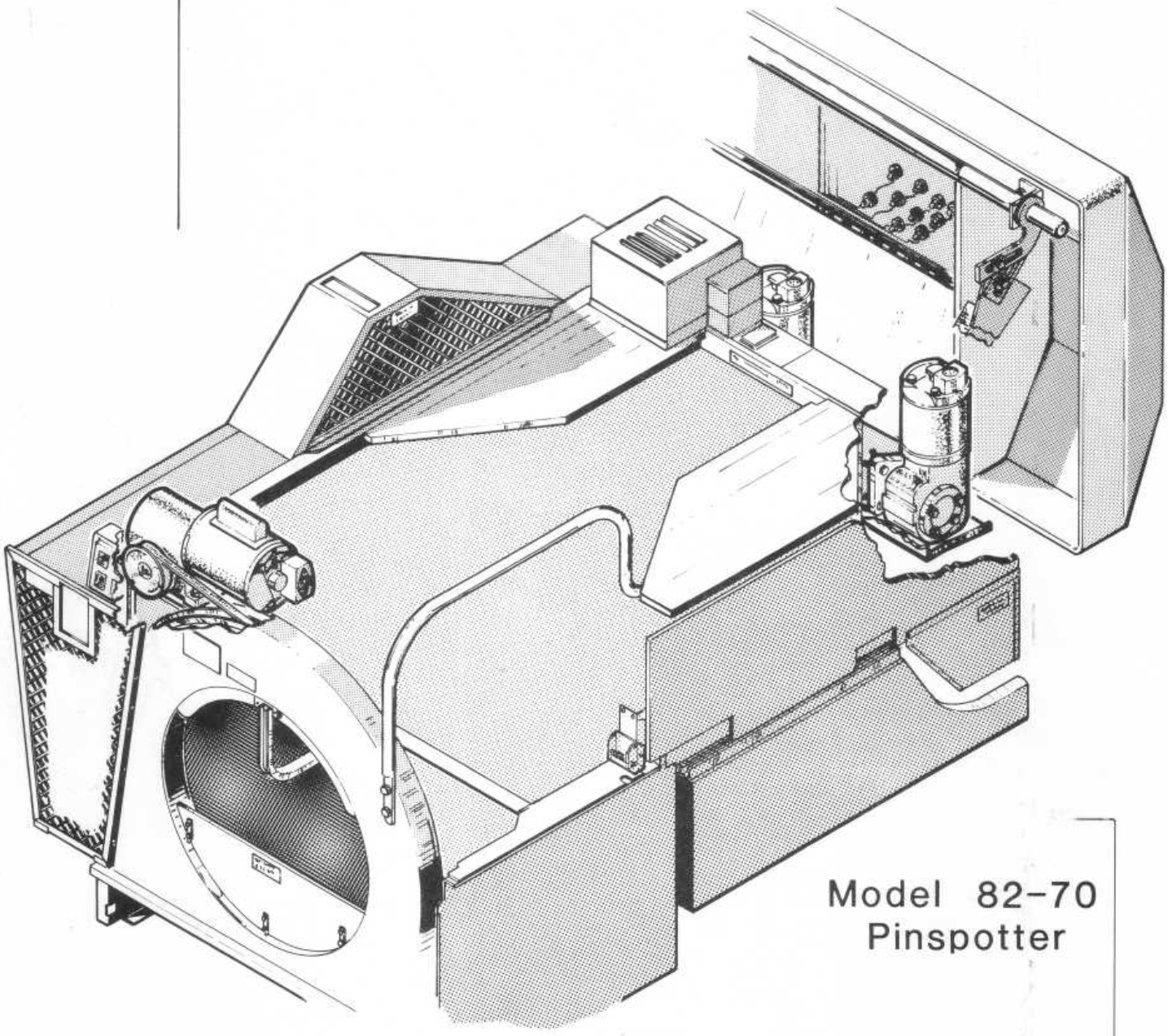
AMF



Model 82-70
Pinspotter

MOTOR REPAIR MANUAL

and

assembly parts lists

610 007 010

CONTENTS

GEAR DISASSEMBLY INSTRUCTIONS

REFER TO DRAWINGS - PAGES 25 THRU 36

BACK END DRIVE UNIT (711)

Please read the entire disassembly and reassembly instructions prior to starting work. Gears and bearings must be kept clean and care must be exercised in their handling so that gear teeth are not nicked, burred, or otherwise damaged. These instructions cover complete disassembly and all operations may not be required depending upon service operation to be performed.

DISASSEMBLY: GEAR END

D-1: Drain all the oil from the unit.

D-2: Remove the six cap screws (148) and pry off the offset cover (102) from housing (100). Wrap the keyway portion of the offset shaft (111) with thin shim stock or equivalent to protect seal lip from damage by sharp keyway edges.

A. Alternately, the entire offset shaft assembly may be removed with the cover (102) in one step. If this is done, separate cover (102) from the offset shaft assembly as in D-2 above and omit step D-4.

D-3: Press seal (143) out of cover (102).

D-4: Remove the offset shaft assembly by pulling straight out on shaft (111) while lightly tapping against housing (100).

D-5: The offset shaft (111) assembly is disassembled as follows:

A. Remove snap ring (152).

B. Support assembly behind offset gear (106) in an arbor press and, by pressing on end of offset shaft (111) (snap ring groove end), press off distributor pinion (107), inboard offset bearing (136), offset gear spacer (119) and offset gear (106). Remove distributor pinion key (128) and offset gear key (127).

C. Remove outboard offset shaft bearing (137) with suitable bearing puller, applying presure behind bearing (137) and on outboard end of offset shaft (111).

D-6: Mark wheel shaft cap (103) and housing (100) so that parts will be positioned correctly with respect to each other upon reassembly.

D-7: Remove the four cap screws (174) and pry wheel shaft cap (103) loose from housing (100). Wrap the keyway in the wheel shaft (112) with shim stock or equivalent to protect the seal (144) and slide cap (103) off the wheel shaft (112).

CAUTION: Retain shims (115).

D-8: Press seal (144) and outer race of outboard wheel bearing (140) out of wheel cap (103).

D-9: Slide oil collector tray (166) out of housing (100).

D-10: Remove wheel shaft (112) assembly from housing (100) by pressing downward slightly on end of wheel shaft (112) and pulling outward on the shaft. The outer race of the inboard wheel bearing (140) may then be removed from the housing (100) with a suitable puller.

CAUTION: Retain shims (116).

D-11: The wheel shaft (112) assembly is disassembled as follows:

A. Support the wheel shaft assembly behind the wheel (110) in an arbor press and press on the inboard end of the shaft (112) to remove inboard wheel shaft bearing (140) and wheel (110). Remove wheel key (130) from shaft (112).

B. Support behind outboard bearing (140) and press on the outboard end of wheel shaft (112) to remove outboard bearing (140). An alternate method would be to use a suitable bearing puller.

D-12: Mark distributor cap (104) and housing (100) so that parts will be correctly positioned upon reassembly.

D-13: Remove the four cap screws (150) and pry distributor cap (104) loose from housing (100). Wrap the keyway portion of the distributor shaft (113) with thin shimstock or equivalent to protect seal lip from damage.

D-14: Press seal (145)out of distributor cap (104).

D-15: Remove distributor shaft (113) assembly by pulling straight out on shaft (113) while lightly tapping against housing (100).

D-16: The distributor shaft (113) assembly is disassembled as follows :

A. To remove inboard bearing (138) from distributor output shaft (113), support behind bearing (138) and press on inboard end of shaft. An alternate method would be to use a suitable bearing puller.

B. To remove inboard bearing (138), distributor output gear (108) and spacer (120), support behind inboard gear (108) in an arbor press and press on inboard end of distributor shaft (113). Remove distributor gear key (129).

C. With suitable bearing puller, remove outboard distributor bearing (139) by applying pressure behind bearing (139) and on outboard end of shaft (113).

DISASSEMBLY: MOTOR END

D-17: Mark endshield (10), stator (7), adaptor (101) and housing (100) so that parts will be correctly positioned with respect to each other upon reassembly.

D-18: Remove four thru-bolts (26). Note position of one long bolt and spacer (117).

D-19: Tap stator (7) lightly to remove from adaptor (101). Leave endshield (10) on the stator (7) and be careful to retain OPE bearing shims (122)/(123).

D-20: Remove offset pinion nut (146) and press on outboard end of worm shaft (109) to remove complete worm shaft assembly (19)/(109) from housing (100). Note: Offset pinion (105) and offset pinion spacer (118) should be removed as they become free from worm shaft (109). Outboard worm bearing (135) will stay in housing (100) as the worm shaft assembly is removed. Remove offset pinion key (126) from worm shaft (109).

D-21: Remove OPE motor bearing (141) using a suitable bearing puller applying pressure on the end of shaft (19) and behind bearing pull washer (121). It is not necessary to remove rotor and worm shaft assembly from housing (100) to remove bearing (141).

D-22: If worm shaft (109) must be removed from rotor shaft (19), see D-28.

D-23: Remove snap ring (151) from housing (100) and lightly tap on outboard worm bearing (135) to remove from housing (100).

NOTE: Do not disassemble further unless it is necessary to replace the parts involved.

D-24: Remove inboard motor bearing seal (142) by use of a small pry bar. Seal will be destroyed by this operation.

If inboard motor bearing (134) is to be removed, seal (142) will be removed in the process. See D-25 below.

D-25: Inboard motor bearing (134) and inboard motor bearing seal (142) may be removed by inserting a drift pin through the gear end of the housing (100) and driving the bearing (134) which in turn will drive the seal (142) out of the housing (100). Both parts must be replaced if removed.

D-26: With a drift pin inserted through the air opening of adaptor (101) gently tap the air deflector (125) free from the adaptor (101). Reposition drift frequently to avoid cocking the air deflector. If it is distorted on removal it should be replaced.

D-27: Remove four cap screws (147) and by gently tapping on adaptor (101) it may be removed from housing (100).

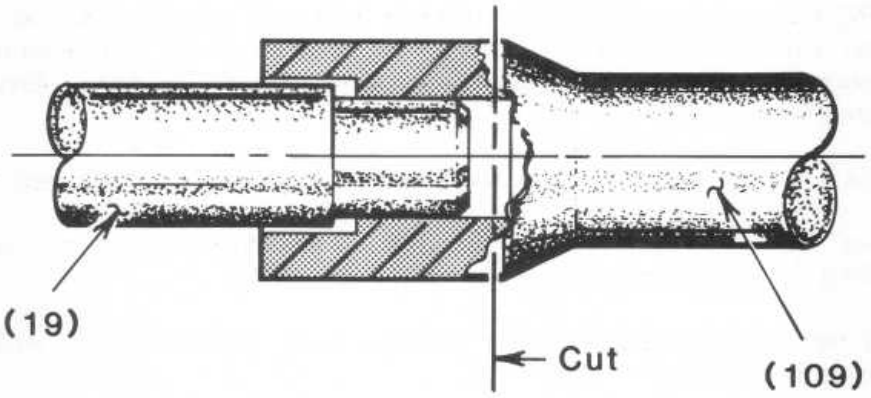
CAUTION: Do not remove oil pickup wire (165) from housing (100).

NOTE: Clean all parts removed in performing the required service operations. This cleaning must include removal of all old sealing compound and gasket material from covers, caps, housing mating faces, and registers if removed. Dress off any burrs or nicks that were produced during disassembly on register surfaces and and seal or bearing bores or seats. Seal seat surfaces may be polished lightly with a very fine crocus cloth.

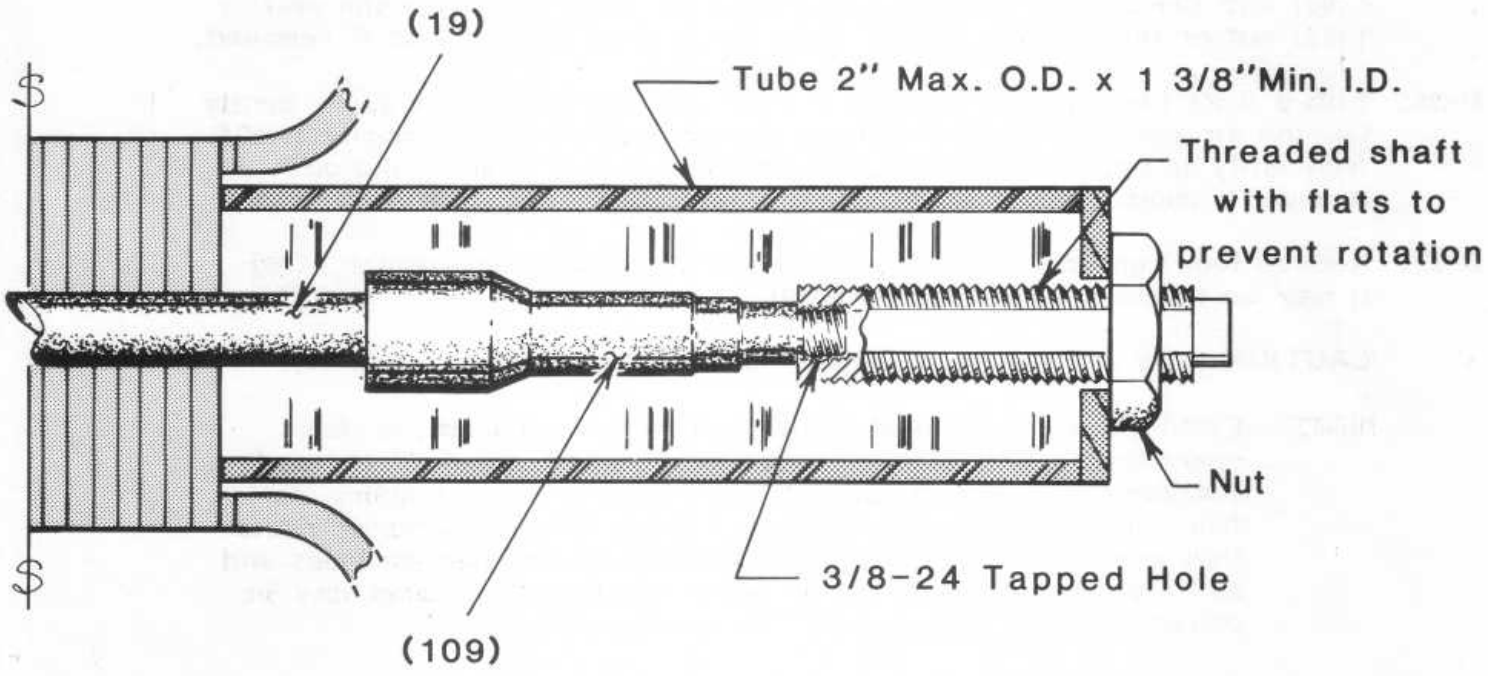
ROTOR-WORM DISASSEMBLY INSTRUCTIONS

D-28: The worm shaft (109) may be removed from the rotor shaft (19) in several ways as follows:

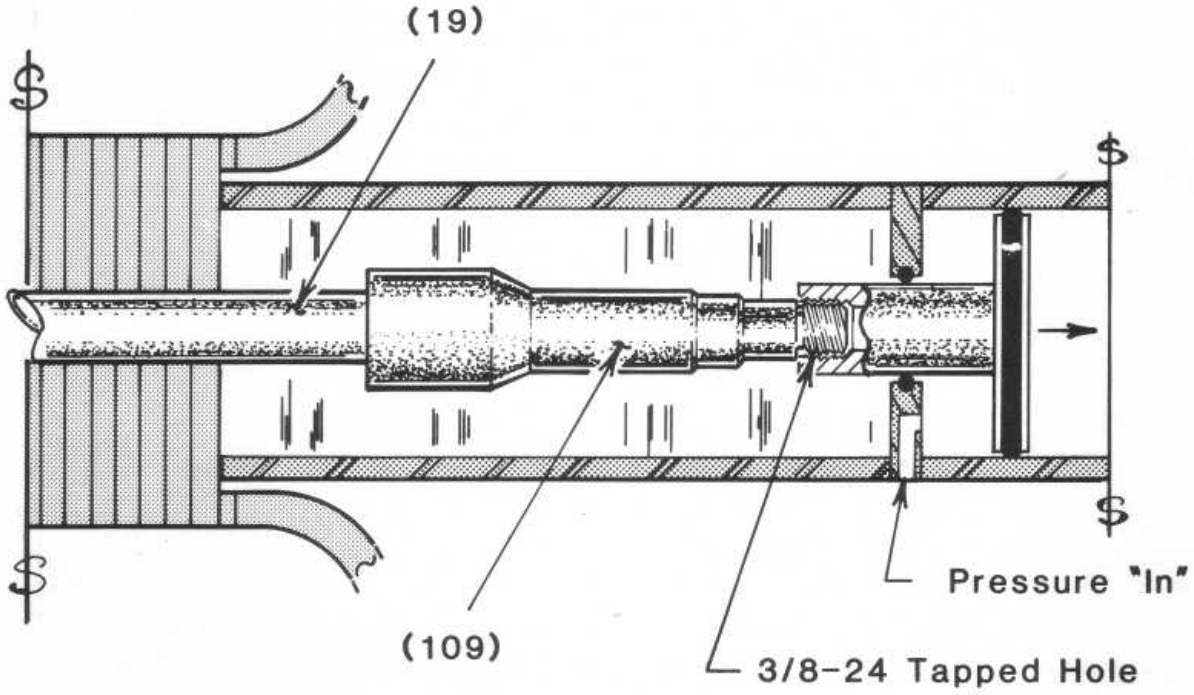
A. If the worm shaft is to be scrapped, the forward end of the worm shaft may be cut off with a hacksaw or cut-off wheel at the start of the taper at the forward end of the inboard bearing (134) seat. This will expose the end of the rotor shaft and leave a "collar" on the rotor shaft which may now be removed with a conventional bearing puller.



B. A simple "puller" may be made up as shown which will remove the worm shaft without damage to the parts:



C. The threaded rod of (B) may be replaced by a hydraulic cylinder (Power Draw) as shown below:



GEAR REASSEMBLY INSTRUCTIONS

REFER TO DRAWINGS - PAGES 25 THRU 36

BACK END DRIVE UNIT (711)

R-1: The housing parts are reassembled as follows:

NOTE: Lubricate all bearings prior to installation with the new gear oil used to refill gear case. AMF Part No. 715 020 906.

