



# SERVICE MANUAL

*\* Updated technical documentation is attached to the end of this manual.*



A200 Shown

## MODELS A120 AND A200 SERIES MIXERS

A120	ML-104865	(WITH TIMER)
A200	ML-104859	(WITHOUT TIMER)
	ML-104858	(WITH TIMER)
	ML-104861	(FLOOR MODEL WITH TIMER)
	ML-104863	(DELUXE FINISH WITH TIMER)

### - NOTICE -

This Manual is prepared for the use of trained Hobart Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Hobart Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Hobart Service Technician.

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# GENERAL

## INTRODUCTION

The A120 mixer is a 12 quart, painted, bench model with a 1/3 H.P. motor, timer and a NO. 12 attachment hub.

The A200 series mixers are 20 quart, with a 1/2 H.P. motor and have a NO. 12 attachment hub.

The A200 series can be ordered as bench or floor models. The bench model can be ordered with or without a timer.

The floor model and deluxe finish bench model come with a timer as standard.

## OPERATION

Detailed operation and care instructions are included in Model A120 Instructions Manual F-34406 and Model A200 Instructions Manual F-34387.

## LUBRICATION

For lubrication information, refer to LUBRICATION MANUAL. Lubricants are available at your local Hobart Service office.

## TOOLS

Standard set of hand tools.

VOM with A/C current tester (any quality VOM with a sensitivity of at least 20,000 ohms per volt can be used).

(A200 models) Reed switch gauge, part number 437215. Used to adjust interlock switch (1 LS).

Loctite number 242, part number 520228. Used to secure planetary acorn nut.

Locquic (R) primer T. Loctite 7471, part number 544434-2. Used to secure planetary acorn nut.

Thin 3/4" wrench (2) required, part number TL 17229-1. Used on planetary locknut and acorn nut.

# REMOVAL AND REPLACEMENT OF PARTS

**NOTE:** The procedures apply to all models unless specified otherwise. The Model A200 was used for photographs unless specified otherwise.

## PLANETARY

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. (A120) Pull drip cup straight down from planetary. (A200) Remove wire cage assembly.
2. (A200) Remove three screws holding cage guard assembly to planetary and pull straight down.

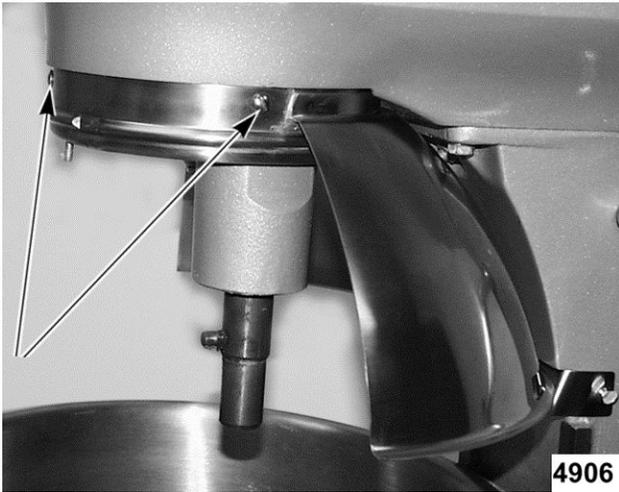


Fig. 1

3. Supporting the planetary, remove the acorn nut, locknut, retaining washer and fiber washer.

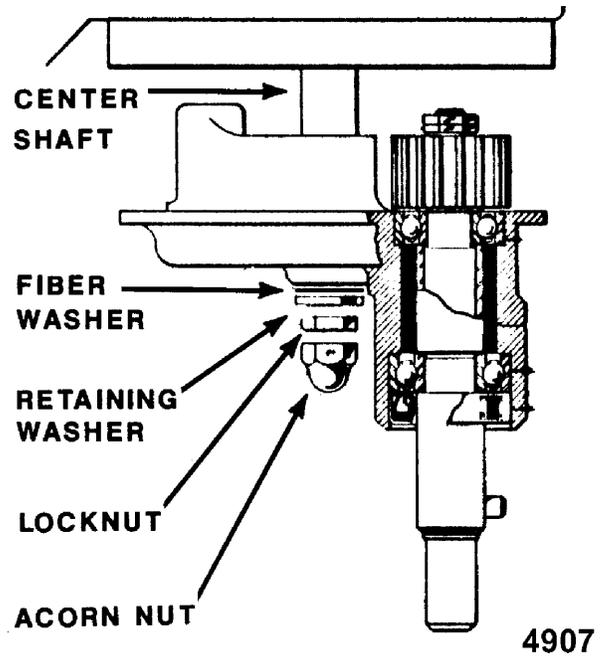


Fig. 2

- A. Slip the planetary from the center shaft.

**NOTE:** When the planetary is removed the spacer/"O" ring assembly may also come off the center shaft. The assembly must be reinstalled as shown.

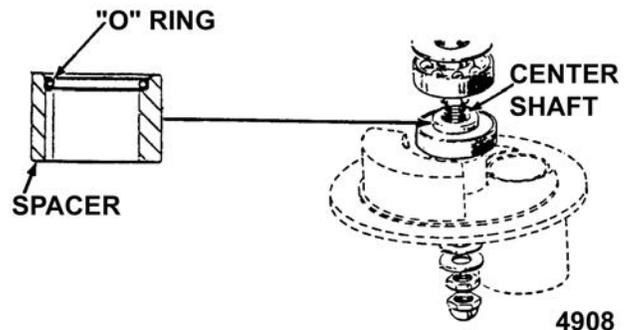


Fig. 3

4. Remove the retaining ring, pinion and the key.

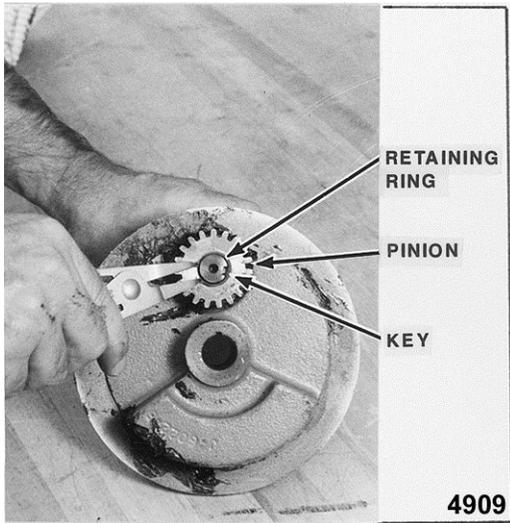


Fig. 4

5. The shaft can be pressed out of the planetary from the top side.



Fig. 5

6. Lift the upper bearing from the planetary.

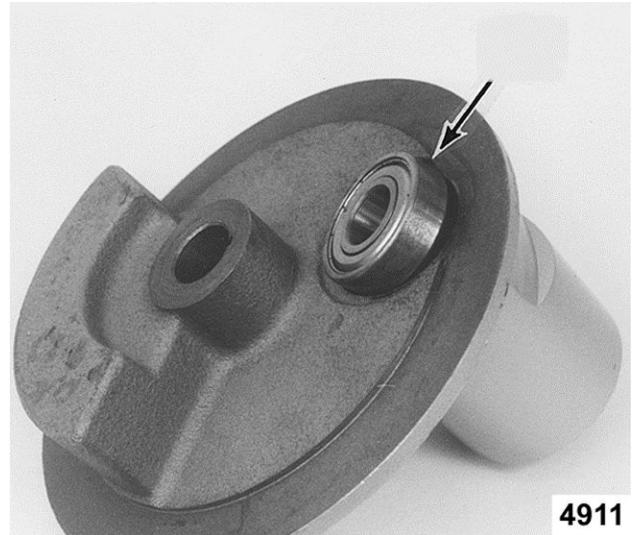


Fig. 6

7. Remove the lower bearing and seal from the top of the shaft.

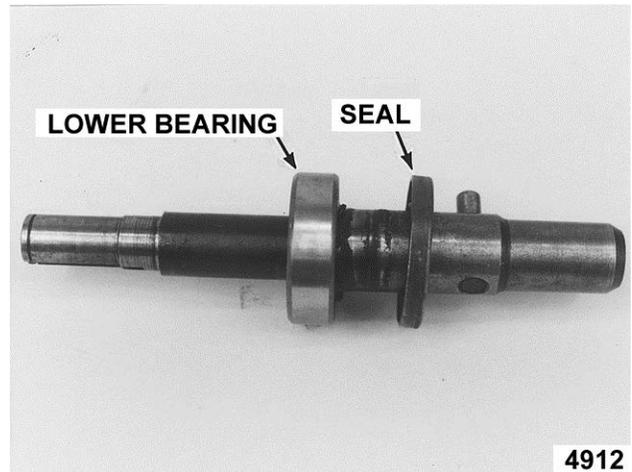
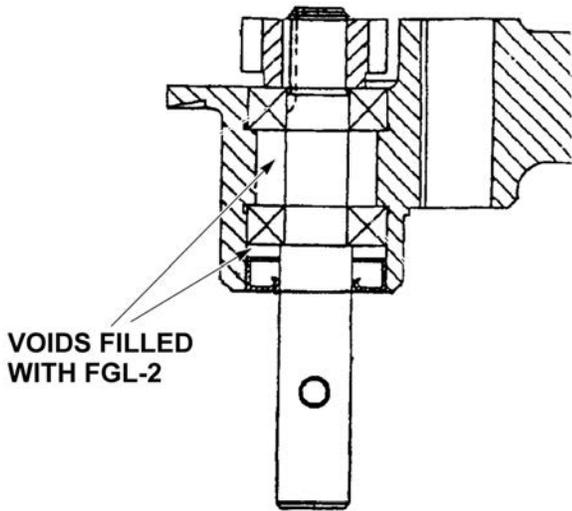


Fig. 7

**NOTE:** During reassembly fill the casting voids as shown with FGL-2 lubricant.



4913

Fig. 8

**NOTE:** When installing the locknut on the center shaft tighten it finger tight and back it off 1/2 turn (there should be end play between the locknut and the planetary). Install the acorn nut using Loctite no. 242, Locquic (R) Primer T/Loctite 7471 on the center shaft threads. Using the thin 3/4" wrenches hold the locknut in place and torque the acorn nut to 372-415 in Lbs.

8. Reassemble in reverse order.
9. Check unit for proper operation.

## INTERNAL GEAR

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Remove the "PLANETARY".
2. Remove six screws to free the gear.

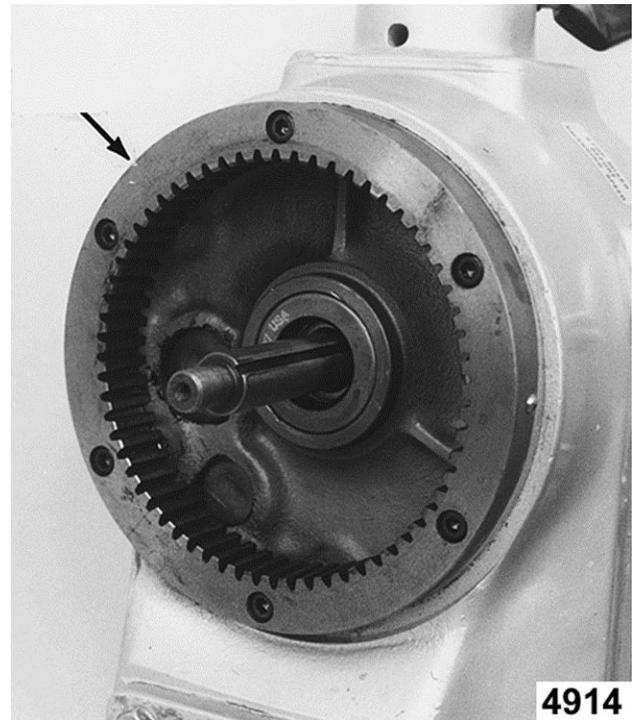


Fig. 9

**NOTE:** When reinstalling the gear it must be positioned as shown.

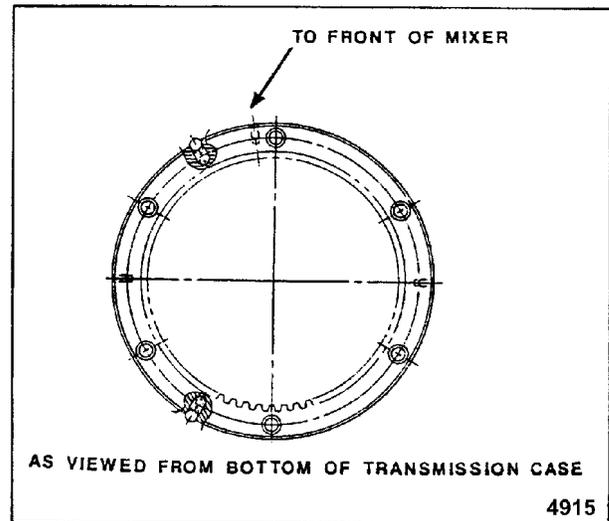


Fig. 10

3. Reassemble in reverse order
4. Check unit for proper operation.

## TRANSMISSION DISASSEMBLY

### ⚠ WARNING

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

**NOTE:** The transmission should only be disassembled until the malfunctioning component is removed.

1. Remove cover by removing front screw and loosening rear screw. The rear screw has locknuts to contact the underside of the cover, they act as a jack in forcing the cover upward.

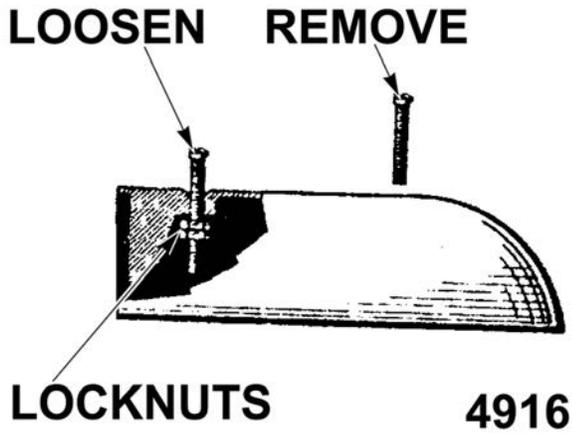


Fig. 11

**NOTE:** Block the opening in the transmission case to prevent foreign matter from dropping into the motor compartment.

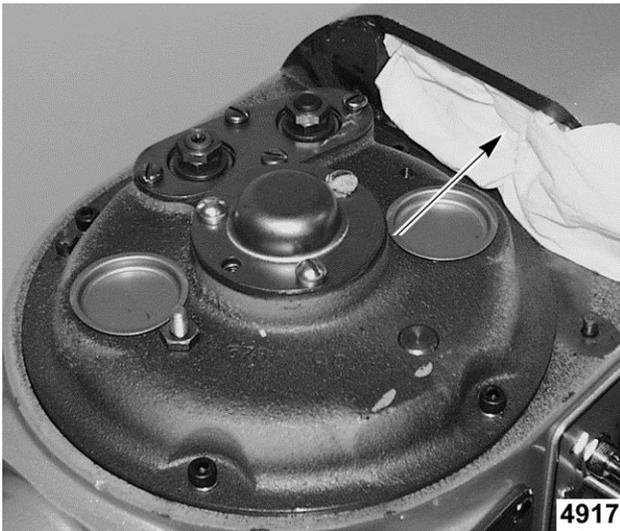


Fig. 12

2. Remove three screws and lockwashers from the bearing retainer cap.

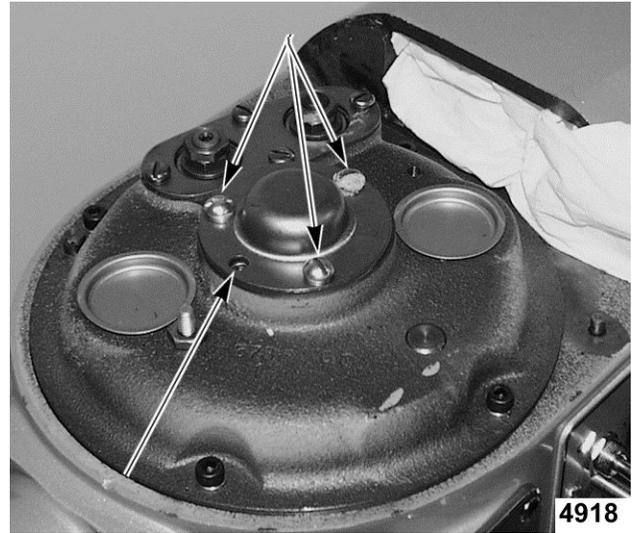


Fig. 13

**NOTE:** The front hole is used for the housing cover front screw.

3. Remove the bearing retainer cap.
4. Remove the retainer.

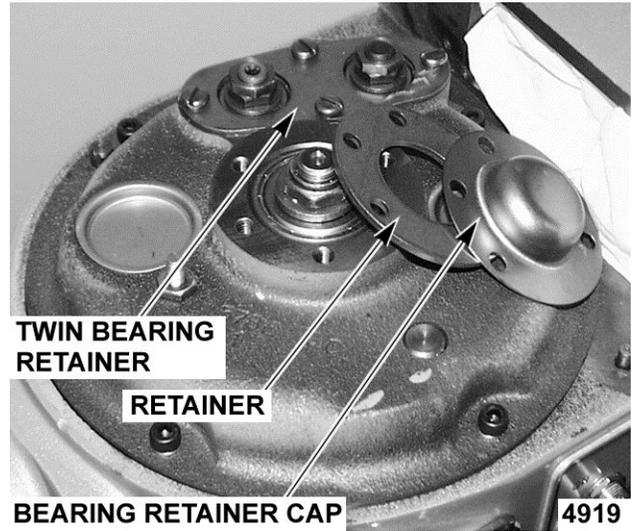


Fig. 14

5. Remove four screws and lockwashers from the twin bearing retainer.
  - A. Remove retainer.
6. Remove nuts and washers from the worm gear shaft and the transmission shaft.



Fig. 15

7. Remove stop nut from the center shaft.



Fig. 16

8. Remove the "PLANETARY".
9. Remove the spacer/"O" ring assembly from the center shaft.

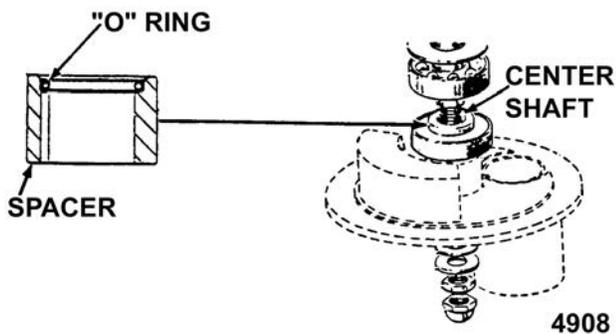


Fig. 17

10. Remove four screws and lockwashers holding transmission support to the transmission case. Do not disturb the screw and nut. This does not hold the support but extends inside where it serves as a grease breaker.

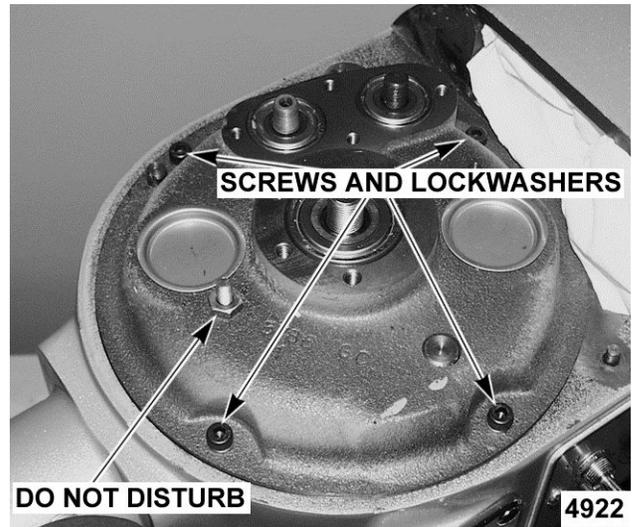


Fig. 18

11. Remove the two friction plugs.
12. Remove the transmission shaft support using a gear puller. A light tapping in a upward motion around the perimeter of the support with a plastic or rubber mallet will help to free the support.

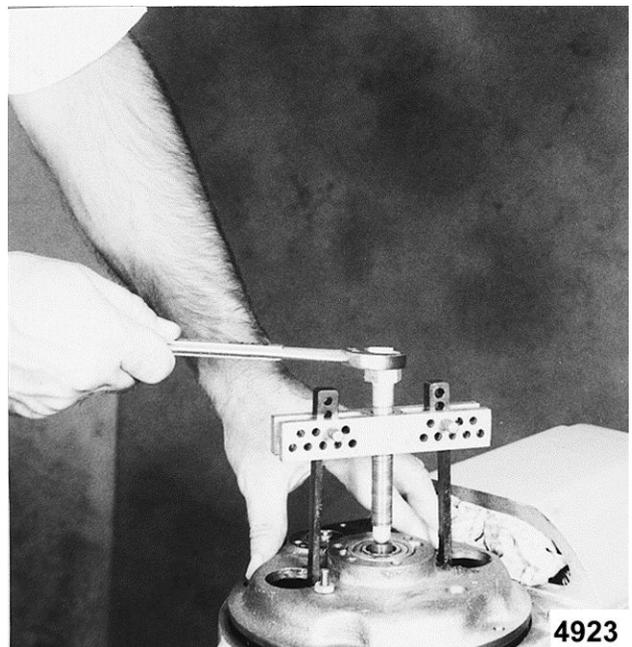


Fig. 19

13. Check for center shaft shims stuck to the support. These shims must be reinstalled.

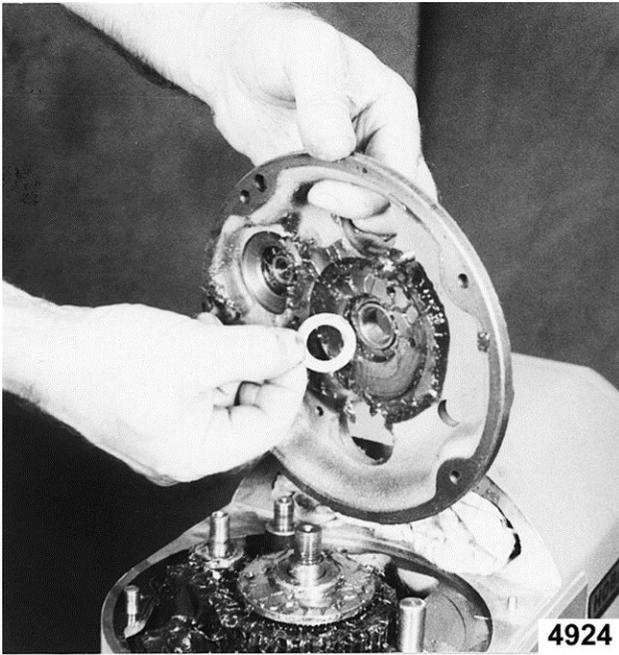


Fig. 20

14. Position the shift handle in first speed.

- A. Remove four screws holding shifter assembly to side of transmission case.

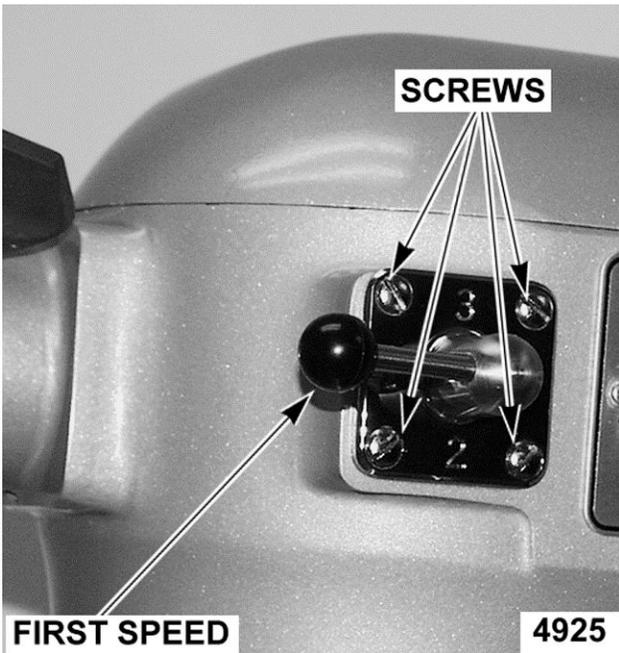


Fig. 21

- B. Pull the shifter assembly from the transmission case.

15. Disassemble the center shaft.

- A. Remove spacer.

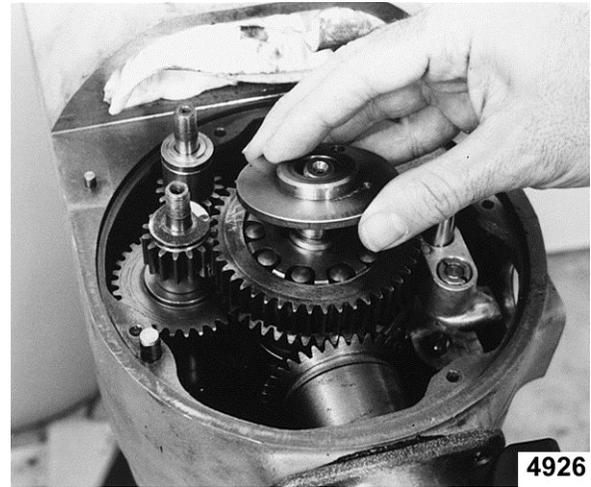


Fig. 22

- B. Remove bevel gear and roller clutch assembly as a unit.

**NOTE:** Older models utilize a diving key style center shaft. Refer to: A200 SM for Hobart built motors

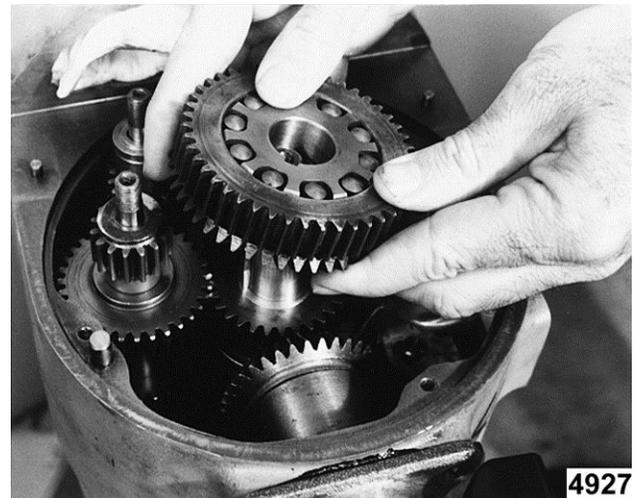


Fig. 23

- C. Remove the key.

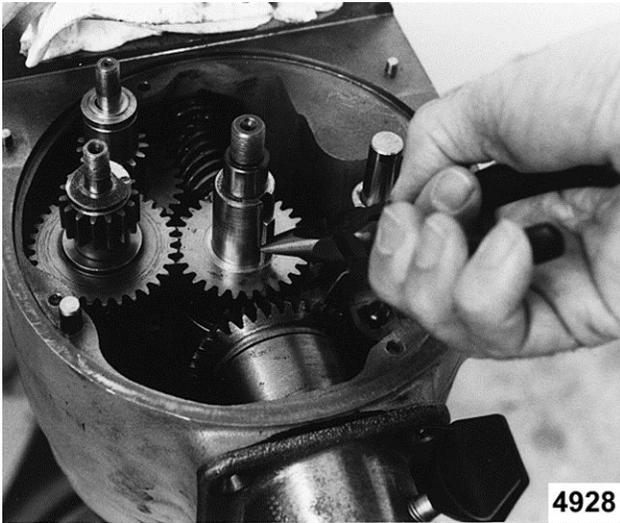


Fig. 24

D. Remove the upper clutch gear and bearing.

**NOTE:** This is a 29 tooth gear.

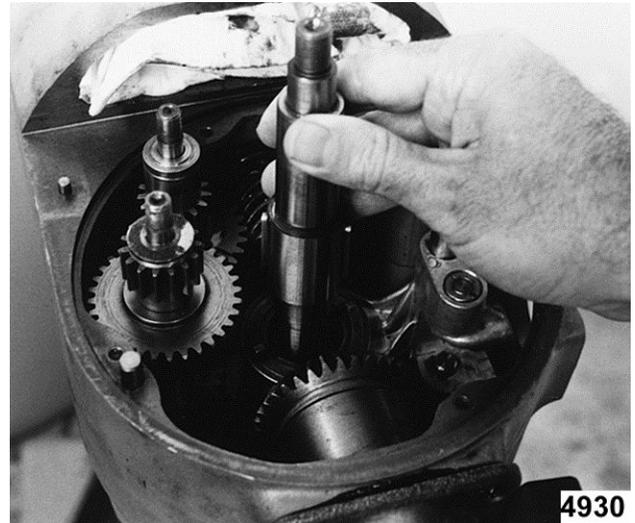


Fig. 26

F. Remove the keys from the center shaft.



Fig. 25

E. Remove the center shaft.

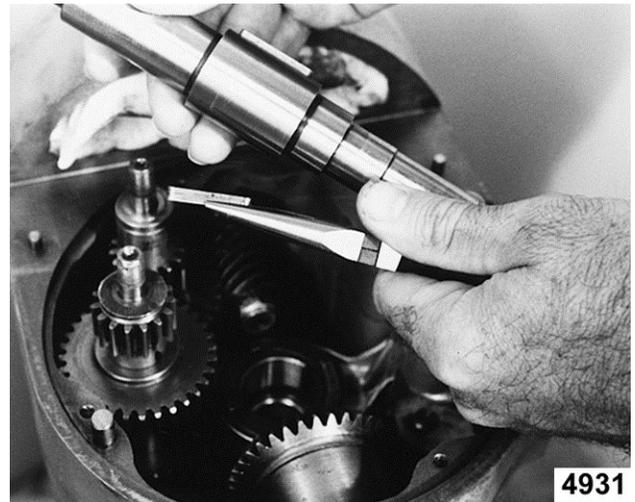


Fig. 27

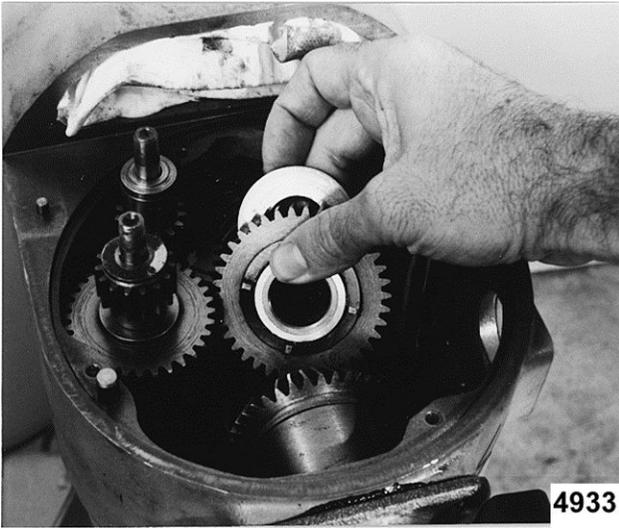
G. Remove clutch sleeve and shifter yoke.



Fig. 28

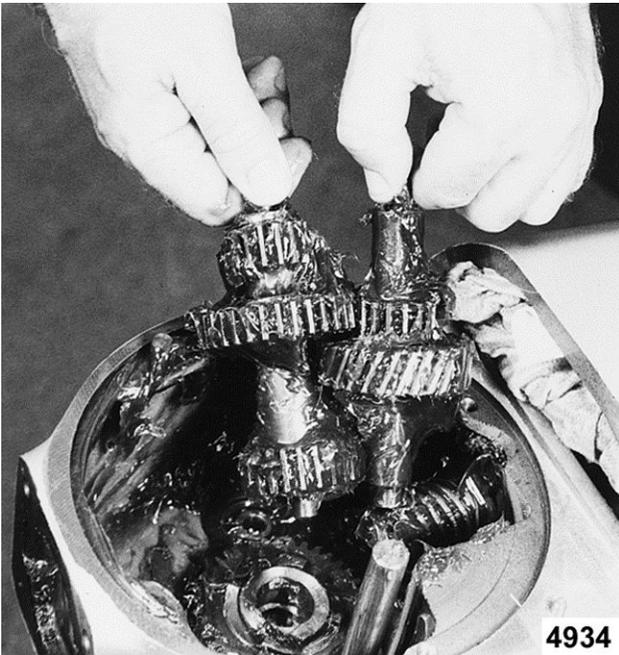
H. Remove lower clutch gear and spacer.

**NOTE:** This is a 38 tooth gear.



**Fig. 29**

16. Remove worm gear shaft and transmission shaft together.



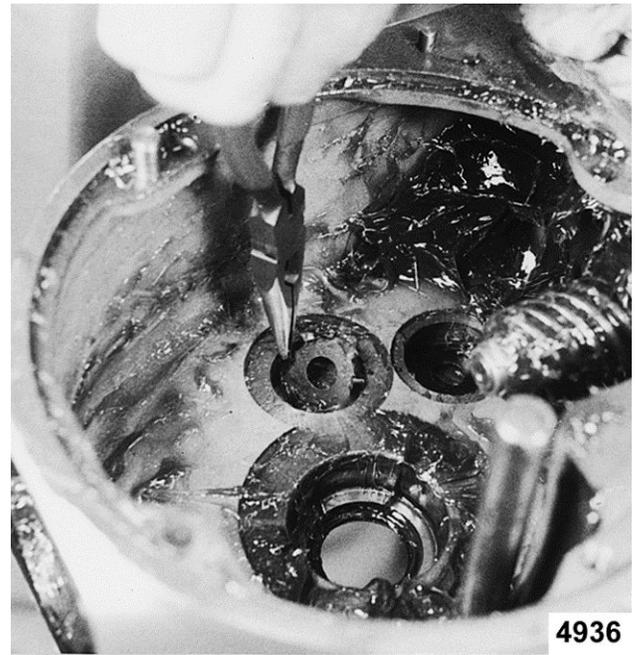
**Fig. 30**

17. Remove the lower bearings.



**Fig. 31**

18. Remove the pre-loading springs.



**Fig. 32**

19. Remove the center shaft seal.

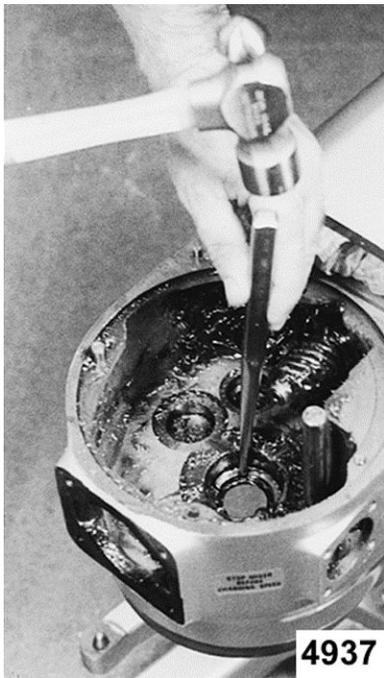


Fig. 33

20. Disassemble the worm gear shaft.

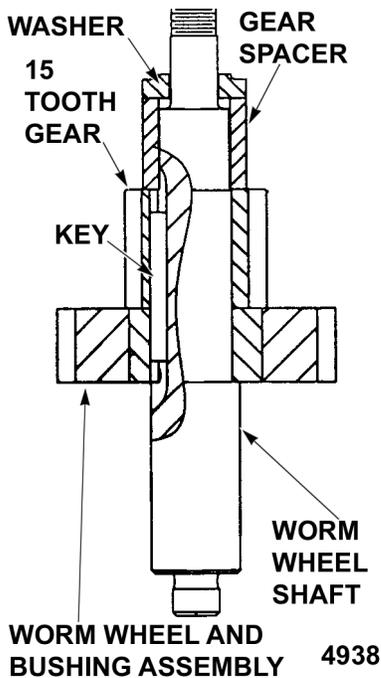


Fig. 34

- A. Remove the washer.
- B. Remove the gear spacer.
- C. Remove 15 tooth gear.
- D. Remove worm wheel and bushing assembly.
- E. Remove key from worm gear shaft.

- F. Reassemble worm gear shaft assembly in reverse order.
21. Disassemble the transmission shaft assembly.

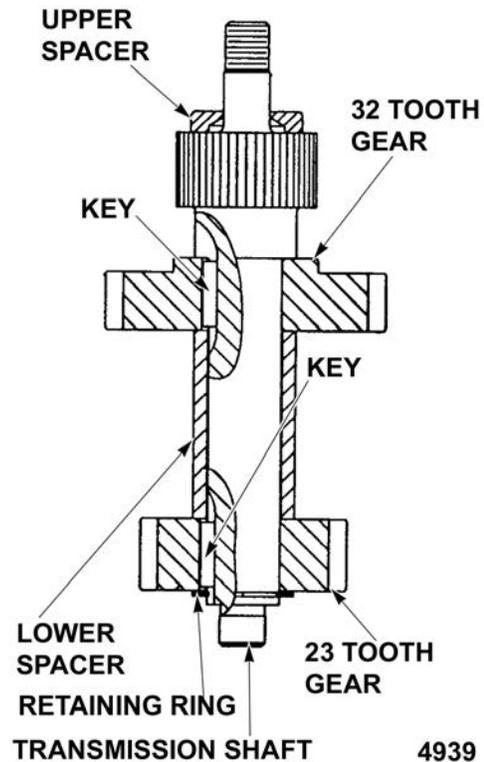


Fig. 35

- A. Remove the upper spacer.

