



# SERVICE MANUAL

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



V1401 SHOWN

**31849**

## MODEL M-802 & MODEL V-1401 MIXERS

M802  
V1401

### - 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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# SECTION 1 GENERAL

## GENERAL

The Hobart M-802 and V-1401 mixers are designed primarily to mix food products. However, they are used for various industrial applications.

An optional attachment hub provides versatility of operation through the use of optional attachments and accessories.

Both the attachment hub and the planetary are driven by the four speed transmission. A timer (15 minute) and a brake are standard equipment on these heavy duty mixers as is the power bowl lift system. An optional timer (30 or 60 minute) is also available.

An optional taller pedestal (14" on the M-802 and 17" on the V-1401) is an operational advantage as it allows removal of the bowl without removing the agitator.



# SECTION 2 SPECIFICATIONS

## SPECIFICATIONS

1. **Motors.**

A. M-802

3 hp, fan cooled, 1725 RPM (Solid State Mixer).

2 hp, fan cooled, 1725 RPM (Non Solid State Mixer).

B. V-1 401

5 hp, fan cooled, 1725 RPM.

2. **Electrical Specifications.**

200 volts, 60 Hz., 1 phase

230 volts, 60 Hz., 1 phase

220 volts, 50 Hz., 1 phase

200 volts, 60 Hz., 3 phase

230 volts, 60 Hz., 3 phase

460 volts, 60 Hz., 3 phase

220 volts, 50 Hz., 3 phase

380 volts, 50 Hz., 3 phase

415 volts, 50 Hz., 3 phase

3. **Operating Speeds.**

A. M-802

SPEED	AGITATOR	ATTACHMENT
First	55	102
Second	96	179
Third	181	336
Fourth	318	591

B. V-1401

SPEED	AGITATOR	ATTACHMENT
First	46	85
Second	80	149
Third	150	280
Fourth	265	494

4. **Over-all Dimensions** with Standard Bowl.

A. M-802

Height	68-1/8"
Width	27-1/4"
Depth	42-5/8"

B. V-1401

Height	73-3/8"
Width	29-1/4"
Depth	45-5/8"

5. **Net Weight**, including Bowl, Beater and Whip.

MODEL	NET WT.
M-802	1150 lbs.
V1401	1548 lbs.

## SECTION 3 INSTALLATION

### INSTALLATION

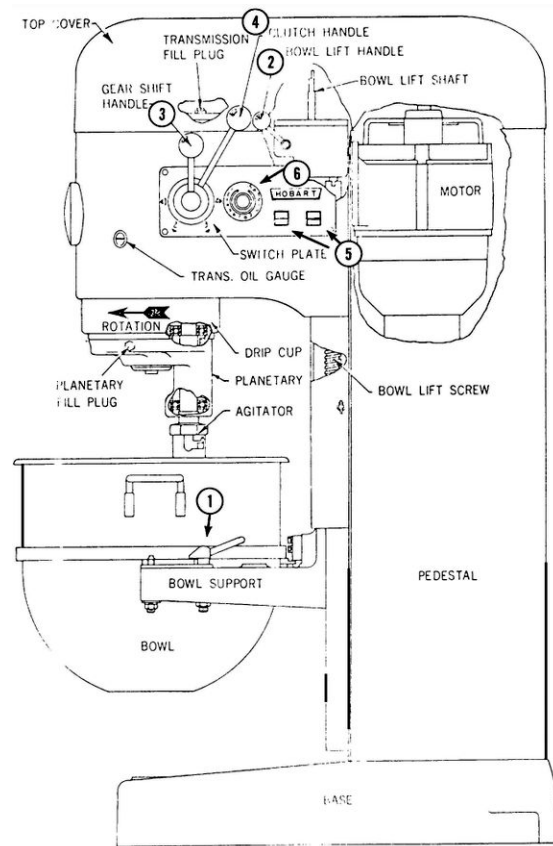
Detailed installation instructions are included in the "Instruction Manual with Replacement Parts" attached to each new machine. For installation instructions, refer to that manual.

