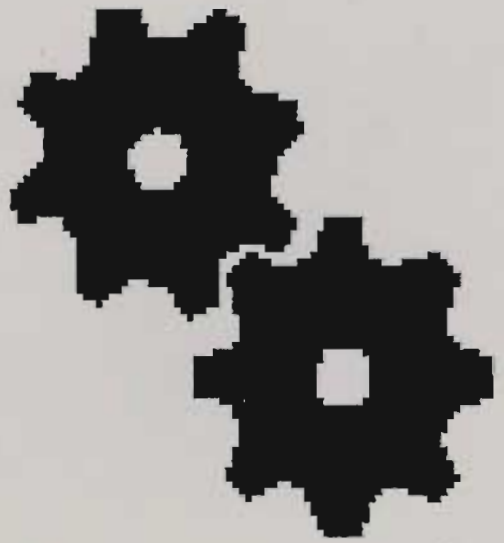
AMF

82-90XL PINSPOTTER MOTOR / GEARBOX REPAIR AND MAINTENANCE MANUAL



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PART 1

GEARBOX
REPAIR AND MAINTENANCE

REPAIR OF THE FRONT END GEARBOX

1.0 PURPOSE

This section describes the procedures for the repair and maintenance of the front end gearboxes for the 82-90XL Pinspotter. It contains parts lists, drawings and repair kit information.

2.0 SCOPE

The front end gearbox is a field serviceable item that comes in two different gear ratios for the 60 and 50 Hz motors. The repair procedures for both gearboxes are identical; however, special attention must be given to ensure the proper gear ratios are re-installed.

A front end gearbox is shown in an exploded view in Figure #1, Page 6. The corresponding parts are identified in Table #1, Page 7. The 50 Hz and 60 Hz units are treated alike, although the two have unique sets of helical gears. The 50 Hz gearboxes have red tag name plates; the 60 Hz gearboxes have black tag name plates.

APPLICATION	AMF PART NO.
60 Hz Front End	090-004-504
50 Hz Front End	090-004-509

Parts available for gearbox repair are packaged in kits and may be ordered by kit number. The gearbox packing kit is required for all repairs or any service requiring disassembly. For individual parts contact AMF for availability.

3.0 PROCEDURE

3.1 DETECTING GEARBOX PROBLEMS

Inspect the gearboxes at least once every 60 days to identify the need for service or repairs. The following symptoms can be detected without any disassembly, and sometimes may indicate the required repair.

3.1.1 Oil Leakage

Oil leakage from seals may indicate shaft and/or seal wear. Leaks from other areas such as case covers, plugs etc. may be corrected by proper use of thread sealant such as Loctite. All threads must be clean and free of oil and grease when they are re-assembled.

3.1.2 High Internal Operating Temperature

The maximum normal operating temperature of a front end gearbox is 50° F (28° C) above ambient . Higher temperatures may be caused by low oil level or internal component failure. As a general rule, higher operating temperatures warrant a more complete examination.

3.1.3 Shaft End Play and/or Gear Backlash

Excessive radial or axial movement of the gearbox shafts indicate worn bearings, broken retaining rings, etc. Excessive backlash (rotational shaft movement without resistance) indicates gear wear.

3.1.4 Excessive Noise

Excessive noise such as grinding sounds coming from a gearbox indicates internal problems. This unit should be removed from service and examined.

3.2 OIL SEAL REPLACEMENT

3.2.1 To remove the output shaft seal (Item 35), remove the cap screws from the flange (Item 4) and remove the flange. The oil seal should come off with the flange. Remove and discard the oil seal.

3.2.2 To remove the input shaft seal (Item 36), remove the cap screws from the input end open cap (Item 39) and remove the cap. Remove and discard the oil seal.

3.2.3 To replace a seal: clean the shaft and seal seating area. Apply lubricant to the shaft and seal lip, and Permatex or equivalent to the outside diameter of the seal housing. Re-install the flange and end cap. Torque screws to 70 in. lbs. on the end cap and 120 in. lbs. on the output flange.

3.3 DISASSEMBLY OF THE FRONT END GEARBOX

3.3.1 Remove the motor gearbox assembly from the pinspotter. Separate the gearbox from the motor.

3.3.2 Loosen the breather plug (Item 32), remove the drain plug (Item 31) and drain the lubricating oil from the gearbox. Discard the old lubricant.

3.3.3 Remove the mounting flange (Item 4), closed cap (Item 5) and input end open cap (Item 39).

3.3.4 Remove the expansion plug (Item 13) by first punching a hole in it and then by prying it out of the housing. Ensure that the inside diameter of the opening in the housing is not damaged during this operation. This instruction pertains to the first repair of the unit; once you have installed the replacement flanged plug, removal will be easier.

3.3.5 After removing the expansion plug, remove the bolt (Item 20) and washer (Item 22) at the end of the worm assembly (Item 46), and remove the worm assembly.

3.3.6 After removal of the worm, the other gears may be removed thru the appropriate port in the housing.

3.3.7 Remove the snap ring (Item 25) and bearing (Item 16) from the housing.

NOTE: Remove components as described. Do not attempt to remove gears or bearings from shafts.

3.4 ASSEMBLY OF THE FRONT END GEARBOX

NOTE: Degrease and clean all serviceable components selected for reuse prior to reassembly.

3.4.1 Assemble the worm bearing (Item 16) using shims (Item 21) as required to eliminate end play when the retaining ring (Item 25) is installed. The shims are placed between the bearing and the housing.

NOTE: Pay special attention to the installation of shims, spacers and retaining rings while making the assembly so that endplay and backlash are eliminated.

3.4.2 Install the intermediate shaft assembly (Item 45). This unit is factory assembled; do not attempt to remove the worm gear. Use shims (Items 1 and 2) as required between the housing and closed cap (Item 5). Ensure that the worm gear rotates freely without end play. Lubricate the O-ring (Item 37) on the closed cap and the housing bore. Apply Loctite to the cap screws (Item 18) and install the closed cap using 70 in. lbs. of torque.

3.4.3 Install the output gear assembly (Item 47). Use shims (Items 11 and 12) as required between the flange (Item 4) and the housing; ensure that the output gear rotates freely without end play. Lubricate the O-ring (Item 38) in the flange. Apply Loctite to the cap screws (Item 19) and install the flange using 120 in.lb. of torque.

3.4.4 Insert the worm assembly (Item 46). Install washer (Item 22) and bolt (Item 20) to seat the worm flush against the bearing. Use Loctite on the bolt threads and torque to 150 in.lb.

3.4.5 For units made after August 1992, with the date code of 928 or later: Place wave spring washer (Item 41) against the bearing (Item 40). Lubricate the O-ring (Item 43), install cap (Item 39), apply Loctite to screws (Item 42), torque screws to 70 in. lbs., and install oil seal (Item 36).

3.4.6 For all other units, follow step 3.4.5 omitting reference to wave spring washer (Item 41).

NOTE: Keep dirt and foreign particles off shafts in the seal area to minimize wear.

3.4.7 Install seal (Item 35) on the output gear.

NOTE: Make sure that the spring loaded lip of the seal is facing towards the gearbox. Apply Permatex Sealant Type I or II to the outer diameter of the seal before it is placed on the shaft.

3.4.8 Install the flanged cup (Item 13) in the housing opening at the end of the worm. Apply Permatex Sealant to the sealing rim of the cup. Ensure that the barrel of the housing opening is clean and free of any sealant from the previous application.

3.4.9 Clean and recoat the drain plug (Item 31) and the level indicator plug (Item 32) with Loctite and re-install. Fill the gearbox 45 ounces or 1.275 liters, Mobil 660 W Cylinder Oil). Replace the vent plug. Do not overfill the gearbox.

3.4.10 Re-attach the gearbox to the drive motor. Apply Loctite to the screws and torque to 120 in. lbs.

3.5 SUBASSEMBLIES

The gear box components have been grouped into replaceable subassemblies available in kits.

NOTE: It is recommended that the worm/worm gear and helical gears be replaced as sets. This recommendation is based on the wear characteristics of the mating teeth.

Front End Worm Gear Replacement Kit consists of the worm assembly (Item 46, including Items 7,40), the intermediate gear assembly (Item 45, including Items 6,8,14,16,23,26), and the output gear assembly (Item 47, including Items 9, 15, 17).

50 Hz - Part #610-900-063
60 Hz - Part #610-900-064

Front Gear Drive Packing Kit includes disposable maintenance items (Items 1, 2, 11, 12, 13, 16, 21, 25, 35, 36, 37, 38, 41, 44, 43). Also included is Loctite Sealant 242, Seal Grease NLG1 Class 0 or 1, and Permatex Gasket Sealant Aviation Form-A-Gasket #3. (Figure 2)