**NOTE:** The hollow side of the spacer goes toward the gear when reinstalled.

- B. Remove retaining ring.
- C. Remove 23 tooth gear and key.
- D. Remove lower spacer.
- E. Remove the 32 tooth gear and key.

**NOTE:** Reassemble transmission shaft assembly in reverse order.

- F. Reassemble transmission shaft assembly in reverse order.

## TRANSMISSION ASSEMBLY

### ⚠ WARNING

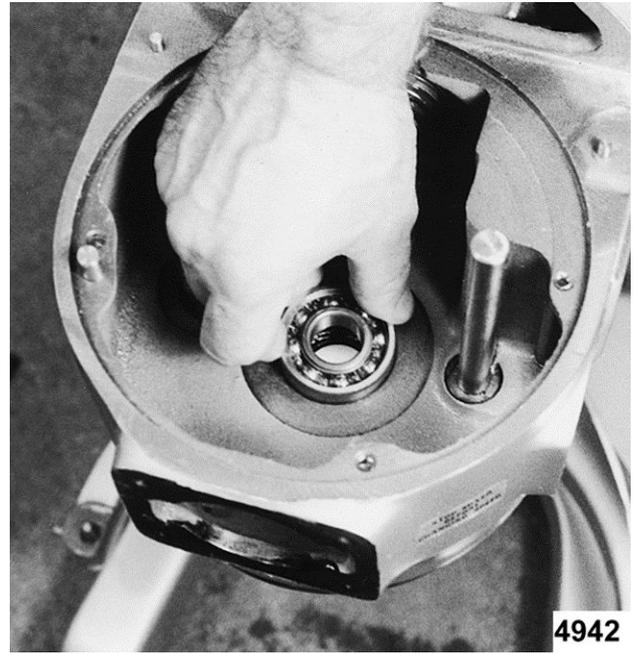
**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Clean the transmission case before assembly.

2. Install center shaft seal. Sealing lip up.

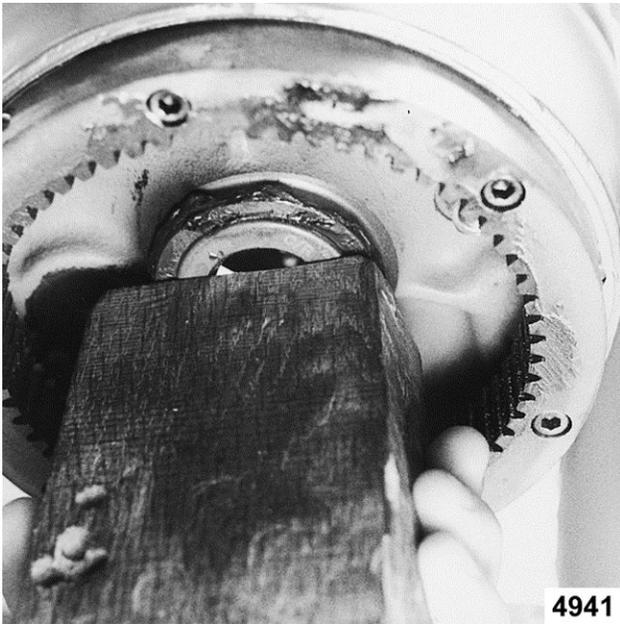


**Fig. 36**

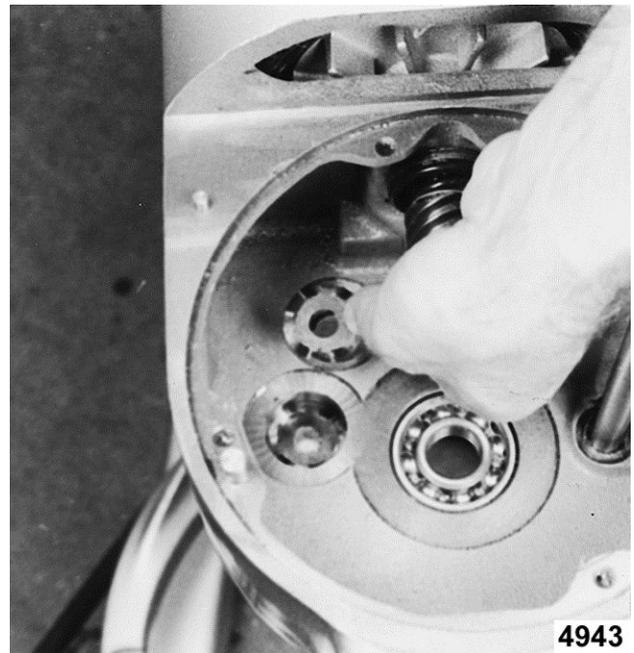


**Fig. 38**

4. Install pre-loading springs in transmission case, fingers up.



**Fig. 37**



**Fig. 39**

3. Install center shaft bearing, open side up.

5. Install transmission and worm gear shaft lower bearings, open side up.

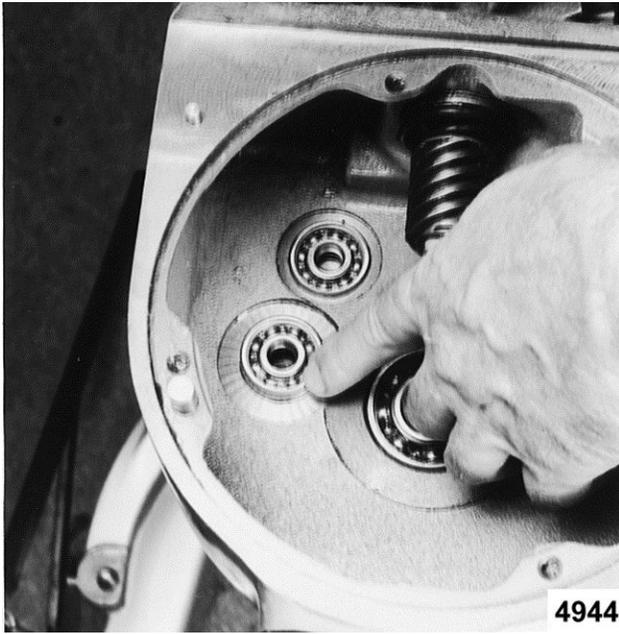


Fig. 40

6. Install worm gear and transmission shaft assemblies together.

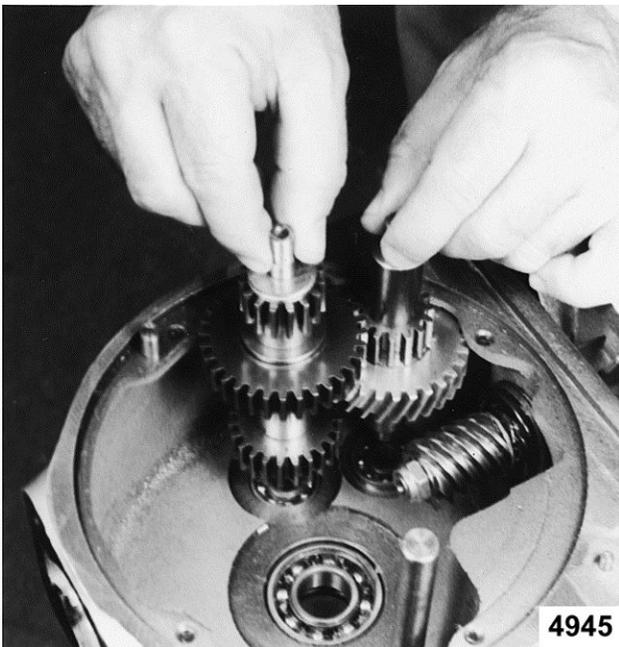


Fig. 41

7. To install the center shaft (roller clutch style center shaft only):

**NOTE:** For diving key style center shaft, refer to [A200 SM](#) for Hobart built motors

- A. Install "O" ring in bottom spacer and place on top of the center shaft bearing in the transmission case. The shoulder goes down.



Fig. 42

- B. Place the lower clutch gear on the center shaft spacer with clutch teeth up.

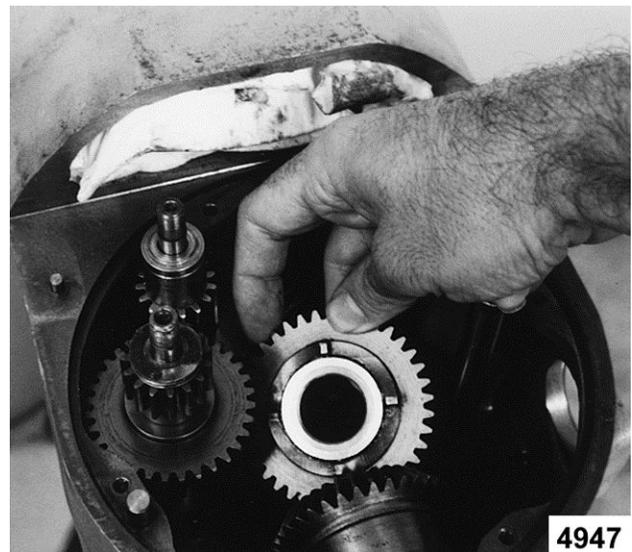
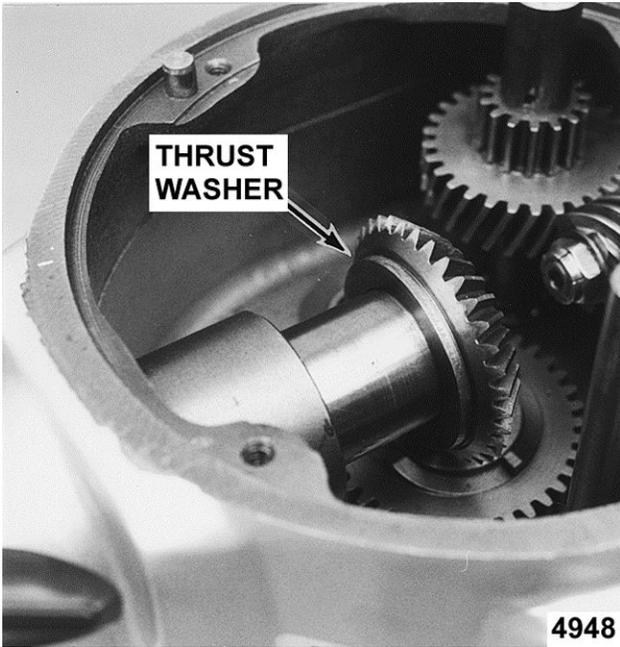


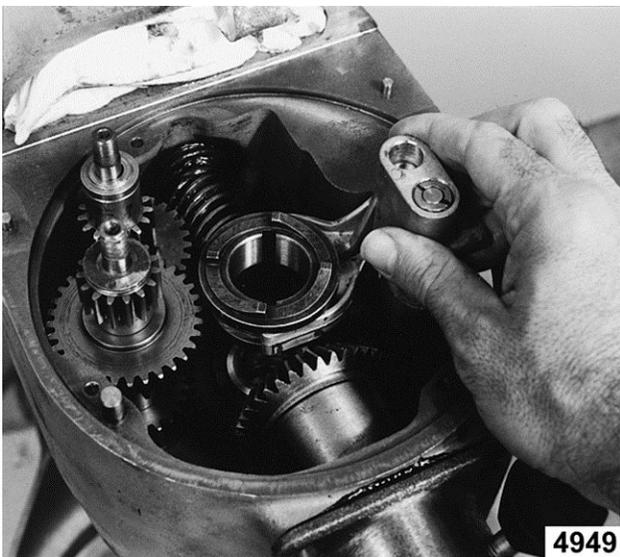
Fig. 43

**NOTE:** If the attachment hub was not removed and the bevel gear and thrust washer is not installed, the bevel gear and thrust washer must be installed now.



**Fig. 44**

C. Install the clutch sleeve and shifter yoke.



**Fig. 45**

D. Install lower keys in center shaft.

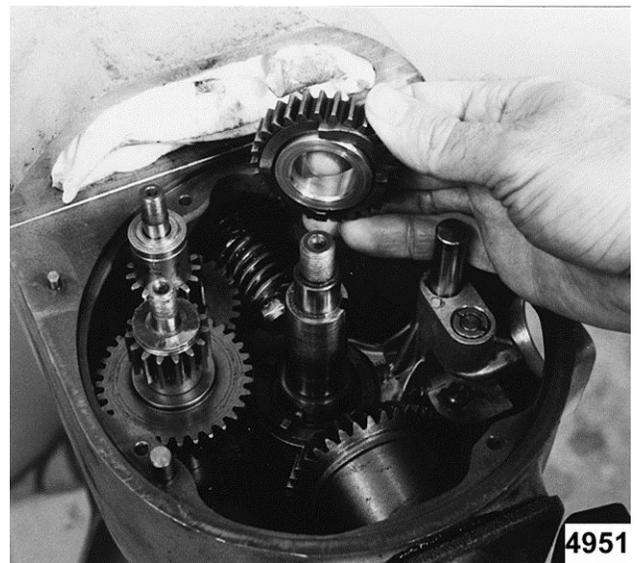
- 1) Install shaft.



**Fig. 46**

E. Install busing in upper clutch gear.

- 1) Install on center shaft with clutch side down.



**Fig. 47**

F. Install upper key in center shaft.

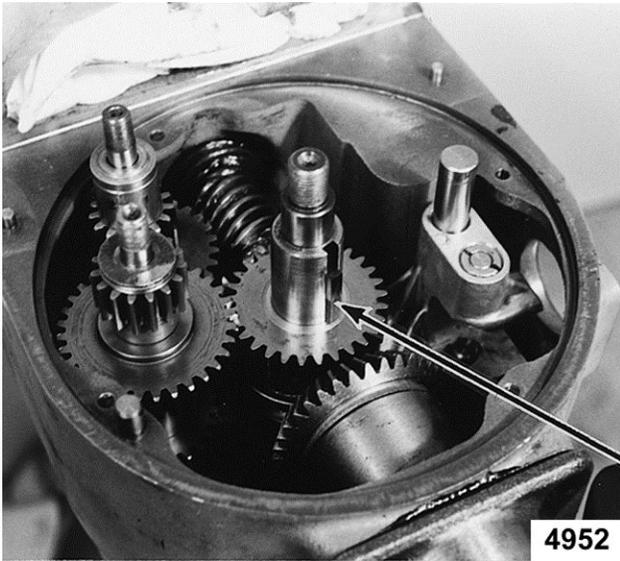


Fig. 48

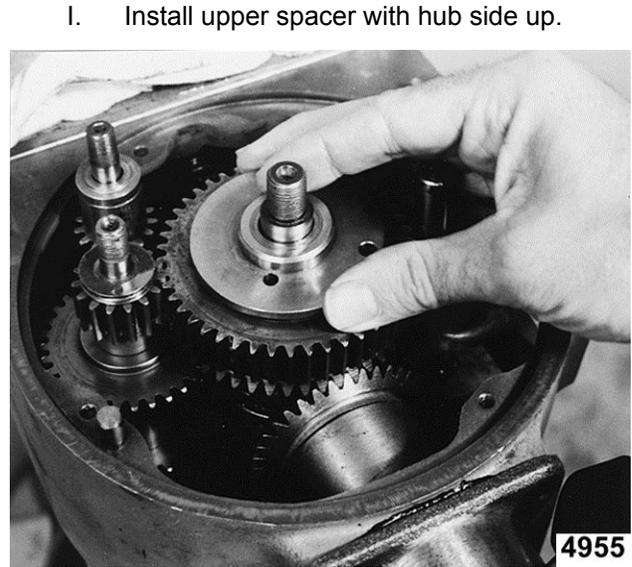


Fig. 51

- G. Assemble the roller clutch gear as shown, Slip the (46 tooth) gear over the drive sleeve then insert the ten roller and springs.

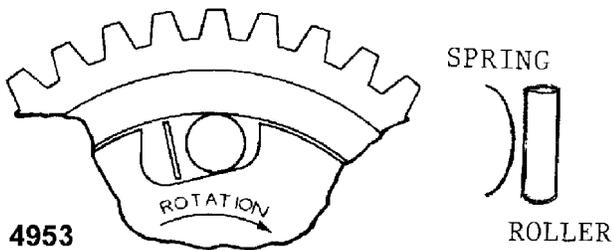


Fig. 49

- H. Install the bevel gear and roller clutch assembly as a unit. Turn the center shaft so the gear teeth of the bevel gear pass through those of the low speed pinion on the transmission shaft.

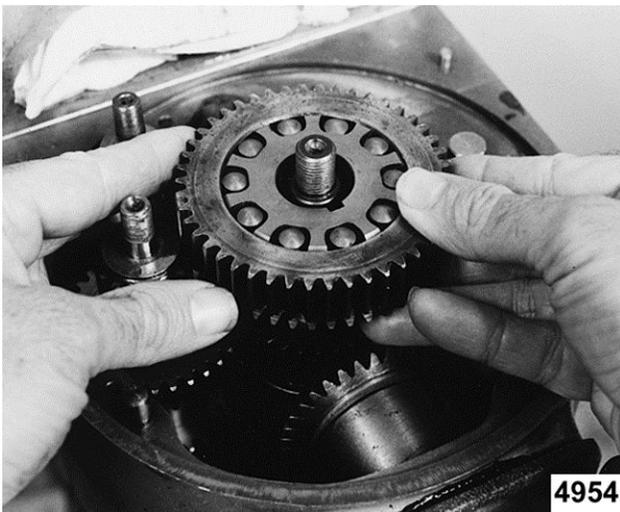


Fig. 50

8. Install shifter assembly and four screws.

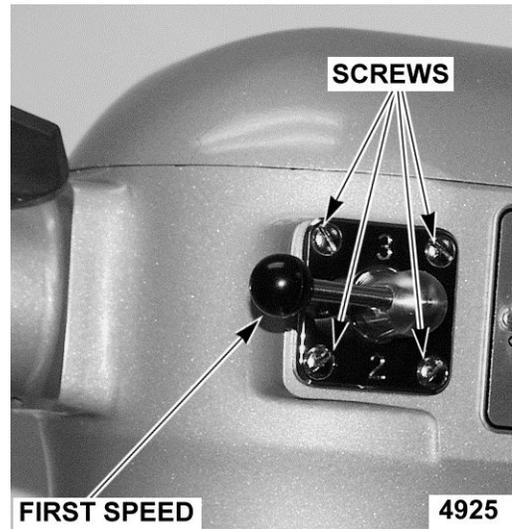


Fig. 52

9. Install shaft support and tap it down over the dowel pins.  
 A. Install and tighten four screws and lockwashers.



Fig. 53

10. Install bearings on worm gear and transmission shafts, open side down.

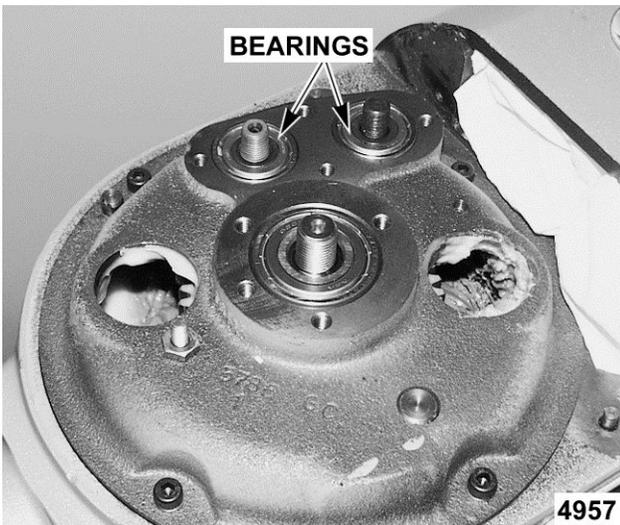


Fig. 54

11. Install flat washers and nuts on worm gear shaft and transmission shaft.

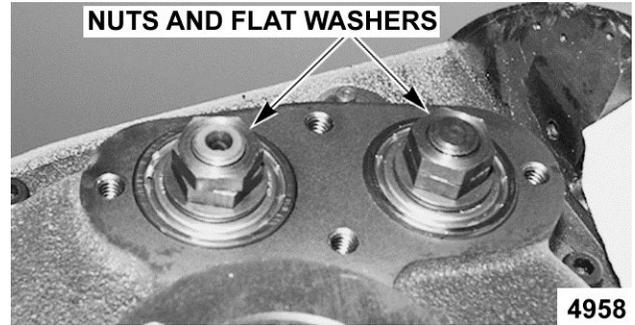


Fig. 55

12. Install twin bearing retainer.

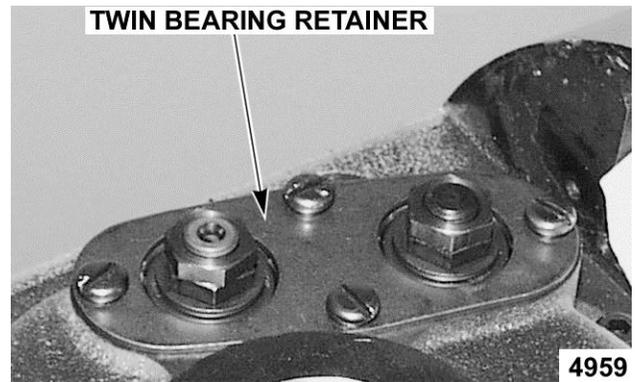


Fig. 56

13. Install shim washers on center shaft.

14. Install center shaft bearing, flat washer and jam nut on shaft.

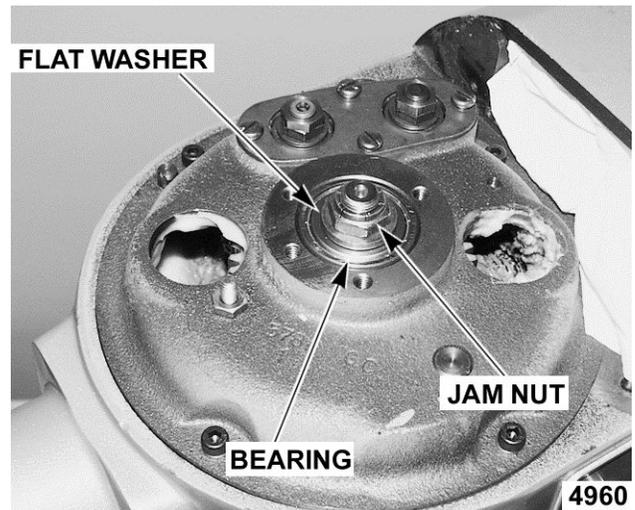


Fig. 57

15. Install long key and spacer/"O" ring assembly on center shaft.

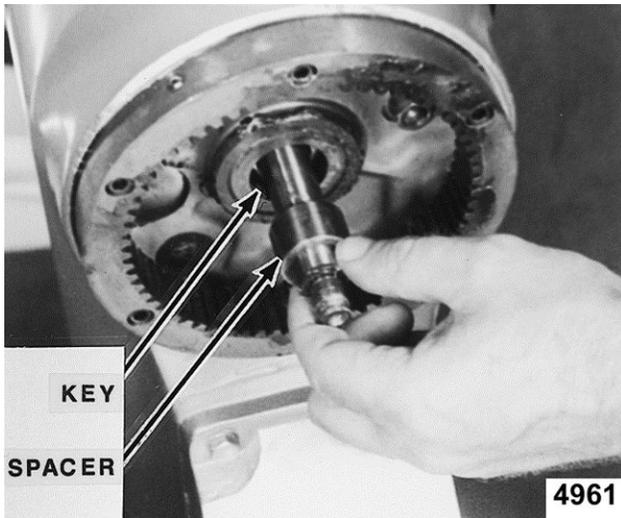


Fig. 58

NOTE: Install spacer/"O" ring assembly as shown.

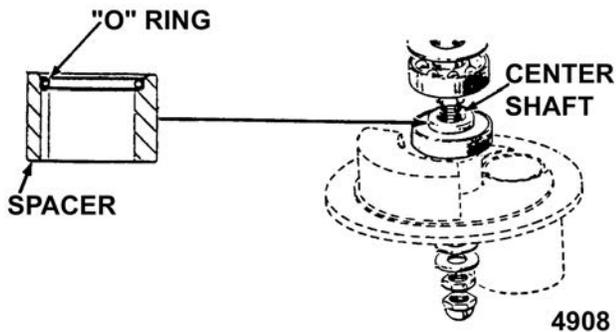


Fig. 59

16. Tighten nut on top of center shaft.
17. Install planetary on center shaft.

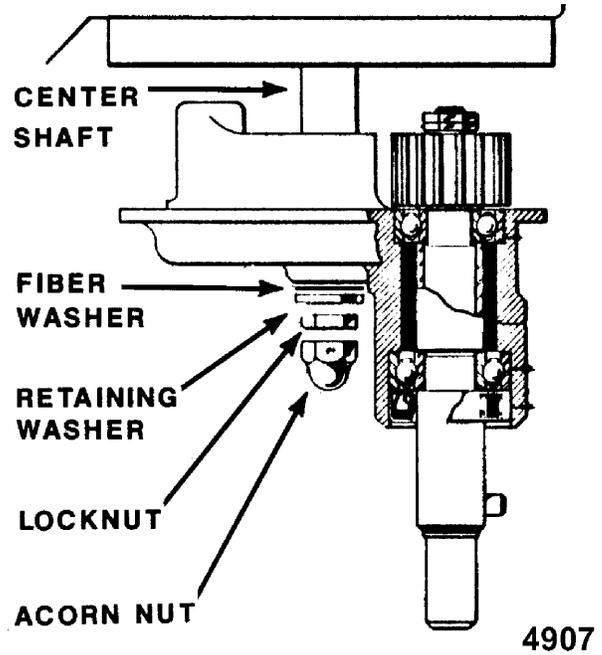


Fig. 60

- A. Install fiber washer, flat washer and locknut. Finger tighten the locknut and back locknut off 1/2 turn (there should be end play between the locknut and the planetary).

NOTE: When installing the acorn nut use Loctite no. 242, Locquic (R) Primer T/Loctite 7471 on the center shaft threads.

18. Install the acorn nut and using the thin 3/4" wrenches, one wrench holding the locknut in place, torque the acorn nut to 372-415 in. Lbs.
19. Install center shaft bearing retainer and cap.

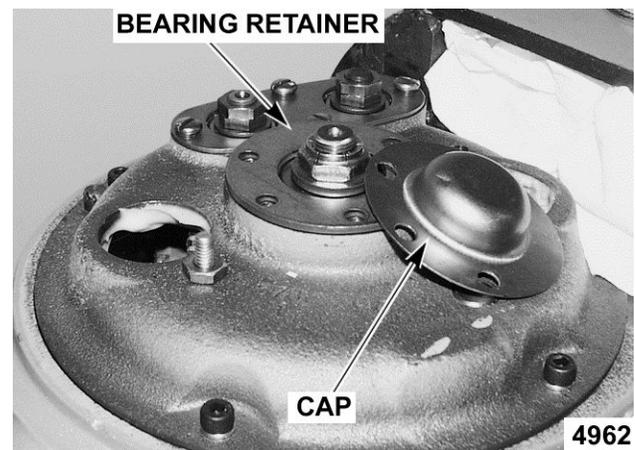


Fig. 61

20. Check attachment hub for proper bevel gear mesh, in "SERVICE PROCEDURES AND ADJUSTMENTS".

21. Lubricate the transmission case as outlined in Z\_ITW Food Equipment Group Lubrication Manual.
22. Remove rag from motor opening.
23. Install friction plugs in transmission shaft support.



Fig. 62

24. Install top cover.
25. (Model A120) Install drip cup.
26. (Model A200) Install splash shield and wire cage assembly.
27. Check unit for leaks and proper operation.

## ATTACHMENT HUB ASSEMBLY

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. When a painted unit is opened for the first time, the painted joints must be broken. Run a knife point along the joints cutting through the paint. This helps prevent the paint from chipping at the joint. You must also locate the hold down screws and remove the pain.

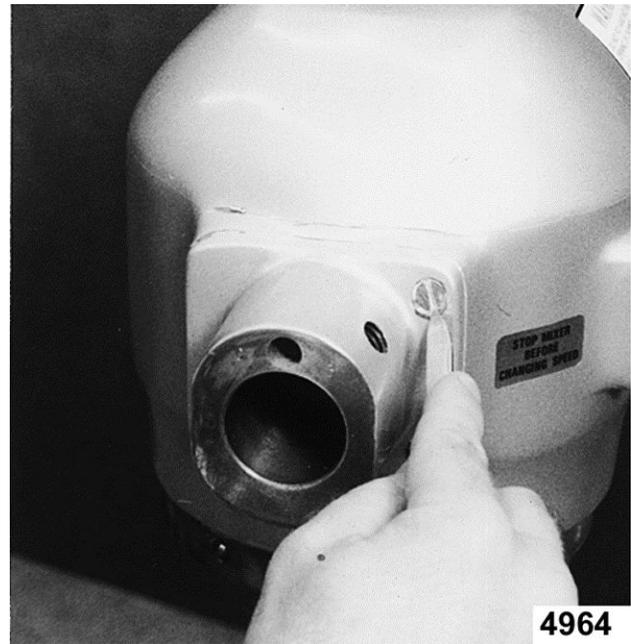


Fig. 63

2. Remove four screws and pull attachment hub assembly from transmission case.
  - A. Remove quad ring from hub assembly.

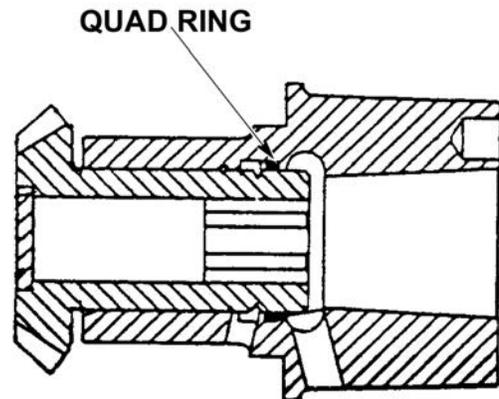


Fig. 64

3. Reassemble in reverse order.
4. Check "BEVEL GEAR ADJUSTMENT" in "SERVICE PROCEDURES AND ADJUSTMENTS".
5. Check unit for a leak and proper operation.

## SHIFTER ASSEMBLY

### **⚠ WARNING**

UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Position shifter in first speed.
2. Remove four screws.

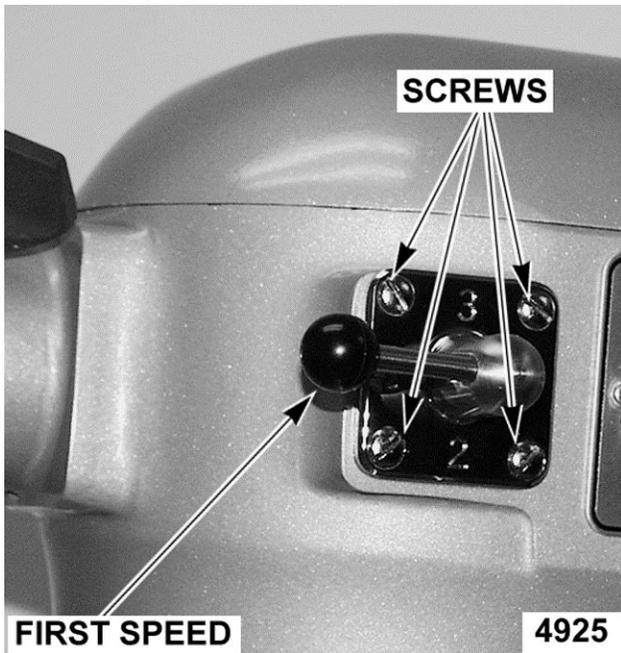


Fig. 65

3. Remove shifter assembly.
  - A. Remove gasket.
4. Disassemble the shifter assembly.
  - A. Drive out the spirol pin.

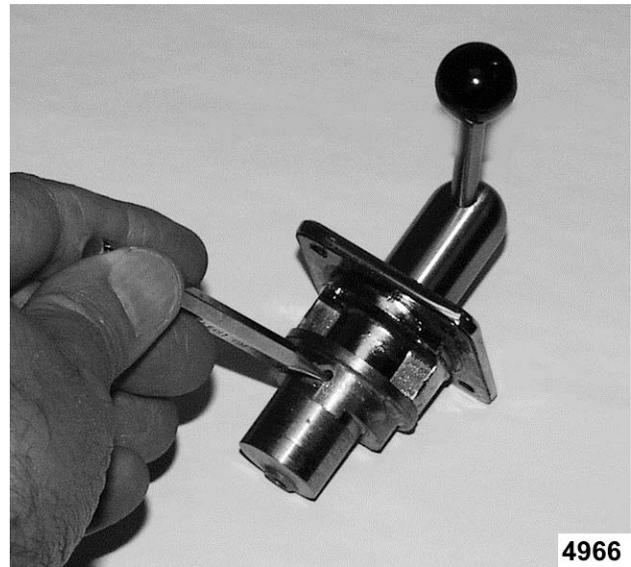


Fig. 66

- B. Carefully separate the pieces.
  - 1) Remove "O" ring from shifter shaft.

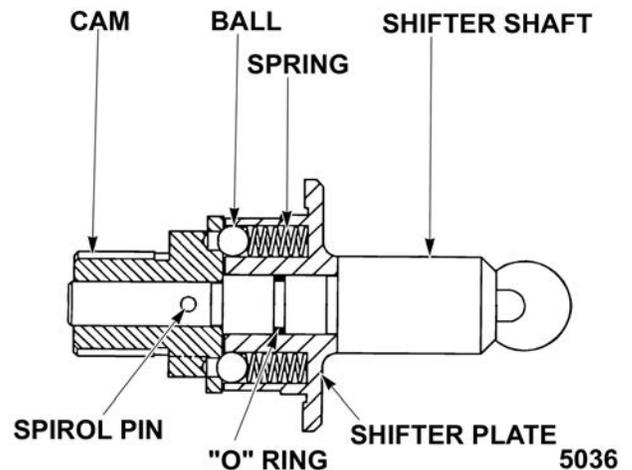


Fig. 67

5. Assemble the shifter assembly.
  - A. Install "O" ring on shifter shaft.
  - B. Install shifter shaft in plate.
  - C. Install springs in plate.
  - D. Place ball on springs.
  - E. Slip cam on the shaft (Handle down with flat part of cam up). Press assembly together.

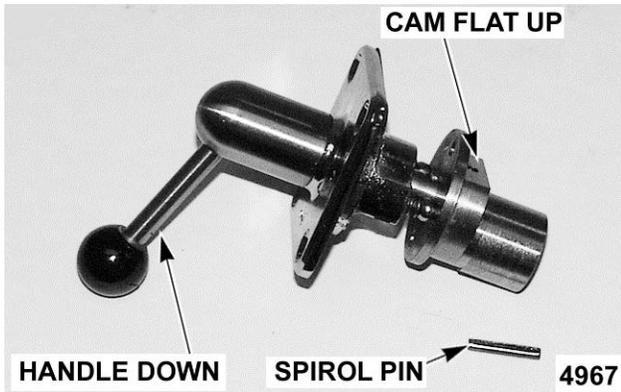


Fig. 68

- F. Drive in the spirol pin.
- G. Put shifter in first speed.
- H. With a gasket on the back of the index plate, install the assembly using four screws.

**NOTE:** If the index plate will not fit flush against the transmission case, the cam is on backwards. Remove and rotate cam 180 degrees.

6. Check unit for proper operation.

## SHIFTER UNIT

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

**NOTE:** The shifter yoke assembly consists of the yoke casting, two plungers and two springs.

**NOTE:** Only spring failure, casting breakage or long hard wear will make service necessary. If a spring is being replaced, both springs should be replaced for equal spring tension.

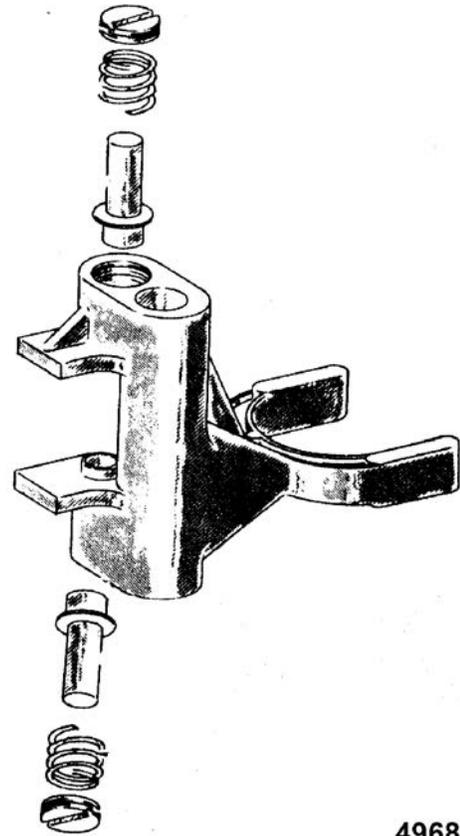


Fig. 69

1. To remove this assembly the transmission must be opened and disassembled as outlined in "TRANSMISSION DISASSEMBLY".
2. Remove the retainers.
  - A. Pull the springs and plungers from the casting.
3. Reassemble in reverse order.
4. Check unit for proper operation.

## BOWL SUPPORT AND LIFT UNIT

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Lay the mixer on its back.
2. Remove lower splash shield.
3. Remove air screen.