# SECTION 4 OPERATING INSTRUCTIONS

## OPERATING INSTRUCTIONS

### 1. Operating Controls.

- A. The Bowl Clamps (1, Fig. 4- 1) are used to lock the bowl in position on the bowl support.
- B. The Bowl Lift Handle (2, Fig. 4- 1) is used to automatically raise and lower the bowl support. The slip clutch on the power bowl lift will ratchet at the top and bottom stop positions to signal end of travel and to protect the operating mechanism.
- C. The Gear Shift Handle (3, Fig. 4- 1) is used to select the desired operating speed. Speed selection must be made WITH THE CLUTCH DISENGAGED.
  - 1) The number "1" (LOW) speed is for heavy mixtures like dough, heavy batters and potatoes.
  - 2) The number "2" (MEDIUM-LOW) speed is for mixing cake batters, mashing potatoes and developing bread doughs.
  - 3) The number "3" (MEDIUM-HIGH) speed is for egg whites, whipping cream, light icing and meringues.
  - 4) The number "4" (HIGH) speed is used for products as in 3rd speed but at an accelerated rate
- D. The Clutch Handle (4, Fig. 4-1) is used to engage the transmission after the speed has been selected.
- E. The Start and Stop switches (5, Fig. 4- 1) are used to start and stop the motor by pressing on the appropriate button.
- F. The Timer (6, Fig. 4- 1) can be set to automatically control the mixing time up to 15 minutes (30 and 60 minute timers are optional). When setting time, turn past 3 and then set the time. For non-timed operation, turn the timer knob counterclockwise to the HOLD position and press the start button. A mechanical stop prevents the timer from being moved clockwise past the maximum time setting to HOLD.



**Fig 4-1**

2. For detailed information concerning bowls, agitators, attachments and accessories, refer to the [Use And Application Handbook for Hobart Mixer Agitators, Attachments and Accessories](#).

## SECTION 5 CLEANING

### CLEANING

Detailed cleaning instructions are included in the M802 & V1401 Mixers Instructions attached to each new machine.

# SECTION 6 LUBRICATION

## LUBRICATION

A list of acceptable LUBRICANTS, as well as the lubricants themselves, are available from your local Hobart Service Office.

### 1. Transmission.

The oil level should be level with the oil level gauge line while the mixer is off. (1, Fig. 6-1)

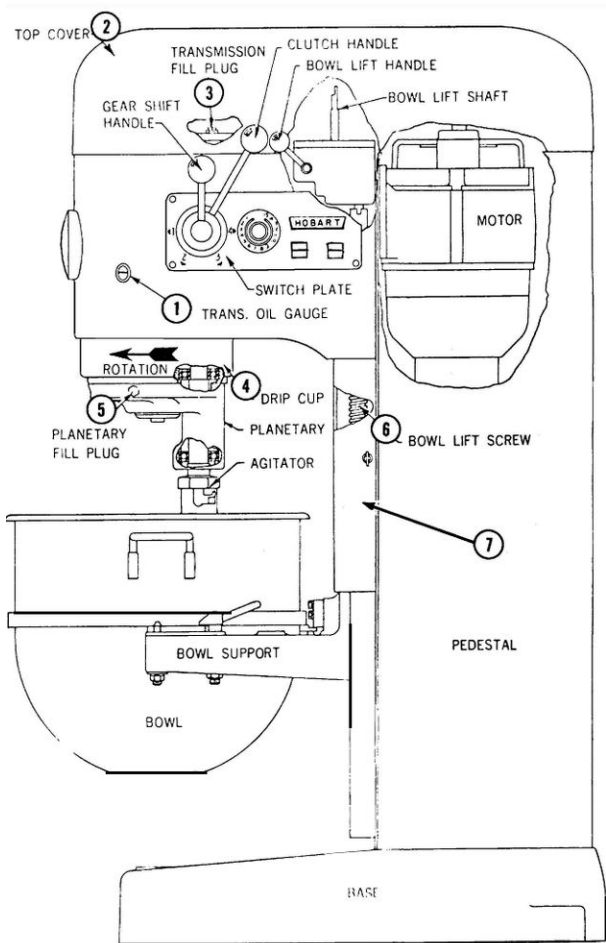


Fig 6-1

Change the oil every 3 years or more frequently with heavy usage.

Take precautions to make sure the new oil remains clean and free of contaminants.

### NOTICE

Overfilling transmission case may result in oil leakage.