Part #610-900-050

FRONT END GEARBOX - EXPLODED VIEW
AMF 82-90XL PINSPOTTER

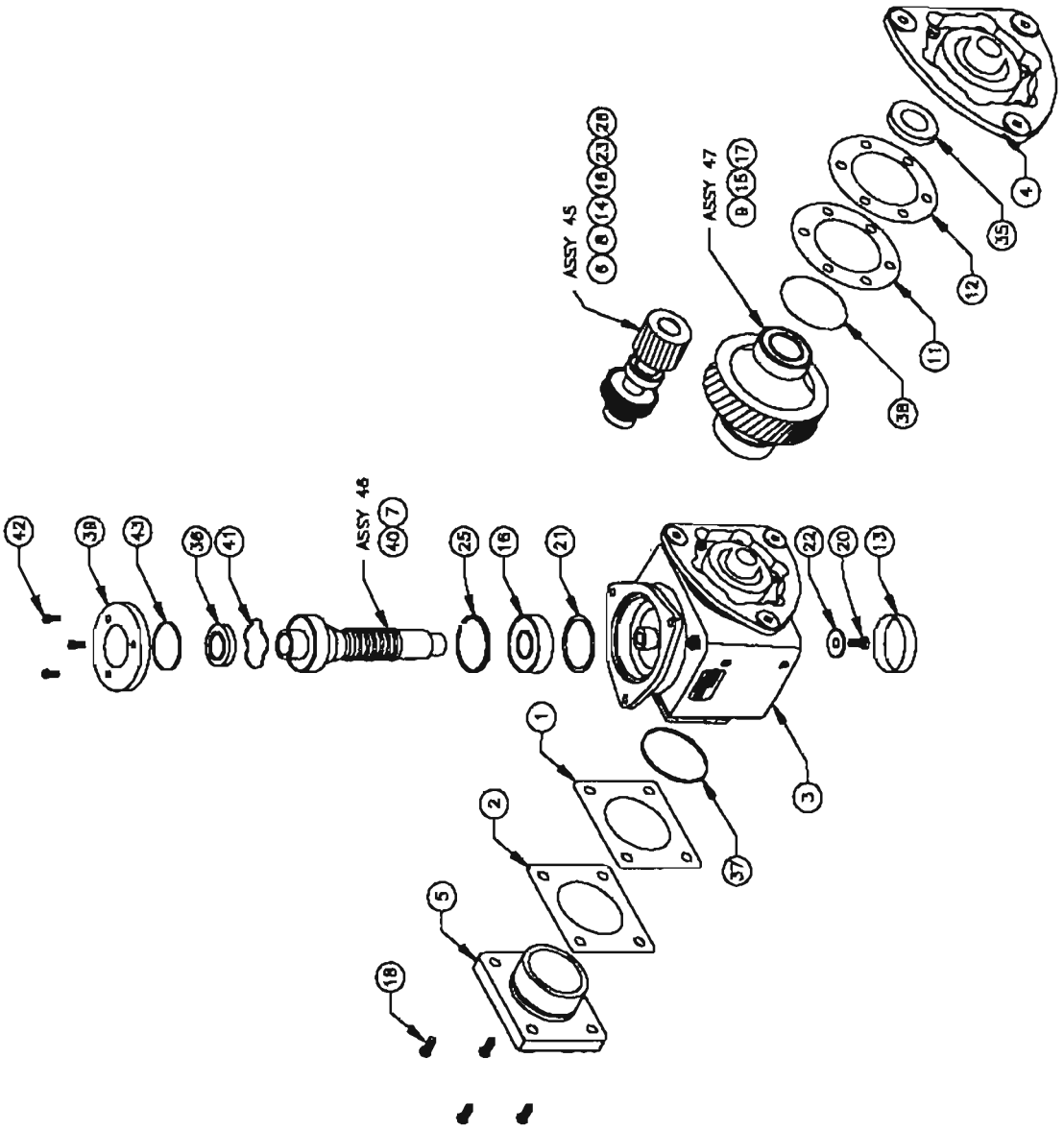


FIGURE #1

FIGURE #1

PARTS LIST - FRONT END GEARBOX
AMF 82-90XL PINSPOTTER

QTY	ITEM	PART NO.	DESCRIPTION
1	44	907-202-500	KEY, P&W 3/16 SQ x 1-3/8
1	43	919-102-300	O-RING, INPUT FLANGE
3	42	809-849-160*	SCREW, HSCP GR5 1/4 NCX1
1	41	962-800-600	SPRING, WAVE
1	40	701-032-037	BEARING, INPUT END BALL SEAL
1	39	785-503-044*	CAP, INPUT END OPEN
1	38	919-102-200	O-RING, OUTPUT FLANGE
1	37	919-102-100	O-RING, CLOSED CAP FLANGE
1	36	785-503-074	SEAL, INPUT SHAFT
1	35	785-503-073	SEAL, OUTPUT SHAFT
1	34	785-503-080*	CAP PLUG
1	32	730-063-088*	PLUG, VENTED 1/8 NPT
2	31	718-507-023*	PLUG, PIPE SOCKET
1	30	718-803-003*	BUSHING, PIPE 1/4 x 1/8
1	29	785-503-075*	BLACK TAG NAME PLATE (60 Hz)
1	29A	785-503-076*	RED TAG NAME PLATE (50 Hz)
.20 oz	28	715-011-801*	GREASE, MOLY-XL
45 oz	27	715-021-711*	OIL, MOBIL 600W CYL
1	26	919-001-100	RING, WORM GEAR RETAINING
1	25	919-001-400	RING, WORM RETAINING
1	23	907-202-200	KEY, P&W 3/16 SQ x 1
1	22	946-264-160*	WASHER, 3/8 x 1 x 1/8
4	21	785-503-040	SHIM, 1 1/2 x 1 13/16 x 0.002
1	20	809-857-120*	SCRW, HX CP GR5 5/16 NCZ 3/4
6	19	809-857-160*	SCRW, HX CP GR5 5/16 NCX 1
4	18	809-849-120*	SCRW, HX CP GR5 1/4 NCX 3/4
1	17	701-000-036	BEARING, BALL
2	16	701-000-034	BEARING, BALL
1	15	701-000-033	BEARING, BALL
1	14	701-000-035	BEARING, BALL
1	13	785-503-043	PLUG, EXPANSION
2	12	785-503-034	SHIM, .005 BLUE
1	11	785-503-033	SHIM, .002 RED
1	9	785-503-025	GEAR, INT HEL LH 46T (60 Hz)
1	9A	785-503-017	GEAR, INT HEL LH 44T (50 Hz)
1	8	785-503-024	GEAR, INTG HEL RH 12T (60 Hz)
1	8A	785-503-016	GEAR, INT G HEL RH 14T (50 Hz)
1	7	785-503-028	WORM, INTG 38/1
1	6	785-503-015	GEAR, WORM 38/1
1	5	785-503-047*	CAP, CLOSED
1	4	785-503-050*	FLANGE, MOUNTING
1	3	785-503-011*	HOUSING
2	2	785-503-032	SHIM, .005 BLUE
2	1	785-503-031	SHIM, .002 RED

*Non stock items

TABLE #1

FRONT GEAR DRIVE PACKING KIT
PART# 610-900-050
AMF 82-90XL PINSPOTTER

FRONT GEAR DRIVE PACKING KIT			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	785-503-031	SHIM, .002 RED
2	2	785-503-032	SHIM, .005 BLUE
11	1	785-503-033	SHIM, .002 RED
12	2	785-503-034	SHIM, .005 BLUE
13	1	785-503-043	PLUG, EXPANSION
16	1	785-503-043	BALL BEARING
21	4	785-503-040	SHIM,1 1/2X1 13/16X0.002
25	1	919-001-400	RING, WORM RETAINING
35	1	785-503-073	SEAL, OUTPUT SHAFT
36	1	785-503-074	SEAL, INPUT SHAFT
37	1	919-102-100	O-RING, CLOSED CAP FLANGE
38	1	919-102-200	O-RING, OUTPUT FLANGE
41	1	962-800-600	SPRING, WAVE
43	1	919-102-300	O-RING, INPUT FLANGE
44	1	907-202-500	KEY

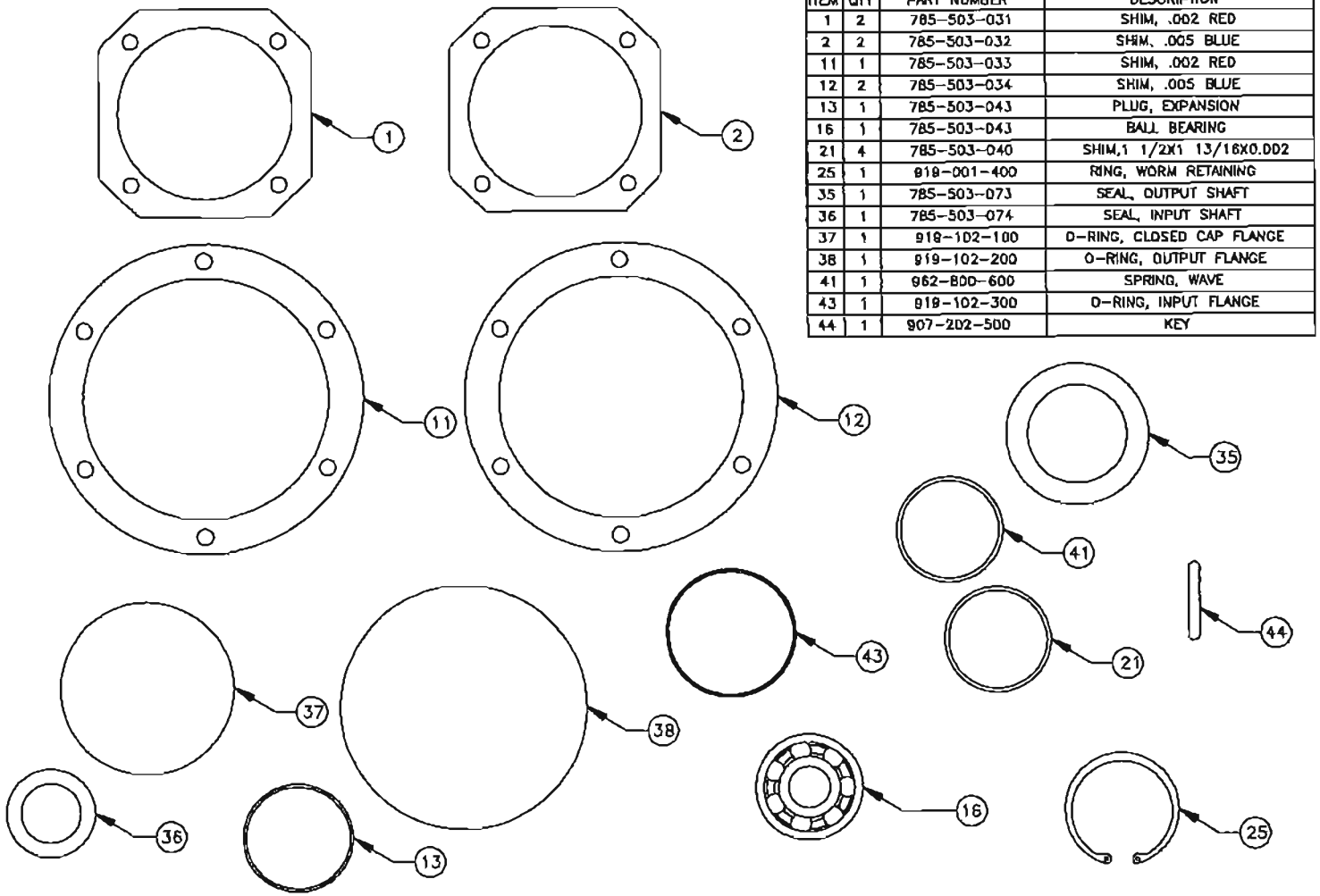


FIGURE #2

FIGURE #2

REPAIR OF THE BACK END GEARBOX

1.0 PURPOSE

This section describes the procedures for the repair and maintenance of the back end gearboxes for the 82-90XL Pinspotter. It contains parts lists, drawings and repair kit information.