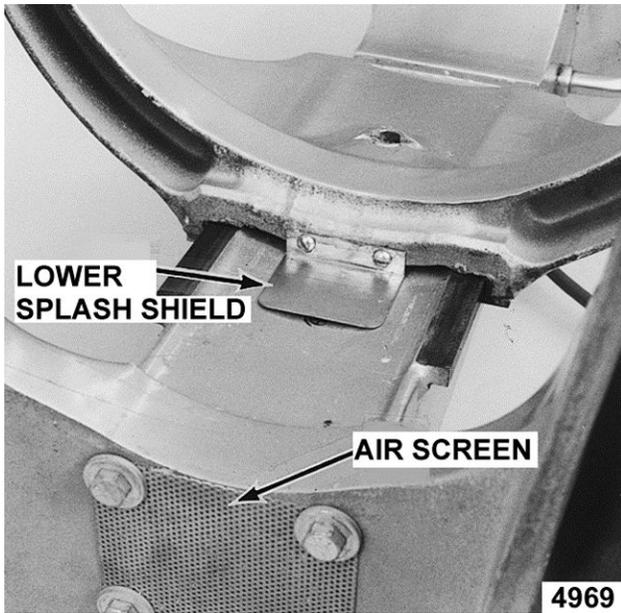


Fig. 70

4. (A200 Floor models) Remove lower splash shield.
  - A. Separate the base from the riser block.
5. Place bowl lift handle in lower position.
6. Remove nut, washer, spring and curved washer. These are accessible through opening in front of pedestal or through base with air screen or riser block removed.

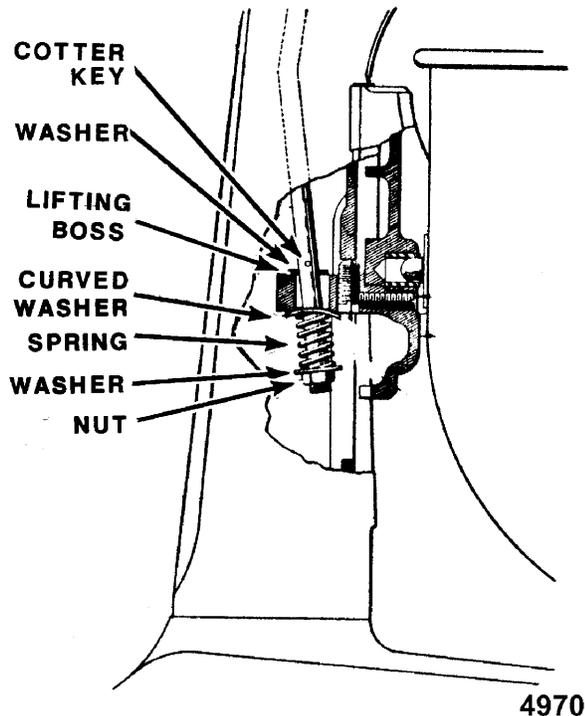


Fig. 71

7. Raise the bowl lift handle and remove flat washer from upperside of lifting boss.
8. Return mixer to upright position (A200 floor model will have to be supported).
9. Remove the two gibs (observing and retaining the shims between the gibs and the bowl support assembly) by removing screws on each side.

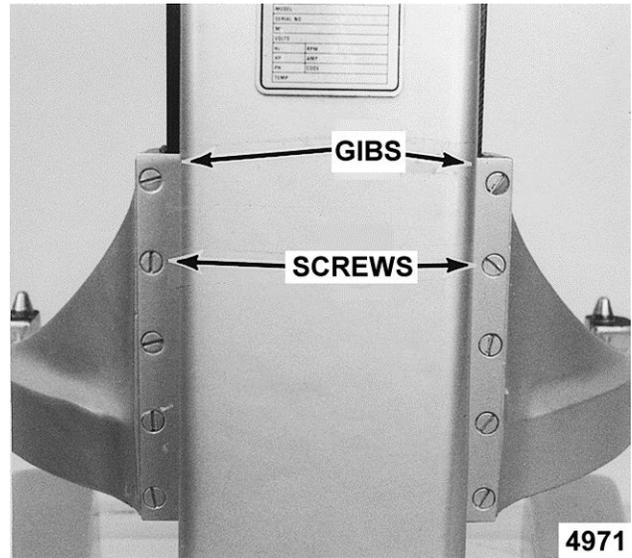


Fig. 72

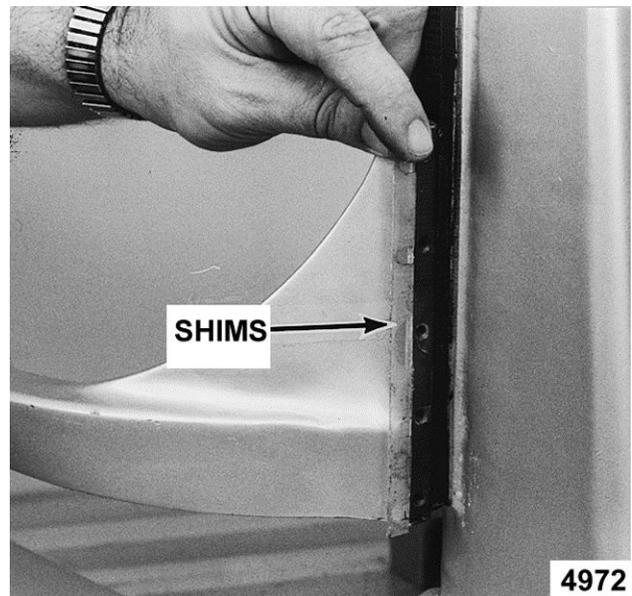


Fig. 73

10. Bowl support installation.
  - A. Place bowl support assembly in position and install gibs (making sure bowl support shims are in place) on each side.

**NOTE:** The bowl support can be loosened or tightened by increasing or decreasing shim thickness.

- B. Tilt the mixer or lay it on its back to reach the lift mechanism.
- C. Install flat washer on bowl lift rod through access hole in front of pedestal through base of unit.
- D. Raise bowl lift handle and position bowl lift in lowest position.

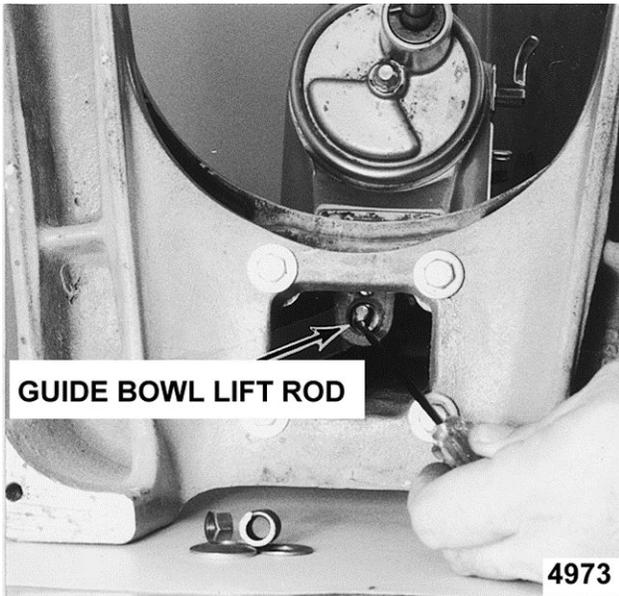


Fig. 74

- 1) Lower bowl lift handle and guide bowl lift rod through lifting boss of bowl support.

- E. Raise bowl support slightly and install curved washer, spring, flat washer and nut.

- 11. Check bowl lock position as outlined under "BOWL LOCK ADJUSTMENT" in SERVICE PROCEDURES AND ADJUSTMENTS". Adjust as required.
- 12. Install lower splash shield, air screen and/or base.
- 13. Check unit for proper operation.

## BOWL LIFT HANDLE

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

- 1. Remove two machine screws and lockwashers from the rear of transmission case.

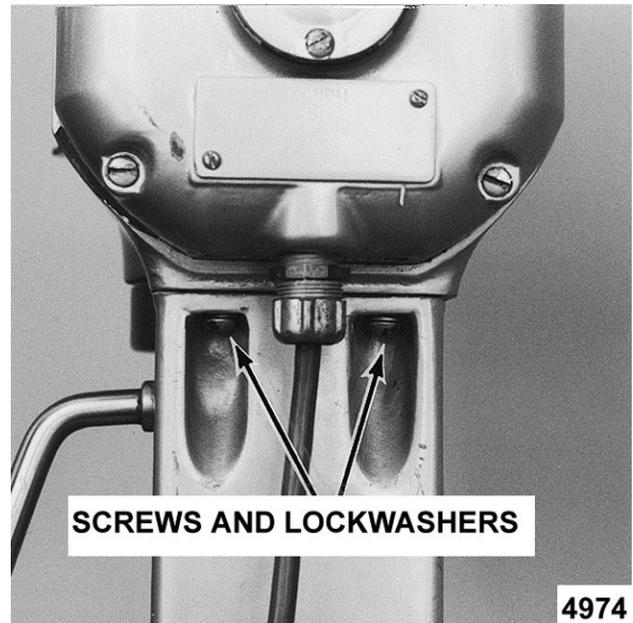


Fig. 75

- 2. Remove two cap screws and lockwashers from the front of transmission case.

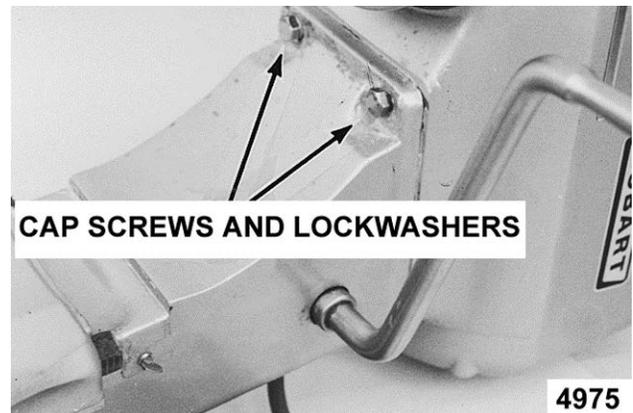


Fig. 76

- 3. Carefully separate the transmission case from the pedestal. (A200, far enough to access the interlock switch 1LS wiring connection at the common of the bowl height sensing switch 2LS and disconnect. Free the bowl height sensing switch from the pedestal and set it aside).
- 4. Place lift handle in lower position and knock out spiro pin.
- 5. Remove handle and note location of washer and fiber washer.
- 6. Reassemble in reverse order.
- 7. Check unit for proper operation.

## BOWL LIFT ARM

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

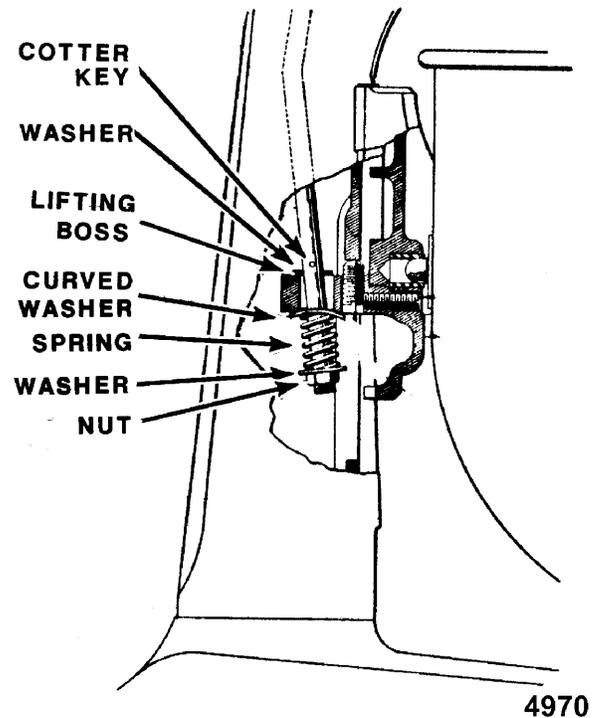
1. Perform steps 1 through 5 as outlined under "BOWL LIFT HANDLE".
2. Remove cotter pin and remove bowl lift arm from bowl lift rod.
3. Reassemble in reverse order.
4. Check unit for proper operation.

## BOWL LIFT ROD

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Perform steps 1 through 3 as outlined under "BOWL LIFT HANDLE".
2. Remove cotter pin and remove bowl lift rod from bowl lift arm.
3. Lay mixer on its back.
4. On bench models remove air screen from base.
5. (A200) On floor models remove base from riser block.
6. Reach through bottom of pedestal and remove nut, washer, spring, and curved washer.



4970

Fig. 77

7. Remove rod from top of pedestal.
8. Remove flat washer from rod.
9. Install cotter key in new rod.
10. Install flat washer below cotter key.
11. Install rod through top of pedestal through bowl support lifting boss.
12. Insert top of rod through bowl lift arm and install cotter key.
13. Install curved washer, spring, flat washer and nut on bottom of rod.
14. Perform "BOWL LOCK ADJUSTMENT" as outlined in "SERVICE PROCEDURES AND ADJUSTMENTS".
15. Install air screen on bench models.
16. (A200) Install base on floor models.
17. Check unit for proper operation.

## BASE

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Lay the mixer on its back.
2. Bench models remove the four cap screws and screen.
3. (A200) Floor models remove the four cap screws.
4. Separate the base from the pedestal or riser block.
5. Reassemble in reverse order.
6. Check unit for proper operation.

## (A200) RISER BLOCK (FLOOR MODELS ONLY)

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Lay the mixer on its back.
2. Remove four cap screws and separate the base from the riser block.
3. Remove four cap screws and separate riser block from pedestal.
4. Reassemble in reverse order.
5. Check unit for proper operation.

## PEDESTAL

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Remove two machine screws and lockwashers from the rear of transmission case.

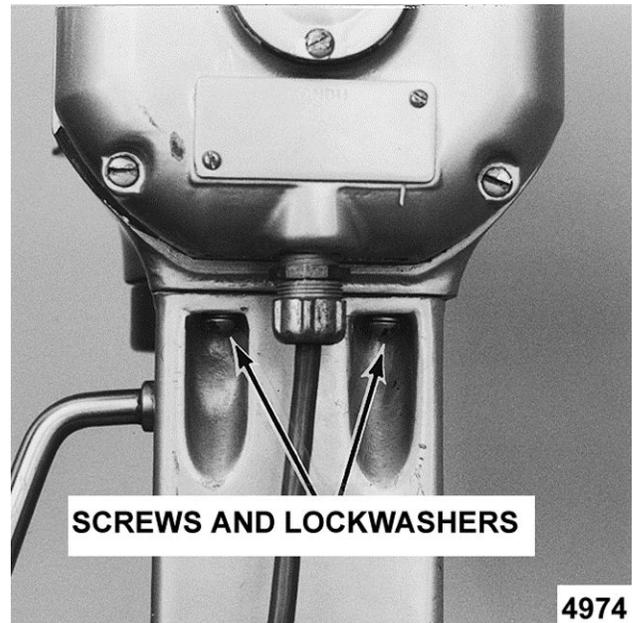


Fig. 78

2. Remove two cap screws and lockwashers from the front of transmission case.

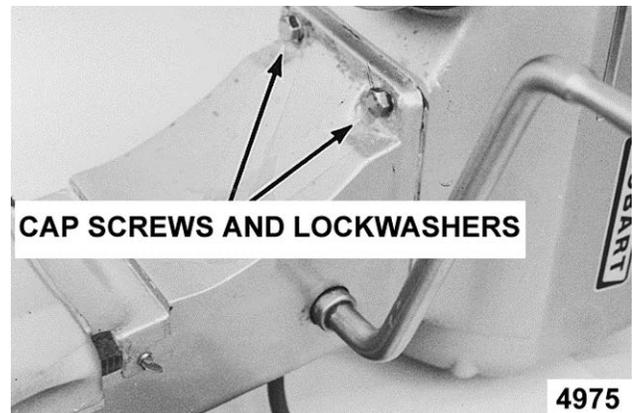


Fig. 79

3. Carefully separate the transmission case from the pedestal. (A200, far enough to access the interlock switch 1LS wiring connection at the common of the bowl height sensing switch 2LS and disconnect. Free the bowl height sensing switch from the pedestal and set it aside).
4. Lay the pedestal on its back.
5. Bench models remove four cap screws, washers and screen.
  - A. Separate base from pedestal.

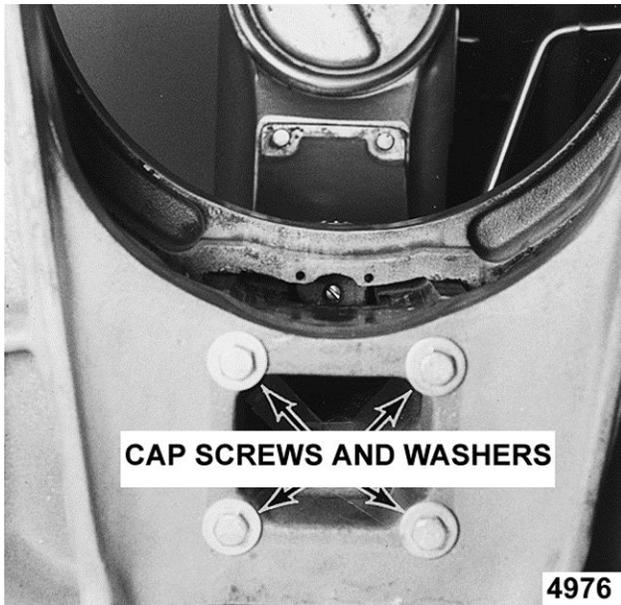


Fig. 80

6. (A200) Floor models remove four cap screws, washers and separate base from riser.
  - A. Remove four cap screws, washers and separate riser block from pedestal.
7. Remove "BOWL SUPPORT AND LIFT UNIT", "BOWL LIFT HANDLE", "BOWL LIFT ROD", "(A200) INTERLOCK SWITCH (1LS)", "(A200) BOWL HEIGHT SENSING SWITCH (2LS)" and upper splash shield.
  - A. Reassemble them on new pedestal. (A200) Adjust "INTERLOCK SWITCH (1LS)" as outlined in removal and replacement of parts, during reassembly.
8. Perform "BOWL LOCK ADJUSTMENT" as outlined in "SERVICE PROCEDURES AND ADJUSTMENTS".
9. Reassemble in reverse order.
10. Check unit for proper operation.

## MOTOR

### **⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Remove four screws and remove the bracket.

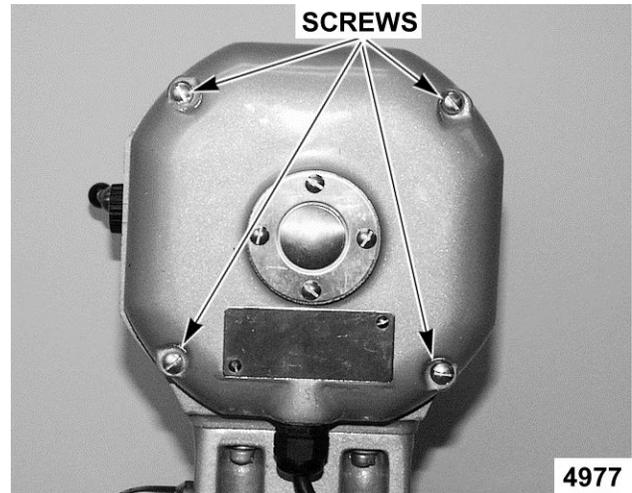


Fig. 81

2. Disconnect the capacitor wires.
  - A. Cut the wire ties holding the capacitor to the motor.
3. Remove two of the motor retaining screws to free the component mounting bracket assembly.

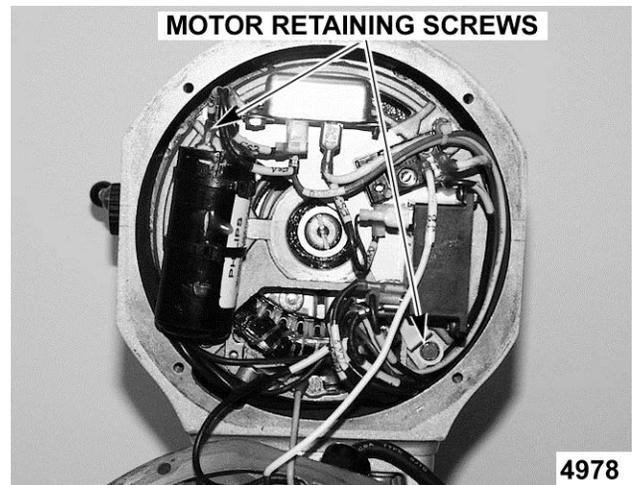


Fig. 82

- A. Place the assembly to the side.

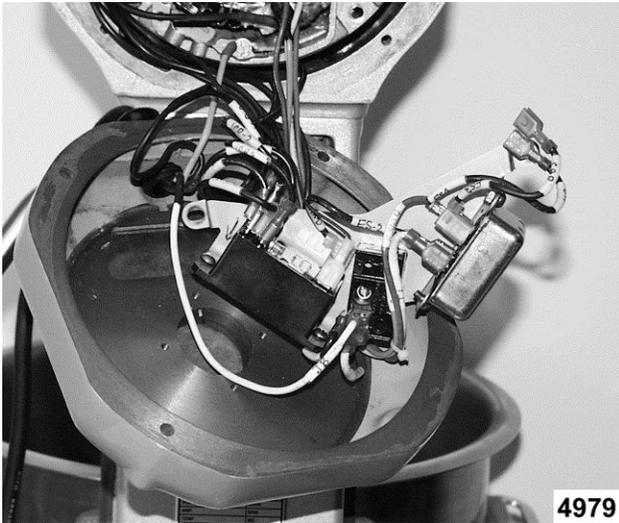


Fig. 83

4. Disconnect all electrical leads to the motor.
5. Keep the mixer upright so grease will not be lost through the motor shaft hole.

**NOTE:** There is a screwdriver slot in the motor shaft to aid in aligning the gears during removal and installation of the motor.

6. Remove the two remaining motor retaining screws and pull the motor from the transmission case.
7. Remove the nut, worm, washer, spring and grease deflector from the motor shaft.

**REMOVE NUT FROM TWO SCREWS  
(REPLACEMENT MOTOR)**

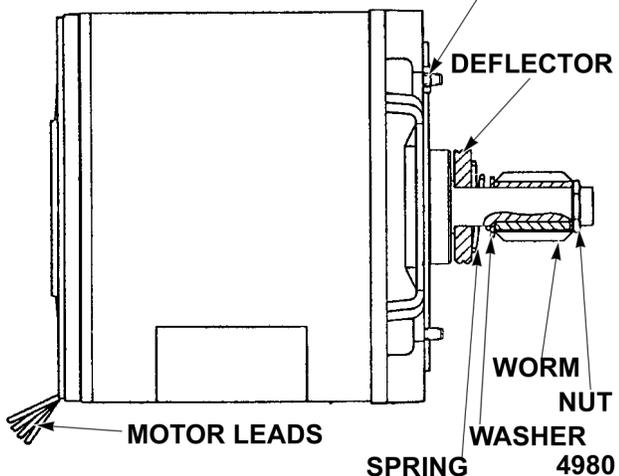


Fig. 84

8. If replacing the motor remove a nut from two of the motor retaining screws.

**NOTE:** Removal of the top transmission cover will allow viewing of the top motor retaining screws, for

ease of alignment with the transmission holes during installation of the motor.

9. Orienting the motor leads toward the bottom of the mixer, reassemble in reverse order steps 7-1.
10. Check the unit for proper operation.

**(A200) INTERLOCK SWITCH (1LS)**

**⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Remove the wire cage assembly.
2. Remove agitator and bowl.
3. Remove three screws holding cage guard assembly to planetary and pull straight down.

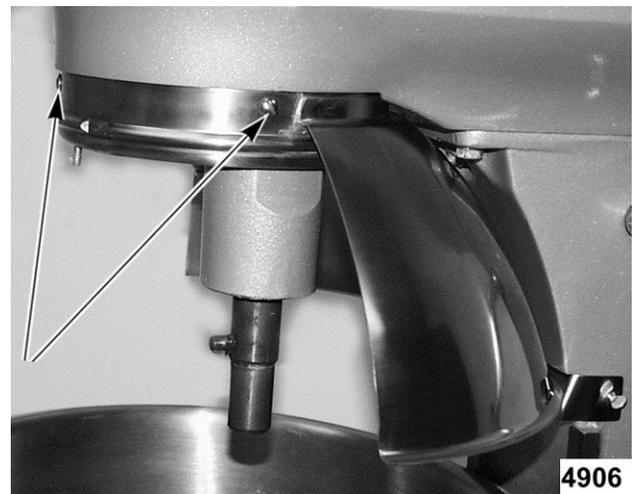


Fig. 85

**NOTE:** The Interlock Switch is assembled into the pedestal assembly. Accessing the part and wiring connections requires splitting of the transmission case and the pedestal assembly. It is recommended that when the unit is placed on the floor for disassembly, supports are placed under the two assemblies to aid in alignment during reassembly. The supports should be covered to prevent damage to the finish.

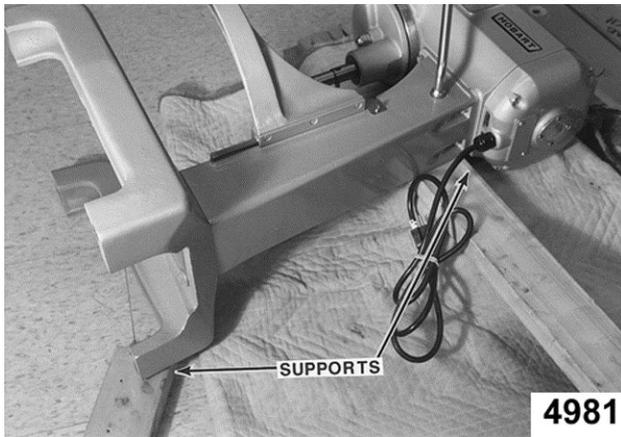


Fig. 86

4. Place the side of the mixer opposite the controls on the floor and install supports under the assemblies.
5. Remove four screws and remove the bracket.

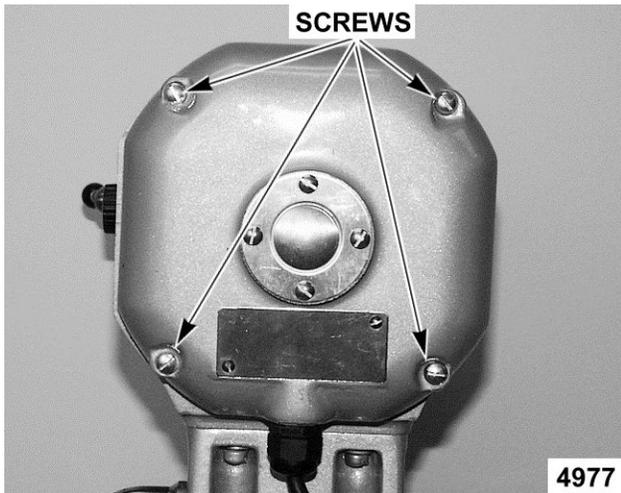


Fig. 87

- A. Disconnect the interlock wire from terminal 1 on the relay.
- B. Cut off the wire tie.
6. Free the pedestal assembly from the transmission case and carefully split them far enough apart to access the interlock switch wiring connection at the common of the bowl height sensing switch (2LS).
  - A. Disconnect the wire.
7. Pull the other wire disconnected from the relay from the slot in the bottom of the transmission case.
8. Unscrew the nuts from the interlock switch and unscrew the interlock switch from the pedestal.

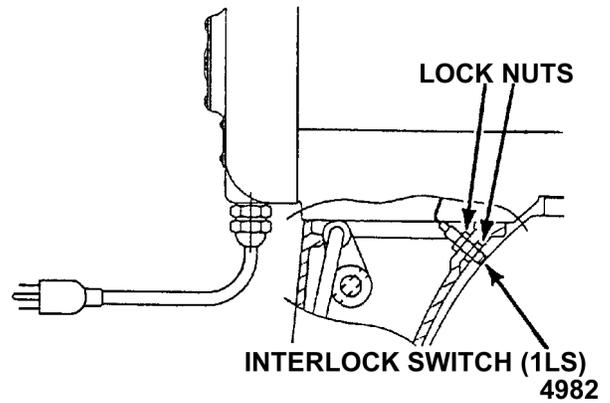


Fig. 88

- A. Before installing the replacement interlock switch, check the switch with a meter for proper operation by holding the wire cage magnet approximately 3/32" away from the switch.
9. With the replacement switch installed in the pedestal, without the wires connected, and the nuts loose, adjust the switch as follows.
  - A. Go to the top of the pedestal and scribe a line between the outer edges of the two front transmission mounting holes.



Fig. 89

- 1) Holding the reed switch gauge on the pedestal above the reed switch, align the vertical line on the gauge 90° to the scribed line on the pedestal.
- B. Turn the reed switch until it just touches the gauge and tighten the nuts.

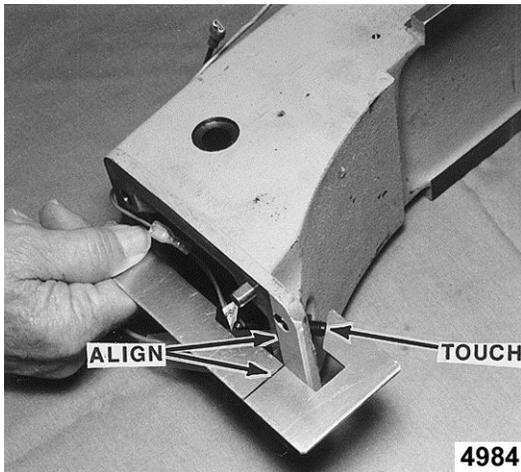


Fig. 90

C. Recheck the reed switch adjustment.

**NOTE:** The switch plate assembly is being removed so that when the transmission case and pedestal are reassembled the slack in the wiring to the switch plate assembly and the relay can be taken up, to avoid pinching of wires.

10. Free switch plate assembly from the transmission case.
11. Reassemble in reverse order steps 7 through 1, taking up the slack in the wires.
12. Reinstall switch plate assembly.
13. Check for proper operation of the interlock switch.
  - A. Mixer must run with the wire cage assembly centered and the bowl support is in the up position.
  - B. Mixer must stop when the cage is rotated.
  - C. Mixer must not run with the wire cage assembly removed.

### (A200) BOWL HEIGHT SENSING SWITCH (2LS)

**⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Remove the wire cage assembly.
2. Remove agitator and bowl.
3. Remove three screws holding cage guard assembly to planetary and pull straight down.

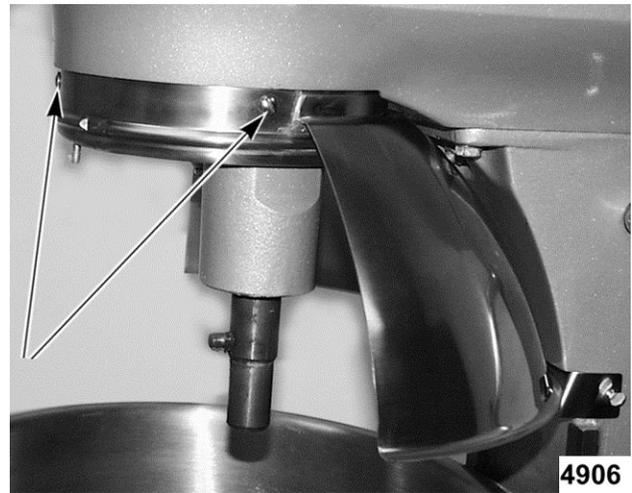


Fig. 91

**NOTE:** The Bowl Height Sensing Switch is assembled into the pedestal assembly. Accessing the part and wiring connections requires splitting of the transmission case and the pedestal assembly. It is recommended that when the unit is placed on the floor for disassembly, supports are placed under the two assemblies to aid in alignment during reassembly. The supports should be covered to prevent damage to the finish.

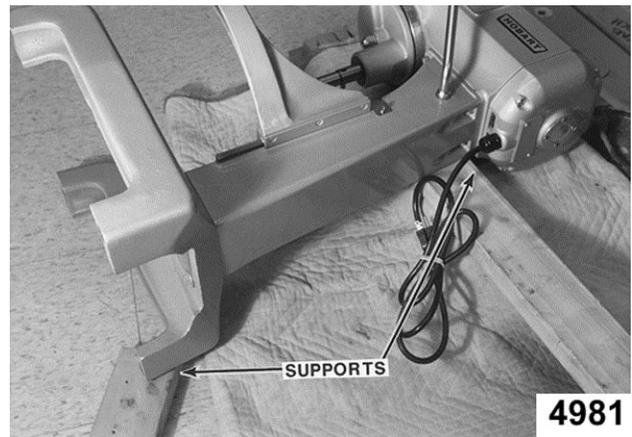


Fig. 92

4. Place the side of the mixer opposite the controls on the floor and install supports under the assemblies.
5. Free the pedestal assembly from the transmission case and carefully split them far enough apart to access the bowl height sensing switch and the wiring connection.
  - A. Note the wiring connections and disconnect them.

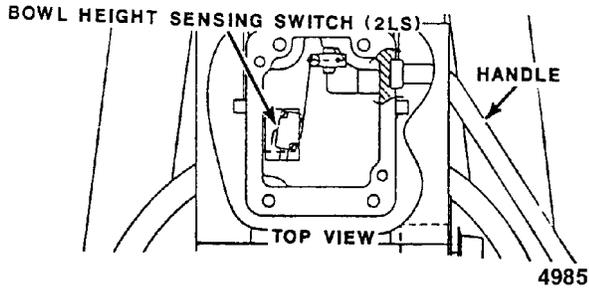


Fig. 93

6. Remove two screws to remove the switch and switch insulator.

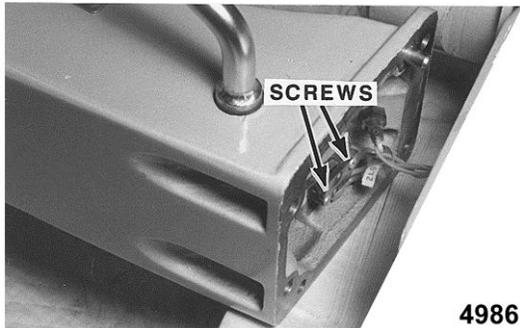


Fig. 94

7. Continuity check the replacement switch prior to reassembly.
8. Free the switch plate assembly and rear bracket from the transmission case. Take up the slack in the bowl height sensing switch wiring to avoid pinching of wires during reassembly.
9. Reassemble in reverse order.
10. Check for proper operation of the bowl height sensing.
  - A. Bowl down position and wire cage assembly centered. Push "ON/OFF" switch to "ON" position and hold-mixer runs.
    - 1) Release switch-mixer stops.
  - B. Bowl up position and wire cage assembly centered. Push "ON/OFF" switch to "ON" position and release-mixer runs.
  - C. Lower bowl from up position with the mixer running, mixer stops.

## (A200) RELAY (1CR) AND ELECTRONIC START SWITCH (ES)

### **⚠ WARNING**

UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove four screws and remove the bracket.

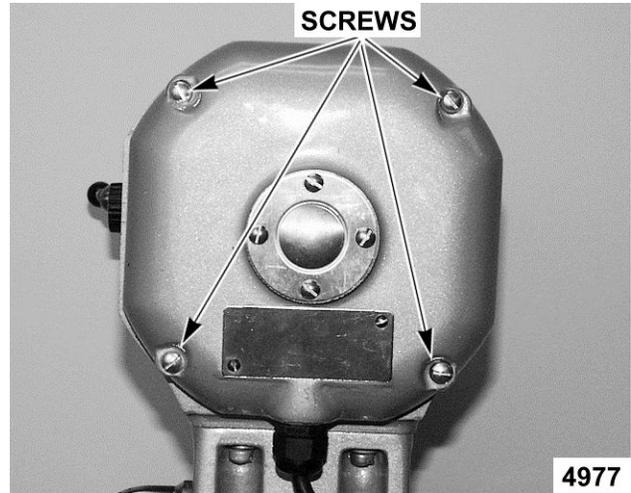


Fig. 95

### ELECTRONIC START SWITCH

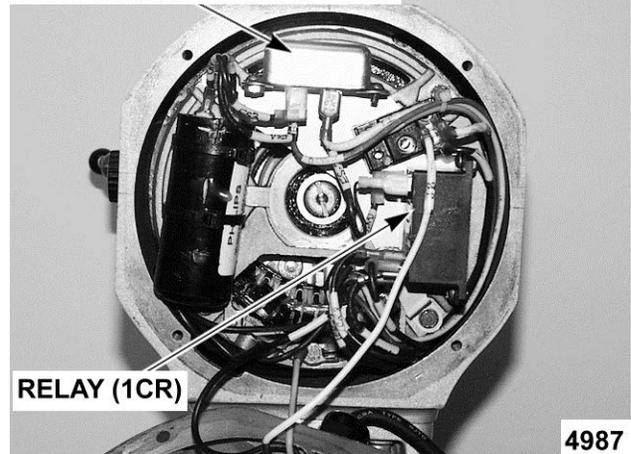


Fig. 96

2. Disconnect the wires.
3. Remove the mounting nuts and screws.
4. Reassemble in reverse order.
5. Check unit for proper operation.