A. Draining and/or Adding Oil.

### ⚠ WARNING

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- 1) To drain: Remove oil drain plug (1, Fig. 6-2) and drain all old oil.

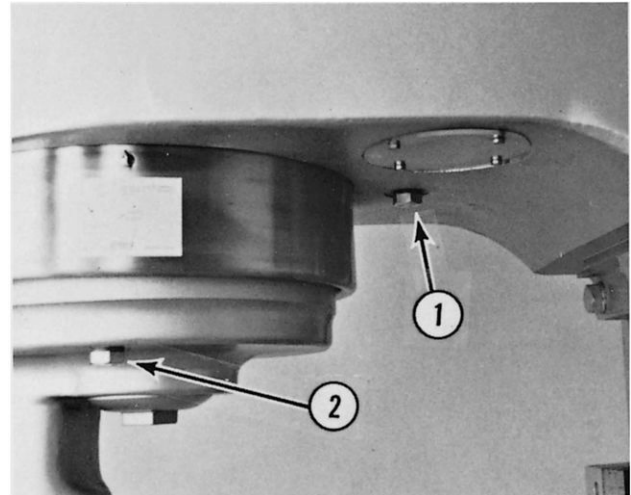


Fig. 6-2

- 2) Replace the drain plug.
- 3) To add oil: Remove the top cover (2, Fig. 6-1) and the transmission fill plug (3, Fig. 6-1).
- 4) Refer to LUBRICANTS for proper type transmission oil. Add oil through the transmission fill plug until the oil level is even with the line on the gauge (1, Fig. 6-1).
- 5) Turn on the power, start the mixer and look down the oil fill hole. Oil should be flowing from the oil delivery tube across the gear face.
- 6) If oil is not flowing, shut off the mixer and refer to Transmission Service.

### 2. Planetary.

The planetary has its own oil supply but due to the relatively small volume of oil (5 to 7 ounces) it is advisable to change it more frequently than the transmission oil, depending on usage.

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- A. Remove the drip cup (4, Fig. 6-1). It has 2 screws.

**NOTE:** On the V-1401 mixer, the drip cup does not have to be removed.

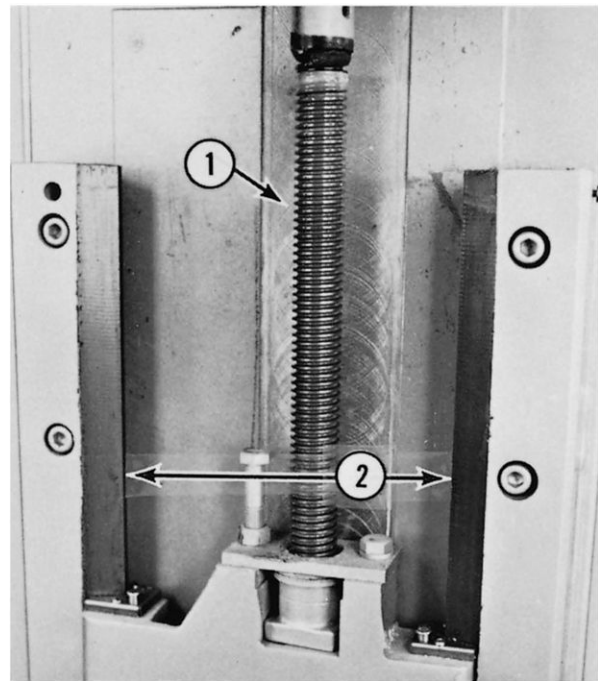
- B. Remove the planetary oil drain plug (2, Fig. 6-2) and drain the old oil.
- C. Replace the drain plug.
- D. Remove the oil fill plug (5, Fig. 6-1) and pour the oil into the planetary. (Refer to LUBRICANTS for the proper type and amount of lubrication.) The oil level should be even with the bottom of the oil fill hole.
- E. Replace the oil fill plug and the drip cup.

3. **Bowl Lift Gear Case.**

The bowl lift unit is grease packed and should not require additional lubrication. If unit is serviced, repack with new grease. (Refer to LUBRICANTS for the proper type and amount of lubrication.)