2.0 SCOPE

The back end gearbox is a field serviceable item that comes in two different gear ratios for the 60 and 50 Hz motors. It also has a left and right hand version for each gear ratio for a total of 4 different models. The repair procedures for all models are identical; however, special attention must be given to ensure the proper gear ratios are re-installed.

A back end gearbox is shown in an exploded view in Figure #3, Page 14. The corresponding parts are identified in Table #2, Page 15. The 50 Hz and 60 Hz units are treated alike, although the two have unique sets of worm gears. The 50 Hz gearboxes have red tag name plates; the 60 Hz gearboxes have black tag name plates.

APPLICATION	AMF PART NO.
60 Hz Back End Right Hand	090-004-501
60 Hz Back End Left Hand	090-004-502
50 Hz Back End Right Hand	090-004-506
50 Hz Back End Left Hand	090-004-507

Parts available for gearbox repair are packaged in kits and may be ordered by kit number. The gearbox packing kit is required for all repairs or any service requiring disassembly. For individual parts contact AMF for availability.

3.0 PROCEDURE

3.1 DETECTING GEARBOX PROBLEMS

Inspect the gearboxes at least once every 60 days to identify the need for service or repairs. The following symptoms can be detected without any disassembly, and sometimes may indicate the required repair.

3.1.1 Oil Leakage

Oil leakage from seals may indicate shaft and/or seal wear. Leaks from any other areas such as case covers, plugs etc. may be corrected by proper use of thread sealant such as Loctite. All threads must be clean and free of oil and grease when they are re-assembled.

3.1.2 High Internal Operating Temperature

The maximum normal operating temperature of a back end gearbox is 50° F (28° C) above ambient . Higher temperatures may be caused by low oil level or internal component failure. As a general rule, higher operating temperatures warrant a complete examination.

3.1.3 Shaft End Play and/or Gear Backlash

Excessive radial or axial movement of the gearbox shafts indicate worn bearings, broken retaining rings, etc. Excessive backlash (rotational shaft movement without resistance) indicates gear wear.

3.1.4 Excessive Noise

Excessive noise such as grinding sounds coming from a gearbox indictates internal problems. The unit should be removed from service and examined.

3.2 OIL SEAL REPLACEMENT

Replacement of the input shaft seal (Item 43) and pin elevator shaft seal (Item 41) requires complete disassembly. The distributor shaft seal and the carpet drive shaft seal may be replaced without disassembling the gearbox.

3.2.1 To remove the distributor shaft seal (Item 42), remove the cap screws (Item 23) from the distributor drive port cap (Item 6) and remove the cap. Remove and discard the oil seal.

3.2.2 To remove the carpet shaft seal (Item 42), remove the cap screws (Item 23) from the carpet drive port cap (Item 5) and remove the cap. Remove and discard the oil seal.

3.2.3 To replace a seal: clean the shaft and seal seating area. Apply lubricant to the shaft and seal lip, and Permatex or equivalent to the outside diameter of the seal housing. Re-install the distributor driveor carpet drive port cap. Apply Loctite to the screws and torque the cap screws to 60 in lb.

3.3 DISASSEMBLY OF THE BACK END GEARBOX

3.3.1 Remove the motor gearbox assembly from the machine and separate the gearbox from the motor. Drain and discard the oil.

3.3.2 Remove the carpet drive port cap (Item 5) and the distributor drive port cap (Item 6). The corresponding shafts can then be removed through their ports.

3.3.3 Remove the expansion plug (Item 19) at the end of the worm shaft and remove the bolt (Item 24) and washer (Item 27) at the end of the worm shaft. Remove the seal (Item 43) at the quill end and remove worm thru the seal opening.

3.3.4 Remove the retaining (Item 33) and bearing (Item 22) from the housing.

NOTE: Remove components as described. Do not attempt to remove gears or bearings from shafts.

3.4 ASSEMBLY OF THE BACK END GEARBOX

NOTE: Degrease and clean all serviceable components selected for reuse prior to assembly.

Reassembly of the back end gearbox should be conducted using new components as determined by subsequent analysis and visual observation. All seals and shims shall be replaced.

3.4.1 Place shims (Item 25) as required and install the bearing (Item 22) inside the gearbox housing. Next install the retaining ring (Item 33), ensuring that there is no end play in the bearing.

3.4.2 Install the carpet drive shaft assembly (Item 47). Add shims (Items 1 and 3) between the cap (Item 5) and housing (Item 4) to eliminate end play. Install cap screws with Loctite and torque to 60 in. lbs.

3.4.3 Install the distributor drive shaft assembly (Item 48). Add shims (Items 17 and 18) between the cap (Item 6) and housing (Item 4) to eliminate end play. Install cap screws with Loctite and torque to 60 in. lbs.

3.4.4 Install the pin elevator drive shaft assembly (Item 45). Shims (Item 26) in front of first bearing will adjust the bevel gear engagement depth by moving output gear (Item 16) away from the mating gear (Item 15). The backlash between the two gears should be .002" - .005". Shims (Item 26) between the second bearing and the housing will take up the rest of the shaft end play. The gear pair should rotate freely with minimal shaft end play.

3.4.5 Insert the worm (Item 7). Use the washer (Item 27) and the bolt (Item 24) to assemble the worm flush against the bearing. Use Loctite on the bolt threads and torque to 120 in. lbs..

3.4.6 Install the flanged cup (Item 19) in the housing opening at the end of the worm. Use Permatex Sealant on the cup flange. Ensure that the bore in the housing is clean and free of any leftover sealant.

3.4.7 Install all new seals, with the lip of the seal facing towards the gear-box.

3.4.8 Clean and recoat the drain plug and the level indicator plug with Loctite and replace in the housing. Fill the gearbox with 38 ounces (1.075 liters) of Mobil 600W Cylinder Oil. Replace the vent plug. Do not overfill the gearbox.

3.4.9 Re-attach the gearbox to the drive motor. Apply Loctite to the screws and torque to 120 in. lbs.

3.5 SUBASSEMBLIES

The gear box components have been grouped into replaceable subassemblies available by number.

Back End Worm Gear Replacement Kit consists of the worm (Item 7) and carpet drive shaft assembly (Item 47, including Items 8, 9, 13, 14, 21, 29)

50 Hz kit - Part #610-900-085
60 Hz kit - Part #610-900-090

Distributor Drive Replacement Kit consists of the distributor drive shaft assembly (Item 48, including Items 2, 10, 11, 15, 21, 30, 31)

Part #610-900-100

Pin Elevator Wheel Drive Replacement Kit consists of pin elevator drive shaft assembly (Item 49, including Items 12, 16, 20, 26, 28, 31, 32).

Part #610-900-105

Back Gear Drive Packing Kit includes disposable maintenance items (Items 1, 3, 17, 18, 19, 22, 25, 26, 33, 41, 42, 43, 44, 45, 46)
Also included is Loctite Sealant 242, Seal Grease NLG1 Class 0 or 1, and Permatex Gasket Sealant - Aviation Form-A-Gasket #2 (Figure 4).

