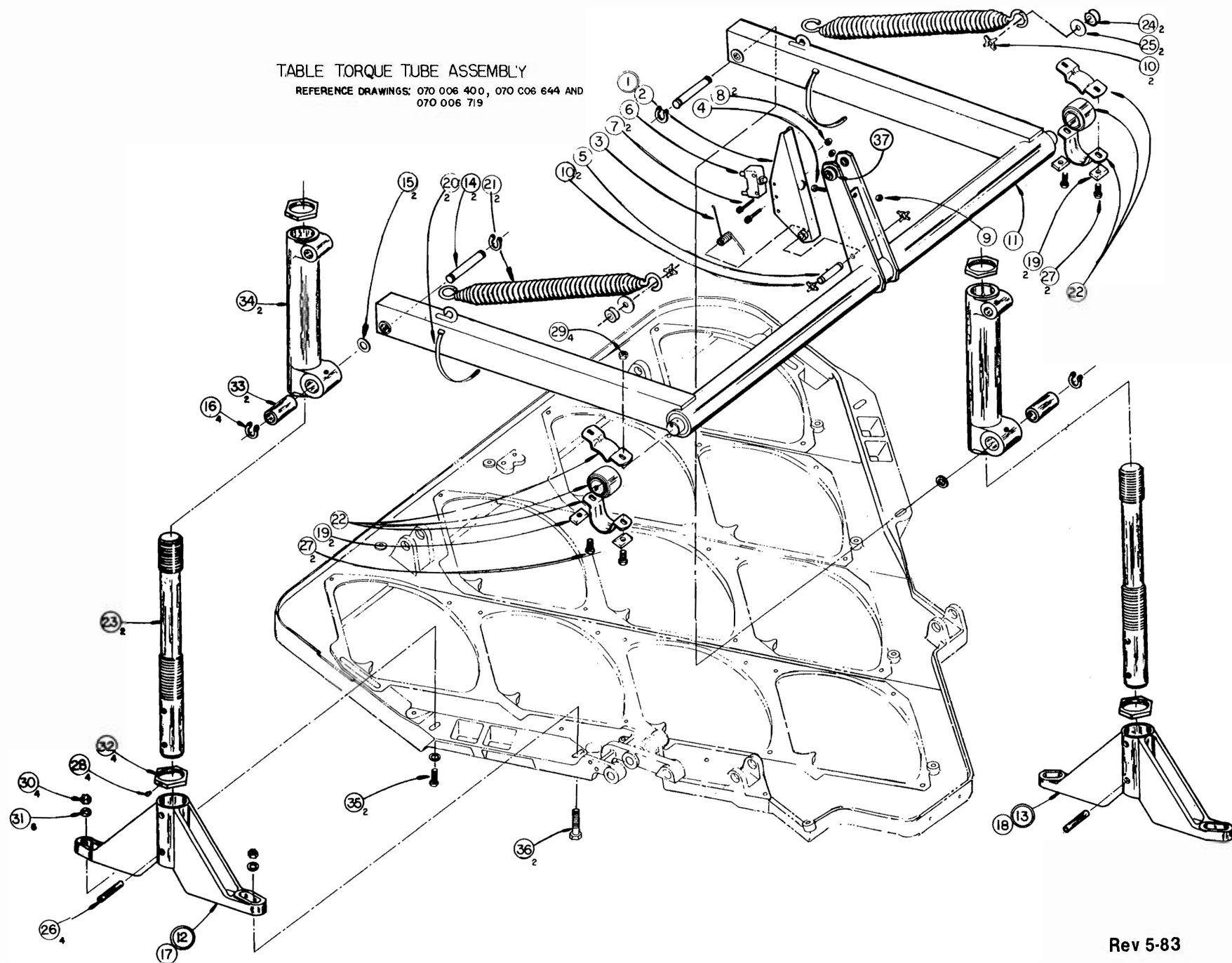
070-006-644

070-006-719

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-001-770	Lever Assembly - Table Arm Over Travel	18	070-001-670	Foot - R.H.
2	070-001-852	Lever	19	070-008-182	Bearing Block
3	070-001-853	Spring	20	770-011-010	Ty-Rap (14.19" LG.)
4	070-001-854	Screw (Special)	21	000-022-782	Spring
5	070-001-591	Pin	22	000-022-811	Pillow Block (Bearing & Stamping)
5a	880-457-240	Shoulder Screw	23	070-001-677	Tube
5b	839-057-002	ESNA Lock Nut $\frac{5}{16}$ -18	24	070-001-668	Roller, Spring
6	000-026-042	Micro Switch	25	945-867-242	Washer (1.50 O.D. x .406 I.D. x .050 THK.)
7	818-227-202	Screw Sems Rd. Hd. (#6-32 x 1 $\frac{1}{4}$ LG.)	26	913-456-320	Roll Pin ESNA
8	843-127-002	Nut Keps (#6-32)	27	809-865-245	Screw Hex Hd. Cap. ($\frac{3}{16}$ -16 x 1 $\frac{1}{4}$ LG.)
9	839-549-002	Flex Lock Nut $\frac{1}{4}$ -20	28	070-001-909	Set Screw
10	963-400-002	"X" Washer (9000-12)	29	840-065-002	Nut, Flex-Loc ($\frac{3}{8}$ -16)
11	070-001-550	Table Torque Tube	30	844-069-002	Nut, Lock (Stover $\frac{7}{16}$ -14)
12	070-001-682	Table Support Ass'y. (L.H.) (Items 17, 23, 26, 28, 32, 33, and 34)	31	949-100-002	Washer ($\frac{59}{64}$ O.D. x $\frac{19}{32}$ I.D. x $\frac{1}{16}$ THK)
13	070-001-684	Table Support Ass'y. (R.H.) (Items 18, 23, 26, 28, 32, 33, and 34)	32	070-001-679	Nut
14	070-001-583	Pin	33	900-110-403	Bushing
15	070-001-609	Spacer	34	070-001-656	Sleeve
16	919-010-700	Tru-Arc Retaining Ring	35	809-869-365	Screw Hex. Hd. Cap. ($\frac{7}{16}$ -14 x 2 $\frac{1}{4}$)
17	070-001-671	Foot - L.H.	36	809-869-445	Screw Hex. Hd. Cap. ($\frac{7}{16}$ -14 x 2 $\frac{3}{4}$)
			37	070-001-924	Bearing

TABLE TORQUE TUBE ASSEMBLY

REFERENCE DRAWINGS: 070 006 400, 070 006 644 AND
070 006 719



Rev 5-83

SPOT & RESPOT TIE ROD INSTALLATION

ITEM	PART NUMBER	DESCRIPTION
1	070-001-601	Respot Tie Rod Ass'y. (31 $\frac{5}{8}$ Lg. Center to Center)
2	070-001-602	Spot Tie Rod Ass'y. (34 $\frac{5}{8}$ Lg. Center to Center)
3	070-001-607	Tie Rod
4	070-001-606	Tie Rod
5	000-025-004	End Fitting R.H.
6	000-025-005	End Fitting L.H.
7	835-570-002	Jam Hex Nut $\frac{7}{16}$ -20
8	835-670-002	Jam Hex Nut $\frac{7}{16}$ -20 L.H.
9	710-501-013	Grease Fitting - Alemite
10	070-006-499	Spot - Respot Link Ass'y.
11	809-869-365	Hex Hd. Cap Screw $\frac{7}{16}$ -14 x 2 $\frac{1}{4}$
12	809-869-245	Hex Hd. Cap Screw $\frac{7}{16}$ -14 x 1 $\frac{1}{2}$
13	809-869-285	Hex Hd. Cap Screw $\frac{7}{16}$ -14 x 1 $\frac{3}{4}$
14	844-069-002	Stover Locknut $\frac{7}{16}$ -14
15	949-100-002	Washer Plain $\frac{15}{32}$ x 5 $\frac{9}{16}$ x $\frac{1}{16}$
16	070-002-578	Spot Lever Ass'y.
17	070-002-727	Swifter Link Ass'y.
18	070-002-728	Cam Link Ass'y.

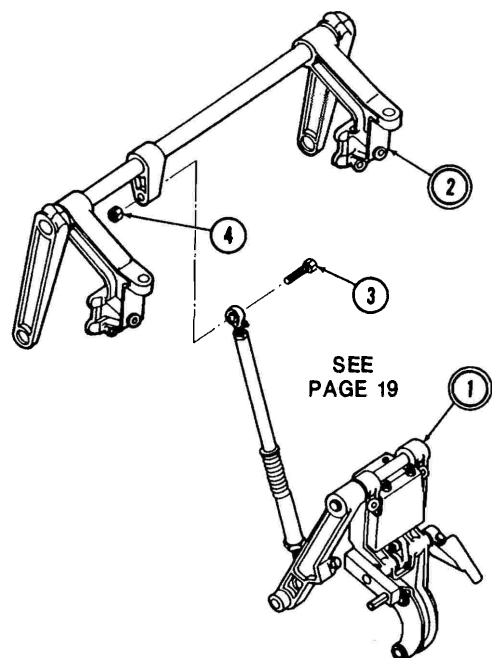
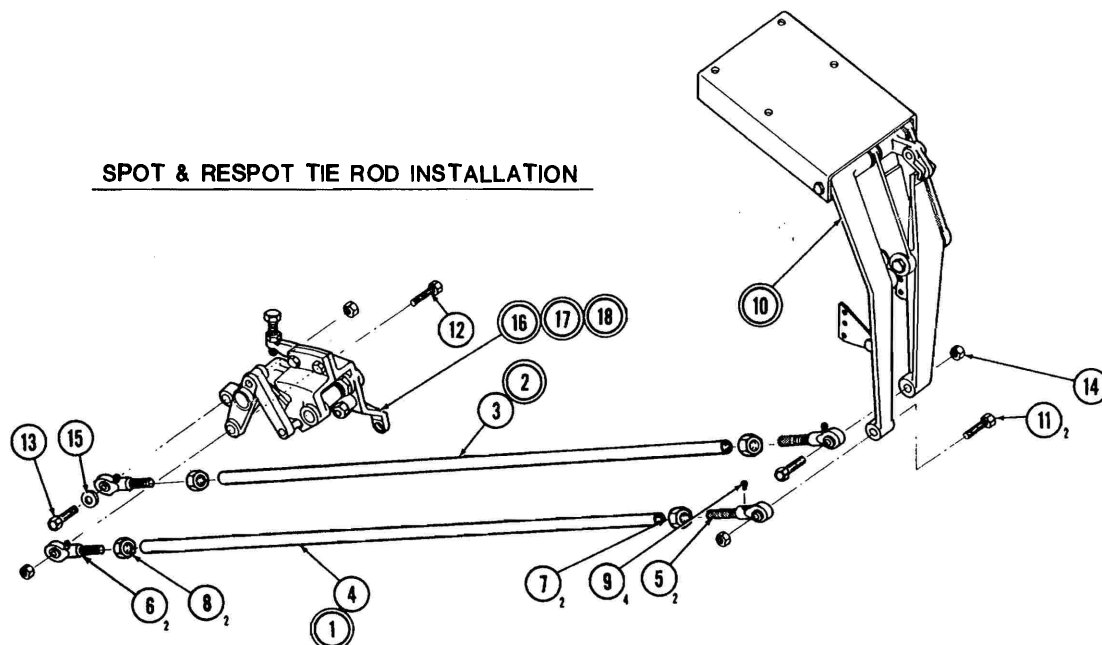
TABLE TIE ROD INSTALLATION R.H.

ITEM	PART NUMBER	DESCRIPTION
1	070-007-295	Table Support Weldment R.H.
1a	070-007-296	Table Support Weldment L.H. (Not Shown)
2	070-007-303	Spacer ($\frac{7}{16}$ I.D.)
3	070-001-558	Table Tie Rod Ass'y. (36" Center To Center)
4	070-001-557	Tie Rod (33 $\frac{1}{2}$ LG)
5	000-025-004	End Fitting R.H.
6	000-025-005	End Fitting L.H.
7	835-570-002	Hex Jam Nut $\frac{7}{16}$ -20
8	835-670-002	Hex Jam Nut $\frac{7}{16}$ -20 L.H.
9	710-501-013	Grease Fitting - Alemite
10	070-006-399	Cross Beam
11	809-869-325	Hex Hd. Cap Screw $\frac{7}{16}$ -14 x 2 Lg.
12	809-869-445	Hex Hd. Cap Screw (Right Side) $\frac{7}{16}$ -14 x 2 $\frac{3}{4}$ Lg. - Shown
12a	809-869-365	Hex Hd. Cap Screw (Left Side) $\frac{7}{16}$ -14 x 2 $\frac{1}{4}$
13	844-069-002	Locknut Stover $\frac{7}{16}$ -14
14	949-100-002	Washer Plain $\frac{15}{32}$ x 5 $\frac{9}{16}$ x $\frac{1}{16}$ thk.

CONNECTING ROD INSTALLATION

ITEM	PART NUMBER	DESCRIPTION
1	070-006-495	Shutter Operator & Solenoid Ass'y.
2	070-006-350	Bin Assembly
3	809-865-245	Hex Hd. Cap Screw $\frac{3}{8}$ -16 x 1 $\frac{1}{2}$ Lg.
4	840-065-002	Flex Lock Nut $\frac{3}{8}$ -16

SPOT & RESPOT TIE ROD INSTALLATION



CONNECTING ROD INSTALLATION

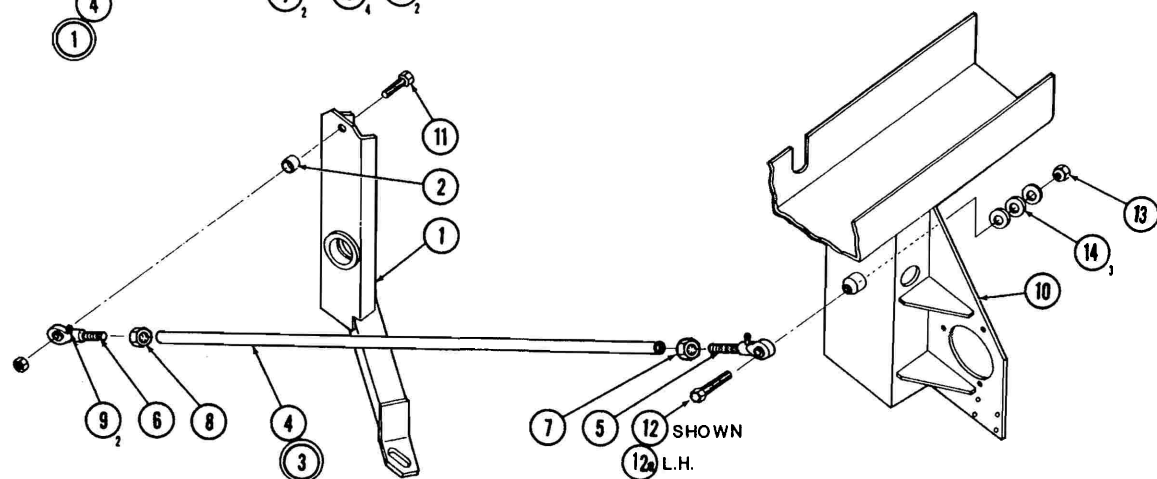


TABLE TIE ROD INSTALLATION R.H. (L.H. NOT SHOWN)

SHUTTLE ASSEMBLY

070-006-250

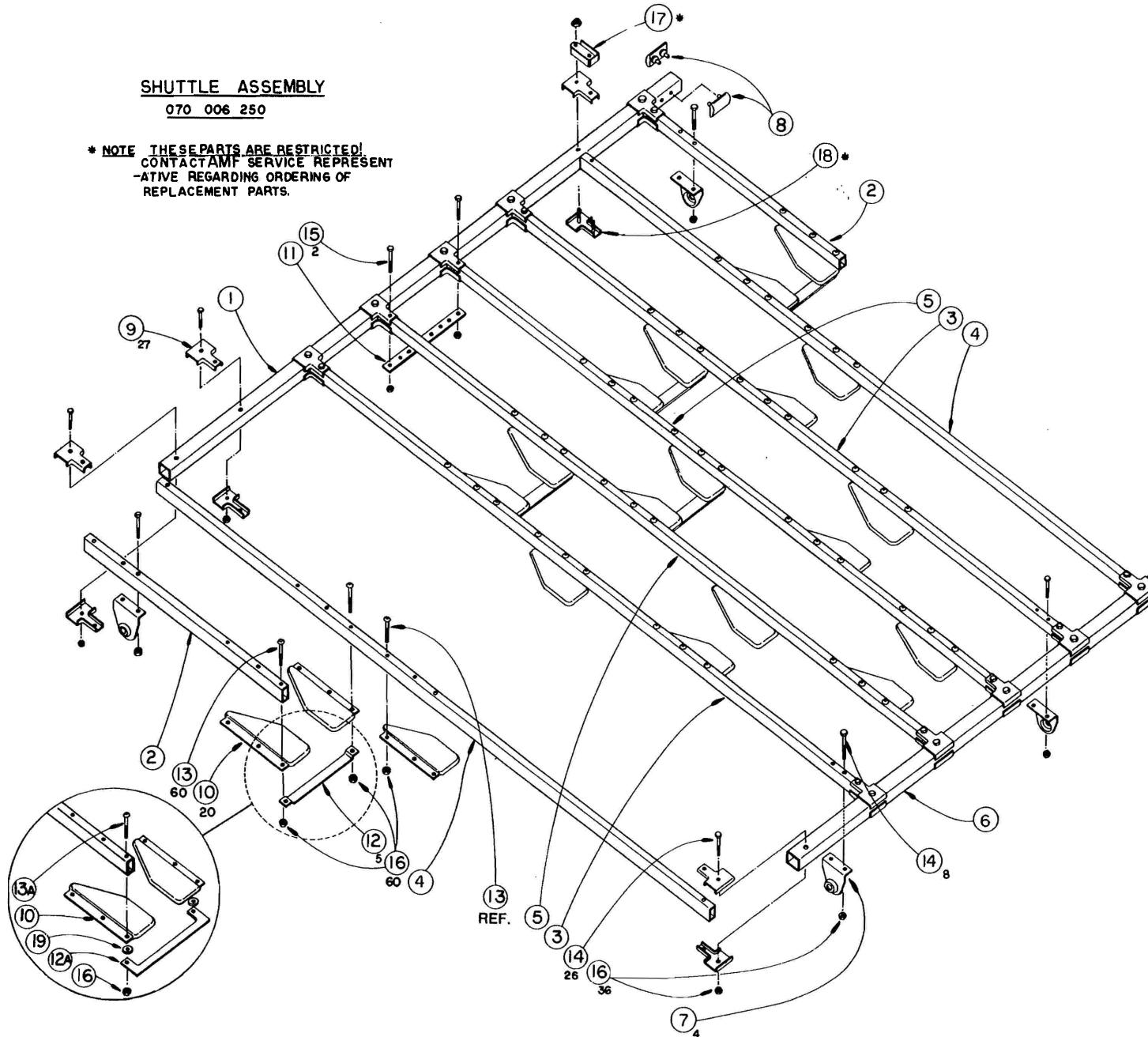
ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-006-253	Tube, Cross (Long)	13	808-549-240	Screw, Soc. Button Hd. (1/4-20 x 1 1/2 Lg.)
2	070-006-254	Tube, Side (Short)	13a	808-549-320	Screw, Soc. Button Hd. (1/4-20 x 2" Lg.)
3	070-006-255	Tube, Side (Long)	14	809-849-245	Screw, Hex Hd. Cap (1/4-20 x 1 1/2 Lg.)
4	070-006-256	Tube, Outside	15	809-849-285	Screw, Hex Hd. Cap (1/4-20 x 1 3/4 Lg.)
5	070-006-257	Tube, Center	16	844-049-002	Nut, Hex Lock (Stover 1/4-20)
6	070-006-258	Tube, Cross (Short)	17	SEE NOTE	Channel, Security
7	070-006-259	Bracket, Arm	18	SEE NOTE	Bracket, Clamp
8	070-006-260	Bumper, Counter	19	070-006-390	Spacer
9	070-006-261	Clamp, End			
10	070-006-265	Pin Holder Assembly			
11	070-006-266	Strap, (7) Hole			
12	070-006-268	Strap, (Rev A) (Used 5-7-8-9-10 Pin)			
12a	070-006-268	Strap, (Rev New) (Used 7-10 Pin)			

*NOTE: Ordering or installation of parts (Items 17 and 18) is authorized in sale only by an AMF Service Representative. Therefore replacement part numbers are restricted. Contact your local AMF SERVICE Department for assistance.

SHUTTLE ASSEMBLY

070 006 250

* NOTE THESE PARTS ARE RESTRICTED!
CONTACT AMF SERVICE REPRESENT-
ATIVE REGARDING ORDERING OF
REPLACEMENT PARTS.



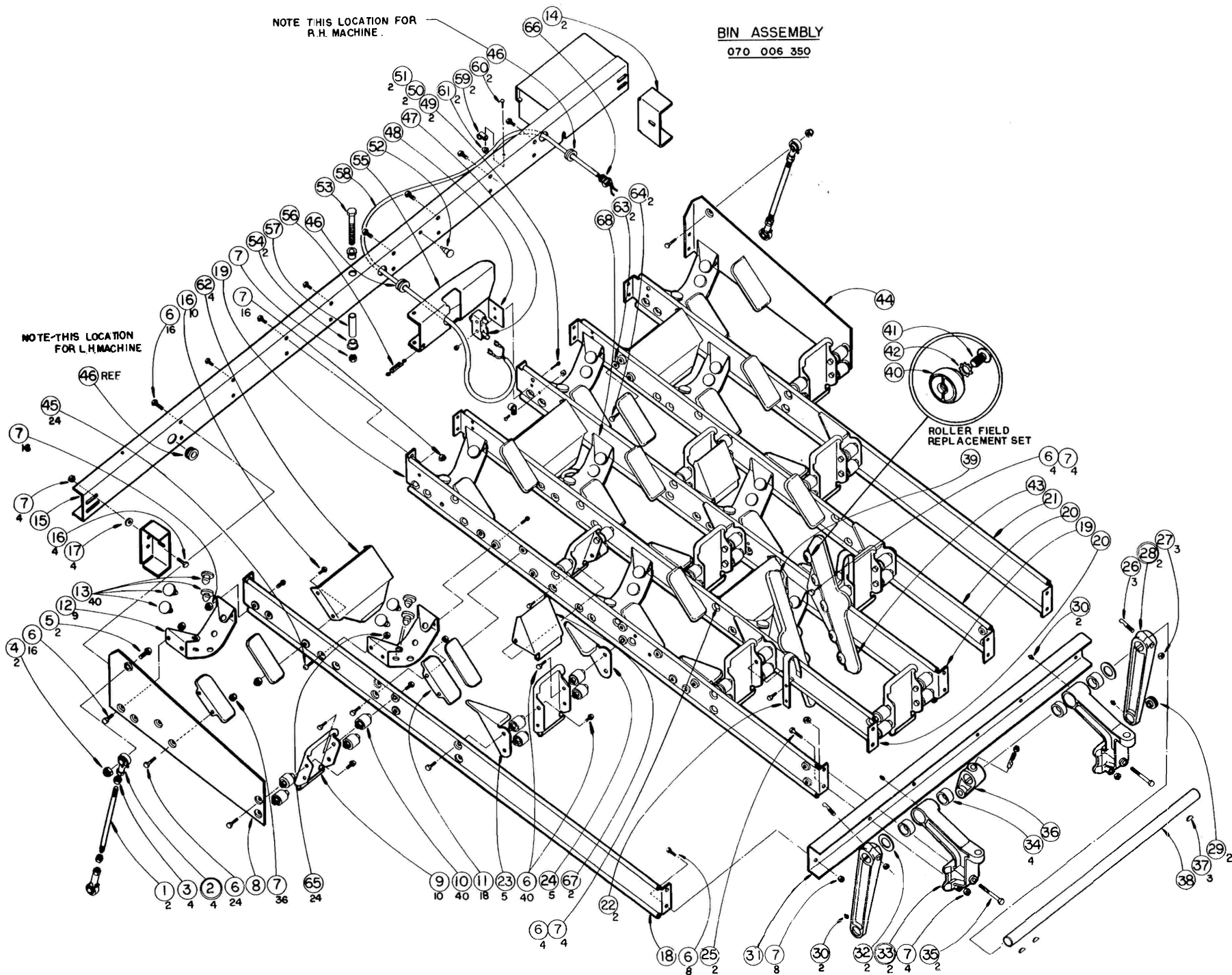
BIN ASSEMBLY

Ref. Drawing 070 006 350

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 006 351	Rod	36	070 006 408	Lever Bin Ass'y.
2	000 026 446	Rod End With 710 502 010 Lub Fitting	37	907 000 600	Hi-Pro Key (HP 706)
3	835 566 002	Hex Jam Nut $\frac{3}{8}$ -24	38	070 006 402	Shaft
4	844 065 002	Hex Lock Nut $\frac{3}{8}$ -16	39	070 006 386	Track Ass'y. L.H.
5	809 865 165	Hex Head Cap Screw $\frac{3}{8}$ -16 x 1	40	000 026 251	Bearing (Roller) (Threaded for field use only)
6	809 849 085	Hex Head Cap Screw $\frac{1}{4}$ -20 x $\frac{1}{2}$	41	813 540 082	Screw Phillips Truss Head 10-32 x $\frac{1}{2}$
7	844 049 002	Hex Loc Nut Stover $\frac{1}{4}$ -20	42	957 100 002	Washer Shake Proof Ext. #10
8	070 006 370	Pin Guide L.H.	43	070 006 388	Track Ass'y. R.H.
9	070 006 364	Spacer-Pin Butt Guide	44	070 006 369	Pin Guide R.H.
10	070 006 354	Shock Mount	45	808 549 080	Button Soc. Head Cap Screw $\frac{1}{4}$ -20 x $\frac{1}{2}$
11	070 006 353	Pin Guide	46	711 516 020	Gromet - Atlantic #2861
12	070 006 359	Pin Head Bracket	47	000 026 043	Switch (BZ - 2RD - D2)
13	000 021 992	Bumper	48	000 021 575	Insulator
14	070 006 371	Bracket Supt.	49	818 227 162	Screw - Sems Round Head 6-32 x 1
15	070 006 361	Channel Weldment	50	843 127 002	Nut Kep 6-32
16	809 849 125	Hex Head Cap Screw $\frac{1}{4}$ -20 x $\frac{3}{4}$	51	948 631 062	Flat Washer $\frac{5}{8}$ O.D. x $\frac{9}{32}$ I.D. x .062 THK.
17	948 753 102	Flat Washer $\frac{5}{8}$ OD x $\frac{9}{32}$ ID x .062 THK.	52	070 006 142	Bumper
18	070 006 377	Stringer Outside L.H. (6)	53	809 849 605	Hex Head Cap Screw $\frac{1}{4}$ -20 x $3\frac{3}{4}$
19	070 006 372	Stringer Center R.H. & L.H. (3 + 5)	54	900 206 091	Flange Bearing
20	070 006 373	Stringer Center L.H. & R.H. (2 + 4)	55	070 006 356	Switch Actuator
21	070 006 376	Stringer Outside R.H. (1)	56	000 022 168	Spring
22	070 006 389	Guide No. 1 Pin	57	070 006 108	Spacer
23	070 006 381	Pin Guide No. 6 Pin	58	070 006 272	Bin Switch Cable
24	070 006 380	Pin Guide No. 4 Pin	59	744 203 014	Nyloclip Brundy HP6N
25	809 849 285	Hex Head Cap Screw $\frac{1}{4}$ -20 x $1\frac{3}{4}$	60	818 233 082	Screw - Sems Round Head 8-32 x $\frac{1}{2}$
26	070 006 403	Stud Clamp	61	843 133 002	Nut-Kep 8-32
27	831 565 002	Hex Nut Std. $\frac{3}{8}$ -16	62	070 006 366	Spacer Pin Head Guide
28	070 006 429	Shuttle Operating Arm Ass'y.	63	070 006 390	Spacer
29	000 029 614	Helm - Unibal.	64	809 849 165	Hex Head Cap Screw $\frac{1}{4}$ -20 x 1
30	710 501 007	Grease Fitting Alemite (1792-B)	65	840 049 002	Nut, FlexLock $\frac{1}{4}$ -20 N.C.
31	070 006 363	Channel Short	66	746 001 016	Connector, Straight (T&B3302)
32	701 329 050	Washer-Thrust Oilite (TT 1503)	67	070 006 365	Spacer Pin Guide (4&6)
33	070 006 358	Bracket Ass'y. - Bin Ass'y.	68	070 006 384	Bracket Wldmt. Pin Head (#5)
34	900 114 101	Bearing - Sleeve			
35	809 849 485	Hex Hed Cap Screw $\frac{1}{4}$ -20 x 3			

NOTE THIS LOCATION FOR
R.H. MACHINE.

BIN ASSEMBLY 070 006 350



COUNTER ASSEMBLY*

ITEM	PART NUMBER	DESCRIPTION
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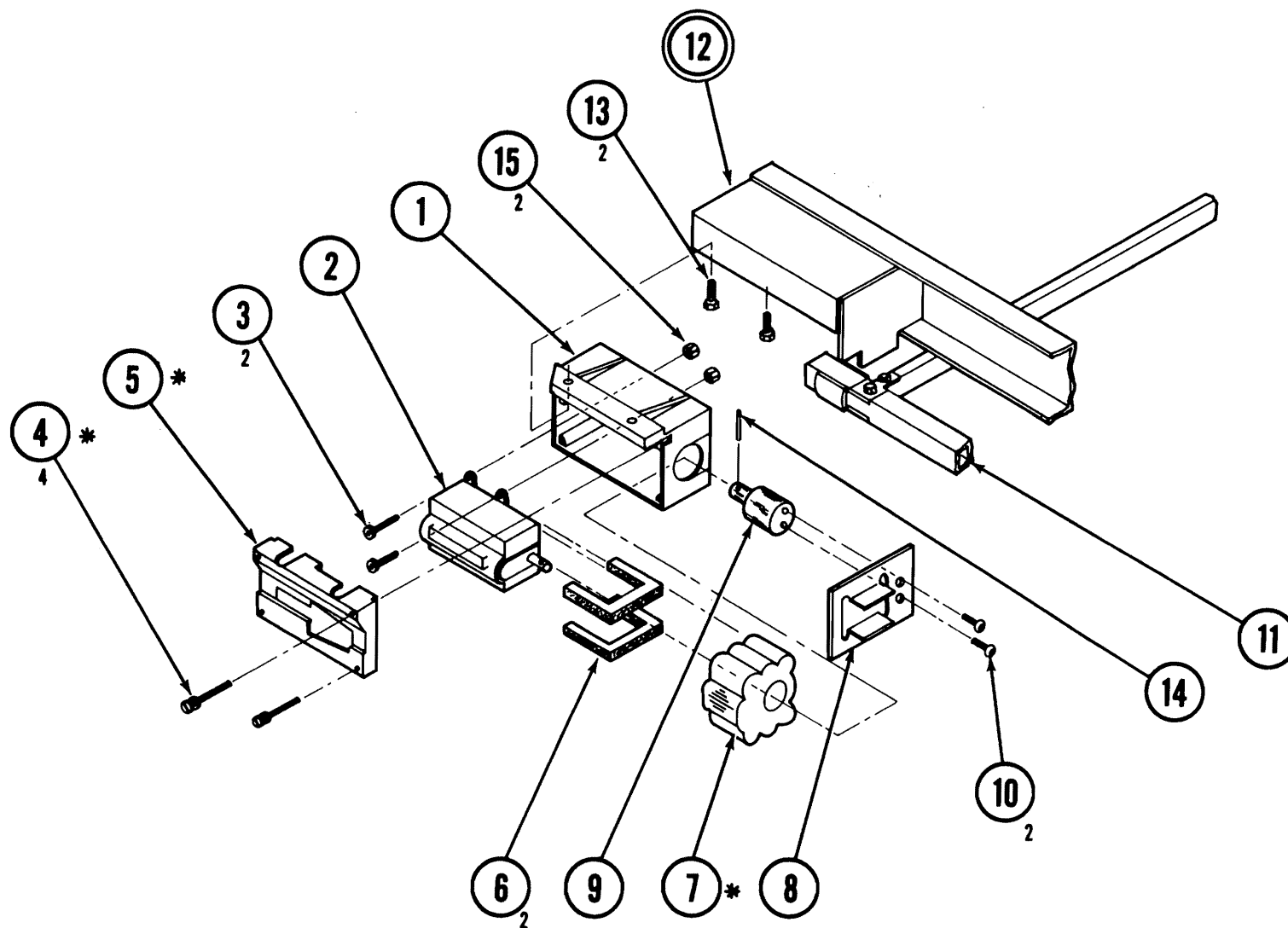
1	000-027-867	Enclosure
2	070-006-437	Counter
3	810-239-160	Soc. Hd. Screw #70-24 x 1 Lg.
4	*	Double Head Screw
5	*	Cover
6	000-021-473	Foam Rubber 1/2 x 1/2
7	*	Glass Cage
8	070-006-435	Lever
9	070-006-436	Hub

ITEM	PART NUMBER	DESCRIPTION
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10	808-549-080	BT. HD. Cap. Screw 1/4-20 x 1/2 Lg.
11	070-006-253	Cross Tube - Long
12	070-006-350	Bin Ass'y.
13	809-849-125	Hex. Hd. Cap Screw 1/4-20 x 3/4 LG.
14	913-423-100	Roll Pin 1/8 x 5/8 Lg.
15	839-539-002	Flex Lock Nut #10-24

*These items are restricted,
Contact AMF SERVICE if parts are needed.

COUNTER ASSEMBLY *



* WARNING – CERTAIN ITEMS ARE RESTRICTED.
CONTACT AMF SERVICEMAN IF REPLACEMENT IS NEEDED.

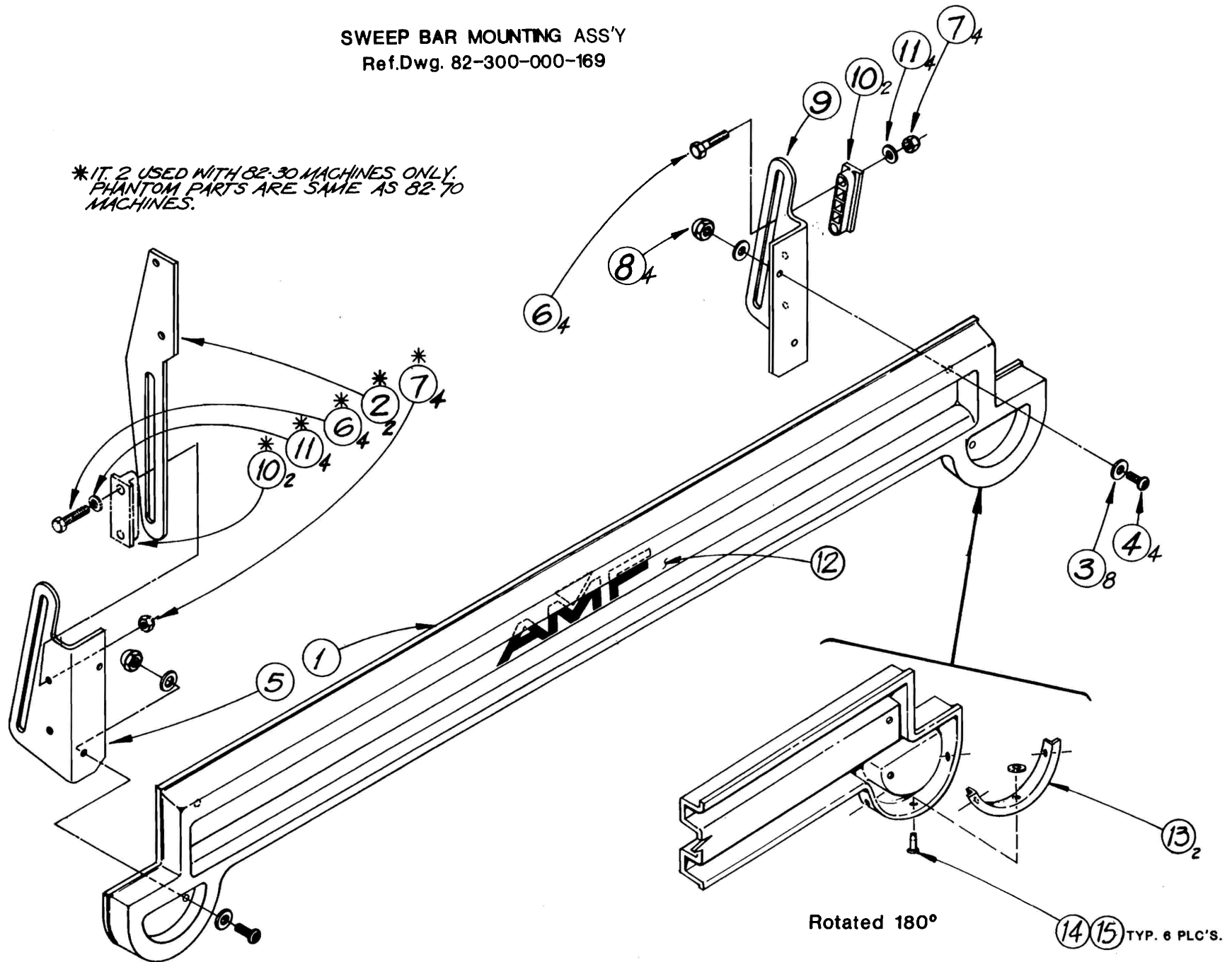
SWEEP BAR MOUNTING ASSEMBLY

Reference Drawing 300 000 169

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	300-000-167	Sweep Bar Ass'y.	9	300-000-170	Bracket - Sweep Mounting, R.H.
2	030-008-361	Hanger - Bracket	10	000-023-182	Slide Bar
3	948-722-111	Washer Flat, Black Oxide, $\frac{1}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK.	11	948-761-112	Washer - Flat $\frac{1}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK.
4	808-557-140	Screw, Soc. Butt. Hd. $\frac{5}{16}$ -18 x $\frac{7}{8}$	12	300-000-166	Insert Sweep "Logo"
5	300-000-171	Bracket - Sweep Mounting, L.H.	13	300-000-175	Cap - Sweep Bar
6	809-857-245	Screw - Hex Hd. Cap $\frac{5}{16}$ -18 x $1\frac{1}{2}$ (GR-8)	14	938-637-100	Rivet - Pop $\frac{3}{16}$ Dia. Aluminum
7	844-057-002	Nut Stover Lock $\frac{5}{16}$ -18	15	749-537-068	Washer - Backup- $\frac{3}{16}$ Pop Rivet
8	830-057-002	Nut - Acorn $\frac{5}{16}$ -18 (Plated)			

SWEEP BAR MOUNTING ASS'Y
 Ref.Dwg. 82-300-000-169

**IT. 2 USED WITH 82-30 MACHINES ONLY.
 PHANTOM PARTS ARE SAME AS 82-70
 MACHINES.*



SWEEP BAR ASSEMBLY

070-003-240

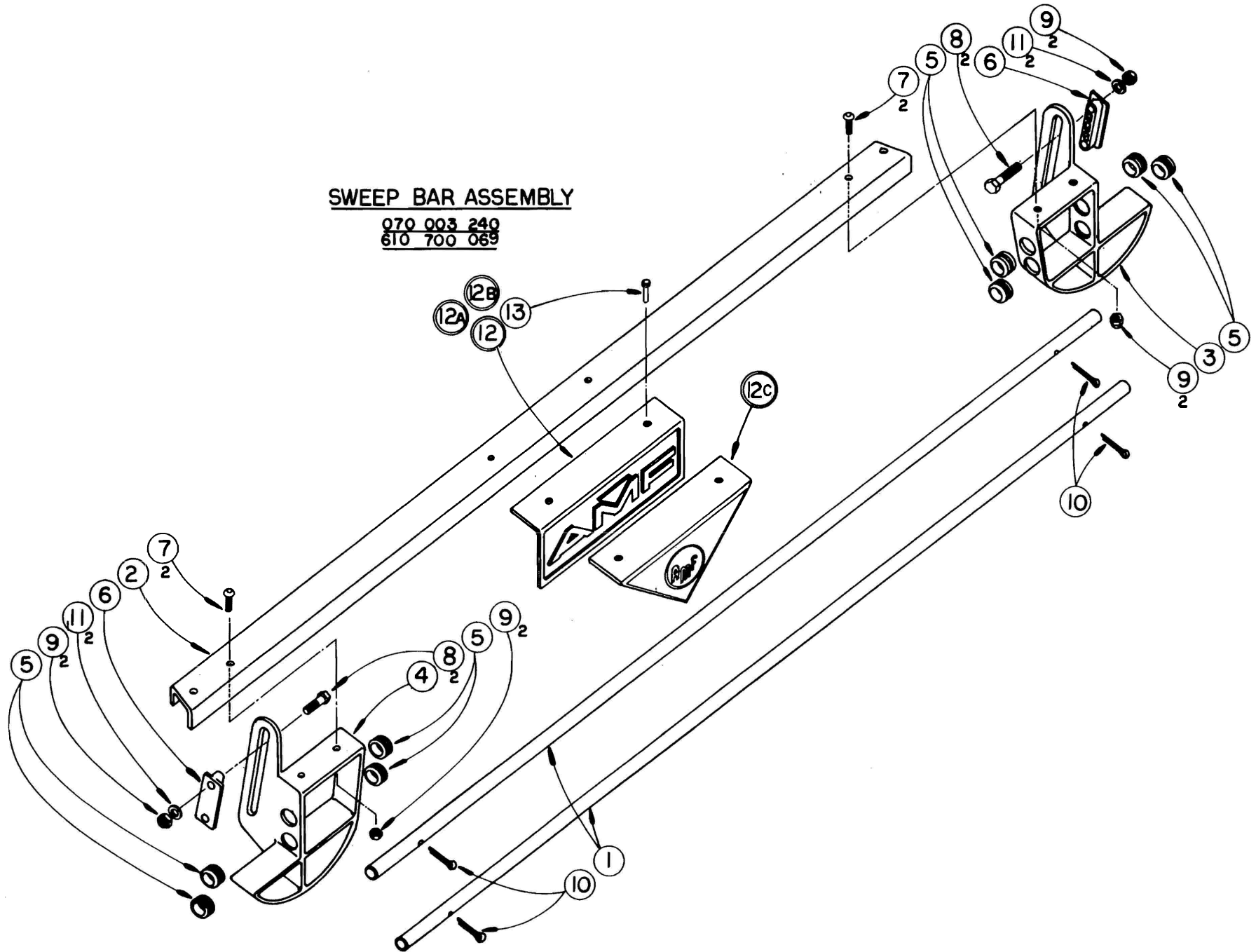
610-700-069 (One Only) Sweep Bar Assy*

610-700-059 (Pair) Sweep Bar Assy*

ITEM PART NUMBER DESCRIPTION			OPTIONAL EQUIPMENT		
1	070-003-180	Tube	ITEM	PART NUMBER	DESCRIPTION
2	070-003-192	Channel Bar — Order 610-700-099 Channel Sweep*	12	610-700-101	Sweep Ornament Kit- '71 Trademark Astro Blue
3	070-003-226	Shield R.H. — Order 610-700-079 Shield R.H.*	12a	610-700-102	Sweep Ornament Kit- '71 Trademark Red
4	070-003-227	Shield L.H. — Order 610-700-089 Shield L.H.*	12b	610-700-103	Sweep Ornament Kit- '71 Trademark Ash
5	070-003-236	Grommet	12c	610-700-130	Sweep Ornament Kit- '59 Trademark
6	000-023-182	Slide Bar	13	938-000-000	Southco Drive Rivet (38-208-20-13) (Included in kits listed above.)
7	808-557-160	Screw, Soc. But. Hd. $\frac{5}{16}$ -18 x 1	*Specify Color		
8	809-857-245	Screw, Hex Hd. Cap, $\frac{5}{16}$ -18 x 1½			
9	844-057-002	Lock Nut Stover, $\frac{5}{16}$ -18			
10	911-023-202	Cotter Pin, $\frac{1}{8}$ Dia. x 1¼			
11	948-761-112	Flat Washer, $\frac{1}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK.			