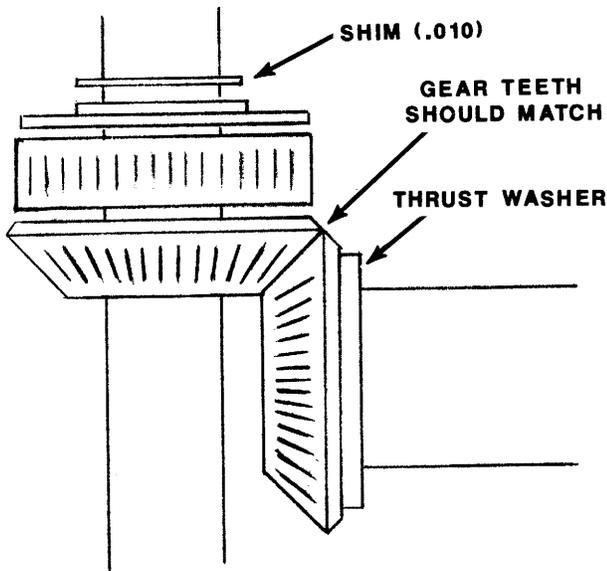
# SERVICE PROCEDURES AND ADJUSTMENTS

## BEVEL GEAR ADJUSTMENT

**⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

**NOTE:** There should be .015" to .030" clearance between the teeth of the two bevel gears. The gears should also mesh properly as shown.



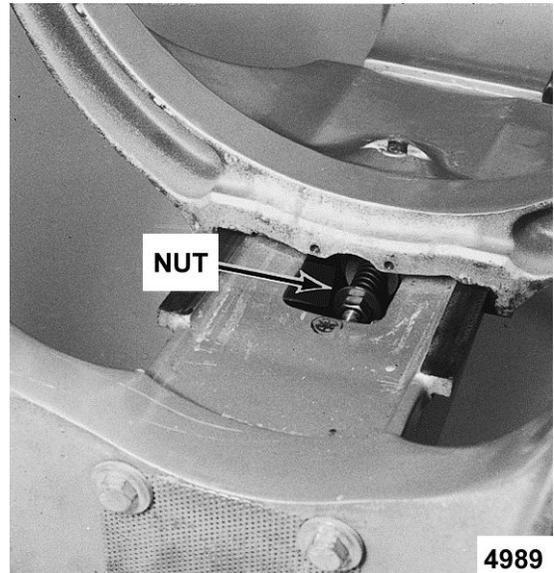
4988

**Fig. 97**

1. Remove attachment hub plug.
2. Insert a finger into the end of the bevel drive gear checking for movement of the gear.
3. The movement should be related to the .015" to .030" clearance.
4. If there is too little or too much clearance, or if the gears do not mesh properly, replace the thrust washer with one of the proper thickness to achieve the desired clearance. It may also be necessary to add/remove a shim or shims to the center shaft to maintain the proper gear mesh.

## BOWL LOCK ADJUSTMENT

**NOTE:** When the bowl is raised, the lift handle will pass top center and stop when the bowl lift rod stops against the pedestal. Spring tension on the handle is adjusted by turning the nut shown.



**Fig. 98**

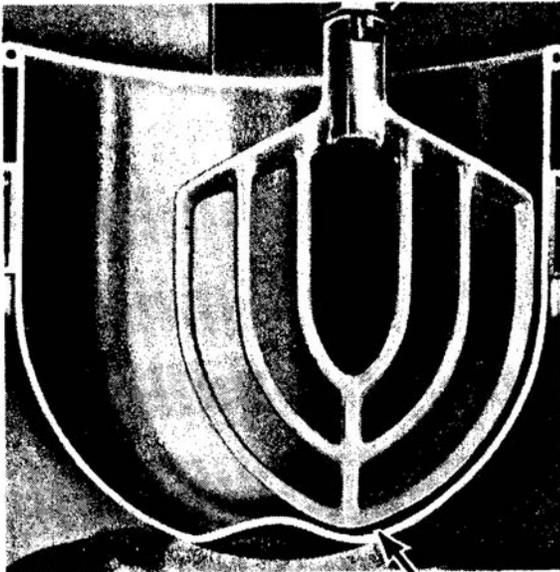
1. The nut is accessible through the opening in the pedestal.
2. Remove lower splash shield from bowl support assembly.
3. Position lift handle assembly in the lock position.
4. Tighten the nut if the handle will not stay up. Loosen the nut if the handle is too stiff to push past top center.
  - A. Check for proper lift handle operation.
  - B. Repeat steps 3 through 4A until the proper adjustment is present.
5. Reinstall lower splash shield on bowl support assembly.
6. Check unit for proper operation.

## BOWL TO BEATER CLEARANCE ADJUSTMENT

### ⚠ WARNING

UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

**NOTE:** The clearance between the "B" beater and the bottom of the bowl is .054" to .115".



**.054" TO .115" CLEARANCE** 4990

Fig. 99

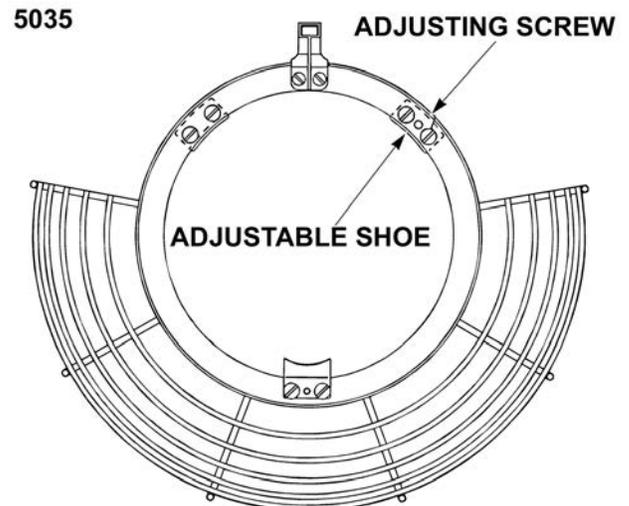
1. Lower bowl lift assembly to the lowest point.
2. Tilt mixer to the rear.
3. Remove lower splash shield.
4. Use a long screw driver to turn the set screw. Each half turn of the adjusting screw equals approximately 1/32". Turning clockwise increases the clearance and counterclockwise decrease the clearance.
  - A. Check for the proper clearance.
  - B. Repeat steps 4 and 4A until the proper clearance is present.
5. Reinstall the lower splash shield.
6. Check unit for proper operation.

## (A200) WIRE CAGE ASSEMBLY ADJUSTMENT

### ⚠ WARNING

UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Rotate wire cage assembly within splash guard assembly, checking for binding or being too loose. To adjust:
  - A. Loosen the two screws holding the adjustable shoe to the cage assembly.
  - B. Turn the adjusting screw. Press the shoe to ensure it is against the screw, then tighten the mounting screws. Repeat this step until proper adjustment is achieved.



WIRE CAGE ASSEMBLY SHOWN UPSIDE DOWN

Fig. 100

## (A200) CHECKING THE RELAY (1CR), INTERLOCK SWITCH (1LS) & BOWL HEIGHT SENSING SWITCH (2LS)

### ⚠ WARNING

UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove four screws and remove the bracket.

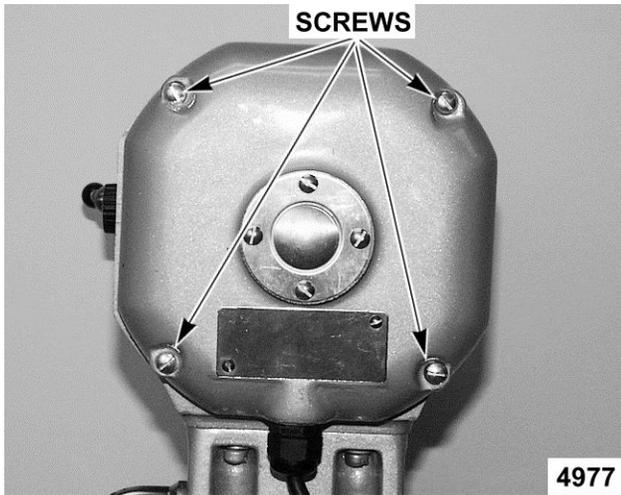


Fig. 101

2. Access the component wiring and troubleshoot the component per the appropriate wiring diagram.
3. Reinstall the bracket.

### (A200) INTERLOCK SWITCH (1LS) ADJUSTMENT

**⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Adjust the interlock switch by following the steps in the switch replacement procedure.
2. Check for proper operation of the interlock switch.
  - A. Mixer must run with the wire cage assembly centered and the bowl support is in the up position.
  - B. Mixer must stop when the cage is rotated.
  - C. Mixer must not run with the wire cage assembly removed.

### TESTING THE MOTOR WINDINGS

**⚠ WARNING**

**UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

1. Remove four screws and remove the bracket.

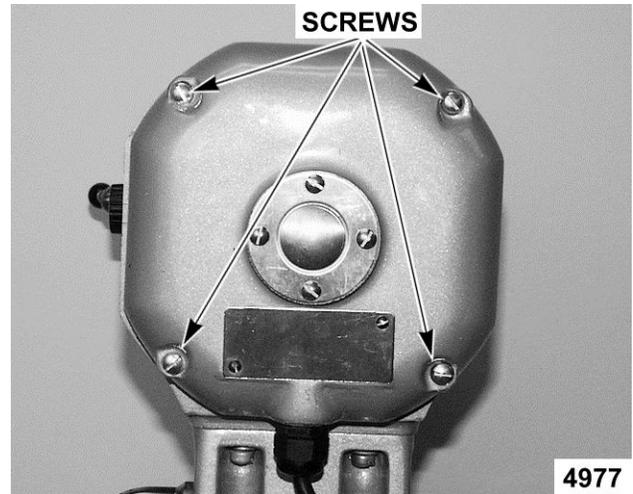


Fig. 102

2. Access the motor and test the motor windings.
  - A. The tolerance on the resistance reading is  $\pm 10\%$ . The resistance readings are based at 72° F.

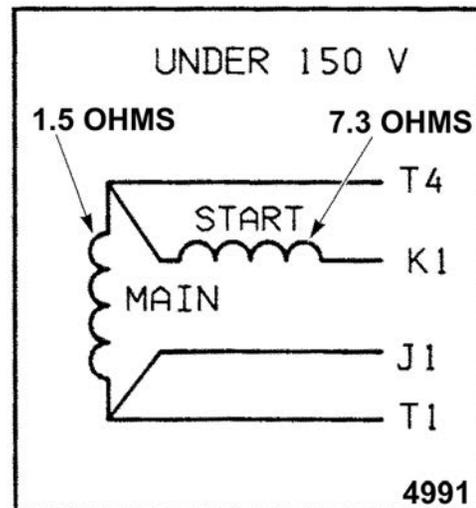


Fig. 103

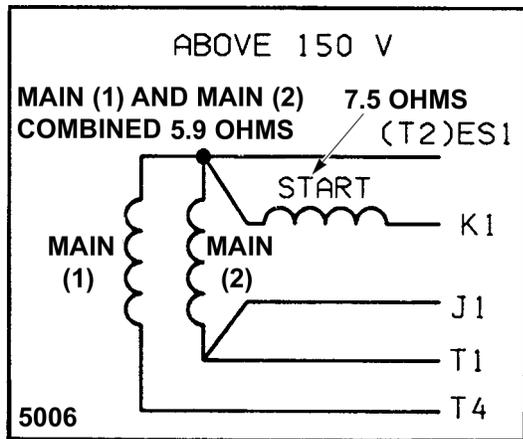


Fig. 104

- B. Check the motor no load amp. draw. Unit voltage  $120/60/1=5.3$  amps.,  $240/60/1=2.9$  amps.
- C. Check the motor leads to ground, a resistance reading of 500,000 ohms or above indicates the motor stator is not shorted to ground.
- D. Reinstall the bracket.

# ELECTRICAL OPERATION

## COMPONENT FUNCTION

- On/Off switch (1S) . . . .** Switch controls the electrical power to the motor (A120), to relay (1CR) (A200).
- (A200) Relay (1CR) ...** Controls power to motor by monitoring operating condition of bowl height sensing switch (2LS) and interlock switch (1LS).
- (A200) Bowl height sensing switch (2LS) .....** Monitors position of bowl lift handle. Ensures the bowl is fully up before mixer will run unless the "On/Off" switch is manually held in the "On" position.
- (A200) Interlock switch (1LS) .....** Monitors position of magnet on wire cage assembly. Ensures the wire cage assembly covers the bowl during mixer operation.
- Electronic start switch (ES) .....** Provides path to start windings during start-up of motor.
- Capacitor .....** The capacitor shifts electrical phase between the motor start winding and run winding so the motor will start in the proper direction.
- Motor .....** Drives transmission.
- Timer .....** Automatically shuts off mixer when the time set has elapsed. Non-timed operation is obtained by setting the dial to the "Hold" position.

## WIRING DIAGRAMS

### A200 units with bowl guard and bowl height sensing

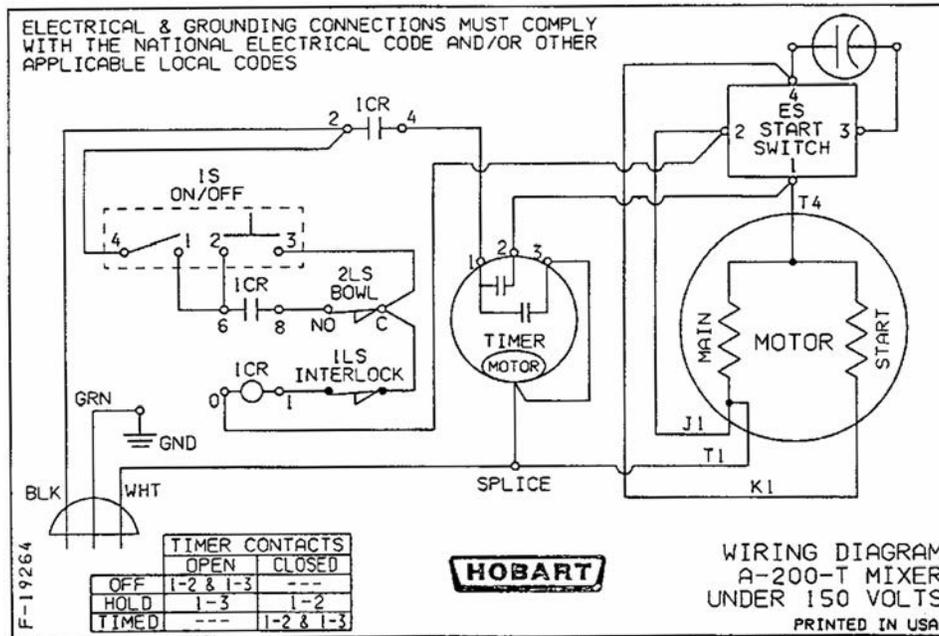


Fig. 105

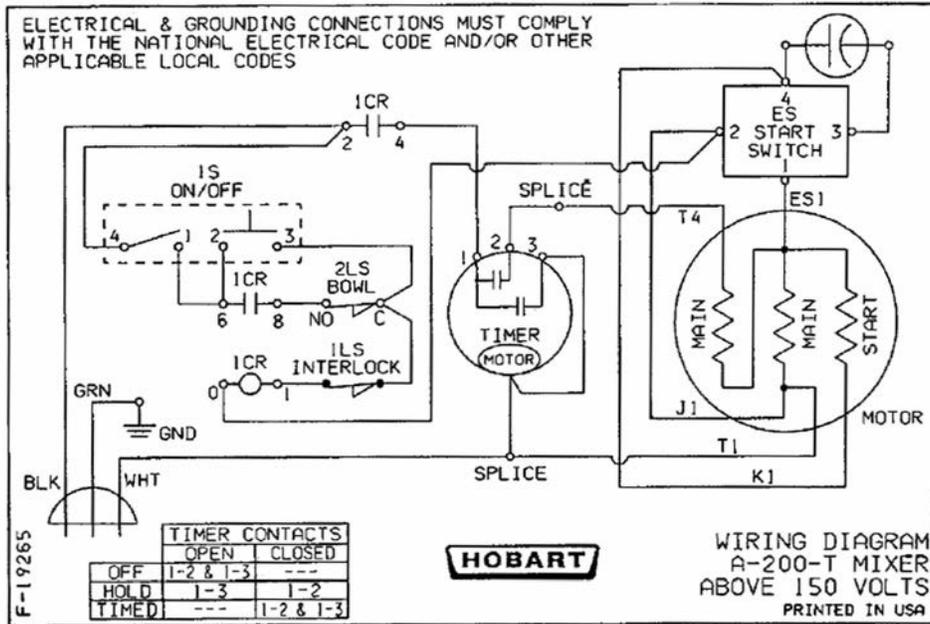


Fig. 106

A200 units with bowl guard and bowl height sensing

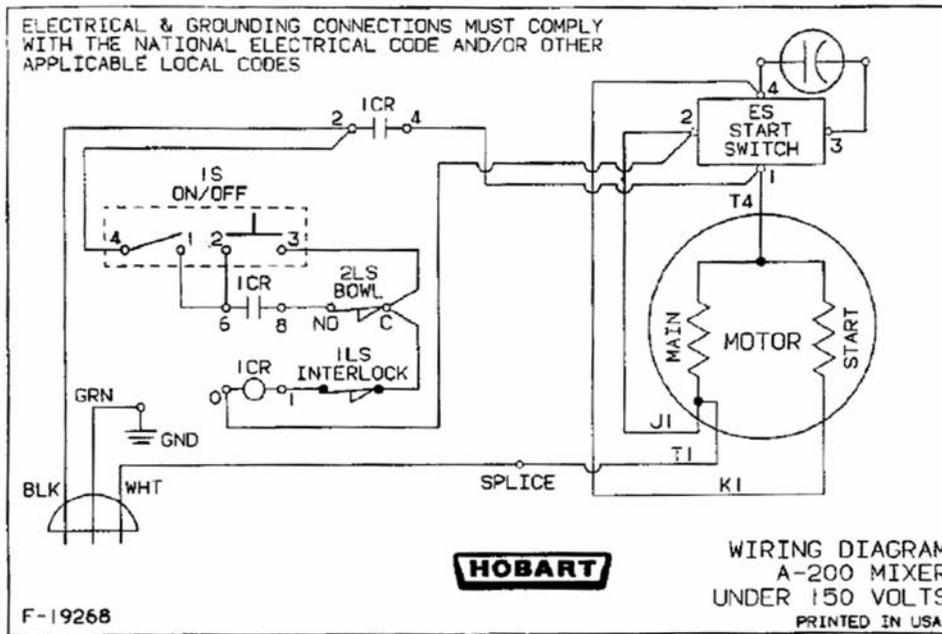


Fig. 107

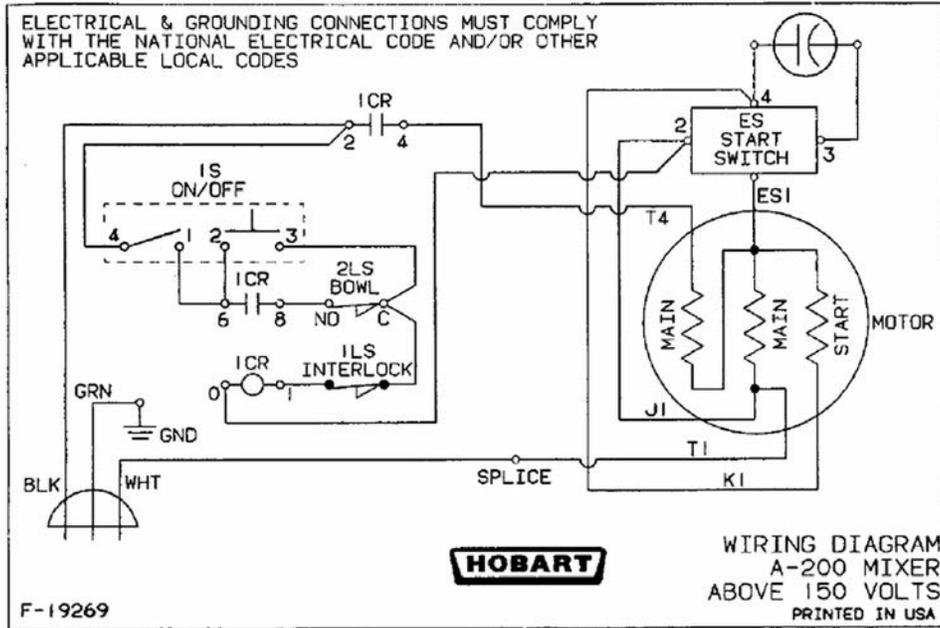


Fig. 108

A120 UNITS

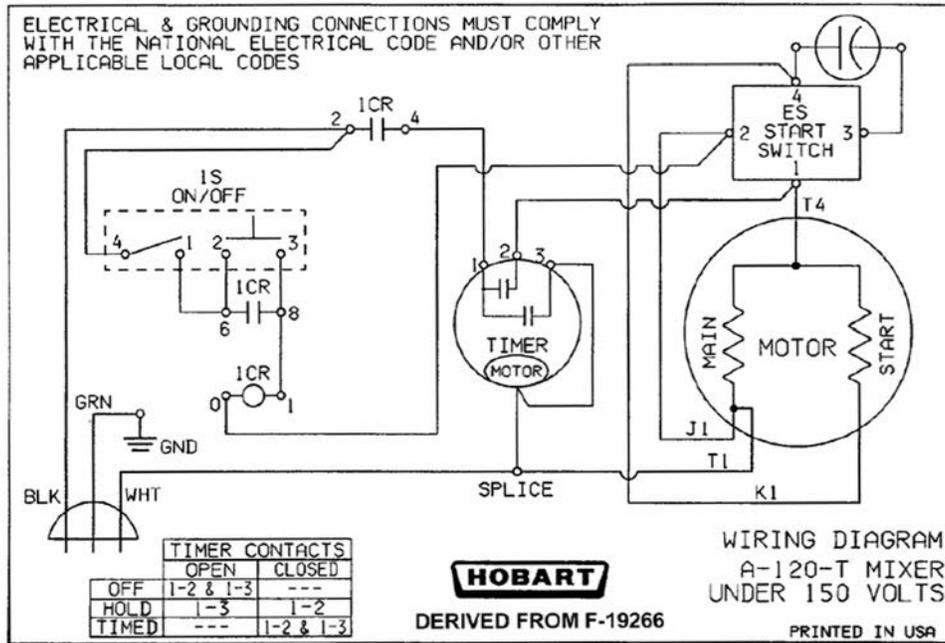


Fig. 109

# TROUBLESHOOTING

## TROUBLESHOOTING CHART

Symptom	Possible Causes
Noise in transmission.	<ol style="list-style-type: none"> <li>1. Worn or damaged gears.</li> <li>2. Improperly meshed gears.</li> <li>3. Worn or broken keys.</li> <li>4. Worm bearings.</li> </ol>
Planetary does not turn in any speed.	<ol style="list-style-type: none"> <li>1. Key sheared.                             <ol style="list-style-type: none"> <li>A. Worm on motor shaft.</li> <li>B. Worm wheel shaft.</li> <li>C. Lower key of transmission shaft.</li> <li>D. Lower key of planetary shaft.</li> </ol> </li> <li>2. Shaft broken.</li> </ol>
Agitator will not turn.	<ol style="list-style-type: none"> <li>1. Key sheared at pinion gear on agitator shaft.</li> </ol>
Attachment drive does not turn.	<ol style="list-style-type: none"> <li>1. Key sheared at attachment hub bevel drive gear.</li> <li>2. Key sheared on planetary shaft.</li> </ol>
Grease leaking from planetary.	<ol style="list-style-type: none"> <li>1. Spacer "O" ring on planetary shaft.</li> </ol>
Grease leaking from attachment hub.	<ol style="list-style-type: none"> <li>1. Quad ring in attachment hub.</li> </ol>
Grease leaking from shifter assembly.	<ol style="list-style-type: none"> <li>1. "O" ring on shift handle.</li> </ol>
Will not run, but motor hums.	<ol style="list-style-type: none"> <li>1. Capacitor.</li> <li>2. Electronic start switch.</li> <li>3. Motor.</li> </ol>
Will not run, motor does not hum.	<ol style="list-style-type: none"> <li>1. (A200) Relay (1CR).</li> <li>2. On/Off switch (1S).</li> <li>3. (A200) Interlock switch (1LS).</li> <li>4. (A200) Bowl height sensing switch (2LS).</li> <li>5. Timer (timed machine).</li> <li>6. Motor.</li> </ol>
Motor/mixer motor will not stay on with bowl up.	<ol style="list-style-type: none"> <li>1. (A200) Relay (1CR).</li> <li>2. (A200) Bowl height sensing switch (2LS).</li> </ol>
Mixer motor will not shut off at end of a timed cycle.	<ol style="list-style-type: none"> <li>1. Timer.</li> </ol>



S E R V I C E

# TECHNICAL SERVICE BULLETIN

HOBART SERVICE

TROY, OHIO 45374-0001

--Enter Product--

VOL. 1 NO. 580

April 1984

## A-120 AND A-200 SERIES MIXERS - SWITCH, TIMER, AND SWITCH PLATE SERVICE

### INTRODUCTION:

Many of the switches used on Model A-120 and A-200 Series Mixers are becoming increasingly difficult to obtain from our vendor (Arrow Hart). Therefore, we have found service replacements for these components. In some cases, the replacement components are not direct replacements for the original components, necessitating the use of service kits. During the time these switch changes were being made, a change from a spring-driven to a motor-driven timer on timed units was also made. This bulletin will identify these changes and their effects on service.

### I. SINGLE PHASE UNTIMED MODEL A-120 & A-200 SERIES MIXERS

<u>MODEL</u>	<u>NEW ML's</u>	<u>CHANGES/SERVICE IMPLICATIONS</u>
A-120	33417	New switch and switch plate which are not directly interchangeable with the old.
A-200	33424	
A-200D	33428	The old switch (87711-99-4) is no longer available.
A-200F	33430	
A-200FD	33432	

To replace 87711-99-4 switch (on machines built prior to the ML's listed above. Order and install a switch service kit, 291821.

Fig. 1

**NOTE:** The single phase thermal overload switch (87810-19-1) remains available.

The Switch Service Kit (291821) consists of the following items:

Qty.	Part Number	Description
1	87711-184-1	Toggle Switch
1	291737	Switch Plate
1	SC-27-28	Screw #8
1	WL-11-01	Lockwasher #8
1	NS-10-11	Nut #8
1	F14584	Electrical Diagram

To Install This Kit:

1. UNPLUG THE MIXER.
2. Remove the switch plate assembly by removing the screws which secure it.
3. Remove the switch by removing the screws which secure it and disconnecting the wires.

4. Assemble the new switch to the new switch plate positioning it so only one or two threads on the threaded stem of the switch are visible above the locknut.
5. Make electrical connections per the electrical diagram provided.
6. Affix the electrical diagram to the back of the switch plate.
7. Install the switch plate assembly.
8. Plug in the unit and check operation.

## II. THREE PHASE, UNTIMED A-200 MIXERS

<u>MODEL</u>	<u>NEW ML's</u>	<u>CHANGES/SERVICE IMPLICATIONS</u>
A-200	33424	New switch direct replacement for old.
A-200	33428	
A-200F	33430	Old switch (87711-57-1) no longer available. To replace the old switch (87711-57-1), order and install the new switch (87711-138-1).
A-200FD	33432	

Fig. 2

## III. A-120 AND A-200 TIMED MACHINES

<u>MODEL</u>	<u>NEW ML's</u>	<u>CHANGES/SERVICE IMPLICATIONS</u>
A-120T	33418	New switch, new motor driven timer and new switch plate which are not directly interchangeable with the old.  Old switch (87711-98-1) timer (114720), and plate (124566) are no longer available.  To replace the old switch timer, or plate (on machines built prior to the above ML numbers, order and install one of the following switch and timer service kits:  291822-1 (115V./60 Hz.) 291822-2 (230V./60 Hz.) 291822-3 (115V./50 Hz.) 291822-4 (230V./50 Hz.)
A-200T	33425	
A-200DT	33429	
A-200FT	33431	
A-200FDT	33433	

Fig. 3

These kits consist of one of the following timers.

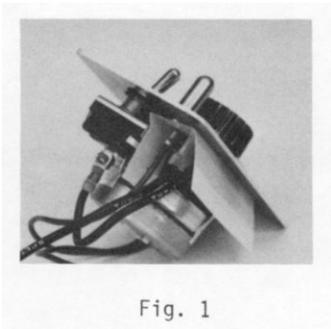
- 294650-4-5 115V./60 Hz.
- 294650-4-6 230V./60 Hz.
- 294650-4-7 115V./50 Hz.
- 294650-4-8 230V./50 Hz.

and the following other components.

Qty.	Part Number	Description
1	87711-184-1	Toggle Switch
1	291739	Switch Plate
1	291746	Insulator
1	87532-90	Lead Wire Assembly
1	87532-90	Lead Wire Assembly
1	SC-27-28	Screw #8
1	WL-11-01	Lockwasher #8
1	NS-10-11	Nut #8
1	291748	Knob
2	SC-13-07	Screw #5
1	F14585	Electrical Diagram

To Install These Kits

1. UNPLUG THE MIXER.
2. Remove the switch plate assembly by removing the screws which secure it and disconnecting the wires.
3. Assemble the switch to the switch plate positioning it so only 1 or 2 threads on the, threaded stem of the switch are visible above the locknuts.
4. Assemble the timer and insulator to the switch plate using the two #5 screws provided. (See Fig. 1).



**Fig. 4**

5. Make electrical connections using the electrical diagrams provided.
6. Affix the self adhesive electrical diagram to the timer.
7. Install switch plate assembly.
8. Plug in the mixer and check operation.

#### IV. AS-200 SERIES MIXERS, TIMED AND UNTIMED

<u>MODELS</u>	<u>NEW ML'S</u>	<u>CHANGES/SERVICE IMPLICATIONS</u>
AS-200	33426	In production, the switch cavity has been enlarged to accommodate a new motor-driven timer. The same switch is used, but a new switch plate is used to accommodate the new timer.  For service of AS-200 Mixers prior to these ML numbers, the rocker switch (87711-82-1) and the switch plates (124568 and 124570) remain available. A direct replacement spring driven timer is available under Part Number 292160. The spring driven timer (114720) is no longer available.
AS-200T	33427	
AS-200D	33434	
AS-200DT	33435	
AS-200F	33436	
AS-200FT	33437	
AS-200FD	33438	
AS-200FDT	33439	

Fig. 5



# TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT TROY, OH. 45374-0001

## MODELS A120, A120T MECHANICAL START SWITCH MOTORS AND A200 BRUSH TYPE MOTOR SERVICE KIT INFORMATION

**Purpose**

The motor used in the A120 and A120T models (ML-38734 and ML-38735) has been discontinued. It can be replaced with a Hobart motor that uses an electronic start switch.

A200 brush type motors can be replaced with the Hobart motor, with the electronic start switch.

Kits are available based on the voltage, hertz and phase. An additional kit, part number 873724, is required for replacement of the A200 brush type motor.

**Parts Information**

If individual parts are required for the previous motor on the A120 and A120T models, refer to parts catalog F-16967 (9-88) page 12. **If a stator or rotor is required a Kit Part Number ML38777 + Voltage Code must be ordered.**

When a kit is installed on an A120 and A 120T model the available service parts will match those shown in A120 parts catalog F-16967 (9-88) page 14.

**Kit Information**

When a **kit** is installed on an A200 that had a brush type motor, the available service parts will match those shown in A200 parts catalog F-16968 (9-88) page 15.

The **kit (ML-38777 + Voltage Code)** consists of the following parts.

----- Indicates it is not a service part.

VOLTAGE CODES
A = 115/60/1
B = 200/60/1
C = 230/60/1
L = 115/50/1
M = 220/50/1

PART NO.	DESCRIPTION	VOLTAGE CODE	QTY.
22275-274	Rotor Assembly	All	1
65477-065-1	Stator 115/60/1	A	1
65477-065-8	Stator 200-230/60/1	B, C	1
65477-065-4	Stator 115/50/1	L	1
65477-065-9	Stator 220/50/1	M	1
438536-2	Bearing Bracket	All	1
SC 012-59	Screw	All	4

PART NO.	DESCRIPTION	VOLTAGE CODE	QTY.
BB 005-30	Ball Bearing	All	1
SC 018-77	Screw	All	1
WL 003-9	Lockwasher	All	1
70487-18	Capacitor	All	1
271937	Capacitor Retaining Clip	All	1
271612-2	Electronic Start Switch	All	1
271794-1	Standoff	All	2
SC 009-64	Screw	All	2
-----	Lead Wire Assembly	All	2
-----	Lead Wire Assembly	A, L	1
-----	A200 Wiring Diagram F-19268 under 150 volts (with bowl guard)	A, L	1
-----	A120/A200 Wiring Diagram F-16931A under 150 volts (without bowl guard)	A, L	1
-----	A200 Wiring Diagram F-19269A above 150 volts (with bowl guard)	B, C, M	1
-----	A120/A200 Wiring Diagram F-16932A above 150 volts (without bowl guard)	B, C, M	1
-----	A200T Wiring Diagram F-19264 under 150 volts (with bowl guard)	A, L	1
-----	A120T/A200T Wiring Diagram F- 16933A under 150 volts (without bowl guard)	A, L	1
-----	A200T Wiring Diagram F-19265 above 150 volts (with bowl guard)	B, C, M	1
-----	A120T/A200T Wiring Diagram F- 16934A above 150 volts (without bowl guard)	B, C, M	1

If replacing an A200 brush type motor an additional kit part number 873724 must be ordered.

The kit consists of the following parts.

PART NO.	DESCRIPTION	QTY.
13174-1	Grease Deflector	1
12671	Stator Retainer	4
66622-1	Capacitor End Cap	1
BB 17-5	Ball Bearing (rear)	1
294306-1	Hub Cover Cap	1
12669	Bearing Spacer	1
SC 10-32	Screw	4
24464	Cover Cap Gasket	1
FE 4-03	Electrical Cover	1

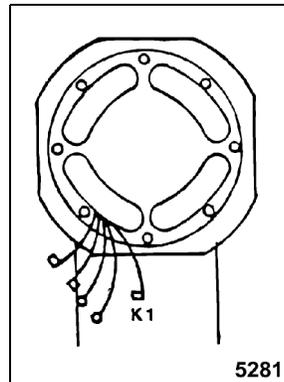
### Service Information

Refer to A120/A200 Service Manual F-4604B (Rev. 12/86).

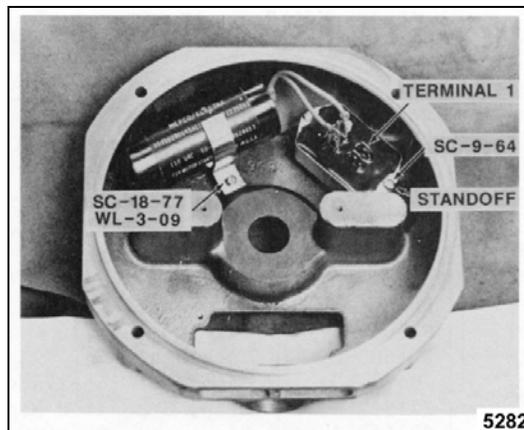
### Installation Instructions

#### WARNING: UNPLUG UNIT BEFORE SERVICING

1. Remove old rotor and stator as outlined in the service manual.
2. Install bearing, grease deflector, worm and associated hardware to the new rotor.
3. Install new stator as shown below.