Part #610-900-051

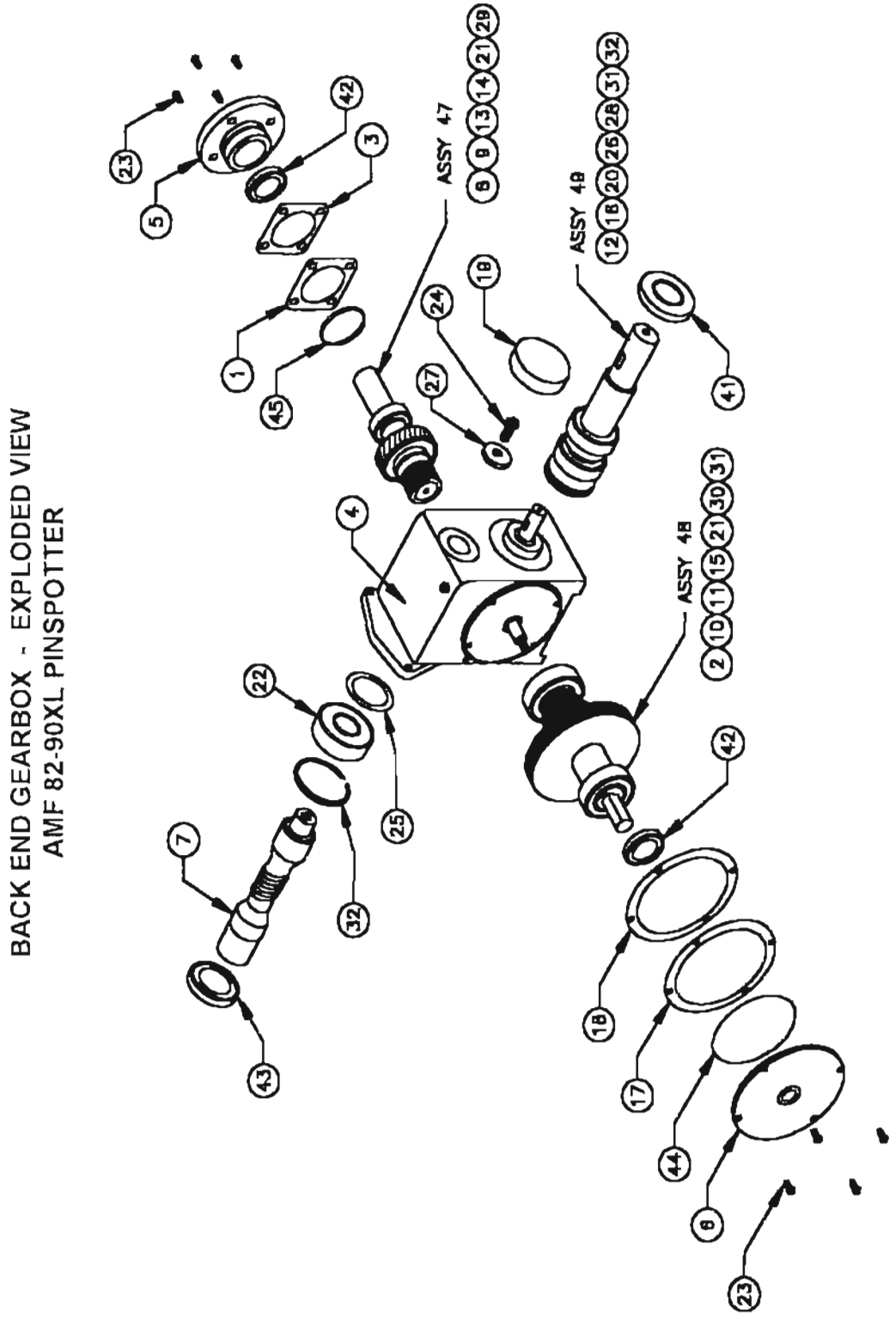


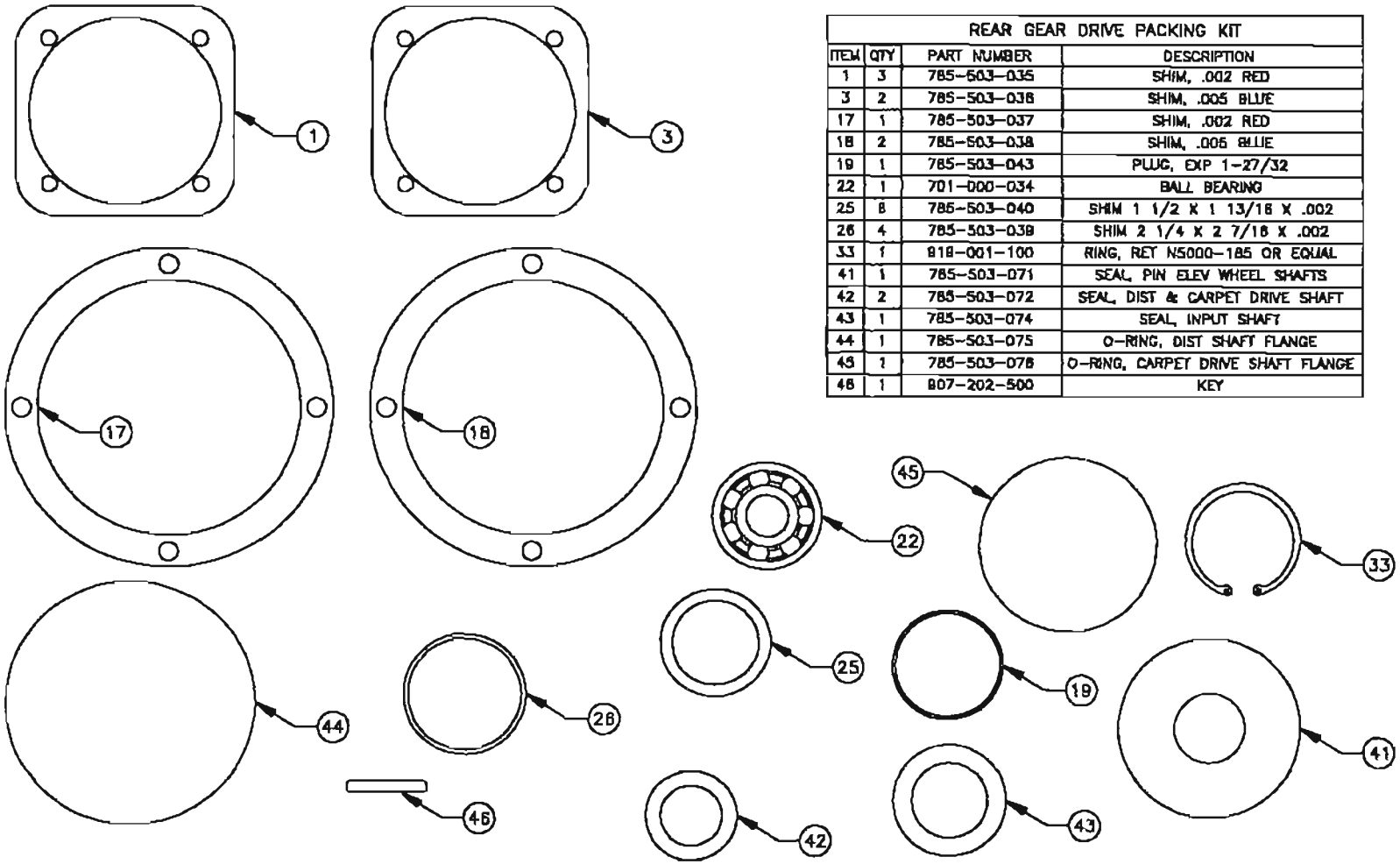
FIGURE #3

FIGURE #3

PART 2

DRIVE MOTOR
REPAIR AND MAINTENANCE

BACK GEAR DRIVE PACKING KIT
PART # 610-900-051
AMF 82-90XL PINSPOTTER



REAR GEAR DRIVE PACKING KIT			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	785-503-035	SHIM, .002 RED
3	2	785-503-036	SHIM, .005 BLUE
17	1	785-503-037	SHIM, .002 RED
18	2	785-503-038	SHIM, .005 BLUE
19	1	785-503-043	PLUG, EXP 1-27/32
22	1	701-000-034	BALL BEARING
25	8	785-503-040	SHIM 1 1/2 X 1 13/16 X .002
26	4	785-503-039	SHIM 2 1/4 X 2 7/16 X .002
33	1	918-001-100	RING, RET N5000-185 OR EQUAL
41	1	785-503-071	SEAL, PIN ELEV WHEEL SHAFTS
42	2	785-503-072	SEAL, DIST & CARPET DRIVE SHAFT
43	1	785-503-074	SEAL, INPUT SHAFT
44	1	785-503-075	O-RING, DIST SHAFT FLANGE
45	1	785-503-076	O-RING, CARPET DRIVE SHAFT FLANGE
46	1	807-202-500	KEY

FIGURE #4

FIGURE #4

REPAIR OF THE DRIVE MOTORS

1.0 PURPOSE

This section describes the procedure for the repair and maintenance of the drive motors for the 82-90XL Pinspotter. It contains parts lists, drawings, and repair information.

2.0 SCOPE

The front and back end motors are field serviceable items. The motors are dual voltage reversible and are provided in 60 Hz and 50 Hz configurations rated for continuous service. Both models are rated at 1/3 horsepower; however, starting current and instantaneous torque may be 200-300% higher. The AMF numbers for the different motors are as follows:

APPLICATION	AMF PART NO.
60 Hz Front End	090-004-503, 090-003-767
50 Hz Front End	090-004-508, 090-003-768
60 Hz Back End	090-004-510, 090-003-766
50 Hz Back End	090-004-505, 090-003-765

The same motor is used for table and sweep drives at the front end. At the back end, the same motor is used for the right and left hand machines. The only difference between the two is the connector arrangement used to connect the power cable to the motor. The front end motor has manual cranking provisions and a brake.

An exploded view of a front end motor is shown in Figure 5, Page 23. A back end motor is shown in Figure 6, Page 25. Parts are identified in Tables 4 and 5, Pages 24 and 25..

Motor repair parts should be ordered by part numbers listed in Tables 4 and 5. Breakdown of subassemblies is not recommended.

3.0 PROCEDURE

The front end and back end motor repair is combined in one section. Only field repairable motor failures are included in this manual. Other failures are not recommended for repair and are more economically corrected by replacing the motor.

The following is a list of field serviceable failures and the step-by-step procedure for each repair.

3.1 REPLACING THE CAPACITOR

3.1.1 Remove the two cover screws (Item 12) and the cover (Item 11)

3.1.2 Remove the capacitor/resistor assembly (Item 10) from the cover.

3.1.3 Remove the leads from the capacitor / resistor assembly terminals. DO NOT PULL ON THE WIRES. Replace leads on new capacitor/resistor assembly terminals.

3.1.4 Place the new capacitor / resistor assembly into the cover making sure that it is properly seated into the cover, otherwise the cover will not mount correctly.

3.1.5 Re-assemble the cover on the motor.

3.2 REPLACING THE ROTOR ASSEMBLY

3.2.1 Note the location of the orientation indicator on the front bell. This cast indicator must be located opposite the capacitor.

3.2.2 Remove four bolts (Item 13).

3.2.3 Tap the OPE end frame lightly with a mallet to dislodge it from the shell. Remove the rotor assembly.

NOTE: Sections 3.2.1, 3.2.2 and 3.2.3 are common to the repair of the thermal overload and the terminal board. Removing the rotor is a precautionary step to protect the key parts of the motor.

3.2.4 Place the new rotor assembly (Item 2) into the shell, locating the oreintation indicator opposite the capacitor. Ensure wires and leads are not in the way of rotating parts.

3.2.5 Replace four bolts (Item 13).

NOTE: The gearbox/motor key should be replaced when a motor is reinstalled (AMF Part No. 907-202-500).

3.3 REPLACING THE THERMAL OVERLOAD (TO)

3.3.1 Follow the procedure to replace the rotor assembly as previously described (Sect. 3.2).

3.3.2 Loosen the rear end frame (Item 3) and pull it away from the motor, allowing access to the screws retaining the thermal overload.

3.3.3 Desolder the terminals on the TO (Item 6).

3.3.4 Remove the two screws (Item 7) and take out the TO.

3.3.5 Position the new TO and replace two screws.

3.3.6 Solder the three leads to the terminals of the new TO (the brown lead connects to terminal 1, the purple to terminal 2 and the yellow to terminal 3).

3.3.7 Follow the procedure to replace the rotor assembly (Sect. 3.2.4, 3.2.5).

3.4 REPLACING THE SOLID STATE SWITCH

3.4.1 Loosen the two outside screws (Item 9) and remove the center screw (Item 9). Slide and lift the motor/receptacle (Item 8).

3.4.2 Remove the mounting screw (Item 16) and dislodge the start switch (Item 15).

3.4.3 Remove the three leads from the switch (Item 15). Discard the old switch.

3.4.4 Connect the leads to the new switch (the gray lead goes to terminal 1, the red to terminal 2 and the pink to terminal 3).

3.4.5 Place the switch back into the end frame and replace the mounting screw. Ensure that the leads do not interfere with the rotating parts of the motor.

3.4.6 Replace the motor/receptacle assembly (Item 8) and screws (Item 9). Tighten the 3 cover screws..

3.5 REPLACING THE TERMINAL BOARD

This board carries terminations to the various leads and no active devices. It will fail only if excessive force is used to remove or reconnect the leads.

3.5.1 Follow the procedure to remove both end frames and the rotor assembly as described previously (Sect. 3.2, 3.3.2).

3.5.2 Remove the screws (Item 5).

3.5.3 Note the color of all the leads on the different terminals on both sides of the terminal board. Remove each without pulling on the wire. Discard the old board.

3.5.4 Re-attach each lead to the correct position on the new board.

3.5.5 Place the board in the end frame and re-assemble the screws (Item 5).

3.5.6 Follow the procedure to replace the rotor assembly (Sect. 3.2.4, 3.2.5).

3.6 REPAIRING THE AMP EXTERNAL CONNECTOR ASSEMBLY (FRONT END DRIVE MOTOR ONLY)

This assemly may be replaced as a complete assembly (Item 8) or as the connector and wire assembly (Item 17). The preferred replacement of the complete assembly is described.