SWEEP BAR ASSEMBLY

Q70 003 240
610 700 069



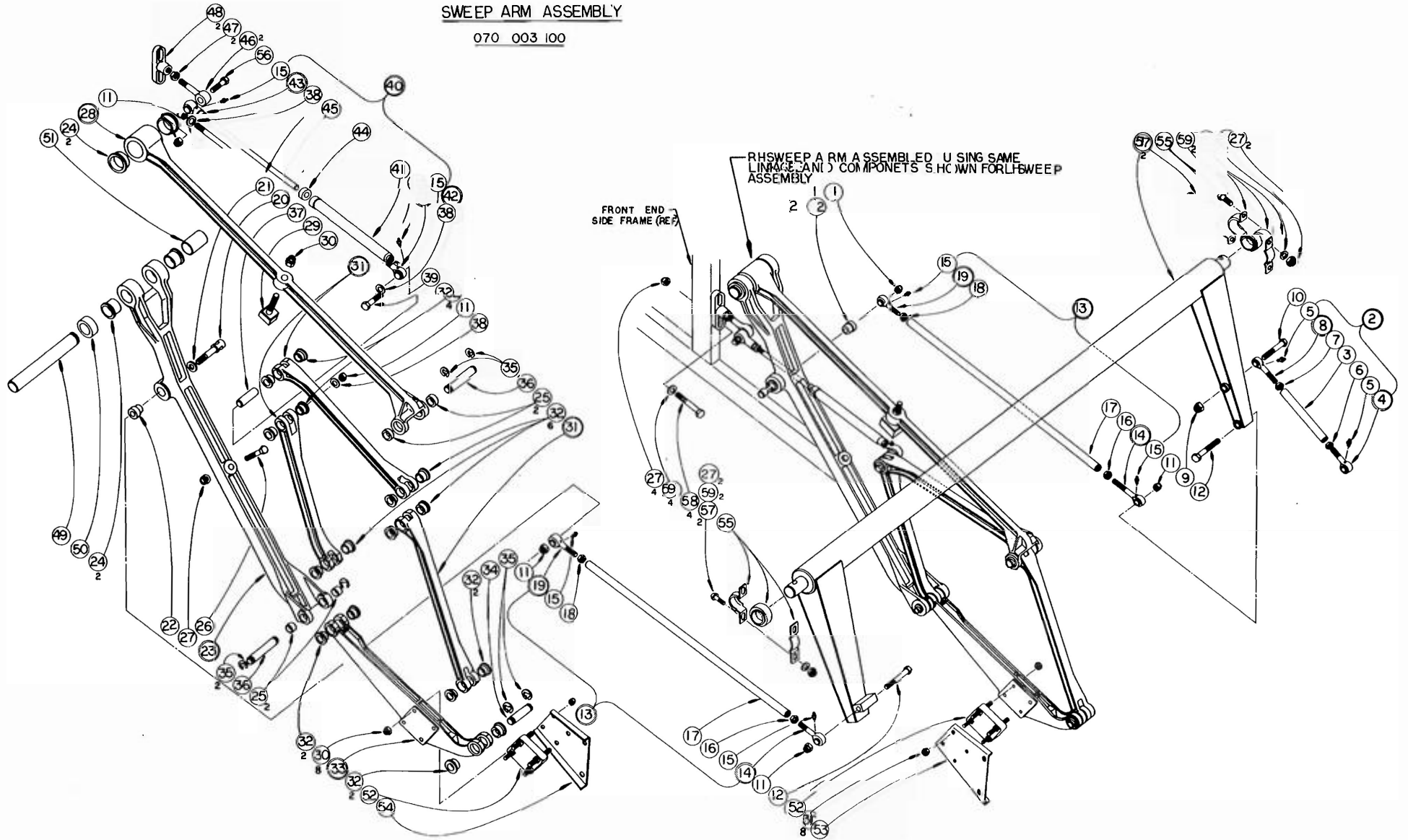
SWEEP ASSEMBLY

070-003-100

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-003-132	Sweep Rocker Arm Assembly	32	000-023-114	Bushing Flanged
2	070-003-162	Motor Connecting Rod Assembly	33	070-003-184	Support Link Assy (With Bushings)
3	070-003-159	Tube	34	070-003-189	Pin-Bearing
4	000-023-160	End Fitting R.H. (With Grease Fitting)	35	919-010-700	Retainer "E" Ring (5133-62)
5	710-502-011	Grease Fitting	36	070-003-103	Pin-Bearing
6	835-574-002	Nut, Hex Jam $\frac{1}{2}$ -20 R.H. Thread	37	070-003-173	Sleeve Bearing
7	835-674-002	Nut, Hex Jam $\frac{1}{2}$ -20 L.H. Thread	38	949-100-002	Washer Flat $\frac{59}{64}$ O.D. x $\frac{15}{32}$ I.D. x .062 THK,
8	000-023-161	End Fitting L.H. (With Grease Fitting)	39	070-003-235	Screw-Bearing
9	844-073-002	Nut Stover Lock $\frac{1}{2}$ -13	40	070-007-280	Telescoping Link Assembly
10	070-003-245	Screw	40a	070-003-230	Sweep Shock Absorber Ass'y. (Replace with item 40)
11	844-069-002	Nut, Stover Lock $\frac{7}{16}$ -14	41	070-007-278	Tube Weldment
12	809-869-365	Screw-Hex Hd. Cap $\frac{7}{16}$ -14 x $2\frac{1}{4}$	42	070-007-281	Rod End Male (With Grease Fitting)
13	070-003-115	Drive Link Connecting Rod Assembly	43	070-007-282	Rod End Female (With Grease Fitting)
14	000-025-004	End Fitting R.H. (With Grease Fitting)	44	070-007-283	Bumper
15	710-501-013	Grease Fitting	45	070-007-276	Rod
16	835-570-002	Nut - Hex Jam $\frac{7}{16}$ -20 R.H. Thread	46	070-003-223	Link - Threaded
17	070-003-116	Tube	47	835-582-002	Nut, Hex Jam $\frac{5}{8}$ -18
18	835-670-002	Nut - Hex Jam $\frac{7}{16}$ -20 L.H. Thread	48	070-003-222	Bracket Shock Mount
19	000-025-005	End Fitting L.H. (With Grease Fitting)	49	070-003-106	Shaft Main Pivot
20	070-003-231	Pin Bearing	50	070-003-233	Spacer-Main Pivot Short
21	070-003-117	Spacer	51	070-003-232	Spacer-Main Pivot-Long
22	070-003-234	Bushing Flanged	52	070-003-195	Shock Mount
23	070-003-158	Drive Link Assembly (With Bearings)	53	070-003-190	Shock Bracket R.H.
24	000-023-104	Flanged Bushing	54	070-003-191	Shock Bracket L.H.
25	000-023-105	Sleeve Bushing	55	000-022-811	Pillow Block
26	070-003-221	Screw	56	809-869-405	Screw, Hex Hd. Cap $\frac{7}{16}$ -14 x $2\frac{1}{2}$
27	839-665-002	Nut, FlexLoc $\frac{3}{16}$ -16	57	809-865-285	Screw, Hex Hd. Cap ($\frac{3}{16}$ -16 NC x $1\frac{3}{4}$ LG)
28	070-003-238	Stabilizing Link Assembly, (w/Bearings)	58	809-865-565	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 NC x $3\frac{1}{2}$ LG)
29	000-023-216	Bumper	59	948-761-112	Washer, Pl. ($\frac{13}{32}$ I.D. x $\frac{13}{16}$ x $\frac{1}{16}$ THK)
30	844-057-002	Nut, Stover $\frac{5}{16}$ -18	60	000-023-646	Washer (Not Shown)
31	070-003-242	Link Assembly			

SWEEP ARM ASSEMBLY

070 003 100

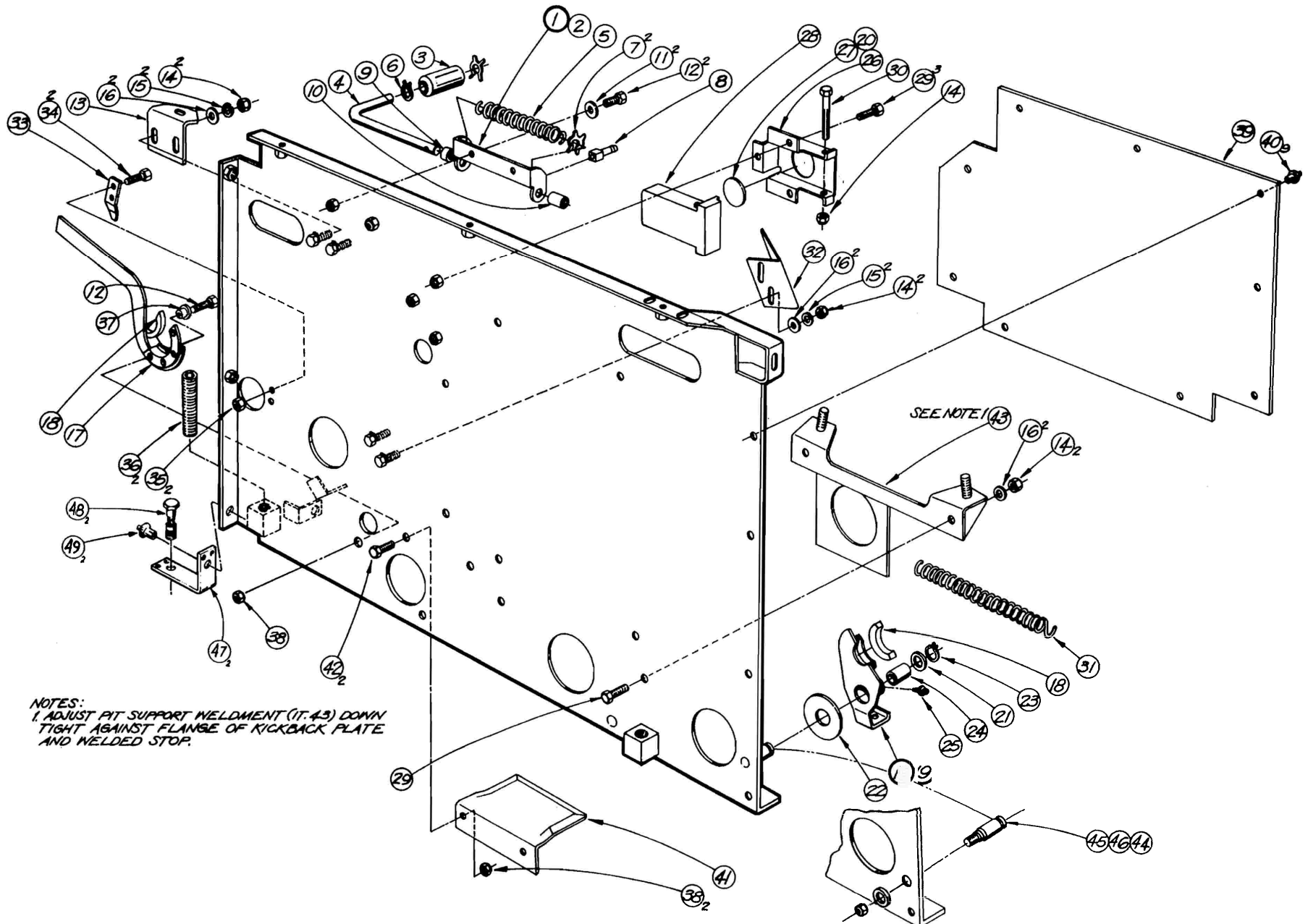


KICKBACK ASS'Y. - SIDE OPP. BALL EXIT

Ref. Drwgs. 070 002 020 L.H. Side/R.H. Mach. (Shown)
070 002 240 R.H. Side/L.H. Mach.

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	000 024 508	Pin Ejector Ass'y. R.H.	23	919 005 800	Truarc Ret. Ring
1a	000 024 507	Pin Ejector Ass'y. L.H. (Not Shown)	24	900 112 203	Plain Sleeve Brg.
2	000 024 511	Bracket Ass'y. R.H.	25	710 501 009	Alemite Fitting - #3006-1
2a	000 024 510	Bracket Ass'y. L.H. (Not Shown)	26	000 022 788	Support Box
3	000 025 803	Roller	27	000 022 300	Shield
4	000 025 804	Shaft	28	000 022 795	Block- L.H.
5	000 024 513	Spring-R.H.	28a	000 022 794	Block - R.H. (Not Shown)
5a	000 024 512	Spring-L.H. (Not Shown)	29	809 865 165	Hx. Hd. Cap Scr. $\frac{3}{8}$ -16 x 1
6	919 005 400	TruArc Retaining Ring	30	809 865 645	Hx. Hd. Cap Scr. $\frac{3}{8}$ -16 x 4-Gr. 8
7	963 600 002	"X" Washer	31	000 021 204	Spring
8	000 029 317	Pin Stop	32	000 023 431	Clip - Bottom - R.H.
9	000 024 515	Bushing - Long	32a	000 023 432	Clip - Bottom - L.H. (Not Shown)
10	000 024 516	Bushing - Short	33	000 023 468	Bracket
11	000 028 334	Washer	34	809 849 125	Hx. Hd. Cap Scr $\frac{1}{4}$ -20 x $\frac{3}{4}$ - Gr. 8
12	809 857 165	Scr. - Hx. Hd. Cap - $\frac{5}{16}$ -18 x 1	35	844 049 002	Stover Locknut - $\frac{1}{4}$ -20
13	000 023 821	Clip Weld.	36	000 024 890	Set Screw
14	839 665 002	Nut - Flexloc - $\frac{3}{8}$ -16	37	000 023 467	Bushing
15	951 164 002	LockWasher	38	844 057 002	Locknut - $\frac{5}{16}$ -18
16	948 767 132	Plain Washer	39	070 002 027	Panel
17	000 023 464	Support Weld. - R.H. Rear Roller	40	937 000 000	Steel Drive Rivet
17a	000 023 465	Support Weld. - L.H. Rear Roller (Not Shown)	41	000 022 878	Angle
18	000 022 924	Support Bearing	42	809 857 125	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x $\frac{3}{4}$
19	000 027 645	Bearing Ass'y. Brk't. L.H. For R.H. Mach.	43	070 007 373	Pit Support Weld.-L.H. For R.H. Mach.
19a	000 027 646	Bearing Ass'y. Brk't. R.H. For L.H. Mach.	43a	070 007 375	Pit Support Weld.-R.H. For L.H. Mach. (Not Shown)
20	008 100 413	Loctite Adhesive #404	44	844 074 002	Stover Lock Nut
21	000 027 642	Washer-Front Roller	45	941 072 200	Flat Washer $\frac{1}{2}$ x $1\frac{1}{4}$ x .083
22	000 027 641	Thrust Brg.	46	000 029 015	Pivot Stud
			47	000 026 464	Kickback Pit Bracket
			48	709 007 037	Taper Bolt
			49	937 738 003	Steel Rivet

KICKBACK ASSY.
REF. DWGS.: 070-002-020 L.H. SIDE/R.H. MACH. (SHOWN)
070-002-240 R.H. SIDE/L.H. MACH.



NOTES:
1. ADJUST PIT SUPPORT WELDMENT (IT. 43) DOWN
TIGHT AGAINST FLANGE OF KICKBACK PLATE
AND WELDED STOP.

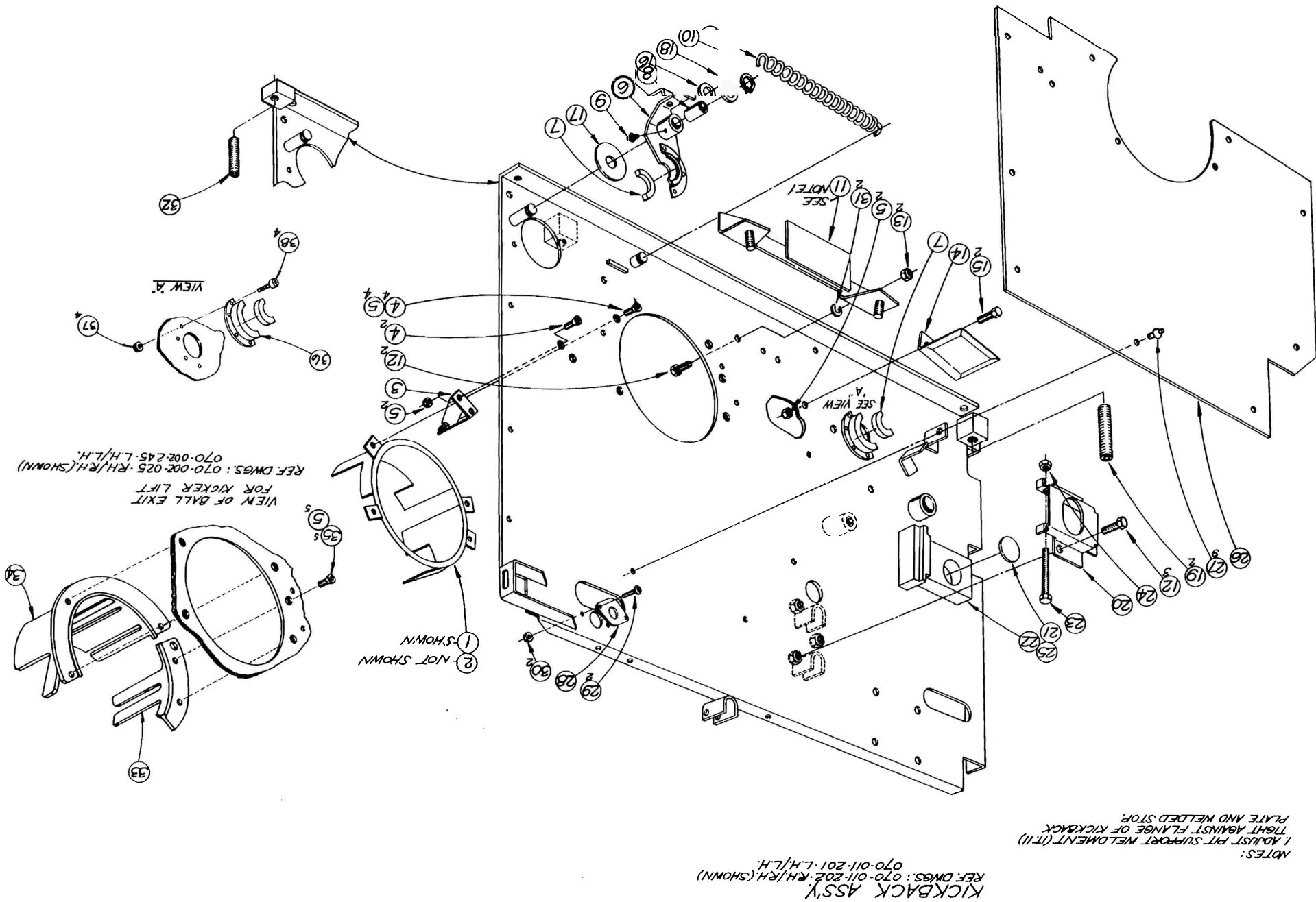
SEE NOTE 1 (43)

FIELD INSTALLATION ONLY

Rev 5-83

KICKBACK ASS'Y.**Ref. Dwgs. 070-011-202 R.H. - Shown****070-011 201 L.H.**

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 011 006	Door Weldment - R.H.	21	000 022 300	Shield
2	070 011 005	Door Weldment - L.H. (Not Shown)	22	000 022 794	Block - R.H.
3	000 024 668	Track Supp't. Brk't. Weldment	22a	000 022 795	Block - L.H. (Not Shown)
4	808 857 120	Fl. Hd. Soc. Scr. - $\frac{5}{16}$ -18 x $\frac{3}{4}$	23	809 865 645	Hx. Hd. Cap Scr. - $\frac{3}{8}$ -16 x 4-Gr. 8
5	844 057 002	Stover Locknut- $\frac{5}{16}$ -18	24	840 065 002	Nut-Flexloc- $\frac{3}{16}$ -16
6	000 029 672	Bearing Ass'y. Bracket - R.H.	25	008 100 413	Locktite Adhesive #404
6a	000 022 249	Bearing Ass'y. Bracket - L.H. (Not Shown)	26	000 029 640	Panel
7	000 022 924	Support	27	937 000 000	Steel Drive Rivet - Southco
8	900 112 203	Plain Sleeve Bearing	28	070 011 286	Bushing-Curtain Rod
9	710 501 009	Fitting - Alemite #3006-1	29	808 549 160	Soc. But. Hd. Scr. - $\frac{1}{4}$ -20 x 1
10	000 021 204	Spring	30	844 049 002	Stover Locknut - $\frac{1}{4}$ -20
11	070 007 372	Pit Support Weldment - R.H./R.H.	31	070 006 639	"C" Washer
11a	070 007 374	Pit Support Weldment - L.H./L.H. (Not Shown)	32	070 007 722	Set Screw - $\frac{1}{4}$ -20 x 3
12	809 865 205	Hx. Hd. Scr. - $\frac{3}{8}$ -16 x $1\frac{1}{4}$	33	000 024 624	Rear Segment R.H. Shown
13	839 665 002	Nut - Flexloc - $\frac{3}{8}$ -16	33a	000 024 623	Rear Segment L.H.
14	000 022 878	Angle	34	000 024 625	Front Segment R.H. Shown
15	809 857 125	Hx. Hd. Scr.- $\frac{5}{16}$ -18 x $\frac{3}{4}$	34a	000 024 626	Front Segment L.H.
16	000 027 642	Washer-Front Roller Supp't.	35	808 857 160	Screw Flt. Soc. Hd. $\frac{5}{16}$ -18 x 1
17	000 027 641	Thrust Bearing	36	000 022 926	Retainer
18	919 005 800	Retaining Ring - 5100-75	37	839 758 002	Nut FlexLock $\frac{5}{16}$ -24
19	000 024 890	Set Screw	38	810 258 100	Screw Soc. Hd. Cap $\frac{5}{16}$ -24 x $\frac{5}{8}$
20	000 022 788	Support Box	39	000 025 207	Lock, Jack Screw (Not Shown)
			40	000 028 362	Bumper

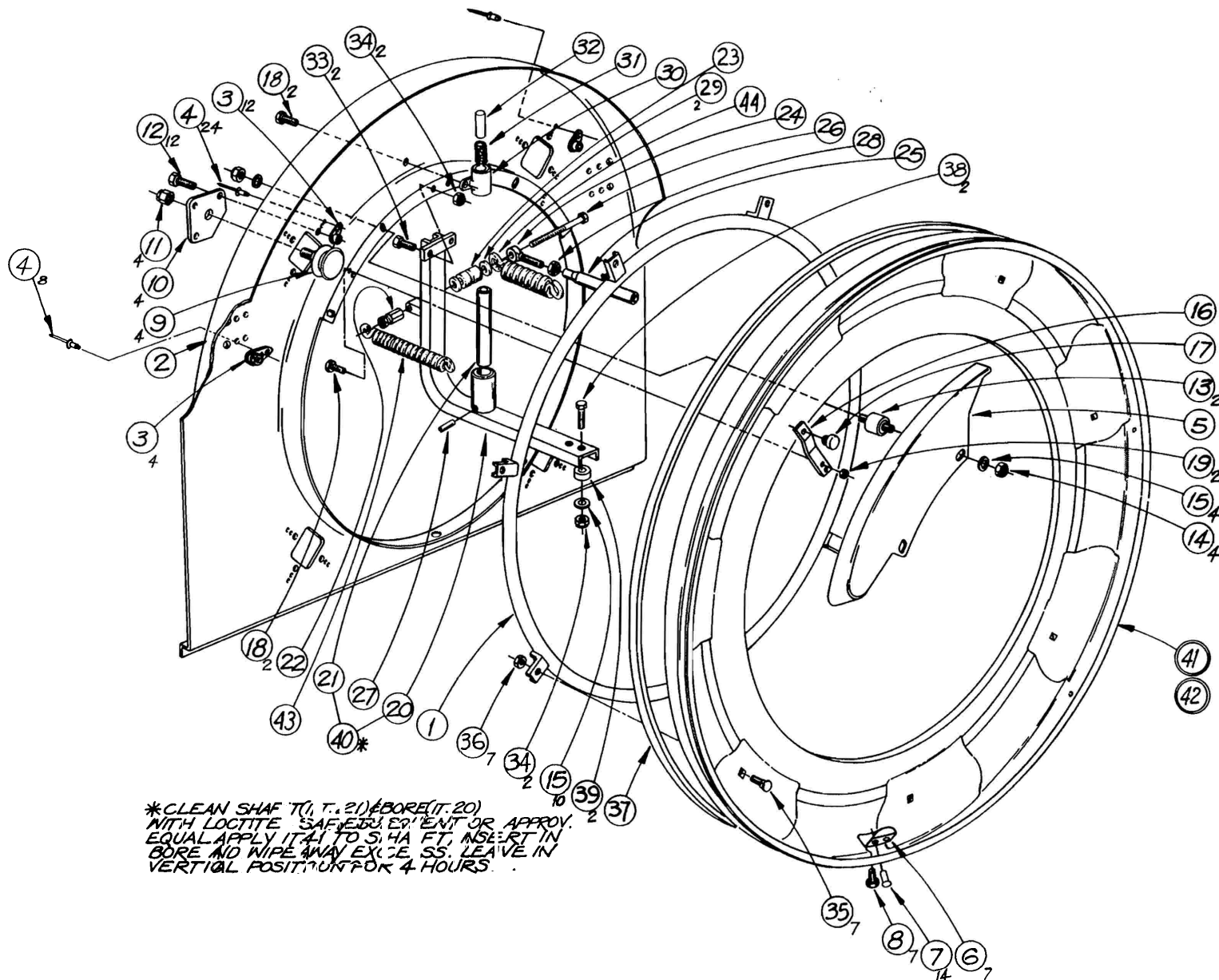


PIN ELEVATOR ASS'Y.

Ref. Dwgs.: 070-006-094-R.H. (Shown)
070-006-194-L.H.

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	000 020 855	Ring Weldment	22	070 006 044	Spring Post Nut
2	070 001 207	Wheel Guard	23	070 006 043	Spacer Clamp
3	830 358 002	Anchor Nut - ESNA - $\frac{5}{16}$ -24	24	070 006 046	Rod End
4	938 523 030	Pop Rivet - SD-43-BS	25	070 006 047	Safety Link Tube
5	070 006 098	Rail - R.H.	26	809 865 725	Hx. Hd. Scr. - $\frac{3}{8}$ -16 x 4 $\frac{1}{2}$ -GR 8
5a	070 006 099	Rail - L.H. (Not Shown)	27	913 437 280	Roll Pin - $\frac{3}{16}$ Dia. x 1 $\frac{3}{4}$ LG.-Steel
6	000 025 331	Pin Holding Bracket - R.H.	28	831 566 002	Nut- $\frac{3}{4}$ -24-SAE 2
6a	000 025 330	Pin Holding Brk't. - L.H. (Not Shown)	29	948 767 132	Plain Washer - $\frac{13}{16}$ x $\frac{13}{32}$ x $\frac{1}{16}$
7	938 537 060	Pop Rivet OMED- $\frac{3}{16}$ Dia.	30	000 029 201	Oiler Body
8	809 858 085	Hex Hd. Cap Scr. - $\frac{5}{16}$ -24 x $\frac{1}{2}$ - GR. 8	31	000 029 202	Spring
9	000 021 211	Roller	32	000 029 203	Wick
10	000 021 210	Plate	33	809 857 165	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x 1
11	844 074 002	Nut - Stover- $\frac{1}{2}$ -20	34	844 057 002	Stover Nut - $\frac{5}{16}$ -18
12	809 858 125	Hx. Hd. Cap Scr. $\frac{5}{16}$ -24 x $\frac{3}{4}$ -GR. 8	35	000 027 014	Bolt - $\frac{1}{4}$ -28 x $\frac{7}{8}$
13	000 029 068	Rubber Mount	36	844 050 002	Nut - Flex Lock $\frac{1}{4}$ -28
14	834 557 002	Hx. Nut-Reg. $\frac{5}{16}$ -18	37	070 002 005	V-Belt
15	948 761 112	Plain Washer - $1\frac{1}{8}$ x $1\frac{1}{32}$ x $\frac{1}{16}$	38	810 257 445	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x 2 $\frac{3}{4}$
16	070 001 415	Bracket	39	070 008 449	Shim
17	000 021 992	Bumper	40	700 107 170	Loctite #601 Adhesive
18	809 849 125	Hx. Hd. Cap Scr. $\frac{1}{4}$ -20 x $\frac{3}{4}$ -GR. 8.	41	070 001 129	Pin Wheel Ass'y. R.H. (Shown)
19	844 049 002	Nut-Stover- $\frac{1}{4}$ -20-GR. C	42	070 002 106	Pin Wheel Ass'y. L.H.
20	070 007 357	Channel Supp't. Weld.	43	000 026 032	Spring, Lateral Drive
21	070 006 045	Distributor Supp't.	44	000 006 030	Spring, Safety Link
			45	070-006-143	Spacer (Not Shown)

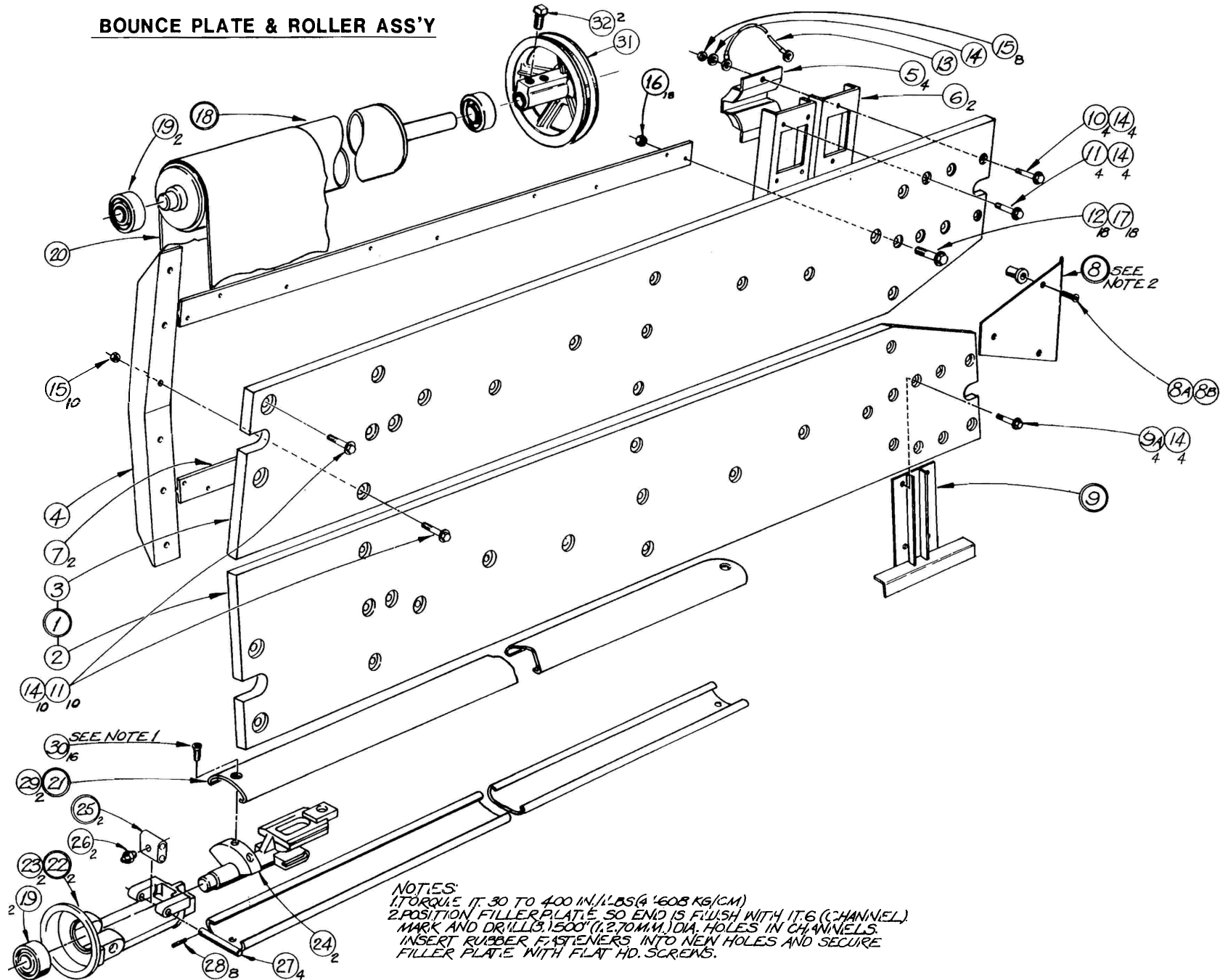
PIN ELEVATOR ASS'Y.
 REF. DWG'S: 070-006-194 R.H. (SHOW V)
 070-006-194 L.H.



BOUNCE PLATE & ROLLER ASSY'S.

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	000 021 420	Bounce Plate Ass'y. - R.H. - Shown	13	000 025 622	Bonding Strap
1a	000 029 656	Bounce Plate Ass'y. L.H. - Not Shown	14	948 753 102	Washer - $\frac{5}{8}$ O.D. x $\frac{9}{32}$ I.D. x $\frac{1}{16}$ THK.
2	000 029 899	Bounce Plate - Front - R.H. - Shown	15	844 049 002	Locknut, Stover - $\frac{1}{4}$ -20-Cr. C Cap Pl.
2a	000 029 925	Bounce Plate - Front - L.H. - Not Shown	16	844 057 002	Locknut, Stover - $\frac{5}{16}$ -18-Gr. C
3	000 029 924	Bounce Plate - Rear - R.H. - Shown	17	948 761 112	Washer - $\frac{1}{16}$ O.D. x $\frac{1}{32}$ I.D. x $\frac{1}{16}$ THK.
3a	000 029 926	Bounce Plate - Rear - L.H. - Not Shown	18	070 002 034	Rear Roller Ass'y.
4	000 029 626	Angle Support	19	000 024 590	Bearing
5	000 021 224	Vibration Dampener	20	000 026 753	Carpet Belt
6	000 021 914	Channel	21	000 024 576	Front Roller Ass'y.
7	000 029 898	Reinforcement Bar (40.5")	22	000 024 592	Hinge Ass'y.
8	070 007 846	Kit, Field-Filler Plate	23	000 024 579	Hinge Roller
8a	808 849 160	Screw, Flat Hd. Soc. Cap. $\frac{1}{4}$ -20 x 1"	24	000 024 580	Shaft - Hinge
8b	070 007 847	Rubber Fastener "Well Nut" #D1420	25	000 024 597	Link Ass'y.
9	610 704 014	Kit-Ball Idling Brk't.	26	710 501 002	Alemite Fitting
9a	809 849 325	Screw Hex Hd. $\frac{1}{4}$ -20 x 2 Gr. 8	27	000 024 582	Roller Pin
10	809 849 205	Hx. Hd. Cap Scr. - $\frac{1}{4}$ -20 x $1\frac{1}{4}$ Gr. 8	28	913 411 100	Esna Roll Pin .078 x $\frac{5}{8}$
11	809 849 165	Hx. Hd. Cap Scr. - $\frac{1}{4}$ -20 x 1" Gr. 8	29	000 024 578	Roller Body
12	809 857 205	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x $1\frac{1}{4}$ -Gr. 8	30	000 025 662	Nyloc Screw
			31	070 002 097	Carpet Pulley
			32	806 265 160	Sq. Hd. Scr. Cup Pt. - $\frac{3}{8}$ -16 x 1

BOUNCE PLATE & ROLLER ASS'Y



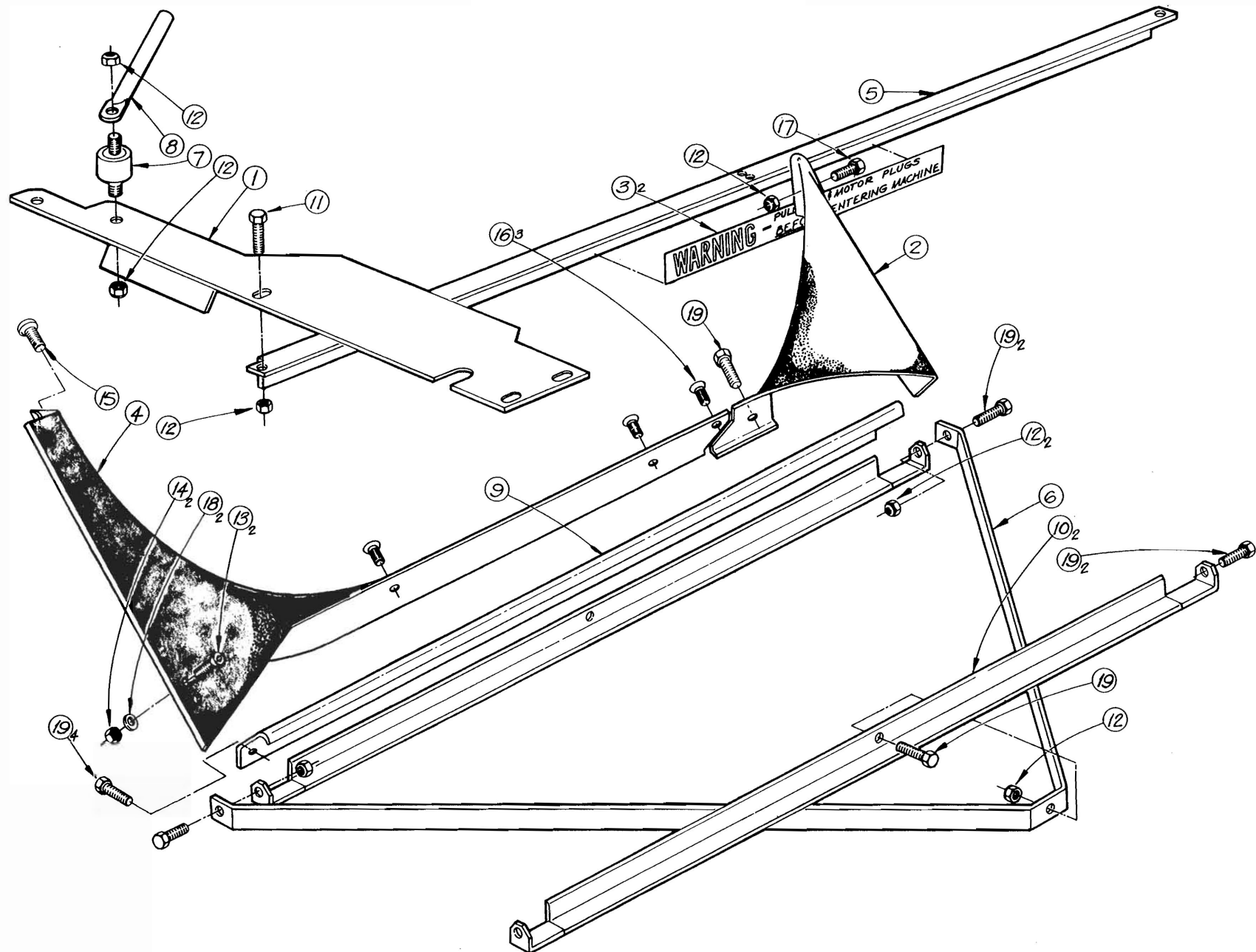
BACK END ASS'Y. PARTS

REF. DWGS. 070-006-100-R.H. MACH.

REF. DWGS. 070-006-200-L.H. MACH.

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 001 357	R.H. Tread Weldment (Shown)	9	000 027 099	R.H. Apron Ass'y. (Shown)
1a	070 002 157	L.H. Tread Weldment (Not Shown)	9a	000 027 100	L.H. Apron Ass'y. (Not Shown)
2	070 001 412	R.H. Plow & Mat Ass'y.- Small (Shown)	10	070 001 184	Strap Weldment
2a	070 002 169	L.H. Plow & Mat Ass'y.- Small (Not Shown)	11	809 857 205	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x 1 $\frac{1}{4}$
3	070 005 614	Warning Decal	12	844 057 002	Stover Locknut - $\frac{5}{16}$ -18
4	000 027 372	R.H. Plow & Mat Ass'y.- Large (Shown)	13	808 849 120	Fl. Hd. Soc. Cap Scr. - $\frac{1}{4}$ -20 x $\frac{3}{4}$
4a	000 027 368	L.H. Plow & Mat Ass'y.- Large (Not Shown)	14	844 049 002	Stover Locknut - $\frac{1}{4}$ -20
5	070 007 359	Bracket Support	15	808 566 160	But. Hd. Soc. Cap Scr. - $\frac{3}{8}$ -24 x 1
6	070 001 185	Brace	16	808 858 120	Fl. Hd. Soc. Cap Scr. - $\frac{5}{16}$ -24 x $\frac{3}{4}$
7	000 029 068	Rubber Shock Mounting	17	809 857 125	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x $\frac{3}{4}$
8	070 001 195	Pin Ejector	18	948 753 102	Washer - $\frac{5}{8}$ O.D. x $\frac{9}{32}$ I.D. x $\frac{1}{16}$ THK.
			19	809 857 165	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x 1

BACK END ASS'Y. PARTS - R.H. SHOWN
 REF. DWGS.: 070-006-100 - R.H. MACH.
 070-006-200 - L.H. MACH.



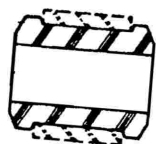
CUSHION, SHOCK ABSORBER & CURTAIN Support Assemblies

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 002 060	Cushion Ass'y. - R.H. (Shown)	21	808 865 400	Fl. Hd. Soc. Scr. - $\frac{3}{8}$ -16 x 2 $\frac{1}{2}$
1a	070 002 260	Cushion Ass'y. - L.H. (Not Shown)	22	809 857 125	Hx. Hd. Cap Scr. - $\frac{5}{16}$ -18 x $\frac{3}{4}$
2	070 002 050	Hanger Wcld. - R.H. (Shown)	23	844 057 002	Stover LockNut - $\frac{5}{16}$ -18
2a	070 002 252	Hanger Wcld. - L.H. (Not Shown)	24	000 022 824	Shock Absorber Ass'y.
3	070 011 288	Curtain Rod	25	000 022 823	Shock Absorber
4	000 024 534	Ear	26	000 022 288	Spring
5	070 001 432	Pad	27	000 022 286	Collar
6	000 028 519	Rivct	28	810 250 200	Soc. Hd. Cap. Scr. - $\frac{1}{4}$ -28 x 1
7	000 024 801	Washer	29	951 148 002	LockWasher - $\frac{1}{4}$ SAE
8	000 024 796	Plank - R.H. (Shown)	30	000 022 287	Washer - Spring Scat
8a	000 024 795	Plank - L.H. (Not Shown)	31	070 007 360	Support Brk't. Weld.
9	000 022 770	Pad - Sponge Rubber	32	070 001 396	Curtain Latch Pin
10	000 024 807	Rubber Cushion - R.H. (Shown)	33	070 001 389	Curtain Latch Spring
10a	000 024 808	Rubber Cushion - L.H. (Not Shown)	34	913 431 160	ESNA Roll Pin $\frac{5}{32}$ x 1
11	070 006 761	Cushion Cover	35	070 004 738	Guard
12	000 026 445	Pin Curtain	36	809 849 125	Hx. Hd. Cap Scr. - GR.8 $\frac{1}{4}$ -20 x $\frac{3}{4}$
13	070 005 610	Link	37	844 049 002	Stover LockNut - $\frac{1}{4}$ -20 GR. C
14	070 001 422	U-Bolt	38	809 857 205	Hx. Hd. Cap Scr. - GR.8 $\frac{5}{16}$ -18 x 1 $\frac{1}{4}$
15	070 001 421	Strap	39	963 600 002	"X" Washer
16	945 091 242	Washcr - 1 $\frac{1}{2}$ O.D. x 1 I.D. x .046 THK.	40	948 975 172	Plain Washer
17	913 437 240	ESNA Roll Pin - .187 x 1 $\frac{1}{2}$ " LG.	41	000 022 821	Pin
18	808 865 320	Fl. Hd. Soc. Scr. $\frac{3}{8}$ -16 x 2	42	000 022 822	Sleeve
19	951 164 002	Lockwashcr	43	809 857 165	Hex. Hd. Cap Scr. GR.8 $\frac{5}{16}$ -18 x 1
20	839 665 002	FlexLoc Nut - $\frac{3}{8}$ -16	44	721 502 005	Bushing, Rubber (Old Style)
			45	721 502 022	Bushing, Rubber (New Style)

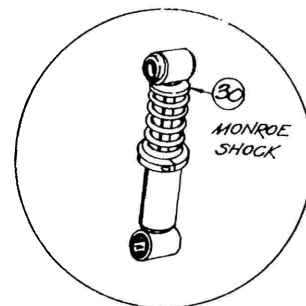
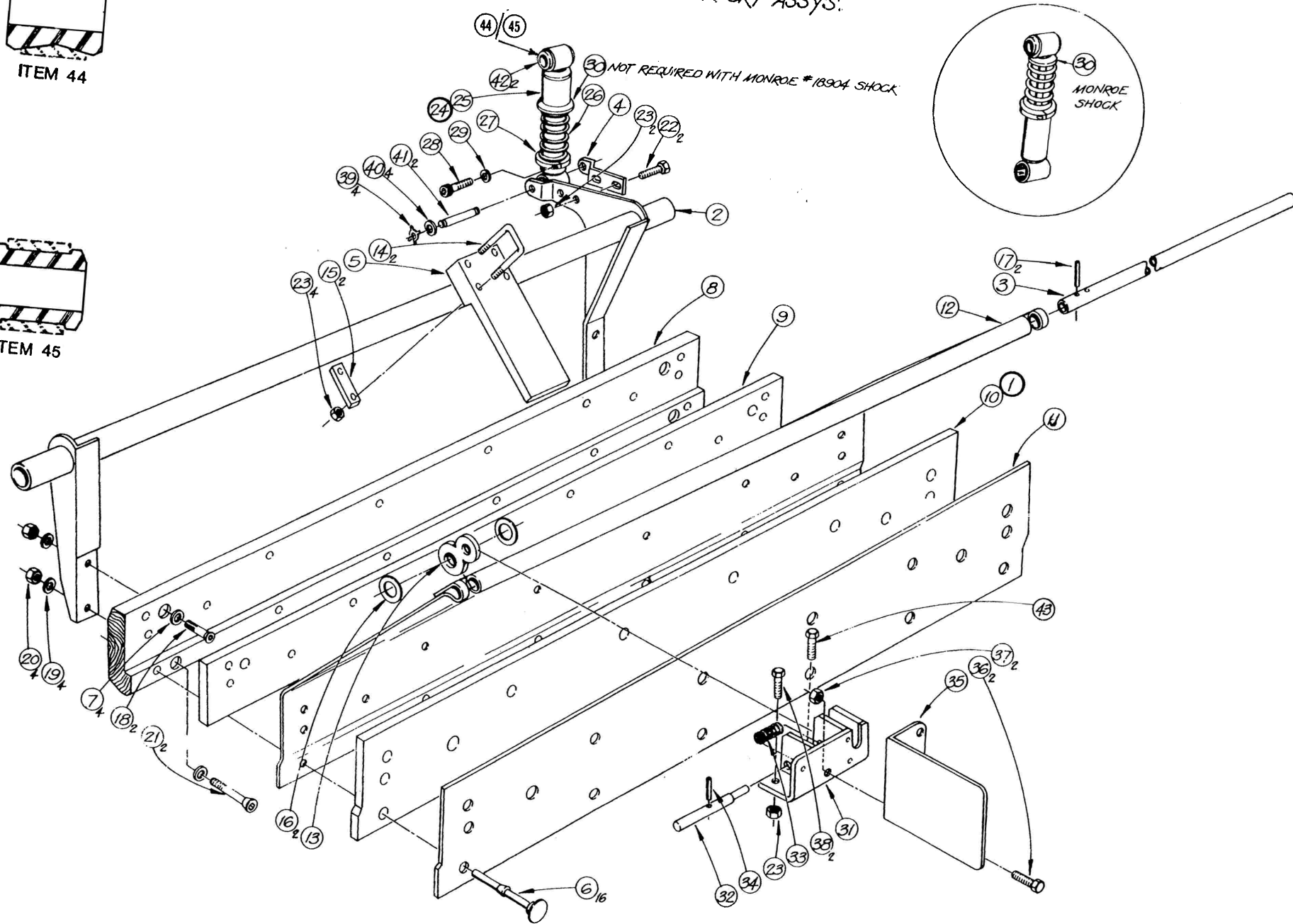
CUSHION, SHOCK ABSORBER & CURTAIN SUPPORT ASSY'S.