A. Insert bearing assembly plug (See sketch page 11) in bearing (134) and, with the two holes in the bearing held on the horizontal center line, press the bearing (134) into its seat in housing (100). It may be necessary to insert a drift through the gear housing (100) to tap out the assembly plug, since one function of the plug is to properly size bearing (134). With bearing (134) properly installed, it should close off the two peripheral cast grooves in housing (100) which carry oil to the oil holes in the bearing (134).

B. Coat O.D. of seal (142) with Permatex 3D or equivalent and press seal (142) into housing (100). Seal should be pressed flush with surface and mounted so that the lip is toward the inside of the housing.

NOTE: Seal (142) should be soaked in neats'-foot oil before installation.

C. Reassemble adaptor (101) to housing (100) using four cap screws (147) and taking care that previously made match marks (D-17) line up.

D. Press air deflector (125) into adaptor (101) until it seats. Take care to avoid "cocking" and/or distorting air deflector (125).

E. Place inboard wheel bearing shims (116) in position and press inboard wheel bearing (140) outer race into housing (100).

F. Install outboard worm bearing (135) in housing (100) and secure with snap ring (151).

R-2: The wheel shaft assembly (112) is reassembled as follows:

A. Install worm wheel key (130) into wheel keyway on shaft (112). Press worm wheel (110) squarely onto its seat on shaft (112) and firmly against its shoulder on shaft (112). Press inboard wheel bearing (140) squarely on its seat and firmly against shoulder of wheel (110).

B. Press outboard wheel bearing (140) squarely on its seat and firmly against its shoulder on wheel shaft (112).

R-3: Press outboard wheel bearing (140) outer race in wheel cap (103).

R-4: Install wheel shaft (112) assembly in housing (100) and assemble outboard wheel shims (115), wheel cap (103) (less seal) in housing (100). Using cap screws (174) bolt cap (103) securely to housing (100).

R-5: The wheel shaft (112) should turn freely but it should have no end play. If the wheel shaft (112) does not turn freely, shim (115) must be added between the wheel cap (103) and housing (100). If any shake can be felt, total thickness of shims (115) must be reduced between wheel cap (103) and housing (100).

R-6: Remove wheel cap (103) and shims (115). Keep shims together. Remove wheel shaft (112) assembly.

R-7: If replacing worm shaft (109), press worm shaft (109) on rotor shaft (19) to hold:

G.E. 50/60HZ	11.735/11.725"	between OPE bearing pull washer (121)
Westinghouse 60HZ	12.448/12.438"	between OPE bearing sleeve (121)
Westinghouse 50HZ	11.948/11.932"	new model 325P205,
	12.448/12.438"	old model 314P 145, between OPE bearing sleeve (121)

shoulder on rotor shaft (19) and outboard worm bearing (135) shoulder on worm shaft (109). Support shaft assembly on the two bearing seats (141) /(135). The center bearing journal (134) should run within .002"TIR.

R-8: Press pull washer (121) (shoulder towards bearing) and OPE bearing (141) on motor end of rotor shaft (19).

CAUTION: If rotor has not been removed from housing, support rotor so that no pressure is applied against outboard worm bearing (135).

R-9: Apply a thin coat of Prussian Blue or Red Lead to the worm (109).

R-10: Insert rotor shaft assembly (19)/(109) into housing (100) and start into outboard worm bearing (135).

CAUTION: Use care to avoid damage to seal (142).

Press shaft into outboard worm bearing (135) so that it sits against shoulder of worm shaft (109).

R-11: Slide offset pinion spacer (118) on to its seat, place offset pinion key (126) into keyway in worm shaft (109) and assemble offset pinion (105) on worm shaft (109). Lock assembly in place with offset pinion locknut(146).

R-12: Reassemble stator (7) to adaptor (101) using four clamp bolts (26). Previously made match marks (D-17) should line up and longest bolt (26) and spacer (117) should be in proper position. Make certain that OPE motor bearing shims (122),(123) are installed as removed.

R-13: Reassemble worm wheel shaft (112) assembly, shims (115), and wheel cap (103) into housing (100). Bolt in place with cap screws (174).

R-14: Operate the unit for a few minutes to allow the Prussian Blue or Red Lead on the worm (109) to establish worm (109) and wheel (110) contact relationship.

R-15: Remove cover bolts (174), wheel cap (103), shims (115), and wheel shaft (112)assembly and check that worm contact is centered on the wheel (110) teeth. If the contact is not centered, the wheel may be moved in an axial direction by increasing or decreasing the thickness of shims (116) behind the inboard wheel bearing (140) outer race in the housing (100).

NOTE: When the thickness of shims (116) is decreased or increased (over the original thickness established for no end float) because of a required axial shift of the wheel, then the thickness of the outboard shims (115) must also be decreased or increased by the same amount to maintain proper fit. I.E.: if shims (116) are decreased in thickness, then the thickness of shims (115) must also be decreased by the same amount.

R-16: Coat O.D. of wheel shaft seal (144) with Permatix 3D or equivalent and press into wheel cap (103). Be certain that seal (144) is installed with lip in toward gear case.

D-17: Place oil tray (166) in housing (100) so that it rests on ledge at bottom of inboard wheel bearing boss and bore for wheel shaft.

R-18: Install wheel shaft (112) assembly in housing (100).

R-19: Coat the register mating faces of the wheel cap (103) and housing (100) with Permatix 3D or equivalent. Use care to avoid getting the sealer into the bearings. A thin piece of shim stock or equivalent should be fitted into the bore of the seal (144) to protect the lip from damage as seal is slid over the wheel shaft. Assemble outboard shims (115) in housing and install wheel cap (103). Fasten in place with four cap screws (174).

R-20: Reassemble the distributor shaft (113) assembly as follows:

A. Place distributor gear key (129) in keyway of distributor shaft (113). Press distributor gear (108) squarely against its shoulder on shaft (113).

B. Place distributor gear spacer (120) against distributor gear (108) and press inboard distributor bearing squarely against spacer (120).

C. Press outboard distributor bearing (139) squarely against shoulder on outboard end of distributor shaft (113).

R-21: Reassemble distributor shaft (113) assembly in housing (100).

R-22: Coat O.D. of distributor shaft seal (145) with Permatex 3D or equivalent and press into distributor cap (104). Be certain that the lip of the seal (145) is facing in towards the housing (100).

R-23: Coat mating faces and register of distributor cap (104) and housing (100) with Permatix 3D or equivalent. Place gasket (168) on distributor cap (104) so that bolt holes are in line. Reassemble distributor cap (104) and gasket (168) on housing (100) with four cap screws (150) making sure that previously made match marks line up.

NOTE: Small notch cast in outside surface of distributor cap should be approximately 15^{o} off the bottom vertical center line.

CAUTION: A thin piece of shim stock or equivalent should be used to protect seal (145) lip against damage from keyway on the distributor shaft (113) during reassembly.

R-24: Reassemble offset shaft (111) assembly as follows:

A. Place offset gear key (127) in its keyway on offset shaft (111). Press offset gear (106) squarely against the shoulder on offset shaft (111).

B. Place offset gear spacer (119) against the offset gear (106) and press inboard offset shaft bearing (136) squarely against spacer (119).

C. Place distributor pinion key (128) in the keyway at the inboard end of offset shaft (111) and press distributor pinion (107) squarely against the inboard offset shaft bearing (136).

D. Install distributor pinion snap ring (152) in groove at inboard end of offset shaft (111).

E. Press outboard offset shaft bearing (137) squarely against the shoulder at the outboard end of offset shaft (111).

R-25: Reassemble offset shaft (111) assembly in housing (100). Use care to mesh properly both the distributor pinion (107) with the distributor gear (108) and the offset gear (106) with the offset pinion (105).

R-26: Coat O.D. of offset shaft seal (143) with Permatex 3D or equivalent and press seal (143) into offset cover (102). Be certain that the lip of the seal (143) is facing toward the housing (100).

R-27: Coat mating faces and register of offset cover (102) and housing (100) with Permatex 3D or equivalent. Position gasket (124) on offset cover (102) so that holes are in line. Reassemble offset cover (102) and gasket (124) on housing (100) with six cap screws (148).

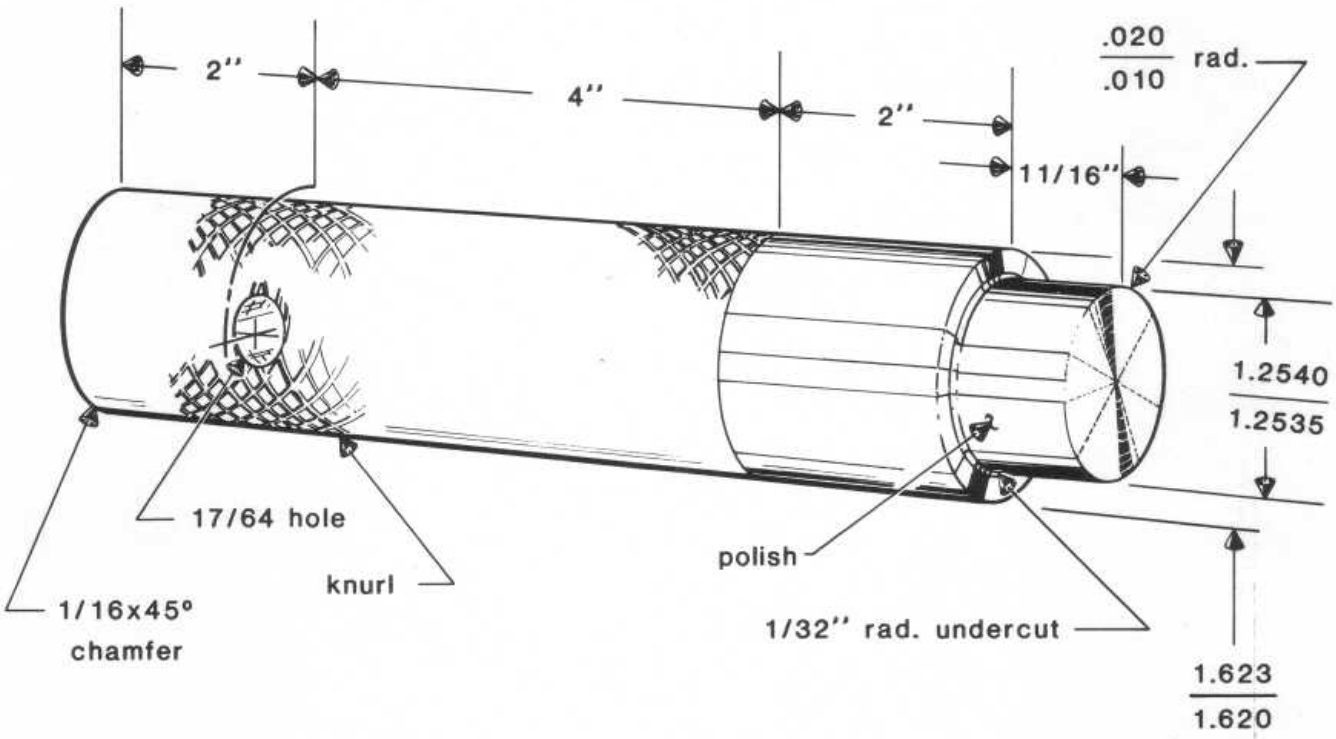
CAUTION: A thin piece of shim stock or equivalent should be used to protect seal (143) lip against damage from keyway on offset shaft (111).

R-28: Refill unit with approximately one pint of Sohivis J-156 lubricant, AMF part number 715 020 906. Make certain oil level comes up to level plug, and check for proper operation.

NOTE: AMF has standardized on Sohivis J-156 for these gear-motors, and it is AMF's desire that this oil be used. If this oil is not available locally, it may be ordered from AMF (Pt. # 715 020 906).

INBOARD WORM SHAFT BEARING SEATING TOOL

Tool No. 070 006 992



GEAR DISASSEMBLY INSTRUCTIONS

REFER TO DRAWINGS - PAGES 37 THRU 42

CAPACITOR REGENERATIVE BRAKING TABLE & SWEEP UNITS

Please read the entire disassembly and reassembly instructions prior to starting work. Gears and bearings must be kept clean and care must be exercised in their handling so that gear teeth are not nicked, burred, or otherwise damaged. These instructions cover complete disassembly and all operations may not be required - depending upon service operation to be performed.

D-1: Drain all the oil from the unit.

D-2: Mark cover (103) and housing (100) so that parts will be correctly positioned with respect to each other upon reassembly.

D-3: Remove the four cap screws (137) and pry cover (103) until loose. Grasp output shaft (105) and remove cage and planet assembly and output cover (103) together. It may be necessary to tap the output shaft lightly with a rawhide mallet, while pulling straight out on the output shaft, to loosen the inner cage bearing in the adapter.

D-4: The cover (103) and cage and planet assembly may now be separated by hand.

D-5: Press seal (130) out of cover (103).

D-6: Remove the four cap screws (138) and pry back cover (102) until loose and remove.

CAUTION: Be careful to retain all of the shims (115) which will be found between back cover (102) and housing (100) mating surfaces.

D-7: Remove the worm wheel shaft assembly by pulling down and out on the end of the wheel shaft (108).

D-8: The cage and planet assembly is disassembled as follows:

A. Pry off cage bearings (122)/(123).

B. Position cage assembly in an arbor press with output shaft down and press out planet spindles (107), pressing on the top ends. Remove planet gears (106).

C. Do not remove expansion plug (204) unless it is leaking and must, therefore, be replaced.

D-9: The worm wheel (109) and wheel shaft bearings (127)/(128) may be removed from the wheel shaft (108) in an arbor press. Support wheel and press shaft away from wheel removing wheel and one bearing race, then press off remaining bearing race.

D-10: Mark endshield (10), stator (7), and gear housing (100) so that parts will be correctly positioned with respect to each other upon reassembly.

D-11: Remove the four thru-bolts (26) and tap the stator (7) lightly to remove from housing (100). Leave the endshield on the stator and be careful to retain the OPE bearing washers (201)/(203).

D-12: Using an offset or universally jointed socket wrench, remove the four cap screws (139) holding the worm shaft cap (133) to housing (100).

D-13: Lightly tap the rotor body while pulling the rotor in a direction away from the gear housing (100) until the inboard bearing (124) comes free from its bore in housing (100). The entire rotor and worm shaft assembly may then be carefully removed from the housing (100).

NOTE: It is not necessary to perform any gear end disassemblies (D-1 thru D-9 inclusive) to remove the rotor and worm shaft assembly.

D-14: The rotor and worm shaft assembly is disassembled as follows:

A. Remove locknut (136) from worm shaft (19).

B. Support the worm (110) in an arbor press and press the end of shaft (19).

CAUTION: Use bronze or copper rod so as not to damage end of shaft (19). Press until outboard bearing (125), outboard spacer (113), and worm (110) are removed. Now, remove worm key (120).

C. Carefully support worm shaft seal cap (133) in an arbor press and press on end of shaft (19), as in "B" above, press until inboard worm spacer (112), inboard bearing (124), and worm shaft seal cap (133) are removed.

CAUTION: To prevent damage to worm shaft seal cap (133), support cap close to shaft (19). To prevent damage to worm shaft (19), do not let shaft fall free. Retain shims (114) remove from between cap (133) and bearing (124).

D. Press seal (131) from worm shaft seal cap (133).

E. Remove OPE motor bearing (126) using a suitable bearing puller. Apply pressure on the end of shaft (19) and behind bearing pull washer (200). It is not necessary to remove rotor and worm shaft assembly from housing (100) to remove bearing (126).

NOTE: Clean all parts removed in performing the required service operations. This cleaning must include removal of all old sealing compound from covers, adapters, seal caps, housing mating faces, and registers if removed. Dress off any burrs or nicks on register surfaces and seal or bearing bores or seats produced during disassembly. Seal seat surfaces may be polished lightly with a very fine crocus cloth.

GEAR REASSEMBLY INSTRUCTIONS

REFER TO DRAWINGS - PAGES 37 THRU 42

CAPACITOR REGENERATIVE BRAKING TABLE & SWEEP UNITS

R-1: The rotor and worm shaft assembly is reassembled as follows:

A. Press GE pull washer (200), or Westinghouse collar (157), (with shoulder against bearing) and bearing (126), onto end of shaft (19).

CAUTION: If rotor and worm shaft assembly has not been removed from housing (100), support rotor so that no pressure is applied against inboard bearing (124) to prevent damage to this bearing and to seal (131).

B. Coat O.D. of seal (131) with Permatex 3D or equivalent and press seal (131) into worm shaft seal cap (133). Be certain that seal (131) is installed so that seal lip is toward inside of gear housing (100).

C. Place assembled seal (131) and cap (133) over worm shaft (19), seal lip toward inside of gear housing - or away from motor, and press back onto seal seat diameter of worm shaft (19). Place shims (114) over shaft (19) and slide them up next to cap (133).

D. Place inboard worm bearing (124) and inboard worm spacer (112) over end of worm shaft (19) and, using an arbor press, press on spacer (112) to seat bearing (124).

E. Reassemble worm key (120) into keyway in worm shaft (19) and slide worm (110) over shaft (19) into place.

F. Place outboard worm spacer (113) and outboard worm bearing (125) on shaft (19) and press to seat bearing (125) against spacer (113).

G. Reassemble locknut (136) to end of shaft (19) and tighten to 240 inch pound torque.

H. Support assembled rotor and worm shaft assembly using center holes on each end and rotate assembly. Using a dial indicator, check for runout on O.D. of bearing (124). This runout should not exceed .004 inches total indicator runout. If the maximum allowable runout is exceeded, loosen locknut (136) and rotate spacers (112) and (113) to different relative positions, retighten locknut (136) and recheck runout. This is to balance out minor differences in parallelism between the mating surfaces of the parts when assembled.

R-2: The worm wheel and shaft assembly is reassembled as follows:

A. Reassemble wheel key(119) into keyway in worm wheel shaft (108) and press wheel (109) into place. Note that protruding side of hub goes against shaft shoulder.