3.6.1 Loosen the two outside screws (Item 9) and remove the center cover screw (Item 9).

3.6.2 Separate the external connector assembly (Item 8) away from the motor.

3.6.3 Keep a written record of how the different leads are connected. Cut the crimped leads at the crimp. Remove the remaining leads from the terminal board. Disconnect the ground lead from the motor frame.

NOTE: If only the outlet is being replaced, remove the 4 screws and replace the old outlet with the new outlet. Replace the screws.

3.6.4 Install the new connector assembly. Use yellow wire nuts for the leads that used to be crimped. Connect the other leads to the terminal board exactly as removed.

3.6.5 Push the extra lead lengths back into the conduit cavity and replace cover.

3.6.6 Secure cover with three screws (Item 9).

3.7 REPLACING THE BRAKE

The brake is an independent auxilliary device (Item 20) which should require littlle or no service other than possible cleaning.

If the brake fails it should be replaced as an assembly. Order Kit #610-900-035. The brake is described in Fig. #7 Page 27 .

3.7.1 To remove the brake, remove the 2 screws, 4 washers and 2 hold down plates. The brake will now slide off.

3.7.2 Slide a new brake assembly in place lining up the shaft as noted in Fig. #7. Re-assemble the screws, washers and plates.

4.0 TERMINAL CONNECTIONS

The motor terminals are connected for the high voltage and the low voltage applications as follows:

HIGH VOLTAGE (230V)

TERMINAL	WIRE COLOR
L1	
3	BLUE
4	RED
5	VIOLET
L2	ORANGE

LOW VOLTAGE (115V)

TERMINAL	WIRE COLOR
L1	
3	VIOLET
4	RED
5	
L2	BLUE & ORANGE

All motors are wired for high voltage when they leave the AMF facilities in Richmond. To change to low voltage, move wire BLUE from terminal 3 to L2 and wire VIOLET from terminal 5 to terminal 3.

DRIVE MOTOR, FRONT END
AMF 82-90XL PINSPOTTER

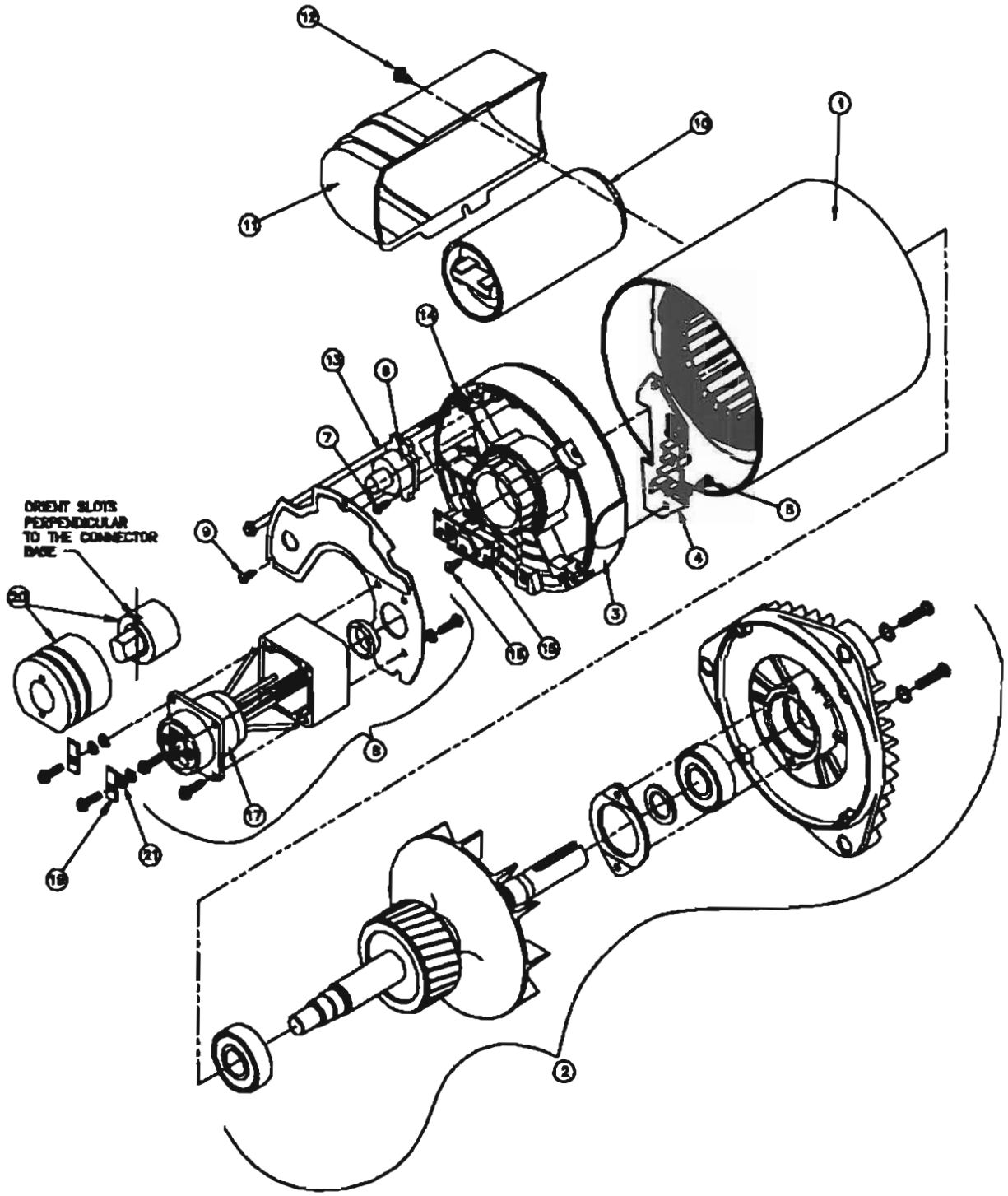


FIGURE #5

DRIVE MOTOR, FRONT END
AMF 82-90XL PINSPOTTER
(SEE FIGURE #5)

ITEM	QTY	PART #	DESCRIPTION
1	1		STATOR CORE ASSEMBLY
2	1	090-004-525	ROTOR ASSEMBLY (60 Hz)
2A	1	090-004-526	ROTOR ASSEMBLY (50 Hz)
3	1		END FRAME - OPE
4	1	090-003-629	TERMINAL BOARD
5	2		SCREW, SELF TAPPING, ROUND HEAD, SLOTTED, TYPE SF, #32 x 3/8"
6	1	090-003-630	OVERLOAD, THERMAL
7	2		SCREW, SELF TAPPING, ROUND HEAD
8	1	090-004-524	MOTOR RECEPTACLE
9	3		SCREW, TRUSS HEX WASHER HEAD, #32 x 3/8"
10	1	090-003-634	CAPACITOR/RESISTOR ASSEMBLY
11	1		COVER, CAPACITOR
12	1		SCREW, TRUSS HEX WASHER HEAD, #32 x 5/16"
13	4	709-013-056	THRU-BOLT (60 Hz)
13A	4	709-013-057	THRU-BOLT (50 Hz)
14	4		LOCKWASHER Item 10, THRU BOLT
15	1	090-004-560	SWITCH, SOLID STATE (60 Hz)
15A	1	090-004-550	SWITCH, SOLID STATE (50 Hz)
16	1		SCREW, SELF TAPPING ROUND HEAD, SLOTTED, TYPE SF, #32 x 3/8"
17	1	755-050-773	RECEPTACLE, 7 PIN WITH WIRES
18	2		SCREW, 6-32 X 1/2" TYPE B
19	2	090-003-556	HOLD DOWN PLATE
20	1	090-003-550	BRAKE ASSEMBLY
21	4	945-735-062	WASHER
22	1	907-202-500	KEY (NOT SHOWN)

TABLE 4

DRIVE MOTOR, BACK END
AMF 82-90XL PINSPOTTER

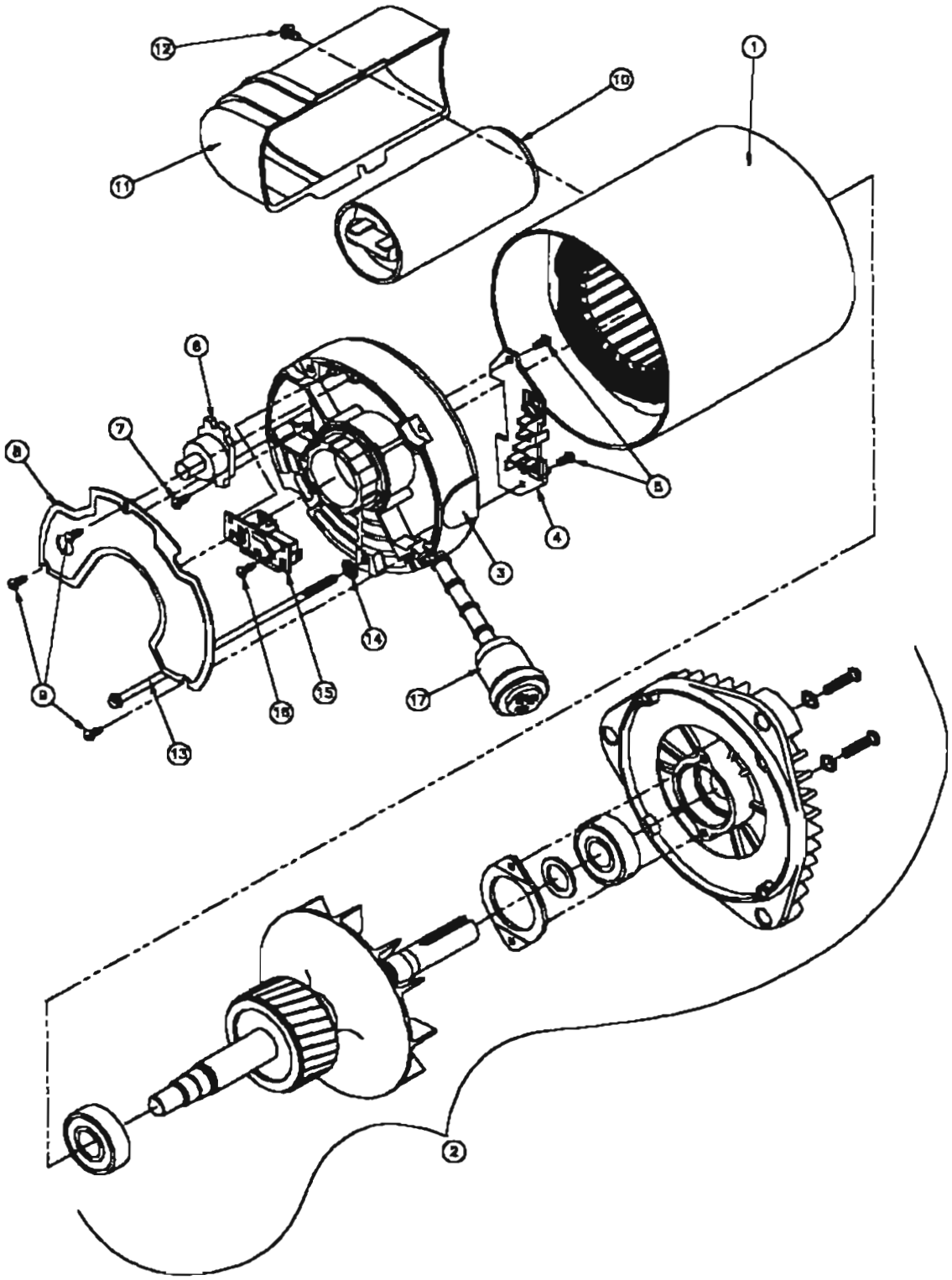


FIGURE #6

DRIVE MOTOR, BACK END
AMF 82-90XL PINSPOTTER
(SEE FIGURE #6)