ITEM 44



ITEM 45



MONROE SHOCK

MOTOR BRK'T. ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION
1	070-002-084	Motor Mount Brk't. Weld. - R.H. Front
1a	070-002-214	Motor Mount Brk't. Weld. - L.H. Front (Not Shown)
2	070-002-074	Motor Mount Brk't. Weld. - R.H. Rear
2a	070-002-212	Motor Mount Brk't. Weld. - L.H. Rear (Not Shown)
3	000-029-624	Shock Mount Bracket
4	000-026-043	Micro Switch
5	000-022-296	Insulator
6	000-022-828	Switch Bracket
7	000-023-621	SW. Lever Ass'y.
8	000-023-625	SW. Lever Bumper
9	000-021-431	Spring
10	000-022-821	Pin
11	963-600-002	"X" Washer - 9000-16
*12	000-028-036	Shim
13	000-021-992	Bumpe
14	724-501-072	Tinnerman Clip - #C-45065-017-4
15	070-011-250	SW. Protection Bracket
16	809-849-125	Hx. Hd. Cap Scr. - 1/4-20 x 3/4
17	844-049-002	Stover Nut - 1/4-20
18	818-227-202	Rd. Hd. Sems Scr. - #6-32 x 1 1/4
19	839-527-002	FlexLoc Nut - #21FA-632
20	070-002-004	Belt Tightener Arm Ass'y. - R.H.
20a	070-002-216	Belt Tightener Arm Ass'y. - L.H. (Not Shown)
21	070-002-007	Belt Tightener Pulley Ass'y.
22	070-002-094	Pulley
23	900-208-161	Flanged Bearing
24	900-108-141	Sleeve Bearing
25	913-437-160	Roll Pin - .187 x 1
26	070-002-012	Pivot Shaft
27	807-357-080	Soc. Set Scr. Kn. Cup Pt. - 5/16-18 x 1/2
28	070-002-010	Drip Pan
29	000-023-758	Gasket
30	000-022-172	Back End Drive Sheave
31	000-023-673	Pin Elevator Sheave
32	807-358-060	Soc. Set Scr. Kn. Cp. Pt. 5/16-24 x 3/8
33	809-857-205	Hx. Hd. Cap Scr. - 5/16-18 x 1 1/4
34	844-057-002	Stover Nut - 5/16-18
35	809-857-125	Hx. Hd. Cap Scr. - 5/16-18 x 3/4
**36	070-001-284	Housing & Receptacle Ass'y.
37	000-025-590	Receptacle Housing
38	000-025-906	Male Receptacle
39	823-126-062	Rd. Hd. Type A Scr. - #6 x 3/8
40	760-015-038	Fl. Spade Terminal - #41473 (Not Shown)
41	010-101-300	#16 Ga. - 600V Wire - Black (Not Shown)
42	010-101-309	#16 Ga. - 600V Wire - White (Not Shown)
50	000-029-601	Spring (Not Shown)

NEW BACKEND MOTOR & RECEPTACLE ASSEMBLIES

43	610-704-043	R.H. Westinghouse 60 Hz.
43a	610-704-042	L.H. Westinghouse 60 Hz.
44	070-007-693	R.H. National 60 Hz.
44a	070-007-694	L.H. National 60 Hz.

***MOTOR EXCHANGE PROGRAM (DOMESTIC)

BACKEND MOTOR & RECEPTACLE ASSEMBLY

Customer Returns
Used Motor #

AMF Ships To Customer
Rebuilt Motor#
(90 Day Warranty)

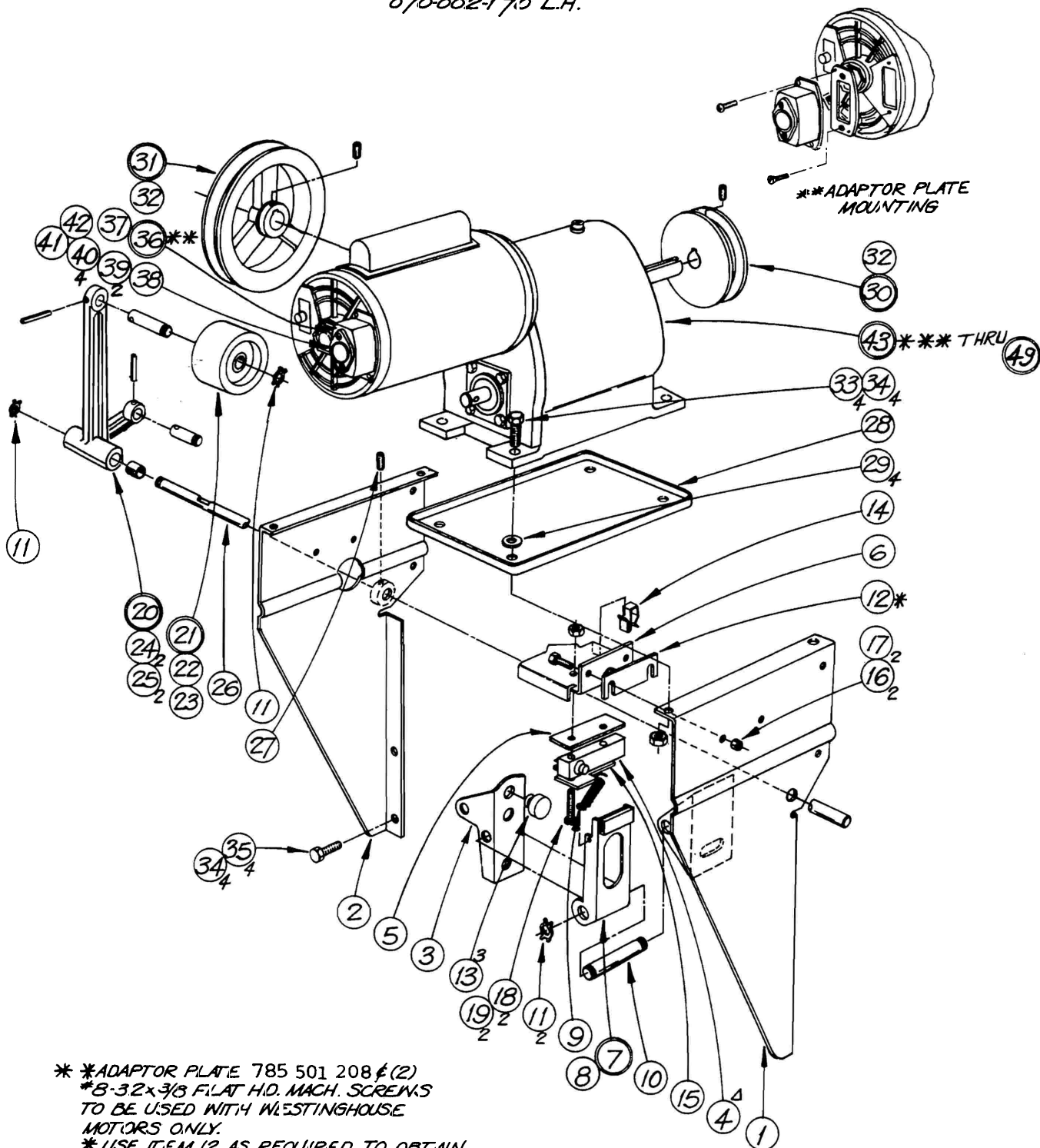
ITEM	PART NUMBER	DESCRIPTION	
45	630-704-043	R.H. Westinghouse 60 Hz.	620-704-043
45a	630-704-042	L.H. Westinghouse 60 Hz.	620-704-042
46	530-706-208	R.H. General Electric 60 Hz.	520-706-208
46a	530-706-207	L.H. General Electric 60 Hz.	520-706-207
47	530-707-693	R.H. National 60 Hz.	520-707-693
47a	530-707-694	L.H. National 60 Hz.	520-707-694

INTERNATIONAL DIVISION MOTORS (NEW)

48	070-004-036	R.H. Westinghouse 115/230V-50 Hz.
48a	070-004-037	L.H. Westinghouse 115/230V-50 Hz.
49	070-007-691	R.H. National 115V-50 Hz.
49a	070-007-692	L.H. National 115V-50 Hz.

***International Division Customers Contact Your Area A.M.F. Inc.
Service Depot For Part Numbers And Details Of Exchange Program.***

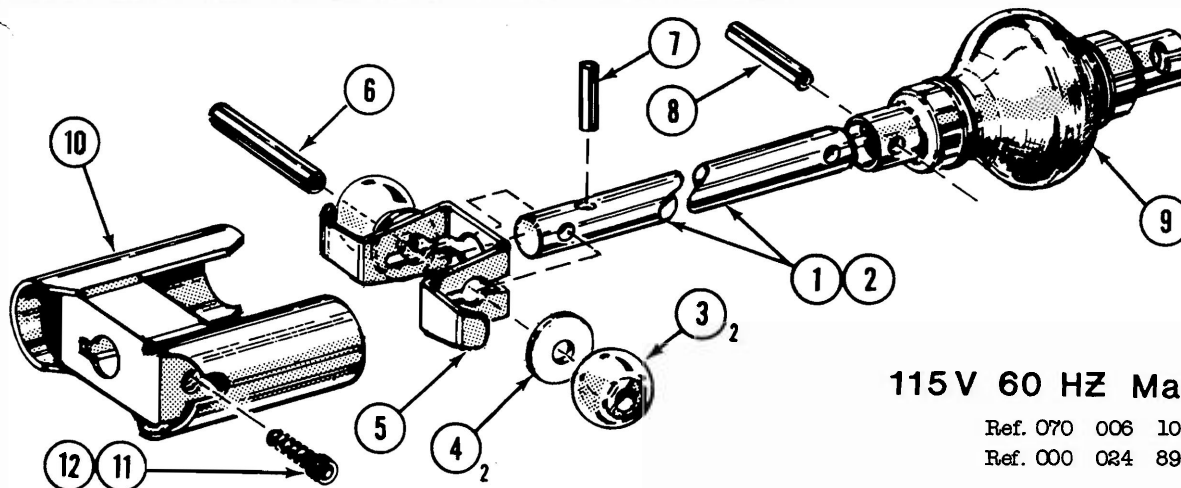
MOTOR MOUNT BRKT. ASSY.- BACK END ASS'Y.
 REF. DWGS: 070-001-414 RH (SHOW IN)
 070-002-170 LH.



- * *ADAPTOR PLATE 785 501 208 ϕ (2)
- * 8-32 $\times$ 3/8 FLAT HD. MACH. SCREWS
 TO BE USED WITH WESTINGHOUSE
 MOTORS ONLY.
- * USE ITEM 12 AS REQUIRED TO OBTAIN
 A GAP OF 7.91 IN. (2.39 mm.) BETWEEN
 ITEM 7 ϕ ITEM 3.
- Δ REMOVE NO. CONTACT BEFORE MOUNTING.

DISTRIBUTOR DRIVE SHAFT ASSEMBLY

Note: This shaft ass'y. is used on all 60 Hz. motors.



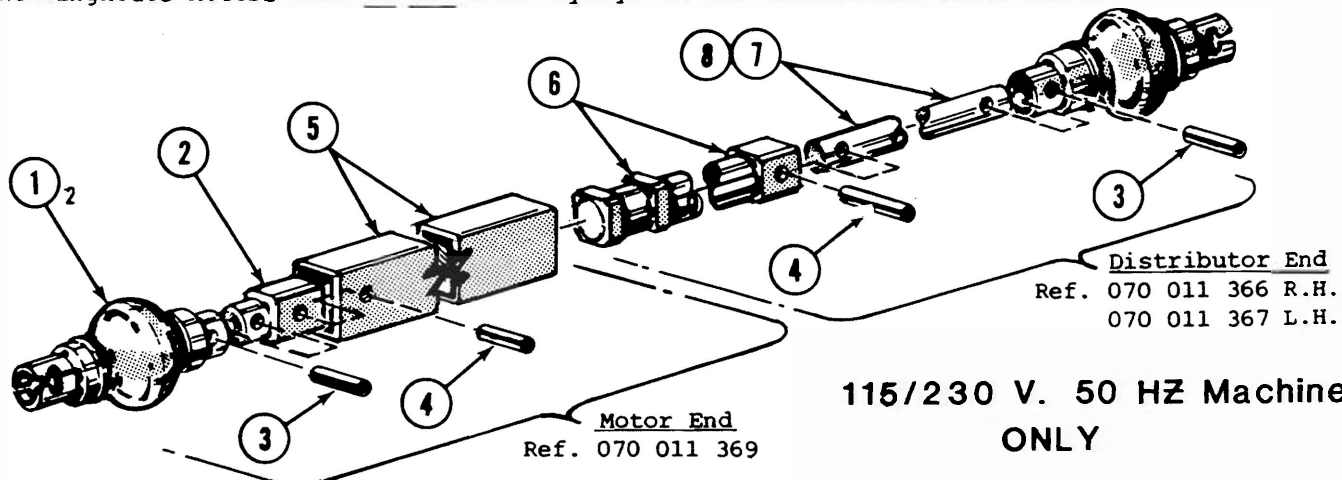
115V 60 HZ Machine ONLY

Ref. 070 006 102 R.H.

Ref. 000 024 893 L.H.

ITEM	PART NUMBER	DESCRIPTION	REQ'D.
1	070 006 101	Shaft, R.H. Mach.	1
2	000 022 369	Shaft, L.H. Mach.	1
3	000 026 461	Ball Bearing	2
4	000 029 073	Washer	2
5	000 024 892	Ball Bearing Retainer	1
6	000 022 717	Pin	1
7	913 423 120	Roll Pin, ESNA, .125 1/8 Dia. x 3/4 Lg.	1
8	913 437 120	Roll Pin, ESNA, .187 3/16 Dia. x 3/4 Lg.	1
9	070 008 004	Universal Joint	1
10	000 027 390	Housing Wldm't. (Dist. Drv.)	1
11	807 358 060	Set Screw, Soc. Kn. Cup. 5/16-24 x 3/8 Lg.	1
12	700 107 146	Loc Tite	A/R

Note: This shaft ass'y is used on machines that have G.E. 50 Hz. Motors and Westinghouse Motors that DO NOT have keyways in the distributor drive shaft.



115/230 V. 50 HZ Machine ONLY

ITEM	PART NUMBER	DESCRIPTION	REQ'D.
1	070 008 004	Universal Joint	2
2	070 011 370	Stud	1
3	913 437 120	Roll Pin-.187 x 3/4"	2
4	913 437 160	Roll Pin-.187 x 1"	2
5	070 011 368	Tubing	
6	070 011 365	Slide	1
7	070 008 187	Shaft, Short R.H. Mach.	1
8	070 008 188	Shaft, Long L.H. Mach.	1

DISTRIBUTOR ASS'Y. (S H 1)

Ref. Dwg. 070-006-150

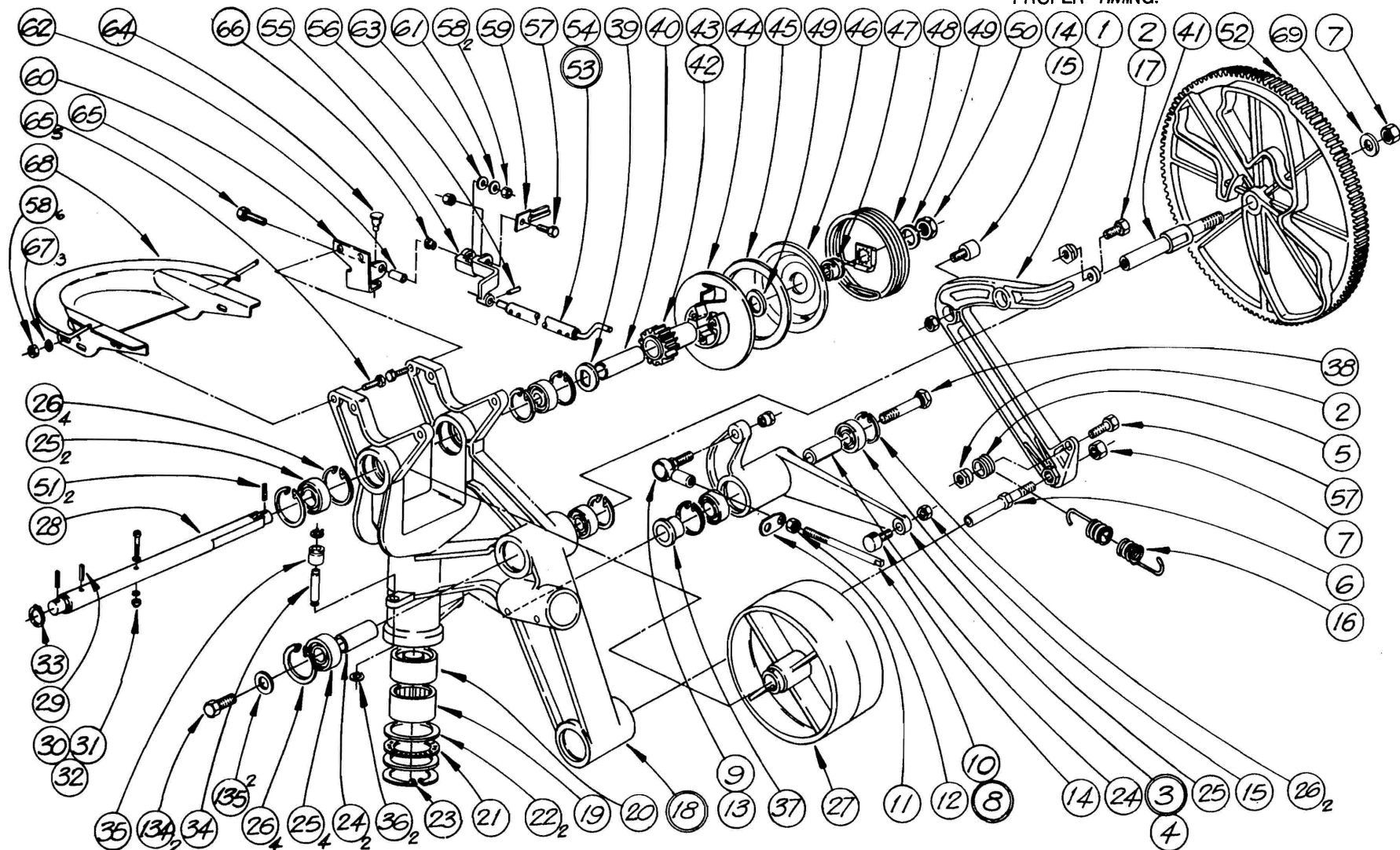
ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 006 051	Arm	38	070 006 048	Bolt, Special
2	000 022 173	Nut, Special	39	070 007 376	Washer, Thrust
3	070 007 119	Drive Arm Ass'y. (Lateral)	40	070 006 676	Sleeve
4	070 006 052	Drive Arm	41	070 006 061	Shaft, Cam Support
5	070 006 111	Spring Post Sleeve	42	070 006 679	Bushing, Pinion
6	070 006 049	Shaft Arm	43	610 704 005	Pinion & Gear Sleeve Ass'y.
7	844 073 002	Nut Lock, Stover 1/2-13	44	610 704 006	Kit, Clutch Plate Ass'y.
8	070 007 137	Rod Link Ass'y.	45	070 006 126	Friction Disc
9	070 006 066	Rod End, Female	46	070 006 130	Clutch Plate, Drive
10	070 006 067	Rod, Safety Link	47	070 006 125	Worm
11	070 006 068	Spring Support	48	070 006 128	Spring Ass'y.
12	831 565 002	Nut, Hex-Reg. 3/8-16	49	070 006 121	Washer
13	070 006 069	Nut, Special	50	070 006 124	Nut, Special
14	070 006 071	Cam Follower	51	913 437 140	Roll Pin (ESNA) 3/16" x 7/8" LG
15	844 050 002	Nut, Lock-Stover 1/4-28	52	070 006 149	Cam Index
16	070 006 034	Spring, Linear	53	070 006 668	Trip Stop Rod & Support Casting Ass'y.
17	808 849 100	Screw, Sofl. 1/4-20 x 5/8" LG.	54	070 006 663	Trip Stop Rod Ass'y.
18	070 006 136	Main Casting & Bearing Ass'y.	55	070 006 667	Trip Support Casting Ass'y.
19	070 006 076	Needle Bearing, Open End	56	913 415 090	Roll Pin (0.94 x 3/16" LG.) AC3.
20	070 006 075	Needle Bearing, Closed End	57	809 849 125	Screw, Hex Hd. Cap 1/4-20 x 3/4" LG.
21	070 006 074	Needle Thrust Bearing	58	844 049 002	Lock Nut, Stover 1/4-20
22	070 006 073	Thrust Washer	59	070 006 691	Stop Blade
23	919 004 200	Ring, Tru-Arc (Internal)	59a	070 006 083	Stop Blade (Used W/Old Clutch Plate Ass'y.- 070 006 062 Only)
24	070 006 064	Spacer Bearing	60	070 006 084	Trip Stop Support Brkt.
25	000 024 679	Bearing	61	000 026 865	Washer
26	919 000 600	Ring, Tru-Arc (Internal)	62	070 006 685	Pivot -(1 1/2 LG)
27	070 006 666	Pulley, Drive	62a	070 006 087	See Page 75
28	070 006 077	Shaft	63	070 007 651	Washer, Nylon
29	914 037 206	Spirol Pin (187-1250L-B-R)	64	070 006 142	Bumper
30	810 239 240	Screw, Soc. Hd. Cap. 10-24 X 1 1/2" LG.	65	809 849 205	Screw, Hex Hd. Cap 1/4-20 x 1 1/4 LG.
31	840 039 002	Nut, FlexLoc 10-24	66	701 712 097	Press Bearing - Spyralign (FSB 375)
32	948 745 082	Washer 7/32" I.D. x 1/2" O.D. x 3/64 THK.	67	948 753 102	Washer, 5/8 O.D. x 3/32 I.D. x 0.62 THK.
33	919 005 600	Ring, Tru-Arc (External)	68	070 006 144	Orienter Pan Ass'y.
34	070 006 082	Pin, Spring Post	69	948 975 172	Washer, 1 1/8 O.D. x 1 1/32 I.D. x 3/32 THK.
35	000 026 081	Spring Post Sleeve	134	809 857 080	Screw, Hx. Hd. Cap. 5/16-18 x 1/2 AC3
36	919 005 300	Ring, Tru-Arc External	135	948 761 112	Washer, Plain 1 1/16" O.D. x 1 1/32 I.D. x 1/16" THK.
37	070 006 065	Clamp Race			

DISTRIBUTOR ASS'Y. (Sheet 1).

Ref. Dwg. 82-070 006 150

NOTES:

1. ADJUST TORQUE NUT (IT. 50) TO 250 LBS. IN.
2. ASSEMBLE MARKED TOOTH OF PINION (IT. 52) INTO MARKED TOOTH SPACE OF CAM GEAR FOR PROPER TIMING.



DISTRIBUTOR ASS'Y. (SH.2) Ref. Drawing 82-70 006 150

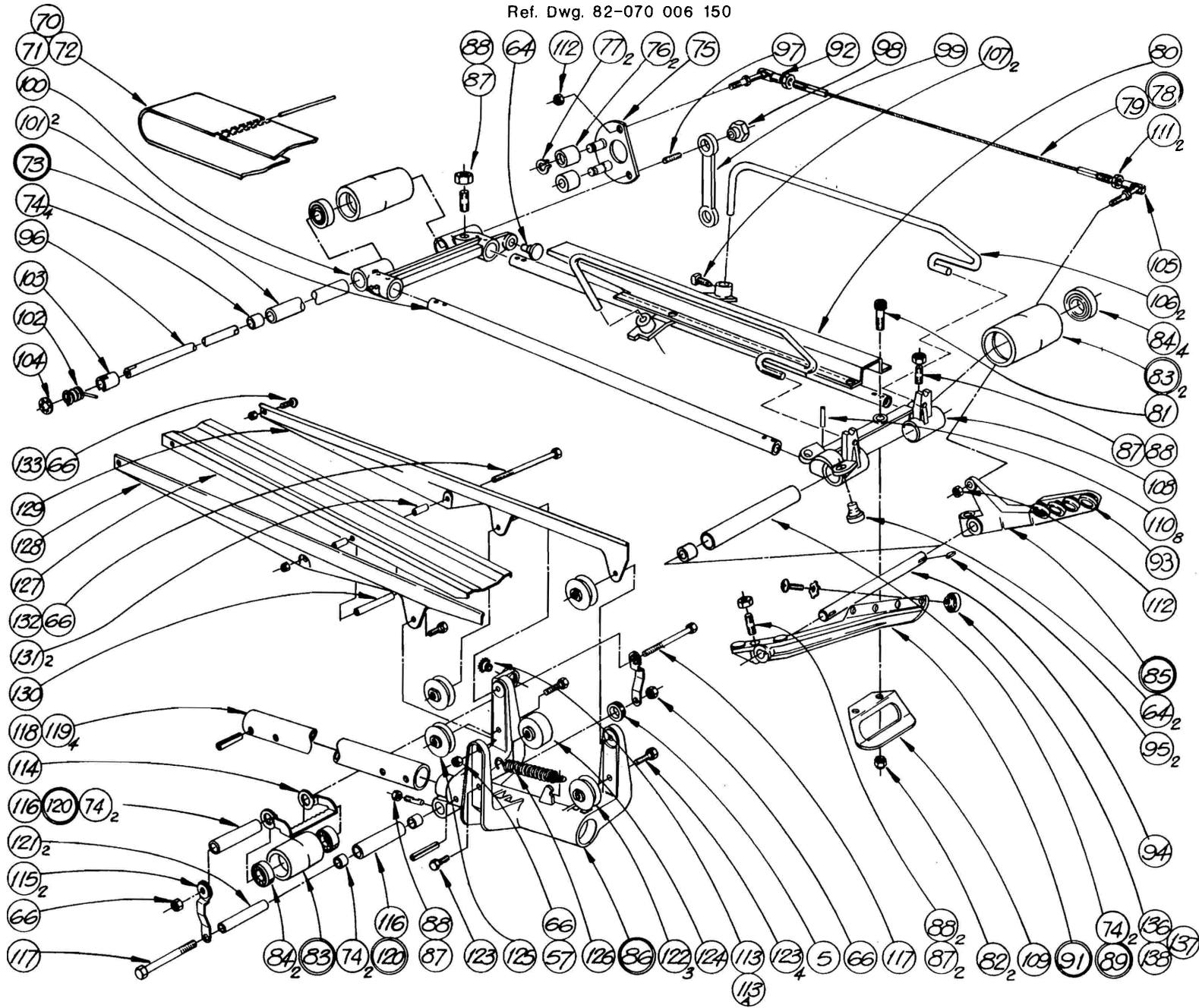
72

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
5	070-006-111	Spring Post Sleeve	105	070-011-173	Ball Joint Ass'y. (9/16)
57	809-849-125	Screw, Hex Hd. Cap 1/4-20x3/4" LG.	106	070-006-013	Pin Guide
64	070-006-142	Bumper	107	806-249-060	Set Screw, Sq. Hd. Cup Pt. 1/4-20 x 3/8 LG.
66	844-049-002	Locknut, Stover 1/4-20	108	070-006-055	Carriage - Front
70	070-006-757	Belt	109	070-006-137	Belt Guard
71	070-006-036	Belt Lacing	110	913-437-140	Pin (ESNA) 3/16x7/8" LG.
72	070-006-037	Belt Pin	111	835-549-002	Nut, Hex, Jam - 1/4-20
73	070-006-683	Tube Middle-Ass'y.(7 7/64" Long)	112	840-040-002	Nut, FlexLoc Thin #10-32
73a	070-006-022	See Page 75	113	701-710-098	Spyralign - Press Bearing
74	900-106-081	Bearing	113a	900-206-091	Oilite Bearing (Used on Old Carriage Supp't. Ass'y.)
75	070-006-661	Trip Rocker Arm Wldm't.	114	070-006-106	Tracking Brkt.
75a	070-006-028	See Page 75	115	070-006-109	Link
76	070-001-857	Roller	116	070-006-107	Tube
77	919-005-000	Retaining Ring	117	809-849-605	Screw Hex Hd. Cap 1/4-20 x 3 3/4 LG.
78	070-011-170	Trip Cable Ass'y.	118	070-006-120	Carriage Support Tube
79	070-011-171	Cable	119	913-464-280	Roll Pin (ESNA) 3/8 x 1 3/4" LG.
80	070-006-009	Belt Runner Support Ass'y.	120	070-006-105	Tube Ass'y.
81	810-239-160	Screw, Soc. Hd. Cap 10-24x1" LG.	121	070-006-108	Spacer
82	840-039-002	Nut, FlexLoc 21 FK, 10-24	122	070-006-118	Bearing, Grooved - Excentric
83	070-006-011	Pulley Ass'y.	123	809-849-162	Screw, Hex Hd. Cap 1/4-20 x 1" LG.
84	000-024-679	Bearing	*124	701-849-124	Bearing Thr'd Bore Concentric
85	070-006-015	Trip Arm Ass'y. (R.H.)	125	070-006-117	Bearing, Grooved - Concentric
86	070-006-688	Carriage Support, Casting Ass'y.	126	000-026-031	Spring, Belt Tightener
87	070-006-116	Clamp Stud	127	070-006-042	Belt Runner, Rear
88	834-549-002	Nut, Hex (Reg.) 1/4-20	128	070-006-103	Support Guide L.H.
89	070-006-021	Tube Ass'y.- Front	129	070-006-104	Support Guide R.H.
90			130	070-006-139	Spacer, Inner
91	070-006-016	Trip Arm Ass'y. (L.H.)	131	070-006-140	Spacer, Outer
92	070-011-172	Ball Joint Ass'y. (7/16")	132	809-849-885	Screw, Hex Hd. Cap 1/4-20x5 1/2" LG.
93	070-004-176	Bearing (See Items 136, 137 & 138 for Replcm't.	133	808-549-200	Screw, Soc. Hd. Button 1/4-20 x 1 1/4 " LG.
94	070-006-014	Shaft	136	813-540-082	Screw, Phil. Hd. Truss 10-32 x 1/2" LG. (Use W/IT 138)
95	907-000-100	Key, Hi-Pro HP403	137	957-100-002	Washer, Star #1110-00 (Use W/IT. 138)
96	070-006-659	Shaft	138	000-026-251	Bearing, Field Rpl. For Item 93
97	807-249-160	Set Screw, Soc. Hd. Cup Pt. 1/4-20x1"			
98	000-022-173	Nut, Special			
99	070-006-029	Connecting Link			
100	070-006-672	Carriage, Rear			
101	070-006-004	Tube			
102	070-006-035	Spring			
103	070-006-019	Collar			
104	919-006-800	Ring, Retaining - Tru Arc 5115-37			

* NOTE: Roller must be all steel bearing on installations with MAGiSCORE.

DISTRIBUTOR ASS'Y. (Sheet 2).

Ref. Dwg. 82-070 006 150



TRIP STOP SUPPORT ASS'Y. & CLUTCH PLT. ASS'Y.

ITEM	PART NUMBER	DESCRIPTION
57	809 849 125	Screw Hex Hd. Cap. 1/4-20 x 3/4" LG.
58	844 049 002	Lock Nut Stover 1/4-20
59A	070 006 083	Stop Blade Used With 070 006 062 Clutch Plate Ass'y.
60	070 006 084	Trip Stop Support Brk't.
61	000 026 865	Washer
62A	070 006 087	Pivot-(3 1/2 Long)
64	070 006 142	Bumper
139	809 849 245	Screw, Hex Hd. Cap 1/4-20 x 1 1/2" LG.

TRIP ROCKER ARM ASS'Y. & TRIP ROD ASS'Y.

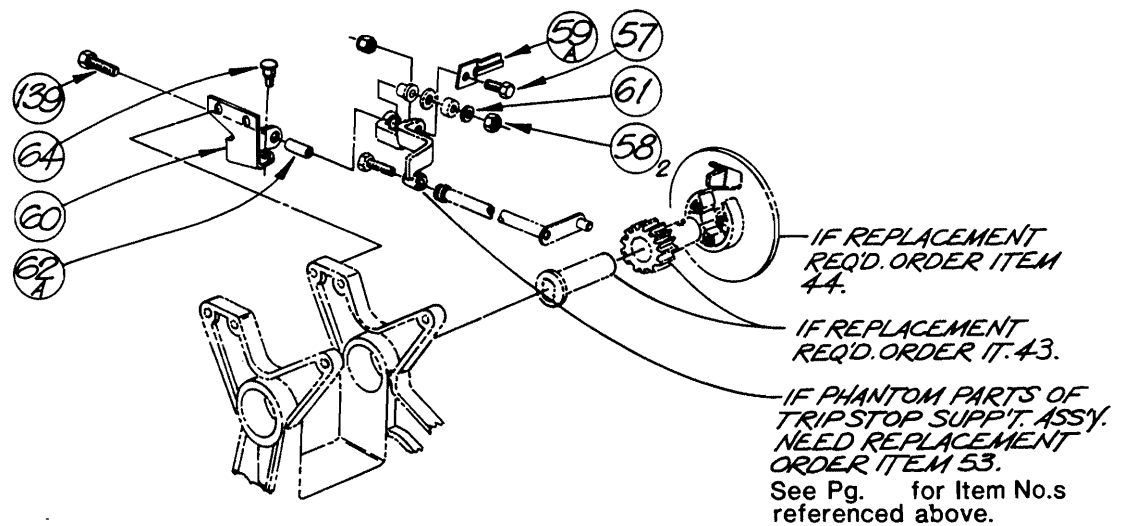
ITEM	PART NUMBER	DESCRIPTION
31	840 039 002	Nut, FlexLoc 10-24
73a	070 006 022	Tube Ass'y. Middle (7 1/2" Long)
75a	070 006 028	Trip Rocker Arm Weldm't.
81	810 239 160	Screw, Soc. Hd. Cap. 10-24 x 1
102	070 006 035	Spring
103	070 006 019	Collar (Spring)
140	810 239 120	Screw, Soc. Hd. Cap - 10-24 x 3/4"
141	070 007 304	Rod End

DRIVE PULLEY

ITEM	PART NUMBER	DESCRIPTION
27a	070 006 078	Drive Pulley (HUB 15/16" Dia.)
28	070 006 077	Shaft
30	810 239 240	Screw, Soc. Hd. Cap 10-24 x 1 1/2"
31	840 039 002	Nut, FlexLoc 10-24
142	070 006 079	Drive Block
143	610 704 027	Drive Lug Kit (Includes Item 142 Drive Blocks)

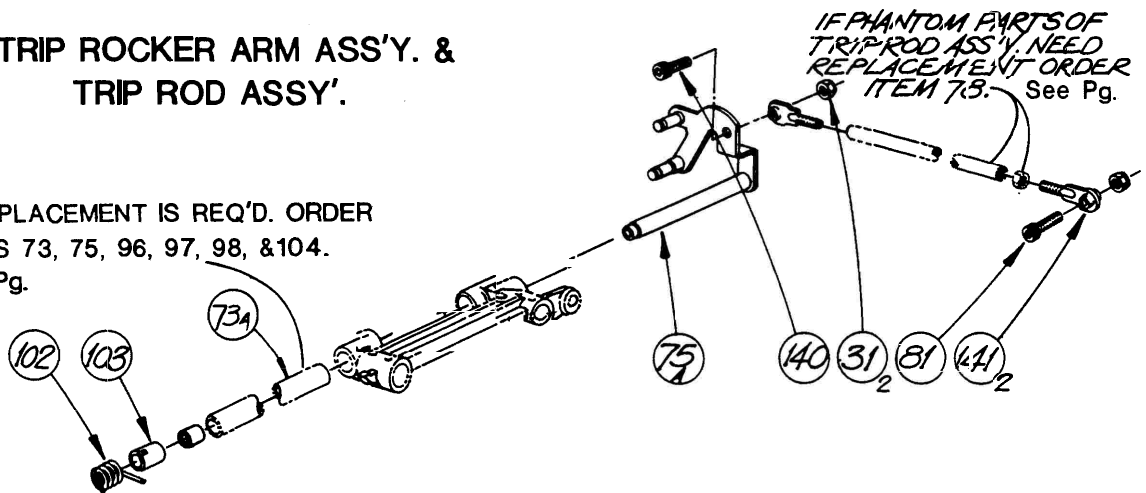
NOTE: Item 143 Not Used With 070 006 666 Drive Pulley (HUB 1 1/8" Dia.)

TRIP STOP SUPPORT ASS'Y. & CLUTCH PLATE ASS'Y.

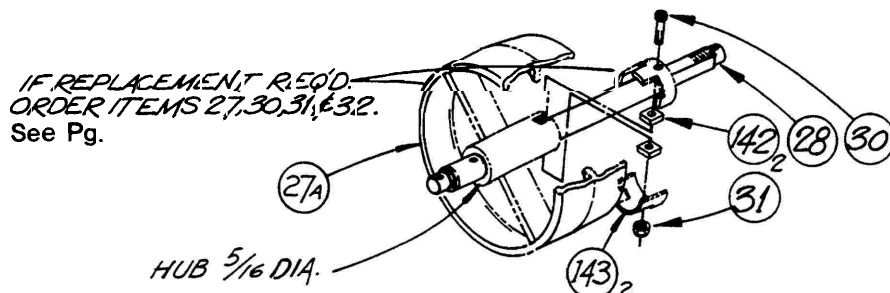


TRIP ROCKER ARM ASS'Y. & TRIP ROD ASSY'.

IF REPLACEMENT IS REQ'D. ORDER ITEMS 73, 75, 96, 97, 98, & 104. See Pg.



DRIVE PULLEY



POSITIVE BALL LIFT

82-070-011-000

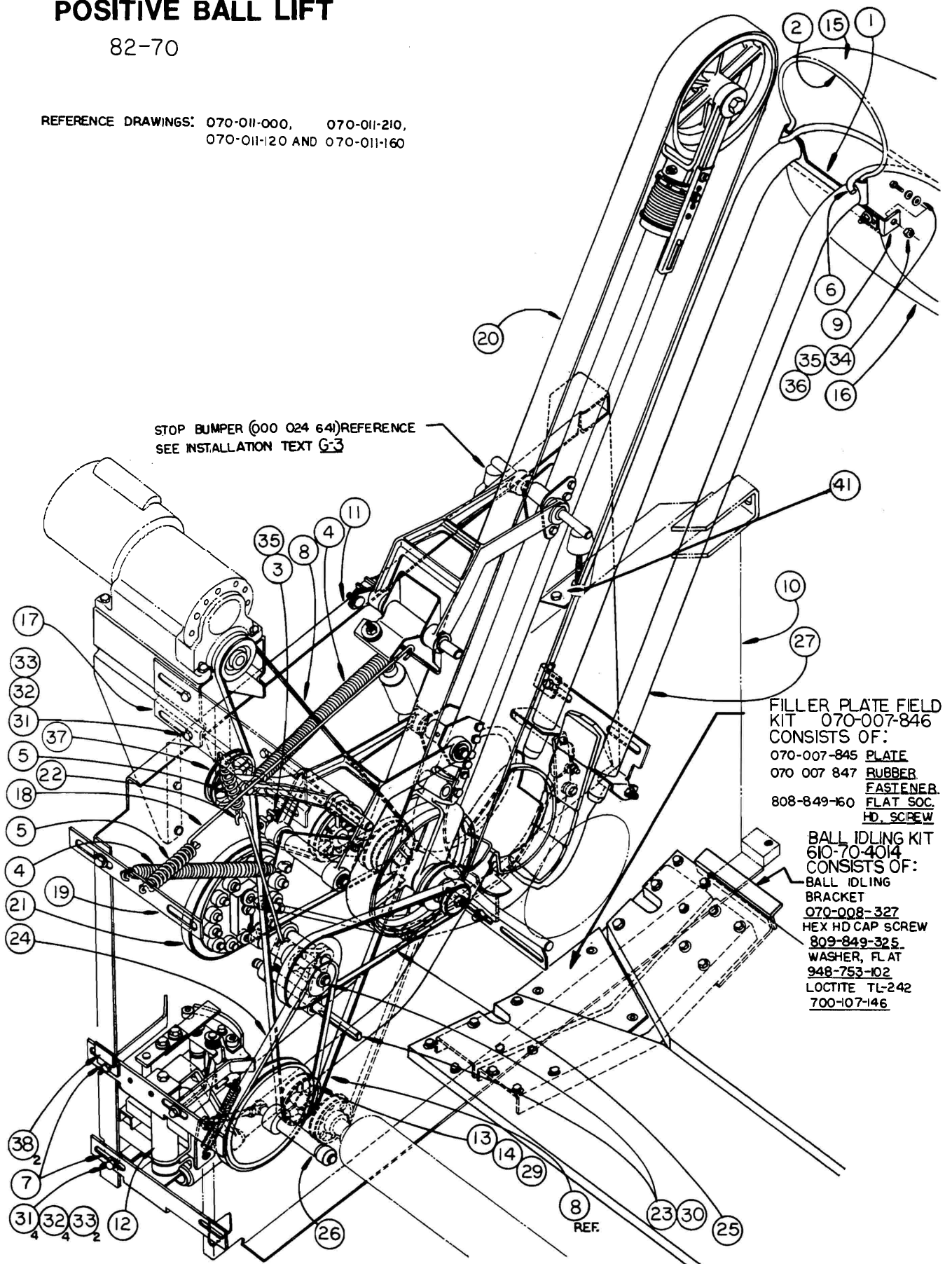
REF. DRAWINGS 070-011-200,
070-011-160 and 070-011-120

ITEM	PART NUMBER	DESCRIPTION
1	000-021-813	Support, Wiper
2	000-021-814	Ring, Wiper Cloth
3	000-024-610	Stud, Clamp ($\frac{3}{8}$ Diameter)
4	000-024-673	Spring
5	000-026-031	Spring
6	000-029-629	Down Sweep Weldment
7	000-029-910	Shim
8	000-022-099	"V" Belt, Carpet Drive (113.75/2890.1)
9	070-004-654	Bracket, Down Track
10	070-011-202	Kickback Assembly (RH-For RH Machine)
11	070-011-201	Kickback Assembly (LH-For LH Machine)
12	070-011-120	Light Ball Sensor Assembly
13	070-002-034	Roller Assembly (Rear)
14	070-002-097	Sheave, Carpet Drive
15	070-004-669	Wiper Cloth
16	070-004-670	Dust Trap
17	070-007-129	Tie Plate Assembly (Complete)-Not Shown
18	070-011-034	Extension Rod
19	070-011-035	Strap
20	070-011-052	Ball Lift Assembly
21	070-011-064	"V" Belt, Ratchet Drive, (Gates #1450 45"/1143 MM)
22	070-011-106	Spring, Extension
23	070-011-132	Belt Tensioner Assembly
24	070-011-147	"V" Belt, (Gates #1380 38"/965.2 MM)
25	070-011-148	"V" Belt, (Gates #1400 40"/1016 MM)
26	070-011-178	Crank Assembly, Rudder Drive
27	070-011-414	Track Rail Assembly
28	700-107-146	Loctite (TL-242) - Not Shown
29	806-265-160	Screw, Sq. Hd. Set ($\frac{3}{16}$ -16 N.C. x 1" Lg.)
30	807-265-060	Screw, Soc. Hd. Set ($\frac{3}{8}$ -16 N.C. x $\frac{3}{8}$ " Lg.)
31	809-857-165	Screw, Hex Hd. Cap ($\frac{5}{16}$ -18 N.C. x 1" Lg.)
32	844-057-002	Nut, Hex ($\frac{5}{16}$ -18 N.C.)
33	948-761-112	Washer ($\frac{11}{32}$ I.D. x $\frac{11}{16}$ O.D. x $\frac{1}{16}$ Thick)
34	809-865-285	Screw, Hex Hd. Cap ($\frac{3}{8}$ -16 N.C. x 1 $\frac{3}{4}$ Lg.)
35	844-065-002	Nut, Hex Stover ($\frac{3}{8}$ -16 N.C.)
36	948-767-132	Washer ($\frac{13}{32}$ I.D. x $\frac{13}{16}$ O.D. x $\frac{1}{16}$ Thick)
37	070-007-124	Belt Tightener Package
38	070-011-310	Support-B.E. Motor Guard
39	000-024-699	B.E. Motor Guard Assy.
40	070-004-730	Ball Lift Guard (Not Shown)
41	070-004-642	Bracket, Stop

POSITIVE BALL LIFT

82-70

REFERENCE DRAWINGS: 070-011-000, 070-011-210,
070-011-120 AND 070-011-160



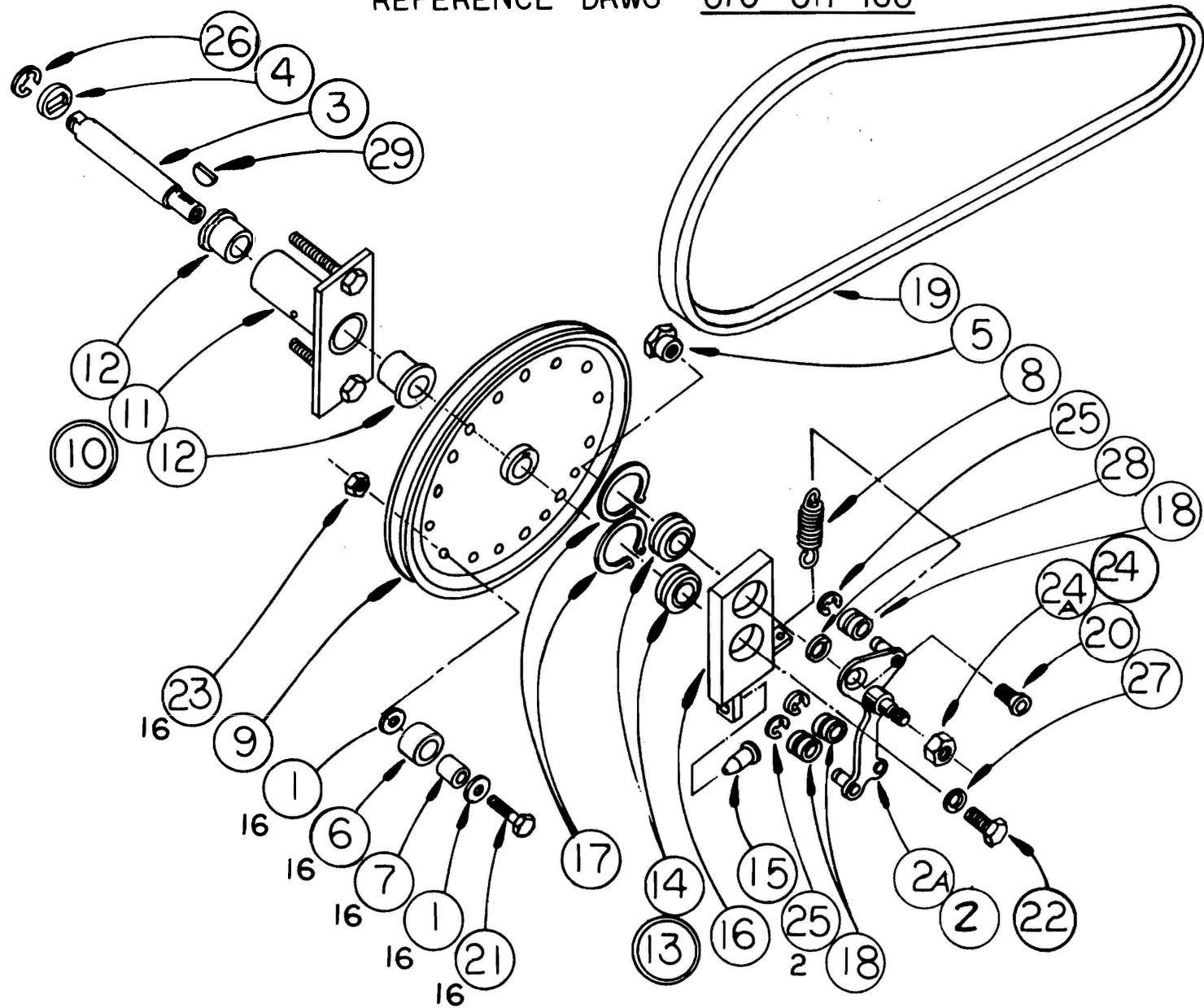
RATCHET ASSEMBLY 070-011-039

ITEM	PART NUMBER	DESCRIPTION
1	000 026 865	Washer
2	070 011 217	Ratchet Arm Weld. Eff. to Jan., 1978
2A	070 011 217	Ratchet Arm Weld. Effective after January, 1978
3	070 011 027	Shaft-Ratchet Assembly
4	070 011 028	Washer
5	070 011 029	Nut-Ratchet
6	070 011 030	Roller
7	070 011 031	Spacer-Roller
8	070 011 032	Spring-Ratchet Assembly
9	070 011 033	Pulley-Ratchet
10	070 011 036	Bearing and Housing Assy.
11	070 011 009	Housing
12	900 212 161	Bearing-Flange
13	070 011 037	Crank Assembly
14	000 024 679	Bearing
15	070 006 142	Bumper
16	070 011 013	Crank Weldment
17	919 000 600	Tru-Arc Ring 5000-137
18	070 011 040	Roller-Ratchet Arm