B. Press the inner races of wheel shaft bearings (127)/(128) into place on both ends of wheel shaft (108).

R-3: The cage and planet assembly is reassembled as follows:

A. Check that expansion plug is properly seated in cage (105).

B. Support the cage (105) in an arbor press with the output shaft down, position planet (106), and press spindle (107) down through the bearing into place. Repeat for the other two planets. The planets (106) should be in the centers of the spindles (107) so that the ends of spindles (107) do not rub on the races of bearings (122)/(123) when installed. Spindles should be perpendicular to planet faces so bearings are not damaged.

C. Press cage bearings (122)/(123) into place on cage (105).

R-4: Coat O.D. of seal (130) with Permatex 3D or equivalent and press seal (130) into cover (103). Be certain that seal (130) is installed so that lip is in toward the gear housing (100).

R-5: Install wheel shaft assembly and wheel shaft bearings into gear housing (100). Make sure shims (116) are installed between bearing (127) and housing (100).

R-6: Reassemble back cover (102) to the gear housing (100) being careful to install the associated shims (115) removed between the back cover (102) and housing (100). Match marks originally made should line up. Tighten cap screws (138).

R-7: CAUTION: The wheel shaft should turn freely but it should have no endplay. If the wheel shaft (108) does not turn freely, shims (115) must be added between back cover (102) and housing (100). If any shake can be felt in the wheel shaft (108), shims (115) must be removed from between back cover (102) and housing (100).

R-8: Apply a thin coat of throughly clean Prussian Blue or Red Lead to the worm (110) and reassemble the rotor and worm shaft assembly to the gear housing (100).

CAUTION: Make certain that worm shaft bearings (124) and (125) are square in their bores in housing (100) before tapping rotor and worm shaft assembly into place. Use a rawhide or fibre mallet so as not to deform the end of the rotor shaft.

R-9: Reassemble worm shaft seal cap (133) to housing (100) using cap screws (139). Rotor shaft endplay should not exceed .007 inches. Measure and record endplay - see R-15.

R-10: Reassemble stator (7) and endshield to the gear housing (100) using the four thru-bolts (26). Be certain OPE motor bearing shims (201)/(203) are installed as removed.

R-11: Operate the unit for a few minutes to allow the Prussian Blue or Red Lead on the worm to establish worm (110) and worm wheel (109) contact relationship.

R-12: Remove back cover (102) and the worm wheel (109) and shaft (108) assembly (D-6 & D-7) and check that the worm (110) contact is centered on wheel (109) teeth. If the contact is not centered, the axial wheel movement required to obtain centering is obtained by equal adjustment of the thickness of shims (116) and shims (115).

CAUTION: Unequal adjustment of the thickness of shims (116) between bearing (127) and housing (100), and shims (115), between back cover (102) and housing (100) will destroy previously determined (R-7) bearing loading.

EXAMPLE: If wheel (109) must be moved .003 inches toward back cover (102) to center, add .003 inches thickness to both shims (115) and shims (116).

EXAMPLE: If wheel (109) must be moved .002 inches away from back cover (102) to center, remove .002 inches thickness from both shims (115) and shims (116).

R-13: After proper centering of worm (110) and wheel (109) tooth contact has been determined, remove back cover (102) and wheel (109) shaft assembly.

R-14: Remove stator (7), (D-10 & D-11) and rotor and worm shaft assembly (D-12 & D-13).

R-15: Adjust thickness of shims (114) between cap (133) and bearing (124) to hold rotor and worm shaft assembly endplay to within .007 inches.

R-16: Coat the O.D. of worm shaft seal cap (133) with Permatex 3D or equivalent and reassemble rotor and worm shaft assembly (See R-8 CAUTION note & R-10).

CAUTION: Do not get sealing compound in the bearing (124) or bearing bore as this could cause premature bearing failure. Cast slots in cap (133) should be in a vertical line.

R-17: Reassemble stator (7) and endshield to gear housing (100) using four thru-bolts (26). Previously made match marks (D-10) should line up.

D-18: Coat the register mating faces of back cover (102) and housing (100) with Permatex 3D or equivalent and reassemble back cover (102) and worm wheel shaft assembly to gear housing (100), as in (R-5 & R-6), making certain shims (115) and (116) are in place. Previously made match marks (D-2) should line up.

R-19: Reassemble cage and planet assembly into cover (103). A thin piece of shim stock or equivalent should be fitted into the seal bore to help expand the seal without damaging the seal when it is fitted over the shaft. Be careful to properly engage the planet and ring gear teeth as, when properly engaged, the assembly will drop freely into the ring gear in cover (103).

R-20: Coat the register mating surfaces of back cover (103) and housing (100) with Permatex 3D or equivalent.

R-21: Reassemble the back cover (103) and cage and planet assembly to the housing (100) using the same care in meshing the planets and pinion (108) that was taken in the step (R-19).

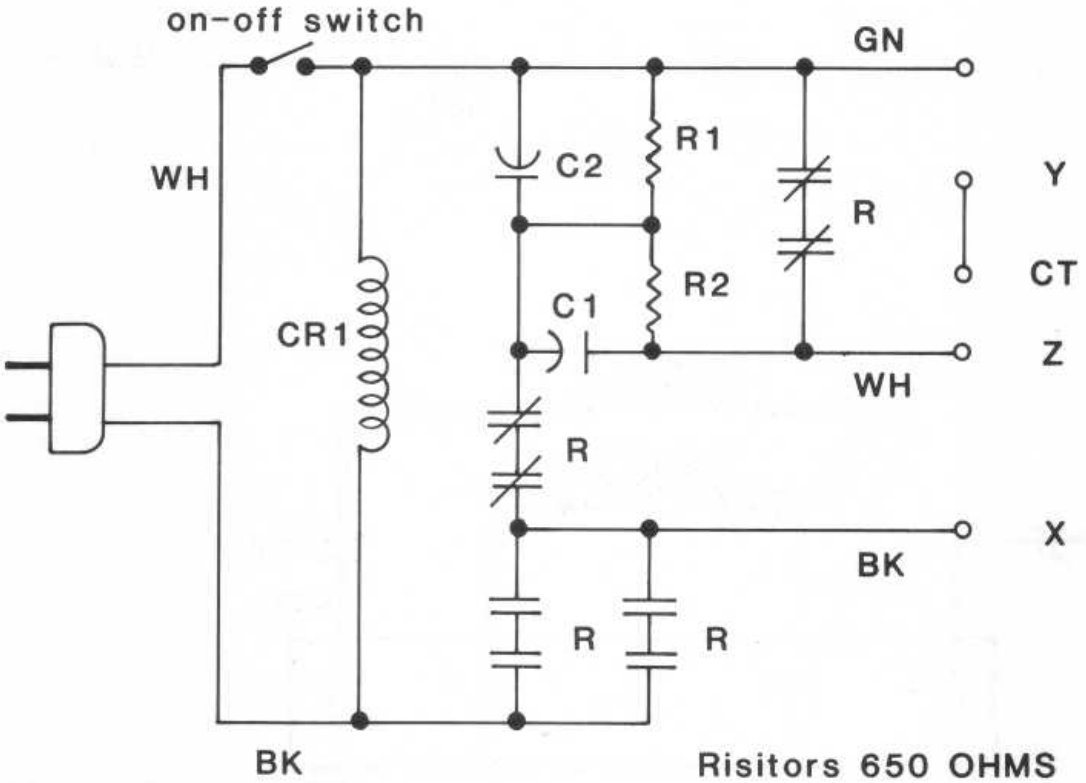
R-22: Refill unit with approximately one pint of Sohivis J-156 lubricant, AMF part number 715 020 906. Make certain oil level comes up to level plug, and check for proper operation.

NOTE: AMF has standardized on Sohivis J-156 for these gear motors, and it is AMF's desire that this oil be used. If this oil is not available locally, it may be ordered from AMF (Part #715 020 906).

TEST CONNECTIONS FOR CAPACITOR BRAKING 60HZ GEAR MOTORS

(may be used on 50hz. motors)

Capacitors External To Gear Motor



The following points should be checked if the gear motor fails to brake properly:

A. If gear motor starts and runs, but does not brake properly - -

1. Loose or poor connections
2. Improper relay sequencing in control chassis
3. Dirty, burned, or sticking relay contacts
4. One capacitor shorted

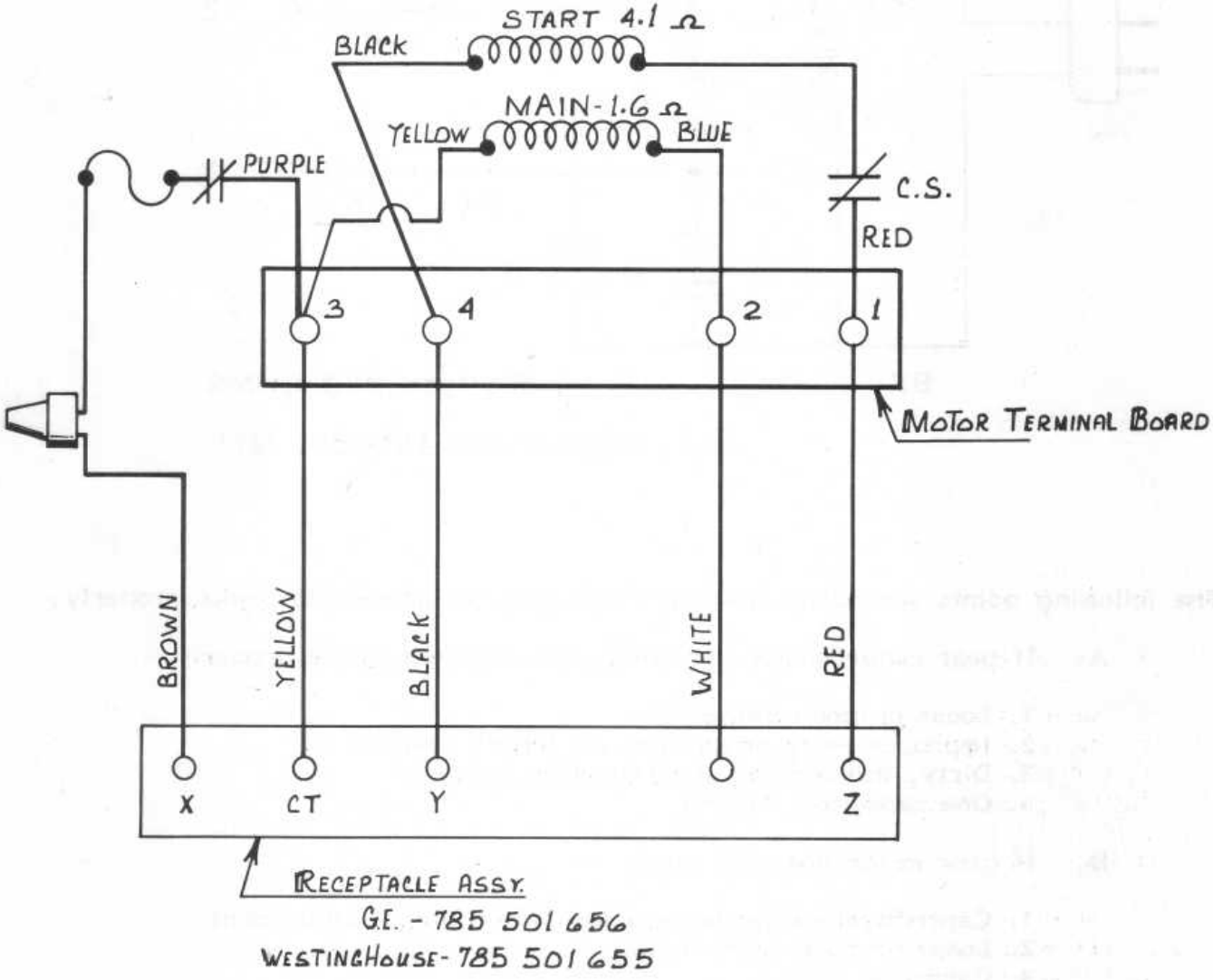
B. If gear motor does not start - -

1. Centrifugal mechanism and/or switch out of adjustment
2. Loose or poor connections
3. Capacitor open

WIRING DIAGRAM - COMBINATION MOTOR

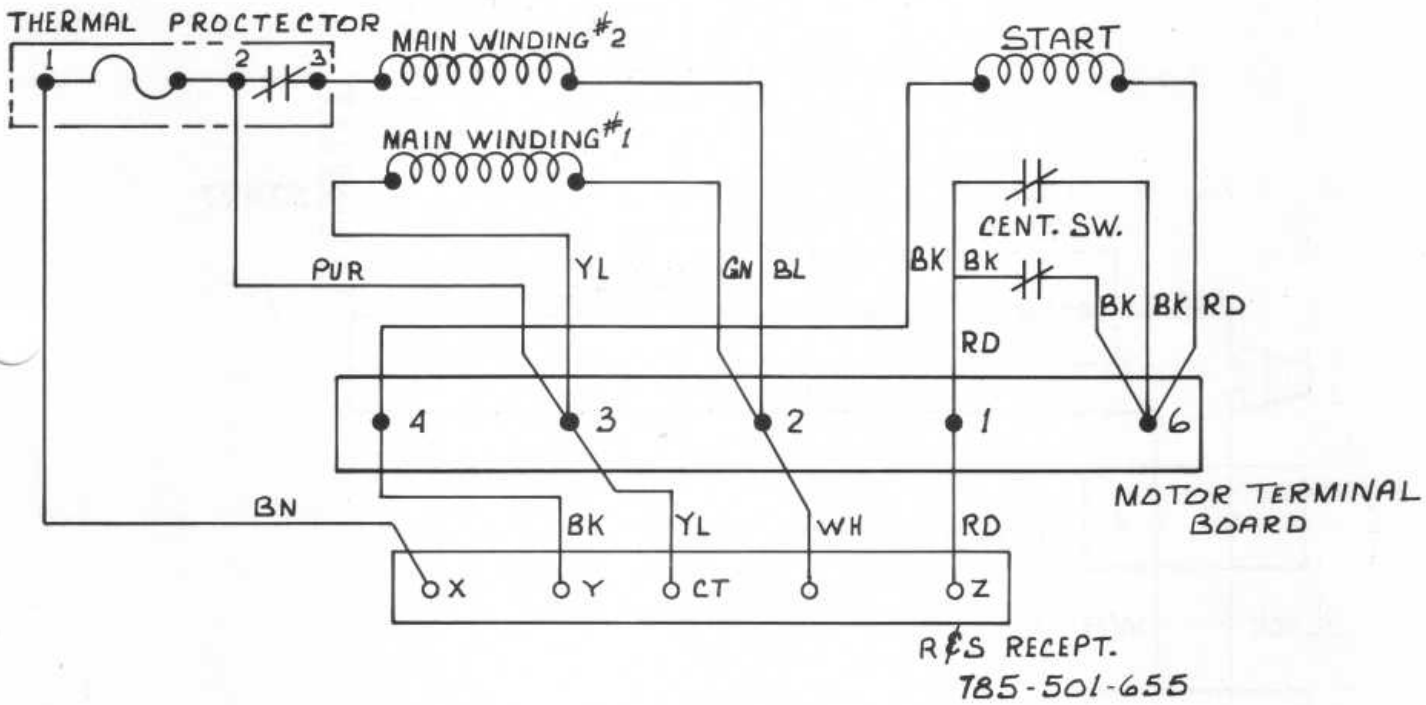
82-70-1702 GENERAL ELECTRIC 60HZ

82-70-4052 WESTINGHOUSE 60HZ



WIRING DIAGRAM - COMBINATION MOTOR

82-70-4047 50HZ



TO CONNECT FOR 220 V

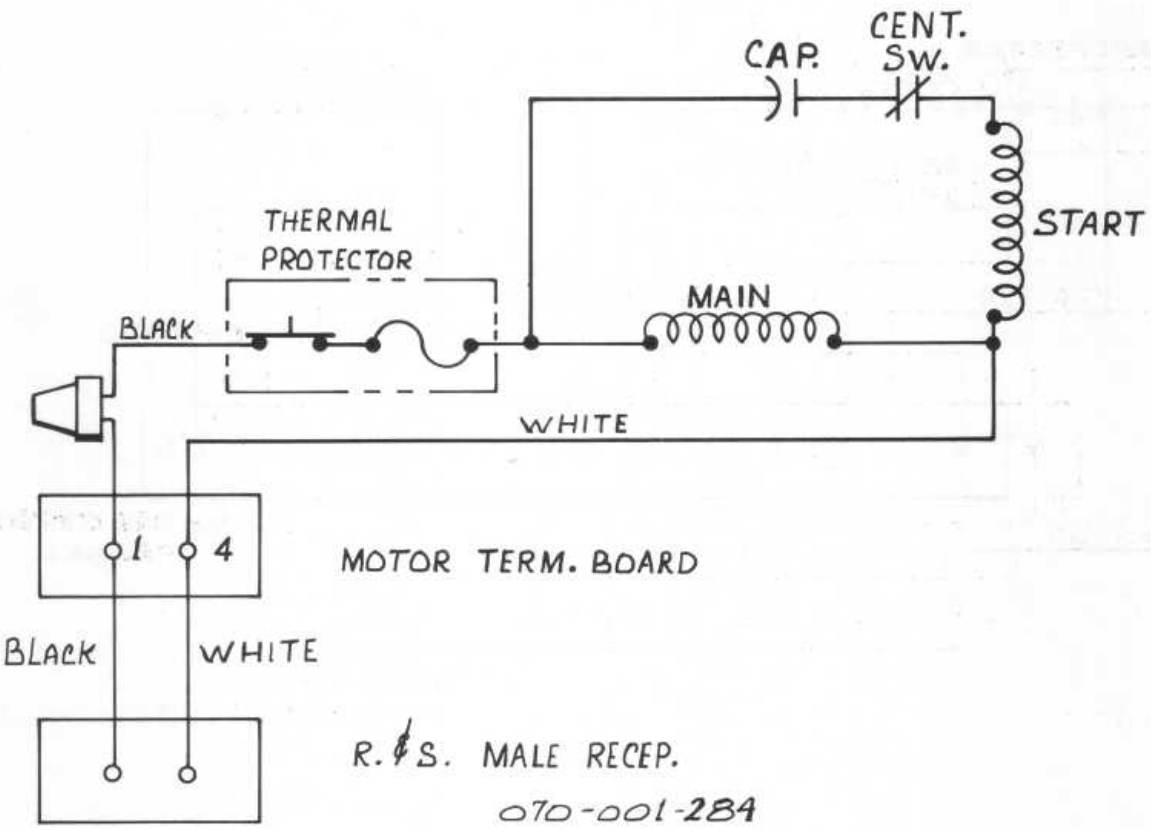
1. Remove Purple lead from terminal #3 and insulate by taping.