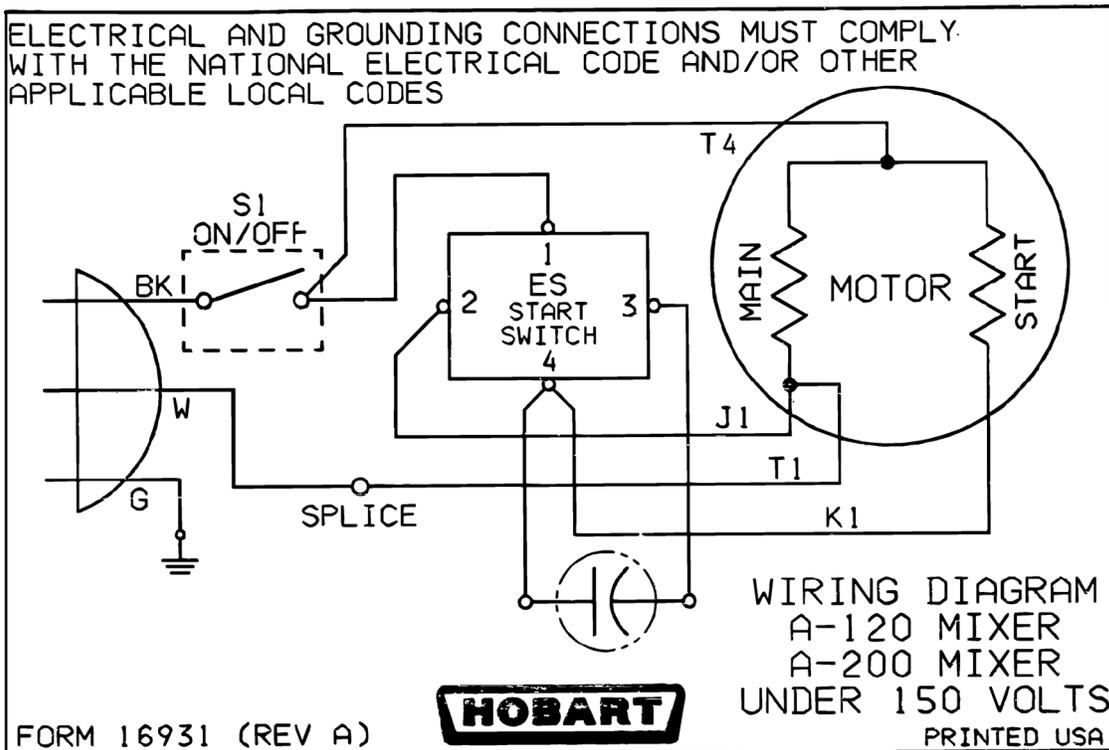
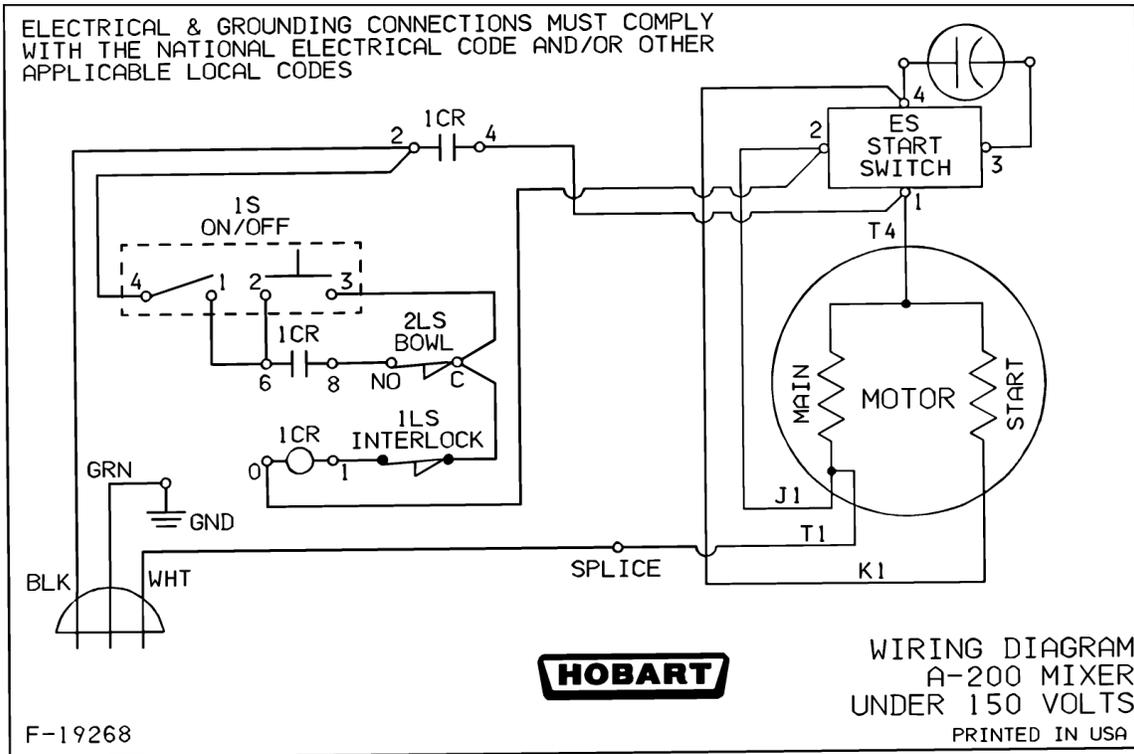
4. Install new rotor.
5. Assemble capacitor and electronic start switch to bearing bracket as shown.



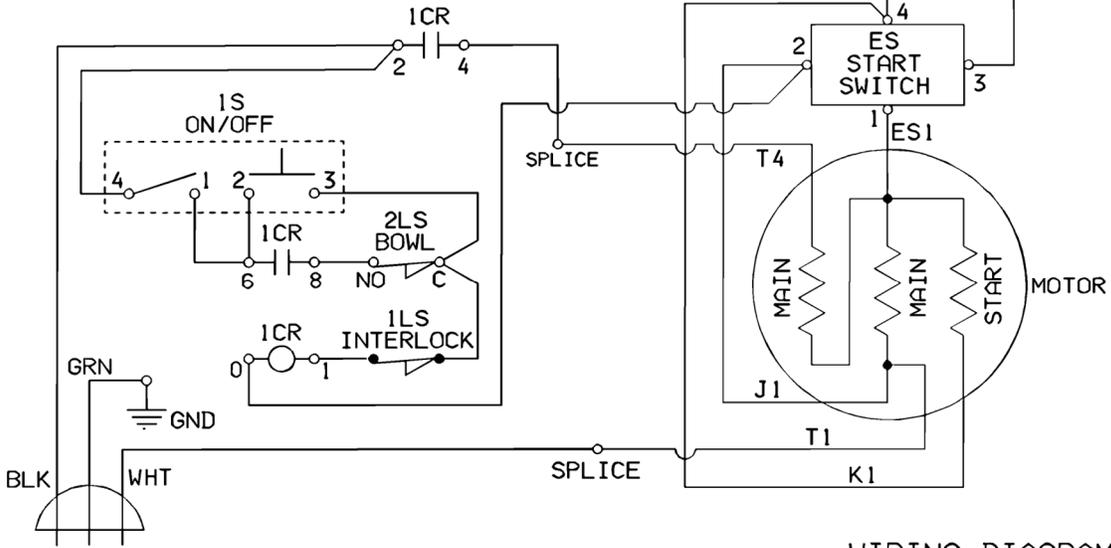
6. Connect all wiring according to the appropriate wiring diagram and install bearing bracket.
7. Attach new wiring diagram over the existing diagram.
8. Test unit for proper operation.

### Wiring Diagrams

The proper wiring diagram is determined by the mixer voltage, if it does or does not have a timer and if it does or does not have a bowl guard.



ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES

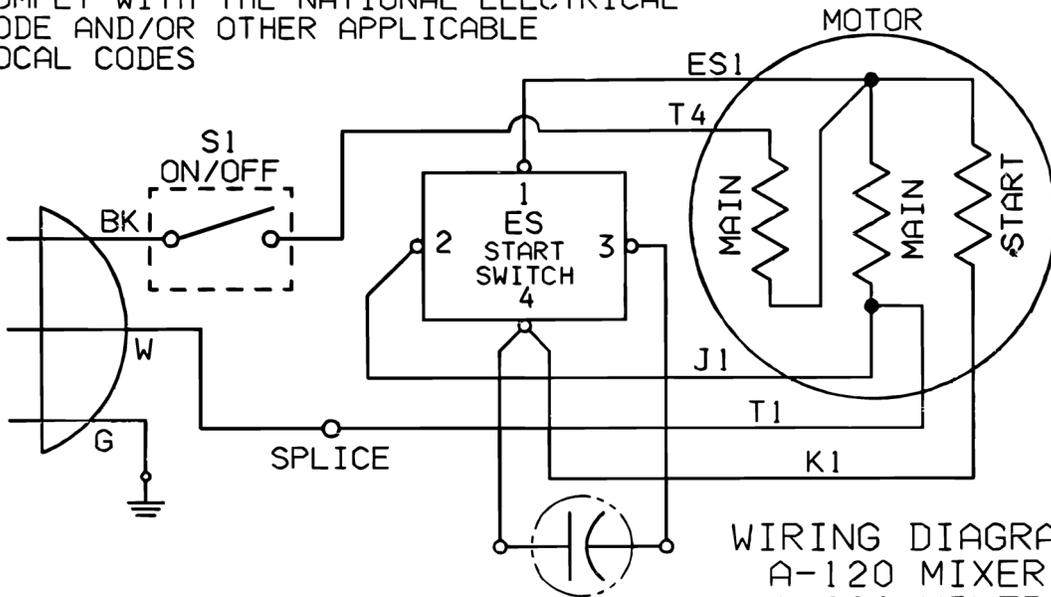


**HOBART**

WIRING DIAGRAM  
A-200 MIXER  
ABOVE 150 VOLTS  
PRINTED IN USA

F-19269A

ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES

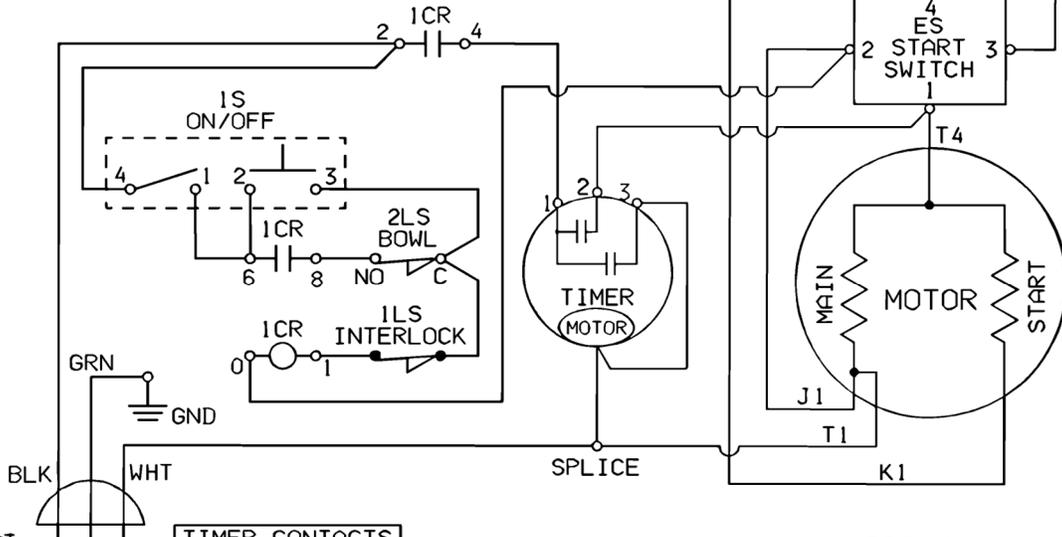


**HOBART**

WIRING DIAGRAM  
A-120 MIXER  
A-200 MIXER  
ABOVE 150 VOLTS  
PRINTED USA

FORM 16932 (REV A)

ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES

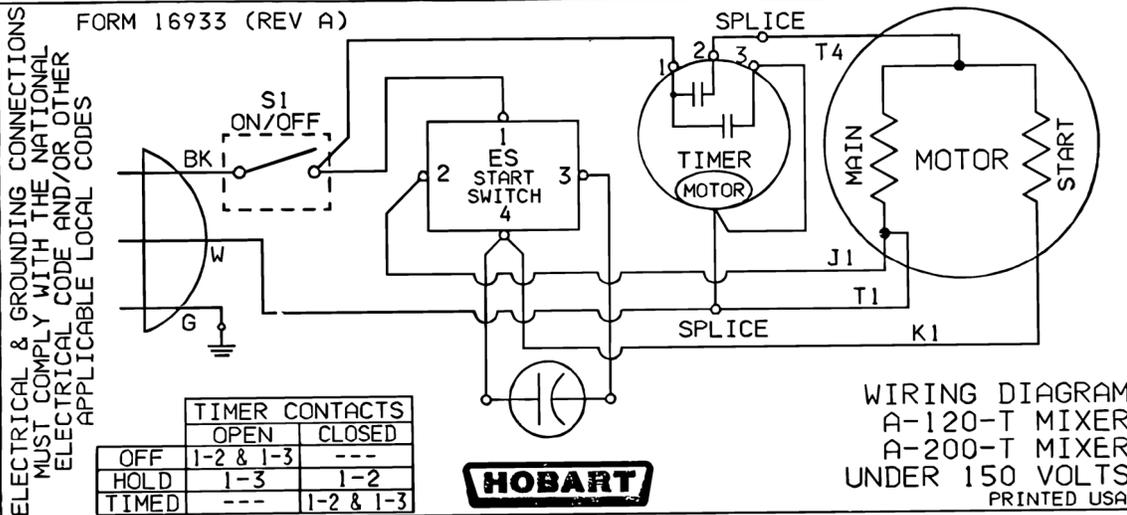


F-19264

	TIMER CONTACTS	
	OPEN	CLOSED
OFF	1-2 & 1-3	---
HOLD	1-3	1-2
TIMED	---	1-2 & 1-3

**HOBART**

WIRING DIAGRAM  
A-200-T MIXER  
UNDER 150 VOLTS  
PRINTED IN USA



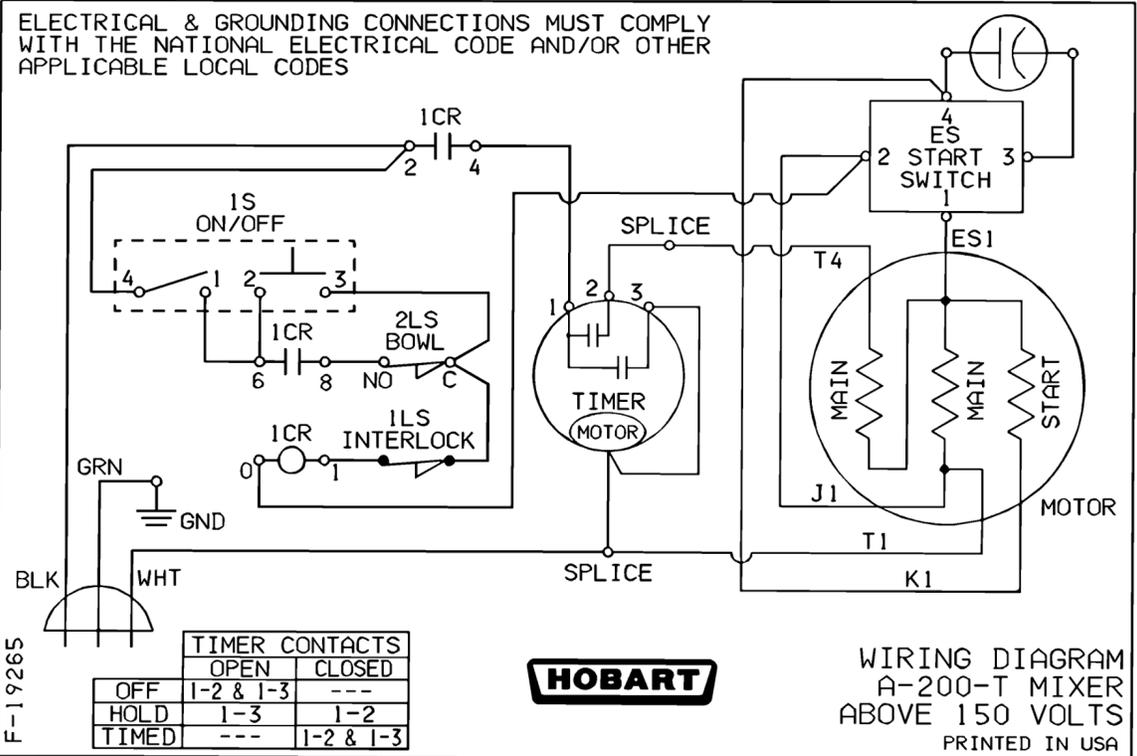
ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES

	TIMER CONTACTS	
	OPEN	CLOSED
OFF	1-2 & 1-3	---
HOLD	1-3	1-2
TIMED	---	1-2 & 1-3

**HOBART**

WIRING DIAGRAM  
A-120-T MIXER  
A-200-T MIXER  
UNDER 150 VOLTS  
PRINTED USA

ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES

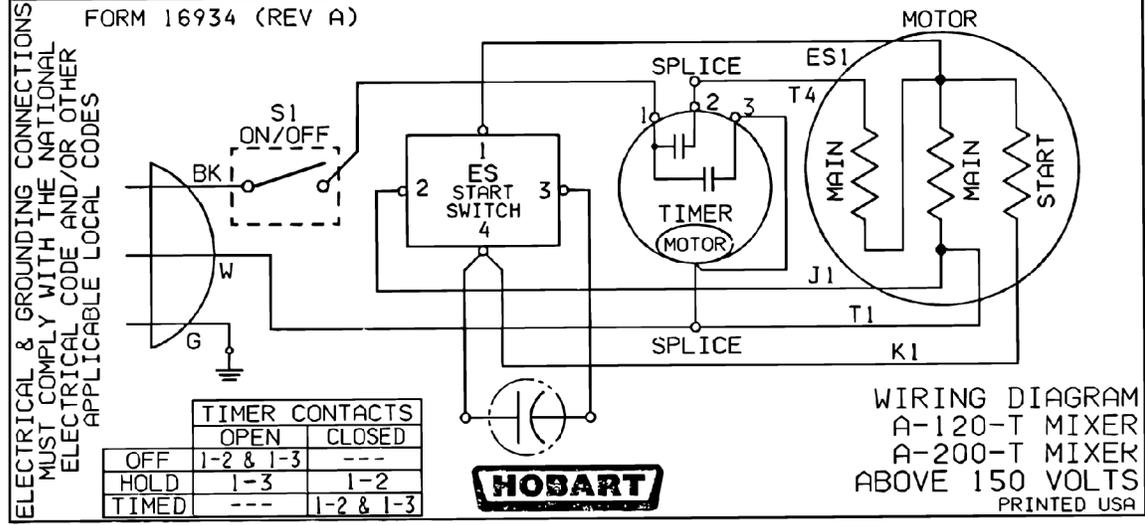


F-19265

	TIMER CONTACTS	
	OPEN	CLOSED
OFF	1-2 & 1-3	---
HOLD	1-3	1-2
TIMED	---	1-2 & 1-3



WIRING DIAGRAM  
A-200-T MIXER  
ABOVE 150 VOLTS  
PRINTED IN USA



ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES

	TIMER CONTACTS	
	OPEN	CLOSED
OFF	1-2 & 1-3	---
HOLD	1-3	1-2
TIMED	---	1-2 & 1-3



WIRING DIAGRAM  
A-120-T MIXER  
A-200-T MIXER  
ABOVE 150 VOLTS  
PRINTED USA

## TECHNICAL SERVICE BULLETIN

**NATIONAL SERVICE DEPARTMENT**

TROY, OHIO 45374

A-200 MIXER - ELECTRONIC START SWITCH AND NEW STATOR ORIENTATION

Background and New ML Numbers

A-200 Mixers with the following ML numbers utilize an electronic start switch in place of the mechanical (stationary and rotating) start switch.

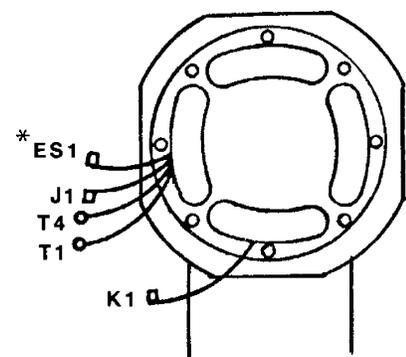
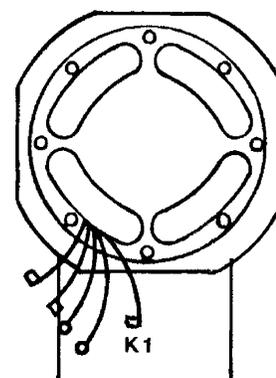
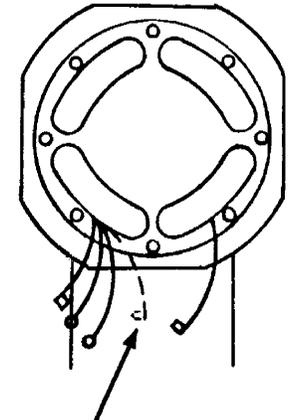
- A-200 - ML-38906
- A-200T - ML-38907
- A-200DT - ML-38908
- A-200FT - ML-38909

Service parts will remain available for the A200 Mixers using the mechanical start switch. Refer to current "Catalog of Replacement Parts" for part numbers of both style switches.

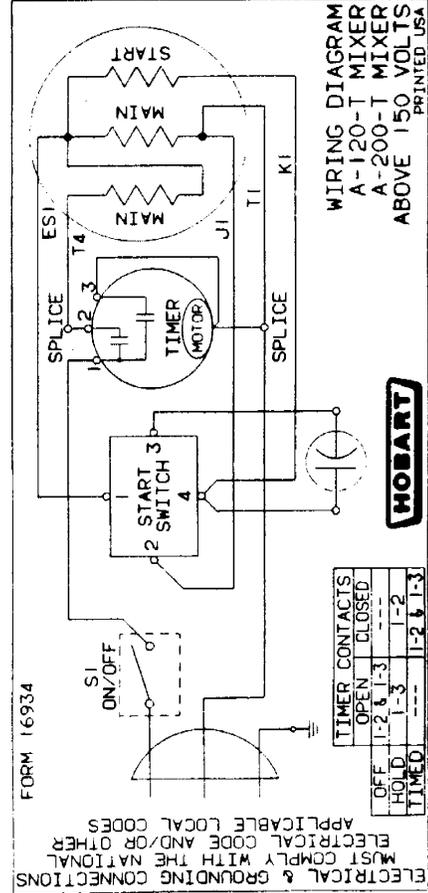
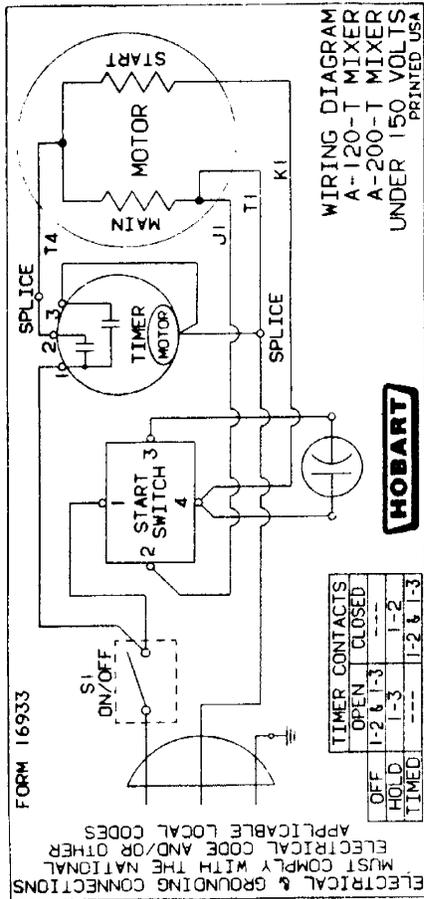
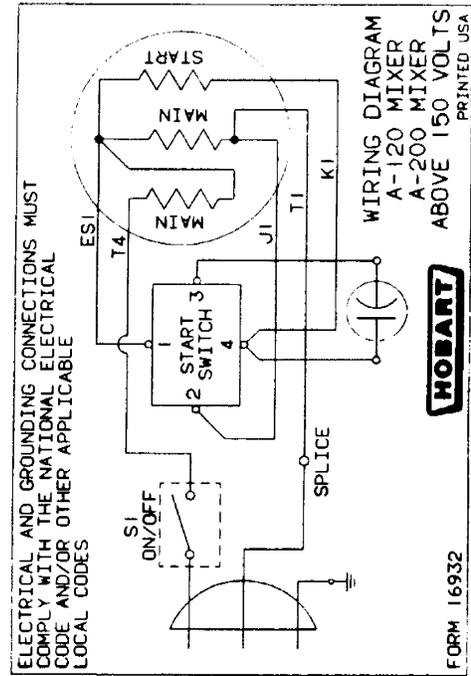
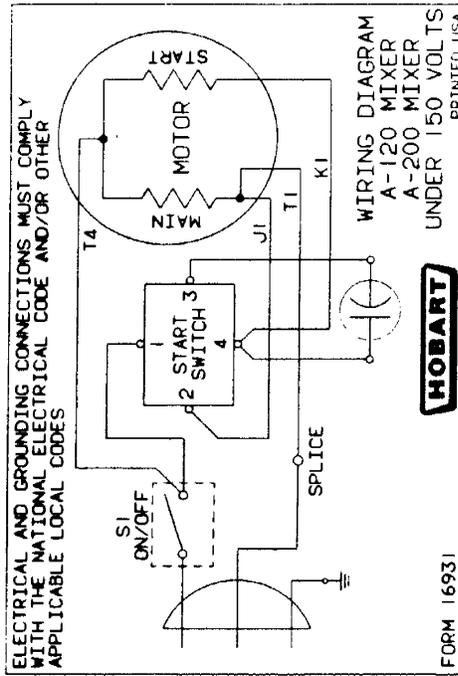
NOTE: The AS-200 has not been changed.

Service Notes

- . Wiring may exit the stator windings in two different locations, even though the part number is the same. Orientation of the stator is determined by the location of the wires.
- . Re-install the stator according to instructions below to prevent damage to the wiring.

<p>If mixer has an <u>electronic start switch</u> with K1 lead as shown, position stator as shown.</p>  <p style="text-align: center;">* ES1 IS ONLY ON STATORS ABOVE 150 VOLT WITH ELECTRONIC START SWITCH</p>	<p>If mixer has an <u>electronic start switch</u> with K1 lead as shown, position stator as shown.</p> 	<p>If mixer has a <u>mechanical start switch</u>, position stator as shown.</p>  <p style="text-align: center;">ALTERNATE POSITION FOR K1</p>
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# Wiring Diagrams





S E R V I C E

# TECHNICAL SERVICE BULLETIN

HOBART SERVICE

TROY, OHIO 45374-0001

Mixers

VOL. 1 NO. 751

December 1988

## MODEL A-120, A-120T MIXERS - ELECTRONIC START SWITCH CONVERSION KIT #271927

### PURPOSE OF KIT

The mechanical start switch (stationary, Part No. 111688-5 and rotating, Part No. 109222-16) is no longer used in production. When service stock is depleted on these parts, the mixer will have to be converted to the electronic start switch.

### VOLTAGE REQUIREMENTS

This Service Kit is only for low voltage (below 150 volts) applications. For mixers above 150 volts, it will be necessary to replace the entire motor. Refer to TSB-733D for part numbers and replacement instructions.

### PART NUMBERS

The Service Kit (271927) consists of the following parts.

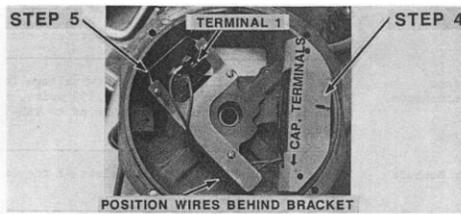
Part No.	Description	Qty.
271612-1	Electronic Start Switch	1
271924	Bracket, Start Switch	1
SD-24-13	Screw, 8-32 x 3/8"	2
87532-178	Lead Wire (Non-Timed Only)	1
87532-185	Lead Wire (Timed Only)	1
87525-635	Lead Wire	1
87525-638	Lead Wire	1
F-16950	Wiring Diagram (Non-Timed Only)	1
F-16951	Wiring Diagram (Timed)	1
522898	Wire Tie	1

Parts are included for both timed and non-timed machines.<NL >Discard the parts not required for your machine.

### INSTALLATION INSTRUCTIONS

**⚠ WARNING** UNPLUG UNIT BEFORE SERVICING.

1. Remove the switch plate and bearing bracket.
2. Remove and discard rotary actuator from rotor.
3. Remove and discard the stationary start switch and insulator. Save hardware to mount new switch bracket later.
4. Remove capacitor from its present location, attach lead wires from Service Kit and remount capacitor on other side of bearing bracket as shown.

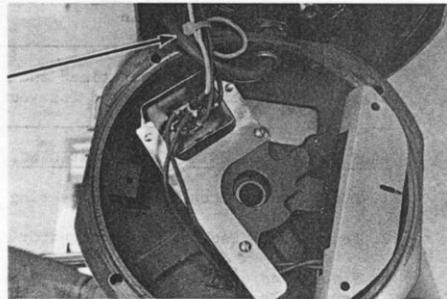


**Fig. 1**

- Assemble start switch to its mounting bracket and mount to bearing bracket as shown.

Fig. 1

- Select proper lead wire (87532-185, timed or 87532-178, non-timed) from Service Kit. See chart with wiring diagrams for wire descriptions. Route wire from rear of mixer along side existing wiring to switch compartment and attach per appropriate wiring diagram.
- Attach remaining lead wires to start switch per wiring diagram. Coil excess wire from white lead and tie with wire tie from Service Kit as shown.

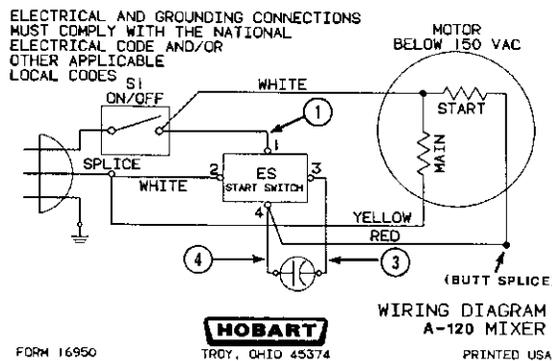


**Fig. 2**

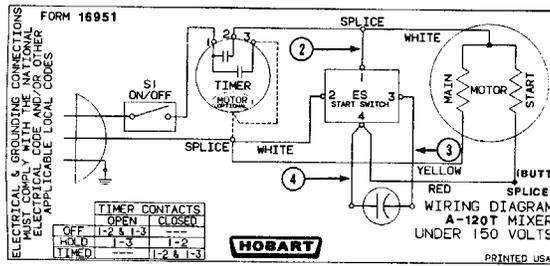
- Attach appropriate wiring diagram to inside of switch plate, reassemble and test mixer.

## WIRING DIAGRAMS

Part No.	Color	Length	Brand
87532-178	Black	14"	S1 - ES1
87532-185	Black	14"	Splice - ES1
87525-635	Red	7"	ES3 - CAP
87525-638	red	7"	ES4 - CAP