4. **Bowl Lift Screw Assembly.**

The bowl lift screw assembly (1, Fig. 6-3) should be greased semi-annually (or more often depending on usage). See LUBRICANTS for proper lubricant.



**Fig 6-3**

- A. Place the bowl support in its lowest position.

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- B. Remove the apron to gain access.
- C. Apply grease to the lift screw (1, Fig. 6-3). Refer to LUBRICANTS for the correct type of lubrication.
- D. Reinstall the apron.

5. **Slideways.**

The slideways (2, Fig. 6-3) should be lubricated semi-annually (or more often depending on usage).

- A. Place the bowl support in its lowest position.
- B. Remove the apron (7, Fig. 6-1) to gain access.
- C. Oilers are provided for lubricating the bowl slideways. Refer to LUBRICANTS for the correct type of lubrication.
- D. Reinstall the apron.

# SECTION 7 ADJUSTMENTS

## 1. BOWL TO BEATER CLEARANCE

### A. To Check

(1) With the flat "B" beater on the agitator shaft and the bowl securely locked on the bowl support, raise the bowl support to the extreme top position.

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

(2) Check the clearance between the bottom of the beater and the bowl (1, Fig. 7-1). This clearance should be no more than 3/32".

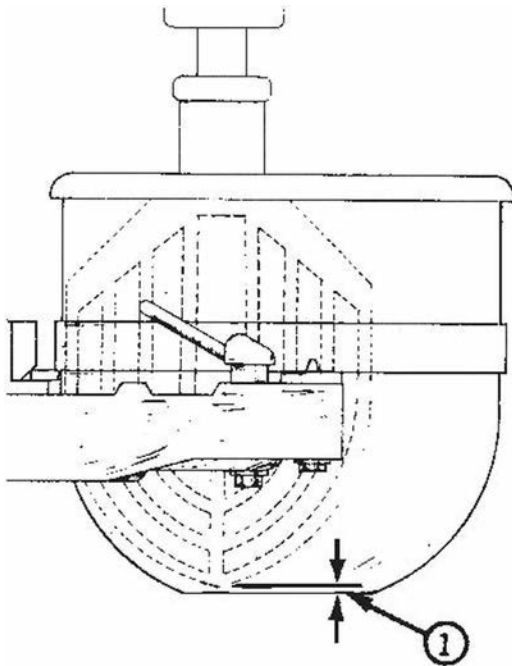


Fig 7-1

### B. To Adjust:

(1) Remove the bowl apron (1, Fig. 7-2) and inner apron. (Older mixers do not have an inner apron.)

(2) Loosen the locknut (2, Fig. 7-2) and turn the stop screw (3, Fig. 7-2) clockwise to decrease the clearance or counterclockwise to increase the clearance.

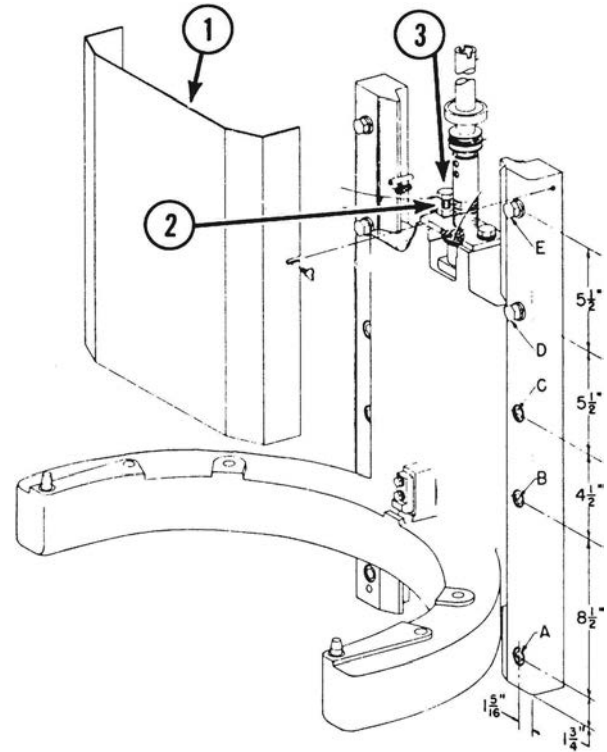


Fig. 7-2

(3) Tighten the locknut while holding the stop screw.