ITEM	QTY	PART #	DESCRIPTION
1	1		STATOR CORE ASSEMBLY
2	1	090-004-546	ROTOR ASSEMBLY (60 Hz)
2A	1	090-004-545	ROTOR ASSEMBLY (50 Hz)
3	1		END FRAME - OPE
4	1	090-003-629	TERMINAL BOARD ASSEMBLY
5	2		SCREW, SELF TAPPING, ROUND HEAD, SLOTTED, #32 x 3/8"
6	1	090-003-630	OVERLOAD, THERMAL (MANUAL RESET)
7	2		SCREW, SELF TAPPING, ROUND HEAD
8	1		COVER ASSEMBLY, CONDUIT CAVITY
9	3		SCREW, TRUSS HEX WASHER HEAD, #32 x 3/8"
10	1	090-003-634	CAPACITOR/RESISTOR ASSEMBLY
11	1		COVER, CAPACITOR
12	1		SCREW, TRUSS HEX WASHER HEAD, #32 x 5/16"
13	4	709-013-056	THRU-BOLT (60 Hz)
13A	4	709-013-057	THRU-BOLT (50 Hz)
14	4		LOCKWASHER
15	1	090-004-560	SWITCH, SOLID STATE (60 Hz)
15A	1	090-004-550	SWITCH, SOLID STATE (50 Hz)
16	1		SCREW, SELF TAPPING ROUND HEAD, SLOTTED, #32 x 3/8"
17	1		RECEPTACLE, 3 PIN
18	1	907-202-500	KEY (NOT SHOWN)

TABLE 5

FRONT END MOTOR DRAG BRAKE
AMF 82-90XL PINSPOTTER

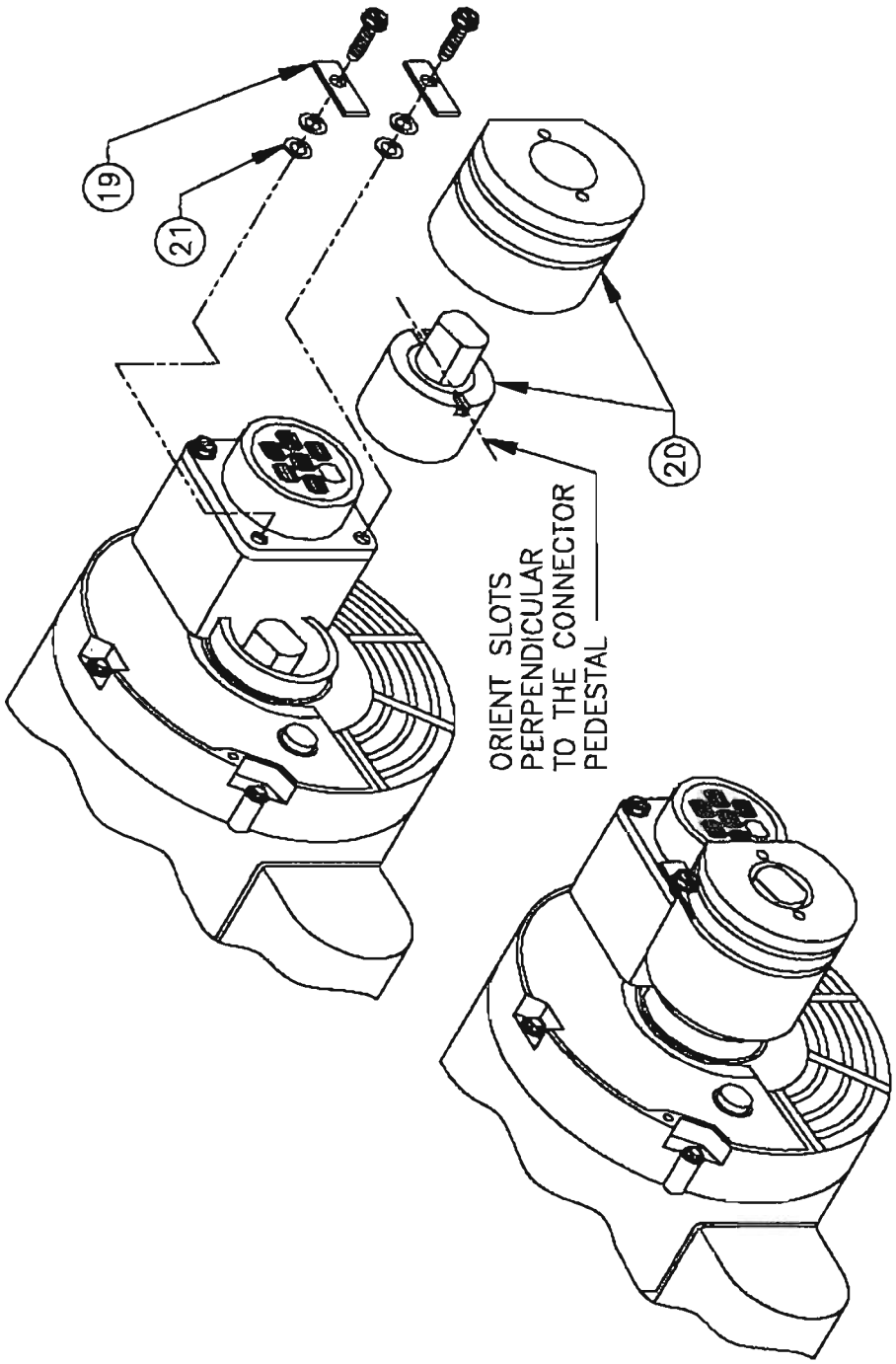


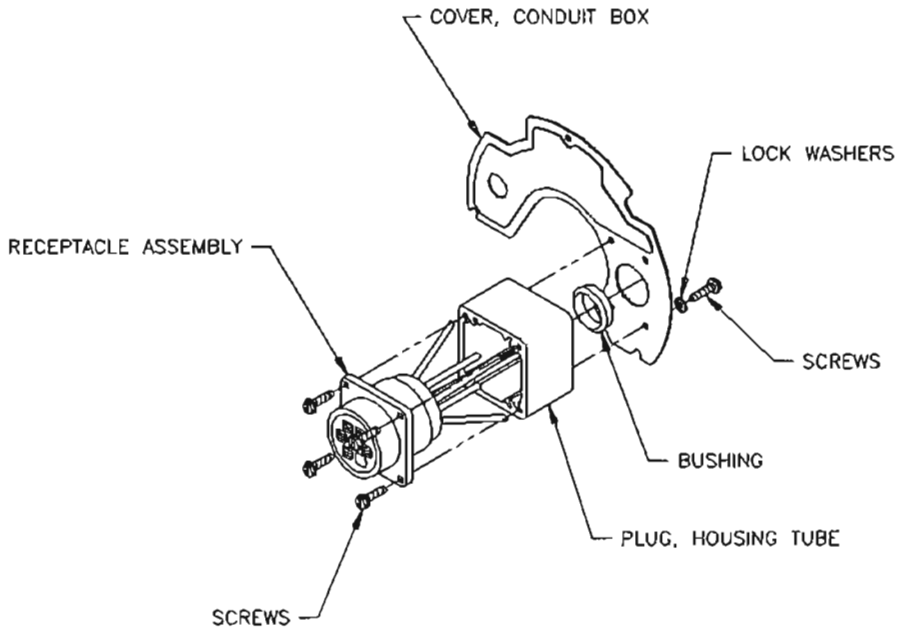
Figure #7

APPENDIX A

GEARBOX DRAWINGS
MOTOR DRAWINGS

ENG. CHANGE	REV	SUB	CHANGE	ZONE	BY	DATE
CE-00758	NEW		NEW DRAWING		PWW	03/23/94

NOTES:
1. MATERIAL: SEE BELOW
2. UNIT TO BE ASSEMBLED COMPLETE AT MANUFACTURER



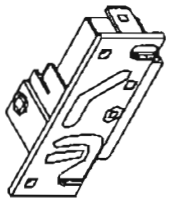
SPECIFICATION CONTROL DRAWING

QTY.	ITEM	SIZE	PART NO.	DESCRIPTION

N.T.S
PWW 03/23/94
AS NOTED
MOTOR RECEPTACLE
82 090 004-524

B SIZE 1:1

ENG CHANGE	REV	SUB	CHANGE	ZONE	BY	DATE
CE-00756	NEW		NEW DRAWING		PWW	04/08/94



SPECIFICATION CONTROL DRAWING

QTY.	ITEM	SIZE	PART NO.	DESCRIPTION
			090-004-510	
			090-004-503	

2:1

PWW 04/08/94

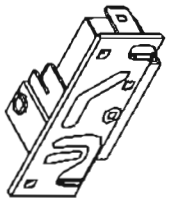
AS NOTED

START SWITCH 60Hz

82 090 004-560

B SIZE 2:1

ENG. CHANGE	REV	SUB	CHANGE	ZONE	BY	DATE
CE-00756	NEW		NEW DRAWING		PWW	04/08/94



SPECIFICATION CONTROL DRAWING

QTY.	ITEM	SIZE	PART NO.	DESCRIPTION
			090-004-508	
			090-004-505	2.1

PWW 04/08/94

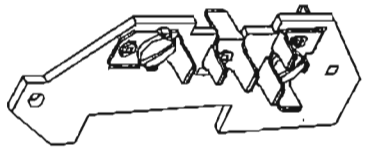
AS NOTED

START SWITCH 60Hz

82 090 004-550

B SIZE 2:1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/17/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

090-004-503	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	GENERAL TOLERANCES: XX DECIMALS ± .015; XXX DECIMALS ± .005; ANGLES ± .5'
090-004-508		
090-004-510	REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100
090-003-766		
090-003-765	MATERIAL	
090-003-767		ENG APP
090-003-768		CHECKED
090-004-505 NEXT ASSY	DO NOT SCALE THIS DRAWING	DRAWN BY PWW 06/17/94

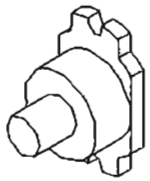
AMF Bowling Inc.