2. Reconnect Blue lead from terminal #2 to terminal #3.

WIRING DIAGRAM - BACK END MOTOR

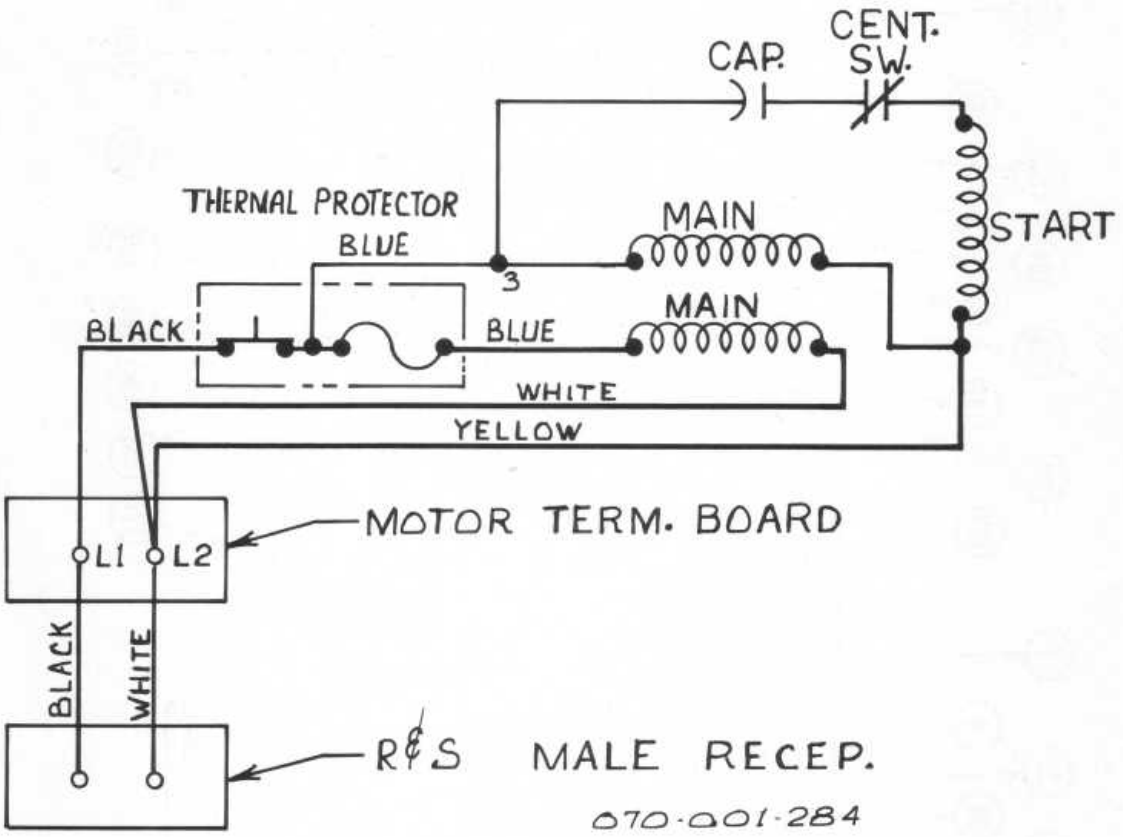
82-70-4042 60HZ

82-70-4042 60HZ



WIRING DIAGRAM - BACK END MOTOR

82-70-4037 50HZ

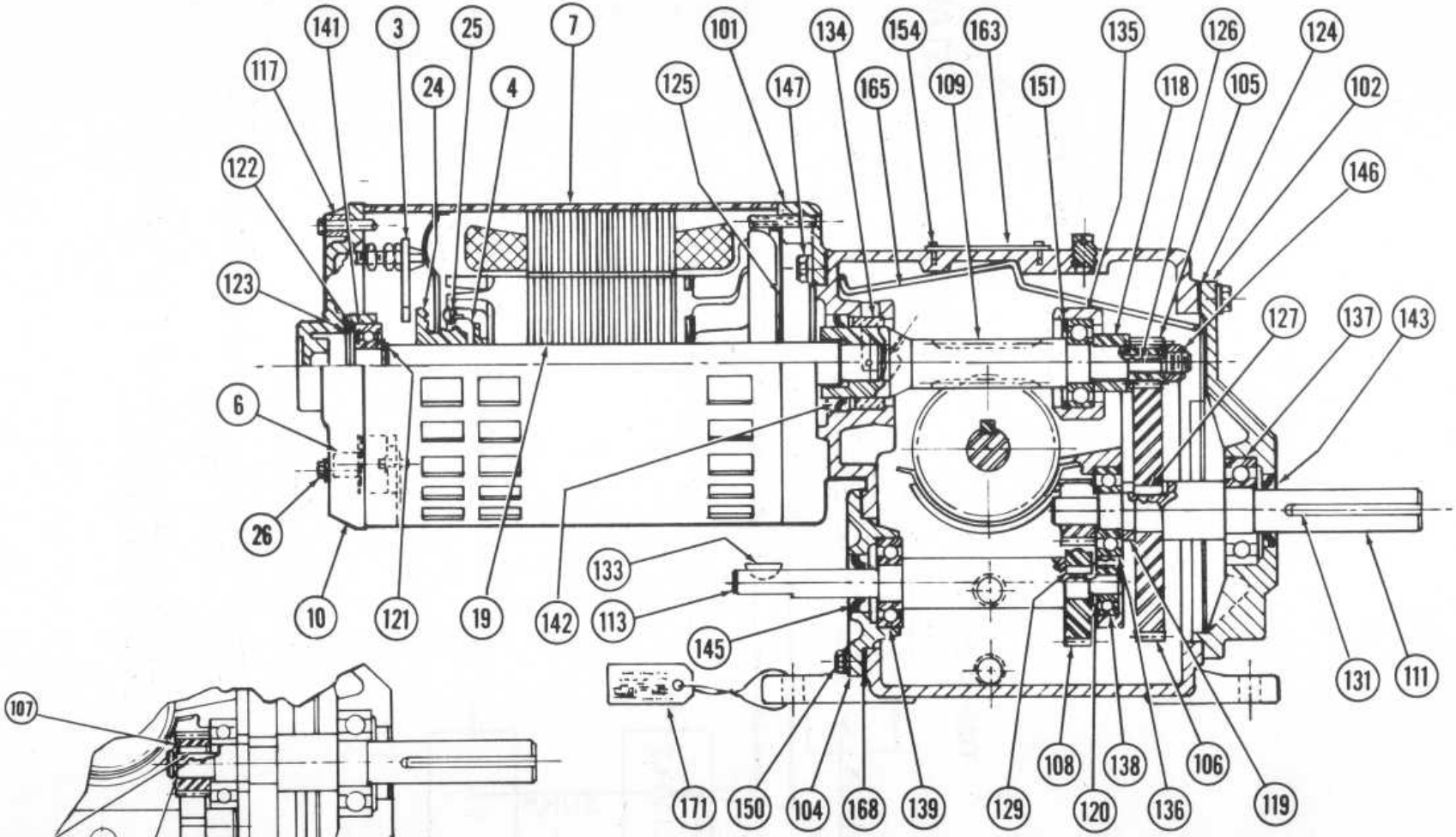


TO CONNECT FOR 220 V

1. Remove Blue lead from terminal #3 and insulate by taping.
2. Reconnect White lead from terminal L2 to terminal #3.

BACK END MOTOR 82-70 PINSPOTTER

GENERAL ELECTRIC 60HZ
LEFT HAND ASS'Y.

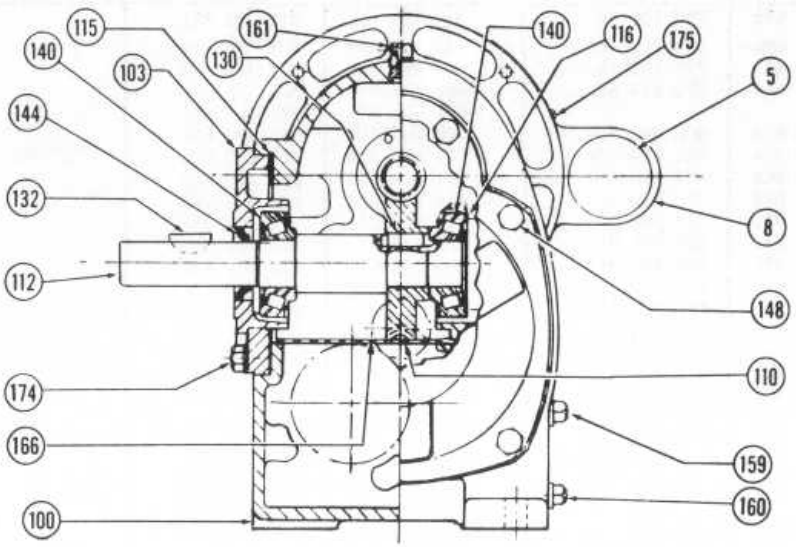


AUXILIARY OFFSET OUTPUT SHAFT ASS'Y.
MODEL NO. 7GG711D2K.

BACK END MOTORS 52-70 PINSPOTTER

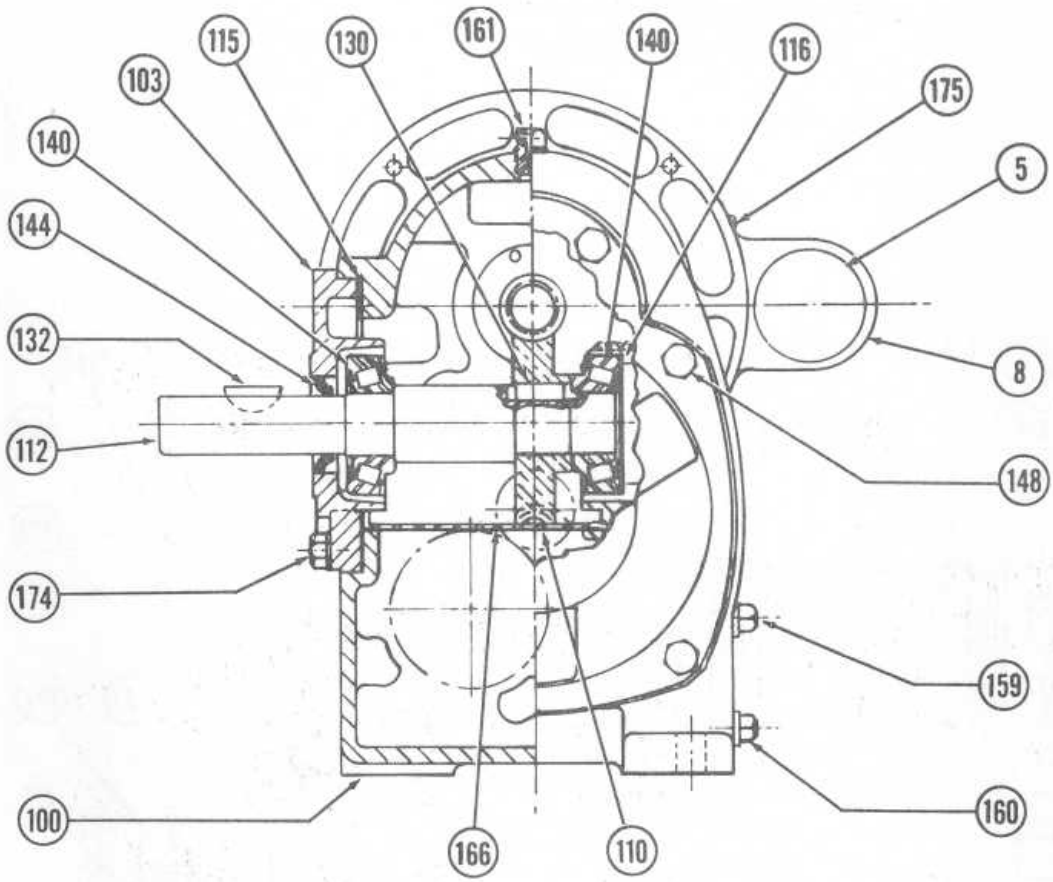
		GENERAL ELECTRIC 60HZ					
MOTOR MODEL NO.		7GG711D2K		7GF711D2K		7GF711YD2K	
	MOTOR & RECEPTACLE ASS'Y.	070 001 400	070 002 200	070 006 097	070 006 199	070 006 208	070 006 207
	MOTOR ONLY	070 001 410	070 002 205	070 006 096	070 006 198	070 006 206	070 006 205
REF. NO.	DESCRIPTION	(R.H.)Y03	(L.H.) Y04	(R.H.) Y11	(L.H.) Y12	(R.H.) Y17	(L.H.) Y18
3	Centrifugal Switch	785 501 375	785 501 375	785 501 375	785 501 375	785 501 375	785 501 375
4	Centrifugal Mechanism	785 501 194	785 501 194	785 501 194	785 501 194	785 501 194	785 501 194
6	Thermal Protector	785 501 387	785 501 387	785 501 387	785 501 387	785 501 387	785 501 387
7	Stator	785 501 363	785 501 363	785 501 363	785 501 363	785 501 363	785 501 363
10	End Shield	785 501 317	785 501 317	785 501 317	785 501 317	785 501 317	785 501 317
19	Rotor With Shaft	785 501 247	785 501 247	785 501 247	785 501 247	785 501 247	785 501 247
24	Push - Collar - Cent. Mech.	785 501 082	785 501 082	785 501 082	785 501 082	785 501 082	785 501 082
25	Spring - Centrifugal Mech.	785 501 349	785 501 349	785 501 349	785 501 349	785 501 349	785 501 349
26	Through Bolt (3 Req.)	785 501 019	785 501 019	785 501 019	785 501 019	785 501 019	785 501 019
26A	Through Bolt (1 Req.)	785 501 020	785 501 020	785 501 020	785 501 020	785 501 020	785 501 020
101	Adaptor, Motor	785 501 449	785 501 449	785 501 449	785 501 449	785 501 449	785 501 449
102	Cover Offset	785 501 095	785 501 095	785 501 095	785 501 095	785 501 095	785 501 095
104	Cap, Distributor Output	785 501 058	785 501 058	785 501 059	785 501 059	785 501 059	785 501 059
105	Gear, Offset Pinion	785 501 129	785 501 130	785 501 129	785 501 130	785 501 129	785 501 130
106	Gear, Offset, Output	785 501 127	785 501 120	785 501 121	785 501 119	785 501 121	785 501 119
107	Gear, Distributor, Pinion	785 501 133	785 501 133				
108	Gear, Distributor, Output	785 501 118	785 501 118	785 501 122	785 501 122	785 501 117	785 501 117
109	Gear, Worm & Shaft	785 501 149	785 501 148	785 501 149	785 501 148	785 501 149	785 501 148
111	Shaft, Offset Output	785 501 283	785 501 283	785 501 277	785 501 277	785 501 276	785 501 276
113	Shaft, Dist. Output	785 501 274	785 501 274	785 501 621	785 501 621	785 501 621	785 501 621
117	Spacer, Motor Thru Bolt	785 501 329	785 501 329	785 501 329	785 501 329	785 501 329	785 501 329
118	Spacer, Worm Shaft	785 501 342	785 501 342	785 501 342	785 501 342	785 501 342	785 501 342
119	Spacer, Offset Shaft	785 501 330	785 501 330	785 501 398	785 501 398	785 501 398	785 501 398
120	Spacer, Dist. Output Shaft	785 501 331	785 501 331	785 501 331	785 501 331	785 501 331	785 501 331
121	Pull Washer	785 501 412	785 501 412	785 501 412	785 501 412	785 501 412	785 501 412
122	Washer, Flat	785 501 407	785 501 407	785 501 407	785 501 407	785 501 407	785 501 407
123	Washer, Belleville	785 501 396	785 501 396	785 501 396	785 501 396	785 501 396	785 501 396
124	Gasket, Offset Cover	785 501 116	785 501 116	785 501 116	785 501 116	785 501 116	785 501 116
125	Air Baffle	785 501 007	785 501 007	785 501 007	785 501 007	785 501 007	785 501 007
126	Key, Offset Pinion	907 200 100	907 200 100	907 200 100	907 200 100	907 200 100	907 200 100
127	Key, Offset Gear	907 200 700	907 200 700	907 200 700	907 200 700	907 200 700	907 200 700
128	Key, Distributor Pinion	907 200 300	907 200 300				
129	Key, Distributor Gear	907 200 200	907 200 200	907 200 200	907 200 200	907 200 200	907 200 200
131	Key, Offset Output Shaft	907 201 100	907 201 100	907 201 100	907 201 100	907 201 100	907 201 100
133	Key, Distributor Output Shaft	907 000 300	907 000 300	907 000 300	907 000 300	907 000 300	907 000 300
134	Bearing, Worm Shaft, Inboard	785 501 014	785 501 014	785 501 014	785 501 014	785 501 014	785 501 014
135	Bearing, Worm Shaft, Outboard	701 021 008	701 021 008	701 021 008	701 021 008	701 021 008	701 021 008
136	Bearing, Offset Shaft Inboard	701 021 008	701 021 008	701 025 011	701 025 011	701 025 011	701 025 011
137	Bearing, Offset Shaft Outboard	701 025 011	701 025 011	701 025 011	701 025 011	701 025 011	701 025 011
138	Bearing, Dist. Shaft Inboard	701 011 003	701 011 003	701 011 003	701 011 003	701 011 003	701 011 003
139	Bearing, Dist. Shaft Outboard	701 021 008	701 021 008	701 021 008	701 021 008	701 021 008	701 021 008
141	Bearing, Motor OPE	701 019 007	701 019 007	701 019 007	701 019 007	701 019 007	701 019 007
142	Seal, Worm Shaft	716 501 009	716 501 009	716 501 009	716 501 009	716 501 009	716 501 009
143	Seal, Offset Shaft	716 503 023	716 503 023	716 503 023	716 503 023	716 503 023	716 503 023
145	Seal, Distributor Shaft	716 503 022	716 503 022	716 503 022	716 503 022	716 503 022	716 503 022
146	Nut, Offset Pinion - Lock	838 866 002	838 866 002	838 866 002	838 866 002	838 866 002	838 866 002
147	Screws, Adpt. 5/16-18 x 1 Hex Taptite	826 057 162	826 057 162	826 057 162	826 057 162	826 057 162	826 057 162
150	Screws, Dist. Cap 10-24 x 5/8 Hex Hd. Taptite	826 049 122	826 049 122	826 049 122	826 049 122	826 049 122	826 049 122
151	Snap Ring, Worm Shaft Brg. OB.	919 000 700	919 000 700	919 000 700	919 000 700	919 000 700	919 000 700
152	Snap Ring, Distributor Pinion	919 005 500	919 005 500				
154	Drive Pins, Oil Plate	829 912 032	829 912 032	829 912 032	829 912 032	829 912 032	829 912 032
163	Oil Plate	785 501 216	785 501 216	785 501 216	785 501 216	785 501 216	785 501 216
165	Pick-Up Wire, Oil	785 501 416	785 501 416	785 501 416	785 501 416	785 501 416	785 501 416
168	Gasket, Distributor Cap	785 501 110	785 501 110	785 501 008	785 501 008	785 501 008	785 501 008