**NOTE:** It may be necessary to restart the mixer and lower the bowl in order to turn the stop screw counterclockwise.

(4) Operate the bowl lift several times contacting both bottom and top stops. With the bowl lift against the top stop, recheck the clearance to assure correct adjustment.

## 2. BOWL CLAMP ADJUSTMENT

A. The tension of the bowl clamps (1, Fig. 7-3) is controlled by a spring washer (2, Fig. 7-3) and locknuts (3-4, Fig. 7-3). The tension of the bowl clamp should be tight enough to maintain its position while engaged.

B. To increase or decrease tension on the bowl clamps, reposition the locknuts.

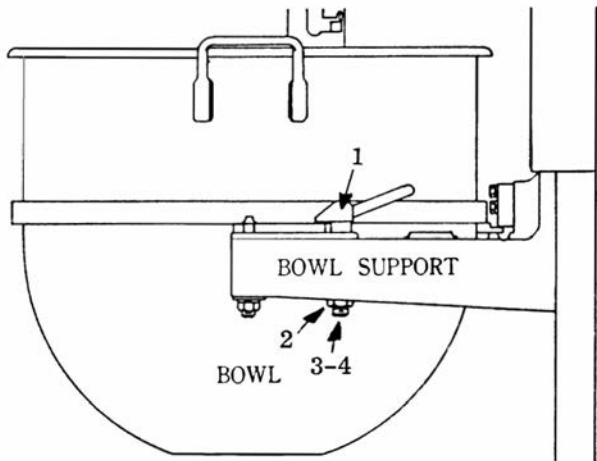


Fig 7-3

### 3. SLIDEWAYS

Clearance between the slideways and bowl support should be held to a minimum without binding. Use the following procedure to adjust the slideways.

- A. Remove the bowl and agitator.
- B. Remove the apron (1, Fig. 7-2) and inner apron. (Older mixers do not have an inner apron.)

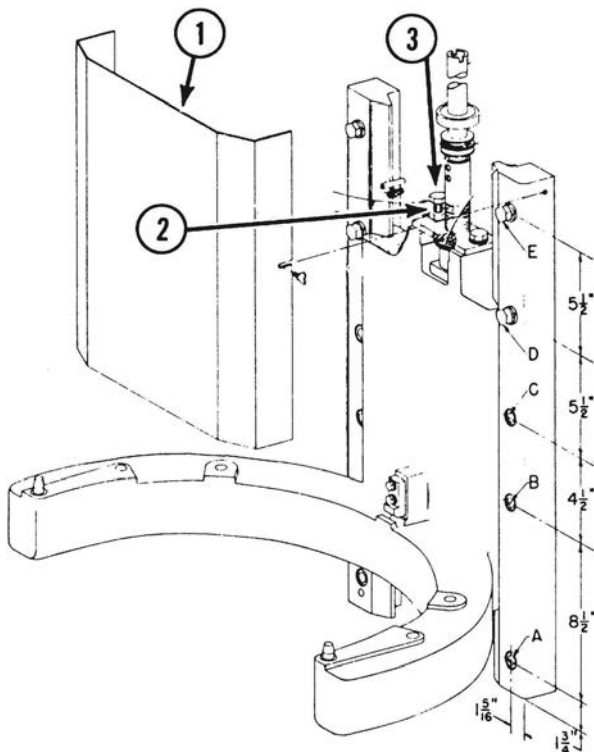


Fig 7-2

- C. Raise the bowl support to its top position and remove the body putty and paint from in front of the 3 bottom bolts (A, B, C., Fig. 7-2) on the right hand slideway.

**NOTE:** The left hand slideway is doweled and should not be loosened.

- D. Slightly loosen all 5 bolts that hold the right hand slideway to the pedestal.
- E. Holding a rag against the right hand slideway to protect the finish, tap the slideway with a rubber mallet until it is snug against the bowl support.
- F. Tighten the top slideway bolt (E, Fig. 7-2).
- G. Lower the bowl lift to 1-1/2" from the bottom. Tap on the slideway and tighten the bottom bolt.
- H. Tighten the remaining bolts and run the bowl lift up and down, with a load, to check for binding.