TERMINAL BOARD

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-629	H

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/17/94	PWW

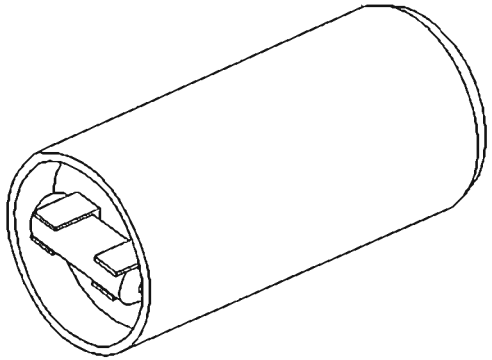


ITEM	QTY	PART NUMBER	DESCRIPTION
		PARTS LIST	

090-004-503	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	GENERAL TOLERANCES	AMF Bowling Inc.
090-004-508		XX DECIMALS ± .015 / XXX DECIMALS ± .005 / ANGLES ± .5°	
090-004-510	REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100	THERMAL OVERLOAD
090-003-766			
090-003-765			
090-003-768	MATERIAL	ENG APP	
090-003-767		CHECKED	
090-004-505	NEXT ASSY	DRAWN BY PWW 06/17/94	SCALE: N.T.S / WEIGHT: / SHEET 1 OF 1

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-630	01

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/17/94	PWW



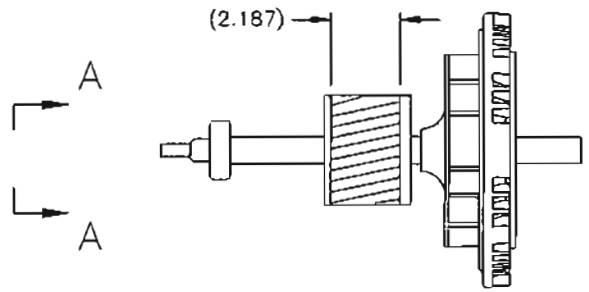
ITEM	QTY	PART NUMBER	DESCRIPTION

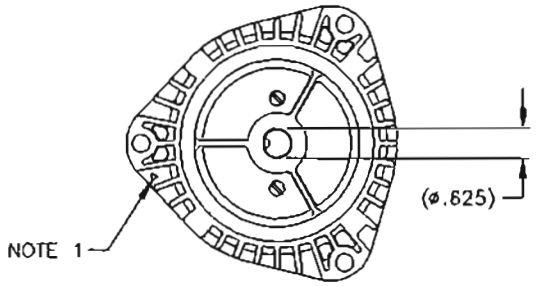
PARTS LIST

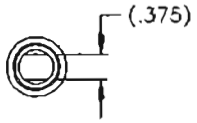
090-004-503	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	GENERAL TOLERANCES	
090-004-508		XX DECIMALS ± .015 / XXX DECIMALS ± .005 / ANGLES ± .5°	AMF Bowling Inc.
090-004-510	REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100	CAPACITOR
090-003-766			
090-003-765	MATERIAL	ENG APP	SIZE B / CLASS 82 / DIV 090 / NUMBER 003-634 / REV NEW
090-003-767		CHECKED	
090-003-768		DRAWN BY PWW 06/17/94	SCALE: N.T.S / WEIGHT: / SHEET 1 OF 1
090-004-505	NEXT ASSY	DO NOT SCALE THIS DRAWING	

NOTES:
1. ORIENTATION REFERENCE MARK

REVISIONS			
NEW	CE-00775	NEW DRAWING	05/10/94







SECTION A–A
SCALE: 2:1

ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES		
XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES
INSIDE CORNERS
SURFACE ROUGHNESS ✓

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

MATERIAL

ENG APP			
CHECKED			
DRAWN BY	PWW	05/10/94	

090-004-503
NEXT ASSY

DO NOT SCALE THIS DRAWING

AMF Bowling Inc.

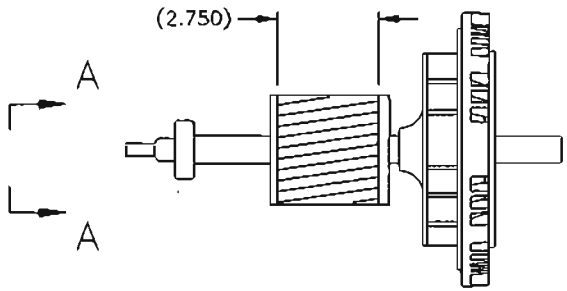
FRONT END
ROTOR ASSEMBLY
60 Hz

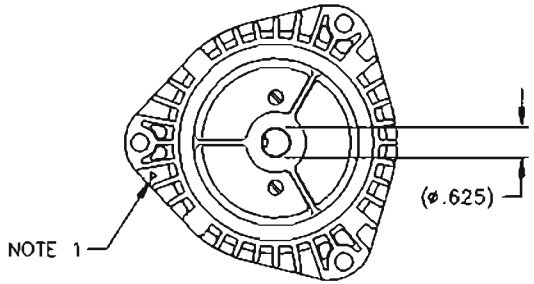
SIZE	CLASS	DIV	NUMBER	REV
B	82	090	004-525	[illegible]

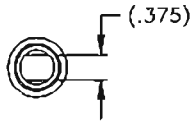
SCALE: N/A | WEIGHT: | SHEET 1 OF 1

NOTES:
1. ORIENTATION REFERENCE MARK

REVISIONS			
NEW	CE-00775	NEW DRAWING	05/10/94







SECTION A–A
SCALE: 2:1

ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M–1982 AND MIL-STD-100		
MATERIAL	ENG APP		
	CHECKED		
DO NOT SCALE THIS DRAWING	DRAWN BY	PWW	05/10/94

090-004-508
NEXT ASSY

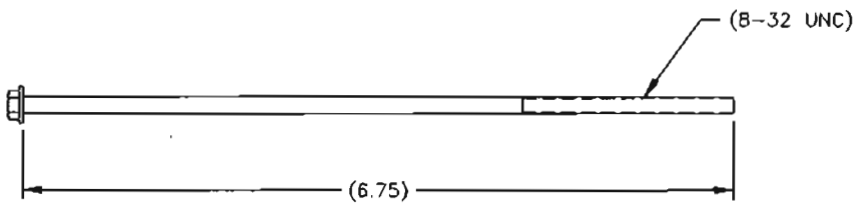
AMF Bowling Inc.

FRONT END
ROTOR ASSEMBLY
50 Hz

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	004–526	

SCALE: N/A | WEIGHT: | SHEET 1 OF 1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	07/01/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

090-004-510		
090-004-503		
090-003-767		
090-003-766		
NEXT ASSY		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES
INSIDE CORNERS
SURFACE ROUGHNESS ✓

MATERIAL

DO NOT SCALE THIS DRAWING

GENERAL TOLERANCES

XX DECIMALS	XXX DECIMALS	ANGLES
± .015	± .005	± .5°

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

ENG APP			
CHECKED			
DRAWN BY	PWW	07/01/94	

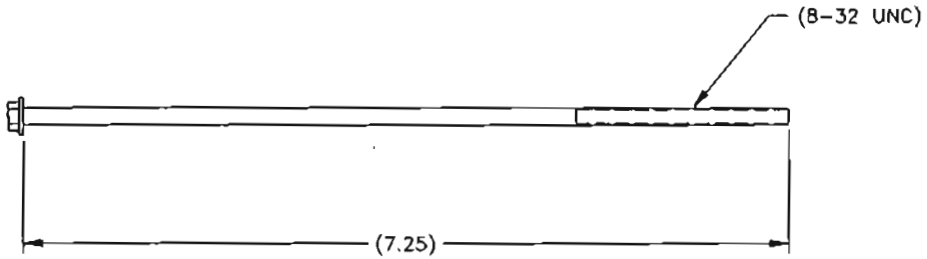
AMF Bowling Inc.

THRU BOLT
60 Hz

SIZE	CLASS	DIV	NUMBER	REV
B	82	709	013-056	NEW

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	07/01/94	PWW

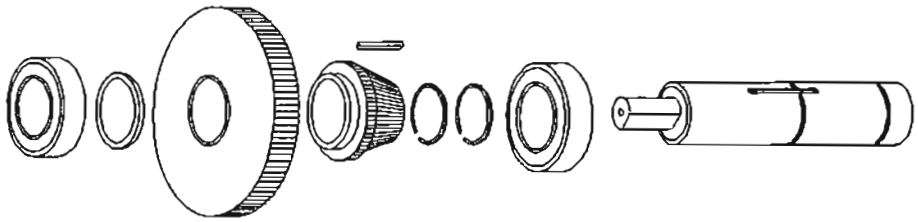


ITEM	QTY	PART NUMBER	DESCRIPTION
		PARTS LIST	

	GENERAL TOLERANCES		AMF Bowling Inc.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5'
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		THRU BOLT 50 Hz
MATERIAL	ENG APP		SIZE B | CLASS 82 | DIV 709 | NUMBER 013-057 | REV A1
	CHECKED		
DO NOT SCALE THIS DRAWING	DRAWN BY PWW	07/01/94	SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

NEXT ASSY
090-004-505
090-004-508
090-003-755
090-003-768

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		
MATERIAL	ENG APP		
610-900-105	CHECKED		
NEXT ASSY	DRAWN BY	PWW	06/16/94
DO NOT SCALE THIS DRAWING			

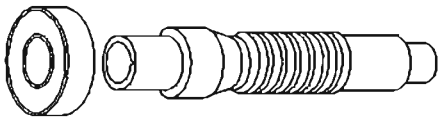
AMF Bowling Inc.