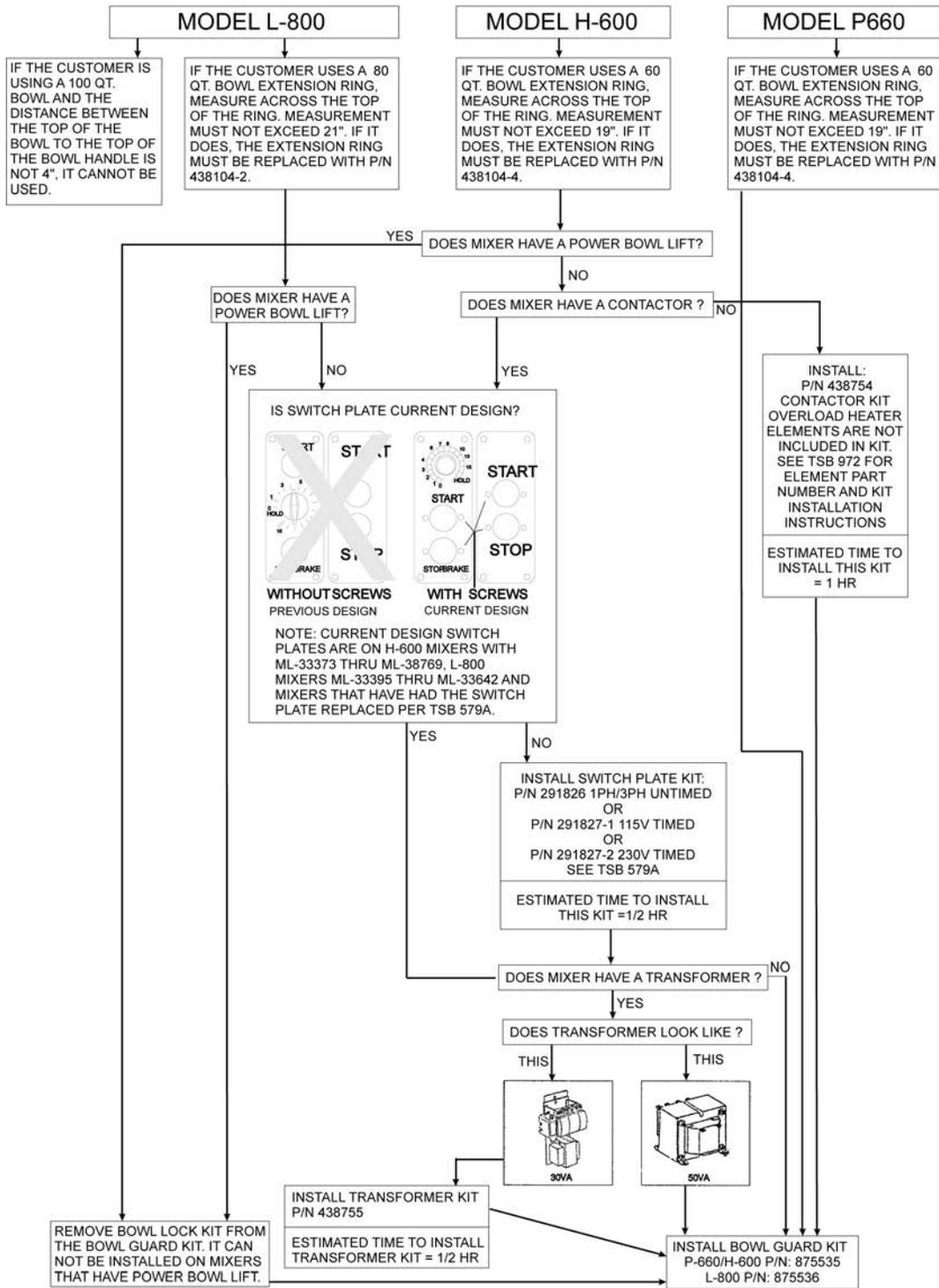
## A-120 MIXER



**A-120T MIXER**

# FLOW CHARTS

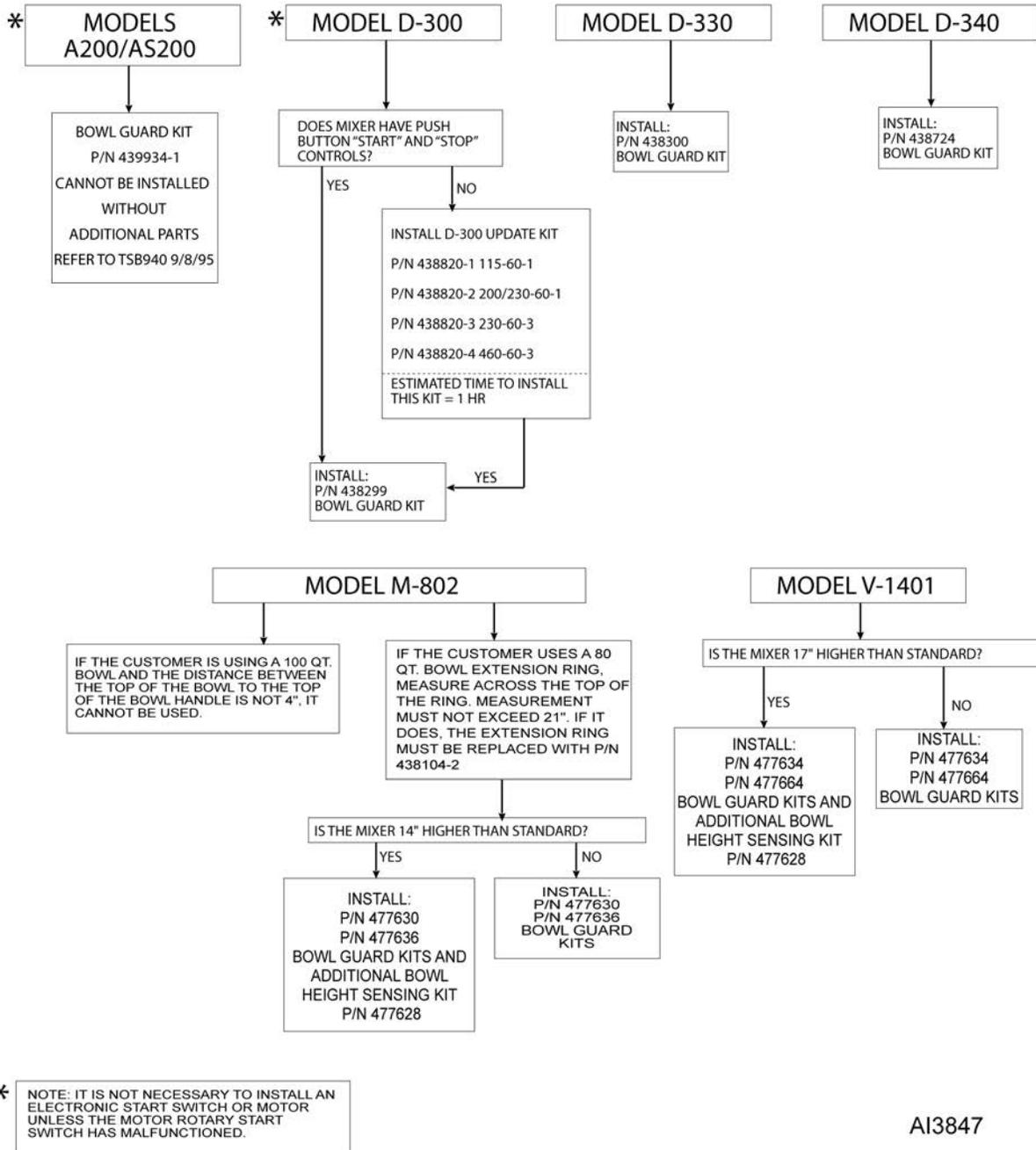
## BOWL GUARD KIT FLOW CHART



AI3844

Fig. 1

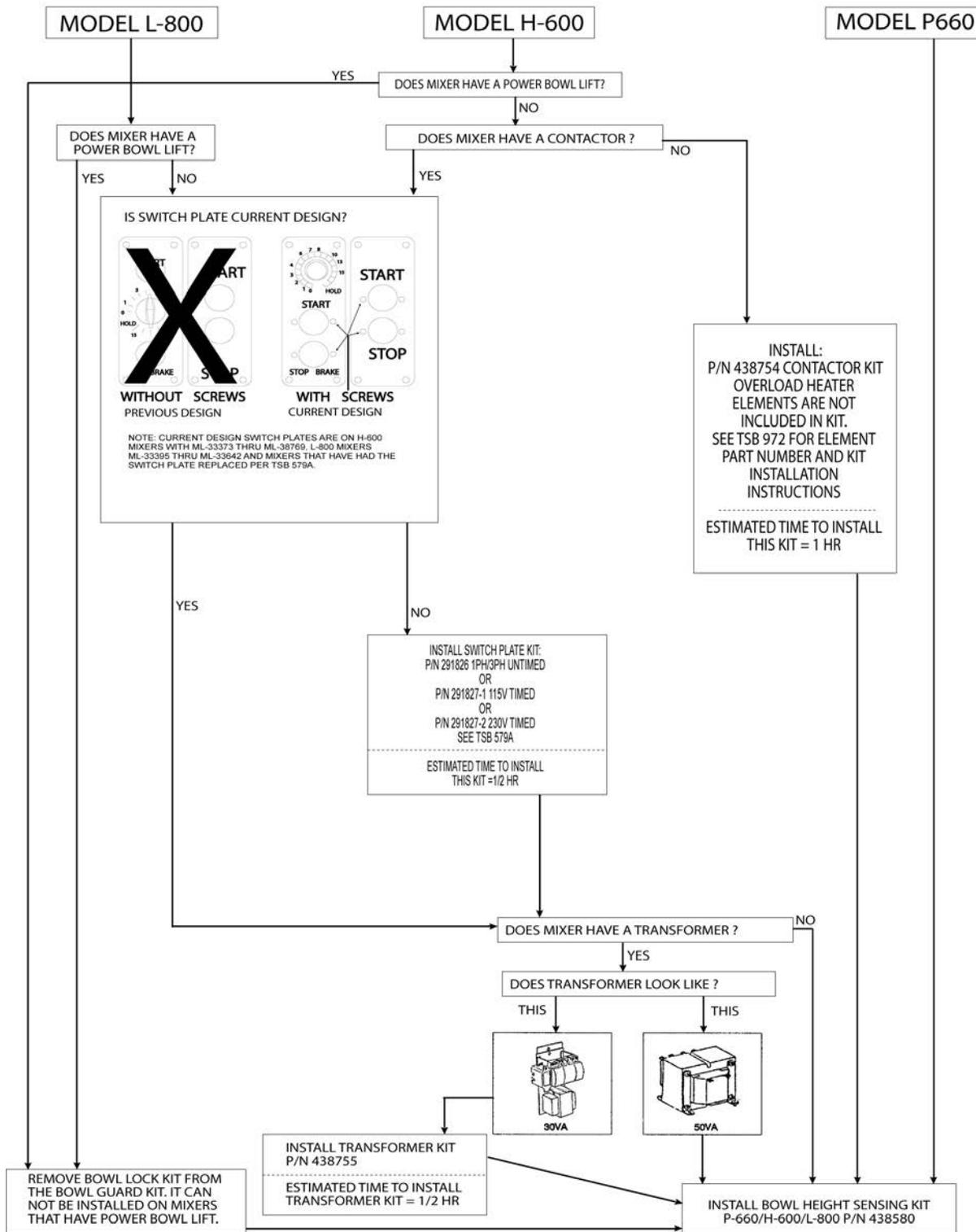
## BOWL GUARD KIT FLOW CHART



AI3847

Fig. 2

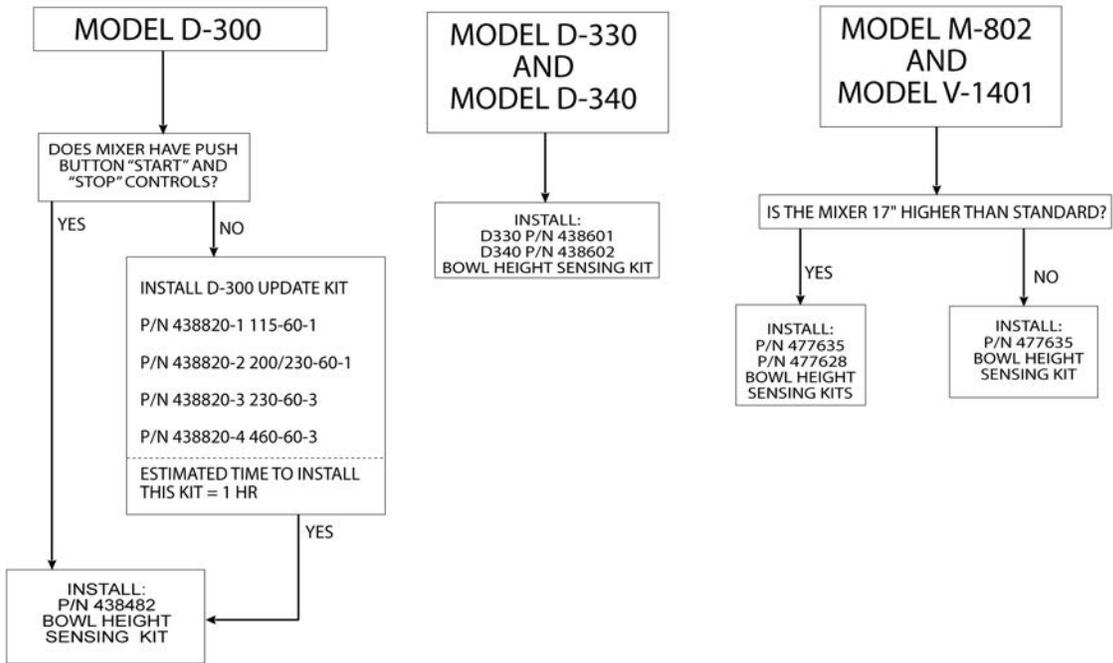
# BOWL HEIGHT SENSING KIT FLOW CHART



AI3845

Fig. 3

# BOWL HEIGHT SENSING KIT FLOW CHART



AI3846

Fig. 4





S E R V I C E

**TECHNICAL SERVICE BULLETIN**

HOBART SERVICE

TROY, OHIO 45374-0001

**MODELS A200, A200T, A200DT & A200FT BOWL GUARD INTRODUCTION**

MODEL AND NEW ML NUMBERS
A200 - ML-104567-Painted
A200T - ML-104568 Painted, Timed
A200DT -ML-104569 - Deluxe, Timed
A200FT - ML-104570 - Painted, Timed

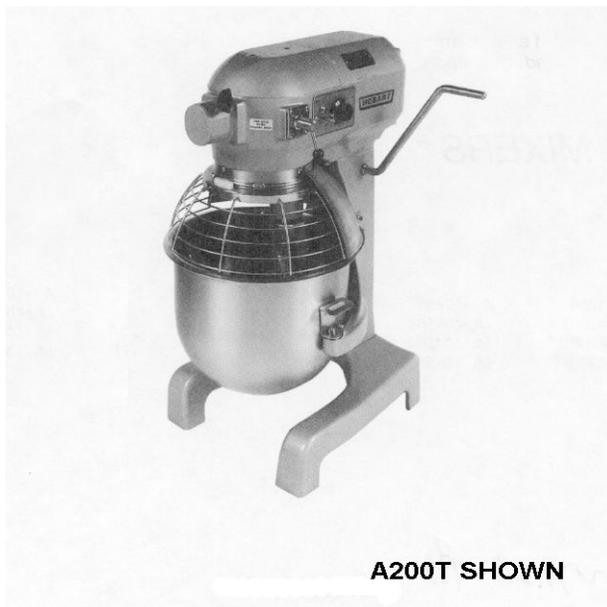


Fig. 1

**PRODUCTION CHANGES**

Current production units built under the above ML's now include:

- Bowl Guard - Covers the bowl during mixer operation.
- Bowl Height Sensing - insures the bowl is fully up before the mixer will run unless the On/Off switch is manually held in the momentary "ON" position.

**PREVIOUSLY BUILT UNITS**

In the future information will be furnished to add these features to previously built units.

**SERVICE PARTS**

Refer to Parts Manual F-19357.

**REFERENCE MATERIAL**

Service Manual F-4604B (Rev. 12/86)

## TOOLS

Reed switch gauge, part no. 437215

## REPLACEMENT OF ELECTRICAL PARTS UNIQUE TO BOWL GUARD AND BOWL HEIGHT SENSING FEATURES

### RELAY (1CR)

**⚠ WARNING** UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Free the motor bearing bracket from the transmission case and the rotor assembly. Carefully pull it out to expose the relay wiring.
  - A. Note the location of the wires and disconnect them.

#### Relay (1CR)

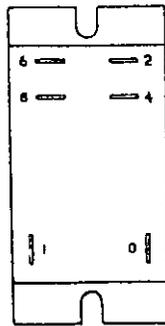


Fig. 2

2. Remove the two mounting screws.
3. Reassemble in reverse order.
4. Check for proper operation.

### INTERLOCK SWITCH (1LS)

**⚠ WARNING** UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Lower bowl support.
2. Remove agitator and bowl.
3. Remove wire cage assembly.

**NOTE:** The Interlock switch is assembled into the pedestal assembly. Accessing the part and wiring connections requires splitting of the transmission case and the pedestal assembly. It is recommended that when the unit is placed on the floor for disassembly, supports are placed under the two assemblies to aid in alignment during reassembly. The supports should be covered to prevent damage to the finish.

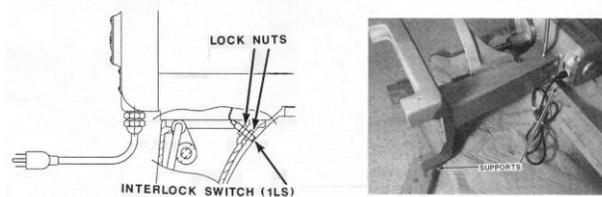
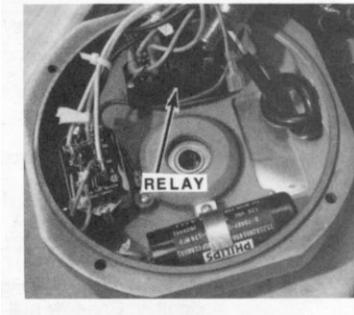


Fig. 3

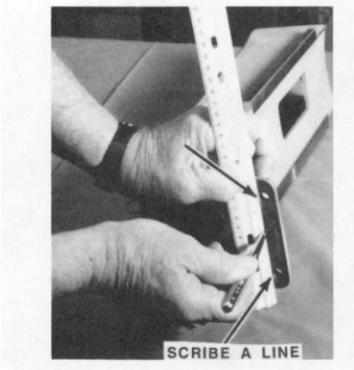
4. Place the side of the mixer opposite the controls on the floor and install supports under the assemblies.

5. Free the motor bearing bracket from the transmission case and the rotor assembly. Carefully pull it out to expose the relay wiring.
  - A. Disconnect the interlock switch wire from terminal 1 on the relay.

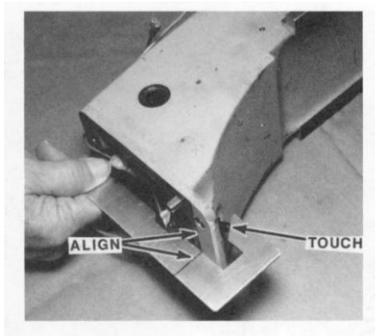


**Fig. 4**

- B. Cut off wire tie.
6. Free pedestal assembly from transmission case and carefully split them far enough apart to access the interlock switch and the wiring connection at the common of the bowl height sensing switch (2LS).
  - A. Disconnect the wire.
    - A. Pull the other wire disconnected in step 7A from the slot in the bottom of the transmission case.
    - B. Unscrew the nuts from the interlock switch and unscrew the interlock switch from the pedestal.
      - 1) Before installing the replacement interlock switch, check the switch with a meter for proper operation by holding the wire cage magnet approximately 3/32" away from the switch.
    - C. With the replacement switch installed in the pedestals without the wires connected, and the nuts loose adjust the switch as follows.
      - 1) Go to the top front of the pedestal and scribe a line between the outer edges of the two front transmission mounting holes.
        - a. Holding the reed switch gauge on the pedestal above the reed switch align the vertical line on the gauge at 90° to the line scribed on the pedestal.
      - 2) Turn the reed switch until it just touches the gauge and tighten the nuts.



**Fig. 5**



**Fig. 6**

- 3) Recheck the reed switch adjustment.

**NOTE:** The switch plate assembly is being removed so that when the transmission case and pedestal assembly are reassembled the slack in the wiring to the switch plate assembly and motor bearing bracket can be taken up, to avoid pinching of wires.

- D. Free switch plate assembly from transmission case.
- E. Reassemble in reverse order.
- F. Check for proper operation of the interlock switch.
  - 1) Mixer must run with the wire cage assembly centered and the bowl support is in the up position.
  - 2) Mixer must stop when cage is rotated.
  - 3) Mixer must not run with the wire cage assembly removed.

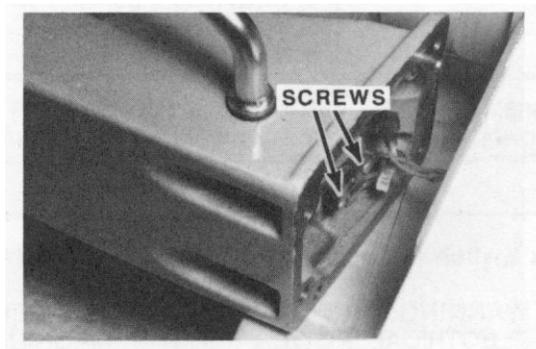
#### **BOWL HEIGHT SENSING SWITCH (2LS)**

**CAUTION** UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Lower bowl support.
2. Remove agitator and bowl.
3. Remove wire cage assembly.
4. Remove splash guard assembly.

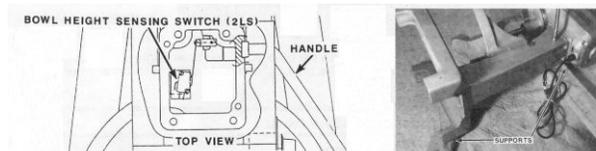
**NOTE:** The Bowl Height Sensing Switch is assembled into the pedestal assembly. Accessing the part and wiring connections requires splitting of the transmission case and the pedestal assembly. It is recommended that when the unit is placed on the floor for disassembly, supports are placed under the two assemblies to aid in alignment during reassembly. The supports should be covered to prevent damage to the finish

5. Place the side of the mixer opposite the controls on the floor and install supports under the assemblies.
6. Free the pedestal assembly from transmission case and carefully split them apart to access the bowl height sensing switch and the wiring connections.
  - A. Note the wiring connections and disconnect them.
7. Remove two screws to remove the switch and switch insulator.



**Fig. 7**

8. Continuity check the switch prior to re-assembly.
9. Free the switch plate assembly and the motor bearing bracket from the transmission case. Take up the slack in the wiring to these parts to avoid pinching of wires.
10. Reassemble in reverse order.
11. Check for proper operation of bowl height sensing.
  - A. Bowl down position and wire cage assembly centered. Push "ON/OFF" switch to "ON" position and hold - mixer runs.
    - 1) Release switch - mixer stops.
  - B. Bowl up position and wire cage assembly centered. Push "ON/OFF" switch to "ON" position and release - mixer runs.
  - C. Lower bowl from up position with the mixer running, mixer stops.



**Fig. 8**

#### **WIRE CAGE ASSEMBLY ADJUSTMENT**

**⚠ WARNING** UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Rotate wire cage assembly within splash guard assembly, checking for binding or being too loose.
  - A. Loosen the two screws holding the adjustable shoe to the cage assembly.
  - B. Turn the adjusting screw. Press the shoe to ensure it is against the screw, then tighten the mounting screws. Repeat this step until proper adjustment is achieved.

#### **INTERLOCK SWITCH (1LS) ADJUSTMENT**

**⚠ WARNING** UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT INDICATING THE CIRCUIT IS BEING SERVICED.

1. Adjust interlock switch by following the steps in the replacement procedure.

#### **TROUBLESHOOTING**

This chart is unique to units with the bowl guard and bowl height sensing and should be used in conjunction with the troubleshooting procedure found in other service literature.

SYMPTOM	POSSIBLE CAUSES
Will not run, but motor hums.	<ol style="list-style-type: none"> <li>1. Motor</li> <li>2. Electronic start switch.</li> <li>3. Capacitor.</li> </ol>
Will not run, motor does not hum.	<ol style="list-style-type: none"> <li>1. Relay (1CR).</li> <li>2. On/Off switch (1S).</li> <li>3. Interlock switch (1LS).</li> <li>4. Bowl height sensing switch (2LS).</li> <li>5. Timer (timed machine).</li> <li>6. Motor.</li> </ol>
Motor/mixer runs, will not stay on with bowl up.	<ol style="list-style-type: none"> <li>1. Relay (1CR)</li> <li>2. Bowl height sensing switch (2LS).</li> </ol>

Fig. 9

**TO CHECK RELAY (1CR), INTERLOCK SWITCH (1LS), AND BOWL HEIGHT SENSING SWITCH (2LS)**

**⚠ WARNING** UNPLUG UNIT BEFORE SERVICING OR DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove four screws in motor bearing bracket.
2. Carefully slide the motor bearing bracket and rotor assembly away from the transmission case to access the component wiring and troubleshoot the component per the appropriate wiring diagram.

**WIRING DIAGRAMS**

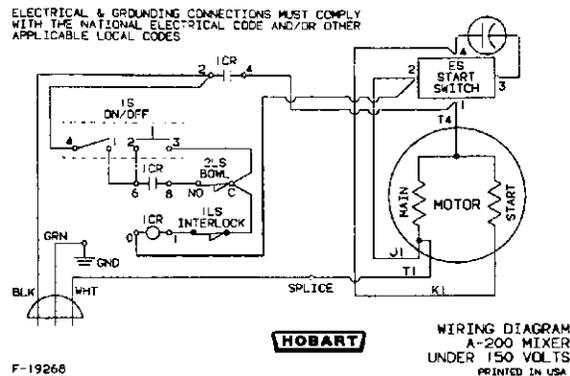
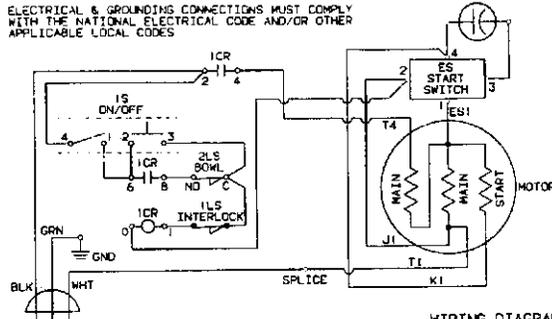


Fig. 10

ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES



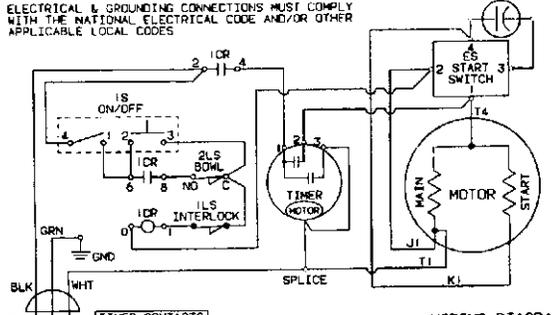
**HOBART**

WIRING DIAGRAM  
A-200 MIXER  
ABOVE 150 VOLTS  
PRINTED IN USA

F-19269

Fig. 11

ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES



**HOBART**

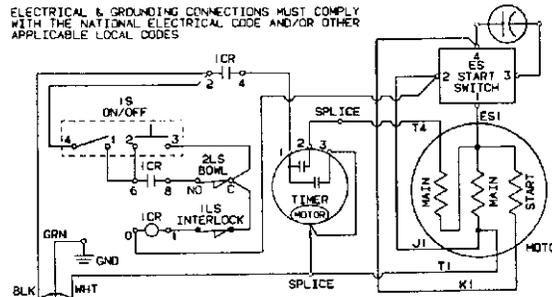
WIRING DIAGRAM  
A-200-T MIXER  
UNDER 150 VOLTS  
PRINTED IN USA

F-19264

TIMER CONTACTS	
OPEN	CLOSED
OFF	1-2 & 1-3
ON	1-3
TIMED	1-2 & 1-3

Fig. 12

ELECTRICAL & GROUNDING CONNECTIONS MUST COMPLY WITH THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES



**HOBART**

WIRING DIAGRAM  
A-200-T MIXER  
ABOVE 150 VOLTS  
PRINTED IN USA

F-19265

TIMER CONTACTS	
OPEN	CLOSED
OFF	1-2 & 1-3
ON	1-3
TIMED	1-2 & 1-3

Fig. 13



# TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

## A200/AS200 MIXERS - BOWL GUARD KIT PART NO. 439934-1

### Introduction

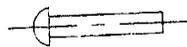
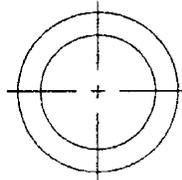
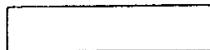
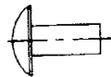
The updating of any A200 Model built prior to the introduction of bowl guarded units, will require ordering a basic kit, plus additional parts based on the configuration of the unit. In some cases a physical inspection of the unit will be required to determine the proper additional parts to order.

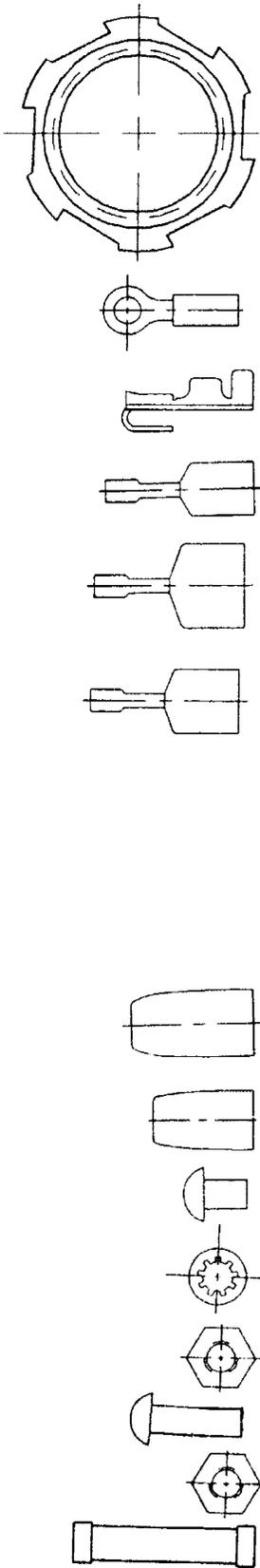
### Parts Information

The bowl guard kit part no. 439934-1 consists of the following parts. The hardware and terminals in the kit can be identified by holding the item to the illustration.

--- Not a service part

ITEM NO.	PART NO.	NAME OF PART	QTY.
1	----	Cage Assembly	1
2	438533	Drip Cup Guard Assembly	1
3	SC-053-35	Mach. Screw 8-32 x 3/8	5
4	438524-2	Internal Gear	1
5	438528	Lift Handle	1
6	PS-004-15	Spiral Pin 1/4 Dia. x 1-1/8	1
7	WS-009-13	Washer .625 x .875 x .062	1
8	438540	Reed Switch Bushing	1
9	087711-252-1	Reed Switch	1
10	F-19183	Switch Template	1
11	438541	Switch Bracket	1
12	439892	Switch Insulator	1
13	087711-248	Bowl Height Switch	1
14	SC-060-40	Mach. Screw 4-40 x 5/8	2
15	438131-57	Warning Label	1
16	121676-4	Drive Screw	2
17	120388	Switch Assembly	1
18	FP-054-08	Pipe 1/2 x 1-1/8	1





ITEM. NO.	PART NO.	NAME OF PART	QTY.
19	FE-006-05	Electrical Lockwasher 7/8	4
20	065890-19	Ring Terminal	10
21	065890-114	Piggyback Terminal	10
22	065890-119	Terminal	5
23	065890-138	Insulated Terminal	5
24	065890-139	Female Terminal	15
25	----	Lead Wire Assembly, Brand 1S-3	1
26	----	Lead Wire Assembly, Brand 2LS-C	1
27	----	Lead Wire Assembly, Brand 1S-2	1
28	----	Lead Wire Assembly, Brand 1S-1	1
29	----	Lead Wire Assembly, Brand 1S-4	1
30	----	Lead Wire Assembly, Brand 2LS-NO	1
31	FE-006-29	Wire Nut Connector 22-14 Awg	5
32	FE-018-16	Wire Nut Connector 22-16 Awg	2
33	SC-027-28	Mach. Screw 8-32 x 1/4 (Brass)	5
34	WL-011-01	Internal Lockwasher (Bronze)	5
35	NS-010-11	Mach. Hex Nut 8-32 (Brass)	5
36	SC-009-61	Mach. Screw 8-32 x 1/2" (Steel)	8
37	NS-009-12	Mach. Hex Nut 8-32 (Steel)	8
38	65890-23	Butt Splice	1
39	F-19385	Supplemental Wiring Diagram	1
40	502374	Insul. Wire 18 Awg, 105C	7 Ft.
41	F-19470	Operation and Care Instructions	1

Continue Parts Information

Parts Information Continued

The additional parts required, based on the configuration of the unit, are listed in the following chart. The ML or Spec. Nos. are to be used as a reference. The older the unit is, the more likely it has been updated to a newer configuration, therefore requiring a physical inspection of the unit before ordering parts.

**Configuration**                      **Additional part numbers and quantity required**

Non-Timed Unit		REF. SPEC. #	ML #	439949-1 SMALL BDX	439949-2 LARGE BDX	87714-42-1 RELAY-1/5 V	87714-42-3 RELAY-2/0 V	812248-1 CIRCUIT BREAKER	812248-2 CIRCUIT BREAKER	438537 SWITCH PLATE	438537-1 SWITCH PLATE	294590-4-2 TIMER-1/0/60	294590-4-6 TIMER-2/0/60	291630-4-7 TIMER-1/0-7	291630-4-8 TIMER-2/0-8	812123 COVER PLATE	291748 KIMB	291748 INSULATOR	SC-13-07 MOUNTING SCREWS	101936 TRANSFORMER	877143-98-1 CONTACTOR-1/5 V	877143-98-2 CONTACTOR-2/0 V	61711-289 PUSHBUTTON	615008 DIRECTION OF ROT.		
120 VOLTS 1 PHASE	ON/OFF SWITCH TOGGLE	38714 33424 38906																								
	ON/OFF SWITCH OVERLOAD	16861 33424 19204 17668																								
	ON/OFF SWITCH TUMBLER	19204 17668 16861 3943 8932 9080 3225																								
230 VOLTS 1 PHASE	ON/OFF SWITCH TOGGLE	38714 33424 38906																								
	ON/OFF SWITCH OVERLOAD	16861 33424 19204 17668																								
	ON/OFF SWITCH TUMBLER	19204 17668 16861 3943 8932 9080 3225																								
BELOW 250 VOLTS 3 PHASE	33424 19204 17668 16861																									
ABOVE 250 VOLTS 3 PHASE	8932 3943																									

**Timed Unit**

120 VOLTS 1 PHASE	ELECTRICAL TIMER	ELECTRONIC MOTOR SWITCH	38907 38908 38909																							
		CENTRIFUGAL MOTOR SWITCH	38715 38719 38721 33425 33429 33431																							
	MECHANICAL TIMER	60 HZ	19205 19211 19213 17669 17671 16317 16862 16864 8102 8104 8938 9137																							
60 HZ		19205 19211 19213 17669 17671 16317 16862 16864 8102 8104 8938 9137																								
230 VOLTS 1 PHASE	ELECTRICAL TIMER	ELECTRONIC MOTOR SWITCH	38907 38908 38909																							
		CENTRIFUGAL MOTOR SWITCH	38715 38719 38721 33425 33429 33431																							
	MECHANICAL TIMER	60 HZ	19205 19211 19213 17669 17671 16317 16862 16864 8102 8104 8938 9137																							
60 HZ		19205 19211 19213 17669 17671 16317 16862 16864 8102 8104 8938 9137																								

**AS200 Unit \***

(ALL MODELS)	-----			2																						
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\* ALL AS200 MIXERS WILL ALSO BE REQUIRED TO ORDER 19 FT OF MSI 502374 (18 GAUGE ELECTRICAL WIRE)

## Special Tools Required

- 3/8" variable speed electric hand drill.
  - 5/8"-11 NC tap, 3/8" square drive.
  - 17/32" special drill bit, part no. 534355
  - 1/4" drill bit.
  - 9/32" drill bit.
  - 3/8" drill bit.
  - 11/64" drill bit.
  - No. 46 drill bit.
  - Drill jig fixture, part no. 438545, which includes three bushings, one inspection plug and a locking screw. 3/8" pilot hole bushing, part no. 438545-2, 17/32" hole bushing, part no. 438545-3, tap bushing part no. 438545-4, inspection plug, part no. 438545-6 and locking screw, part no. 438545-5.
  - Crimping tool, part no. 516991.
- 

**Reference Material** Service Manual F-4604B (Rev. 12/86).

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## Installation Instructions

**NOTE:** Depending on the model, configuration and age of the unit, not all parts in the basic bowl guard kit will be used. On timed models (except AS200) wiring of the unit is based on use of an electrical timer.

**WARNING:** UNPLUG UNIT BEFORE SERVICING.

**NOTE:** Care should be taken during these procedures to protect the finish of the mixer.

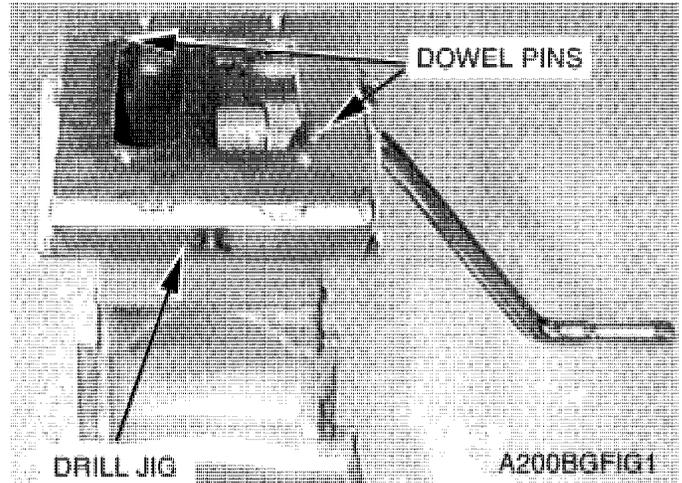
1. Lower the bowl support.
2. Remove agitator.
3. Remove bowl.
4. Remove switch plate assembly. Save screws for mounting switch plate to transmission. AS200 models after this is done (step 4 only) skip to step 5.
  - A. Remove switch. Discard switch and as required switch plate, timer.
  - B. Push wires into motor cavity.
  - C. (1 Ph.) Disconnect cord and plug assembly ground wire and discard hardware.
5. Block up the rear of the mixer so that when rotor or armature is removed, grease will not run into the motor cavity.
6. Remove back motor bearing bracket.
  - A. (1 Ph.) remove strain relief connector, cord and plug assembly and save.
  - B. (3 Ph.) remove lockwasher, junction box and conduit bushing. Remove grounding lug from junction box and mounting hardware and save. Discard lockwasher, junction box and conduit bushing.
7. Remove rotor/armature.
8. Remove stator. If stator cannot be removed, skip to step 9.
9. AS200 models skip to step 10. All other models pull wires from switch cavity to rear of unit.
10. Remove transmission case with planetary from pedestal by removing four screws.

Continue Installation Instructions

Installation Instructions Continued

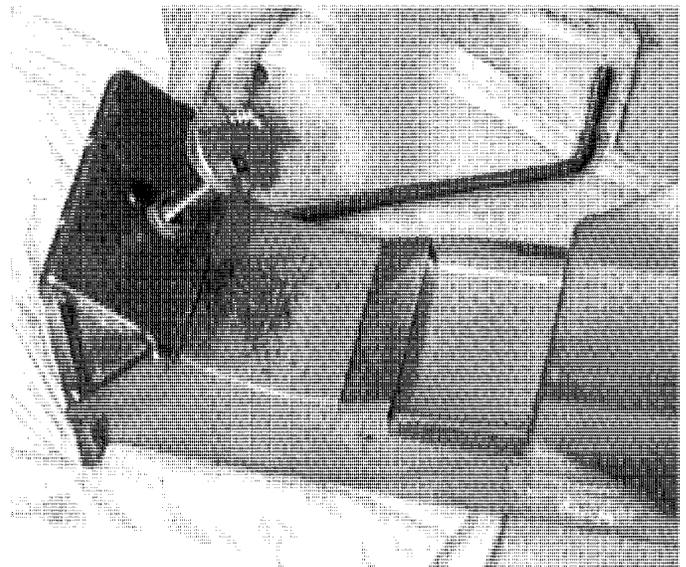
11. Install drill jig fixture on dowel pins at top of pedestal.
  - A. Reinstall two screws removed in step 10, in the pedestal (from bottom), tightening until drill jig is secured to pedestal.
  - B. Place pedestal on its back on floor.

**NOTE:** Place a shop cloth on top of bowl support to keep shavings from entering slideway.



- C. Place the pedestal against something to support it during drilling and tapping.
- D. Install 3/8" pilot bushing in drill jig and drill 3/8" pilot hole.
- E. Remove pilot bushing and install 17/32" drill bushing.
  - (1) Drill 17/32" hole, using special drill bit.
- F. Remove 17/32" drill bushing and install tap bushing.
  - (1) Tap 5/8"-11 NC hole, using an adjustable wrench.
- G. Remove tap bushing.
- H. Stand pedestal up and remove two screws to free drill jig from pedestal.
- I. Remove drill jig from pedestal.
- J. Clean shavings from pedestal and remove shop cloth from slideways.

**NOTE:** If the stator could not be removed in step 8, the hole should be drilled on an angle toward the planetary, taking care not to drill into stator.

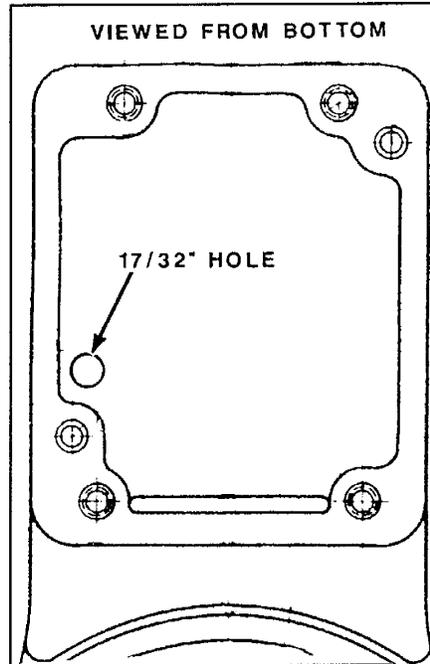


Installation Instructions Continued

12. Position and support the transmission case/planetary so a  $17/32$ " hole can be drilled through the bottom of the transmission case as shown below.

A. It is suggested that a  $3/8$ " pilot hole be drilled before drilling the  $17/32$ " hole.

B. Deburr the hole and remove any shavings.



13. Place switch template F-19183 (10) on dowel pin at rear and fold on line, over the side, to determine location of mounting holes for bowl height sensing switch bracket.

A. Center punch holes as shown on template.

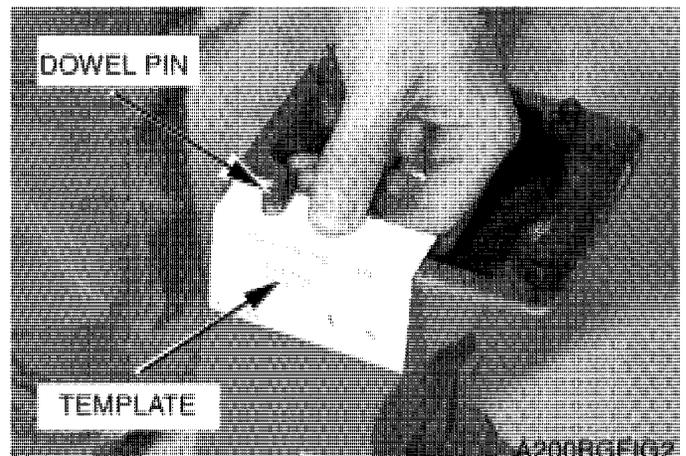
**NOTE:** Place a shop cloth on top of bowl support to keep shavings from entering slideway.

B. Using a  $11/64$ " drill bit, drill two through holes.

**NOTE:** In order to install the lift handle (5), it may require the spiral pin hole in the bowl lift arm be drilled to accept spiral pin (6).

14. Remove lift handle, discard along with spiral pin and washer(s).

A. Install lift handle (5) and washer (7), using spiral pin (6). Drill bowl lift arm to install pin (if required) using a  $1/4$ " drill bit.