ITEM	PART NUMBER	DESCRIPTION
19	070 011 064	Belt (Gates #1450 45"/1143 MM)
20	808 865 140	Flat HD Soc Cap Screw $\frac{3}{8}$ -16 x $\frac{7}{8}$
21	809 849 205	Hex HD Cap Screw $\frac{1}{4}$ -20 x $1\frac{1}{4}$
22	809 965 125	Hex HD Cap Screw (Long-Lok) $\frac{3}{8}$ -16 x $\frac{3}{4}$
23	839 549 002	Flexloc Nut $\frac{1}{4}$ -20
24	844 065 002	Hex Nut-Stover $\frac{3}{8}$ -16 Eff. to Jan., 1978
24A	838 866 002	Nut Hex Esna Thn $\frac{3}{8}$ -24 Effective after January, 1978
25	919 005 200	Tru-Arc Ring #5100-31
26	919 005 800	Tru-Arc Ring #5100-75
27	948 767 132	Flat Washer $\frac{13}{32}$ ID x $\frac{13}{16}$ OD x $\frac{1}{16}$ Thk
28	948 964 142	Flat Washer .375 ID x .875 OD x .094 Thick
29	907 000 200	Key Hi-Pro HP 404
Note: Items Listed Below Are Used To Mount Ratchet Drive Assembly To Side Plate But Are Not Shown.		
30	070 008 212	Spacer
31	844 057 002	Nut Hex Stover $\frac{5}{16}$ -18
32	948 767 132	Washer Plain $\frac{13}{32}$ x $\frac{13}{16}$ x $\frac{1}{16}$

RATCHET DRIVE ASSEMBLY 070-011-039

REFERENCE DRWG 070-011-160



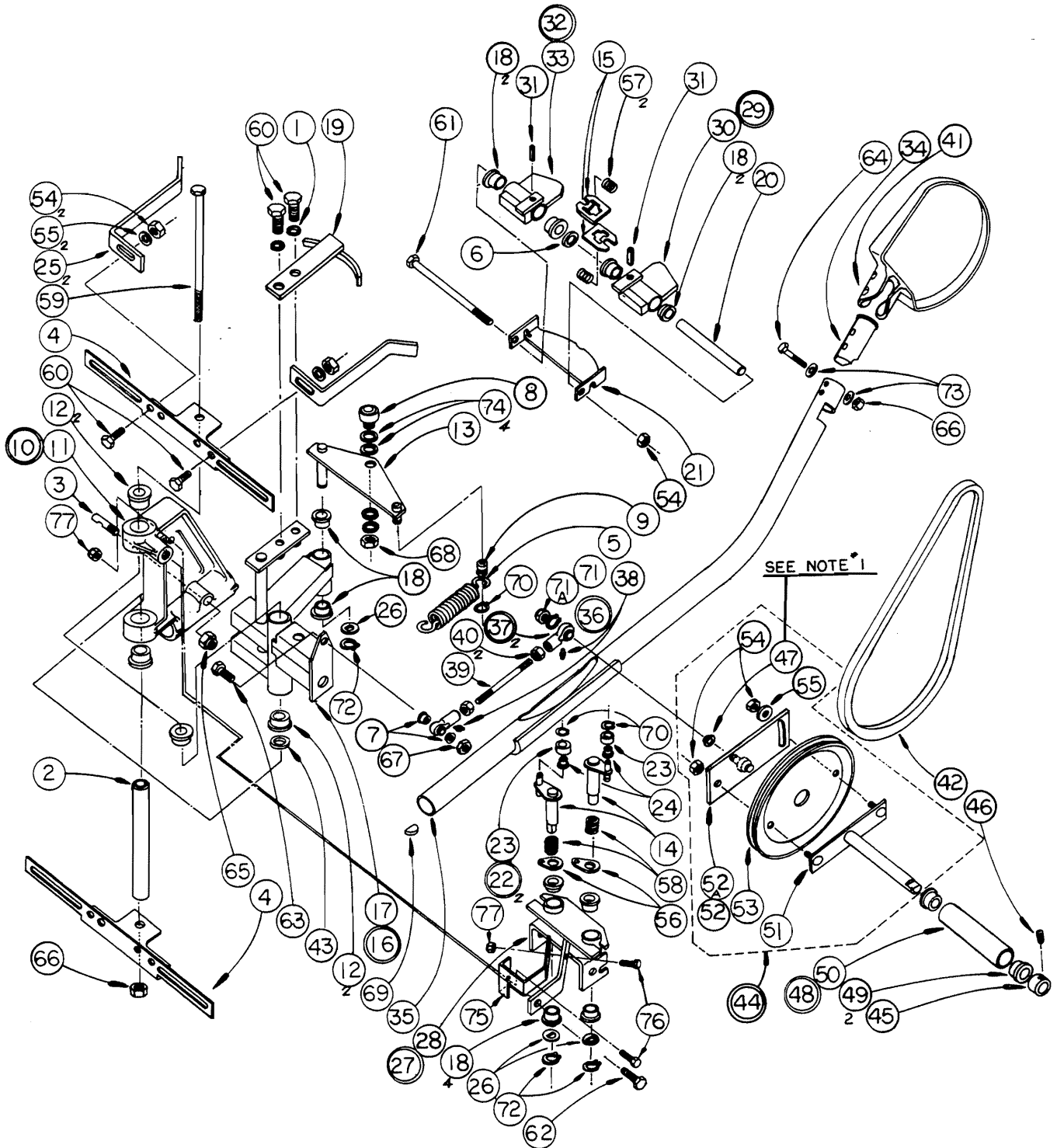
LIGHT-BALL-SENSOR ASSEMBLY

070-011-120

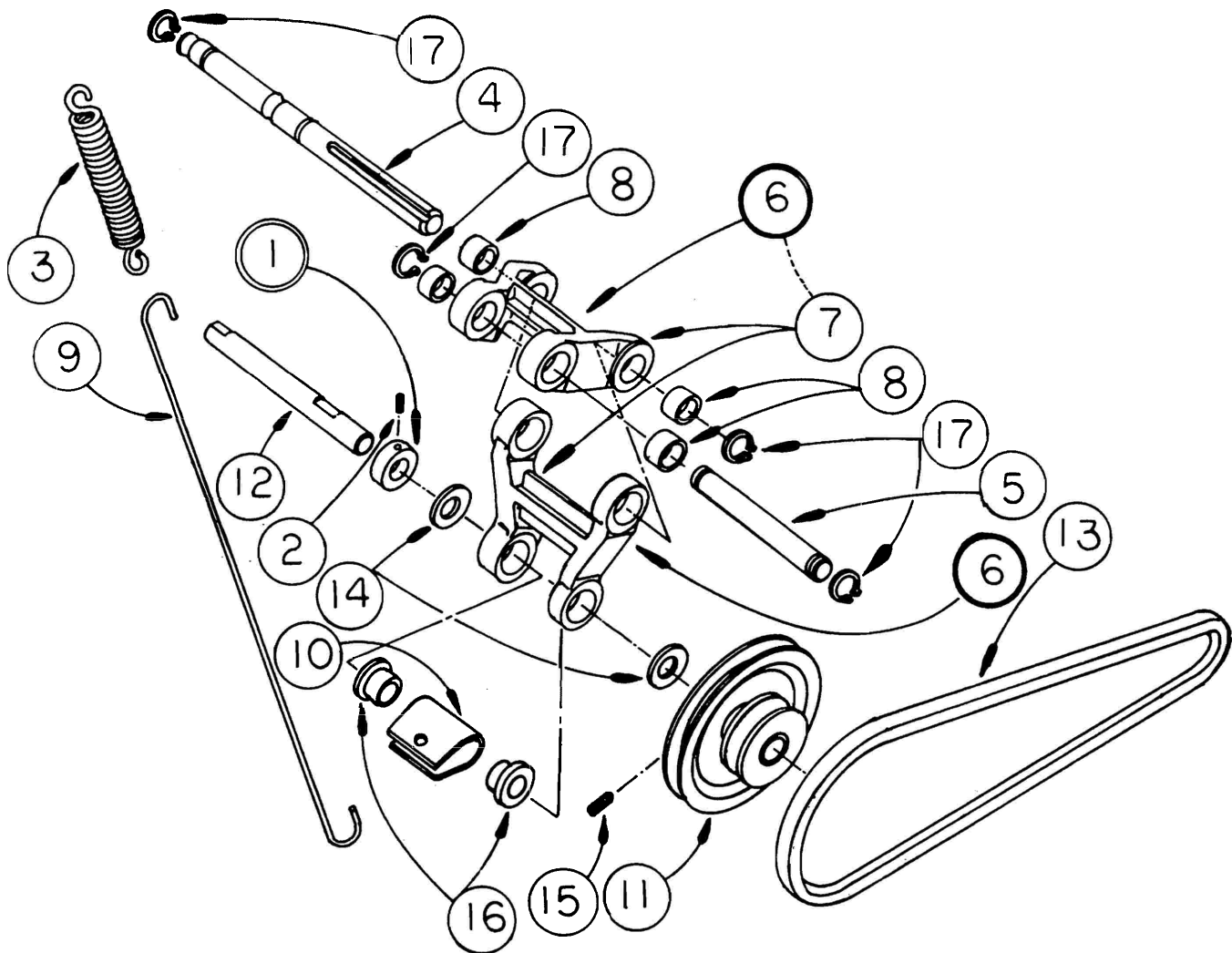
ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1-	000 022 869	Washer Flat	41-	070 011 146	Paddle
2-	000 024 615	Shaft Rudder	42-	070 011 147	V-Belt (Gates #1380-38"/965.2 MM)
3-	000 024 616	Clamp Stud	43-	070 011 151	Spacer Rudder Drive
4-	070 011 319	Rudder Arm Support	44-	070 011 178	Rudder Drive Crank Assembly
5-	000 026 031	Spring	45-	000 021 423	Collar (With Set Screw)
6-	000 027 264	Washer-Spacer	46-	807 357 040	Soc Set Screw KN Cup Pt 5/16-18 x 1/4
7-	000 029 611	Washer-Uniball Bearing	47--	000 029 611	Washer-Uniball Brg. Efft. to 1-78
8-	070 006 728	Cam Follower	48--	000 029 696	Tube Adjustment Assembly
9-	070 011 040	Roller	49-	000 021 427	Flange Bearing
10-	070 011 066	Rudder Arm Support Assy.	50-	000 029 697	Tube
11-	070 011 067	Rudder Arm Support	51-	070 011 092	Crank Shaft Weldment
12-	900 212 201	Flange Bearing	52-	070 011 225	Crank Adjustment Plate Weld. Efft. to 1-78
13-	070 011 068	Link Weldment	52a-	070 011 225	Crank Adj. Plate Weld Efft. 1-78
14-	070 011 626	Trip Arm Ass'y.	53-	070 011 097	Crank Pulley
15-	070 011 077	Trip Finger	54--	844 057 002	Nut Stover 5/16-18
16-	070 011 080	Rudder Drive Assy.	55--	948 761 112	Washer 1/8 x 1/2 x 1/8
17-	070 011 079	Rudder Drive Weldment	56--	070 011 273	Tab
18-	900 208 091	Flange Bearing	57-	722 971 522	Spring
19-	070 011 418	Cam Weldment	58-	722 985 512	Spring
20-	070 011 098	Sleeve	59-	802 865 996	Bolt Hex Hd 5/16-16 x 9 1/2
21-	070 011 099	Cam	60-	809 857 165	Screw Hex Hd 5/16-18 x 1
22-	070 011 105	Roller Assembly	61-	809 857 880	Screw Hex Hd 5/16-18 x 5 1/2
23--	070 011 096	Roller	62-	809 865 165	Screw Hex Hd 5/16-16 x 1
24--	900 205 081	Flange Bearing	63-	809 865 205	Screw Hex Hd 5/16-16 x 1/4
25-	070 011 107	Trip Arm	64-	809 865 405	Screw Hex Hd 5/16-16 x 2 1/2
26-	070 011 108	Washer	65-	831 573 002	Nut Hex 1/2-13
27-	070 011 110	Cam Sensor Assembly	66-	839 565 002	Nut Hex Flexloc 5/8-16
28--	070 011 100	Cam Sensor Weldment	67-	840 065 002	Nut Hex Thin Flexloc 5/8-16
29-	070 011 407	Rudder Cam Assembly L.H.	68-	844 070 002	Nut Hex Stover 5/8-20
30-	070 011 405	Rudder Cam Weldment L.H.	69-	907 000 900	Key Hi Pro #910
31--	913 448 120	Roll Pin 1/4 x 3/4	70-	919 005 200	Retaining Ring 5100-31
32-	070 011 406	Rudder Cam Assembly R.H.	*71-	919 005 300	Retaining Ring 5100-37 Efft. to 1-78
33-	070 011 404	Rudder Cam Weldment R.H.	71A-	838 866 002	Nut Hex Esna 5/8-24 Efft. 1-78
34-	070 011 121	Plug	72-	919 005 500	Retaining Ring 5100-50
35-	070 011 122	Rudder Arm	73-	948 767 132	Washer Plain 1/8 x 1/2 x 1/8
36-	070 011 123	Rod Assembly	74-	949 100 002	Washer Plain 5/16 x 1/2 x 1/8
37--	000 026 446	Rod End	75-	070 011 299	Brace Sensor
38--	710 502 010	Lubricator Fittings-LU-E-40	76-	809 849 145	Screw Hex Hd 1/4-20 x 7/8
39-	070 011 124	Rod	77-	844 049 002	Nut Hex Stover 1/4-20
40--	835 566 002	Hex Jam Nut 5/8-24			

NOTE *1 Retaining Ring and Spacer in this application only replaced by Item 71A in January, 1978.

LIGHT BALL SENSOR ASSEMBLY O70-O11-120



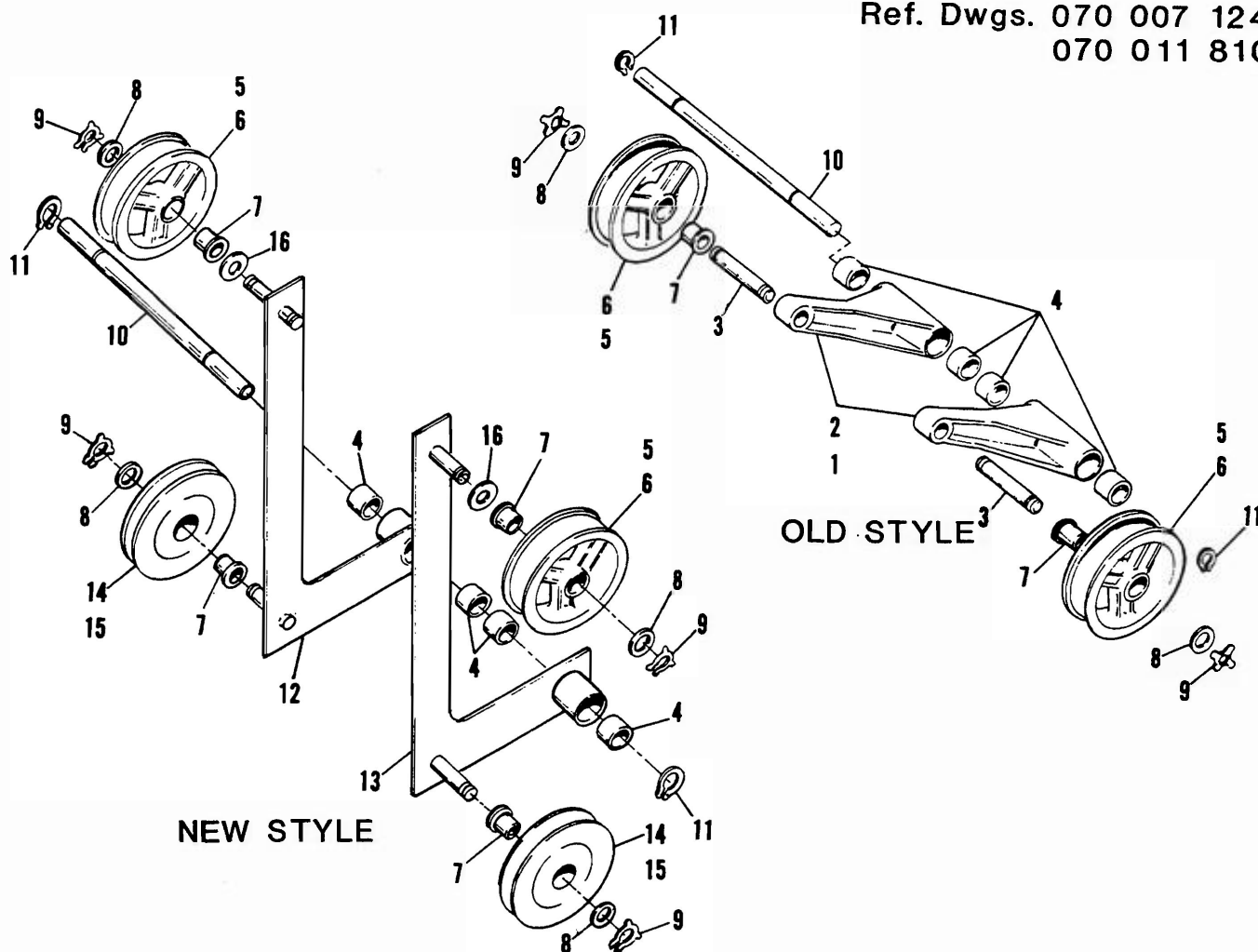
BELT TENSIONER ASSEMBLY 070-011-132



ITEM	PART NUMBER	DESCRIPTION
1	000 021 423	Collar
2	807 357 040	Soc. Set Screw Knurled Cup Pt. $\frac{5}{16}$ -18 x $\frac{1}{4}$
3	000 026 031	Spring
4	000 029 605	Shaft
5	000 029 606	Shaft
6	000 029 659	Hanger Arm Assembly
7	000 029 625	Hanger Arm
8	900 110 081	Bearing-Sleeve
9	070 011 106	Spring Extension
10	070 011 109	Spring Clip
11	070 011 131	Pulley-Weldment
12	070 011 133	Shaft
13	070 011 148	V-Belt (Gates #1400 40"/1016 MM)
14	701 320 045	Thrust Washer
15	807 257 060	Set Screw-Socket Cup Pt. $\frac{5}{16}$ -18 x $\frac{3}{8}$
16	900 210 101	Flange Bearing
17	919 005 600	Tru-Arc Ring 5100-62

Belt Tightner Assembly

Ref. Dwgs. 070 007 124
070 011 810



NEW STYLE FIRST USED ON SERIAL NO. 151326

ITEM	PART NUMBER	DESCRIPTION
1.	070 001 411	Arm Assembly
2.	000 029 628	Arm
3.	070 002 072	Idler Shaft
4.	900 112 121	Bearing Sleeve
5.	000 021 408	Idler Pulley Assembly
6.	000 022 071	Idler Pulley
7.	900 208 161	Bearing, Flange
8.	948 975 172	Washer, Plain (1-1/16 OD x 17/32 ID x 3/32 Thk.)
9.	963 600 002	"X" Washer (9000-16)
10.	000 029 603	Shaft
11.	919 005 800	Retaining Ring (5100-75)
12.	070 011 524	Belt Tightener LH
13.	070 011 523	Belt Tightener RH
14.	070 011 525	Idler Sheave Assy. (Stl.)
15.	070 011 526	Idler Sheave
16.	701 316 041	Thrust Bearing

BALL LIFT ASSEMBLY

070-011-052

ITEM	PART NUMBER	DESCRIPTION
1	070-011-323	Shock Absorber Assembly
2	000-027-996	Cushion
3	000-027-998	Retainer
4	000-028-057	Retainer
5	000-029-660	Shaft
6	000-029-661	Shock Absorber
7	070-011-289	Bracket
8	831-566-002	Nut 3/8-24
9	919-005-600	Retaining Ring #5100-62
10	948-983-212	Washer Plain 1-5/16 x 21/32 x .093
11	000-024-603	Spring
12	000-024-604	Belt-V-Guide Red
13	000-024-605	Retainer-Lower
14	000-024-608	Retainer-Upper
15	000-024-648	Pin Pivot
16	000-024-650	Roller Assembly
17	000-024-647	Roller
18	900-206-081	Flange Bearing
19	000-024-651	Link Assembly-Lower
20	000-024-653	Link
21	900-110-121	Bearing-Sleeve
22	900-112-161	Bearing-Sleeve
23	070-001-995	Yoke-Upper
24	000-024-661	Belt Pulley
25	000-024-720	Link Assembly-Upper
26	000-024-716	Spring Holder
27	900-112-203	Bearing-Sleeve
28	000-028-737	Pivot Shaft
29	000-029-613	Rail
30	*070-006-320	Shaft Assy. Adj. 9-1/2" to 11" Spacing
31	*070-006-325	Shaft Assy. Fixed 9-1/2" to 11" Spacing
32	*070-006-328	Shaft Assy. Fixed 11" to 12-5/8" Spacing
33	*070-006-329	Shaft Assy. Adj. 11" to 12-5/8" Spacing
34	*070-006-330	Shaft Assy. Fixed 12-5/8" to 14" Spacing
35	*070-006-333	Shaft Assy. Adj. 12-5/8" to 14" Spacing
36a	070-011-797	Ball Bearing (for "D" shaft)
36b	070-006-699	Ball Bearing (old style)
37a	070-011-795	Shaft-Upper ("D" shaft)
37b	070-006-747	Shaft Upper (old style)
38	070-006-748	Spacer
39	070-011-004	Tube and Support Assembly
40	000-024-606	Support Assembly-Upper
41	000-024-607	Tube
42	070-011-002	Support Lower
43	809-849-365	Screw Hex Head Cap 1/4-20 x 2-1/4
44	070-011-042	Belt Tightener Assembly
45	000-021-408	Idler Pulley Assembly
46	000-022-071	Idler Pulley
47	900-208-161	Bearing-Flanged
48	070-007-192	Washer
49	070-008-217	Short Spacer
50	070-008-218	Long Spacer
51	070-011-040	Roller
52	070-011-041	Belt Tightener Weldment Assembly
53	070-008-215	Belt Tightener Weldment
54	900-212-161	Bearing Flange
55	146-005-277	Countersunk Washer
56	808-849-565	Screw Flat Soc. Hd. 1/4-20 x 3-1/2
57	839-549-002	Nut Flexloc 1/4-20 21FA420
58	919-005-200	Tru-Arc Ring #5100-35
59	070-011-047	Yoke Assembly Lower
60	000-024-659	Yoke Lower
61a	070-011-796	Shaft Lower ("D" shaft)
61b	070-006-746	Shaft Lower (old style)
62	070-006-749	Clutch Race
63a	**070-008-205	Sheave Assy. 3.5 Da. 2 Req'd.
63b	**000-024-811	Pulley Assy. B.L. Roller Clutch 1 Req'd.
63c	**000-024-812	Pulley Assy. B.L. Roller Clutch 1 Req'd.
64	**070-007-291	Clutch and Bearing Assembly
65a	**070-008-204	Sheave-Ball Lift (3-1/2" Dia.)
65b	**000-028-771	Sheave-Ball Lift (4-1/4" Dia.)
66	700-107-170	Loctite #601
67	070-008-210	Sheave-Paddle Drive
68	070-008-211	Sheave-First Stage Lift
69	700-107-146	Loctite TL242
70	806-265-160	Square Head Set Screw Cup Pt. 3/8-16 x 1
71	807-265-080	Soc. Set Screw Cup Pt. 3/8-16 x 1/2
72	856-070-002	Flange Nut 7/16-20
73	710-501-007	Lubricator Fitting #1792B
74	807-265-060	Soc. Set Screw Cup Pt. 3/8-16 x 3/8
75	809-865-165	Screw Hex Head 3/8-16 x 1
76	809-865-445	Screw Hex Head 3/8-16 x 2-3/4
77	839-665-002	Nut Flexloc 3/8-16
78	840-057-002	Nut Stover 5/16-18
79	845-100-000	Bearing Locknut
80	919-005-800	Tru-Arc Ring #5100-75
81	948-761-112	Washer Plain 11/32 x 11/16 x 1/16
82	951-164-002	Lockwasher Medium 3/8
83	839-549-002	Nut Flexloc 1/4-20
84	070-008-212	Spacer
Ref.	610-704-150	Upper Shaft Conversion Kit
Ref.	610-704-151	Lower Shaft Conversion Kit
		Use item 69 with above kits when installing bearings.

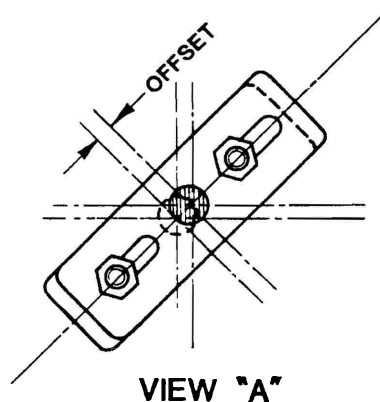
*9-1/2"=241.30 MM, 11"=279.40 MM,
12-5/8"=320.68 MM, 14"=355.6 MM,
3-1/2-88.9 MM, 4-1/4"=107.95 MM

**Refer to view which matches your
Ball Lift Assembly for item numbers.

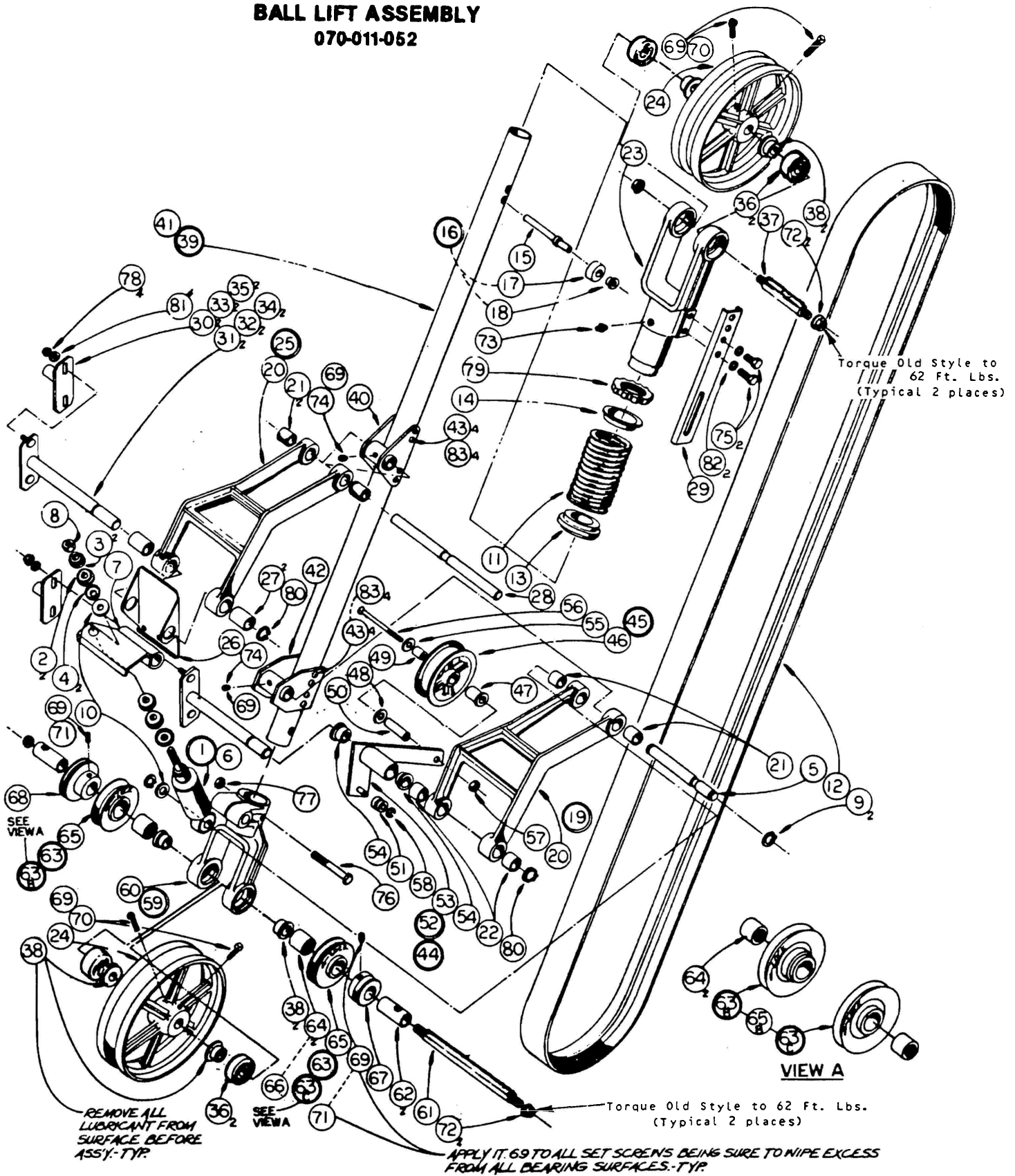
***Adjustable Ball Lift Support Shafts
(Items 30 thru 35) are provided to
allow alignment of the Ball Lift
to the track rails.

Adjustment is required when the
Shaft Supports on the metal Kickback
Assemblies are not aligned.

Alignment is achieved by turning
plates on the Support Shaft Assemblies
till the plates are parallel to the
direction of offset. (See view A).



BALL LIFT ASSEMBLY 070-011-052



TRACK RAIL ASSEMBLY

070 011 414

ITEM	PART NUMBER	DESCRIPTION
ITEM	PART NUMBER	DESCRIPTION
1-	000 021 813	Support Wiper
2-	070 011 279	Track Assembly
3-	000 024 663	Track Cover Upper
4-	070 011 440	Track Cover Lower
5-	000 024 666	Track Rail Weldment
6-	000 024 668	Track Support Assembly
7-	070 011 049	Rod Assembly
8-	000 026 446	Rod End With Lube Fitting
9--	710 502 010	Lubricator Fitting
10--	070 011 048	Rod
11--	835 566 002	Hex Jam Nut
12-	070 011 018	Ball Guide
13-	070 011 021	Lever Arm Weld. Effective to 1-78
13A-	070 011 375	Lever Arm Weld. Effective after 1-78
14-	070 011 053	Spacer Effective to 1-78
15-	070 011 230	Lift Assembly Effective To 3-79
15a	070 011 413	Lift Assembly Effective After 3-79
16	070 002 784	Liner
17	070 008 191	Bracket
18	070 011 062	Lift Arm Assembly Effective to 3-79
18a	070 011 412	Lift Arm Assembly Effective After 3-79
19	070 011 015	Lift Arm Weldment Effective to 3-79
19a	070 011 411	Lift Arm Weldment Effective After 3-79
20--	900 210 161	Flange Bearing
21--	070 011 063	Shaft
22-	809 865 992	Screw Hex Head Cap $\frac{3}{8}$ -16 x 9
23-	844 065 002	Nut Stover $\frac{3}{8}$ -16
25-	808 857 280	Screw-Flat Soc Head $\frac{5}{16}$ -18 x $1\frac{3}{4}$
26-	809 865 165	Screw Hex Head $\frac{3}{8}$ -16 x 1
27-	809 865 205	Screw Hex Head $\frac{3}{8}$ -16 x $\frac{1}{4}$ Effective to 1-78
28-	809 865 325	Screw Hex Head $\frac{3}{8}$ -16 x 2 Effective to 1-78
29-	810 265 400	Screw Soc Head Cap $\frac{3}{8}$ -16 x $2\frac{1}{2}$ Effective to 1-78
29A-	810 365 401	Screw Soc Head Cap Long Loc $\frac{3}{8}$ -16 x $2\frac{1}{2}$ Effective 1-78
30-	844 057 002	Nut Stover $\frac{5}{16}$ -18
31-	948 767 132	Washer Plain $1\frac{3}{32}$ x $1\frac{13}{16}$ x $\frac{1}{16}$
32-	958 584 002	Shakeproof Washer
33-	951 164 002	Lockwasher Spring $\frac{3}{8}$ Medium
34-	838 866 002	Esna Hex Nut $\frac{3}{8}$ -24

NOTE: IN SOME OLDER INSTALLATIONS THE TRACK TUBE ASSEMBLIES MAY REQUIRE FINE THREAD BOLTS LISTED BELOW AS SUBSTITUTE.

Substitute 26 - 809 866 165 Screw Hex Head $\frac{3}{8}$ -24-1

Substitute 29A - 810 366 401 Soc Hd Cap Long Loc $\frac{3}{8}$ -24 x $2\frac{1}{2}$

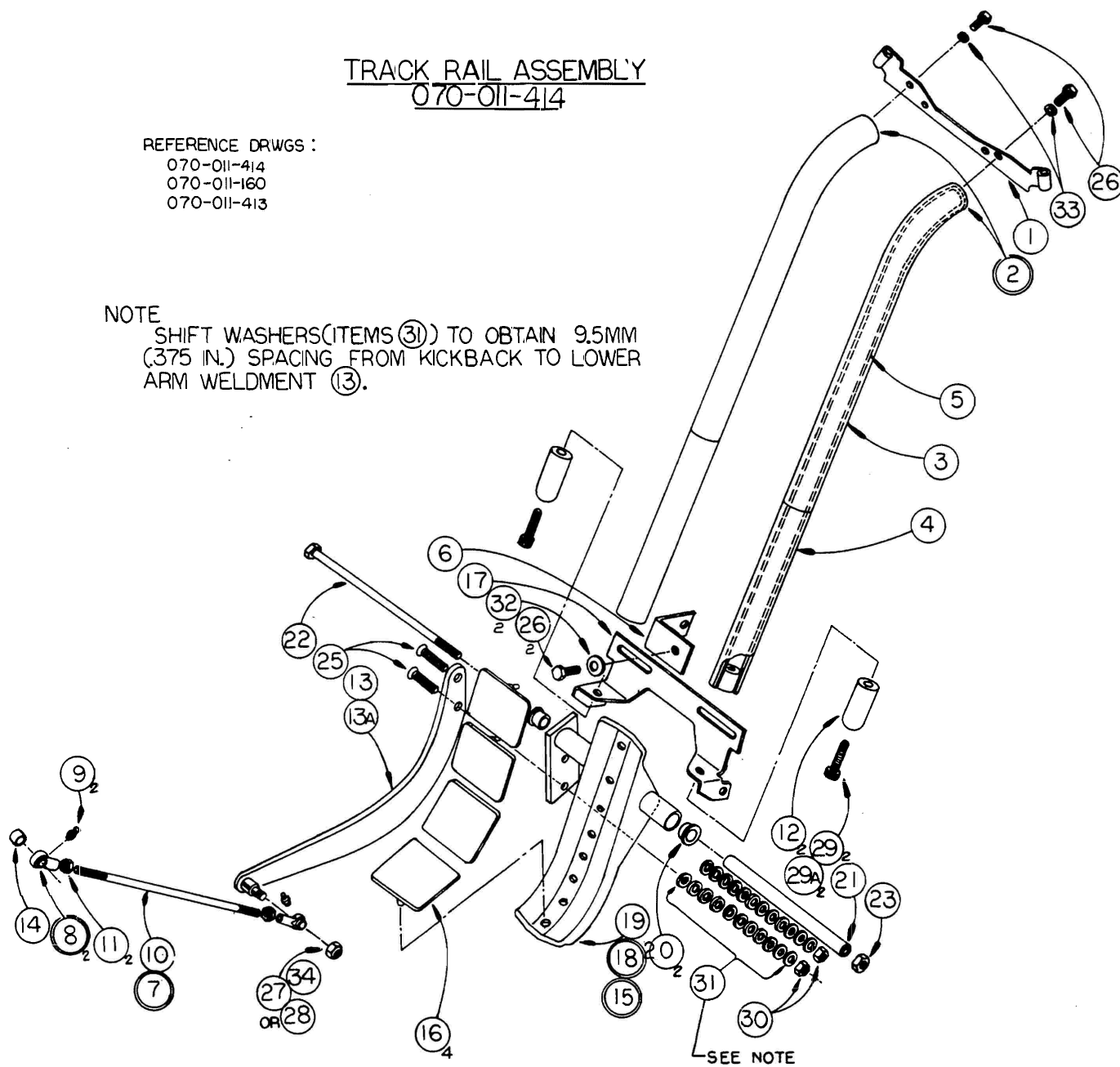
Items 27 or 28 are replaced by an Esna Nut after 1-78.

Part #838 866 002 - Nut Esna Hex Thin $\frac{3}{8}$ -24 Item 34

TRACK RAIL ASSEMBLY 070-011-414

REFERENCE DRWGS :
070-011-414
070-011-160
070-011-413

NOTE
SHIFT WASHERS (ITEMS 31) TO OBTAIN 9.5MM
(.375 IN.) SPACING FROM KICKBACK TO LOWER
ARM WELDMENT 13.

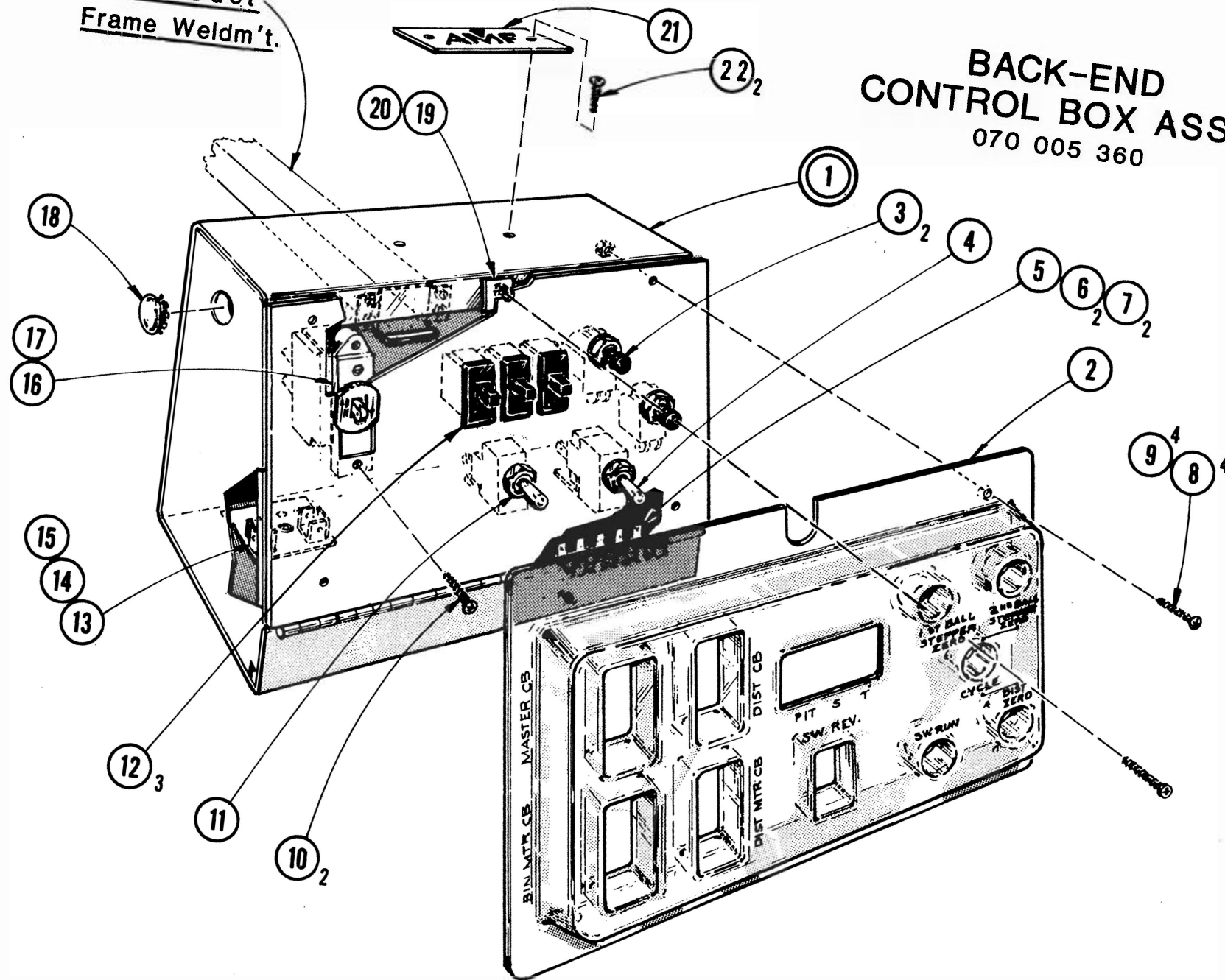


BACK END CONTROL BOX

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-005-355	Box Weldment, Control Box Ass'y.	14	818-233-122	Screw, Sems Rnd. Hd. 8-32 x ¾" Lg.
2	070-005-361	Cover (Safety), Control Box Ass'y.	15	843-133-002	Nut, Kep - Ext L.W. 8-32
3	000-025-865	Switch, Plunger (Single Pole)	16	070-009-821	Circuit Breaker, Special Used with Item 91 Page 97 & 99
4	070-005-529	Switch (Double Pole) Incl. Lockwasher	16a	000-025-292	Circuit Breaker, Used When Item 91, Pg. 97 & 99 Not Used
5	760-600-002	Term. Strip, Ark-les 3000M	17	070-009-823	Circuit Breaker - Adapter Pit.
6	817-921-080	Screw, Sems Rnd. Hd. 4-40 x ½" Lg	18	000-029-012	Plug Button
7	843-121-002	Nut, Kep 4-40	19	724-511-006	Nut, Tinnerman - C1314 832-4 Type "U" Speed
8	818-227-082	Screw, Sems Rnd. Hd. 6-32 x ½" Lg.	20	818-233-082	Screw, Sems Rnd. Hd. 8-32 x ½
9	843-127-002	Nut, Kep 6-32	21	070-006-655	Logo Plate
10	818-227-042	Screw, Sems Rd. Hd. 6-32 x ¼" Lg.	22	829-905-042	Screw, Selftap "0" x ¼" Lg. Type "U"
11	070-005-530	Switch			
12	000-026-037	Switch - Toggle			
13	000-021-217	Term Block			

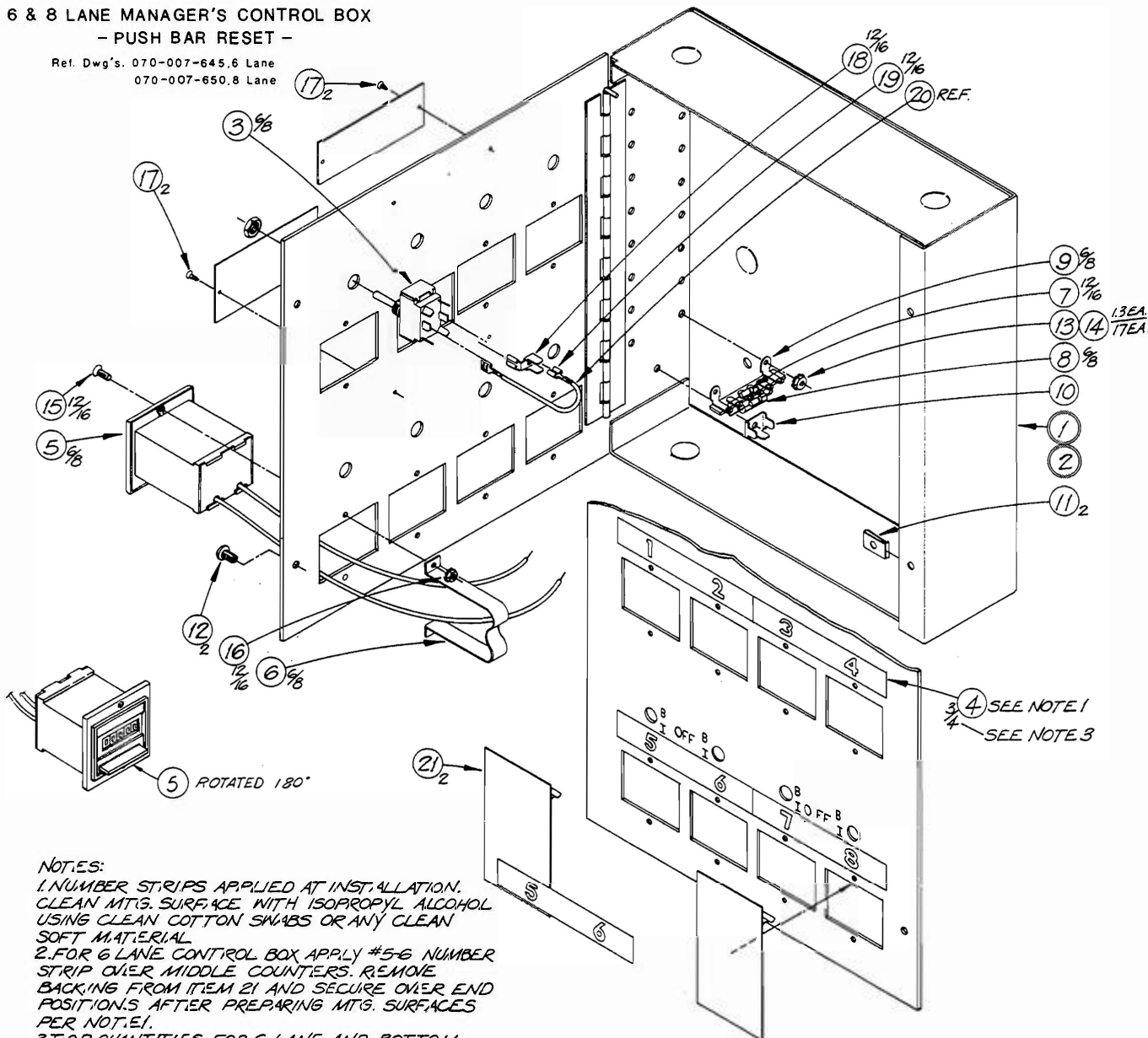
Cable Duct
Frame Weldm't.