BACK END MOTOR 82-70 PINSPOTTER



MOTOR MODEL NO.		GENERAL ELECTRIC 60HZ					
		7GG711YD2K		7GF711YD2K		7GF711YD2K	
MOTOR & RECEPTACLE ASS'Y.		070 001 400	070 002 200	070 006 097	070 006 199	070 006 208	070 006 207
MOTOR ONLY		070 001 410	070 002 205	070 006 096	070 006 198	070 006 206	070 006 205
REF. NO.	DESCRIPTION	(R.H.) Y03	(L.H.) Y04	(R.H.) Y11	(L.H.) Y12	(R.H.) Y17	(L.H.) Y18
5	Capacitor	743 000 017	743 000 017	743 000 017	743 000 017	743 000 017	743 000 017
8	Capacitor Cover	785 501 085	785 501 085	785 501 085	785 501 085	785 501 085	785 501 085
100	Housing, Gear	785 501 161	785 501 162	785 501 163	785 501 164	785 501 163	785 501 164
103	Cap, Wheel	785 501 066	785 501 066	785 501 066	785 501 066	785 501 066	785 501 066
110	Gear, Wheel	785 501 147	785 501 146	785 501 147	785 501 146	785 501 147	785 501 146
112	Shaft, Wheel Output	785 501 297	785 501 297	785 501 297	785 501 297	785 501 297	785 501 297
115	Shims, Wheel Brg. OB.	785 501 309	785 501 309	785 501 309	785 501 309	785 501 309	785 501 309
116	Shims, Wheel Brg. IB.	785 501 306	785 501 306	785 501 306	785 501 306	785 501 306	785 501 306
130	Key, Wheel	907 200 800	907 200 800	907 200 800	907 200 800	907 200 800	907 200 800
132	Key, Wheel Output Shaft	907 000 500	907 000 500	907 000 500	907 000 500	907 000 500	907 000 500
140	Bearing, Wheel Shaft (2)	701 224 030	701 224 030	701 224 030	701 224 030	701 224 030	701 224 030
144	Seal, Wheel Shaft	716 503 023	716 503 023	716 503 023	716 503 023	716 503 023	716 503 023
148	Screws, Hex Hd Taptite ¼-20 x 7/8"	826 049 142	826 049 142	826 049 142	826 049 142	826 049 142	826 049 142
159	Plug, Oil Level	718 508 008	718 508 008	718 508 008	718 508 008	718 508 008	718 508 008
160	Plug, Oil Drain	718 508 008	718 508 008	718 508 008	718 508 008	718 508 008	718 508 008
161	Breather Plug	785 501 040	785 501 040	785 501 040	785 501 040	785 501 040	785 501 040
166	Tray, Oil	785 501 395	785 501 395	785 501 395	785 501 395	785 501 395	785 501 395
174	Screw, Hex Hd. Taptite 10-24 x 5/8"	826 039 102	826 039 102	826 039 102	826 039 102	826 039 102	826 039 102
175	Screw, Rd. Hd. Slt. Tpt. 10-32 x 5/16"	828 540 052	828 540 052	828 540 052	828 540 052	828 540 052	828 540 052

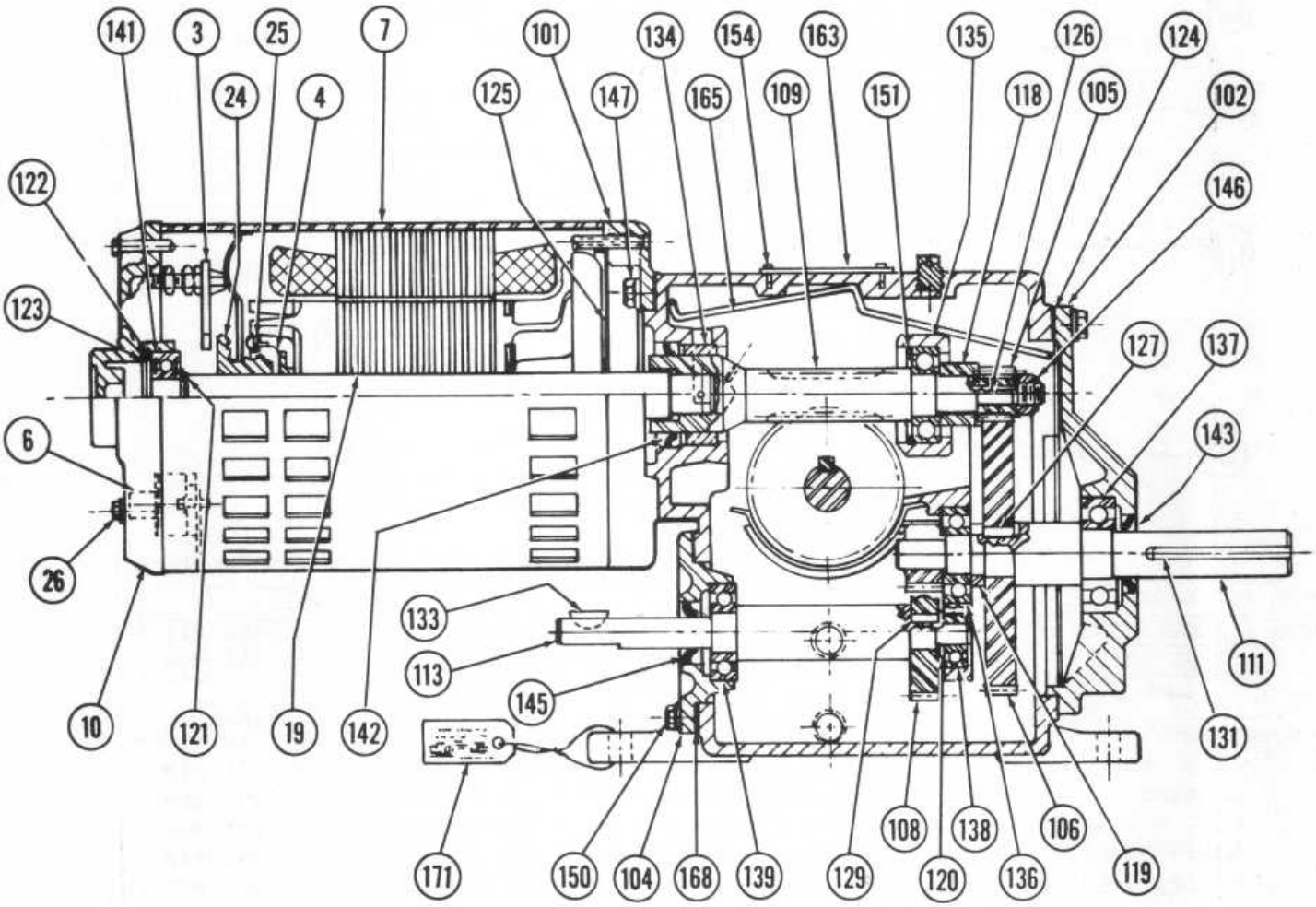
BACK END MOTOR 82-70 PINSPOTTER



		GENERAL ELECTRIC 50HZ			
MOTOR MODEL NO.		7GF711YD3K		7GF711YD3K	
MOTOR & RECEPTACLE ASS'Y.		070 006 191	070 006 189	070 006 212	070 006 211
MOTOR ONLY		070 006 192	070 006 196	070 006 210	070 006 209
REF. NO.	DESCRIPTION	(R.H.) Y13	(L.H.) Y14	(R.H.) Y19	(L.H.) Y20
5	Capacitor	785 501 509	785 501 509	785 501 509	785 501 509
8	Capacitor, Cover	785 501 513	785 501 513	785 501 513	785 501 513
100	Housing	785 501 163	785 501 163	785 501 163	785 501 163
103	Cap, Wheel	785 501 066	785 501 066	785 501 066	785 501 066
110	Gear, Wheel	785 501 541	785 501 542	785 501 541	785 501 542
112	Shaft, Wheel Output	785 501 297	785 501 297	785 501 297	785 501 297
115	Shims, Wheel Brg. OB.	785 501 309	785 501 309	785 501 309	785 501 309
116	Shims, Wheel Brg. IB.	785 501 306	785 501 306	785 501 306	785 501 306
130	Key, Wheel	907 200 800	907 200 800	907 200 800	907 200 800
132	Key, Wheel Output Shaft	907 000 500	907 000 500	907 000 500	907 000 500
140	Bearing Wheel Shaft (2)	701 224 030	701 224 030	701 224 030	701 224 030
144	Seal, Wheel Shaft	716 503 023	716 503 023	716 503 023	716 503 023
148	Screws, Hex Hd. Taptite ¼-20 x 7/8	826 049 142	826 049 142	826 049 142	826 049 142
159	Plug, Oil Level	718 508 008	718 508 008	718 508 008	718 508 008
160	Plug, Oil Drain	718 508 008	718 508 008	718 508 008	718 508 008
161	Plug, Breather	785 501 040	785 501 040	785 501 040	785 501 040
166	Tray, Oil	785 501 395	785 501 395	785 501 395	785 501 395
174	Screw, Hex Hd. Taptite 10-23 x 5/8	826 039 102	826 039 102	826 039 102	826 039 102
175	Screw, Rd. Hd. Slt. 10-32 x 5/16	828 540 052	828 540 052	828 540 052	828 540 052

BACK END MOTOR 82-70 PINSPOTTER

GENERAL ELECTRIC 50HZ
LEFT HAND ASS'Y.

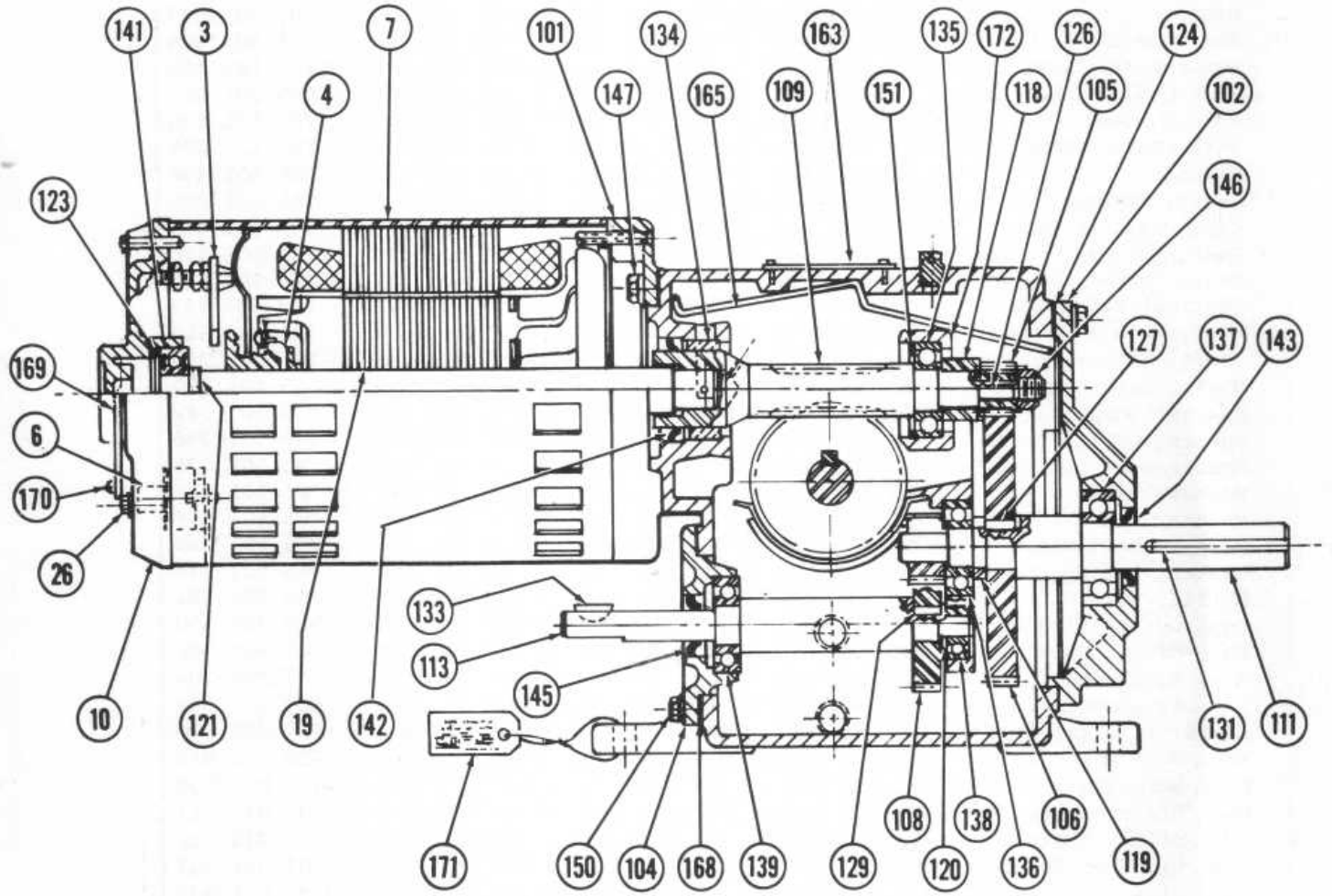


BACK END MOTOR 82-70 PINSPOTTER

		GENERAL ELECTRIC 50HZ			
MOTOR MODEL NO.		7GF711YD3K		7GF711YD3K	
MOTOR & RECEPTACLE ASS'Y.		070 006 191	070 006 189	070 006 212	070 006 211
MOTOR ONLY		070 006 192	070 006 196	070 006 210	070 006 209
REF. NO.	DESCRIPTION	(R.H.) Y-13	(L.H.) Y-14	(R.H.) Y-19	(L.H.) Y-20
3	Centrifugal Switch	785 501 539	785 501 539	785 501 539	785 501 539
4	Centrifugal Mechanism	785 501 192	785 501 192	785 501 192	785 501 192
6	Thermal Protector	785 501 508	785 501 508	785 501 508	785 501 508
7	Stator	785 501 503	785 501 503	785 501 503	785 501 503
10	End Shield	785 501 504	785 501 504	785 501 504	785 501 504
19	Rotor-With Shaft	785 501 502	785 501 502	785 501 502	785 501 502
24	Push Collar Cent. Mech.	785 501 081	785 501 081	785 501 081	785 501 081
25	Spring, Cent. Mech.	785 501 506	785 501 506	785 501 506	785 501 506
26	Thru Bolts, Motor	785 501 505	785 501 505	785 501 505	785 501 505
101	Adaptor	785 501 496	785 501 496	785 501 496	785 501 496
102	Cover, Offset	785 501 095	785 501 095	785 501 095	785 501 095
104	Cap, Dist. Output	785 501 059	785 501 059	785 501 059	785 501 059
105	Gear, Offset Pinion	785 501 497	785 501 510	785 501 497	785 501 510
106	Gear, Offset Output	785 501 122	785 501 122	785 501 117	785 501 117
108	Gear, Dist. Output	785 501 122	785 501 122	785 501 117	785 501 117
109	Gear, Worm & Shaft	785 501 499	785 501 512	785 501 499	785 501 512
111	Shaft, Offset Output	785 501 277	785 501 277	785 501 276	785 501 276
113	Shaft, Dist. Output	785 501 500	785 501 500	785 501 500	785 501 500
118	Spacer, Worm Shaft	785 501 342	785 501 342	785 501 342	785 501 342
119	Spacer, Offset Shaft	785 501 398	785 501 398	785 501 398	785 501 398
120	Spacer, Dist. Output Shaft	785 501 331	785 501 331	785 501 331	785 501 331
121	Washer, Pull	785 501 411	785 501 411	785 501 411	785 501 411
122	Washer, Flat	785 501 408	785 501 408	785 501 408	785 501 408
123	Washer, Belleville	785 501 396	785 501 396	785 501 396	785 501 396
124	Gasket, Offset Cover	785 501 116	785 501 116	785 501 116	785 501 116
125	Baffle, Air	785 501 501	785 501 501	785 501 501	785 501 501
126	Key, Offset Pinion	907 200 100	907 200 100	907 200 100	907 200 100
127	Key, Offset Gear	907 200 700	907 200 700	907 200 700	907 200 700
129	Key, Dist. Gear	907 200 200	907 200 200	907 200 200	907 200 200
131	Key, Offset output Shaft	907 201 200	907 201 200	907 201 200	907 201 200
133	Key, Dist. Output Shaft	907 000 300	907 000 300	907 000 300	907 000 300
134	Brg., Worm Shaft IB.	785 501 014	785 501 014	785 501 014	785 501 014
135	Brg., Worm Shaft OB.	701 021 008	701 021 008	701 021 008	701 021 008
136	Brg., Offset Shaft IB	701 025 011	701 025 011	701 025 011	701 025 011
137	Brg., Offset Shaft OB	701 025 011	701 025 011	701 025 011	701 025 011
138	Brg., Dist. Shaft IB	701 011 003	701 011 003	701 011 003	701 011 003
139	Brg., Dist. Shaft OB	701 021 008	701 021 008	701 021 008	701 021 008
141	Bearing, Motor O.P.E.	701 021 010	701 021 010	701 021 010	701 021 010
142	Seal, Worm Shaft	716 501 009	716 501 009	716 501 009	716 501 009
143	Seal, Offset Shaft	716 503 023	716 503 023	716 503 023	716 503 023
145	Seal, Dist. Shaft	716 503 022	716 503 022	716 503 022	716 503 022
146	Nut, Offset Pinion Lock	838 866 002	838 866 002	838 866 002	838 866 002
147	Screws, Adaptor Hex Hd. 5/16-18 x 1	826 057 162	826 057 162	828 057 162	828 057 162
150	Screws, Dist. Cap. Hex Hd. 10-25 x 5/8	826 039 102	826 039 102	826 039 102	826 039 102
151	Snap, Ring Worm Shaft Bearing, Outboard	919 000 700	919 000 700	919 000 700	919 000 700
154	Drive Pins, Oil Plate	829 912 032	829 912 032	829 912 032	829 912 032
163	Oil Plate	785 501 216	785 501 216	785 501 216	785 501 216
165	Pick-Up Wire, Oil	785 501 416	785 501 416	785 501 416	785 501 416
168	Gasket, Dist. Cap	785 501 108	785 501 108	785 501 108	785 501 108
171	Warning Label	785 501 579	785 501 579	785 501 579	785 501 579