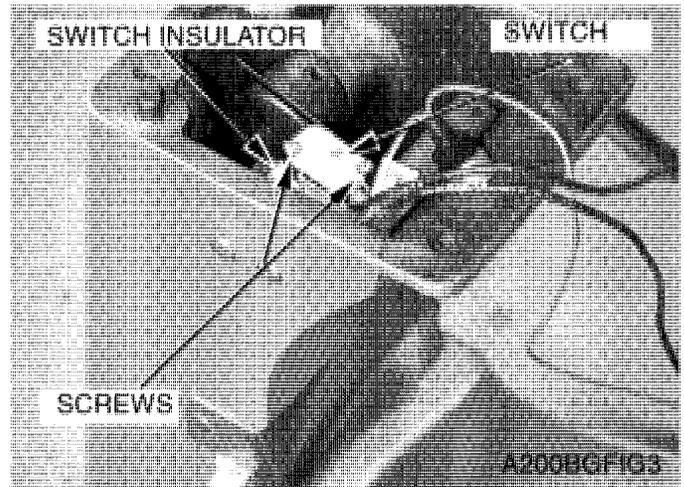
15. Screw reed switch bushing (8) all the way into  $5/8$ " -11 NC hole in pedestal.

**NOTE:** In order to properly set the distance the reed switch extends out the front of the pedestal, the drill jig and an inspection plug are used.

Continue Installation Instructions

Installation Instructions Continued

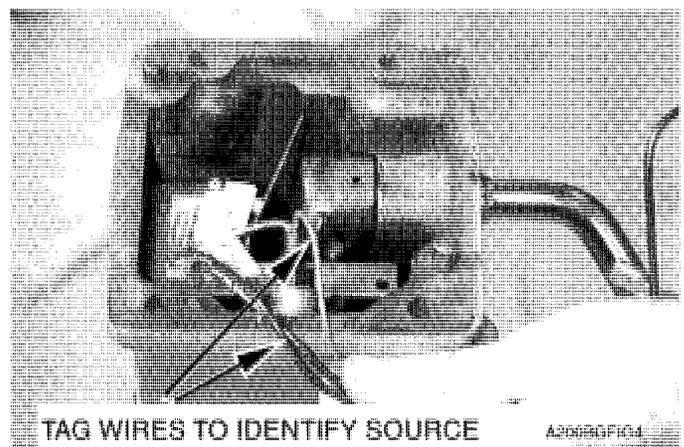
16. Install reed switch (9) into bushing, leaving just a single plastic nut loose on the inside of pedestal. A nut is not needed on the outside.
  - A. Install drill jig on top of pedestal per steps 11 and 11A.
    - (1) Install inspection plug in drill jig.
  - B. Turn reed switch (9) until you feel the end just touch the inspection plug and tighten the plastic nut. Do not over torque plastic nut.
  - C. Remove drill jig.
17. With the screw heads on the outside of the pedestal, install two screws (3) in holes for mounting bowl height sensing switch bracket and screw them into bracket (11).
18. Install terminal end of lead wire assembly (26) on common terminal of bowl height sensing switch (2LS) (13).
19. Install terminal end of lead wire assembly (30) on normally open terminal of bowl height sensing switch (2LS) (13).
20. Install switch insulator (12) and bowl height sensing (2LS) switch (13) on bracket (11) using two screws (14).
21. Check the reed switch with a meter for proper operation by holding the cage assembly magnet approximately 3/32" away from the switch.
22. Continuity check the bowl height sensing switch by raising and lowering bowl lift handle.
23. AS200 Models skip to step 24. All other models Install short lead wire of reed switch on piggyback terminal at common of bowl height sensing switch (2LS).
24. AS200 Models remove terminal from short lead wire of reed switch.
  - A. Install wire in one end of butt splice (38).
  - B. Take one end of insulated wire (40) install in other end of butt splice (38).



**NOTE:** It is recommended that the pedestal assembly and the transmission/planetary assembly be placed close to each other on supports on the floor to aid in alignment during reassembly. The supports should be covered to prevent damage to the finish.

**NOTE:** Before feeding the wires from the pedestal switches through the hole in bottom of transmission, they should be identified to indicate their source.

25. Place the pedestal assembly and transmission assembly on the floor close to each other leaving enough room to feed the wires from the pedestal switches through the 17/32" hole in bottom of transmission.
  - A. Feed the switch wires through the hole in transmission. Move pedestal assembly into position to assemble to transmission.
  - B. Assemble pedestal to transmission using screws from step 10, taking care not to pinch the switch wires.



Continue Installation Instructions

Installation Instructions Continued

26. Stand unit up. All models except AS200 skip to step 28.

**NOTE:** On AS200 Models a hole is drilled in the switch plate to accept a push button switch. The switch when assembled to the switch plate must clear the rocker switch timer and the wall of the switch cavity of the transmission case. The dimensions shown may vary depending on the age of the unit. Check for switch clearance before drilling the hole.

27. AS200 Models drill a 9/32" hole in the switch plate as shown:

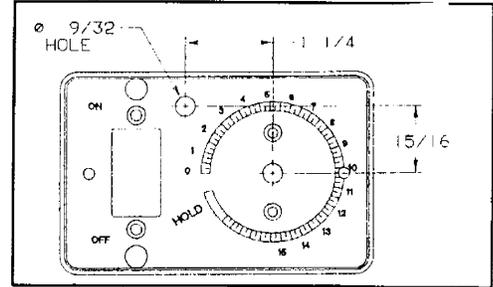
A. Install push button switch to switch plate.

(1) Install green cap on push button switch.

28. AS200 models skip to step 30. Assemble switch assembly (17) to switch plate.

A. As required on a timed unit, assemble proper timer and insulator(s) to switch plate.

(1) Install knob.



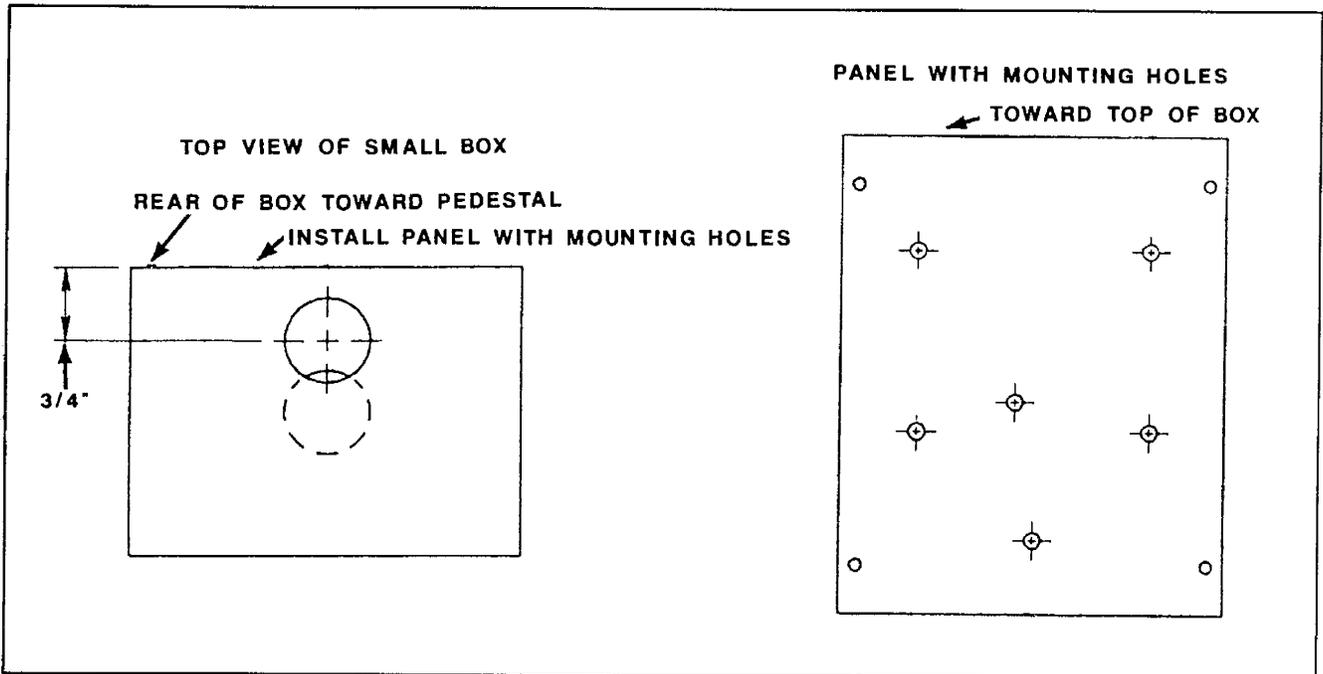
29. Install terminal end of lead wire assemblies (25), (27), (28) and (29) to the proper switch terminals as indicated by the branding.

30. Thread one lockwasher (19) onto pipe (18) and screw pipe (18) into bottom of bearing bracket until threads on end are even with inside of casting.

A. Thread one lockwasher (19) onto other end of pipe.

(1) One lockwasher will go against the bearing bracket and one against the top of the component box once everything is installed.

31. If a small box is being installed on pipe (18), it must be assembled using the hardware with the box. The box panel with the mounting holes for component(s) should be installed at the rear of the box as shown. The rear of the box when mounted on pipe is toward the pedestal.

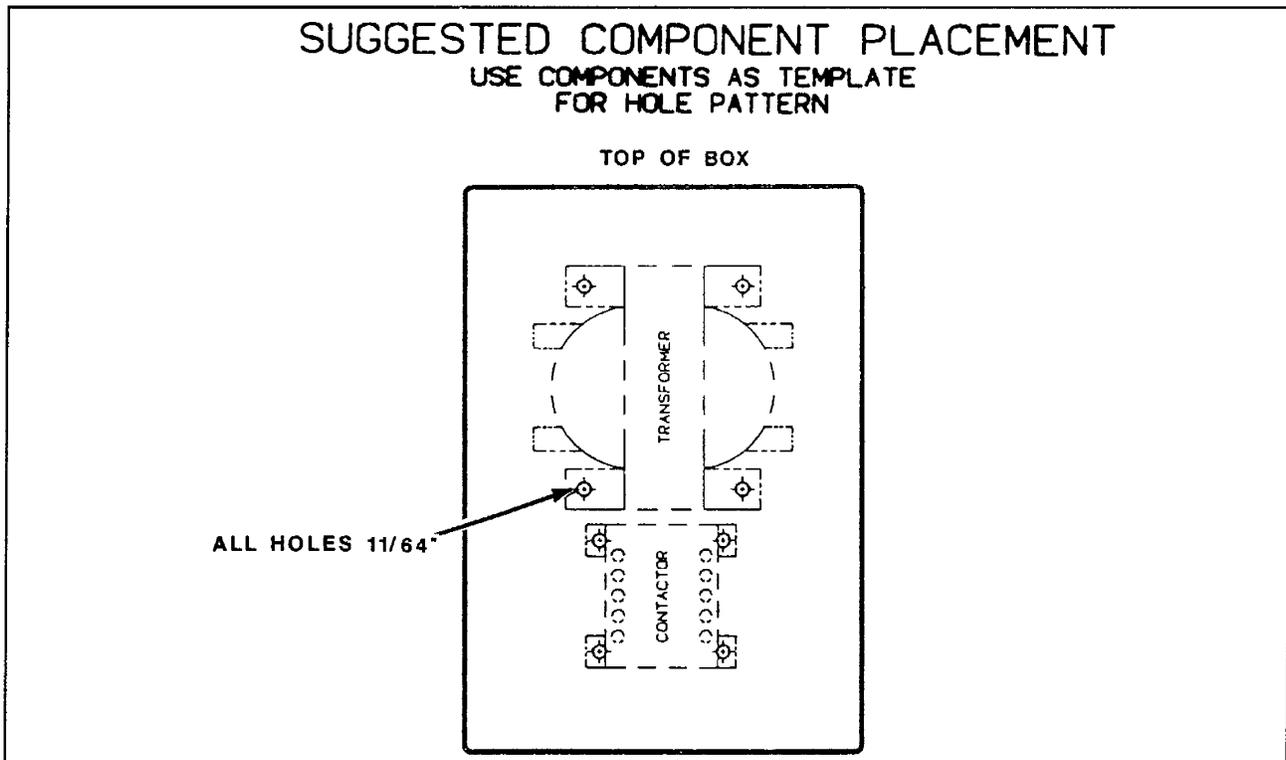
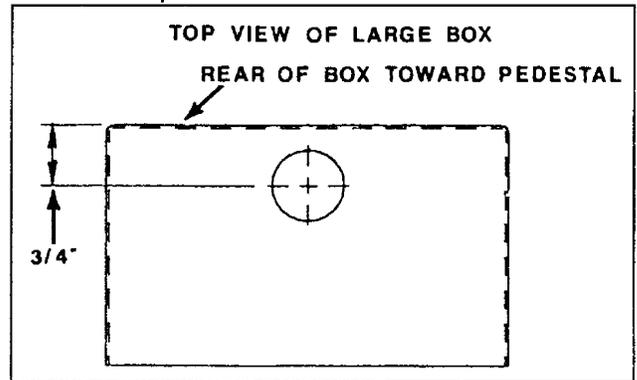


Continue Installation Instructions

Installation Instructions Continued

- A. Install box component(s) as required. Example: Relay, contactor, on mounting plate using screws (36) and nuts (37). Screw heads on outside of box.
  - B. Install box on pipe (18) using a lockwasher (19).
    - (1) Position rear of box so that when bearing bracket is installed, it is toward pedestal.
    - (2) Tighten top lockwasher on pipe against bearing bracket.
    - (3) Tighten bottom lockwasher on pipe against box and tighten lockwasher in box against top.
  - C. (1 Ph. unit). Install strain relief connector and cord and plug assembly saved in step 6A, in bottom hole of box, using a lockwasher (19) on strain relief connector.
  - D. (3 Ph. unit) install grounding lug and hardware saved in step 6B, in hole in box.
32. (3 Ph. above 250 volts) A large box is installed on pipe (18) It should be installed as shown. The rear of the box when mounted on the pipe is toward the pedestal.

- A. Shown below is the suggested component placement in the box. Each component is used as a template for drilling the mounting holes in the rear of the box:



- B. Install components in box and box to pipe per steps 31 A., 31 B. (1), B. (2) and B. (3).
  - C. Install grounding lug and hardware saved in step 6B.
- Continue Installation Instructions

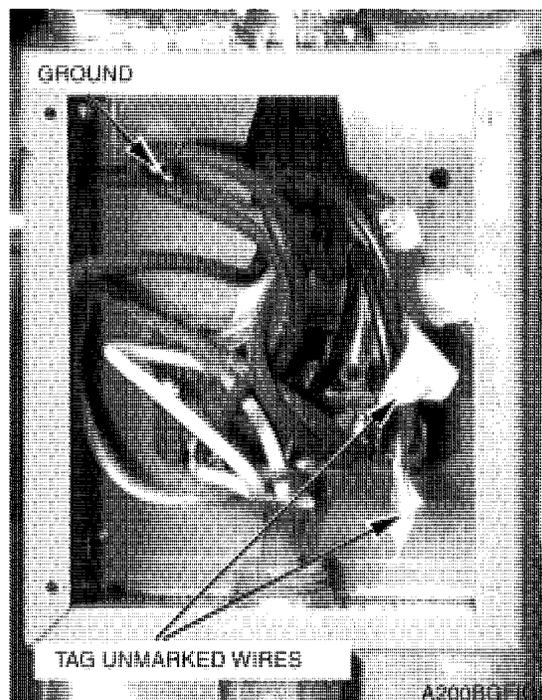
Installation Instructions Continued

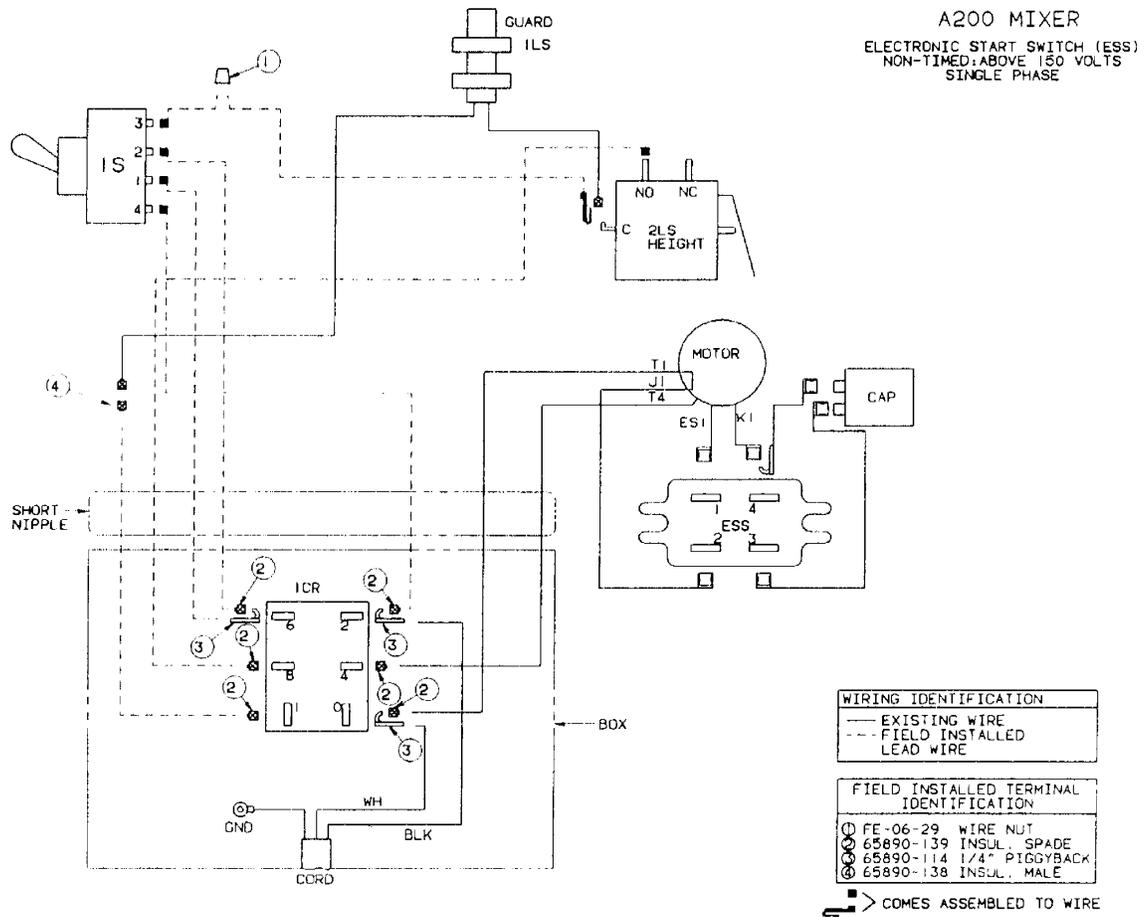
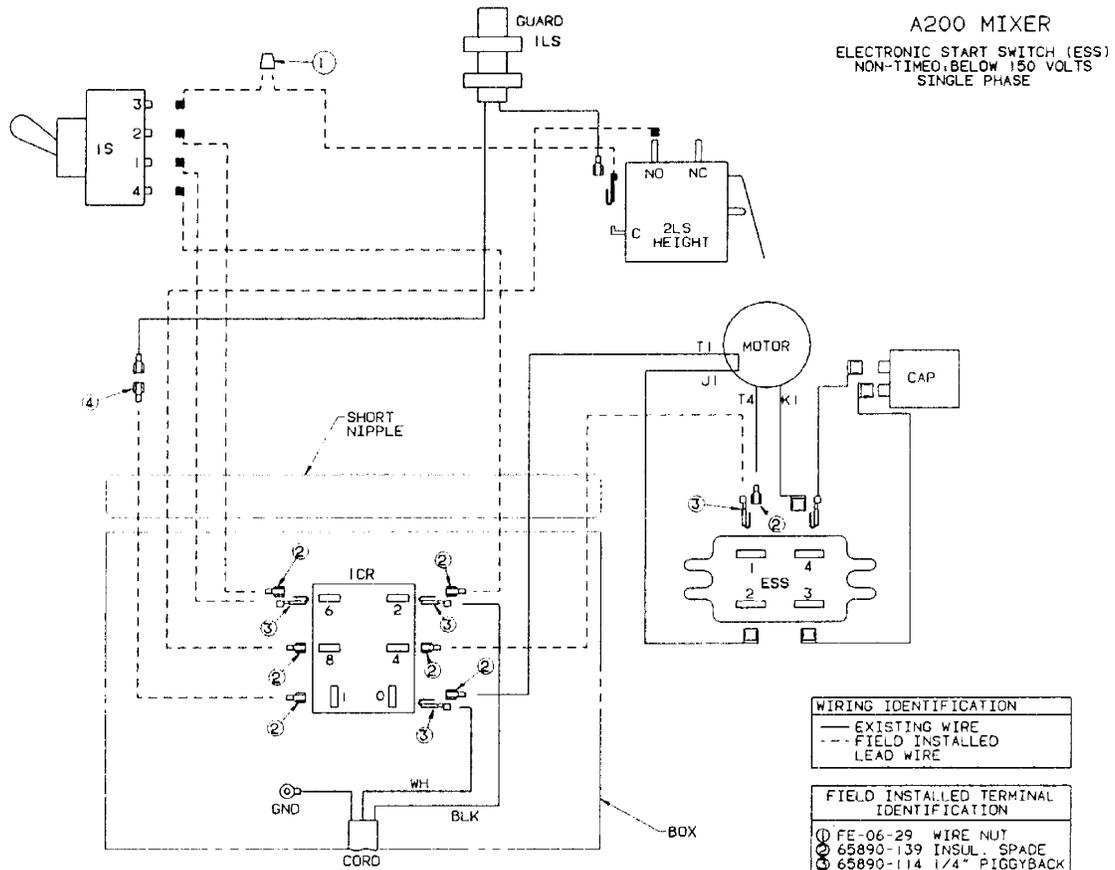
33. If the original on/off switch had overload protection, remove and discard conduit cover from rear bearing bracket, save mounting screws.
  - A. Assemble circuit breaker to new conduit cover.
  - B. Assemble conduit cover/circuit breaker to rear bearing bracket using saved mounting screws.
34. Reinstall stator.
35. Reinstall rotor or armature.
36. Position the rear bearing bracket/box assembly near the transmission case.
37. In order to complete the wiring of the unit, you will have to in some cases eliminate wires, re-terminate old wires, splice old and new wires together using a wire nut, create new wires and install a terminal on a new wire. Any wiring should not be so long as to interfere with any moving object in the motor area. Wiring going from the rear of the unit to the front should be routed along side the stator. Care should be taken to not pinch any wiring. Below is a listing of point to point wiring diagrams. Select the proper one.

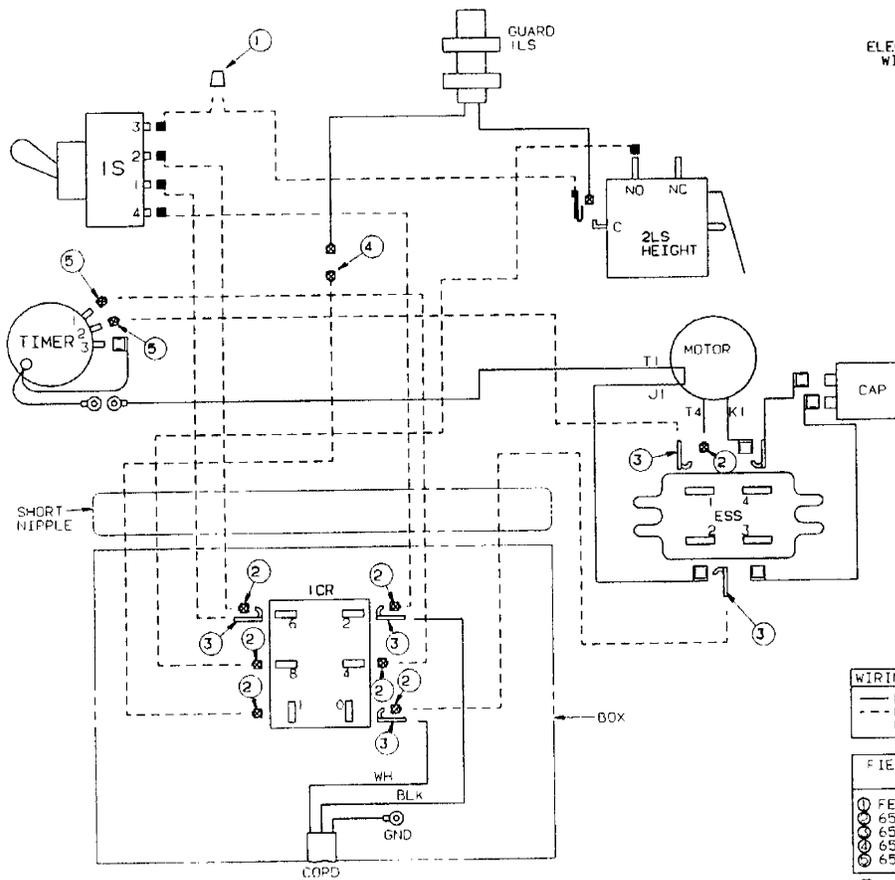
DESCRIPTION OF UNIT	VOLTAGE	PHASE	DIAGRAM PAGE NO.
Electronic start switch non-timed	Below 150V	1	11
Electronic start switch non-timed	Above 150V	1	11
Electronic start switch timed	Below 150V	1	12
Electronic start switch timed	Above 150V	1	12
Non-timed 2 or 4 wire motor	All voltages	1	13
Non-timed 2 or 4 wire motor with overload	All voltages	1	13
Timed 2 or 4 wire motor	All voltages	1	14
Non-timed	Below 250V	3	14
Non-timed	Above 250V	3	15
AS200 non-timed			15
AS200 mechanical timer			16
AS200 electrical timer			16

- A. Using the selected point to point diagram wire the unit.
- B. We strongly recommend, as required, tag wire(s) for termination points as an aid for servicing the unit.
- C. Terminate the power cord (1 Ph.) ground wire in component box hole using screw (33), internal lockwasher (34) and nut (35).
- D. For any wiring connection calling for a screw, washer and nut use (33), (34) and (35).

Continue Installation Instructions on page 17





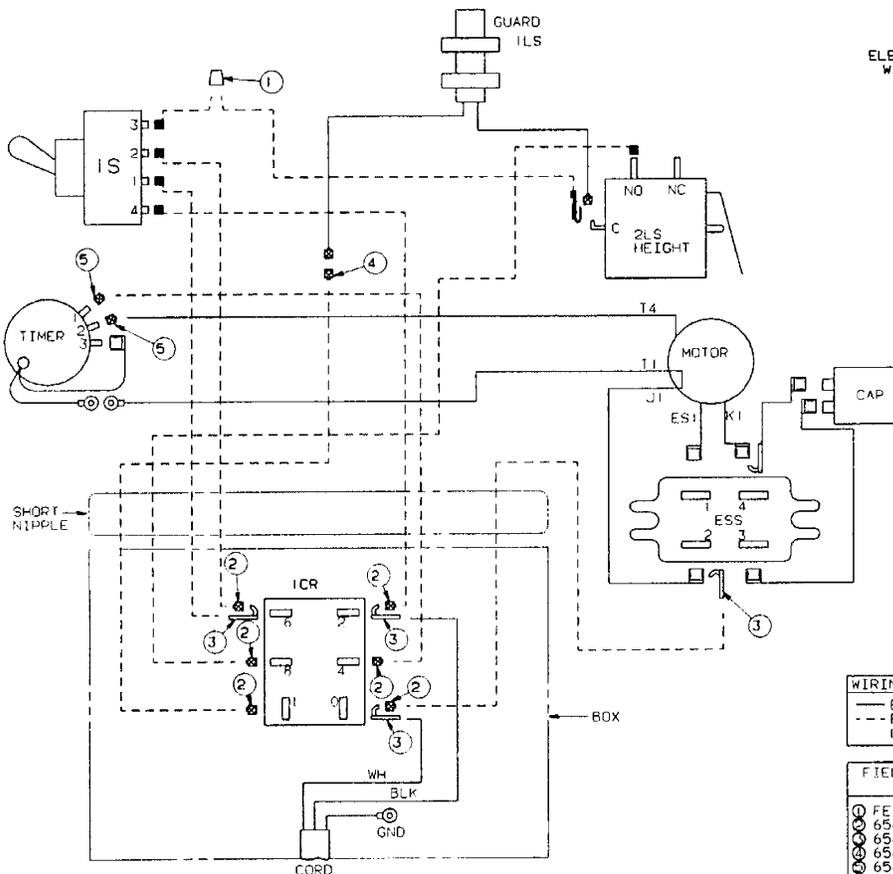


A200 MIXER  
ELECTRONIC START SWITCH (ESS)  
WITH TIMER BELOW 150 VOLTS  
SINGLE PHASE

WIRING IDENTIFICATION:	
—	EXISTING WIRE
- - -	FIELD INSTALLED LEAD WIRE

FIELD INSTALLED TERMINAL IDENTIFICATION	
⊙	FE-06-29 WIRE NUT
⊖	65890-139 INSUL. SPADE
⊕	65890-114 1/4" PIGGYBACK
⊗	65890-138 INSUL. MALE
⊙	65890-119 3/16" SPADE

⊣ > COMES ASSEMBLED TO WIRE



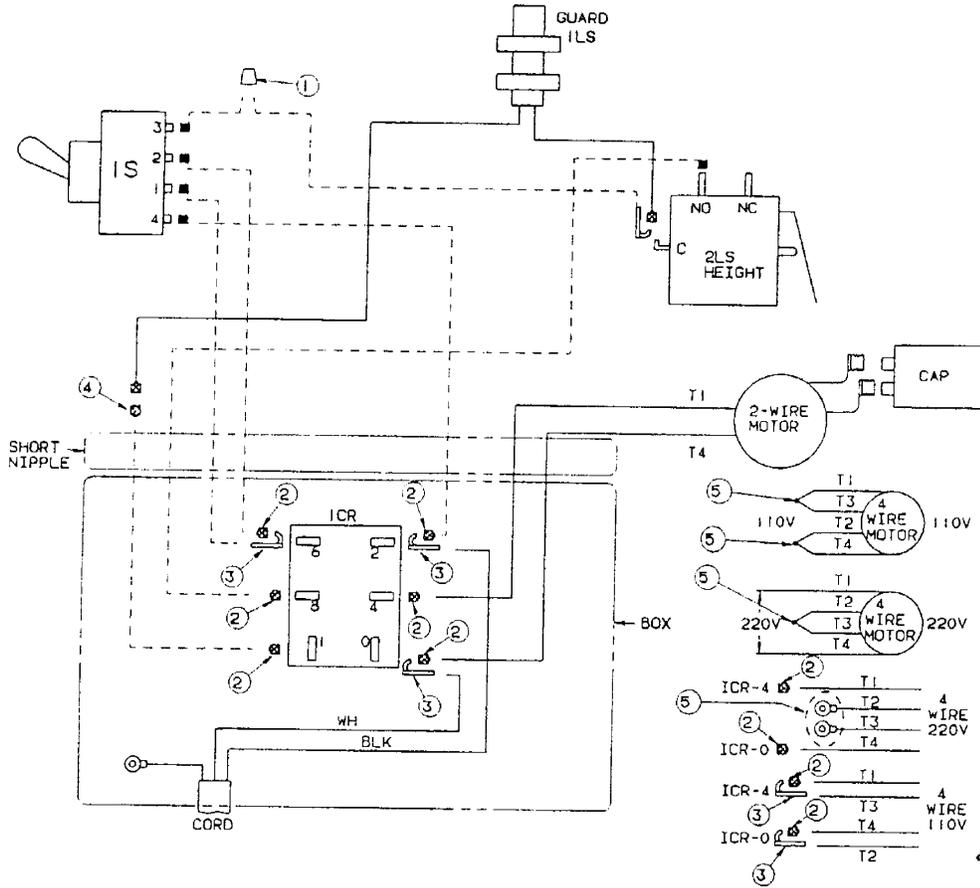
A200 MIXER  
ELECTRONIC START SWITCH (ESS)  
WITH TIMER ABOVE 150 VOLTS  
SINGLE PHASE

WIRING IDENTIFICATION:	
—	EXISTING WIRE
- - -	FIELD INSTALLED LEAD WIRE

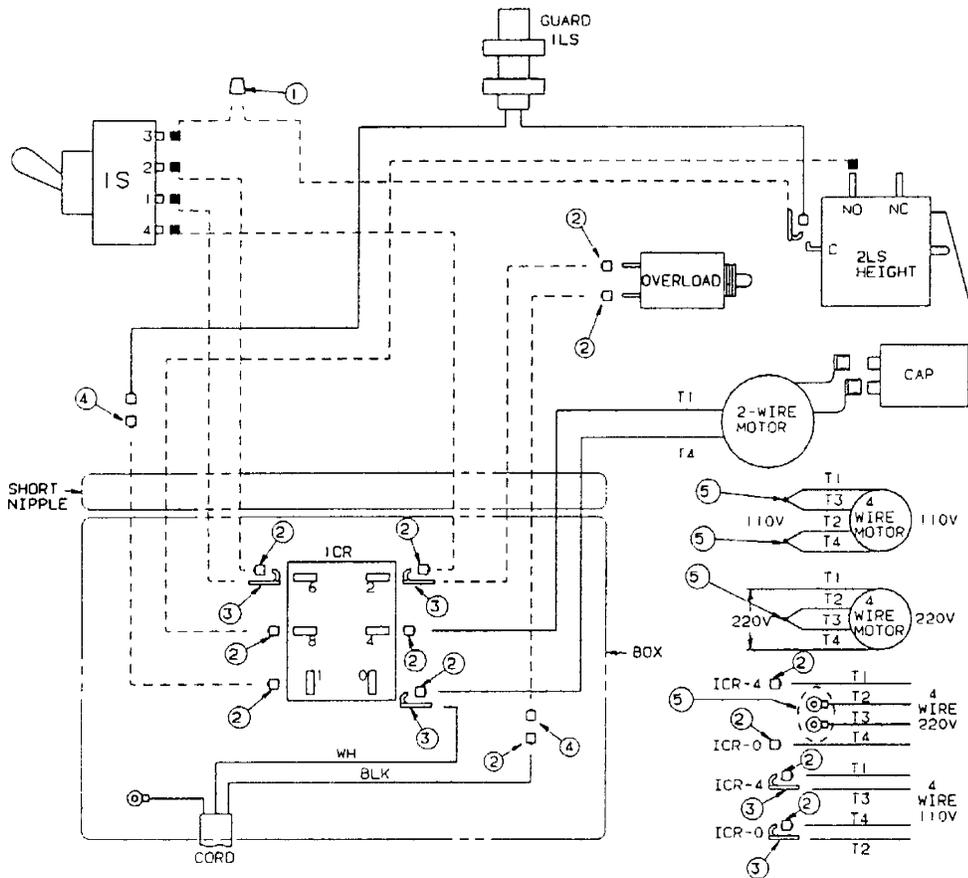
FIELD INSTALLED TERMINAL IDENTIFICATION	
⊙	FE-06-29 WIRE NUT
⊖	65890-139 INSUL. SPADE
⊕	65890-114 1/4" PIGGYBACK
⊗	65890-138 INSUL. MALE
⊙	65890-119 3/16" SPADE