BACK-END CONTROL BOX ASS'Y. 070 005 360



6 & 8 LANE MANAGER'S CONTROL BOX - PUSH BAR RESET -

Ref. Dwg's. 070-007-645, 6 Lane
070-007-650, 8 Lane



NOTES:

1. NUMBER STRIPS APPLIED AT INSTALLATION. CLEAN MTS. SURFACE WITH ISOPROPYL ALCOHOL USING CLEAN COTTON SWABS OR ANY CLEAN SOFT MATERIAL.
2. FOR 6 LANE CONTROL BOX APPLY #5-6 NUMBER STRIP OVER MIDDLE COUNTERS. REMOVE BACKING FROM ITEM 21 AND SECURE OVER END POSITIONS AFTER PREPARING MTS. SURFACES PER NOTE 1.
3. TOP QUANTITIES FOR 6 LANE AND BOTTOM QUANTITIES FOR 8 LANE.

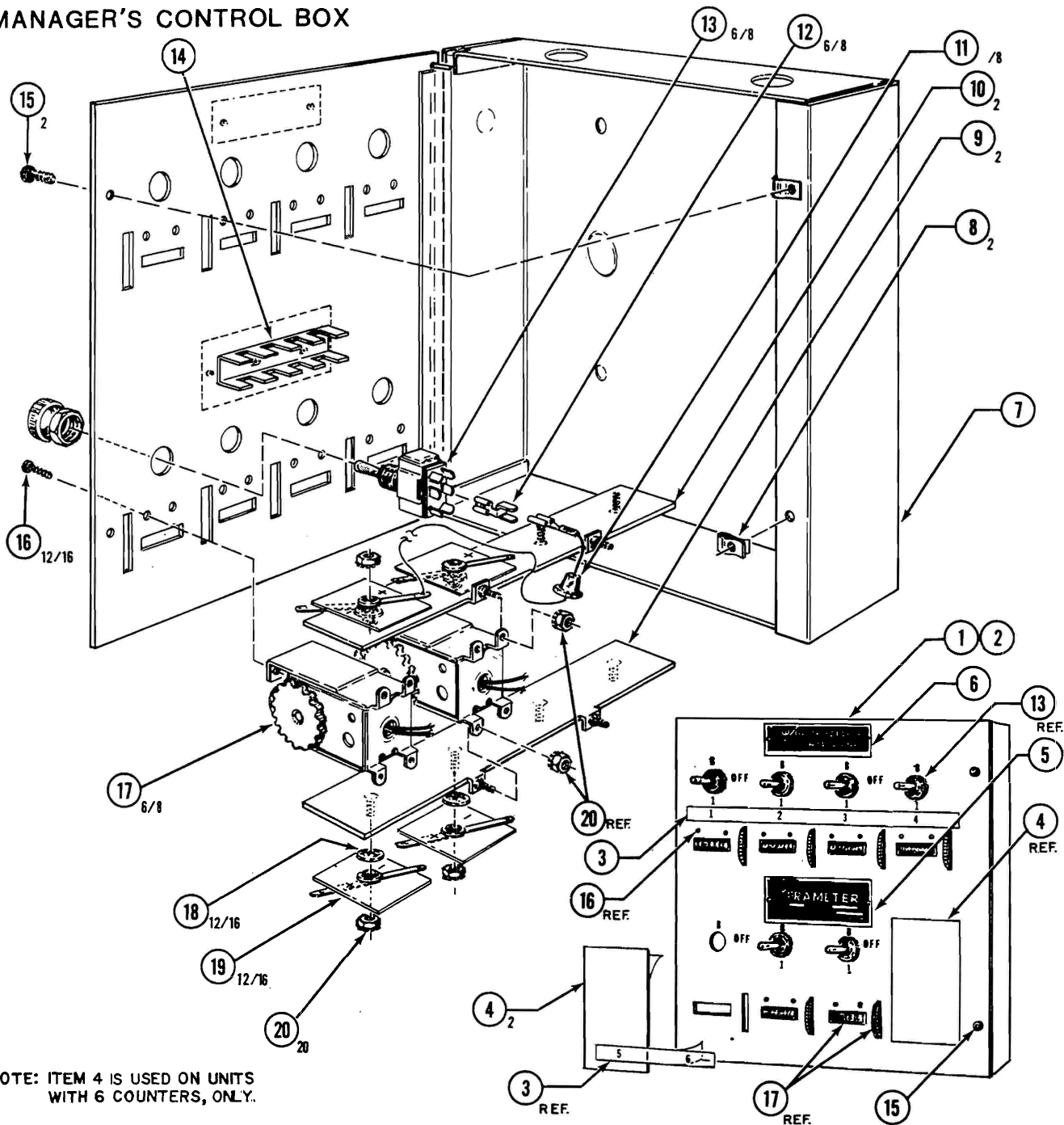
Manager's Control Box - Push Bar Reset

Ref. Dwgs. 070-007-645, 6 Lane

Ref. Dwgs. 070-007-650, 8 Lane

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	610 700 131	6 Unit Framemeter Push Bar	12	808 539 060	But. Hd. Soc. Scr. - #10-24x $\frac{3}{8}$
2	610 700 132	8 Unit Framemeter Push Bar	13	813 327 062	Sl. Pan Hd. Scr. #6-32 x $\frac{3}{8}$
3	000 028 078	Switch	14	843 127 002	Kep Nut #6-32
4	000 024 953	Number Strip	15	812 021 061	Fl. Hd. Scr. - Blk Oxide #4-40 x $\frac{3}{8}$
5	070 007 643	Counter Push Bar	16	843 121 002	Kep Nut #4-40
6	070 008 129	Support Bracket	17	829 912 042	Drive Scr. - Ty. "U" - Cad. Plt. #2 x $\frac{1}{4}$ Lg.
7	070 007 569	Diode-1N4384	18	760 001 070	Terminal Chair (Arkless 3000S-5-1)
8	000 026 837	Capacitor-50UF-50VDC	19	760 017 045	Terminal Amp #41969
9	760 600 011	Term. Strip (Cinch Jones #54A)	20	010 100 309	Wire - 22GA - 300V. -White
10	760 010 089	Terminal (Ark-Less #3000M48L)	21	070 007 614	Cover Plate
11	724 508 046	Tinnerman Nut-C-8046-1024-27			

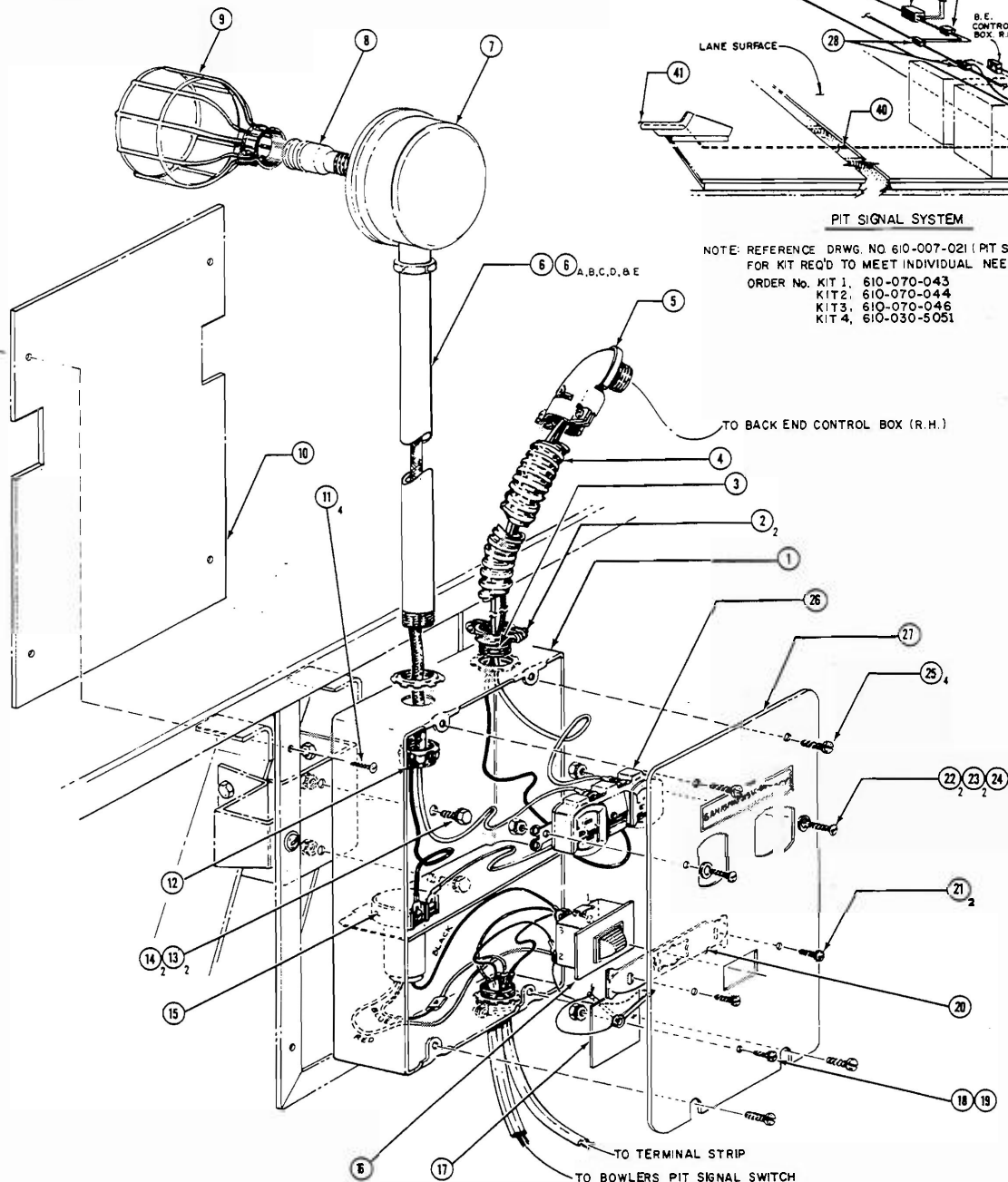
MANAGER'S CONTROL BOX



ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070 005 315	Managers Control (6 Unit)-Thumb-wheel Counter, No Longer Available Order 610 700 131 Managers Control (6 Unit) Push Bar Counter	9	000 026 827	Bracket (Lower) (No Longer Avail.)
2	070 005 320	Managers Control (8 Unit)-Thumb-wheel Counter, No Longer Available Order 610 700 132 Managers Control (8 Unit) Push Bar Counter	10	000 026 828	Bracket (Upper) (No Longer Avail.)
3	000 024 953	Number Strip - Specify Number Req'd. Per No. Of Lanes	11	070 005 562	Rectifier Ass'y.
4	070 007 614	Cover (Used on 6 Counter Units Only)	12	760 001 070	Terminal Adaptor, Chair/Brass Switch
5	000 027 179	Name Plate (No Longer Available)	13	000 028 078	Terminal Strip
6	000 025 363	Name Plate (No Longer Available)	14	760 600 002	Screw, Button Hd. Soc. Cap 10-24 x 3/8" L.G.
7	000 026 170	Box Ass'y. (No Longer Available)	15	808 539 060	Screw, Pan Hd. Ph. 4-40 x 3/8" L.G.
8	724 508 046	Speed Nut (Tinnerman-Type J 1024-27-C 8046)	16	813 321 062	Thumbwheel Counter-No Longer Available-Order Kit 610 704 113 (Conversion To Push Bar Counter).
			17	000 026 165	Lockwasher, #1206 Shakeproof
			18	959 600 002	Rectifier
			19	000 026 830	Nut, Keps 6-32
			20	843 127 002	

NOTE: Two Quantity Nos. Beside The Item No. Indicates The Difference In Requirements For The 6 Or 8 Counter Unit. The Lesser Number Represents The 6 Counter Unit.

Pit Signal System



ITEM	PART NUMBER	DESCRIPTION
1	741 008 008	Electrical Box
2	746 001 015	Connector, Str./Locknut Included
3	741 510 200	Bushing, Anti-Short - 1/4" Dia.
4	905 064 000	Conduit, Flex-1/2" Dia. (70 & 3000 Mach. Only)
5	746 003 008	Connector, 90°-1/2" Dia. (70 & 3000 Mach. Only)
6	070 005 498	Lamp Mast Conduit, 1/2" Dia. (70 & 3000 Mach. Only)
6A	030 004 845	Lamp Mast Conduit, 1/2" Dia. (30 Mach. Only)
6B	744 101 020	Clamp (30 Mach. Only) Not Shown
6C	744 101 021	Clamp Back (30 Mach. Only)
6D	810 250 200	Screw, Soc. Hd. Cap., 1/4-28 x 1 1/4" LG. (30 Mach. Only) Not Shown
6E	844 050 002	Nut, 1/4-28 (30 Mach. Only) Not Shown
7	770 012 012	Unilet
8	000 024 695	Socket, Lamp
9	770 006 006	Lamp Guard
*10	000 024 694	Cover (Safety)
*11	828 133 082	Screw, Rnd. Hd. Tap #8 x 1/2" LG.
12	741 520 301	Bushing, Conduit- 1/2" Dia. T & B.
13	809 849 125	Screw, Hex. Hd. Gr. 8, 1/4-20 x 3/4 LG.
14	844 049 002	Nut, Hex Stover 1/4-20
15	000 026 509	Relay
16	000 024 823	Momentary Switch
17	000 026 508	Rectifier
18	808 533 120	Screw, Button Hd. Soc. 8-32x3/4" LG.

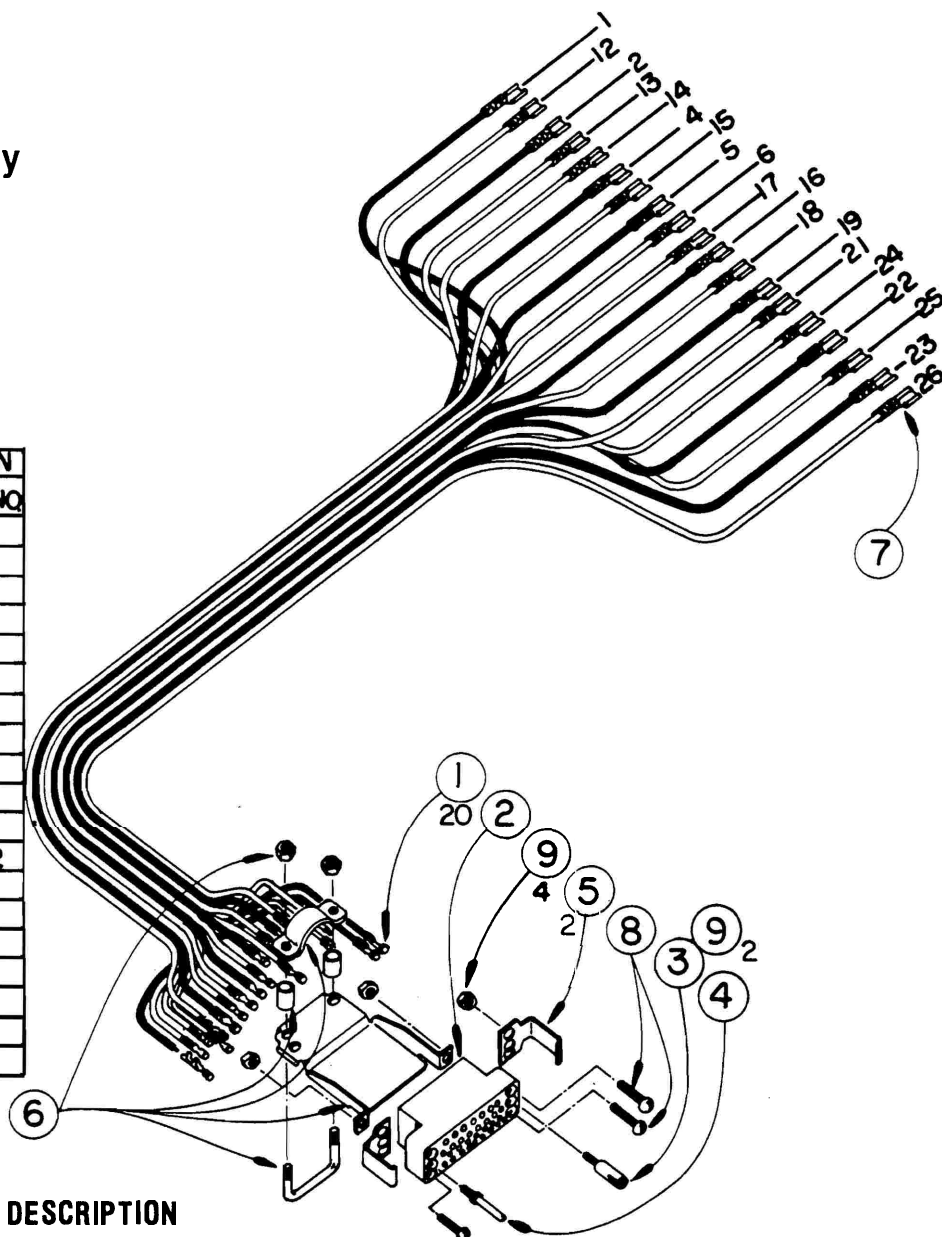
ITEM	PART NUMBER	DESCRIPTION
19	843 133 002	Nut, Keps 8-32
20	744 104 005	Strap
21	818 227 042	Screw, Sems 6-32 x 1/4" LG.
22	812 827 062	Screw, Rnd. Hd. 6-32 x 3/4" LG.
23	948 631 062	Washer, Plain 1/2" I.D. x 1/2" O.D. x .046 TH.
24	840 027 002	Nut, Lock 6-32
25	813 240 082	Screw, Pan Hd. Mach. 10-32 x 1/2" LG.
26	000 024 822	Duplex Outlet
27	000 024 803	Cover, Electrical Box
28	000 026 512	Terminal Block
29	000 026 514	Transformer
30	000 026 509	Relay
31	000 026 837	Capacitor
32	000 023 700	Bell, 4"
33	000 026 515	Bell Relay
34	000 028 024	Box, Fustat
35	000 026 709	Cover & Switch (Fustat Box)
36	000 026 710	Fustat
37	000 026 711	Adaptor
38	208 111 296	Decal (Fuse Rating)
39	070 005 360	Backend Control Box R. H. (Ref)
40	000 029 962	Mast Lamp Ass'y.
41	000 024 946	Two (2) Conductor Cable

Note: Asterisk () Indicates Items Req'd. When The P.S.S. Is Not Used.

C-1 Cable Assembly

070 006 473

WIRE NO.	COLOR	DESTINATION PIN NO.	T.S. NO.
1	BLACK	42 H	18
2	BLACK	41 C	18
4	BLACK	46 AA	19
5	BLACK	45 W	19
6	BLUE	19 NN	35
12	YLLW	33 K	12
13	PURPLE	23 N	27
14	BLUE	24 T	23
15	WHITE	13 L	1A1
16	BLACK	22 J	7
17	BLUE	21 D	1A1
18	GRAY	28 LL	TSG2
19	BLACK	47 EE	18
21	RED	44 S	8
22	BLACK	36 Y	3
23	BLACK	31 A	22
24	WHITE	16 Z	17
25	RED	32 E	20
26	WHITE	34 P	17



ITEM	PART NUMBER	DESCRIPTION
1	760-019-201	Socket, .062 Series (AMP)
2	000-025-144	Male Block (34 Pin)
3	000-028-441	Guide, Socket
4	000-028-442	Guide, Pin
5	000-029-013	Locking Spring Clip
6	000-029-093	Strain Relief Clamp Assembly
7	760-017-035	Terminal, Straight Faston (AMP)
8	813-321-062	Screw, Pan Hd. (#4-40 x 3/8 Lg.)
9	834-821-000	Nut, Hex (#4-40)
10	010-100-200	Wire 18 Ga. 600V Black (State Length)
11	010-100-202	Wire 18 Ga. 600V Red (State Length)
12	010-100-204	Wire 18 Ga. 600V Yellow (State Length)
13	010-100-206	Wire 18 Ga. 600V Blue (State Length)
14	010-100-207	Wire 18 Ga. 600V Violet (State Length)
15	010-100-208	Wire 18 Ga. 600V Grey (State Length)
16	010-101-300	Wire 16 Ga. 600V Black (State Length)
17	010-101-302	Wire 16 Ga. 600V Red (State Length)
18	010-101-306	Wire 16 Ga. 600V Blue (State Length)
19	010-101-309	Wire 16 Ga. 600V White (State Length)

SWEEP AND TABLE CAM SWITCH ASSEMBLY

Ref. Dwg. 070-006-420 & 070-006-452

ITEM	PART NUMBER	DESCRIPTION
1	000-021-575	Insulator
2	000-021-645	Switch Lever
3	000-021-714	Adjusting Screw
4	000-024-657	Spring
5	000-026-042	Switch
6	000-026-401	Shaft
7	000-026-419	Housing Weldment
8	744-203-014	Nyloclip - Burndy HP6N
9	818-227-402	Screw, Sems Rd. Hd. (#6-32 x 2½ Lg.)
10	818-233-082	Screw, Sems Rd. Hd. (#8-32 x ½ Lg.)
11	835-550-002	Nut, Hex Jam (¼-28)
12	843-127-002	Nut, Keps (#6-32)
13	843-133-002	Nut, Keps (#8-32)
14	963-200-002	"X" Washer (9000-8)

WIRE HARNESS

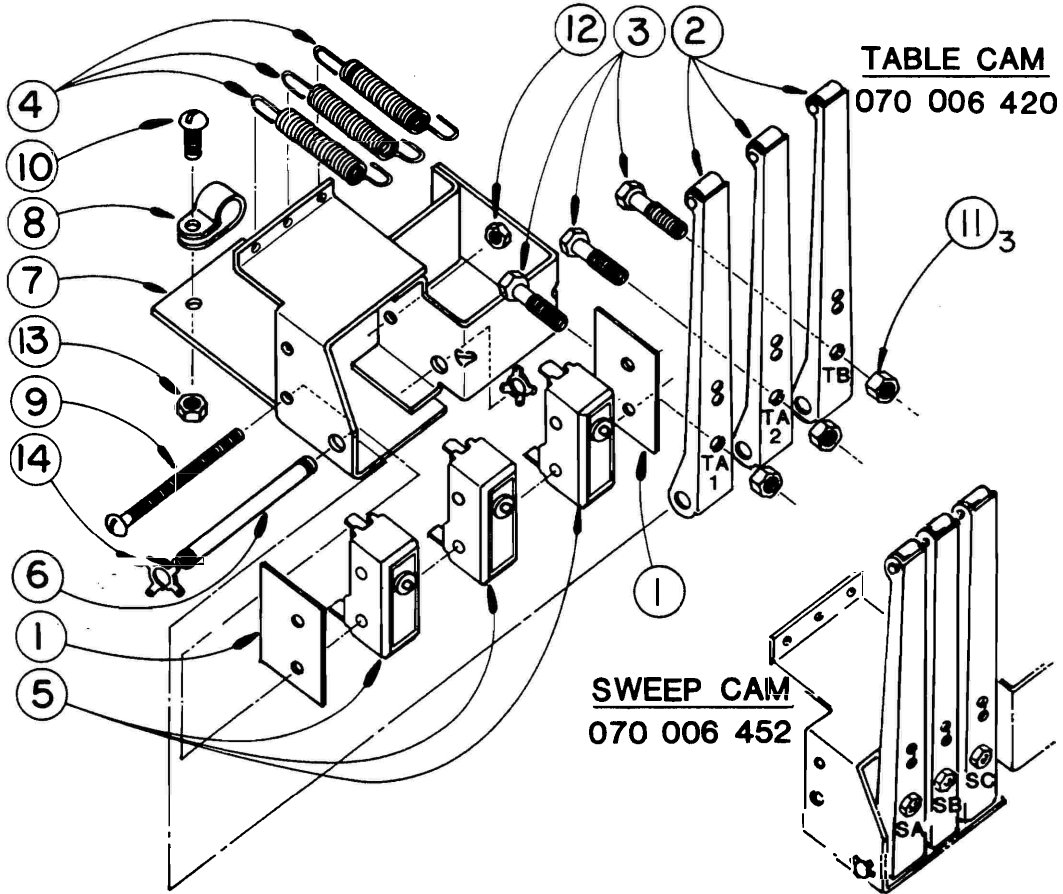
SWEEP CAM SWITCH & TABLE CAM SWITCH

Reference Drawings 070-006-452 & 070-006-420

ITEM	PART NUMBER	DESCRIPTION
1	940-268-160	Aphlex Tubing PVC 105 (7/16 x 1'-8" Lg. State Length)
2	760-006-042	Terminal, Flag (AMP 41532 Fast-On)
3	760-017-035	Terminal, Straight (AMP #41274)
4	010-100-200	Wire 18 Ga. Stranded 600V Black (State Length)
5	010-100-201	Wire 18 Ga. Stranded 600V Brown (State Length)
6	010-100-202	Wire 18 Ga. Stranded 600V Red (State Length)
7	010-100-204	Wire 18 Ga. Stranded 600V Yellow (State Length)
8	010-100-205	Wire 18 Ga. Stranded 600V Green (State Length)
9	010-100-206	Wire 18 Ga. Stranded 600V Blue (State Length)
10	010-100-207	Wire 18 Ga. Stranded 600V Violet (State Length)
11	010-100-208	Wire 18 Ga. Stranded 600V Gray (State Length)
12	010-100-209	Wire 18 Ga. Stranded 600V White (State Length)
13	010-100-212	Wire 18 Ga. Stranded 600V Pink (State Length)

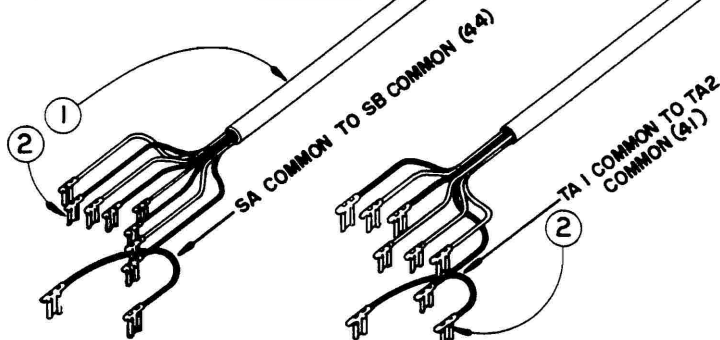
SWEEP AND TABLE CAM SWITCH ASSEMBLY

REFERENCE DRAWINGS 070 006 420 & 070 006 452



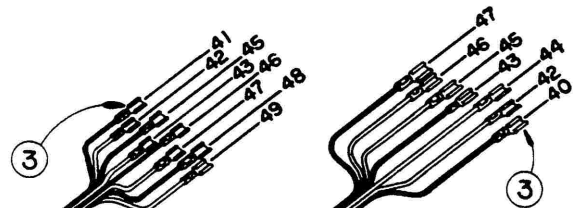
WIRE NO.	COLOR	DESTINATION
49	WHITE	SA(N.C.) TO TS(31)
48	BRWN	SB(N.C.) TO TS(16)
47	RED	SB(N.O.) TO TS(1A2)
46	GREEN	SC(COM) TO TSA(1)
45	BLACK	SA(COM) TO TS(15)
43	PINK	SC(N.O.) TO TS(61)
42	YLLW	SC(N.C.) TO TS(9)
41	BLUE	SA(N.O.) TO TS(14)

WIRE HARNESS
SWEEP CAM SWITCH
REFERENCE DRAWING 070 006 452



WIRE HARNESS
TABLE CAM SWITCH
REFERENCE DRAWING 070 006 420

WIRE NO.	COLOR	DESTINATION
47	GREEN	TB(N.O.) TO TSA(5)
46	BLUE	TA-2(N.C.) TO TS(33)
45	GRAY	TA-2(N.O.) TO TS(32)
44	PINK	TA-1(N.C.) TO TS(30)
43	PURPLE	TA-1(N.O.) TO TS(10)
42	BRWN	TB(COM) TO TS(61)
40	BLACK	TA-1(COM) TO TS(15)



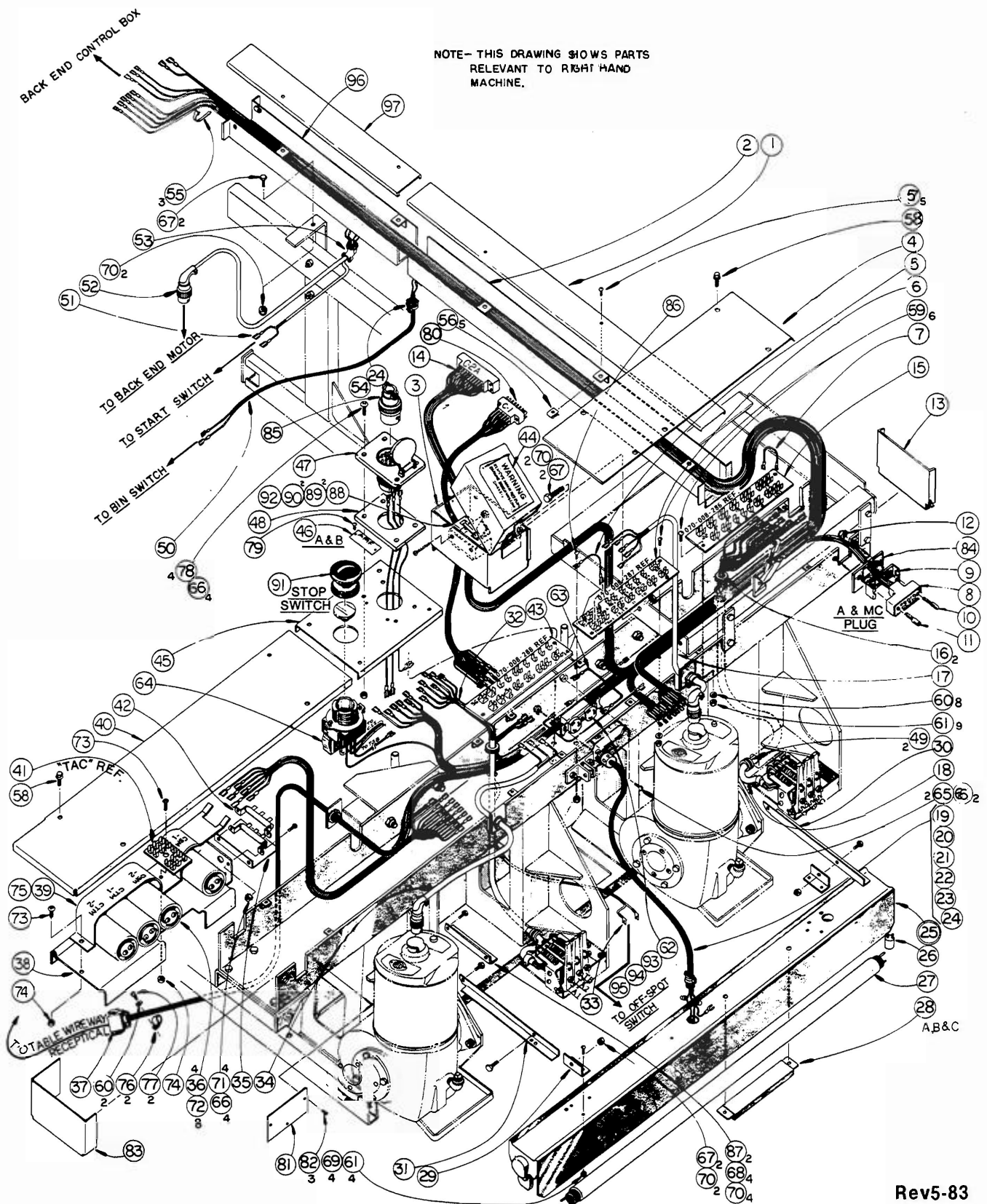
FRONT END ELECTRICAL INSTALLATION

Reference Drwgs. 070-006-469

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-007-747	Cover, Cable Duct.	52	070-005-094	Cable Ass'y., B.E. Motor
2	070-007-748	Frame Weldment, Cable Duct.	53	746-003-008	Connector - 90° (T & B 266)
3	070-005-570	Box Weldment, Plug Duct.	54	746-007-002	Connector, Insulated (AMP 231235) (Splice)
4	070-005-472	Cover, Cross Beam-R.H.	55	770-011-010	Ty-Rap (T & B-528)
5	070-005-609	Wire Ass'y. (TSA-5 To Ground)	56	724-511-074	"U" Nut, Tinnerman #10-32
6	070-007-287	Terminal Strip	57	812-840-082	Screw, Rnd. Hd., #10-32 x 1/2" Lg.
7	070-005-605	Wire Ass'y. (TS-1A1 To TS-17)	58	826-032-060	Screw, Hex Washer Hd. (Tap-Tite) #8-32 x 3/8" Lg.
8	000-025-078	Block, Female (14 Pin)	59	818-233-122	Screw, Sems Rnd. Hd. #8-32 x 3/4" Lg.
9	000-025-556	Locking Spring Catch	60	948-637-682	Washer, Pln. (7/16 O.D.x3/16 I.D.)
10	000-028-442	Guide Pin	61	843-133-002	Nut, Keps - #8-32
11	000-028-441	Guide Socket	62	070-007-115	Receptical (Twist Lock) Ass'y.
12	834-621-000	Nut, Hex-#4-40 Brass	63	070-005-608	Wire Ass'y. (Green) Recp't To Ground
13	070-005-531	End Plate (Cable Duct Side)	64	746-605-011	Contact Block
14	070-006-498	C-2A Harness Ass'y. R.H.	65	818-227-082	Screw, Sems Rnd. Hd. #6-32x 1/2" Lg.
15	070-007-286	Terminal Strip	66	843-127-002	Nut, Keps #6-32
16	711-520-017	Grommet (ATL. #2764)	67	809-849-085	Screw, Hex Hd. Cap -1/4-20 N.C. x 1/2" Lg.
17	070-005-542	Cable Ass'y., Sweep Motor	68	809-849-125	Screw, Hex Hd. Cap -1/4-20 N.C. x 3/4" Lg.
18	See Pg. 95	Cable Ass'y., Sweep Cam Switch	69	812-833-062	Screw, Rnd. Slot Hd.-Mach.-#8-32 x 3/8" Lg.
19	010-102-210	Cable, Pit Light (35") 18 Ga-3 Cond So.	70	849-044-002	Nut, Hex Lock-1/4-20 N.C., Stover
20	754-020-312	Plug, Twist Lock	71	818-227-042	Screw, Sems Rnd. Hd. #6-32x 1/4" Lg.
21	760-015-039	Terminal, Flat Spade AMP #41473	72	813-340-042	Screw, Pan Slot Hd. Mach. #10-32x 1/4" Lg.
22	742-503-004	Splice Cap, Closed End	73	818-239-122	Screw, Sems Rnd. Hd. #10-24 x 3/4" Lg.
23	742-502-002	Insulator, Splice Cap	74	839-539-002	Nut, Flex-Loc #10-24
24	746-001-016	Straight Connector (T & B 330)	75	070-005-639	Decal (CSM-1, CSM-2, CTM-1 & CTM-2)
25	000-021-652	Pit Light Ass'y.	76	744-203-014	Nylo Clip (Bundy HP-6N)
26	000-027-444	Starter (FS-4 30-40 W.)	77	827-237-062	Screw, Rnd. Phil. Hd. Self-Tapping #6-32 x 3/8" Lg. "D"
27	751-001-429	Fluorescent Light (T8-30W) 60 Hz	78	812-627-122	Screw, Rnd. Phil Hd.-#6-32x3/4" Lg.
27a	751-001-423	Fluorescent Light (T12-30W) 50 & 60 Hz	79	829-905-042	Screw, Drive-Type "U", 1/4" Lg.
28a	740-501-001	Ballast - 120V, 60 Hz	80	070-006-473	Cable Ass'y., C-1
28b	740-503-002	Ballast - 230V, 50 Hz	81	070-006-781	Cover Plate
28c	740-502-003	Ballast - 120V, 50 Hz	81a	070 009 828	Cover Plate (Wide)
28d	740-501-005	Ballast - 120V, 60 Hz, 30/40w Rapid Start (T12)	82	826-149-062	Screw, Hex Hd. Self Tapping - 1/4-20 N.C. x 3/8" Lg. Type "D"
28e	740-501-007	Ballast - 230V, 50 Hz, 30/40w Rapid Start (T12)	83	070-007-377	End Plate, Channel L.H. For R.H. Mach.
28f	740-501-006	Ballast- 118V, 50/60 Hz, 30/40w Rapid Start (T12)	84	070-006-782	Mtg. Plate, A & M C Plug
29	070-007-370	Angle, Pit Light Mount	84a	070 009 829	Mounting Plate, A & MC (Wide)
30	070-001-907	Angle, R.H. Pit Light Mt.	85a	754-010-336	Power Plug, 115V (Plastic)
31	070-001-908	Angle, L.H. Pit Light Mt.	85b	754-010-337	Power Plug, 230V (Plastic)
32	See Pg. 95	Cable & Ass'y., Table Cam Switch	85c	000-023-265	Power Plug, 115V (Metal) (Shown)
33	070-005-534	Cable Ass'y., Off-Spot Switch	86	818-233-082	Screw, Rnd. HD, Sems #8-32 x 1/2" Lg.
34	070-007-751	Cable Ass'y., Table Motor	87	070-001-698	Angle, Pit Light
35	000-025-576	Barrier	88	000-026-247	Switch, C.I.S.
36	743-000-020	Capacitor 460-552 MFD-110 V.A.C.	89	813-227-162	Screw, Pan Hd. Phil. #6-32 x 1" Lg.
37	070-005-604	Cable Ass'y., Table	90	839-537-002	Nut, Flex Loc #6-32
38	070-005-219	Capacitor Bracket	91	759-517-051	Switch, (HSG. OPERATOR)
39	070-005-217	Strap	92	000-022-296	Insulator
40	070-005-465	Cover, Cross Beam (L.H.)	93	070-005-607	Wire Ass'y. White
41	000-025-603	Terminal Board - "TAC"	94	070-005-606	Wire Ass'y. Red
42	916-931-256	Resistor (1250)	95	755-010-303	Receptacle - Twist Lock
43	070-007-288	Terminal Strip	96	070-007-746	Cable Duct Extension
44	070-011-633	Decal, Warning	97	070-007-745	Cover Cable Duct Extension
45	070-005-466	Cover, Cross Beam (Center)			
46a	070-008-140	Plate, Serial No. - 60 Hz			
46b	070-001-992	Plate, Serial No. - 50 Hz			
47	755-020-360	Power Plug Receptacle (Plastic) 230V			
47a	755-020-359	Power Plug Receptacle (Plastic) 115V			
47b	000-024-719	Power Plug Receptacle (Metal)			
48	070-005-539	Spacer			
49	711-520-021	Grommet (Atlantic 2864)			
50	070-006-272	Cable Ass'y., Bin Switch			
51	070-005-521	Cable Ass'y., Start Switch			

REV. 5/86

FRONT END ELECTRICAL INSTALLATION
REFERENCE DRAWING 070 006 469



Rev5-83

Note: New Lamp (T-12) will not work
with items 28A, 28B & 28C.

FRONT END ELECTRICAL INSTALLATION

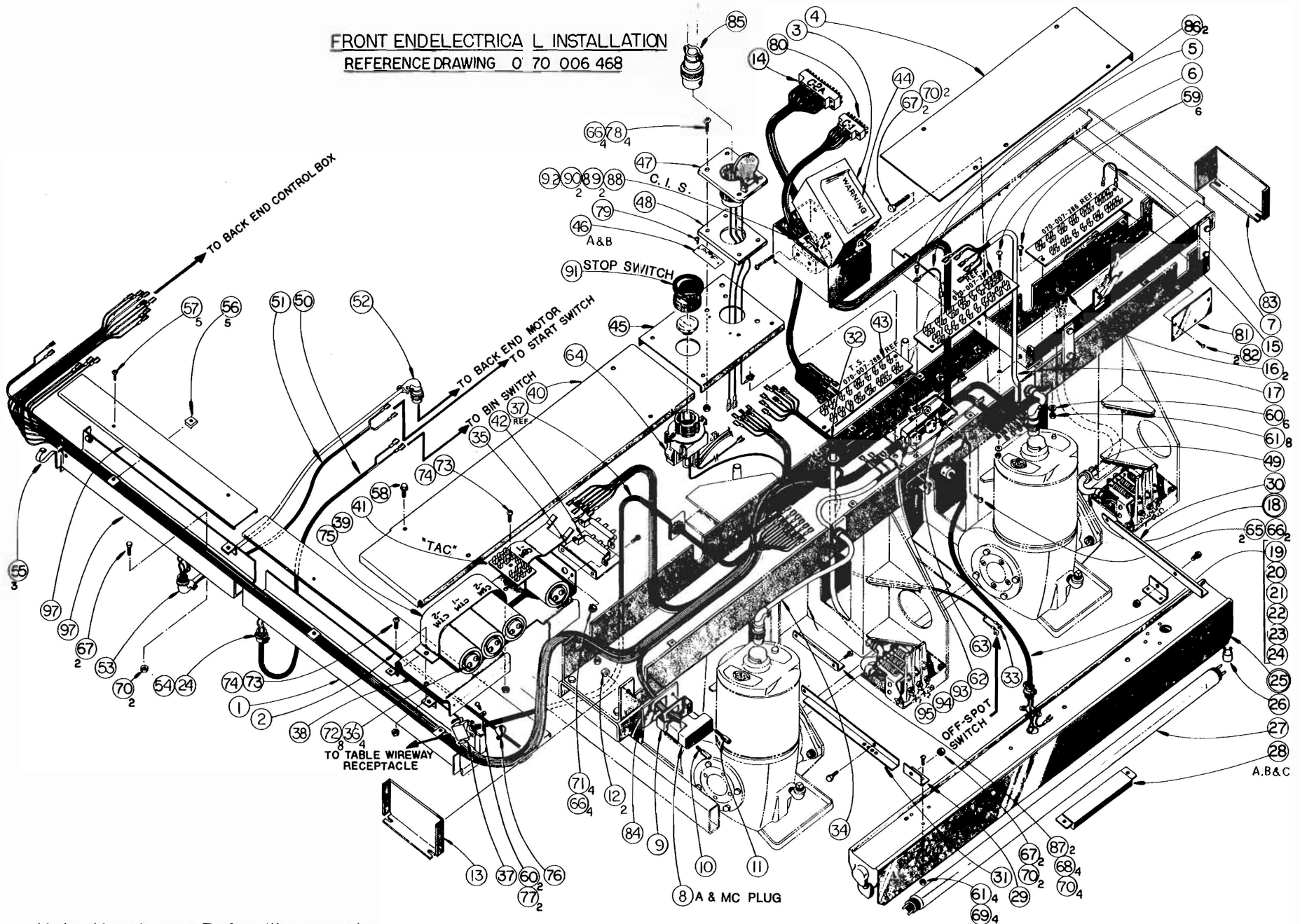
Reference Drawing 070-006-468

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-007-747	Cover, Cable Duct.	52	070-005-094	Cable Ass'y, B.E. Motor
2	070-007-748	Frame Weldment, Cable Duct.	53	746-003-008	Connector - 90° (T & B 266)
3	070-005-570	Box Weldment, Plug Duct.	54	746-007-002	Connector, Insulated (AMP 231235) (Splice)
4	070-005-472	Cover, Cross Beam - R.H.	55	770-011-010	Ty-Rap (T & B - 528)
5	070-005-609	Wire Assembly (TSA-5 To Ground)	56	724-511-074	"U" Nut, Tinnerman #10-32
6	070-007-287	Terminal Strip	57	812-840-082	Screw, Rnd. Hd., #10-32 x 1/2" Lg.
7	070-005-605	Wire Ass'y. (TS-1A1 To TS-17)	58	826-032-060	Screw, Hex Washer Hd. (Tap-Tite) #8-32 x 3/8" Lg.
8	000-025-078	Block, Female (14 Pin)	59	818-233-122	Screw, Sems Rnd. Hd. #8-32 x 3/4" Lg.
9	000-025-556	Locking Spring Catch	60	948-637-682	Washer, Pln. (7/8 O.D. x 3/8 I.D.)
10	000-028-442	Guide Pin	61	843-133-002	Nut, Keps - #8-32
11	000-028-441	Guide Socket	62	070-007-115	Receptical (Twist Lock) Ass'y.
12	834-621-000	Nut, Hex - #4-40 Brass	63	070-005-608	Wire Ass'y. (Green) Recp't To Ground
13	070-005-531	End Plate (Cable Duct Side)	64	746-605-011	Contact Block
14	070-006-497	C-2A Harness Ass'y. L.H.	65	818-227-082	Screw, Sems Rnd. Hd. #6-32 x 1/2" Lg.
15	070-007-286	Terminal Strip	66	843-127-002	Nut, Keps #6-32
16	711-520-017	Grommet (ATL. #2764)	67	809-849-085	Screw, Hex Hd. Cap - 1/4-20 N.C. x 1/2" Lg.
17	070-005-542	Cable Ass'y., Sweep Motor	68	809-849-125	Screw, Hex Hd. Cap - 1/4-20 N.C. x 3/4" Lg.
18	See Page 95	Cable Ass'y., Sweep Cam Switch	69	812-833-062	Screw, Rnd. Slot Hd. - Mach. - #8-32 x 3/8" Lg.
19	010-102-210	Cable, Pit Light (35") 18 Ga-3Cond So.	70	844-049-002	Nut, Hex Lock - 1/4-20 N.C., Stover
20	754-020-312	Plug, Twist Lock	71	818-227-042	Screw, Sems Rnd. Hd. #6-32 x 1/4" Lg.
21	760-015-039	Terminal, Flat Spade AMP #41473	72	813-340-042	Screw, Pan Slot Hd. Mach. #10-32 x 1/4" Lg.
22	742-503-004	Splice Cap, Closed End	73	818-239-122	Screw, Sems Rnd. Hd. #10-24 x 3/4" Lg.
23	742-502-002	Insulator, Splice Cap	74	839-539-002	Nut, Flex-Loc #10-24
24	746-001-016	Straight Connector (T & B 330)	75	070-005-639	Decal (CSM-1, CSM-2, CTM-1 & CTM-2)
25	000-021-652	Pit Light Ass'y.	76	744-203-014	Nylo Clip (Bundy HP-6N)
26	000-027-444	Starter (FS-4 30-40 W.)	77	828-127-062	Screw, Rnd. Phil. Hd. Self-Tapping #6-32 x 3/4" Lg. "D"
* 27		Fluorescent Light	78	812-627-122	Screw, Rnd. Phil Hd. - #6-32 x 3/4" Lg.
* 28		Ballast	79	829-905-042	Screw, Drive - Type "U", 1/4" Lg.
29	070-007-370	Angle, Pit Light Mount	80	070-006-473	Cable Ass'y., C-1
30	070-001-907	Angle, R.H. Pit Light Mt.	81	070-006-781	Cover Plate
31	070-001-908	Angle, L.H. Pit Light Mt.	81a	070-009-828	Cover Plate (Wide)
32	See Page 95	Cable & Ass'y., Table Cam Switch	82	826-149-062	Screw, Hex Hd. Self Tapping - 1/4-20 N.C. x 3/8" Lg. Type "D"
33	070-005-534	Cable Ass'y., Off-Spot Switch	83	070-005-532	End Plate, Channel R.H. For L.H. Mach.
34	070-007-751	Cable Ass'y., Table Motor	84	070-006-782	Mtg. Plate, A & MC Plug
35	000-025-576	Barrier	84a	070-009-829	Mtg. Plate, A & MC Plug (Wide)
36	743-000-020	Capacitor 460-552 MFD - 110 V.A.C.	85a	754-010-336	Power Plug, 115V (Plastic)
37	070-005-604	Cable Ass'y., Table	85b	754-010-337	Power Plug, 230V (Plastic)
38	070-005-219	Capacitor Bracket	85c	000-023-265	Power Plug (Metal)
39	070-005-217	Strap	86	818-233-082	Screw, Rnd. HD. Sems #8-32 x 1/2" Lg.
40	070-005-465	Cover, Cross Beam (L.H.)	87	070-001-698	Angle, Pit Light
41	000-025-603	Terminal Board - "TAC"	88	000-026-247	Switch, C.I.S.
42	916-931-256	Resistor (1250 ohm)	89	813-227-162	Screw, Pan Hd. Phil. #6-32 x 1" L g.
43	070-007-288	Terminal Strip	90	839-537-002	Nut, Flex Loc #6-32
44	070-011-633	Decal, Warning	91	759-517-051	Switch, (HSG. OPERATOR)
45	070-005-466	Cover, Cross Beam (Center)	92	000-022-296	Insulator
46a	070-008-140	Plate, Serial No. - 60 Hz.	93	070-005-607	Wire Ass'y. White
46b	070-001-992	Plate, Serial No. - 50 Hz.	94	070-005-606	Wire Ass'y. Red
47a	000-024-719	Power Plug Receptacle (Metal)	95	755-010-303	Receptacle - Twist Lock
47b	755-020-359	Power Receptacle (Plastic)	96	070-007-746	Cable Duct Extension
48	070-005-539	Spacer	97	070-007-745	Cover Cable Duct Extension
49	711-520-021	Grommet (Atlantic 2864)			
50	070-006-272	Cable Ass'y., Bin Switch			
51	070-005-521	Cable Ass'y., Start Switch			

* See P 96 for Part Number and Description for Items 27 and 28.