BACK END MOTOR 82-70 PINSPOTTER

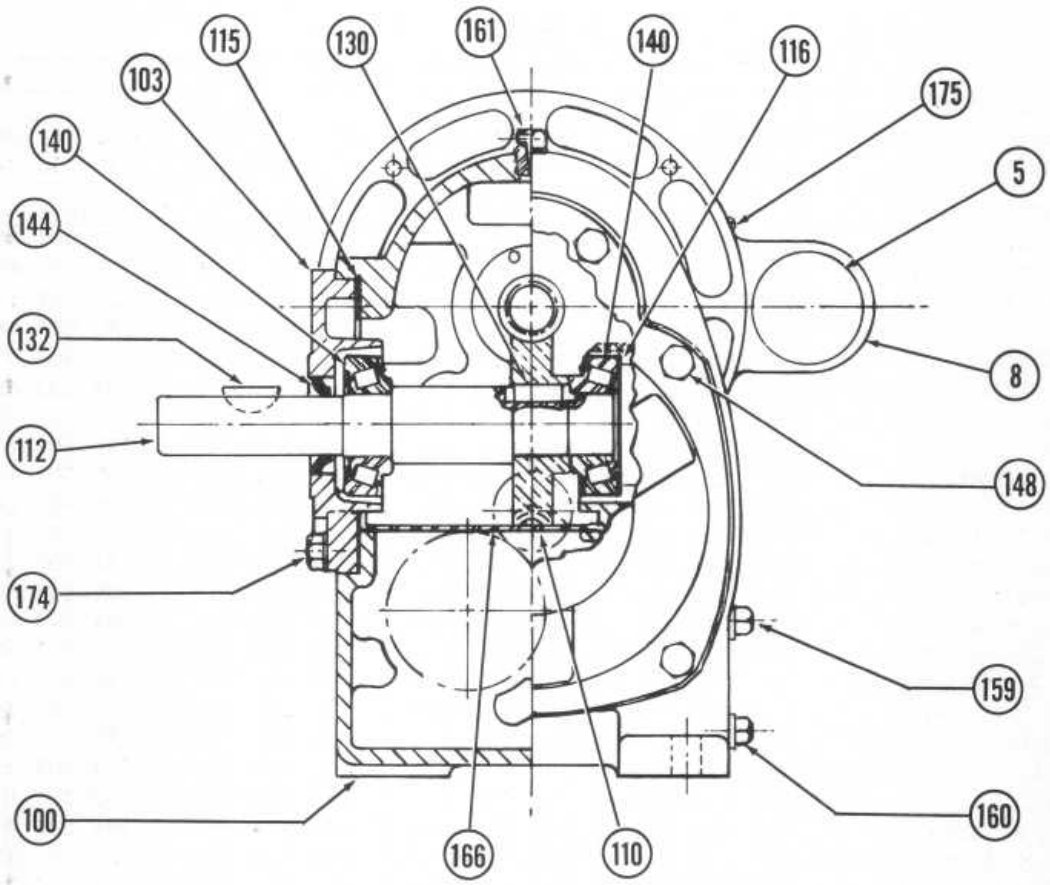
WESTINGHOUSE 60HZ
LEFT HAND ASS'Y.



BACK END MOTOR 82-70 PINSPOTTER

		WESTINGHOUSE 60HZ			
MOTOR MODEL NO.		314 P 079		325 P 201	
MOTOR & RECEPTACLE ASS'Y.		070 004 043	070 004 042	070 004 043	070 004 042
MOTOR ONLY		070 004 044	070 004 041	070 004 044	070 004 041
REF. NO.	DESCRIPTION	(R.H.)	(L.H.)	(R.H.)	(L.H.)
3	Centrifugal Switch	785 501 384	785 501 384	785 501 664	785 501 664
4	Centrifugal Mechanism	785 501 377	785 501 377	785 501 665	785 501 665
6	Thermal Protector	785 501 394	785 501 394	785 501 394	785 501 394
7	Stator	785 501 076	785 501 076	785 501 663	785 501 663
10	End Shield	785 501 015	785 501 015	785 501 015	785 501 015
19	Rotor, With Shaft	785 501 243	785 501 243	785 501 666	785 501 666
26	Thru Bolt (4 Req.)	785 501 022	785 501 022	785 501 563	785 501 563
101	Adaptor, Motor	785 501 104	785 501 104	785 501 104	785 501 104
102	Cover, Offset	785 501 095	785 501 095	785 501 095	785 501 095
104	Cap, Dist. Output	785 501 662	785 501 662	785 501 662	785 501 662
105	Gear, Offset Pinion	785 501 132	785 501 131	785 501 132	785 501 131
106	Gear, Offset Output	785 501 124	785 501 126	785 501 124	785 501 126
108	Gear, Dist. Output	785 501 125	785 501 125	785 501 125	785 501 125
109	Gear, Worm & Shaft	785 501 431	785 501 430	785 501 431	785 501 430
111	Shaft, Offset Output	785 501 298	785 501 298	785 501 298	785 501 298
113	Shaft, Dist. Output	785 501 621	785 501 621	785 501 621	785 501 621
118	Spacer, Worm Shaft	785 501 342	785 501 342	785 501 342	785 501 342
119	Spacer, Offset Shaft	785 501 398	785 501 398	785 501 398	785 501 398
120	Spacer Dist. O.P. Shaft	785 501 331	785 501 331	785 501 331	785 501 331
121	Sleeve	785 501 079	785 501 079	785 501 079	785 501 079
123	Washer, Belleville	785 501 402	785 501 402	785 501 402	785 501 402
124	Gasket, Offset Cover	785 501 106	785 501 106	785 501 106	785 501 106
126	Key, Offset Pinion	907 200 100	907 200 100	907 200 100	907 200 100
127	Key, Offset Gear	907 200 700	907 200 700	907 200 700	907 200 700
129	Key, Dist. Gear	907 200 200	907 200 200	907 200 200	907 200 200
131	Key, Offset Output Shaft	907 201 100	907 201 100	907 201 100	907 201 100
133	Key, Dist. Output Shaft	907 000 300	907 000 300	907 000 300	907 000 300
134	Bearing, Worm Shaft IB.	785 501 014	785 501 014	785 501 014	785 501 014
135	Bearing, Worm Shaft OB.	701 021 008	701 021 008	701 021 008	701 021 008
136	Brg., Offset Shaft IB.	701 025 011	701 025 011	701 025 011	701 025 011
137	Brg., Offset Shaft OB.	701 025 011	701 025 011	701 025 011	701 025 011
138	Brg., Offset Shaft IB.	701 025 003	701 025 003	701 025 003	701 025 003
139	Brg., Dist. Shaft OB.	701 021 008	701 021 008	701 021 008	701 021 008
141	Bearing Motor OPE	701 020 091	701 020 091	701 020 091	701 020 091
142	Seal, Worm Shaft	716 501 009	716 501 009	716 501 009	716 501 009
143	Seal, Offset Shaft	716 503 023	716 503 023	716 503 023	716 503 023
145	Seal, Dist. Shaft	716 503 022	716 503 022	716 503 022	716 503 022
146	Nut, Offset Pinion Lock	838 866 002	838 866 002	838 866 002	838 866 002
147	Screws, Adaptor Soc. Hd. Tap. 5/16-18 x 1	810 457 160	810 457 160	810 457 160	810 457 160
150	Screws, Dist. Cap Hex Wshr. Hd. Tap. 10-24 x 5/8	826 039 102	826 039 102	826 039 102	826 039 102
151	Snap Ring, Worm Shaft Brg. OB	919 000 700	919 000 700	919 000 700	919 000 700
163	Oil Plate	785 501 654	785 501 654	785 501 654	785 501 654
168	Gasket Dist. Cap	785 501 108	785 501 108	785 501 108	785 501 108
169	Adapter Plate	785 501 208	785 501 208	785 501 208	785 501 208
170	Scr. Flt. Hd. Mach. 8-32x5/8	811 933 062	811 933 062	811 933 062	811 933 062
171	Warning Label	785 501 579	785 501 579	785 501 579	785 501 579
172	Shim Kit	785 501 314	785 501 314	785 501 314	785 501 314

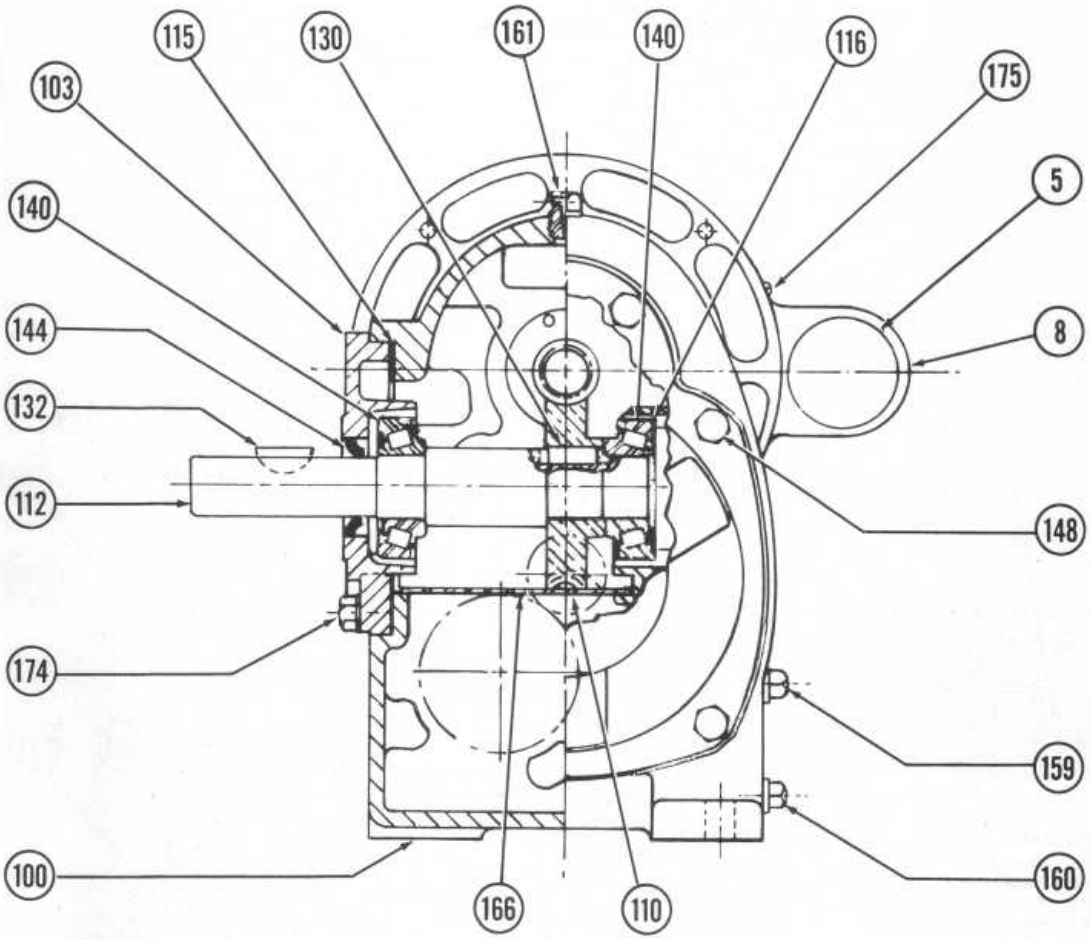
BACK END MOTOR 82-70 PINSPOTTER



LEFT HAND ASS'Y.

		WESTINGHOUSE 60HZ			
MOTOR MODEL NO.		314 P 079		325 P 201	
MOTOR & RECEPTACLE ASS'Y.		070 004 043	070 004 042	070 004 043	070 004 042
MOTOR ONLY		070 004 044	070 004 041	070 004 044	070 004 041
REF. NO.	DESCRIPTION	(R.H.)	(L.H.)	(R.H.)	(L.H.)
5	Capacitor	743 000 015	743 000 015	785 501 528	785 501 528
8	Capacitor Cover	785 501 671	785 501 671	785 501 671	785 501 671
100	Housing	785 501 177	785 501 178	785 501 177	785 501 178
103	Cap, Wheel	785 501 066	785 501 066	785 501 066	785 501 066
110	Gear, Wheel	785 501 434	785 501 439	785 501 434	785 501 439
112	Shaft, Wheel Output	785 501 297	785 501 297	785 501 297	785 501 297
115	Shim, Wheel Brg. OB.	785 501 310	785 501 310	785 501 310	785 501 310
116	Shims, Wheel Brg. IB.	785 501 308	785 501 308	785 501 308	785 501 308
130	Key Wheel	907 200 800	907 200 800	907 200 800	907 200 800
132	Key, Wheel Output Shaft	907 000 500	907 000 500	907 000 500	907 000 500
140	Bearing, Wheel Shaft	701 224 030	701 224 030	701 224 030	701 224 030
144	Seal, Wheel Shaft	716 503 023	716 503 023	716 503 023	716 503 023
148	Screw, Hex Hd. Taptite ¼-20 x 7/8	826 049 142	826 049 142	826 049 142	826 049 142
159	Plug, Oil Level	718 508 008	718 508 008	718 508 008	718 508 008
160	Plug, Oil Drain	718 508 008	718 508 008	718 508 008	718 508 008
161	Plug, Breather	785 501 040	785 501 040	785 501 040	785 501 040
166	Oil Tray	785 501 527	785 501 527	785 501 527	785 501 527
174	Screw, Hex Hd. Taptite 10-24 x 5/8	826 039 102	826 039 102	826 039 102	826 039 102
175	Screw, Rd. Hd. Slt 10-32 x 5/16	828 540 052	828 540 052	828 540 052	828 540 052

BACK END MOTOR 82-70 PINSPOTTER

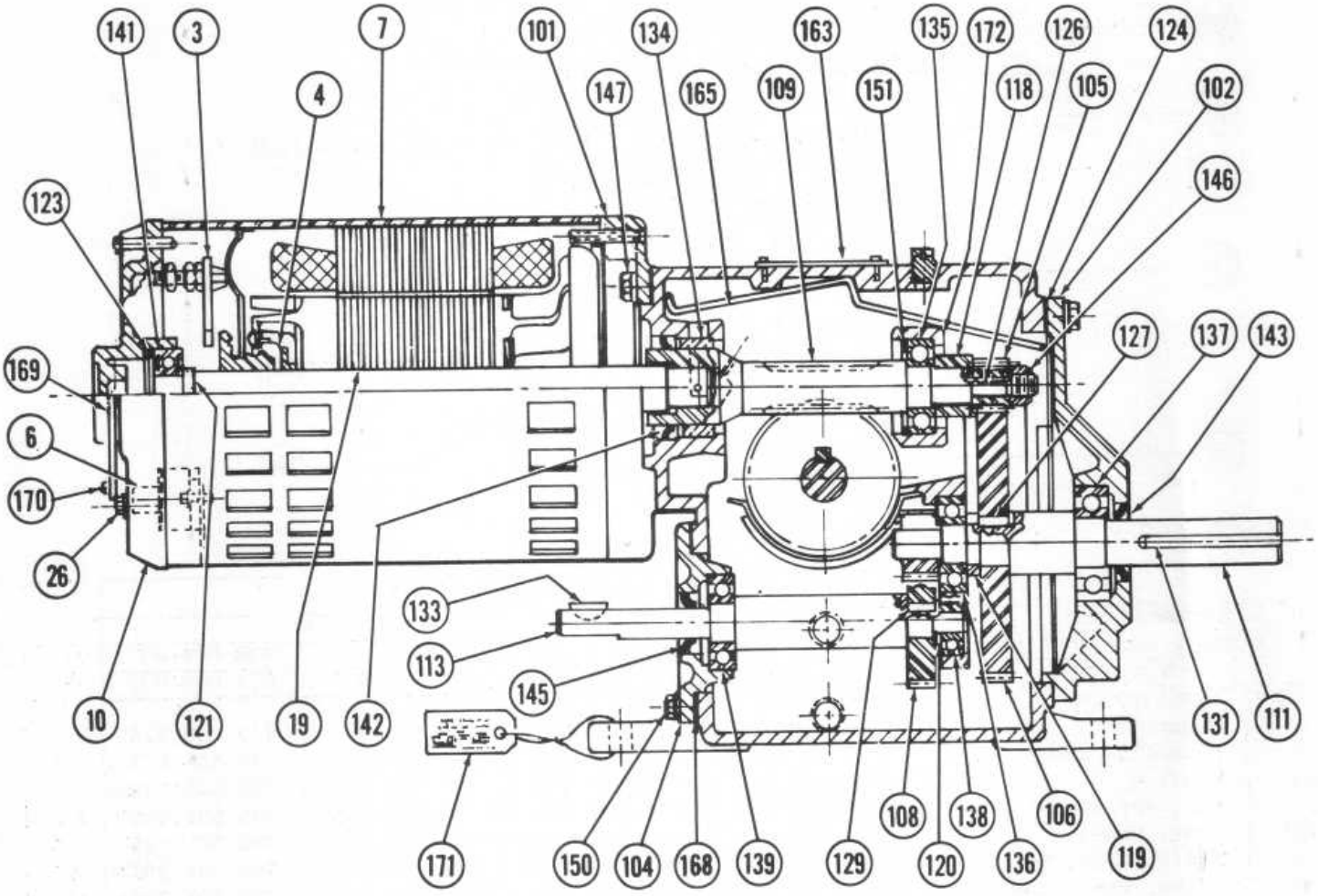


LEFT HAND ASS'Y.