⊣ > COMES ASSEMBLED TO WIRE

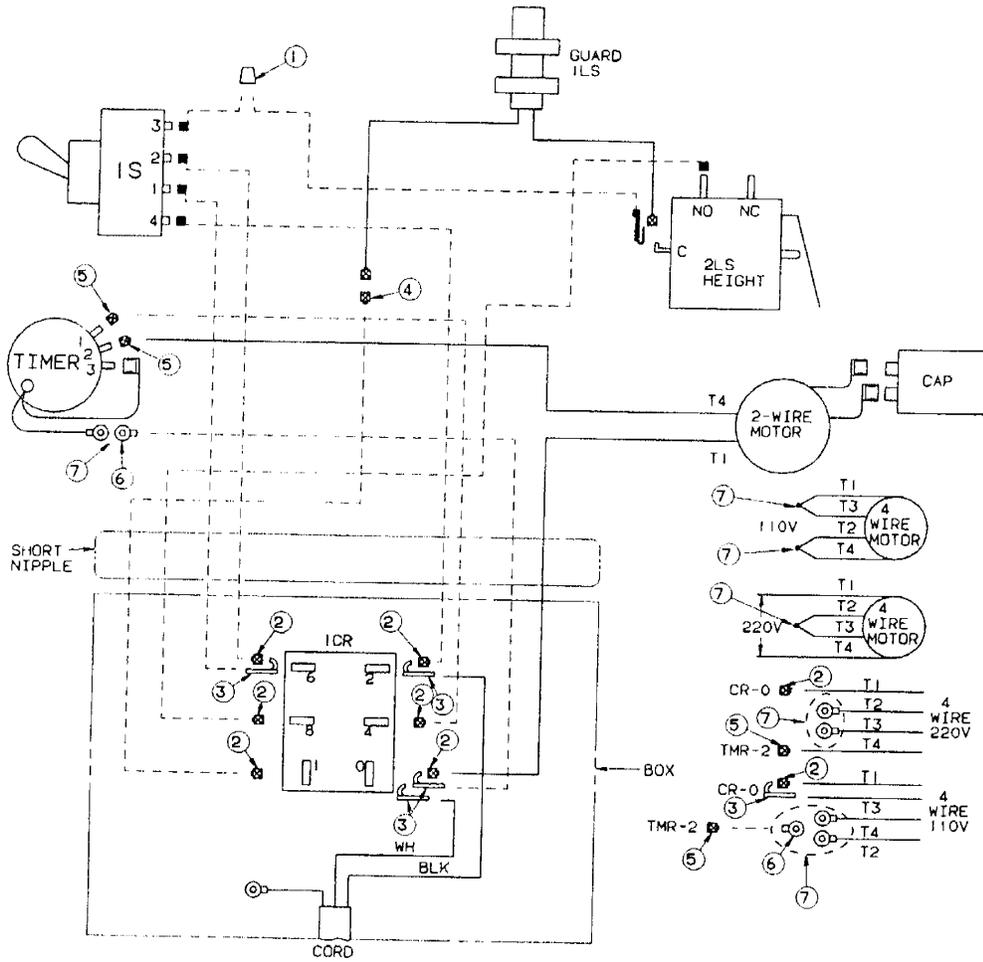
A200 MIXER  
NON-TIMED  
SINGLE PHASE



A200 MIXER  
NON-TIMED  
SINGLE PHASE  
WITH OVERLOAD



A200 MIXER  
WITH TIMER  
SINGLE PHASE

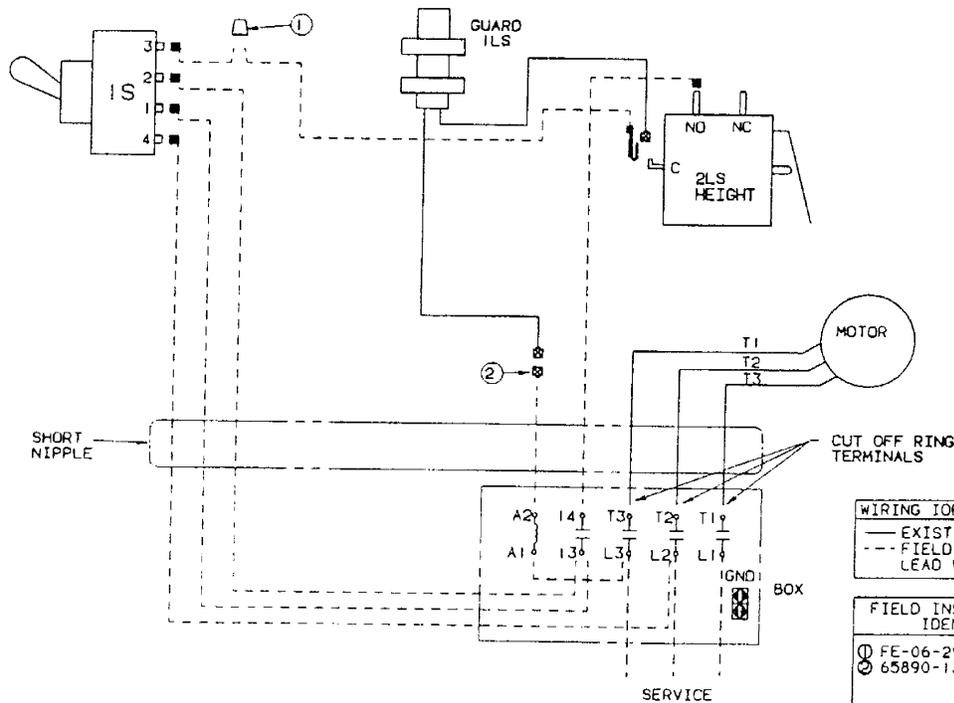


WIRING IDENTIFICATION	
—	EXISTING WIRE
- - -	FIELD INSTALLED LEAD WIRE

FIELD INSTALLED TERMINAL IDENTIFICATION	
①	FE-06-29 WIRE NUT
②	65890-139 INSUL. SPADE
③	65890-114 1/4" PIGGYBACK
④	65890-138 INSUL. MALE
⑤	65980-119 3/16" SPADE
⑥	65890-19 RING
⑦	SCREW/WASHER/NUT

COMES ASSEMBLED TO WIRE

A200 MIXER  
BELOW 250 VOLTS  
3-PHASE

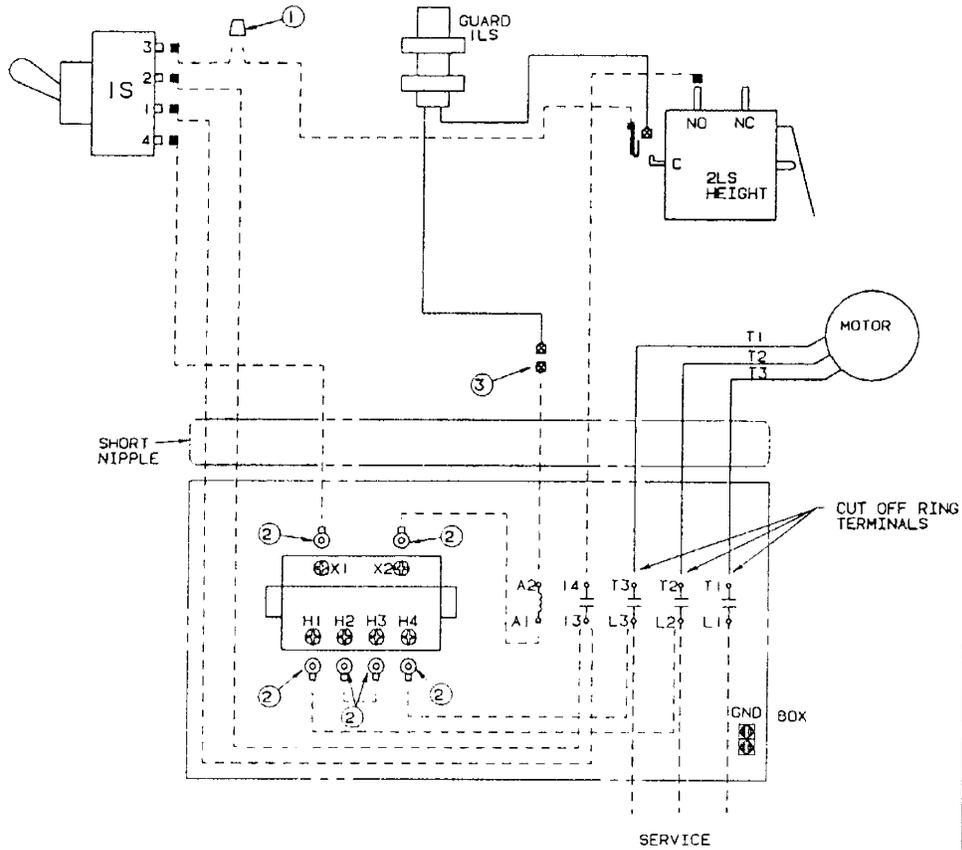


WIRING IDENTIFICATION	
—	EXISTING WIRE
- - -	FIELD INSTALLED LEAD WIRE

FIELD INSTALLED TERMINAL IDENTIFICATION	
①	FE-06-29 WIRE NUT
②	65890-138 INSUL. MALE

COMES ASSEMBLED TO WIRE

A200 MIXER  
 ABOVE 250 VOLTS  
 3 PHASE



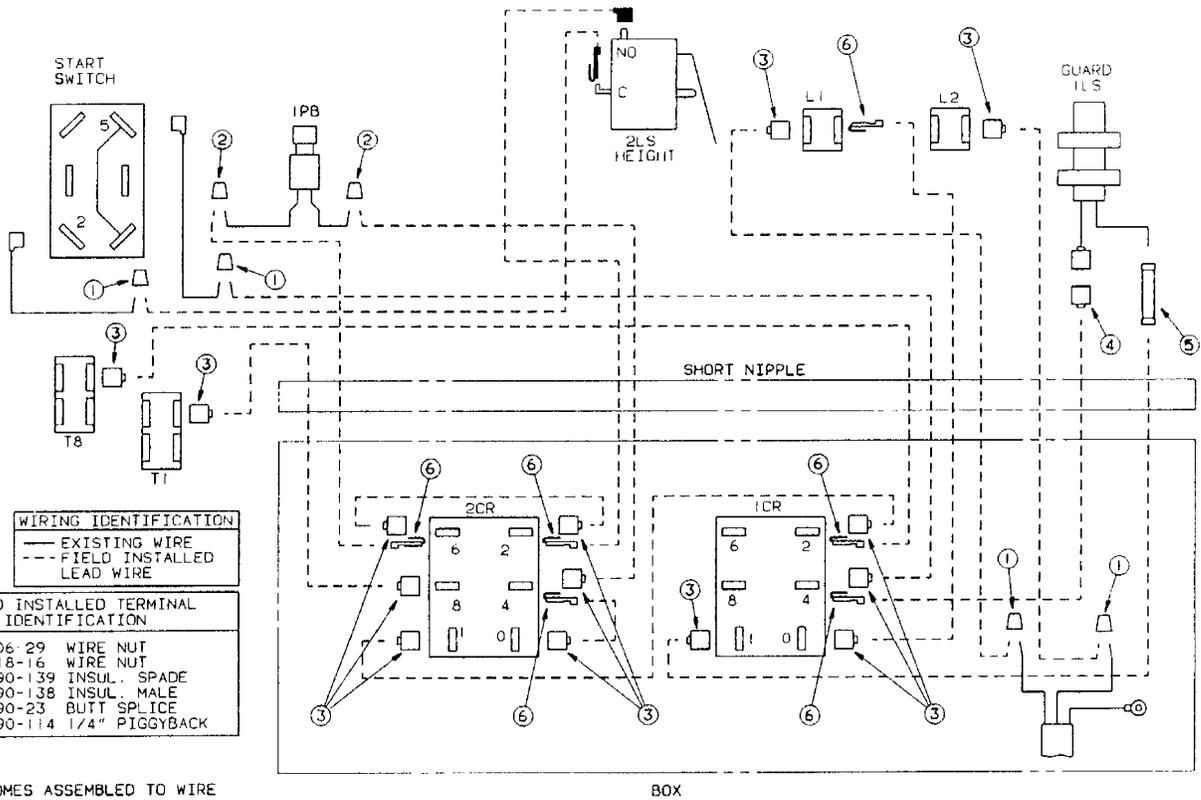
WIRING IDENTIFICATION	
—	EXISTING WIRE
- - -	FIELD INSTALLED LEAD WIRE

FIELD INSTALLED TERMINAL IDENTIFICATION	
①	FE-06-29 WIRE NUT
②	65890-19 RING
③	65890-138 INSUL. MALE

COMES ASSEMBLED TO WIRE

AS-200  
 NO TIMER



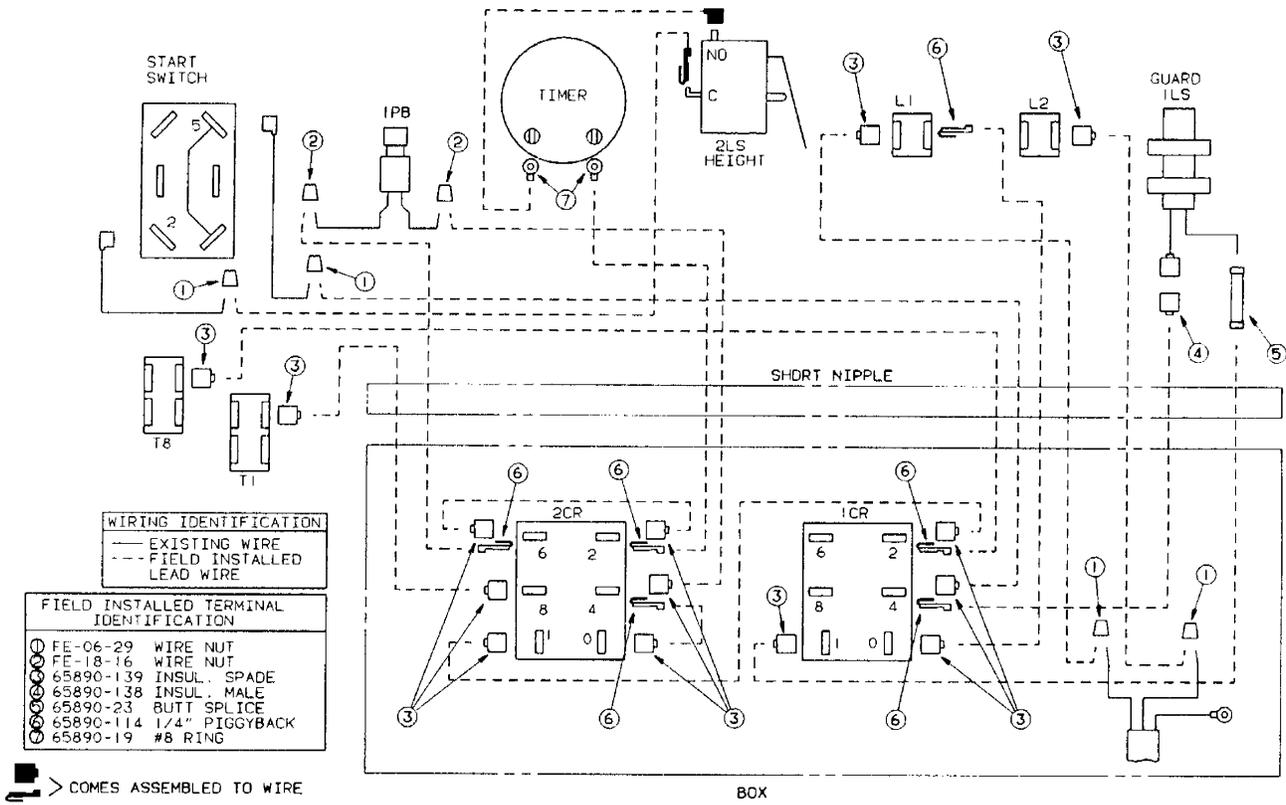
WIRING IDENTIFICATION	
—	EXISTING WIRE
- - -	FIELD INSTALLED LEAD WIRE

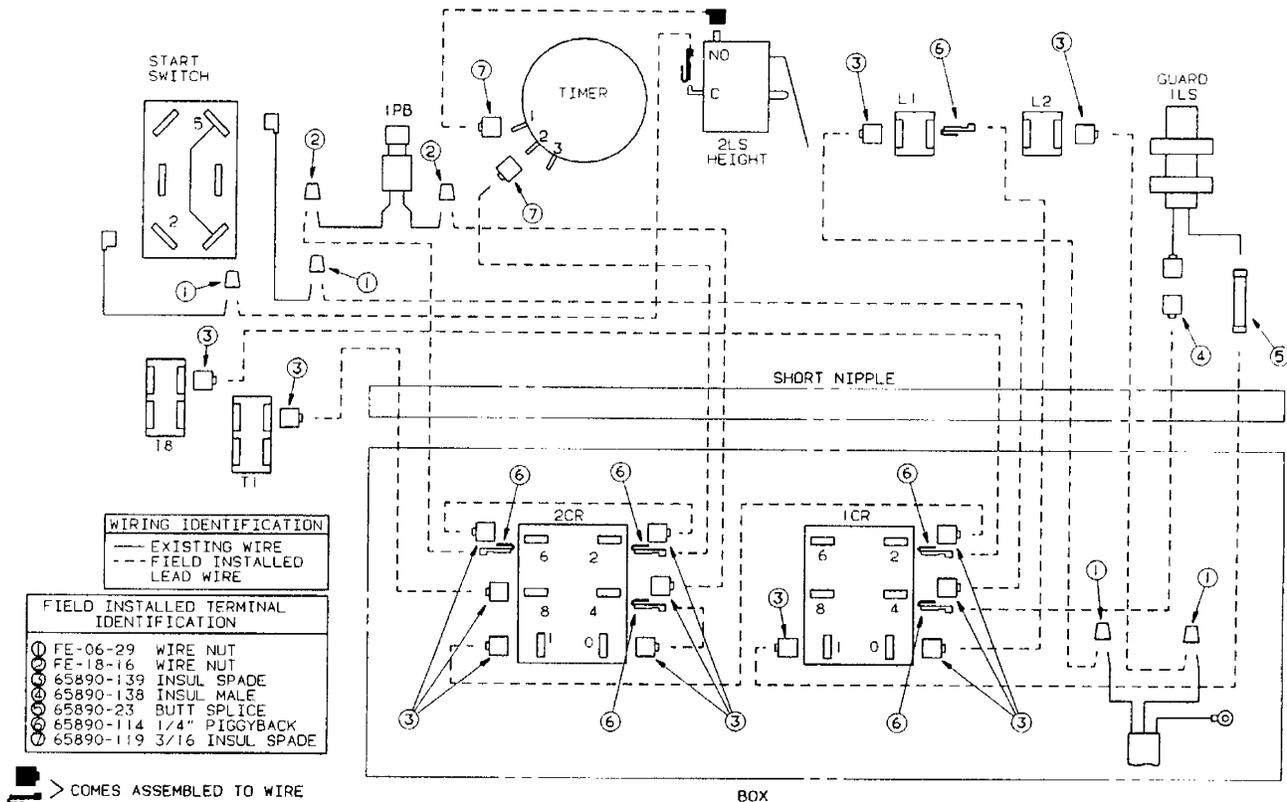
FIELD INSTALLED TERMINAL IDENTIFICATION	
①	FE-06-29 WIRE NUT
②	FE-18-16 WIRE NUT
③	65890-139 INSUL. SPADE
④	65890-138 INSUL. MALE
⑤	65890-23 BUTT SPLICE
⑥	65890-114 1/4" PIGGYBACK

COMES ASSEMBLED TO WIRE

## AS-200 MECHANICAL TIMER

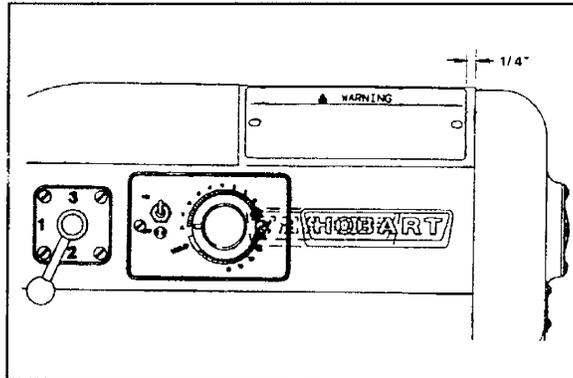


## AS-200 ELECTRIC TIMER

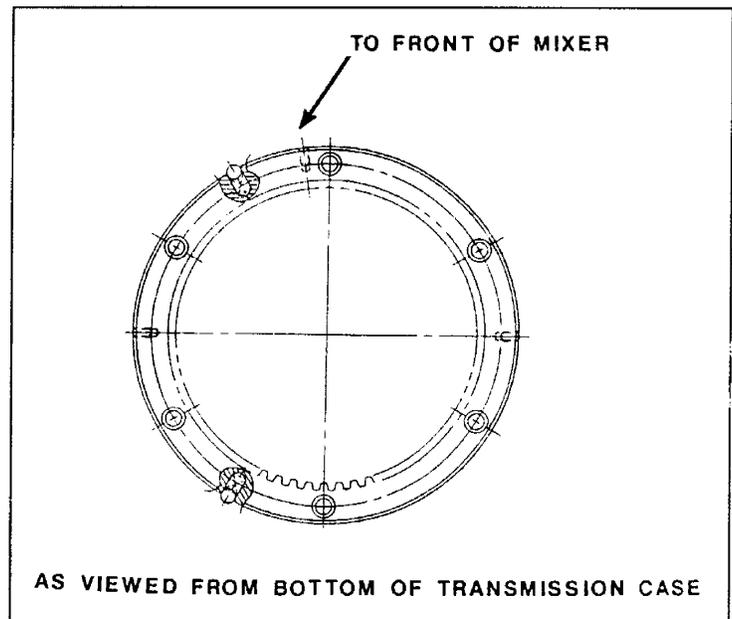


Installation Instructions Continued

38. Reinstall switch plate assembly using screws saved in step 4.
39. Reinstall rear bearing bracket/box assembly, carefully watching for pinched wires and that wires are routed away from any moving object.
40. Determine proper supplemental wiring diagram from F-19385 (36).
  - A. Peel it off and place it on back of front panel of the box.
  - B. Install front panel on box using hardware furnished.
41. Locate the warning plate (15) from the rear of transmission case as shown below.



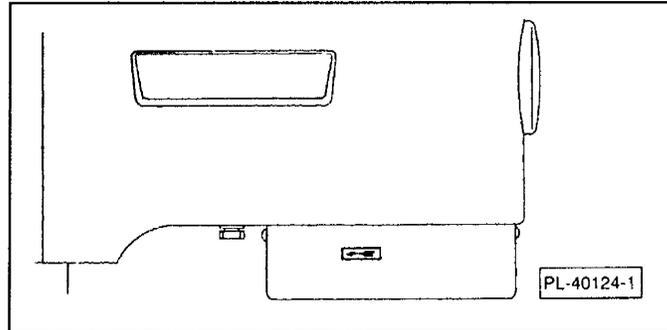
- A. If a metal warning plate is present at this location, remove and discard it.
  - B. Using the warning plate as a template, center punch the mounting holes.
  - C. Using a No. 46 drill bit, drill mounting holes 9/32" deep.
  - D. Remove paper on back of plate to expose adhesive.
  - E. Mount warning plate using two drive screws (16).
42. Remove the drip cup and discard.
  43. Remove the planetary assembly.
  44. Remove the internal gear assembly and discard.
  45. Pull the internal gear (4) straight out of the drip cup guard assembly (2) and install the internal gear assembly (4) as shown.



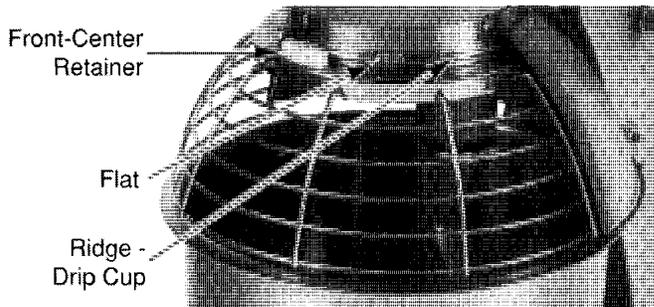
Continue Installation Instructions

Installation Instructions Continued

46. Install the planetary assembly.
47. Install the drip cup guard assembly (2) to the internal gear using three screws (3).
  - A. 3 Ph. unit peel backing from rotation arrow and place on drip cup guard assembly opposite controls as shown below.



48. Install the cage assembly (1) holding it so the top ring is positioned around the planetary drip cup with the grooves in both nylon rear retainers straddling the ridge on the drip cup at the rear. Lift the wire cage Assembly so the front-center Retainer passes up through the flat on the ridge of the drip cup and rotate the cage assembly to the right. The cage is properly assembled when all three retainers straddle the ridge on the drip cup in the three opposed locations. Rotate the cage assembly to the right until it stops at the front-center position.



To Remove:  
Rotate Wire Cage to the Left 340 Degrees until the Front-Center Retainer can be lowered through the Flat on the Ridge of the Drip Cup.

PL-40562-1

49. Rotate cage assembly within drip cup guard assembly checking for binding or being too loose.
  - A. If cage is binding on guard assembly or is too loose, loosen two screws holding adjustable shoe to cage assembly.
    - (1) Turn the adjusting screw. Press the shoe to ensure it is against the screw, then tighten the mounting screws. Repeat this step until proper adjustment is achieved.
50. Check for proper operation of the interlock switch.
  - A. Mixer must run with the cage assembly centered and the bowl support is in the up position.
  - B. Mixer must stop when cage is rotated.
  - C. Mixer must not run with the cage assembly removed.

Continue Installation Instructions

## Installation Instructions Continued

51. Check for proper operation of bowl height sensing.
    - A. Bowl down position and cage assembly centered. Push "ON/OFF" switch to "ON" position and hold - mixer runs.
      - (1) Release switch - mixer stops.
    - B. Bowl up position and cage assembly centered. Push "ON/OFF" switch to "ON" position and release - mixer runs.
    - C. Lower bowl from up position with the mixer running, mixer stops.
  52. AS200 Mixer Operation w/Bowlguard Upgrade

Stir mode:  
The machine will operate the same as before except the bowlguard must be closed. The machine will operate with either the bowl up or down.

Mix mode:  
The upgrade kit adds an additional push button to AS200 controls. The sequence of operation is as follows:

    - A. Close the bowlguard.
    - B. Raise the mixer bowl and lock in position.
    - C. Push rocker switch (existing) to "ON" position.
    - D. Set timer to desired time or hold position.
    - E. Push green push button (new) and mixer will start.
    - F. Mixer can be turned off by timer or pushing rocker switch to "OFF" position (center).
    - G. If the operator opens bowlguard or lowers bowl during mixing or power is interrupted during mixer operation, the machine will shut off. To re-start the operator must again push the green push button.
  53. A200 w/Manual Reset Overload

The addition of the bowlguard update kit requires a special ON/OFF toggle switch. This means that A200's equipped with an optional overload switch must be modified to use a new push button overload. This push button overload is located at the back of the mixer on the motor access cover. The sequence of operation with a new bowlguard update kit is as follows:

    - A. Close mixer bowlguard.
    - B. Raise bowl and lock in position.
    - C. Push toggle switch to "START" position. Mixer will start and run.
    - D. If mixer is overloaded, then the push button overload (new) will open, the button will extend from the overload, and the motor will shut off. The operator must push the overload button in to reset the unit. There is some indeterminate period of time before the overload can be reset, similar to the old style toggle switch/overload combination.
    - E. If the operator opens the bowlguard or lowers the bowl while the overload is tripped, then the sequence of operation starts over at No. A. If not, then the mixer motor will re-start when the overload button is pushed in.
  54. Reinstall agitator.
  55. Reinstall bowl.
  56. 3 Ph. unit check for proper rotation.
  57. Instruct operator in proper operation of mixer.
  58. Leave Operation and Care Instructions F-19470 (41) with operator.
-

## TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

### A200 PLANETARY ASSEMBLY SEAL

#### Introduction

Under certain operating conditions found at KFC, Golden Corral, Cracker Barrel and other high moisture applications, moisture and condensation can build up and enter into the planetary assembly. When this occurs the upper and lower bearings can oxidize and corrode. Corrosion of the bearings may cause issues such as (but not limited to) the mixer making excessive noise and damaged gears.

#### Purpose

A200 planetary part number 916645 has an upper seal to prevent moisture from entering into the planetary bearings. This planetary (916645) should be used when servicing A200 mixers in high moisture applications such as mixing numerous batches of mashed potatoes on a regular basis.

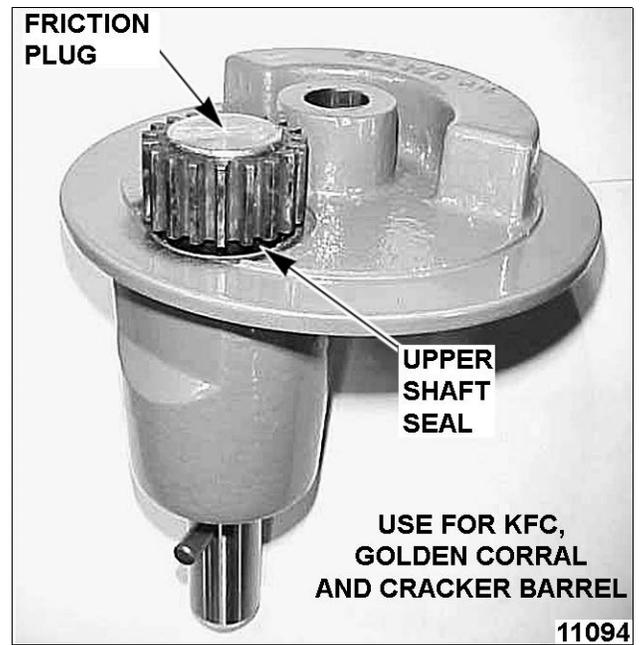
The standard planetary part number 102778-01 should be used to service all other A200 Mixers. When stock of part number 102778-01 is depleted, the new planetary (916645) will be sent as replacement part.

#### Reference Material

- A120 and A200 Service Manual F-24670
- A200 Parts Catalog F-34656



Planetary Assembly 102778-01



Current Planetary Assembly 916645

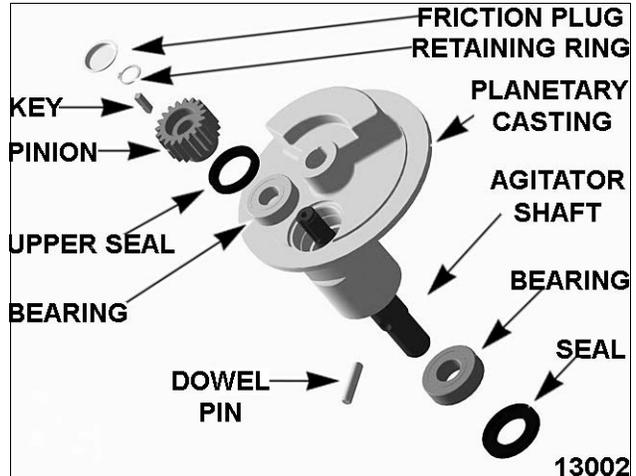
## Parts Information

When servicing assembly 00-102778-01, use the following replacement parts and refer to Service Manual F-24670 REMOVAL AND REPLACEMENT OF PARTS, PLANETARY.

Original Part Number for Assembly 102778-01		Replacement Part for Assembly 102778-01	
00-023166-1	Planetary Casting (obsolete)	00-916645	Planetary Assembly
00-102778-01	Planetary Assembly (obsolete)	00-916645	Planetary Assembly

When servicing assembly 00-916645 use the following replacement parts and service information listed below.

Replacement Part Numbers for Assembly 916645	
00-916336	Plug, Friction 1" DIA
RR-004-18	Ring, Retaining 5100-62
00-012430-00049	Key
00-916335	Pinion, Beater Shaft
00-916512	Seal, Upper
00-916646	Casting, Planetary (MACH)
BB-018-17	Bearing, Upper Ball, SGL RAD 0.6693
00-065062-0000	1 Pin, Dowel - Planetary
00-916647	Shaft, Agitator (Sealed)
BB-005-34	Bearing, Lower Ball SGL RAD 0.7874
00-023482	Seal, Grease -1" DIA Shaft



## Service Information



**WARNING:** DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

To service replacement parts associated with planetary 00-916645, follow steps listed below.

**NOTE:** Ensure all parts are clean before assembly.

1. Remove old grease from cavity of planetary.
2. Clean planetary cavity and verify that no debris is present.
3. Remove lower seal and lower bearing.
4. Install new lower seal and bearing on the beater shaft

**NOTE:** Lip of seal must face inward.

5. Install beater shaft into planetary.
6. Fill planetary casting void 2/3 full with Chevron FM EP-2 grease.
7. Install upper bearing.
8. Apply a small amount of mineral oil to the outer surface of upper seal.
9. Install seal onto planetary.

**NOTE:** Lip of seal must face out.

10. Install pinion.
11. Install key and retaining ring.
12. Apply a small amount of Permatex around the lip of friction plug and smooth with finger.
13. Position friction plug in place.
14. Strike friction plug with rubber mallet to secure in position.
15. Remove any excess Permatex from friction plug.
16. Apply small amount of mineral oil to outer surface of the bottom seal.
17. Install bottom seal.
18. Install PLANETARY
19. Check for proper operation.



S E R V I C E

# TECHNICAL SERVICE BULLETIN

MISCELLANEOUS

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HOBART SERVICE

TROY, OHIO 45374-0001

## MACHINE DATA CODE INFORMATION

### INTRODUCTION

Since January 1, 2002, all Hobart equipment, except microwave ovens, have been marked with a three-letter date code to eliminate duplication at the end of the two-letter date code numbering cycle (i.e. 23 assigned letters for a 23 year date code numbering cycle). Microwave ovens are marked with the month and year as outlined under Manufacture Date (item 2).

Between January 1985 and January 2001 all Hobart equipment, *except* microwave ovens, were marked with a two letter date code.

Refer to manufacturing date code tables.

### MANUFACTURE DATE

- All Hobart equipment is marked with a manufacturing date code in the CODE or MD section on the machine data plate with the exception of microwave ovens. If the CODE or MD section is not available, the manufacturing date code should be marked in the far right of the serial number section. The manufacturing date code will not become part of the serial number.

Exception: Refrigeration equipment is marked with the manufacturing date code directly following the serial number; or with the two-digit numerical date (Month & Year) in the DATE section.

- Microwave ovens are marked with a manufacturing date code in the section designated on the machine data label per UL 923. The month and year of manufacture are both marked without abbreviation, with the year shown as a four-digit number on the machine data label. Example: January 2005.

MANUFACTURING DATE CODES AFTER JANUARY 1, 2002					
*First Letter = Month	*Second and Third Letters = Year				
A = JAN	AA = 2001	AN = 2013	BB = 2025	BP = 2037	CC = 2049
E = FEB	AB = 2002	AP = 2014	BC = 2026	BR = 2038	CD = 2050
R = MAR	AC = 2003	AR = 2015	BD = 2027	BS = 2039	CE = 2051
P = APR	AD = 2004	AS = 2016	BE = 2028	BT = 2040	CF = 2052
Y = MAY	AE = 2005	AT = 2017	BF = 2029	BU = 2041	CG = 2053
U = JUN	AF = 2006	AU = 2018	BG = 2030	BV = 2042	CH = 2054
L = JUL	AG = 2007	AV = 2019	BH = 2031	BW = 2043	
G = AUG	AH = 2008	AW = 2020	BJ = 2032	BX = 2044	
T = SEP	AJ = 2009	AX = 2021	BK = 2033	BY = 2045	
C = OCT	AK = 2010	AY = 2022	BL = 2034	BZ = 2046	
N = NOV	AL = 2011	AZ = 2023	BM = 2035	CA = 2047	
M = DEC	AM = 2012	BA = 2024	BN = 2036	CB = 2048	

\* The letters I, O, and Q have been omitted for clarity.

**NOTE:** For the year 2001, each manufacturing facility had the option of using the last letter of Y in the two letter date code format or begin using the second and third letters of AA in the three-letter date code format (if space was available on the data plate).

<b>MANUFACTURING DATE CODES BETWEEN JANUARY 1985 AND JANUARY 2001</b>					
<b>*First Letter = Month</b>		<b>*Second Letter = Year</b>			
A = JAN	L = JUL	A = 1980	G = 1986	N = 1992	V = 1998
E = FEB	G = AUG	B = 1981	H = 1987	P = 1993	W = 1999
R = MAR	T = SEP	C = 1982	J = 1988	R = 1994	X = 2000
P = APR	C = OCT	D = 1983	K = 1989	S = 1995	Y = 2001
Y = MAY	N = NOV	E = 1984	L = 1990	T = 1996	
U = JUN	M = DEC	F = 1985	M = 1991	U = 1997	

\* The letters I, O, and Q have been omitted for clarity.

3. Before 1985, GE or Chicago Heights cooking equipment serial numbers included a manufacturing date code.

**Serial number coding from 1962 to approximately 1984 for cooking equipment only.**

M                                      C                                      A                                      0000\*  
 Year of Manufacture              Class of Product              Month of Manufacture              Numerical Identification

\*From 1962 to 1963, the number of digits used may vary.

<b>*First Letter = Month</b>		<b>YEAR OF MANUFACTURE</b>		<b>CLASS OF PRODUCT</b>		<b>MONTH OF MANUFACTURE</b>	
Year	Letter	Year	Letter	Product	Letter	Month	Letter
1962	K	1974	B	Cooking	C	JAN	A
1963	L	1975	C	Refrigeration	R	FEB	B
1964	M	1976	D	Sanitation	S	MAR	C
1965	N	1977	E			APR	D
1966	P	1978	F			MAY	E
1967	R	1979	G			JUN	F
1968	S	1980	H			JUL	G
1969	T	1981	J			AUG	H
1970	U	1982	K			SEP	J
1971	W	1983	L			OCT	K
1972	X	1984	M			NOV	L
1973	A					DEC	M

<b>SERIAL NUMBER CODING BEFORE 1962 FOR GE OR CHICAGO HEIGHTS EQUIPMENT ONLY</b>								
	1954	1955	1956	1957	1958	1959	1960	1961
<b>COOKING</b>								
Heavy Equipment	4-0000	B-0000	F-0000	E-0000	C-0000	D-0000	G-0000	H-0000
Counter Equipment	4-0000	B-0000						
Griddles			BG0000	EG0000	CG0000	DG0000	BGG0000	HG0000
Food Warmers			BF0000	EF0000	CF0000	DF0000	GF0000	HF0000
Fry Kettles			BK0000	EK0000	CK0000	CK0000	GK0000	HK0000
Waffle Bakers			BW0000	EW0000	CW0000	DW0000	GW0000	HW0000

SERIAL NUMBER CODING BEFORE 1962 FOR GE OR CHICAGO HEIGHTS EQUIPMENT ONLY								
	1954	1955	1956	1957	1958	1959	1960	1961
<b>REFRIGERATION</b>								
Water Coolers	24600000 to 24999999	55400000 to 55807000	70060000 to 70099999	70190000 to 70199999	70230000 to 70239999	70300000 to 70335000	70335700 to 70359100	70359101 to 70386665
<b>SANITATION</b>		Sanitation serial numbers will vary prior to 1968.						