REV. 5/86

FRONT ENDELECTRICAL INSTALLATION
REFERENCE DRAWING 0 70 006 468



Note: New Lamp (T-12) will not work
 with items 28A, 28B & 28C.

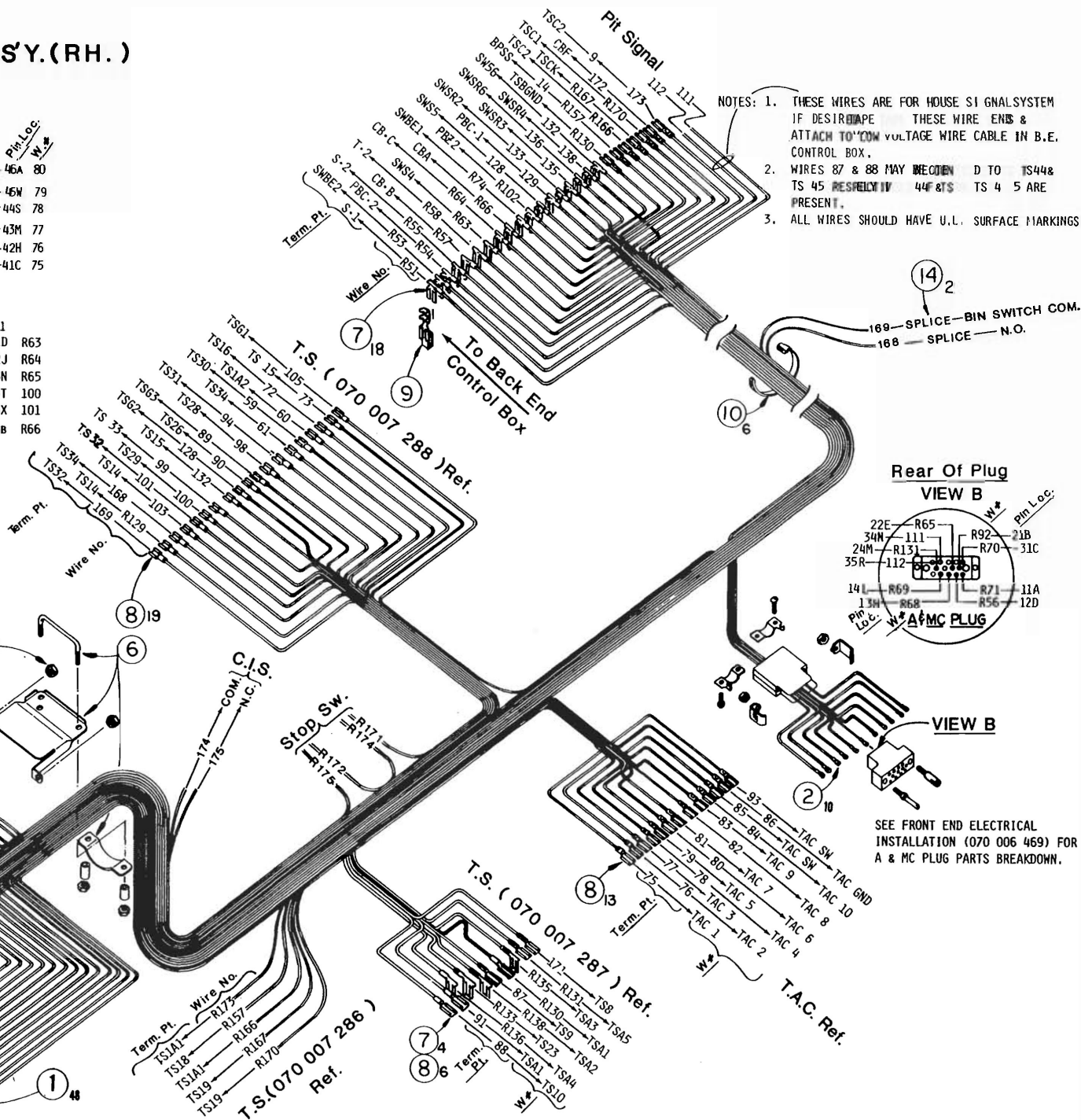
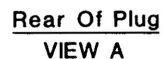
C-2A HARNESS ASSEMBLY

Reference Drawing 070-006-498 (Right Hand)

ITEM	PART NUMBER	DESCRIPTION
1	000-025-076	Pin, .062 Dia. AMP
2	000-025-077	Socket, .062 AMP
3	000-028-409	Male Block (50 Pin)
4	000-028-441	Guide Socket
5	000-029-013	Locking Spring Cup
6	000-029-896	Strain Relief Clamp Assembly
7	760-006-042	Terminal, Flag (Faston AMP)
8	760-017-035	Terminal, Straight (Faston AMP)
9	760-022-150	Terminal, Recp. & Tab Comb. (Faston)
10	770-011-029	Ty-Rap (TY 528)
11	813-321-062	Screw, Slot Hd. Mach. (#4-40 x $\frac{3}{8}$ " Lg.)
12	834-821-000	Hex Nut (#4-40)
13	951-020-000	Lockwasher (#4-40)
14	746-007-105	Connector - Faston Splice
15	010-101-300	Wire 16 GA Strand 600V Black (State Length)
16	010-101-302	Wire 16 GA Strand 600V Red (State Length)
17	010-101-304	Wire 16 GA Strand 600V Yellow (State Length)
18	010-101-305	Wire 16 GA Strand 600V Green (State Length)
19	010-101-306	Wire 16 GA Strand 600V Blue (State Length)
20	010-101-307	Wire 16 GA Strand 600V Purple (State Length)

ITEM	PART NUMBER	DESCRIPTION
21	010-101-309	Wire 16 GA Strand 600V White (State Length)
22	010-100-200	Wire 18 GA Strand 600V Black (State Length)
23	010-100-201	Wire 18 GA Strand 600V Brown (State Length)
24	010-100-202	Wire 18 GA Strand 600V Red (State Length)
25	010-100-203	Wire 18 GA Strand 600V Orange (State Length)
26	010-100-204	Wire 18 GA Strand 600V Yellow (State Length)
27	010-100-205	Wire 18 GA Strand 600V Green (State Length)
28	010-100-206	Wire 18 GA Strand 600V Blue (State Length)
29	010-100-207	Wire 18 GA Strand 600V Purple (State Length)
30	010-100-208	Wire 18 GA Strand 600V Grey (State Length)
31	010-100-209	Wire 18 GA Strand 600V White (State Length)
32	010-100-211	Wire 18 GA Strand 600V Tan (State Length)
33	010-100-212	Wire 18 GA Strand 600V Pink (State Length)

070 006 4 9 8



C-2A HARNESS ASSEMBLY

Reference Drawing 070-006-497 (Left Hand)

ITEM	PART NUMBER	DESCRIPTION
1	000-025-076	Pin, .062 Dia. AMP
2	000-025-077	Socket, .062 AMP
3	000-028-409	Male Block (50 Pin)
4	000-028-441	Guide Socket
5	000-029-013	Locking Spring Cup
6	000-029-896	Strain Relief Clamp Assembly
7	760-006-042	Terminal, Flag (Faston AMP)
8	760-017-035	Terminal, Straight (Faston AMP)
9	760-022-150	Terminal, Recp. & Tab Comb. (Faston)
10	770-011-029	Ty-Rap (TY 528)
11	813-321-062	Screw, Slot Hd. Mach. (#4-40 x $\frac{3}{8}$ " Lg.)
12	834-821-000	Hex Nut (#4-40)
13	951-020-000	Lockwasher (#4-40)
14	746-007-105	Connector - Faston Splice
15	010-101-300	Wire 16 GA Strand 600V Black (State Length)
16	010-101-302	Wire 16 GA Strand 600V Red (State Length)
17	010-101-304	Wire 16 GA Strand 600V Yellow (State Length)
18	010-101-305	Wire 16 GA Strand 600V Green (State Length)
19	010-101-306	Wire 16 GA Strand 600V Blue (State Length)
20	010-101-307	Wire 16 GA Strand 600V Purple (State Length)

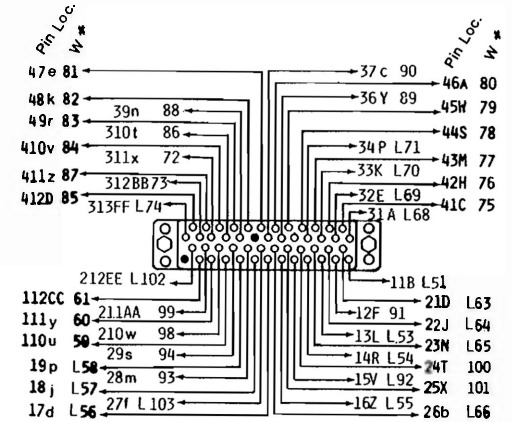
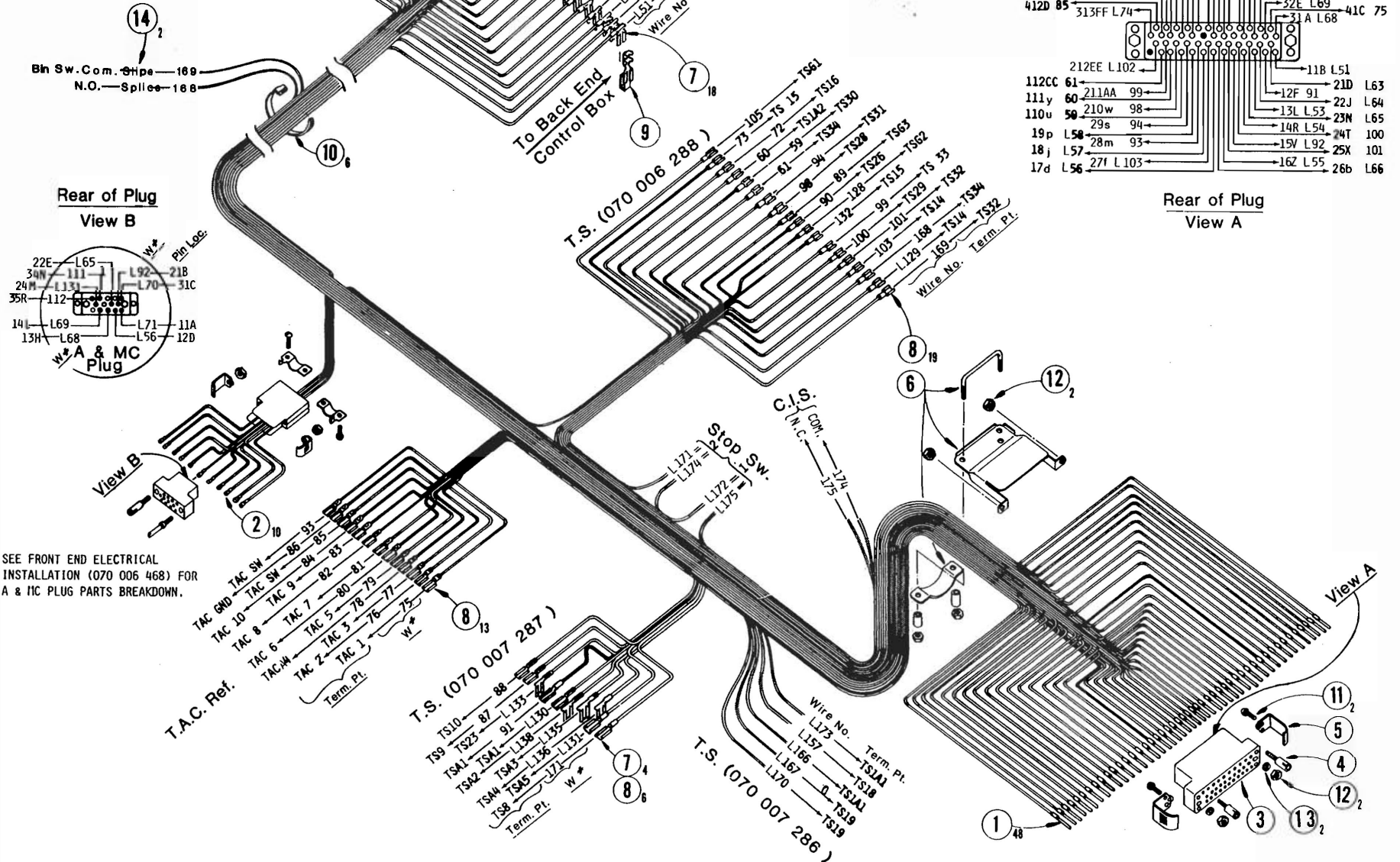
ITEM	PART NUMBER	DESCRIPTION
21	010-101-309	Wire 16 GA Strand 600V White (State Length)
22	010-100-200	Wire 18 GA Strand 600V Black (State Length)
23	010-100-201	Wire 18 GA Strand 600V Brown (State Length)
24	010-100-202	Wire 18 GA Strand 600V Red (State Length)
25	010-100-203	Wire 18 GA Strand 600V Orange (State Length)
26	010-100-204	Wire 18 GA Strand 600V Yellow (State Length)
27	010-100-205	Wire 18 GA Strand 600V Green (State Length)
28	010-100-206	Wire 18 GA Strand 600V Blue (State Length)
29	010-100-207	Wire 18 GA Strand 600V Purple (State Length)
30	010-100-208	Wire 18 GA Strand 600V Grey (State Length)
31	010-100-209	Wire 18 GA Strand 600V White (State Length)
32	010-100-211	Wire 18 GA Strand 600V Tan (State Length)
33	010-100-212	Wire 18 GA Strand 600V Pink (State Length)

C2-A HARNESS ASS'Y. (L.H.)

070 006 497

NOTES:

1. THESE WIRES ARE FOR HOUSE SIGNAL SYSTEM IF DESIRED. TAPE THESE WIRE ENDS & ATTACH TO LOW VOLTAGE WIRE AS LE IN B.E. CONTROL BOX.
2. WIRES 87 & 88 MAY BE CONNECTED TO TS33 & TS45 RESPECTIVELY IF TS 44 & TS 45 ARE PRESENT.
3. ALL WIRES SHOULD HAVE U.L. SURFACE MARKINGS.



Rear of Plug View A

SEE FRONT END ELECTRICAL INSTALLATION (070 006 468) FOR A & IIC PLUG PARTS BREAKDOWN.

CABLE & WIRE ASSEMBLIES

Table Cable Ass'y. 070-005-604

ITEM	PART NUMBER	DESCRIPTION
1	940-372-000	Sleeving (5'4" Lg.)
2	746-001-016	Connector, Straight (T & B #3302)
3	000-025-183	Clamp Washer
4	846-100-000	Locknut (T & B 141)
5	760-017-044	Terminal, Straight Faston (#41772)
6	000-025-077	Socket, Wire Terminal
7	000-025-049	Shield
8	000-025-557	Clip, Locking Spring
9	000-025-078	Contact Block (14 Pin)
10	000-028-441	Guide Socket (With nut & lockwasher)
11	000-028-442	Guide Pin (With nut & lockwasher)
12	010-100-100	18 Ga Str. Wire 300V - Black - Length 5' - 4"
13	010-100-108	18 Ga Str. Wire 300V - Grey - Length 5' - 4"
14	010-100-112	18 Ga Str. Wire 300V - Pink - Length 5' - 4"
15	010-100-105	18 Ga Str. Wire 300V - Green - Length 10' - 8" (2)
16	010-100-104	18 Ga Str. Wire 300V - Yellow - Length 10' - 8" (2)
17	010-100-111	18 Ga Str. Wire 300V - Tan - Length 5' - 4"
18	010-100-106	18 Ga Str. Wire 300V - Blue - Length 5' - 4"
19	010-100-101	18 Ga Str. Wire 300V - Brown - Length 5' - 4"
20	010-100-107	18 Ga Str. Wire 300V - Violet - Length 5' - 4"
21	010-100-103	18 Ga Str. Wire 300V - Orange - Length 5' - 4"
22	010-100-109	18 Ga Str. Wire 300V - White - Length 5' - 4"

Cable Assembly - Backend Motor 070-005-094

1	010-103-210	Cord, 16 Ga. (2) Conductor, 600V (3' - 3" Lg.)
2	760-017-035	Terminal, Straight Faston #41274
3	760-017-038	Terminal, Flat Spade #41473A
4	000-025-907	Plug, Female (2 pin)

TSA-5 To Ground Wire Assembly 070-005-609

1	010-100-205	Wire, #18 Ga. 600V, Green (0' - 4" Lg.)
2	760-017-035	Term, Faston - Straight AMP 41274
3	760-015-055	Term, Spring Spade AMP 60474-2

TS-1A1 To TS-17 Term - Wire Assembly 070-005-605

1	010-101-309	Wire, #16 Ga. 600V White 3" Lg.
2	760-017-035	Term, Faston - Straight AMP 41274

LT-3 To Ground, Wire Assembly 070-005-608

1	010-101-305	Wire, #16 Ga. 600V, Green (0' - 7" Lg.)
2	760-015-038	Term., Flat Spade AMP 41473A
3	760-015-055	Term., Spring Spade AMP 60474-2

Power Plug Harness

ITEM	PART NUMBER	DESCRIPTION
1a	754-010-336	Plug, Power 115V
b	754-010-337	Plug, Power 230V
2a	755-020-359	Receptical, Power 115V
b	755-020-360	Receptical, Power 230V
3	070-005-539	Spacer
4	812-627-122	Screw, Rnd. Hd. Phil. #6-32 x 3/4" Lg.
5	760-017-035	Term, Straight Faston
6	760-015-055	Term., Spring Spade

Respot Cable Assembly 070-005-536

1	010-102-410	Cord - 18 Ga. (2) Conductor 600V (2' - 9" Lg.)
2	760-017-035	Terminal, Straight Faston #41274
3	746-001-016	Connector, Straight (T & B #3302)
4	000-025-183	Clamp Washer
5	940-148-000	Thermofit Tubing (1" Lg.)

Spot Cable Assembly 070-005-535

1	010-102-410	Cord 18 Ga. (2) Conductor 600V. (3' - 1" Lg.)
2	760-017-035	Terminal, Straight Faston #41274
3	746-001-016	Connector, Straight (T & B #3302)
4	000-025-183	Clamp Washer
5	940-148-000	Thermo Fit Tubing (1/4" Dia. x 2 3/4" Lg.)

Off-Spot Cable Assembly 070-005-534

1	010-102-410	Cord, #18 Ga. (2) Conductor 600V (2' - 4" Lg.)
2	760-017-035	Terminal, Straight Faston #41274
3	760-006-042	Terminal, Flag Faston

Cable Assembly - Sweep Motor 070-005-542

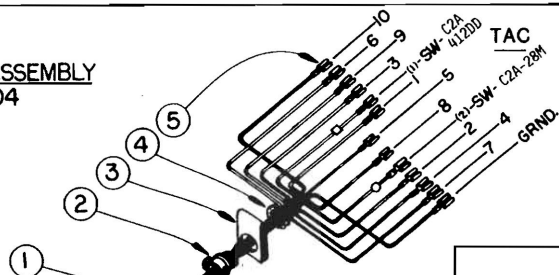
1	010-101-010	Cord, 16 Ga. (5) Conductor 600V. (2' - 6" Lg.)
2	760-017-035	Terminal, Straight Faston #41274
3	760-017-038	Terminal, Flat Spade #41473A
4	746-001-016	Connector, Straight (T & B 3302)
5	000-025-183	Clamp Washer
6	846-100-000	Locknut (T & B 141)
7	000-027-660	Plug, Female (5 Pin)

Cable Assembly Bin Switch 070-006-272

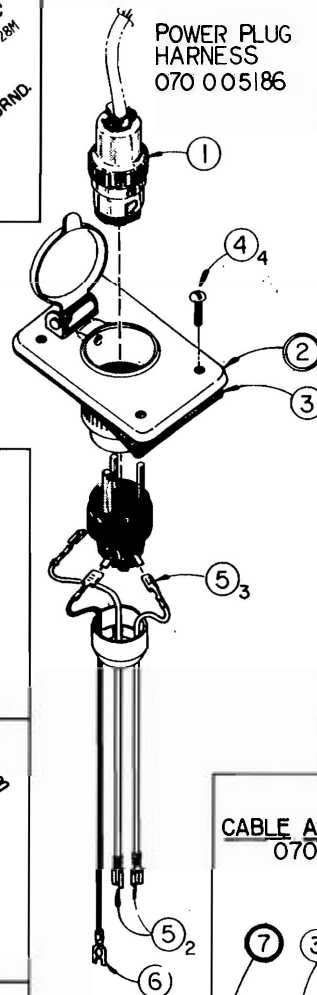
1	010-102-310	Cord #18 Ga. (2) Conductor 300V SJO (4' - 0" Lg.)
2	760-017-035	Terminal, Straight Faston #41274.

TAC NO.	WIRE COLOR	ITEM NO.	TO TAP
10	BLACK	12	11-A
6	GRAY	13	12-D
9	PINK	14	13-H
3	GREEN	15	14-L
SW	YELLOW	16	15-P
1	TAN	17	21-B
5	BLUE	18	22-E
SW	YELLOW	19	23-J
8	BROWN	20	24-M
2	PURPLE	21	31-C
4	WHITE	22	32-F
7	ORANGE	23	33-K
GRD	GREEN	24	34-N

TABLE CABLE ASSEMBLY
070 005 604

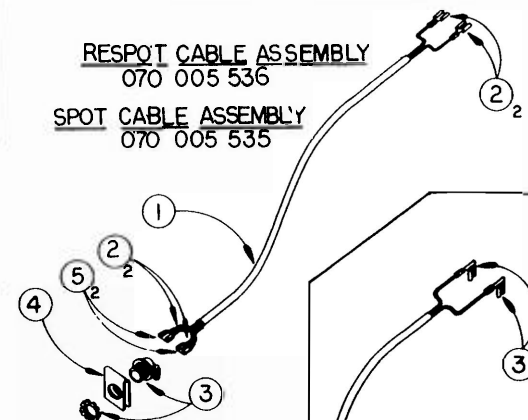


POWER PLUG HARNESS
070 005 186

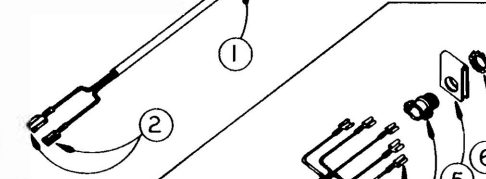


RESPOT CABLE ASSEMBLY
070 005 536

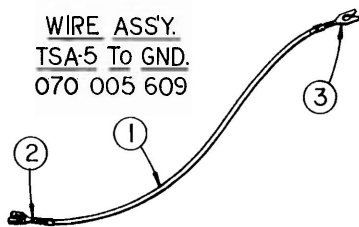
SPOT CABLE ASSEMBLY
070 005 535



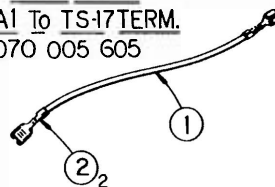
OFF-SPOT CABLE ASSEMBLY
(070 005 534)



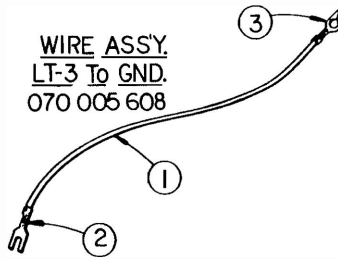
WIRE ASS'Y.
TSA-5 To GND.
070 005 609



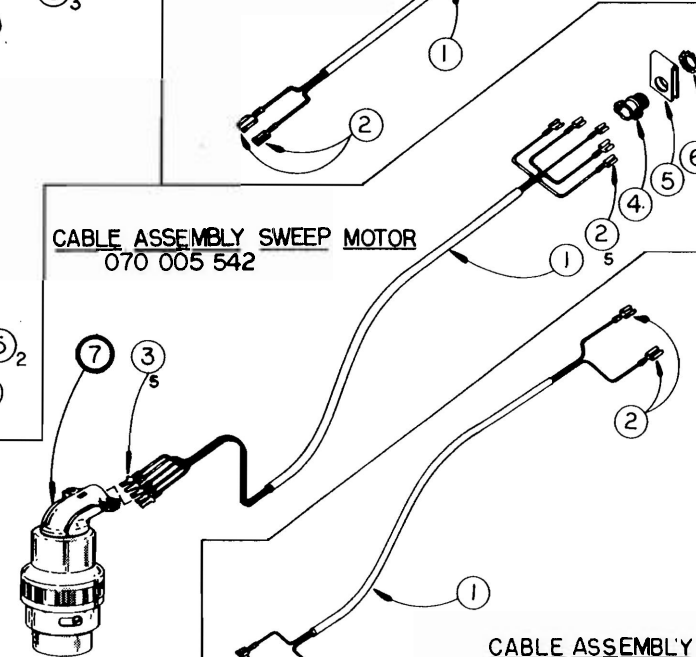
WIRE ASS'Y.
TS-1A1 To TS-17TERM.
070 005 605



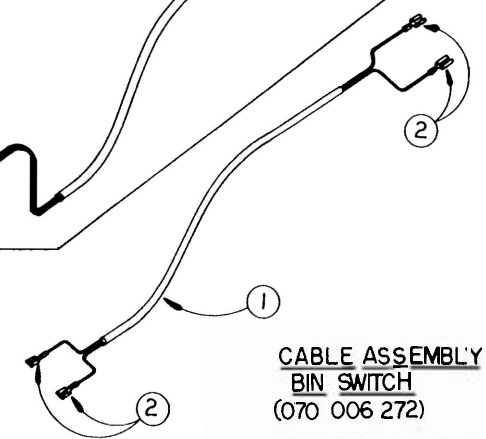
WIRE ASS'Y.
LT-3 To GND.
070 005 608



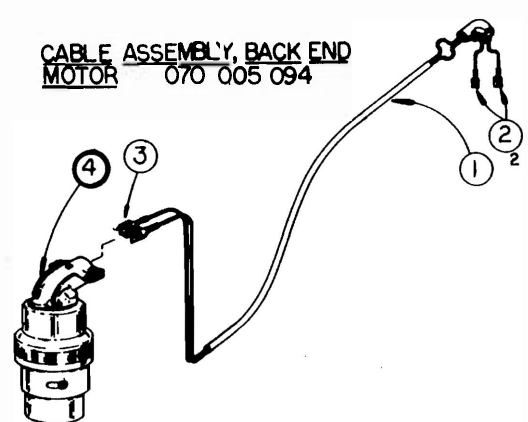
CABLE ASSEMBLY SWEEP MOTOR
070 005 542



CABLE ASSEMBLY
BIN SWITCH
(070 006 272)



CABLE ASSEMBLY, BACK END
MOTOR 070 005 094



MP CHASSIS ASSEMBLY

070-009-800 115 V - 60 HZ

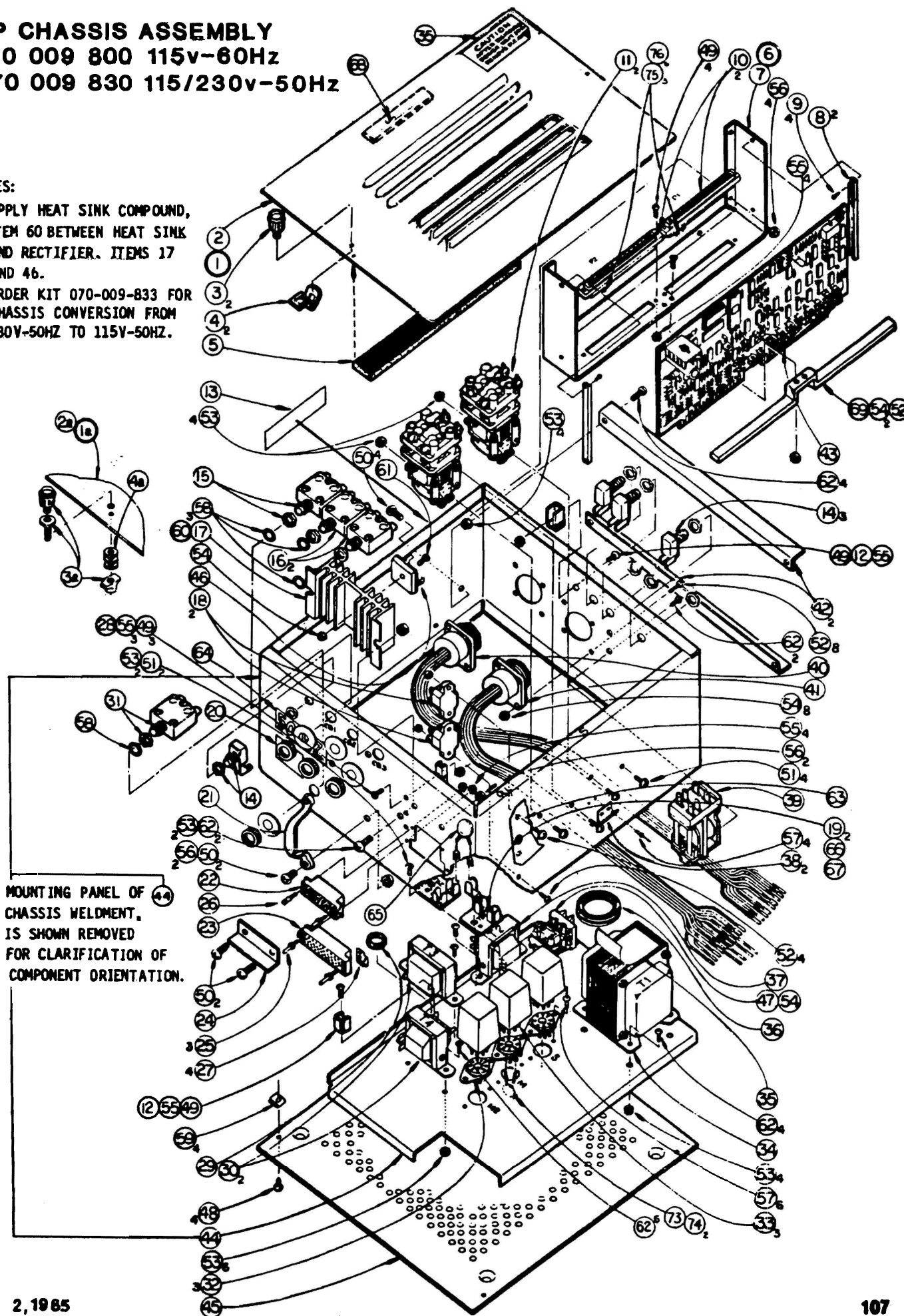
070-009-830 115/230V - 50 HZ

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-001-994	Assembly Cover Plate	37a	000-027-870	Transformer, T2 115/230V-50HZ
1a	070-005-846	Assembly Cover Plate	38	000-028-494	Hook, Camlock
2	070-001-991	Cover Plate	39	000-025-863	Relay, "BE"
2a	070-005-802	Cover Plate	39a	755-504-048	Relay "BE"
3	070-001-990	Knob			After Serial Number 16795
3a	070-005-884	Latch - Panel Adj.	40	070-009-812	Recept. Assy (APS)
4	713-510-007	Pawl	41	070-009-811	Recept. Assy (Mask)
4a	070-005-885	Spacer Latch	42	070-007-638	Angle, Shield
5	070-005-847	Gasket	43	070-009-850	Assy, P.C. Board
6	070-009-801	Bracket Assy-PC Board	43a	070-009-840	Assy, P.C. Board
7	070-009-802	Bracket	43b	070-009-810	Assy, P.C. Board
8	770-023-036	Retaining Guide	44	070-009-806	Weld Assy - Chassis
9	925-307-030	Rivet (.062 Dia. x .188" Lg.)	45	070-006-705	Plate, Base
10	746-008-083	Connector, PC Board	46	756-001-008	Rectifier, Bridge
10a	760-005-129	Terminal For Item 10	47	755-504-006	Relay (S.P.D.T.)
10b	746-108-096	Keying Plug	48	823-132-082	Screw, Type "A", Phil
11*	070-011-755	Contactor (Sweep & Table)			(#8 x 1/2 Lg)
		50/60 HZ Siemens Allis	49	818-221-082	Screw, Sems-Phil RD HD
11a	755-525-034	Replacement Contacts for S/A			(#4-40 x 1/2 Lg)
11b	755-504-049	Contactor (Sweep & Table)	50	813-540-082	Screw, Mach-Phil RD HD
		New Style Allen Bradley			(#10-32 x 1/2 Lg)
12	760-010-065	Terminal-Arkless 3000M-48	51	812-633-102	Screw, Mach-Phil RD HD
13	070-009-813	Decal "MP Chassis"			(#8-32 x 3/4 Lg)
14	000-025-865	Switch	52	818-227-102	Screw, Sems-Phil RD HD
15	743-506-006	Circuit Breaker (3 AMP) CB-1			(#6-32 x 3/4 Lg)
16	743-502-002	Circuit Breaker CB-2 & CB-3	53	843-133-002	Nut, Keps (#8-32)
17	070-009-809	Modified Heat Sink	54	843-127-002	Nut, Keps (#6-32)
18	070-005-666	Circuit Breaker, Thermal	55	843-121-002	Nut, Keps (#4-40)
19	000-021-217	Terminal Block	56	843-140-002	Nut, Keps (10-32)
19a	760-001-070	Terminal Arkless 3000-S	57	938-823-020	Rivet, Pop (Cherry CSPQ42)
20	070-005-548	Plate, Serial Number	58	959-571-102	Lockwasher, Int. Th (1/8, I.D.x 1/8, O.D.)
21	000-029-117	Handle	59	724-511-050	Clip, "U" - (Tinnerman)
22	000-025-068	Block-Female (34 Terminal AMP)	60	770-019-030	Compound, Heat Sink (See Note #1)
23	000-028-410	Block Female (50 Terminal AMP)	61	818-227-162	Screw, Sems Phil RD HD
24	070-005-514	Angle, Shield			(#6-32 x 1" Lg)
25	000-028-442	Pin, Guide (Male)	62	812-633-062	Screw, Mach Phil RD HD
26	000-028-441	Socket, Guide (Female)			(#8-32 x 3/4 LG)
27	000-029-014	Latch, Locking (AMP)	63	070-001-987	Tag, Instruction, Chassis 50 HZ Only
28	760-602-031	Strip, Terminal 14 Position	64	610-700-813	Label, 50 HZ only
29	741-530-404	Grommet (Heyco)	65	070-009-815	Varistor Assy TB1 to TB2 60 HZ
30	762-015-015	Transformer T3 & T4 115V-60HZ	65a	070-009-822	Varistor Assy TB1 to TB2 50 HZ
30a	762-012-012	Transformer T3 & T4	66	203-002-995	Decal TB1
		115/230V - 50 HZ	67	203-002-996	Decal TB2
			68	070-009-817	Gasket - Small
31	743-507-007	Circuit Breaker 1 AMP	69	070-009-819	Bus Bar
32	000-021-231	Socket (11 Pin)	70	812-621-082	Screw-Mach PH RD HD 4-40x 1/2
33	070-005-515	Relay-11 Pin (M2, M & S)	71	834-821-000	Nut Brass - 4-40 Used with AMP
34	762-007-007	Transformer, T1 115V - 60 HZ			(3/8 Hex) Blocks Items
34a	762-011-011	Transformer, T1 115/230V- 50HZ	72	951-020-000	Lock Washer 22 & 23
35	070-007-646	Decal "Caution"	73	761-700-002	Varistor (#V 47Z1)
36	741-530-710	Grommet (Heyco)	74	940-003-000	Tubing FG#18 (2 @ 1/4" Lg.)
37	000-026-836	Transformer, T2 115V - 60 HZ	75	748-010-034	Transzorb (#P6KE43C)
			76	760-005-135	Terminal-AMP #583984-4

MP CHASSIS ASSEMBLY
070 009 800 115v-60Hz
070 009 830 115/230v-50Hz

NOTES:

1. APPLY HEAT SINK COMPOUND, ITEM 60 BETWEEN HEAT SINK AND RECTIFIER. ITEMS 17 AND 46.
2. ORDER KIT 070-009-833 FOR CHASSIS CONVERSION FROM 230V-50HZ TO 115V-50HZ.



SOLID STATE CHASSIS

Ref. Dwg. 070-007-750 (C-23, 120 V-60 HZ), 070-007-720 (C-23, 120 V-50 HZ),
070-007-725 (C-23, 240 V-50 HZ), 070-006-700 (ELCO-120 V-60 HZ),
070-006-710 (ELCO-230 V-50 HZ), 070-006-715 (ELCO-120 V-50 HZ)

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	070-005-959	P.C. Board #5 Assy.	47	070-007-646	Caution Decal
2	070-005-955	P.C. Board #1 Assy.	48	000-021-217	Terminal Block (Not Used On 6700 Chassis)
3	070-005-956	P.C. Board #2 Assy.	49	818-233-042	Screw Sems-Rd. Hd. 8-32 x 1/4
4	070-005-957	P.C. Board #3 Assy.	50	843-133-002	Nut-Keps Ext. L.W. 8-32
5	070-005-958	P.C. Board #4 Assy.	51	818-233-062	Screw Sems Rd. Hd. 8-32 x 3/8
*6	070-007-630	P.C. Board #6 Assy.	52	818-227-102	Screw Sems Rd. Hd. 6-32 x 1/4
6A	070-005-960	P.C. Board #6 Assy. Used With Elco Chassis	53	818-233-082	Screw Sems Rd. Hd. 8-32 x 1/2
7	070-007-656	P.C. Board Align. Supt. Weld R.H.	54	818-233-142	Screw Sems Rd. Hd. 8-32 x 1/8
7A	070-005-840	P.C. Board Align. Supt. Used On Elco Chassis	55	948-637-072	Washer Plain 3/16 Thk
8	070-007-654	Chassis Weld	56	724-511-050	'U' Clip Timmerman
8A	070-005-806	Chassis Weld Elco Chassis	57	070-005-514	Angle-Shield
9	070-007-655	Plate Weld - Side Support	58	711-520-012	Grommet-Atlantic
9A	070-005-879	Plate Weld - Side Support Elco Chassis	59	824-332-082	Type "A" Self Tap Screw
10	070-007-657	P.C. Board Align. Supt. Weld, L.H.	60	916-430-275	Resistor ± 10% 2.75 K-1/2 W. (Under Capacitor Item 22)
10A	070-005-877	P.C. Board Align. Supt. Weld, L.H. Elco Chassis	61	916-430-684	Resistor ± 10% 68 K-1/2 W. (Under Capacitor, Item 18)
11	070-005-846	Cover Plate Assy.	62	000-021-249	Terminal Strip (Under Capacitor, Item 18)
12	070-005-845	Chassis Heat Sink Assy.	63	760-600-002	Terminal Strip
13	070-007-659	Mother Board Assy.	64	070-005-661	MTG Insulator
13A	070-005-961	Mother Board Assy. Elco Chassis	65	000-029-117	Handle
14	070-005-548	Plate-Serial Number	66	070-005-998	Triac
15	070-005-515	Relay-11 Pin, M & MZ	67	818-227-062	Screw, Sems-Rd. Hd. 6-32 x 1/8
16	070-005-883	Relay-11 Pin SP	68	818-227-082	Screw, Sems-Rd. Hd. 6-32 x 1/2
17	000-029-301	Diode 1N2069 (Underside Of Relay Socket & Capacitor Item 18)	69	843-127-002	Nut-Keps-Ext. L.W. 6-32
17A	940-003-005	Vinyl Sleeving - Used With Item 17	70	070-005-669	P.C. Board Auxiliary-Assy.
18	070-005-652	Capacitor-100 MFD, 250 W.V.D.C.	71	813-327-062	Screw Pan Hd. Slotted
19	000-021-231	Socket-11 Pin	72	070-007-636	Angle PC 6 Stop (Not Used On Elco Chassis)
20	070-005-662	Heat Sink (Spider)	73	070-007-638	Angle Shield (Not On Elco Chassis)
21	070-007-637	Plate-Side Support-P.C. Board	74	070-007-631	Recpt. Assy. (PM-WHT) (Not On Elco Chassis)
21A	070-005-878	Plate-Side Support-P.C. Board Elco Chassis	75	070-007-667	Recpt. Assy. (BPP-BLK) (Not On Elco Chassis)
22	070-005-874	Capacitor-Twist-Lok-1500 M.F.D., 50 W.V.	76	743-502-002	Circuit Breaker
23	000-025-863	Relay, B.E.	76A	000-029-010	Fuse Extractor Post May Be Used In Combination
24	070-005-841	Board Guide-Chassis P.C.	76B	000-025-555	Fuse 3 Amp Slo-Blow Two C.B. And One Fuse
25	070-005-853	Transformer, T.I.-60 HZ.	77	959-571-102	Lock Washer Internal Tooth
25A	070-005-898	Transformer, T.I.-All 50 HZ.	78	812-633-102	Screw Phil Rd. Hd. #8-32 x 1/8
26* *	070-011-755	Contact, 50/60 HZ.	79	120-001-175	U.L. Label
		Siemens Alis	80	070-001-990	Knob
27	070-006-705	Base Plate	80A	070-005-884	Latch-Panel Adj. Not Shown
28	000-026-836	Transformer-T2-115 V-60 HZ.	81	713-510-007	Pawl
28A	000-027-870	Transformer-T2-120/240 V-50 HZ.	81A	070-005-885	Spacer Latch Not Shown
29	070-005-666	Circuit Breaker-Thermal	82	070-005-847	Gasket
30	070-005-854	Insulator-Shouldered	83	070-005-839	Relay-Reed (KX) P&B JRM (Eff. Until 12/75)
31	070-005-855	Insulator-Tube	84	818-221-102	Screw Sems Rd.
32	070-005-882	Insulator	85	070-005-887	Conn. Plug
33	000-029-014	Locking Latch-AMP	86	070-005-844	Chassis Heat Sink
34	000-028-410	Block-Female, 50 Place AMP	87	070-005-842	Power Diode
35	000-028-442	Guide Pin (Male)	88	000-028-452	Varistor
36	843-121-002	Nut-Keps Ext. L.W. 4-40	89	070-005-859	Power Diode-Rev. Polarity
37	000-028-441	Guide Socket (Female)	90	760-010-072	Terminal-Kulka
38	000-025-068	Block-Female, 34 Place AMP	91	760-600-006	Terminal Strip
39	818-221-082	Sems Rd Hd Screw Ext. L.W. 4-40 x 1/2	92	753-800-001	Keying Plug
40	813-640-062	Screw-Truss Hd. Mach. 10-32 x 1/8	93	760-011-099	Pins
41	843-140-002	Nut-Keps-Ex. L.W. 10-32	94	000-028-448	Pins
42	938-823-020	CSPQ 42 Pop Rivet (Cherry)	95	760-012-087	Socket
43	938-723-020	AAP 42 Pop Rivet (Cherry)	96	755-023-709	Receptacle Black
44	818-233-102	8-32 x 1/8 Screw	97	755-023-705	Receptacle White
45	070-005-149	Thermal Relay, 'H'	98	070-007-753	Decal - Fuse Rating (Not Shown)
46	000-028-494	Hook-Camlock			

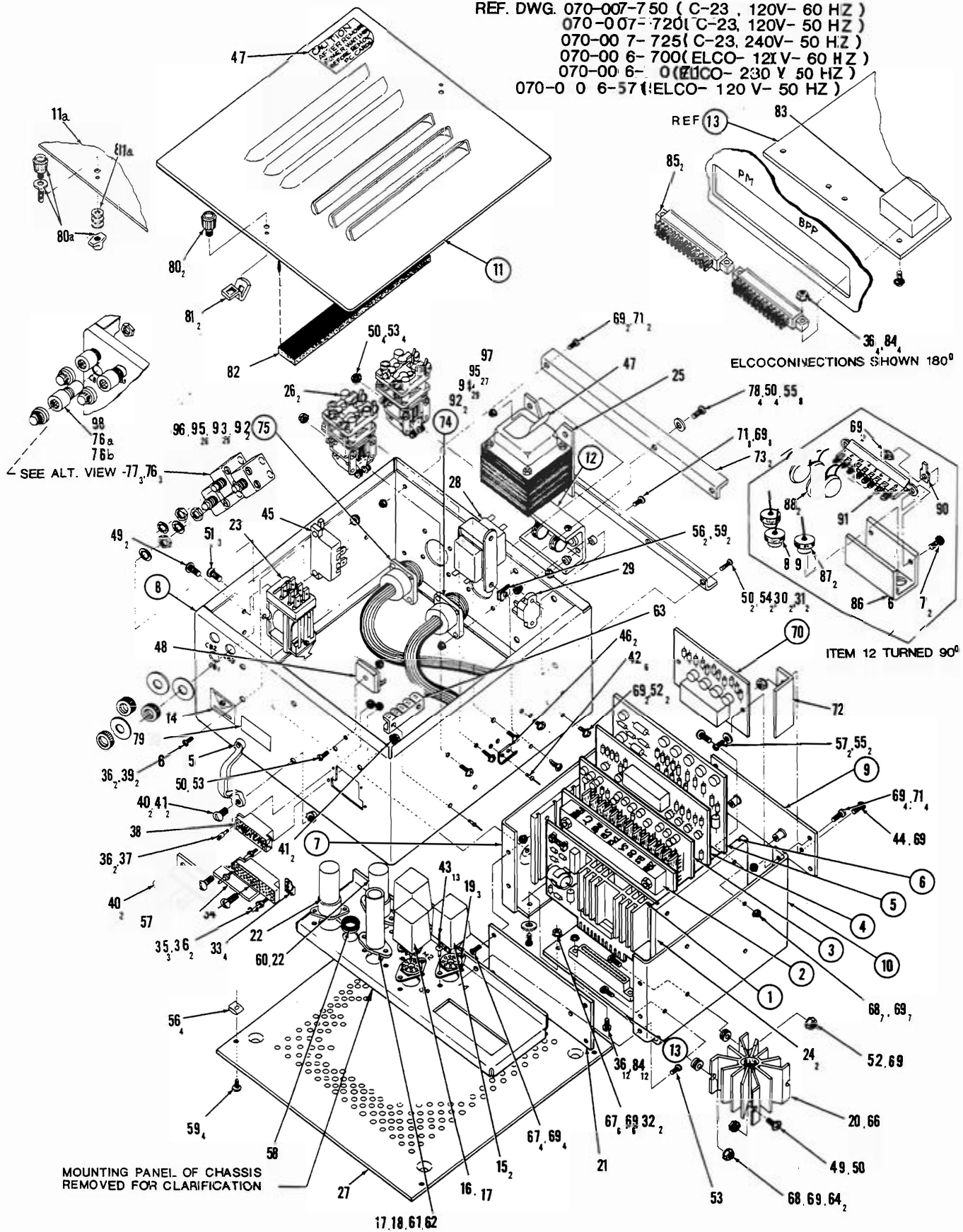
*Caution: This P.C. Board Cannot Be Used Interchangeably In The Elco Solid State Chassis Assembly, Unless All P.C. #6 Boards Of The New Type (070-007-630) Are Used In All Elco Chassis In The Establishment.