		WESTINGHOUSE 50HZ			
MOTOR MODEL NO.		314 P 145		325 P 205	
MOTOR & RECPTACLE ASS'Y.		070 004 036	070 004 037	070 004 036	070 004 037
MOTOR ONLY		070 004 038	070 004 039	070 004 038	070 004 039
REF. NO.	DESCRIPTION	R.H.	L.H.	R.H.	L.H.
5	Capacitor	785 501 528	785 501 528	743 000 125	743 000 125
8	Capacitor Cover	785 501 671	785 501 671	785 501 671	785 501 671
100	Housing	785 501 177	785 501 178	785 501 177	785 501 178
103	Cap, Wheel	785 501 066	785 501 066	785 501 066	785 501 066
110	Gear, Wheel	785 501 526	785 501 525	785 501 526	785 501 525
112	Shaft, Wheel Output	785 501 297	785 501 297	785 501 297	785 501 297
115	Shims, Wheel Brg. OB.	785 501 310	785 501 310	785 501 310	785 501 310
116	Shims, Wheel Brg. IB.	785 501 308	785 501 308	785 501 308	785 501 308
130	Key, Wheel	907 200 800	907 200 800	907 200 800	907 200 800
132	Key, Wheel Output Shaft	907 000 500	907 000 500	907 000 500	907 000 500
140	Bearing, Wheel Shaft (2)	721 224 030	721 224 030	721 224 030	721 224 030
144	Seal, Wheel Shaft	716 503 023	716 503 023	716 503 023	716 503 023
148	Screw, Hex Hd. Taptite (6) ¼-20 x 7/8	826 049 142	826 049 142	826 049 142	826 049 142
159	Plug, Oil Level	718 508 008	718 508 008	718 508 008	718 508 008
160	Plug, Oil Drain	718 508 008	718 508 008	718 508 008	718 508 008
161	Breather	785 501 040	785 501 040	785 501 040	785 001 040
166	Oil Tray	785 501 527	785 501 527	785 501 527	785 501 527
174	Screw, Hex Hd Taptite (4) 10-24 x 5/8	826 039 102	826 039 102	826 039 102	826 039 102
175	Screw, Rd. Hd. Slt. Taptite (2) 10-32 x 5/16	828 540 052	828 540 052	828 540 052	828 540 052

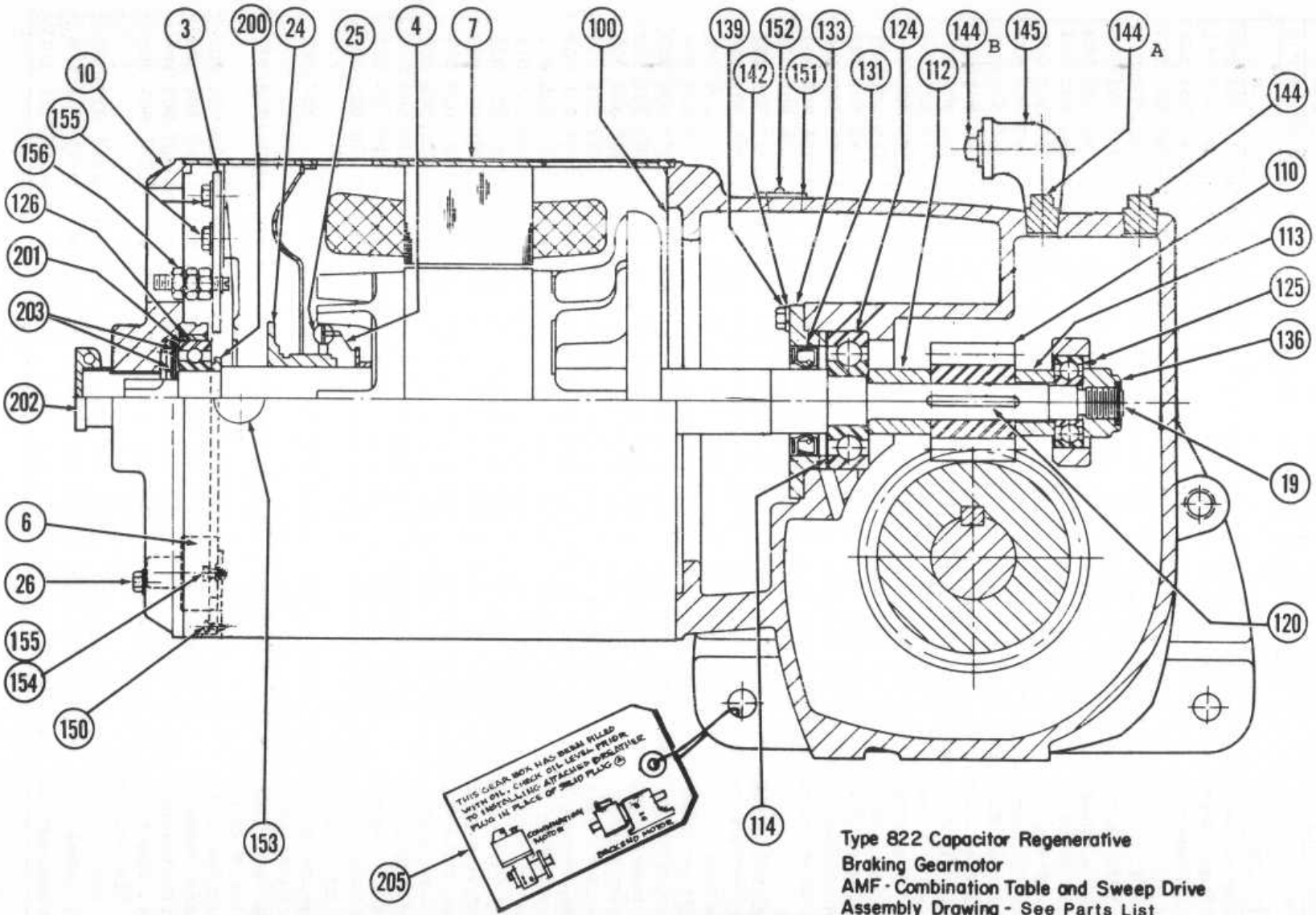
BACK END MOTOR 82-70 PINSPOTTER

WESTINGHOUSE 50HZ
LEFT HAND ASS'Y.



BACK END MOTOR 82-70 PINSPOTTER

		WESTINGHOUSE 50HZ			
MOTOR MODEL NO.		314 P 145		325 P 205	
MOTOR & RECEPTACLE ASS'Y.		070 004 036	070 004 037	070 004 036	070 004 037
MOTOR ONLY		070 004 038	070 004 039	070 004 038	070 004 039
REF. NO.	DESCRIPTION	(R.H.)	(L.H.)	(R.H.)	(L.H.)
3	Centrigugal Switch	785 501 520	785 501 520	785 501 562	785 501 562
4	Centrifugal Mechanism	785 501 521	785 501 521	785 501 561	785 501 561
6	Thermol Protector	785 501 522	785 501 522	785 501 564	785 501 564
7	Stator	785 501 550	785 501 550	785 501 559	785 501 559
10	Endshield	785 501 015	785 501 015	785 501 015	785 501 015
19	Rotor, With Shaft	785 501 519	785 501 519	785 501 560	785 501 560
26	Thru Bolts, Motor (4 Req)	785 501 022	785 501 022	785 501 563	785 501 563
101	Adaptor, Motor	785 501 104	785 501 104	785 501 104	785 501 104
102	Cover, Offset	785 501 095	785 501 095	785 501 095	785 501 095
104	Cap, Distributor Output	785 501 622	785 501 622	785 501 622	785 501 622
105	Gear, Offset Pinion	785 501 517	785 501 516	785 501 517	785 501 516
106	Gear, Offset Output	785 501 515	785 501 514	785 501 515	785 501 514
108	Gear, Distributor Output	785 501 125	785 501 125	785 501 125	785 501 125
109	Gear, Worm & Shaft	785 501 552	785 501 551	785 501 552	785 501 551
111	Shaft, Offset Output	785 501 298	785 501 298	785 501 298	785 501 298
113	Shaft, Dist. Output	785 501 621	785 501 621	785 501 621	785 501 621
118	Spacer, Worm Shaft	785 501 342	785 501 342	785 501 342	785 501 342
119	Spacer, Offset Shaft	785 501 398	785 501 398	785 501 398	785 501 398
120	Spacer, Dist. Output Shaft	785 501 331	785 501 331	785 501 331	785 501 331
121	Sleeve	785 501 079	785 501 079	785 501 079	785 501 079
123	Washer, Belleville	785 501 402	785 501 402	785 501 402	785 501 402
124	Gasket, Offset Cover	785 501 106	785 501 106	785 501 106	785 501 106
126	Key, Offset Pinion	917 200 100	907 200 100	907 200 100	907 200 100
127	Key, Offset Gear	907 200 700	907 200 700	907 200 700	907 200 700
129	Key, Distributor Gear	907 200 200	907 200 200	907 200 200	907 200 200
131	Key, Offset Output Shaft	907 201 100	907 201 100	907 201 100	907 201 100
133	Key, Dist. Output Shaft	907 000 300	907 000 300	907 000 300	907 000 300
134	Bearing, Worm Shaft IB.	785 501 014	785 501 014	785 501 014	785 501 014
135	Bearing, Worm Shaft OB.	701 021 008	701 021 008	701 021 008	701 021 008
136	Bearing, Offset Shaft IB.	701 025 011	701 025 011	701 025 011	701 025 011
137	Bearing, Offset Shaft OB.	701 025 011	701 025 011	701 025 011	701 025 011
138	Bearing, Dist. Shaft IB.	701 011 003	701 011 003	701 011 003	701 011 003
139	Bearing, Dist. Shaft OB.	701 021 008	701 021 008	701 021 008	701 021 008
141	Bearing, Motor O.P.E.	701 020 091	701 020 091	701 020 091	701 020 091
142	Seal, Worm Shaft	716 501 009	716 501 009	716 501 009	716 501 009
143	Sea, Offset Shaft	716 503 023	716 503 023	716 503 023	716 503 023
145	Seal, Dist. Shaft	716 503 022	716 503 022	716 503 022	716 503 022
146	Nut, Offset Pinion Lock	838 866 002	838 866 002	838 866 002	838 866 002
147	Screw, Adaptor Soc. Hd. Taptite 5/16-18 x 1	810 457 160	810 457 160	810 457 160	810 457 160
150	Screw, Distributor Cap Hex Hd. Tap. 10-24 x 5/8	826 039 102	836 039 102	836 039 102	836 039 102
151	Shap Ring, Worm Shaft Outboard Bearing	919 000 700	919 000 700	919 000 700	919 000 700
163	Oil Plate (Name)	785 501 584	785 501 583	785 501 584	785 501 583
168	Gasket, Distributor Cap	785 501 108	785 501 108	785 501 108	785 501 108
169	Adaptor, Plate	785 501 208	785 501 208	785 501 208	785 501 208
170	Screw, Elt. Hd. Mach. 8-32 x 5/8	811 933 062	811 933 062	811 933 062	811 933 062
171	Warning Label	785 501 579	785 501 579	785 501 579	785 501 579
172	Shim Kit Worm Shaft Brg. OB.	785 501 314	785 501 314	785 501 314	785 501 314



Type 822 Capacitor Regenerative
Braking Gearmotor
AMF - Combination Table and Sweep Drive
Assembly Drawing - See Parts List
GMTC Dept. - General Electric Co.

REF. NO	DESCRIPTION	GENERAL ELECTRIC			
		60HZ		50HZ	
		070 001 701	070 005 657	070 005 631	070 005 660
		12.1 RPM	14.5 RMP	12.1 RMP	14.5 RPM
3	Centrifugal Switch	785 501 373	785 501 373	785 501 373	785 501 373
4	Centrifugal Mechanism	785 501 193	785 501 193	785 501 192	785 501 192
6	Thermol Protector	785 501 392	785 501 392	785 501 540	785 501 540
7	Stator	785 501 362	785 501 362	785 501 545	785 501 545
10	Endshield	785 501 316	785 501 316	785 501 316	785 501 316
19	Rotar With Shaft	785 501 249	785 501 249	785 501 546	785 501 546
24	Push Collar-Cent. Mech.	785 501 081	785 501 081	785 501 081	785 501 081
25	Spring - Cent. Mech.	785 501 348	785 501 348	785 501 506	785 501 506
26	Through Bolts	785 501 024	785 501 024	785 501 024	785 501 024
100	Housing	785 501 159	785 501 159	785 501 159	785 501 159
110	Worm	785 501 426	785 501 544	785 501 544	785 501 544
112	Spacer, Worm Inboard	785 501 338	785 501 338	785 501 338	785 501 338
113	Spacer, Worm Outboard	785 501 336	785 501 336	785 501 336	785 501 336
114	Shims, I.B. Worm Bearing (Set)	785 501 305	785 501 305	785 501 305	785 501 305
120	Key Worm	901 200 600	907 200 600	907 200 600	907 200 600
124	Bearing, Worm Shaft I.B.	701 021 014	701 021 014	701 021 014	701 021 014
125	Bearing Worm Shaft O.B.	701 015 004	701 015 004	701 015 004	701 015 004
126	Bearing Motor O.P.E.	701 021 010	701 021 010	701 021 010	701 021 010
131	Seal, Worm Shaft	716 503 015	716 503 015	716 503 015	716 503 015
133	Cap, Worm Shaft Seal	785 501 067	785 501 067	785 501 067	785 501 067
136	Nut, Worm Shaft	838 669 002	838 669 002	838 669 002	838 669 002
139	Cap Screws, Seal Cap	809 839 080	809 839 080	809 839 080	809 839 080
142	Lockwash, Seal Cap Screw	951 138 000	951 138 000	951 138 000	951 138 000
144	Plug, Oil Drain	718 508 008	718 508 008	718 508 008	718 508 008
144A	Plug, Oil Level	718 508 008	718 508 008	718 508 008	718 508 008
144B	Plug, Oil Fill	718 508 008	718 508 008	718 508 008	718 508 008
145	Street Elbow, Oil Fill	718 506 006	718 506 006	718 506 006	718 506 006
150	Fastener - Switch	785 501 460	785 501 060	785 501 060	785 501 060
151	Lube Plate	785 501 216	785 501 216	785 501 216	785 501 216
152	Drive Screw	829 912 032	829 912 032	829 912 932	829 912 032
153	Plug Button	719 024 006	719 024 006	719 024 006	719 024 006
154	Fibre Washer	944 126 060	944 126 060	944 126 060	944 126 060
155	Screw - Hex Washer Head	826 027 062	826 027 062	826 027 062	826 027 062
156	Hex Nut	834 533 002	834 533 002	834 533 002	834 533 002
200	Pull Washer	785 501 411	785 501 411	785 501 411	785 501 411
201	Flat Washer	785 501 408	785 501 408	785 501 408	785 501 408
202	Dust Cover	785 501 093	785 501 093	785 501 093	785 501 093
203	Washer - Bellville	785 501 397	785 501 397	785 501 397	785 501 397
205	Instruction Tag	785 501 579	785 501 579	785 501 579	785 501 579