DISTRIBUTOR DRIVE SHAFT ASSEMBLY

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-637	[illegible]

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		
MATERIAL	ENG APP		
	CHECKED		
DO NOT SCALE THIS DRAWING	DRAWN BY	PWW	06/16/94

610-900-064
610-900-053
NEXT ASSY

AMF Bowling Inc.

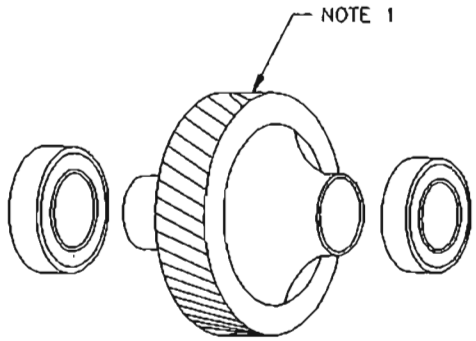
WORM ASSEMBLY

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-640	[illegible]

SCALE: N.T.S	WEIGHT:	SHEET 1 OF 1

NOTES:
1. GEAR HAS 44 TEETH.

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± 005	ANGLES ± .5'
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		
MATERIAL	ENG APP		
	CHECKED		
DO NOT SCALE THIS DRAWING	DRAWN BY	PWW	06/16/94

610-900-063
NEXT ASSY

AMF Bowling Inc.

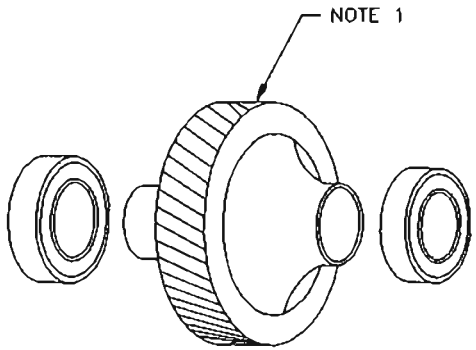
OUTPUT GEAR ASSEMBLY (50Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-643	H

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

NOTES:
1. GEAR HAS 46 TEETH.

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS. SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		
MATERIAL	ENG APP		
	CHECKED		
610-900-064			
NEXT ASSY	DO NOT SCALE THIS DRAWING	DRAWN BY	PWW 06/16/94

AMF Bowling Inc.

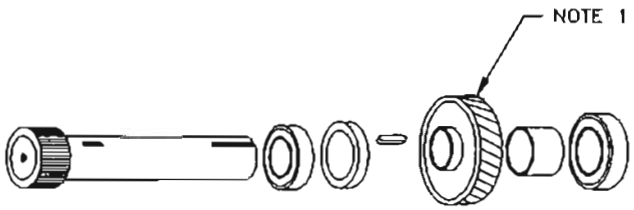
OUTPUT GEAR ASSEMBLY (60Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-644	H

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

NOTES:
1. WORM GEAR FOR 5:1 RATIO.

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS √	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		
MATERIAL	ENG APP		
	CHECKED		
DO NOT SCALE THIS DRAWING	DRAWN BY	PWW	06/16/94

610-900-085
NEXT ASSY

AMF Bowling Inc.

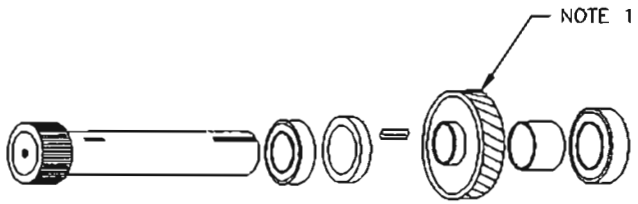
CARPET DRIVE SHAFT ASSEMBLY (50Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-645	NEW

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

NOTES:
1. WORM GEAR 6:1 RATIO.

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

XX DECIMALS	XXX DECIMALS	ANGLES
± .015	± .005	± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

MATERIAL

ENG APP			
CHECKED			
DRAWN BY	PWW	06/16/94	

610-900-090

NEXT ASSY

DO NOT SCALE THIS DRAWING

AMF Bowling Inc.

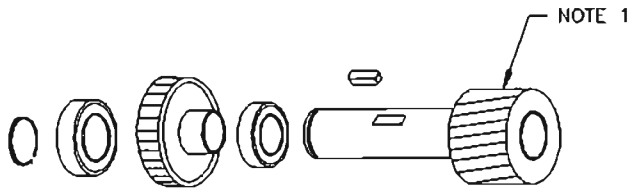
CARPET DRIVE SHAFT ASSEMBLY (60Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-646	

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

NOTES:
1. GEAR HAS 14 TEETH.

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/18/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°
REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓	INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100		
MATERIAL	ENG APP		
	CHECKED		
DO NOT SCALE THIS DRAWING	DRAWN BY	PWW	06/16/94

610-900-063
NEXT ASSY

AMF Bowling Inc.

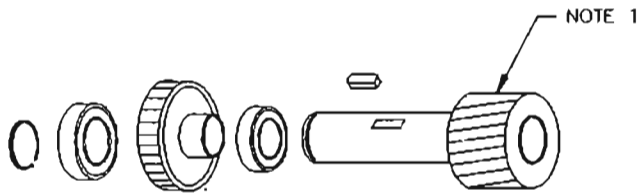
INTERMEDIATE SHAFT ASSEMBLY (50Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-647	[illegible]

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

NOTES:
1. GEAR HAS 12 TEETH.

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES		
XX DECIMALS	XXX DECIMALS	ANGLES
± .015	± .005	± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

MATERIAL

ENG APP			
CHECKED			
DRAWN BY	PWW	06/16/94	

610-900-064

NEXT ASSY

DO NOT SCALE THIS DRAWING

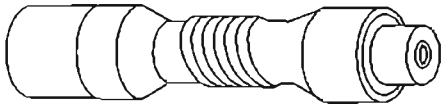
AMF Bowling Inc.

INTERMEDIATE SHAFT ASSEMBLY (60Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	090	003-648	01

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES		
XX DECIMALS	XXX DECIMALS	ANGLES
± .015	± .005	± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES INSIDE CORNERS SURFACE ROUGHNESS ✓

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

MATERIAL

ENG APP			
CHECKED			
DRAWN BY	PWW	06/16/94	

610-900-085

NEXT ASSY

DO NOT SCALE THIS DRAWING

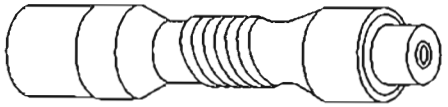
AMF Bowling Inc.

WORM INTG 5/1 (50Hz)

SIZE	CLASS	DIV	NUMBER	REV
B	82	785	503-029	H

SCALE: N.T.S | WEIGHT: | SHEET 1 OF 1

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW



ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES

XX DECIMALS	XXX DECIMALS	ANGLES
± .015	± .005	± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES
INSIDE CORNERS
SURFACE ROUGHNESS ✓

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

MATERIAL

ENG APP		
CHECKED		
DRAWN BY	PWW	06/16/94

AMF Bowling Inc.

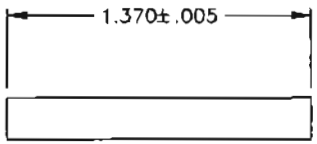
WORM INTG 6/1 (60Hz)

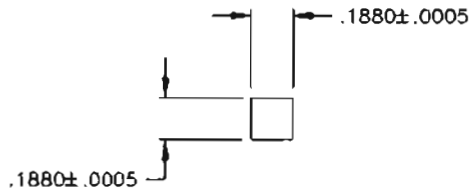
SIZE	CLASS	DIV	NUMBER	REV
B	82	785	503-030	D

610-900-090		
NEXT ASSY	DO NOT SCALE THIS DRAWING	SCALE: N.T.S / WEIGHT: / SHEET 1 OF 1

NOTES:
1. MATERIAL: AISI 8630 STEEL.
2. HARDNESS Rc 45±5
3. FINISH: NONE REQUIRED

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	06/16/94	PWW





ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES		
XX DECIMALS	XXX DECIMALS	ANGLES
± .015	± .005	± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES
INSIDE CORNERS
SURFACE ROUGHNESS √

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

ENG APP			
CHECKED			
DRAWN BY	PWW	06/16/94	

AMF Bowling Inc.

P & W KEY

SIZE	CLASS	DIV	NUMBER	REV
B	82	907	202-500	NC

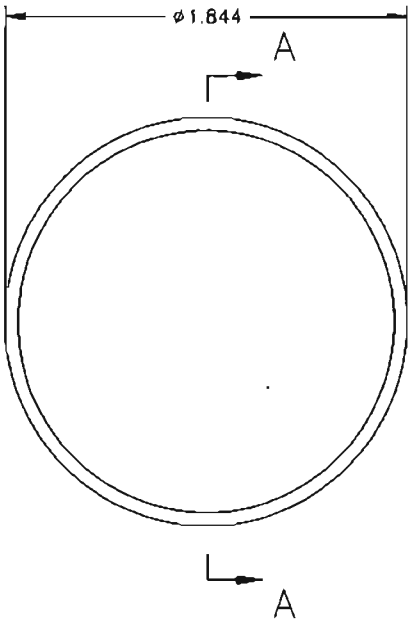
SCALE: 2:1 | WEIGHT: | SHEET 1 OF 1

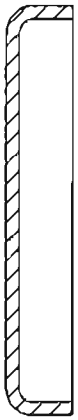
610-900-051
610-900-050
610-904-543
NEXT ASSY

MATERIAL

DO NOT SCALE THIS DRAWING

REVISIONS				
REV	ECR	DESCRIPTION	DATE	BY
NEW	CE-00793	NEW DRAWING	07/01/94	PWW





SECTION A–A

ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

GENERAL TOLERANCES		
XX DECIMALS ± .015	XXX DECIMALS ± .005	ANGLES ± .5°

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

REMOVE BURRS AND BREAK SHARP EDGES
INSIDE CORNERS
SURFACE ROUGHNESS ✓

INTERPRET DRAWING IN ACCORDANCE WITH ANSI Y14.5M-1982 AND MIL-STD-100

MATERIAL

ENG APP			
CHECKED			
DRAWN BY	PWW	07/01/94	

DO NOT SCALE THIS DRAWING

610-900-051
610-900-050
NEXT ASSY

AMF Bowling Inc.

CAP

SIZE	CLASS	DIV	NUMBER	REV
B	82	785	503-043	NEW

SCALE: 2:1 | WEIGHT: | SHEET 1 OF 1