**To replace Allen Bradley relays, order 610-704-141.

Note: Allen Bradley replacement contacts: Upper 788-001-057, Lower 788-001-058.

SOLID STATE CHASSIS

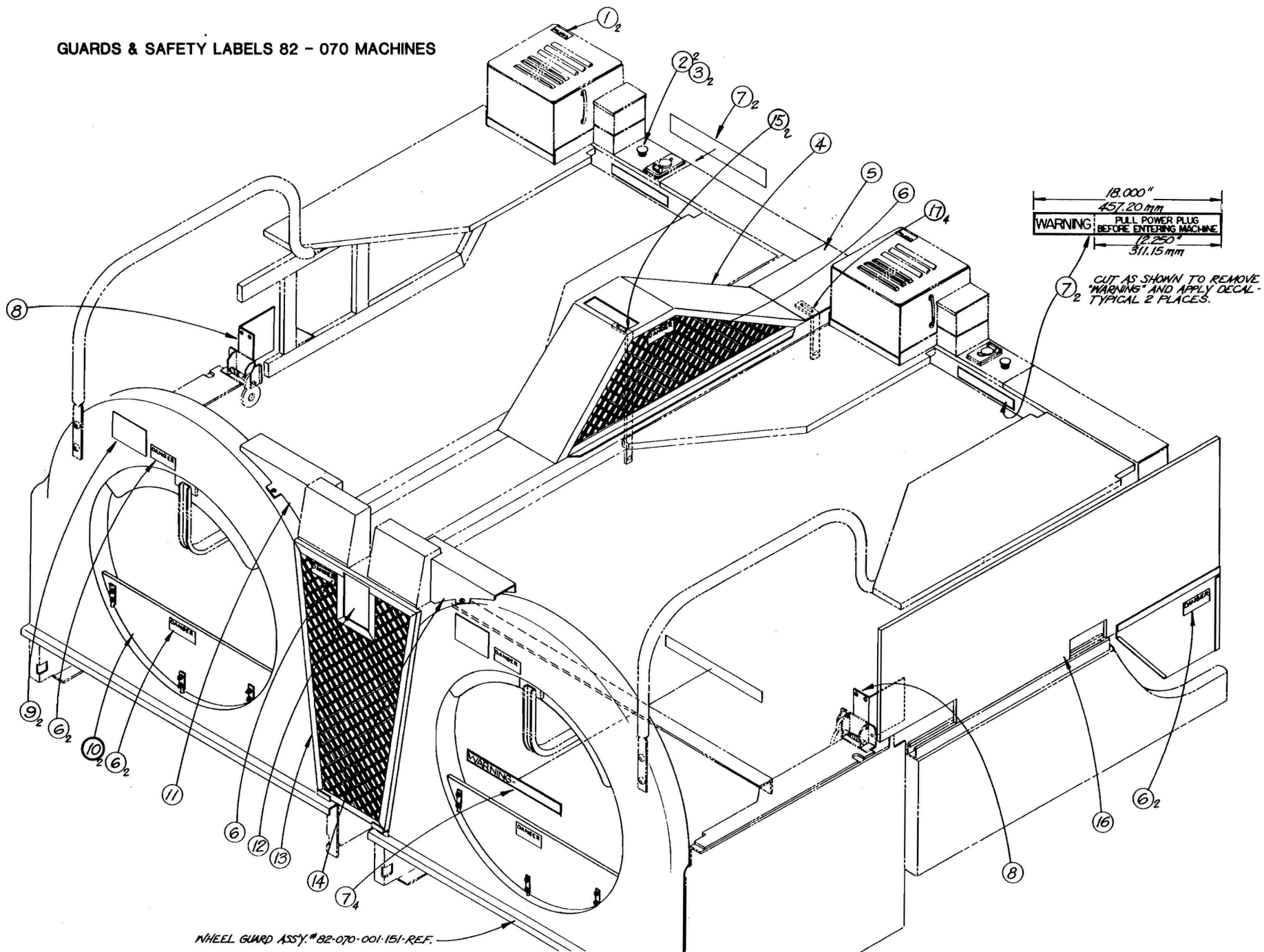
REF. DWG. 070-007-7 50 (C-23 , 120V- 60 HZ)
 070-007-7201 (C-23, 120V- 50 HZ)
 070-00 7- 725 (C-23, 240V- 50 HZ)
 070-00 6- 700 (ELCO- 121 V- 60 HZ)
 070-00 6- 0 (ELCO- 230 V 50 HZ)
 070-0 0 6-57 (ELCO- 120 V- 50 HZ)



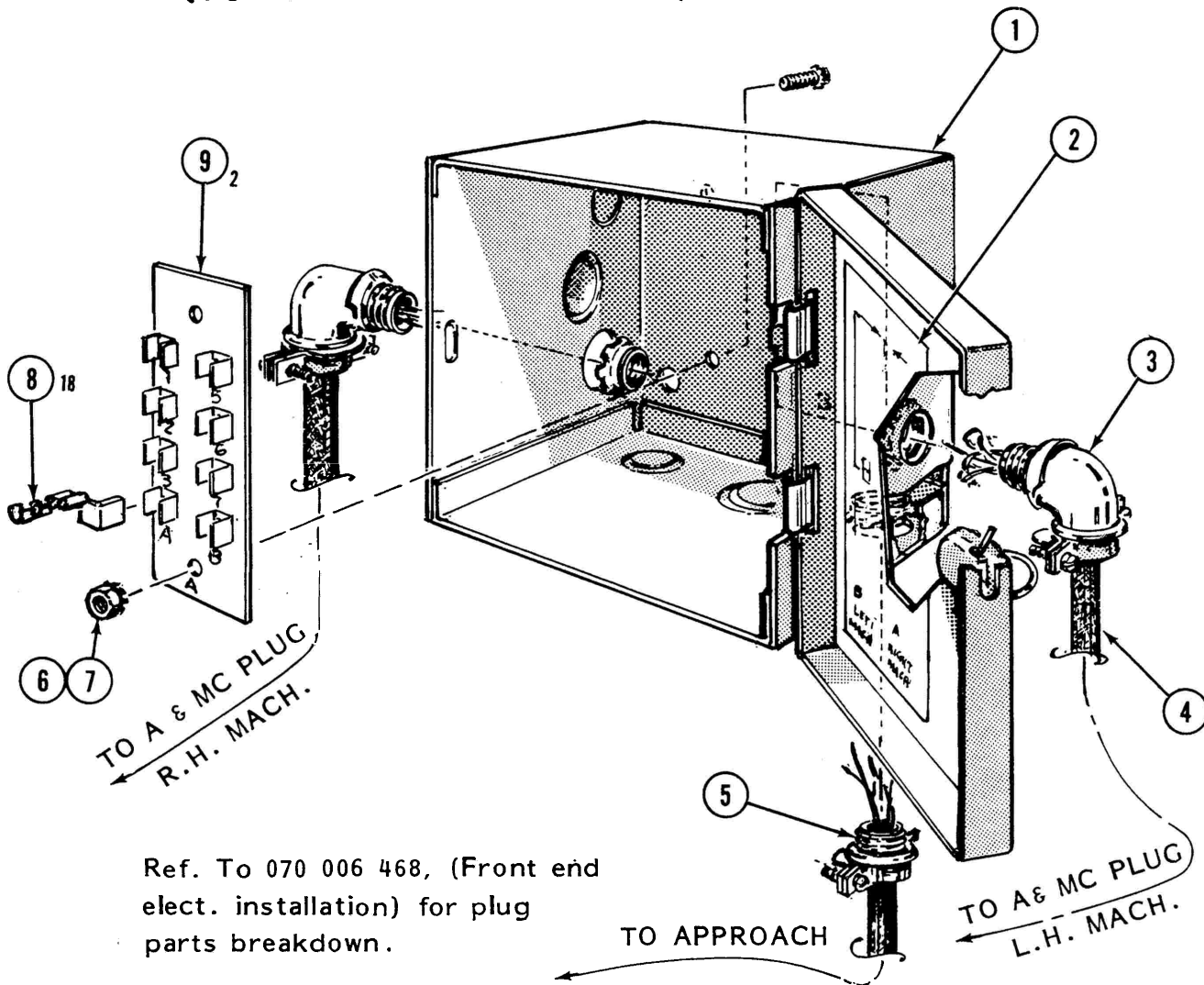
GUARDS & SAFETY LABELS - 82-070 MACHINES

ITEM	PART NUMBER	DESCRIPTION
1	070-007-646	Caution Decal (Chassis Lid)
2	746-605-011	Contact Block
3	759-517-051	Palm Button Safety Switch - Operator Housing
4	070-011-401	Ball Lift Guard WLD.
5	070-004-713	Cover Guard Assembly
6	070-011-211	Danger Decal
7	070-005-614	Warning Decal
8	070-004-738	(Toe) Guard
ITEM	PART NUMBER	DESCRIPTION
9	070-011-409	Safety Guard Plate
10	000-022-219	Pin Elevator Guard Assembly
11	070-011-393	L.H. Belt Guard
12	000-024-694	Filler Plate
13	070-004-690	B.E. Guard
14	070-011-392	R.H. Belt Guard
15	070-010-238	Bracket Front
16	070-005-585	Guard Assembly End Machine
17	070-004-691	Bracket Rear

GUARDS & SAFETY LABELS 82 - 070 MACHINES



**APPROACH AND MANAGERS CONTROL JUNCTION BOX ASS'Y.
(TO R.H. AND L.H. MACHINES) Ref. 070 005 560**



Ref. To 070 006 468, (Front end elect. installation) for plug parts breakdown.

ITEM	PART NUMBER	DESCRIPTION	REQ'D
1	070 011 177	Box(Drilled) With Hinged Cover	1
2	070 007 419	Label - Wiring Diagram	1
3	746 003 008	Connector, 90° T & B #266	2
4	940 372 000	Sleeving .50 I.D. x 3.2 Ft.	2
5	746 010 006	Connector, Str. T & B #3302	1
6	843 133 002	Nut Keys Ex. L.W. #8-32	4
7	818 233 082	Screw, Sems Phil.R.Hd.8-32 x 1/2" LG.	4
8	760 002 145	Terminal Receptical & Tab Comb.	18
9	000 021 368	Terminal Block	2
10	770 011 010	Ty-Rap, Not Shown	4
11	724 001 011	Tape, Elect. 3/4"wd x 36yd. N.S.	
12	010 100 100	Wire #18 Ga. 300V Blk-Not Shown	8.1'
13	010 100 101	Wire #18 Ga. 300V Brwn-Not Shown	10.0'
14	010 100 103	Wire #18 Ga. 300V Orange-Not Shown	8.3'
15	010 100 104	Wire #18 Ga. 300V Yellow-Not Shown	18.3'
16	010 100 105	Wire #18 Ga. 300V Green-Not Shown	16.3'
17	010 100 111	Wire #18 Ga. 300V Tan-Not Shown	8.8'
18	010 100 112	Wire #18 Ga. 300V Pink-Not Shown	16.5'

82-70 "KICKER" BALL LIFT

ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION	ITEM	PART NUMBER	DESCRIPTION
1	000 021 409	Belt Tightened Ass'y.	52	000 024 615	Shaft	101	807 265 080	Screw, Socket Set (Cup Pt.)
2	000 024 673	Spring	53	070 004 630	Rudder Arm Support			3/8- 16 x 1/2"
3	900 112 121	Bearing, Plain SL.	54	000 024 616	Clamp Stud	102	700 107 146	Locktite (As Req'd)
4	948 975 172	Washer, Plain 1 1/16x17/32x3/32	55	835 573 002	Nut, Hex 1/2-13	103	000 024 811	Pulley Ass 'y. L.H.
5	963 600 002	X-Washer	56	000 029 671	Drive Link Ass'y. (Rudder)	104	000 024 661	Belt Pulley
6	000 029 603	Shaft - 9 1/2" to 11" LG.	57	000 024 614	Rudder Arm	105	000 024 604	Belt (Red) 070 011 280 Belt
6a	000 029 604	Shaft - 10 5/8" LG.	58	000 024 622	Plug	106	806 265 160	Screw, Sq. Hd. Set. Cp. 3/8-16 x 1
6b	000 021 435	Shaft - 12 3/4" LG.	59	070 004 674	Paddle Ass'y.	107	070 006 699	Bearing
7	919 005 800	Ret. Ring, TruArc 5100-75	59a	070 007 275	Paddle	107A	070 011 797	Bearing for "D" Shaft
8	000 021 408	Pulley Ass'y.	60	809 865 405	Screw, Hx. Hd. Cap~3/816 x 2 1/2	107B	000 024 683	Bearing for Retainer Ring Shaft
9	000 002 072	Idler Shaft	61	000 022 077	Shaft	108	070 006 748	Spacer
10	000 029 628	Arm	62	806 657 080	Set Screw, Sq. Hd. Fl. Pt.	109	070 006 749	Clutch Race
11	000 022 099	V-Belt, 113.3" LG			Lng. Loc. 5/16-18 x 1/2	110	000 024 812	Pulley Assy R H
12	844 073 002	Nut Lock 1/2-13	63	000 022 080	Roller, Rubber	111	070 006 746	Shaft (Lower)
13	000 022 063	Sheave	64	000 024 679	Bearing	111A	070 011 796	Shaft Lower "D" Shaft
14	000 027 710	V-Belt (Rudder Drive) 36" LG.	65	700 107 370	Loctite (#290)	111B	070 002 175	Shaft Lower (Retainer Ring Type)
15	000 027 264	Washer, P1. 15/16 x 21/32 x 3/32	66	000 025 621	Bearing, P1. S.	112	000 024 651	Link Ass 'y. (Lower)
16	701 320 045	Thrust, Bearing	67	913 437 200	Roll Pin, ESNA 3/16 x 1 1/4	113	000 024 659	Yoke (Lower)
17	000 029 657	Belt Tensioner Ass'y.	68	000 022 082	Pulley	114	000 029 660	Shaft
17a	000 029 659	Hanger Arm Ass'y.	69	000 021 406	Roller Bracket Ass'y. R.H.	115	839 675 002	Nut, Flex Loc 5/16-18
18	000 029 608	Shaft (Shoulder Screw)	69a	000 022 217	Roller Bracket Ass'y. L.H.	116	070 006 320	Shaft, Adj. 9 1/2 to 11"
19	000 029 606	Shaft (Pivot Short) 4 11/32"	70	000 029 610	Shaft	116a	070 006 329	Shaft Adj . 11 to 12 5/8 spc.
20	919 005 600	Ret. Ring (TRUARC 5100-62)	71	000 021 407	Idler Arm Ass'y. R.H.	116b	070 006 333	Shaft Adj . 12 5/8 to 14" spc.
21	900 110 081	Bearing	72	000 022 218	Idler Arm Ass'y. L.H.	117	070 006 325	Shaft, Fixed, 9 1/2 to 11" spc.
22	900 110 141	Bearing	73	000 029 595	Spring Anchor	117a	070 006 328	Shaft, Fixed, 11 to 12 5/8 spc.
23	900 110 161	Bearing	74	700 107 200	Loctite, Retaining Comp.	117b	070 006 330	Shaft, Fixed, 12 5/8 to 14 spc.
24	000 029 609	Spring, Torsion	75	900 108 081	Bearing, P1. S1.	118	000 024 640	Shaft, Pivot
25	000 029 605	Shaft (Pivot)	76	000 021 417	Idler Roller Ass'y.	119	000 024 720	Link Ass 'y. (Upper)
26	806 265 120	Set Screw, Sq. Hd. Cup. Pt.	77	000 022 096	Idler Roller Ass'y.	120	000 024 716	Spring Holder
		3/8-16 x 3/4	78	809 849145	Screw, Hx. Hd.Cap. 1/4-20 x 7/8"	121	900 112 203	Bearing, Sleeve - Bnz
27	000 028 866	Ring (Spring)	79	000 022 173	Nut - Special	122	000 029 662	Bracket
28	000 029 601	Spring	80	000 029 638	Roller Base	123	000 028 002	Nut
29	844 057 002	Nut, Stover 5/16-18	81	000 024 745	Nut, Plate Ass'y.	124	000 028 057	Retainer
30	948 761 112	Washer 11/32 x 11/16 x 1/16	82	000 029 959	Filler Pad Ass'y. (Rear)	125	000 027 996	Cushion
31	809 857 165	Screw, Hx. Hd.Cap. 5/16-18 x 1"	83	000 025 638	Bumper	126	000 027 998	Retainer
32	000 024 743	Rudder Arm Brk't.	84	000 024 678	Filler, Front Ass'y.	127	948 983 212	Washer, P1. 15/16 x 21/32 x 3/32
33	809 857 205	Screw, Hx. Hd.Cap. 5/16-18 x 1 1/4	85	000 024 628	Pad	128	000 029 600	V - Belt 32.5
34	000 029 607	Crank & Sheave Ass'y.	86	000 024 624	Rear Segment R.H. Shown	129	000 029 661	Shock Absorber
34a	000 022 092	Crank P1t. Wldm't.	86a	000 024 623	Rear Segment L.H.	130	000 020 003	Shock Absorber Ass 'y.
35	000 022 079	Sheave	87	000 024 625	Front Segment R.H. Shown	131	835 565 002	Nut, 3/8-16
36	000 029 695	Crank Shaft Wldm't.	87a	000 024 626	Front Segment L.H.	132	000 024 610	Clamp Stud.
37	000 021 427	Bearing, Flange	88	000 024 618	Nut Carriage Ass'y.	133	946 400 002	Washer, 25/64 x 23/32 x V16
38	000 029 696	Tube Ass'y.	89	808 957160	Screw, Flt. Hd. Soc. 5/16-18x 1"	134	000 029 607	Kicker Support Brk 't.
39	000 021 423	Collar	90	821 432 082	Screw, Hx. Hd.Slotted (TypeAB)	135	809 057 002	Screw, Hx. Hd. Cap 5/16-18x 3/4
40	807 249 040	Set Screw, Soc. Hd. 1/4-20 x 1/4			#10 x 1/2"	136	070 006 747	Shaft Upper (Old Style)
41	000 029 596	Nut, Locking	91	000 024 718	Bracket Weldment	137	070 011 795	Shaft. Upper ("D" Shaft)
42	000 021 428	Tube Ass'y. (Alternate)	92	000 024 612	Starter Pad	137a	000 024 645	Shaft, Upper (Retainer Ring Type)
43	000 029 611	Washer, (Spec.)	93	000 024 676	Lower Track Brkt. (024677 Ass'y No.)			
44	000 029 614	Unibal (Heim)	94	000 024 634	Shaft			
45	809 865 245	Screw, Hx. Hd.Cap. 3/8-16 x 11/ 2	95	000 024 681	Screw, Hx. Hd. Cap. SAE #5			
46	000 002 097	Sheave - (Carpet) Drive	96	839 549 002	Nut, Flex THK. 1/4--20			
47	000 028 865	V-Belt (Kicker Drive) 34 1/2"	97	000 026 612	Spring, Torsion			
48	907 000 900	Key (Hi #910 Pro) 5/16 x 1 1/8	98	000 024 631	Bearing, Flange			
49	839 665 002	Nut, Flex Loc 3/8-16	99	856 070 002	Nut, Flange - Cad. Plt'd.			
50	802 865 996	Screw, Hx. Hd.Cap. 3/8-16 x 9 1/2			Two/Way Lock 7/16-20			
51	900 212 201	Bearing	100	000 024 806	Sheave			

NOTE:

Ref 610 704 150 Upper Shaft Conversion Kit
Ref 610 704 151 Lower Shaft Conversion Kit

REV. 10/94

KICKER LIFT ASS'Y

Ref.Dwg. 82 70 4700

CONVERSION SCALE

9 1/2" = 241.30 MM

11" = 279.40 MM

12 5/8" = 320.68 MM

14" = 355.6 MM

3 1/2" = 88.9 MM

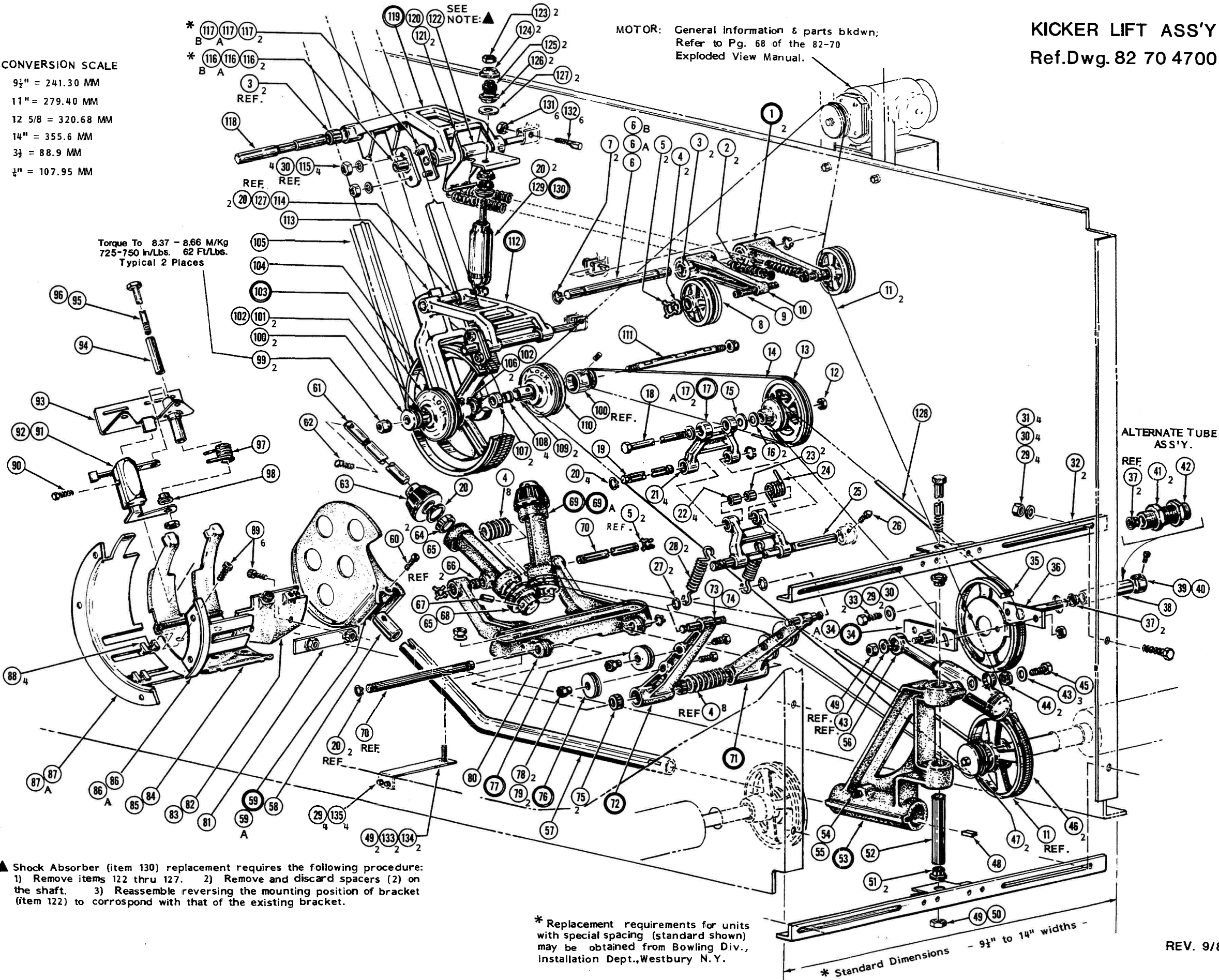
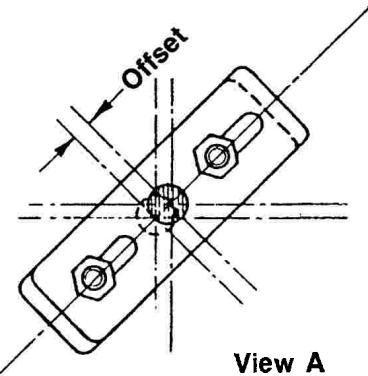
1/2" = 107.95 MM

NOTE

Adjustable Ball Lift Support Shafts are provided to allow alignment of the Ball Lift to the track rails.

Adjustment is required when the Shaft Supports on the metal Kickback Assemblies are not aligned.

Alignment is achieved by turning plates on the Support Shaft Assemblies till the plates are parallel to the direction of offset. (See view A.)



PARTS INDEX LISTING **Listed in Numerical Sequence**

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000 021 420	62	000 022 924	56,58	000 024 651	84
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000 021 786	10,12	000 023 468	56	000 024 720	84
000 021 787	10,12	000 023 621	68	000 024 795	66
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000 022 172	68	000 024 516	56	000 025 049	104
000 022 173	70,72	000 024 534	66	000 025 068	106,108
000 022 219	110	000 024 576	62	000 025 076	100,102
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000 022 738	24	000 024 604	84	000 025 331	60
000 022 770	66	000 024 605	84	000 025 363	91
000 022 782	38,40	000 024 606	84	000 025 549	36
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070 011 013	78	070 011 201	76	530 706 208	68
070 011 015	86	070 011 202	76	530 707 690	14
070 011 018	86	070 011 211	110	530 707 693	68
070 011 021	86	070 011 217	78	530 707 694	68
070 011 027	78	070 011 219	10	610 700 101	52
070 011 028	78	070 011 225	80	610 700 102	52
070 011 029	78	070 011 230	86	610 700 103	52
070 011 030	78	070 011 250	68	610 700 130	52
070 011 031	78	070 011 273	80	610 700 131	90
070 011 032	78	070 011 279	86	610 700 132	90
070 011 033	78	070 011 286	58	610 700 813	106
070 011 034	76	070 011 288	66	610 704 002	16, 18
070 011 035	76	070 011 289	84	610 704 005	70
070 011 036	78	070 011 299	80	610 704 006	70
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070 011 047	84	070 011 392	110	610 704 042	68
070 011 048	86	070 011 393	110	610 704 043	68
070 011 049	86	070 011 401	110	610 704 052	14
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070 011 068	80	070 011 418	80	630 704 052	14
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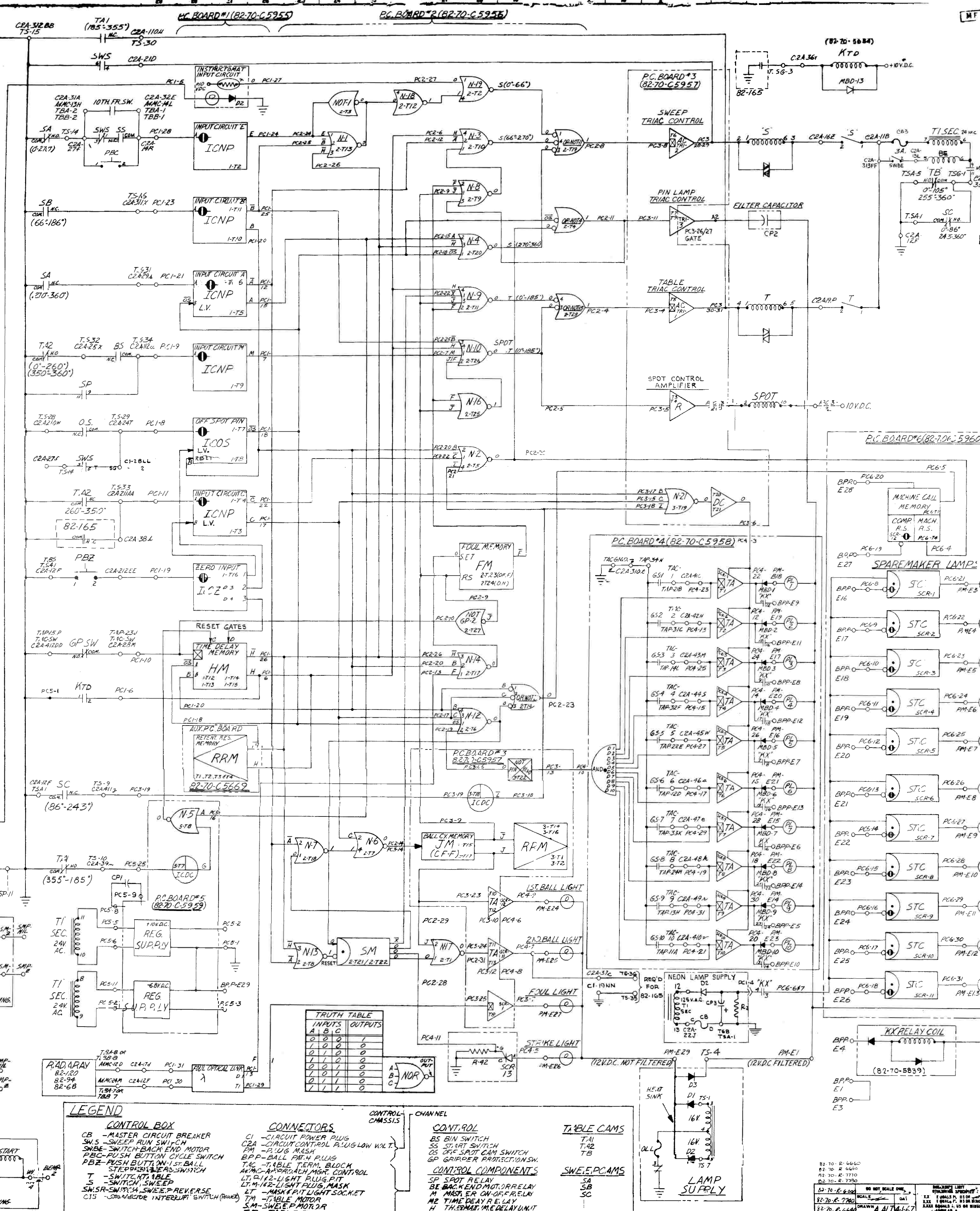
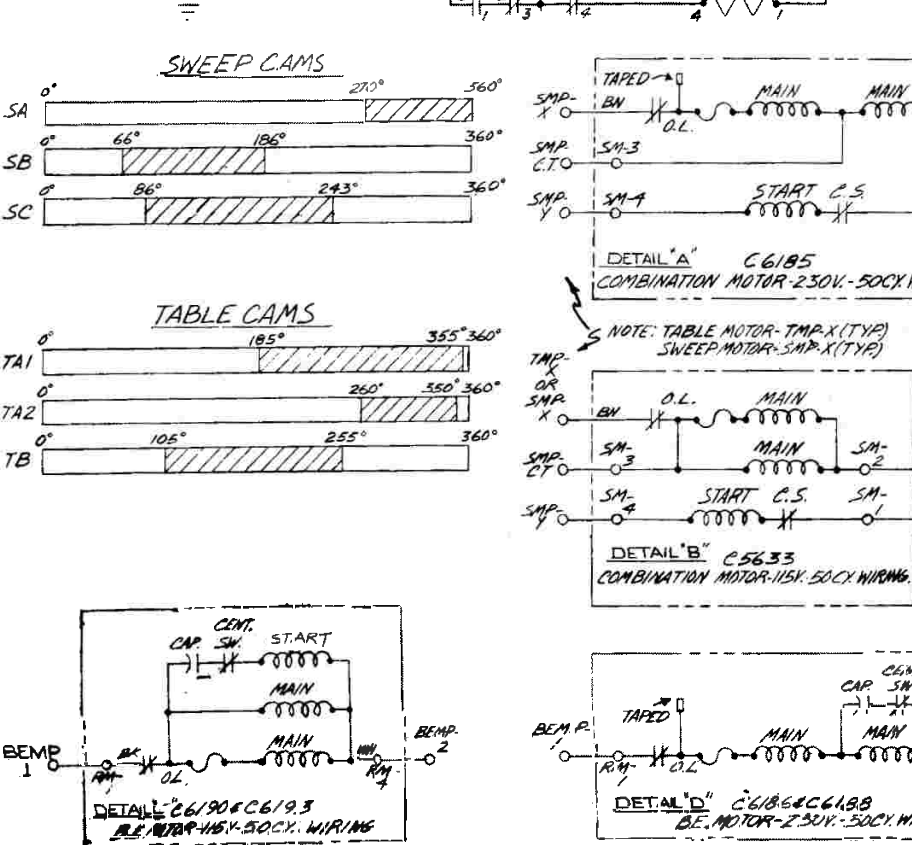
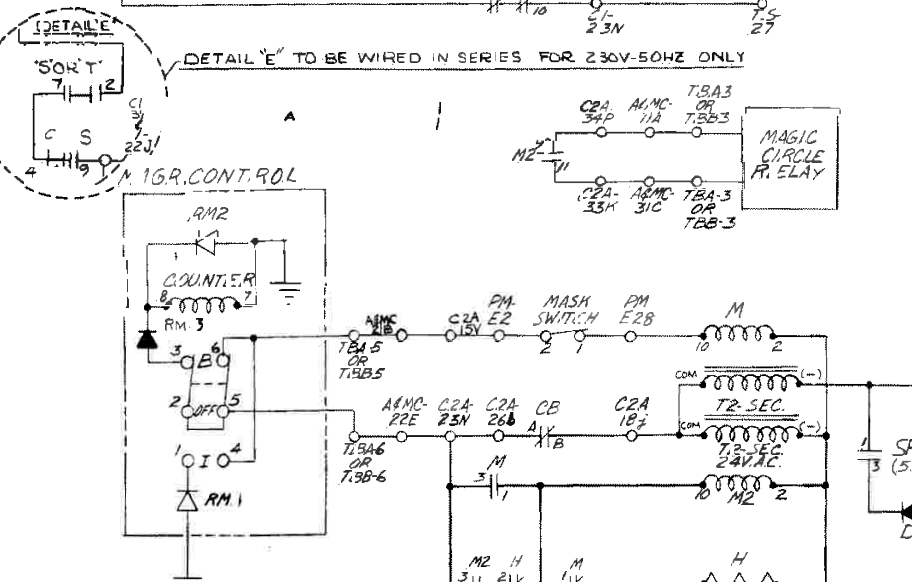
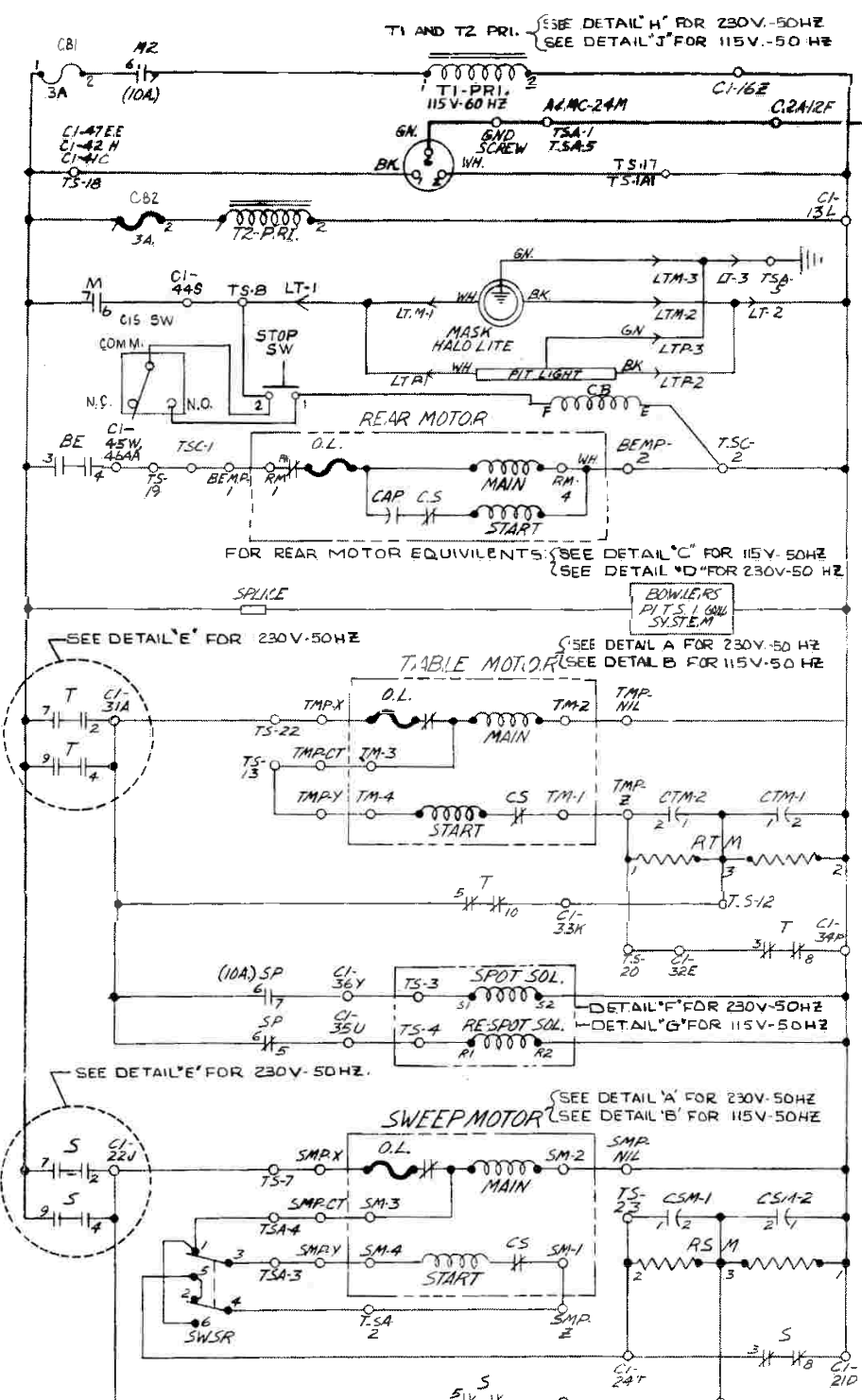
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701 329 050	46	746 108 096	106	807 357 060	24
701 416 058	18	746 605 011	96, 98, 110	807 357 080	68
701 710 098	72	753 800 001	108	807 358 060	68
701 712 097	70	754 020 312	96, 98	808 533 120	92
701 849 124	72	755 010 303	96, 98	808 539 060	90, 91
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710 501 013	42, 54	756 001 008	106	808 557 160	52
710 502 010	18, 80, 86	759 517 051	96, 98, 110	808 566 160	64
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711 516 020	46	760 010 065	106	808 640 141	26, 30, 32
711 520 012	108	760 010 072	108		34
711 520 017	96, 98	760 010 089	90	808 849 120	64
711 520 021	96, 98	760 011 099	108	808 849 160	62
713 510 007	106, 108	760 012 087	108	808 849 565	84
722 971 142	80	760 015 038	68, 104	808 857 120	58
722 985 512	80	760 015 039	96, 98	808 857 160	58
724 501 072	68	760 015 055	104	808 857 280	86
724 507 002	28	760 017 035	93, 94, 100	808 858 120	64
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724 511 006	88	760 017 038	104	808 865 320	66
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743 506 006	106	770 023 036	106	809 849 605	46, 72
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809 858 125	60	813 321 062	91, 93, 100	835 566 002	18, 46, 80
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809 865 165	10, 12, 18	813 327 062	90, 108	835 570 002	18, 42, 54
809 865 165	46, 56, 80	813 340 042	96, 98	835 573 002	10, 12
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809 865 205	10, 12, 18	813 640 062	108	835 582 002	22, 54
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	42	814 333 122	18	838 866 002	78, 80, 86
809 865 285	10, 12, 54	817 921 080	88	838 870 002	84
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809 865 325	10, 12, 86	818 221 102	108	839 033 002	18
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809 865 992	86	818 227 202	38, 40, 68		840
809 869 245	38, 42	818 227 402	94	839 565 002	800
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809 881 640	38	823 132 082	106	840 049 002	460
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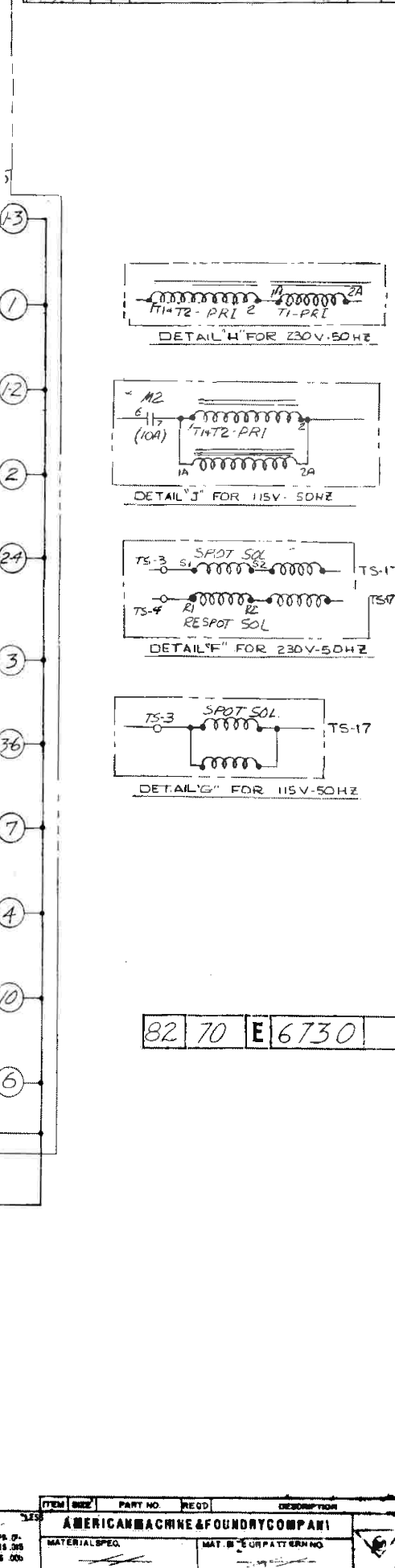
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900 114 101	46	919 005 000	72		
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900 210 101	82	919 010 200	32, 34		
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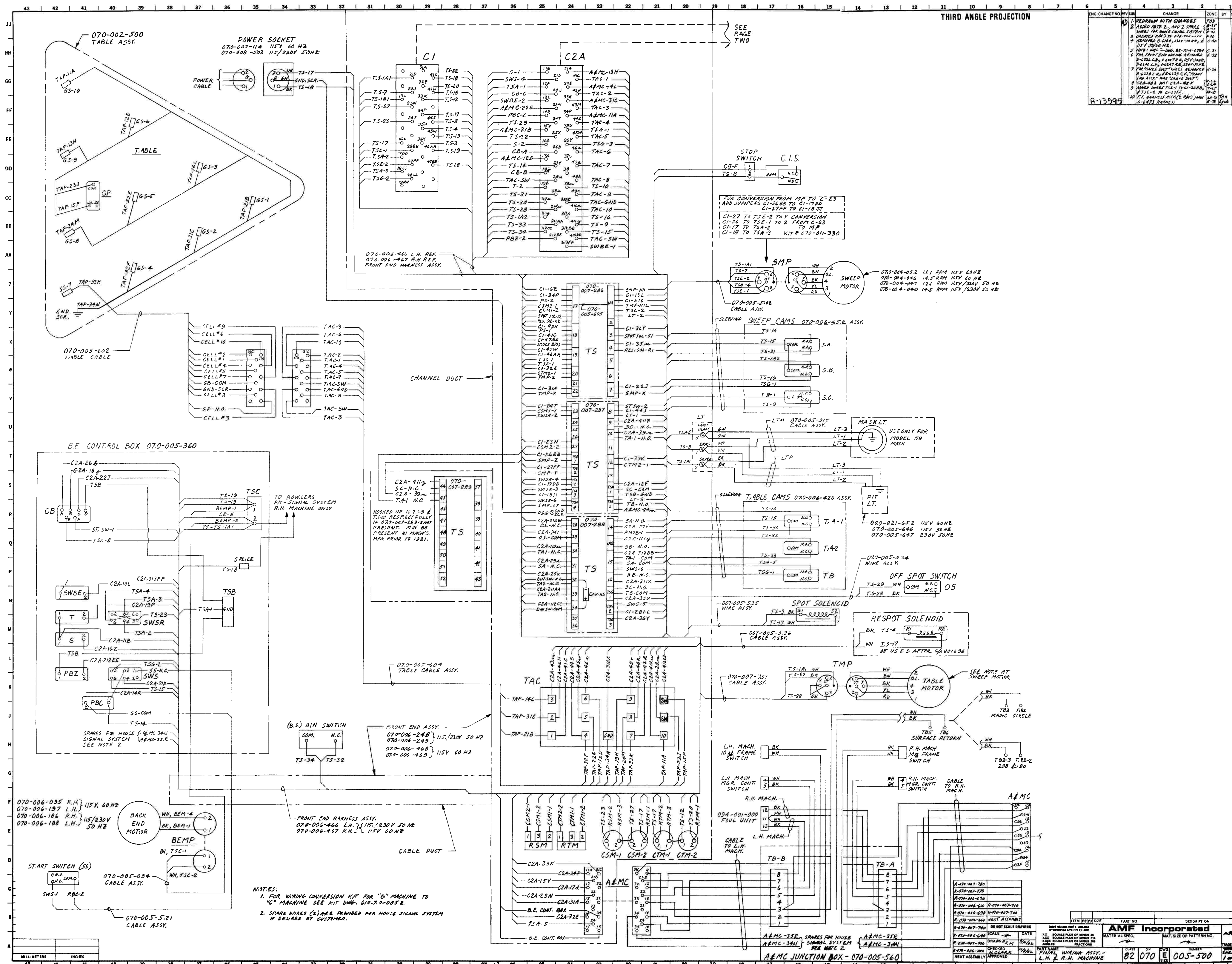
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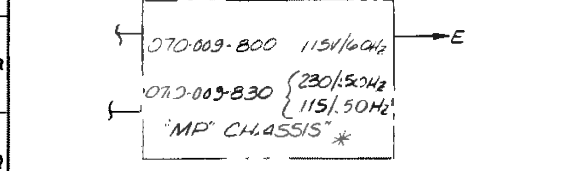
2. MACHINE SHOWN IN ITS ZERO POSITION AWAITING DELIVERY OF A FIRST BALL, NO POWER APPLIED.
2. BIN SWITCH AS SHOWN OPEN INDICATES THERE IS LESS THAN A FULL SET OF PINS IN THE BIN.
3. HALO LIGHT USED ONLY ON MODEL 59 MASK