AMF - COMBINATION TABLE & SWEEP DRIVE

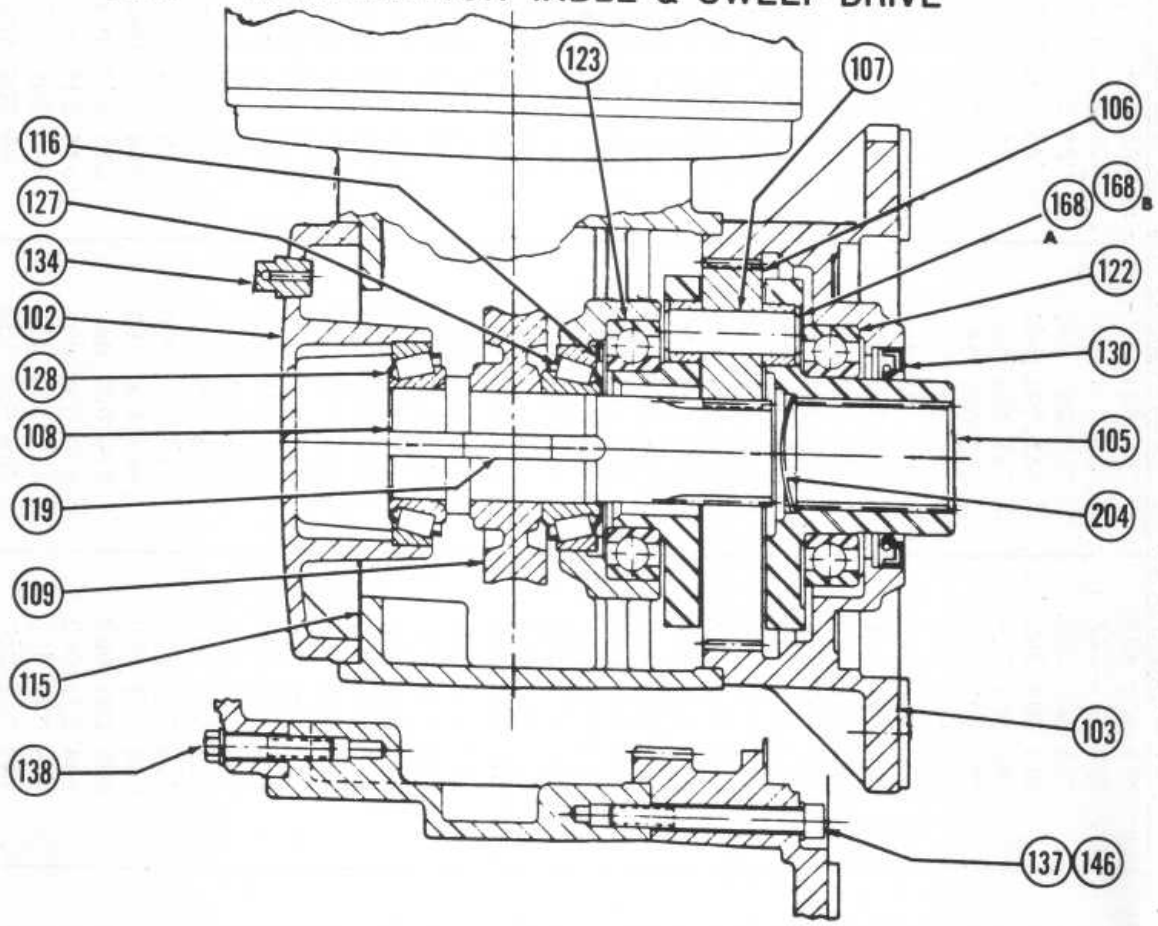


TABLE & SWEEP MOTORS 82-70 PINSPOTTERS

REF. NO.	DESCRIPTION	GENERAL ELECTRIC			
		60 Hz		50 Hz	
		070 001 701	070 005 657	070 005 631	070 005 660
		12.1 R.P.M.	14.5 R.P.M.	12.1 R.P.M.	14.5 R.P.M.
102	Cover, Back Wheel	785 501 097	785 501 097	785 501 097	785 501 097
103	Cover, Flanged with Ring Gear	785 501 094	785 501 094	785 501 094	785 501 094
105	Cage, With Spindle Bearings	785 501 050	785 501 050	785 501 050	785 501 555
106	Planet Gears	785 501 137	785 501 137	785 501 137	785 501 553
107	Spindles	785 501 343	785 501 343	785 501 343	785 501 343
108	Wheel Shaft	785 501 295	785 501 295	785 501 295	785 501 295
109	Wheel	785 501 438	785 501 543	785 501 543	785 501 543
115	Shims O.B. Wheel Bearing(Set)	785 501 312	785 501 312	785 501 312	785 501 312
116	Shims I.B. Wheel Bearing(Set)	785 501 300	785 501 300	785 501 300	785 501 300
119	Key, Wheel	907 201 800	907 201 800	907 201 800	907 201 800
122	Bearing, Cage O.B.	701 077 015	701 077 015	701 077 015	701 077 015
123	Bearing, Cage I.B.	701 077 015	701 077 015	701 077 015	701 077 015
127	Bearing, Wheel Shaft I.B.	701 240 032	701 240 032	701 240 032	701 240 032
128	Bearing, Wheel Shaft O.B.	701 240 032	701 240 032	701 240 032	701 240 032
130	Seal, Output Shaft	716 503 013	716 503 013	716 503 013	716 503 013
134	Breather Plug	785 501 040	785 501 040	785 501 040	785 501 040
137	Cap Screws O.P. Cover	810 249 360	810 249 360	810 249 360	810 249 360
138	Cap Screws Back Cover	809 849 207	809 849 207	809 849 207	809 849 207
146	Lock Washer	951 148 002	951 148 002	951 148 002	951 148 002
168 A	Bushing, Cage - G.E..750 O.D.	785 501 473	785 501 473	785 501 473	785 501 473
168 B	Bushing, Cage - G.E..690 O.D.	785 501 472	785 501 472	785 501 472	785 501 472
204	Expansion Plug	785 501 223	785 501 223	785 501 223	785 501 223

AMF - COMBINATION TABLE & SWEEP DRIVE

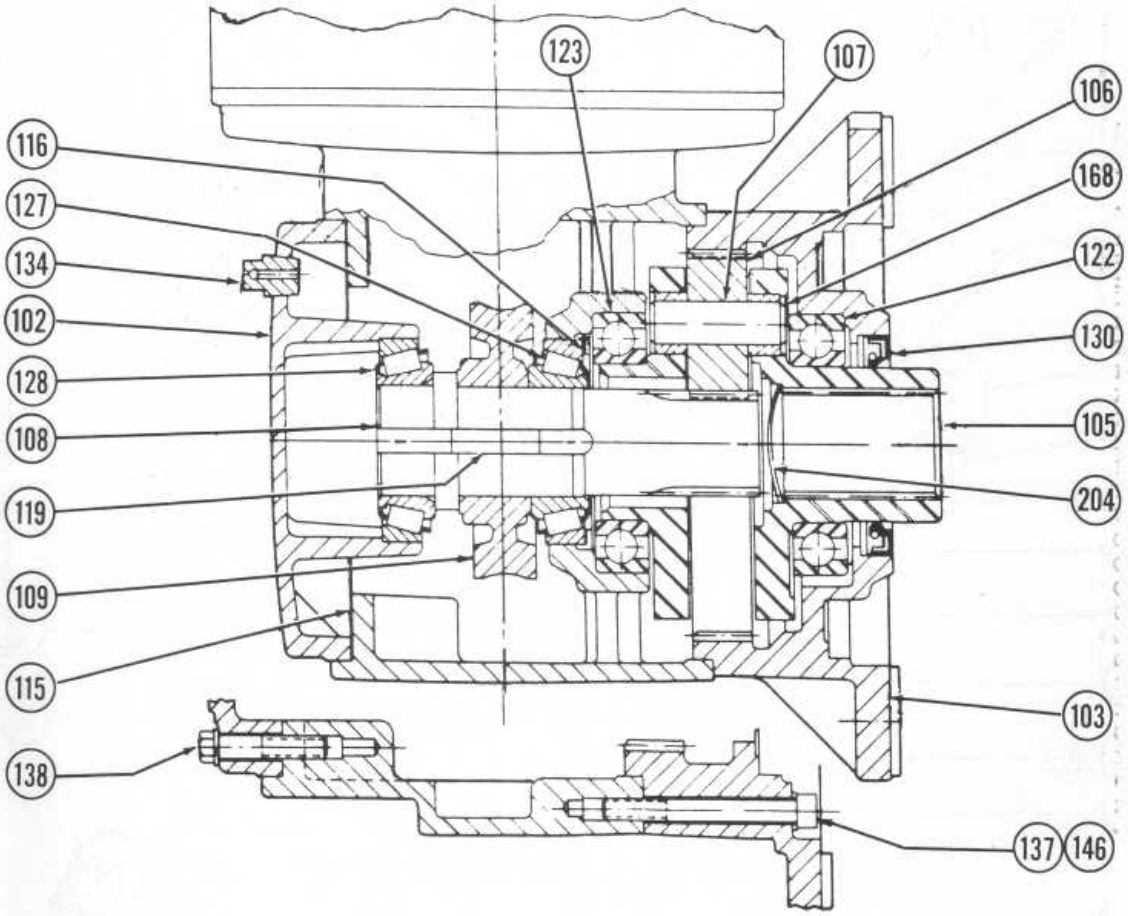


TABLE & SWEEP MOTORS 82-70 PINSPOTTERS

REF. NO.	DESCRIPTION	WESTINGHOUSE			
		60 HZ		50 HZ	
		070 004 051	070 004 058	070 004 068	070 004 045
		12.1 R.P.M.	14.5 R.P.M.	12.1 R.P.M.	14.5 R.P.M.
102	Cover, Back Wheel	785 501 053	785 501 053	785 501 053	785 501 053
103	Cover, Flanged with Ring Gear	785 501 179	785 501 179	785 501 179	785 501 179
105	Cage, With Spindle Bearings	785 501 048	785 501 048	785 501 048	785 501 048
106	Planet Gears	785 501 134	785 501 134	785 501 134	785 501 134
107	Spindles	785 501 287	785 501 287	785 501 287	785 501 287
108	Wheel Shaft	785 501 291	785 501 291	785 501 291	785 501 291
109	Wheel	785 501 435	785 501 437	785 501 437	785 501 536
115	Shims O.B. Wheel Bearing(Set)	785 501 302	785 501 302	785 501 302	785 501 302
116	Shims I.B. Wheel Bearing(Set)	785 501 300	785 501 300	785 501 300	785 501 300
119	Key, Wheel	907 201 700	907 201 700	907 201 700	907 201 700
122	Bearing, Cage O.B.	701 077 015	701 077 015	701 077 015	701 077 015
123	Bearing, Cage I.B.	701 077 015	701 077 015	701 077 015	701 077 015
127	Bearing, Wheel Shaft I.B.	701 240 032	701 240 032	701 240 032	701 240 032
128	Bearing, Wheel Shaft O.B.	701 240 032	701 240 032	701 240 032	701 240 032
130	Seal, Output Shaft	716 503 020	716 503 020	716 503 020	716 503 020
134	Breather Plug	785 501 040	785 501 040	785 501 040	785 501 040
137	Cap Screws O.P. Cover	810 249 360	810 249 360	810 249 360	810 249 360
138	Cap Screws Back Cover	809 849 165	809 849 165	809 849 165	809 849 165
146	Lock Washer	951 148 002	951 148 002	951 148 002	951 148 002
166	Shim, Cover	785 501 304	785 501 304	785 501 304	785 501 304
168	Bushing, Cage	785 501 653	785 501 653	785 501 653	785 501 653
204	Expansion Plug	785 501 223	785 501 223	785 501 223	785 501 223

AMF – COMBINATION TABLE & SWEEP DRIVE

WESTINGHOUSE

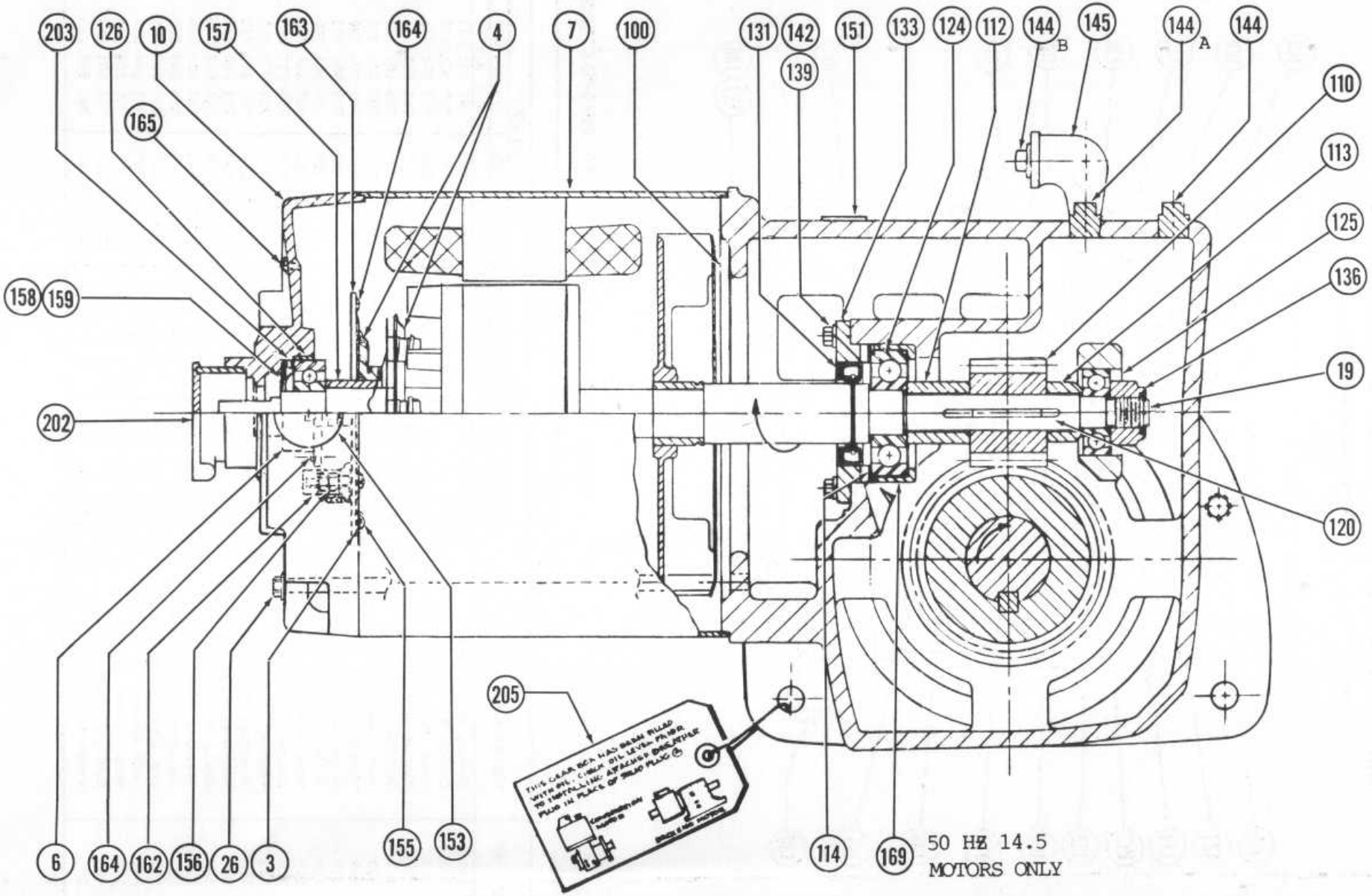


TABLE & SWEEP MOTORS 82-70 PINSPOTTERS

REF. NO.	DESCRIPTION	WESTINGHOUSE			
		60 Hz		50 Hz	
		070 004 051	070 004 058	070 004 068	070 004 045
		12.1 R.P.M.	14.5 R.P.M.	12.1 R.P.M.	14.5 R.P.M.
3	Centrifugal Switch	785 501 386	785 501 386	785 501 386	785 501 386
4	Centrifugal Mechanism	785 501 378	785 501 378	785 501 531	785 501 531
6	Thermal Protector	785 501 393	785 501 393	785 501 393	785 501 393
7	Stator	785 501 075	785 501 075	785 501 532	785 501 532
10	Endshield	785 501 031	785 501 031	785 501 031	785 501 031
19	Rotor With Shaft	785 501 242	785 501 242	785 501 538	785 501 538
26	Through Bolts	785 501 023	785 501 023	785 501 023	785 501 023
100	Housing	785 501 169	785 501 169	785 501 169	785 501 530
110	Worm	785 501 423	785 501 427	785 501 427	785 501 529
112	Spacer, Worm Inboard	785 501 341	785 501 341	785 501 341	785 501 341
113	Spacer, Worm Outboard	785 501 337	785 501 337	785 501 337	785 501 337
114	Shims, I.B. Borm Bearing (Set)	785 501 303	785 501 303	785 501 303	785 501 303
120	Key - Worm	907 200 600	907 200 600	907 200 600	907 200 600
124	Bearing, Worm Shaft I.B.	701 021 014	701 021 014	701 021 014	701 021 014
125	Bearing, Worm Shaft O.B.	701 015 004	701 015 004	701 015 004	701 015 004
126	Bearing, Motor O.P.E.	701 021 009	701 021 009	701 021 009	701 021 009
131	Seal, Worm Shaft	716 503 015	716 503 015	716 503 015	716 503 015
133	Cap, Worm Shaft Seal	785 501 228	785 501 228	785 501 228	785 501 672
136	Nut Worm Shaft	838 669 002	838 669 002	838 669 002	838 669 002
139	Cap Screws, Seal Cap	809 839 080	809 839 080	809 838 080	809 838 080
142	Lockwasher, Seal Cap Screw	951 138 000	951 138 000	951 138 000	951 138 000
144	Plug, Oil Drain	718 508 008	718 508 008	718 508 008	718 508 008
144A	Plug, Oil Level	718 508 008	718 508 008	718 508 008	718 508 008
144B	Plug, Oil Fill	718 508 008	718 508 008	718 508 008	718 508 008
145	Street Elbow, Oil Fill	718 506 006	718 506 006	718 506 006	718 506 006
150	Fastener, Switch	828 527 062	828 527 062	828 527 062	828 527 062
151	Lube Plate	785 501 657	785 501 582	785 501 581	785 501 580
153	Plug Button	785 501 222	785 501 222	785 501 222	785 501 222
155	Screw, Truss Hd. TC.	829 927 062	829 927 062	829 927 062	829 927 062
156	Hex Nut	834 533 002	834 533 002	834 540 002	834 540 002
157	Collar	785 501 078	785 501 078	785 501 078	785 501 078
158	Spacer - Spring (.0149 THK)	785 501 658	785 501 658	785 501 658	785 501 658
159	Spacer - Spring (.0299 THK)	785 501 659	785 501 659	785 501 659	785 501 659
160	Fibre Washer	785 501 400	785 501 400	785 501 400	785 501 400
161	Flat Washer	948 545 072	948 545 072	948 545 072	948 545 072
162	Protector	785 501 391	785 501 391	785 501 391	785 501 391
163	Auxiliary Switch	785 501 372	785 501 372	785 501 372	785 501 372
164	Screw Rd. Hd. TC	828 527 062	828 527 062	828 527 062	828 527 062
165	Screw Rd. Hd. TC	828 133 052	828 133 052	828 133 052	828 133 052
169	Adapter (Worm Bearing I.B.)				070 004 045
202	Dust Cover	785 501 062	785 501 062	786 501 062	785 501 062
203	Washer, Bellville	785 501 350	785 501 350	785 501 350	785 501 350
205	Insturction Tag	785 501 579	785 501 579	785 501 579	785 501 579