DATE	TIME	TO	FROM	REMARKS	INITIALS
R-2420	NEW	MEM	MEM DOW.		11-20
				1. ADDED 0270-1654115 KTD CON. H-10	
				2. ADDED 01-281A 1756-2 TO NEW SPRT DOW. H-10	
R-4495A				3. ADDED 02-04-1756-2 TO NEW SPRT DOW. H-10	
				4. P.C. BOARD 1756-2 (C-5595) H-10	
				5. 52A 27C WAS C-137, ADDED H-10	
				6. CLINICAL WAS C-120, H-10	
				7. KTD-138 H-10	
				8. ADDED SCHEMATIC WIRING FOR T1 SEC. FROM C-138. H-10	
				9. 52B-1C WAS 25-COM. H-10	
				10. 52C-1C WAS 25-COM. H-10	
				11. 52D-1C WAS 25-COM. H-10	
				12. 52E-1C WAS 25-COM. H-10	
				13. 52F-1C WAS 25-COM. H-10	
				14. 52G-1C WAS 25-COM. H-10	
				15. 52H-1C WAS 25-COM. H-10	
				16. 52I-1C WAS 25-COM. H-10	
				17. 52J-1C WAS 25-COM. H-10	
				18. 52K-1C WAS 25-COM. H-10	
				19. 52L-1C WAS 25-COM. H-10	
				20. 52M-1C WAS 25-COM. H-10	
				21. 52N-1C WAS 25-COM. H-10	
				22. 52O-1C WAS 25-COM. H-10	
				23. 52P-1C WAS 25-COM. H-10	
				24. 52Q-1C WAS 25-COM. H-10	
				25. 52R-1C WAS 25-COM. H-10	
				26. 52S-1C WAS 25-COM. H-10	
				27. 52T-1C WAS 25-COM. H-10	
				28. 52U-1C WAS 25-COM. H-10	
				29. 52V-1C WAS 25-COM. H-10	
				30. 52W-1C WAS 25-COM. H-10	
				31. 52X-1C WAS 25-COM. H-10	
				32. 52Y-1C WAS 25-COM. H-10	
				33. 52Z-1C WAS 25-COM. H-10	
				34. 52A-2C WAS 25-COM. H-10	
				35. 52B-2C WAS 25-COM. H-10	
				36. 52C-2C WAS 25-COM. H-10	
				37. 52D-2C WAS 25-COM. H-10	
				38. 52E-2C WAS 25-COM. H-10	
				39. 52F-2C WAS 25-COM. H-10	
				40. 52G-2C WAS 25-COM. H-10	
				41. 52H-2C WAS 25-COM. H-10	
				42. 52I-2C WAS 25-COM. H-10	
				43. 52J-2C WAS 25-COM. H-10	
				44. 52K-2C WAS 25-COM. H-10	
				45. 52L-2C WAS 25-COM. H-10	
				46. 52M-2C WAS 25-COM. H-10	
				47. 52N-2C WAS 25-COM. H-10	
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				103. 52R-4C WAS 25-COM. H-10	
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				112. 52A-5C WAS 25-COM. H-10	
				113. 52B-5C WAS 25-COM. H-10	
				114. 52C-5C WAS 25-COM. H-10	
				115. 52D-5C WAS 25-COM. H-10	
				116. 52E-5C WAS 25-COM. H-10	
				117. 52F-5C WAS 25-COM. H-10	
				118. 52G-5C WAS 25-COM. H-10	
				119. 52H-5C WAS 25-COM. H-10	
				120. 52I-5C WAS 25-COM. H-10	
				121. 52J-5C WAS 25-COM. H-10	
				122. 52K-5C WAS 25-COM. H-10	
				123. 52L-5C WAS 25-COM. H-10	
				124. 52M-5C WAS 25-COM. H-10	
				125. 52N-5C WAS 25-COM. H-10	
				126. 52O-5C WAS 25-COM. H-10	
				127. 52P-5C WAS 25-COM. H-10	
				128. 52Q-5C WAS 25-COM. H-10	
				129. 52R-5C WAS 25-COM. H-10	
				130. 52S-5C WAS 25-COM. H-10	
				131. 52T-5C WAS 25-COM. H-10	
				132. 52U-5C WAS 25-COM. H-10	
				133. 52V-5C WAS 25-COM. H-10	
				134. 52W-5C WAS 25-COM. H-10	
				135. 52X-5C WAS 25-COM. H-10	
				136. 52Y-5C WAS 25-COM. H-10	
				137. 52Z-5C WAS 25-COM. H-10	
				138. 52A-6C WAS 25-COM. H-10	
				139. 52B-6C WAS 25-COM. H-10	
				140. 52C-6C WAS 25-COM. H-10	
				141. 52D-6C WAS 25-COM. H-10	
				142. 52E-6C WAS 25-COM. H-10	
				143. 52F-6C WAS 25-COM. H-10	
				144. 52G-6C WAS 25-COM. H-10	
				145. 52H-6C WAS 25-COM. H-10	
				146. 52I-6C WAS 25-COM. H-10	
				147. 52J-6C WAS 25-COM. H-10	
				148. 52K-6C WAS 25-COM. H-10	
				149. 52L-6C WAS 25-COM. H-10	
				150. 52M-6C WAS 25-COM. H-10	
				151. 52N-6C WAS 25-COM. H-10	
				152. 52O-6C WAS 25-COM. H-10	
				153. 52P-6C WAS 25-COM. H-10	
				154. 52Q-6C WAS 25-COM. H-10	
				155. 52R-6C WAS 25-COM. H-10	
				156. 52S-6C WAS 25-COM. H-10	
				157. 52T-6C WAS 25-COM. H-10	
				158. 52U-6C WAS 25-COM. H-10	
				159. 52V-6C WAS 25-COM. H-10	
				160. 52W-6C WAS 25-COM. H-10	
				161. 52X-6C WAS 25-COM. H-10	
				162. 52Y-6C WAS 25-COM. H-10	
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				165. 52B-7C WAS 25-COM. H-10	
				166. 52C-7C WAS 25-COM. H-10	
				167. 52D-7C WAS 25-COM. H-10	
				168. 52E-7C WAS 25-COM. H-10	
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				172. 52I-7C WAS 25-COM. H-10	
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				174. 52K-7C WAS 25-COM. H-10	
				175. 52L-7C WAS 25-COM. H-10	
				176. 52M-7C WAS 25-COM. H-10	
				177. 52N-7C WAS 25-COM. H-10	
				178. 52O-7C WAS 25-COM. H-10	
				179. 52P-7C WAS 25-COM. H-10	
				180. 52Q-7C WAS 25-COM. H-10	
				181. 52R-7C WAS 25-COM. H-10	
				182. 52S-7C WAS 25-COM. H-10	
				183. 52T-7C WAS 25-COM. H-10	
				184. 52U-7C WAS 25-COM. H-10	
				185. 52V-7C WAS 25-COM. H-10	
				186. 52W-7C WAS 25-COM. H-10	
				187. 52X-7C WAS 25-COM. H-10	
				188. 52Y-7C WAS 25-COM. H-10	
				189. 52Z-7C WAS 25-COM. H-10	
				190. 52A-8C WAS 25-COM. H-10	
				191. 52B-8C WAS 25-COM. H-10	
				192. 52C-8C WAS 25-COM. H-10	
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				194. 52E-8C WAS 25-COM. H-10	
				195. 52F-8C WAS 25-COM. H-10	
				196. 52G-8C WAS 25-COM. H-10	
				197. 52H-8C WAS 25-COM. H-10	
				198. 52I-8C WAS 25-COM. H-10	
				199. 52J-8C WAS 25-COM. H-10	
				200. 52K-8C WAS 25-COM. H-10	
				201. 52L-8C WAS 25-COM. H-10	
				202. 52M-8C WAS 25-COM. H-10	
				203. 52N-8C WAS 25-COM. H-10	
				204. 52O-8C WAS 25-COM. H-10	
				205. 52P-8C WAS 25-COM. H-10	
				206. 52Q-8C WAS 25-COM. H-10	
				207. 52R-8C WAS 25-COM. H-10	
				208. 52S-8C WAS 25-COM. H-10	
				209. 52T-8C WAS 25-COM. H-10	
				210. 52U-8C WAS 25-COM. H-10	
				211. 52V-8C WAS 25-COM. H-10	
				212. 52W-8C WAS 25-COM. H-10	
				213. 52X-8C WAS 25-COM. H-10	
				214. 52Y-8C WAS 25-COM. H-10	
				215. 52Z-8C WAS 25-COM. H-10	
				216. 52A-9C WAS 25-COM. H-10	
				217. 52B-9C WAS 25-COM. H-10	
				218. 52C-9C WAS 25-COM. H-10	
				219. 52D-9C WAS 25-COM. H-10	
				220. 52E-9C WAS 25-COM. H-10	
				221. 52F-9C WAS 25-COM. H-10	
				222. 52G-9C WAS 25-COM. H-10	
				223. 52H-9C WAS 25-COM. H-10	
				224. 52I-9C WAS 25-COM. H-10	
				225. 52J-9C WAS 25-COM. H-10	
				226. 52K-9C WAS 25-COM. H-10	
				227. 52L-9C WAS 25-COM. H-10	
				228. 52M-9C WAS 25-COM. H-10	
				229. 52N-9C WAS 25-COM. H-10	
				230. 52O-9C WAS 25-COM. H-10	
				231. 52P-9C WAS 25-COM. H-10	
				232. 52Q-9C WAS 25-COM. H-10	
				233. 52R-9C WAS 25-COM. H-10	







ITEM		REQD. SIZE		PART NO.		DESCRIPTION	
R 7440	DO NOT SCALE DRAWING	UNLESS OTHERWISE SPECIFIED		AMF Incorporated		SPEC.	
R 6440	SCALE <u>1</u> DATE	TOL. PROHIBITIVE SIGNALS FRACTIONS				MATERIAL SPEC.	
R 7000	DRAWING NO. <u>100-100-100</u>	6-12-87	MILLIMETERS TOL.	ANGLES ±			
R 6000	CHECKED BY <u>DATE</u>	12/27/87	FINAL W/D B-2-R MACHINE		DRG. E	CLASS	NUMBER
NEXT ASSEMBLY	APPROVED BY <u>DATE</u>	12/27/87	MKS. LIMITS		SIZE	82	070005 500
							2088

NOTES:

1. MACHINE SHOWN IN ITS ZERO POSITION
IMMEDIATE DELIVERY OF A FIRST BALL,
NO POWER APPLIED.

2. BIN SWITCH AS SHOWN "OPEN" INDICATES
THERE IS LESS THAN A FULL SET OF PINS
IN THE BIN.

3. LEGEND—

CONTROL BOX

CB—MASTER CIRCUIT BREAKER
SW—SWEEP RUN SWITCH
SWB—SWITCH-BACK END MOTOR
PBC—PUSH BUTTON CYCLE SWITCH
PBZ—PUSH BUTTON—1ST. BALL ZERO
T—SWITCH, TABLE
S—SWITCH, SWEEP
SWR—SWITCH, SWEEP REVERSE

CONNECTORS

CI—CIRCUIT POWER PLUG
C2A—CIRCUIT CONTROL PLUG—LOW VOLTAGE
TAC—TABLE TERM. BLOCK
A1MC—APPROACH, MGR CONTROL
LTP1, 2—LIGHT PLUG, PIT
LTM1, 2—LIGHT PLUG, MASK
LT—MASK / PIT LIGHT SOCKET
TM—TABLE MOTOR
SM—SWEEP MOTOR
TAP—TABLE PLUG
MP—MASK PLUG
APS—A.P.S. PLUG

CONTROL

BS—BIN SWITCH
SS—START SWITCH
OS—OFF SPOT CAM SWITCH
GP—GRIPPER PROTECTION SW.
CIS—CIRCUIT INTERRUPT SWITCH

CHASSIS CONTROL

C SW—CYCLE SWITCH
P Z—PROGRAM ZERO SWITCH
S SW—SWEEP RUN SWITCH
T SW—TABLE RUN SWITCH

CONTROL COMPONENTS

SP—SPOT RELAY
BE—BACK END MOTOR RELAY
M—MASTER ON-OFF RELAY
M2—SWEEP REVERSE RELAY
S—SWEEP CONTACTOR
T—TABLE CONTACTOR
M1—BALL RETURN RELAY

TABLE CAMS

TA1
TA2
TB

SWEEP CAMS

SA
SB
SC

M.P. BOARD CONNECTORS

P-1—PLUG #1
P-2—PLUG #2

APS CHASSIS CONNECTORS

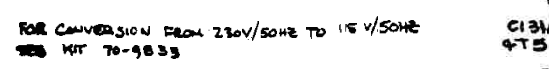
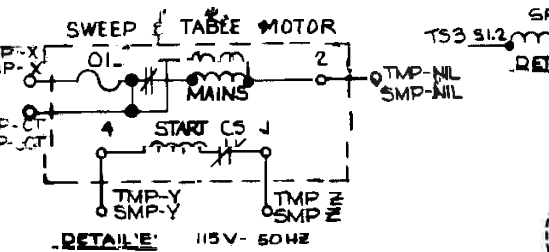
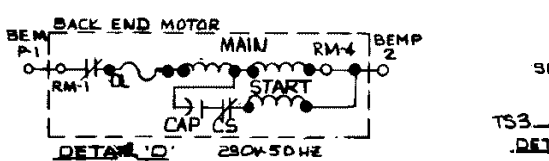
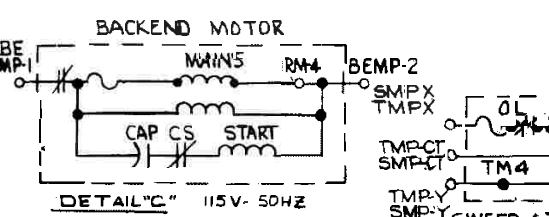
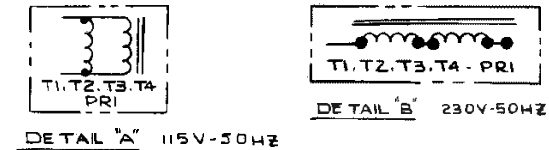
PI/P4 IDENTICAL PLUGS FOR
LEFT / RIGHT MACHINES
*070-009-BIG-ASSY (REF)
*070-009-SMALL-ASSY (REF)
(*DIFFER IN LENGTH ONLY)

4. WHEN UNIT INCLUDES MAGIC SCORE WITH
ACOUSTICAL AUTOMATIC PINSSENSING, OMIT
PBC SWITCH BETWEEN POINTS C2A-27E
AND C2A-14R. TAPE EXISTING WIRE CONNECTIONS
TO PBC. USE ALTERNATE CONNECTION SHOWN
FOR REFERENCE ONLY SEE 070-006-466 AND
070-006-467.

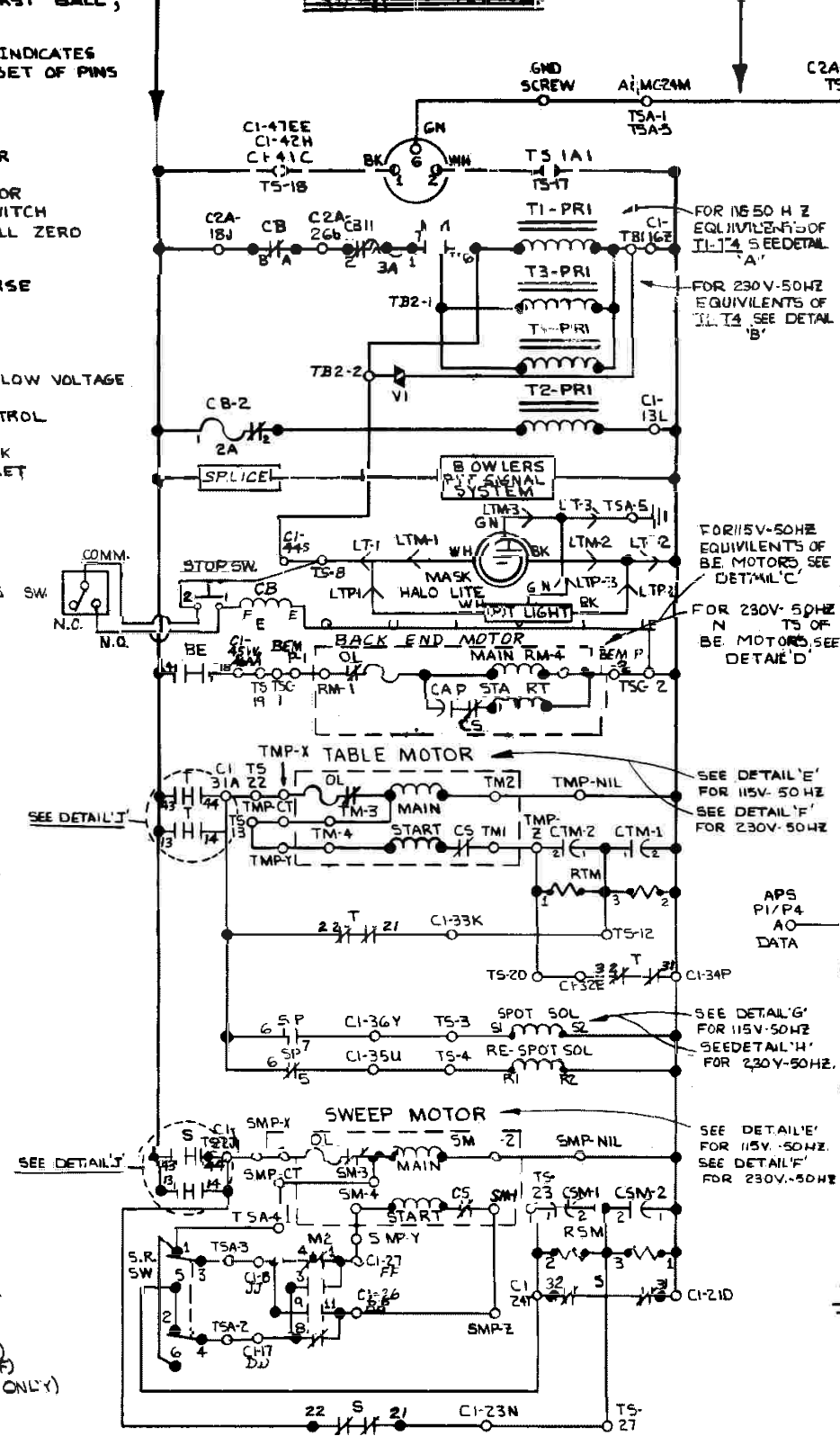
5. GP SWITCH AS SHOWN "CLOSED" INDICATES
RESPOT CELLS ARE IN OPEN POSITION.

6. HALO LIGHT USED ONLY ON MODEL 59 MASK

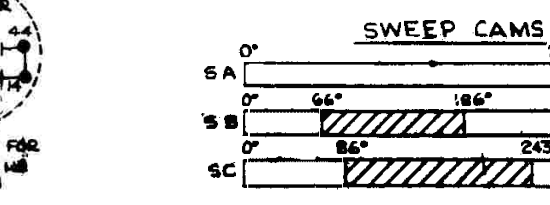
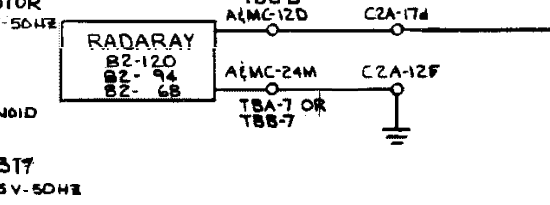
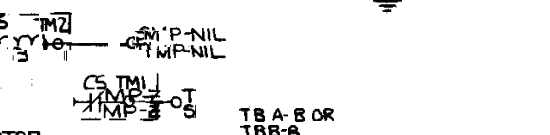
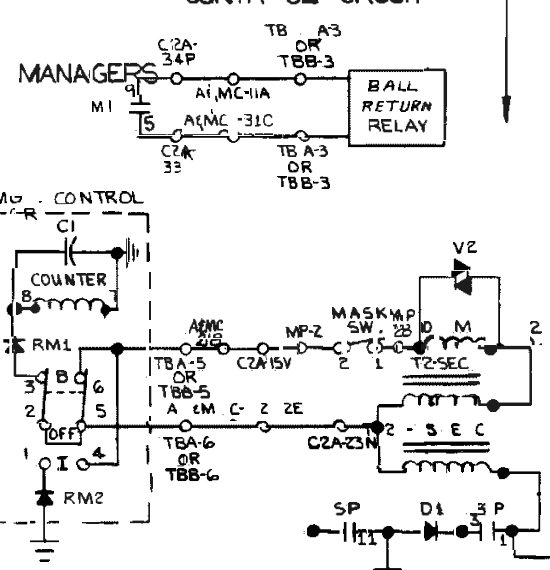
7. 50HZ SCHEMATIC CHANGES PER DETAILS BELOW:



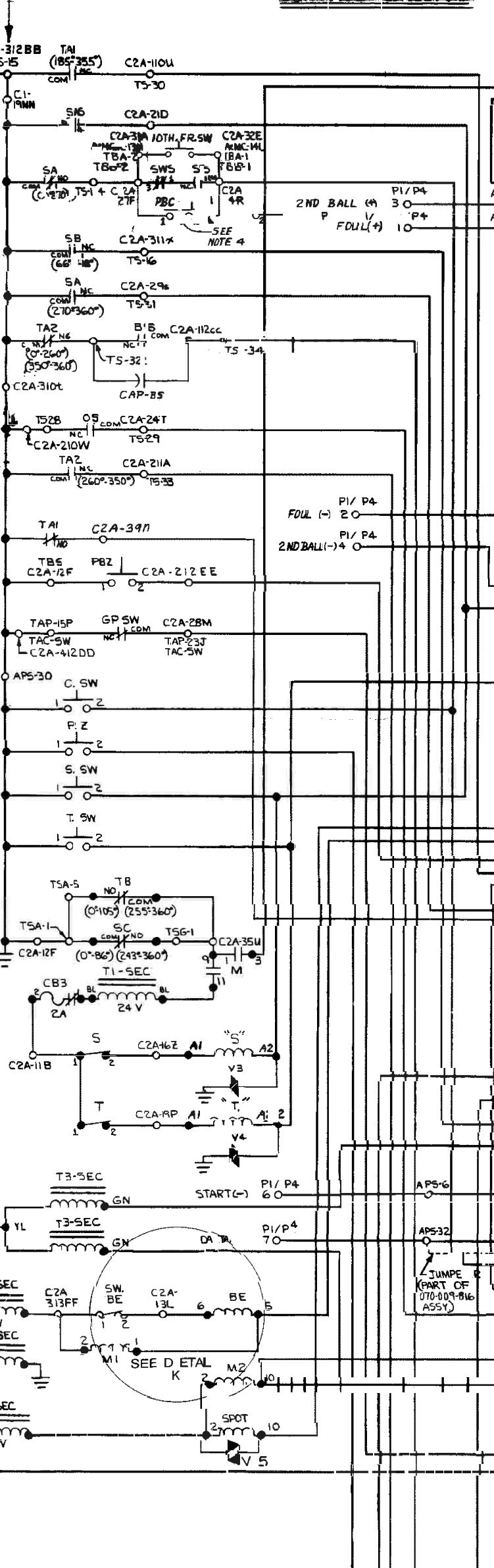
POWER CIRCUITS



CONTR OL CIRCUIT

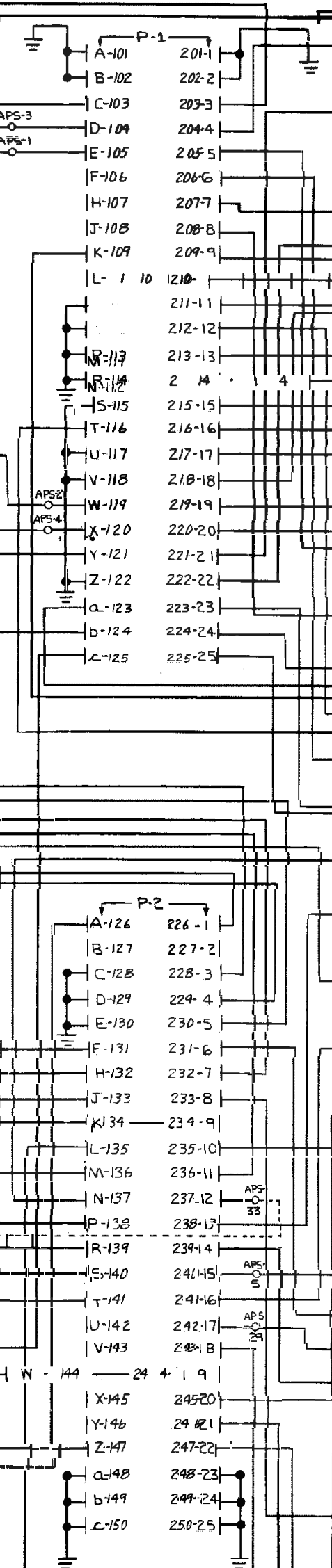


CONTROL CIRCUITS

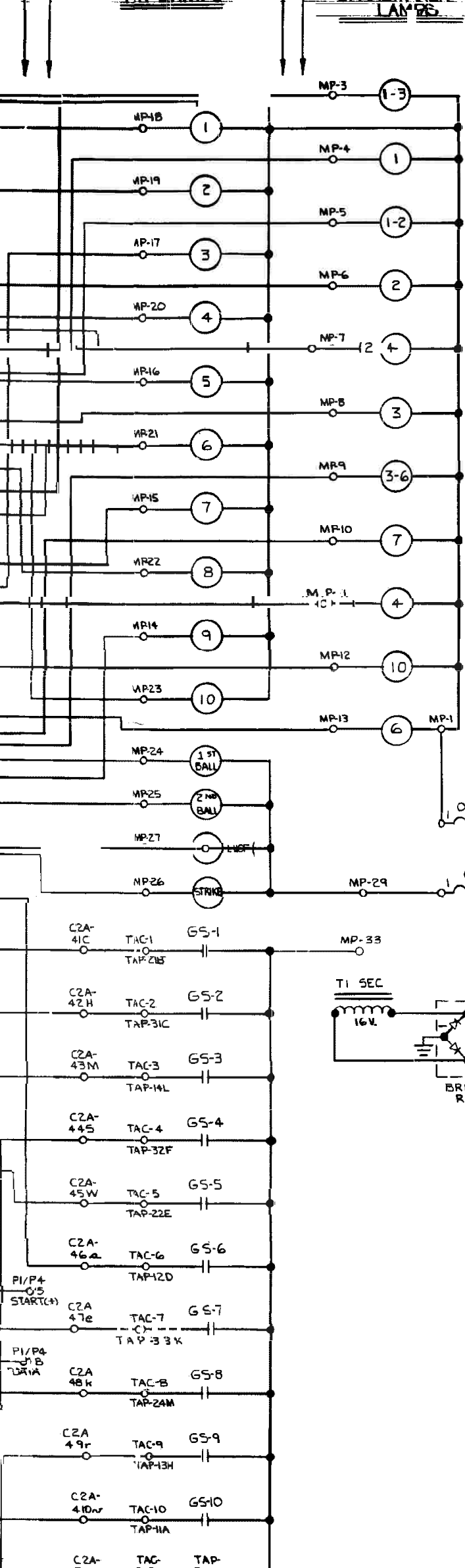


M.P. BOARD

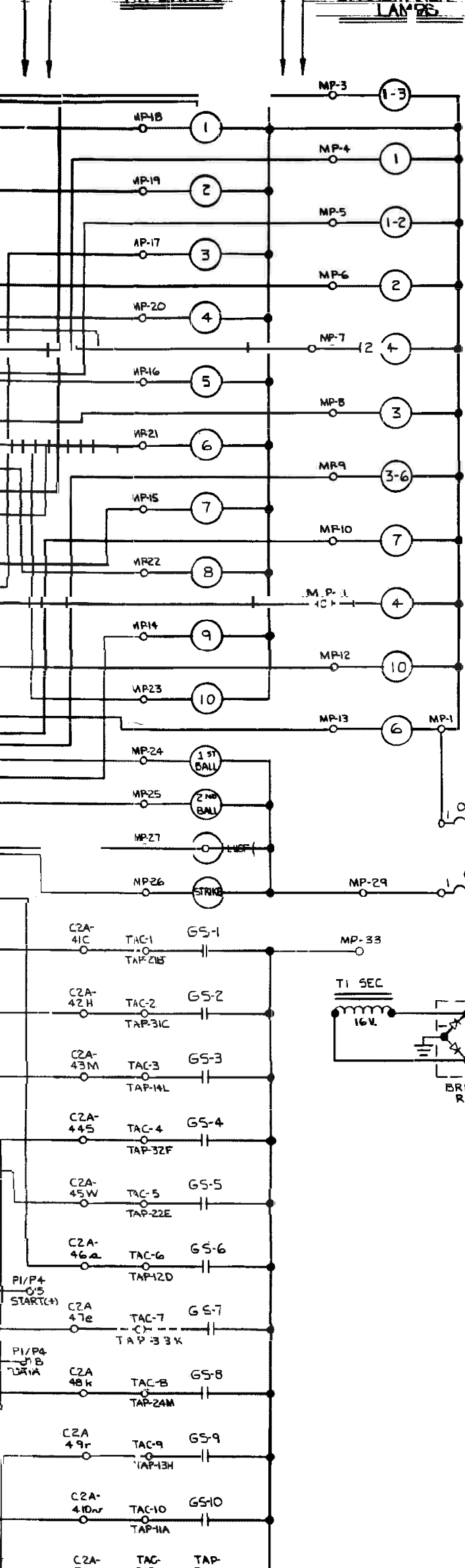
P.C. BOARD CONNECTORS P-#2
VIEWED FROM UNDER SIDE OF CHASSIS
AND P.C.B.D. COMPONENTS TO THE LEFT



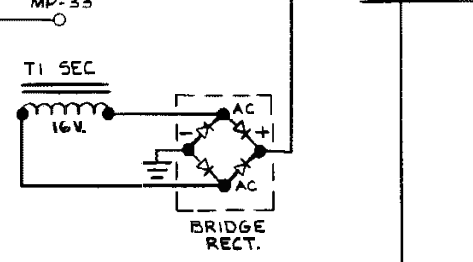
BIN LAMPS



SPAREMAKER LAMPS



LAMP POWER SUPPLY



REV	DATE	BY	CHKD	DESCRIPTION
1	10/29/59	WEG	WEG	NEW DRAWING
2	11/10/59	WEG	WEG	1. ADDED DETAIL 'K' FOR 230V-50HZ
3	11/10/59	WEG	WEG	2. ADDED DETAIL 'L' FOR 230V-50HZ
4	11/10/59	WEG	WEG	3. ADDED DETAIL 'M' FOR 230V-50HZ
5	11/10/59	WEG	WEG	4. ADDED DETAIL 'N' FOR 230V-50HZ
6	11/10/59	WEG	WEG	5. ADDED DETAIL 'O' FOR 230V-50HZ
7	11/10/59	WEG	WEG	6. ADDED DETAIL 'P' FOR 230V-50HZ
8	11/10/59	WEG	WEG	7. ADDED DETAIL 'Q' FOR 230V-50HZ
9	11/10/59	WEG	WEG	8. ADDED DETAIL 'R' FOR 230V-50HZ
10	11/10/59	WEG	WEG	9. ADDED DETAIL 'S' FOR 230V-50HZ
11	11/10/59	WEG	WEG	10. ADDED DETAIL 'T' FOR 230V-50HZ
12	11/10/59	WEG	WEG	11. ADDED DETAIL 'U' FOR 230V-50HZ
13	11/10/59	WEG	WEG	12. ADDED DETAIL 'V' FOR 230V-50HZ
14	11/10/59	WEG	WEG	13. ADDED DETAIL 'W' FOR 230V-50HZ
15	11/10/59	WEG	WEG	14. ADDED DETAIL 'X' FOR 230V-50HZ
16	11/10/59	WEG	WEG	15. ADDED DETAIL 'Y' FOR 230V-50HZ
17	11/10/59	WEG	WEG	16. ADDED DETAIL 'Z' FOR 230V-50HZ
18	11/10/59	WEG	WEG	17. ADDED DETAIL 'AA' FOR 230V-50HZ
19	11/10/59	WEG	WEG	18. ADDED DETAIL 'AB' FOR 230V-50HZ
20	11/10/59	WEG	WEG	19. ADDED DETAIL 'AC' FOR 230V-50HZ
21	11/10/59	WEG	WEG	20. ADDED DETAIL 'AD' FOR 230V-50HZ
22	11/10/59	WEG	WEG	21. ADDED DETAIL 'AE' FOR 230V-50HZ
23	11/10/59	WEG	WEG	22. ADDED DETAIL 'AF' FOR 230V-50HZ
24	11/10/59	WEG	WEG	23. ADDED DETAIL 'AG' FOR 230V-50HZ
25	11/10/59	WEG	WEG	24. ADDED DETAIL 'AH' FOR 230V-50HZ
26	11/10/59	WEG	WEG	25. ADDED DETAIL 'AI' FOR 230V-50HZ
27	11/10/59	WEG	WEG	26. ADDED DETAIL 'AJ' FOR 230V-50HZ
28	11/10/59	WEG	WEG	27. ADDED DETAIL 'AK' FOR 230V-50HZ
29	11/10/59	WEG	WEG	28. ADDED DETAIL 'AL' FOR 230V-50HZ
30	11/10/59	WEG	WEG	29. ADDED DETAIL 'AM' FOR 230V-50HZ
31	11/10/59	WEG	WEG	30. ADDED DETAIL 'AN' FOR 230V-50HZ
32	11/10/59	WEG	WEG	31. ADDED DETAIL 'AO' FOR 230V-50HZ
33	11/10/59	WEG	WEG	32. ADDED DETAIL 'AP' FOR 230V-50HZ
34	11/10/59	WEG	WEG	33. ADDED DETAIL 'AQ' FOR 230V-50HZ
35	11/10/59	WEG	WEG	34. ADDED DETAIL 'AR' FOR 230V-50HZ
36	11/10/59	WEG	WEG	35. ADDED DETAIL 'AS' FOR 230V-50HZ
37	11/10/59	WEG	WEG	36. ADDED DETAIL 'AT' FOR 230V-50HZ
38	11/10/59	WEG	WEG	37. ADDED DETAIL 'AU' FOR 230V-50HZ
39	11/10/59	WEG	WEG	38. ADDED DETAIL 'AV' FOR 230V-50HZ
40	11/10/59	WEG	WEG	39. ADDED DETAIL 'AW' FOR 230V-50HZ
41	11/10/59	WEG	WEG	40. ADDED DETAIL 'AX' FOR 230V-50HZ
42	11/10/59	WEG	WEG	41. ADDED DETAIL 'AY' FOR 230V-50HZ
43	11/10/59	WEG	WEG	42. ADDED DETAIL 'AZ' FOR 230V-50HZ
44	11/10/59	WEG	WEG	43. ADDED DETAIL 'BA' FOR 230V-50HZ
45	11/10/59	WEG	WEG	44. ADDED DETAIL 'BB' FOR 230V-50HZ
46	11/10/59	WEG	WEG	45. ADDED DETAIL 'BC' FOR 230V-50HZ
47	11/10/59	WEG	WEG	46. ADDED DETAIL 'BD' FOR 230V-50HZ
48	11/10/59	WEG	WEG	47. ADDED DETAIL 'BE' FOR 230V-50HZ
49	11/10/59	WEG	WEG	48. ADDED DETAIL 'BF' FOR 230V-50HZ
50	11/10/59	WEG	WEG	49. ADDED DETAIL 'BG' FOR 230V-50HZ
51	11/10/59	WEG	WEG	50. ADDED DETAIL 'BH' FOR 230V-50HZ
52	11/10/59	WEG	WEG	51. ADDED DETAIL 'BI' FOR 230V-50HZ
53	11/10/59	WEG	WEG	52. ADDED DETAIL 'BJ' FOR 230V-50HZ
54	11/10/59	WEG	WEG	53. ADDED DETAIL 'BK' FOR 230V-50HZ
55	11/10/59	WEG	WEG	54. ADDED DETAIL 'BL' FOR 230V-50HZ
56	11/10/59	WEG	WEG	55. ADDED DETAIL 'BM' FOR 230V-50HZ
57	11/10/59	WEG	WEG	56. ADDED DETAIL 'BN' FOR 230V-50HZ
58	11/10/59	WEG	WEG	57. ADDED DETAIL 'BO' FOR 230V-50HZ
59	11/10/59	WEG	WEG	58. ADDED DETAIL 'BP' FOR 230V-50HZ
60	11/10/59	WEG	WEG	59. ADDED DETAIL 'BQ' FOR 230V-50HZ
61	11/10/59	WEG	WEG	60. ADDED DETAIL 'BR' FOR 230V-50HZ
62	11/10/59	WEG	WEG	61. ADDED DETAIL 'BS' FOR 230V-50HZ
63	11/10/59	WEG	WEG	62. ADDED DETAIL 'BT' FOR 230V-50HZ
64	11/10/59	WEG	WEG	63. ADDED DETAIL 'BU' FOR 230V-50HZ
65	11/10/59	WEG	WEG	64. ADDED DETAIL 'BV' FOR 230V-50HZ
66	11/10/59	WEG	WEG	65. ADDED DETAIL 'BW' FOR 230V-50HZ
67	11/10/59	WEG	WEG	66. ADDED DETAIL 'BX' FOR 230V-50HZ
68	11/10/59	WEG	WEG	67. ADDED DETAIL 'BY' FOR 230V-50HZ
69	11/10/59	WEG	WEG	68. ADDED DETAIL 'BZ' FOR 230V-50HZ
70	11/10/59	WEG	WEG	69. ADDED DETAIL 'CA' FOR 230V-50HZ
71	11/10/59	WEG	WEG	70. ADDED DETAIL 'CB' FOR 230V-50HZ
72	11/10/59	WEG	WEG	71. ADDED DETAIL 'CC' FOR 230V-50HZ
73	11/10/59	WEG	WEG	72. ADDED DETAIL 'CD' FOR 230V-50HZ
74	11/10/59	WEG	WEG	73. ADDED DETAIL 'CE' FOR 230V-50HZ
75	11/10/59	WEG	WEG	74. ADDED DETAIL 'CF' FOR 230V-50HZ
76	11/10/59	WEG	WEG	75. ADDED DETAIL 'CG' FOR 230V-50HZ
77	11/10/59	WEG	WEG	76. ADDED DETAIL 'CH' FOR 230V-50HZ
78	11/10/59	WEG	WEG	77. ADDED DETAIL 'CI' FOR 230V-50HZ
79	11/10/59	WEG	WEG	78. ADDED DETAIL 'CJ' FOR 230V-50HZ
80	11/10/59	WEG	WEG	79. ADDED DETAIL 'CK' FOR 230V-50HZ
81	11/10/59	WEG	WEG	80. ADDED DETAIL 'CL' FOR 230V-50HZ
82	11/10/59	WEG	WEG	81. ADDED DETAIL 'CM' FOR 230V-50HZ
83	11/10/59	WEG	WEG	82. ADDED DETAIL 'CN' FOR 230V-50HZ
84	11/10/59	WEG	WEG	83. ADDED DETAIL 'CO' FOR 230V-50HZ
85	11/10/59	WEG	WEG	84. ADDED DETAIL 'CP' FOR 230V-50HZ
86	11/10/59	WEG	WEG	85. ADDED DETAIL 'CQ' FOR 230V-50HZ
87	11/10/59	WEG	WEG	86. ADDED DETAIL 'CR' FOR 230V-50HZ
88	11/10/59	WEG	WEG	87. ADDED DETAIL 'CS' FOR 230V-50HZ
89	11/10/59	WEG	WEG	88. ADDED DETAIL 'CT' FOR 230V-50HZ
90	11/10/59	WEG	WEG	89. ADDED DETAIL 'CU' FOR 230V-50HZ
91	11/10/59	WEG	WEG	90. ADDED DETAIL 'CV' FOR 230V-50HZ
92	11/10/59	WEG	WEG	91. ADDED DETAIL 'CW' FOR 230V-50HZ
93	11/10/59	WEG	WEG	92. ADDED DETAIL 'CX' FOR 230V-50HZ
94	11/10/59	WEG	WEG	93. ADDED DETAIL 'CY' FOR 230V-50HZ
95	11/10/59	WEG	WEG	94. ADDED DETAIL 'CZ' FOR 230V-50HZ
96	11/10/59	WEG	WEG	95. ADDED DETAIL 'DA' FOR 230V-50HZ
97	11/10/59	WEG	WEG	96. ADDED DETAIL 'DB' FOR 230V-50HZ
98	11/10/59	WEG	WEG	97. ADDED DETAIL 'DC' FOR 230V-50HZ
99	11/10/59	WEG	WEG	98. ADDED DETAIL 'DD' FOR 230V-50HZ
100	11/10/59	WEG	WEG	99. ADDED DETAIL 'DE' FOR 230V-50HZ
101	11/10/59	WEG	WEG	100. ADDED DETAIL 'DF' FOR 230V-50HZ
102	11/10/59	WEG	WEG	101. ADDED DETAIL 'DG' FOR 230V-50HZ
103	11/10/59	WEG	WEG	102. ADDED DETAIL 'DH' FOR 230V-50HZ
104	11/10/59	WEG	WEG	103. ADDED DETAIL 'DI' FOR 230V-50HZ
105	11/10/59	WEG	WEG	104. ADDED DETAIL 'DJ' FOR 230V-50HZ
106	11/10/59	WEG	WEG	105. ADDED DETAIL 'DK' FOR 230V-50HZ
107	11/10/59	WEG	WEG	106. ADDED DETAIL 'DL' FOR 230V-50HZ
108	11/10/59	WEG	WEG	107. ADDED DETAIL 'DM' FOR 230V-50HZ
109	11/10/59	WEG	WEG	108. ADDED DETAIL 'DN' FOR 230V-50HZ
110	11/10/59	WEG	WEG	109. ADDED DETAIL 'DO' FOR 230V-50HZ
111	11/10/59	WEG	WEG	110. ADDED DETAIL 'DP' FOR 230V-50HZ
112	11/10/59	WEG	WEG	111. ADDED DETAIL 'DQ' FOR 230V-50HZ
113	11/10/59	WEG	WEG	112. ADDED DETAIL 'DR' FOR 230V-50HZ
114	11/10/59	WEG	WEG	113. ADDED DETAIL 'DS' FOR 230V-50HZ
115	11/10/59	WEG	WEG	114. ADDED DETAIL 'DT' FOR 230V-50HZ
116	11/10/59	WEG	WEG	115. ADDED DETAIL 'DU' FOR 230V-50HZ
117	11/10/59	WEG	WEG	116. ADDED DETAIL 'DV' FOR 230V-50HZ
118	11/10/59	WEG	WEG	117. ADDED DETAIL 'DW' FOR 230V-50HZ
119	11/10/59	WEG	WEG	118. ADDED DETAIL 'DX' FOR 230V-50HZ
120	11/10/59	WEG	WEG	119. ADDED DETAIL 'DY' FOR 230V-50HZ
121	11/10/59	WEG	WEG	120. ADDED DETAIL 'DZ' FOR 230V-50HZ
122	11/10/59	WEG	WEG	121. ADDED DETAIL 'EA' FOR 230V-50HZ
123	11/10/59	WEG	WEG	122. ADDED DETAIL 'EB' FOR 230V-50HZ
124	11/10/59	WEG	WEG	123. ADDED DETAIL 'EC' FOR 230V-50HZ
125	11/10/59	WEG	WEG	124. ADDED DETAIL 'ED' FOR 230V-50HZ
126	11/10/59	WEG	WEG	125. ADDED DETAIL 'EE' FOR 230V-50HZ
127	11/10/59	WEG	WEG	126. ADDED DETAIL 'EF' FOR 230V-50HZ
128	11/10/59	WEG	WEG	127. ADDED DETAIL 'EG' FOR 230V-50HZ
129	11/10/59	WEG	WEG	128. ADDED DETAIL 'EH' FOR 230V-50HZ
130	11/10/59	WEG	WEG	129. ADDED DETAIL 'EI' FOR 230V-50HZ
131	11/10/59	WEG	WEG	130. ADDED DETAIL 'EJ' FOR 230V-50HZ
132	11/10/59	WEG	WEG	131. ADDED DETAIL 'EK' FOR 230V-50HZ
133	11/10/59	WEG	WEG	132. ADDED DETAIL 'EL' FOR 230V-50HZ
134	11/10/59	WEG	WEG	133. ADDED DETAIL 'EM' FOR 230V-5