### 4. BOWL LIFT "V" BELT

#### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- A. To Check Adjustment.

- (1) The "V" belt should have 1/2" deflection (1, Fig. 7-4) between the drive pulley and the power bowl lift pulley.

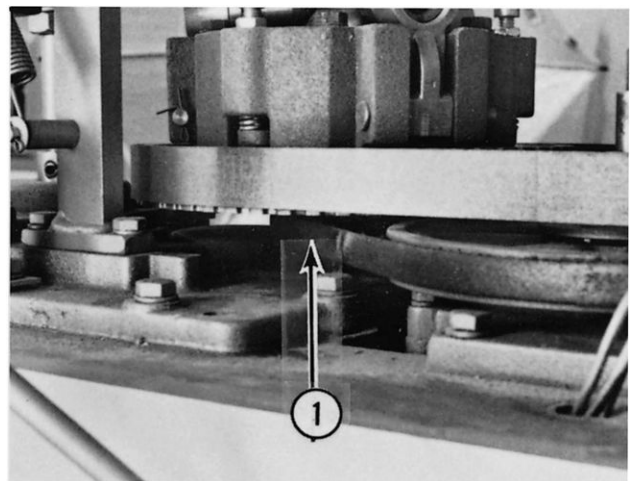


Fig 7-4

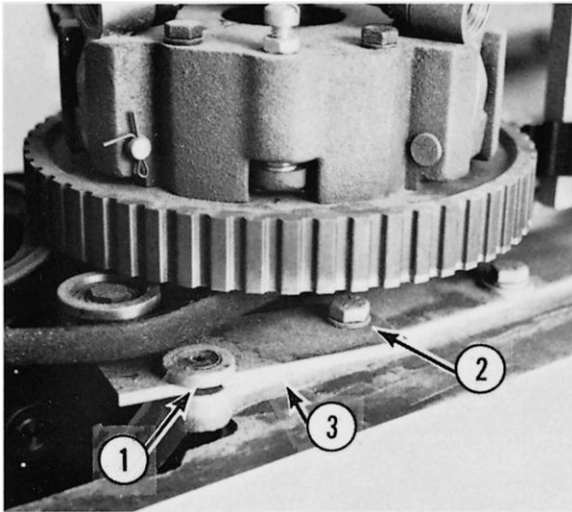
- A. Adjustment Procedure.

#### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- (1) Loosen the holding screw (1, Fig. 7-5) and the pivot screw (2, Fig. 7-5).

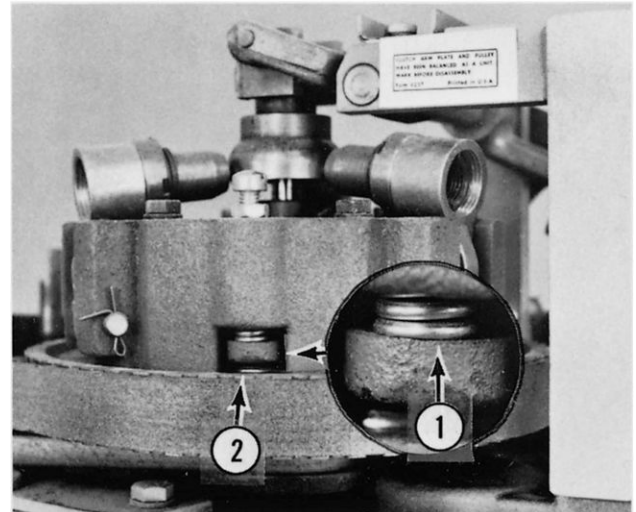




**Fig 7-5**

(2) Move the belt tightener mounting plate (3, Fig. 7-5) to achieve ½" belt deflection between the drive pulley and the power bowl lift pulley.

(3) Tighten both the holding screw and the pivot screw to hold the adjustment.



**Fig.7-6**

(4) If the above listed checks are correct, no further action is required.

(5) If one or more of the above listed checks is not correct, the clutch must be adjusted.

**B. Clutch Adjustment.**

(1) Remove the top cover.

(2) Disengage the clutch.

**5. CLUTCH ADJUSTMENT**

**A. Checking for Correct Adjustment.**

(1) The clutch should not slip under load. The motor should stall before the clutch slips.

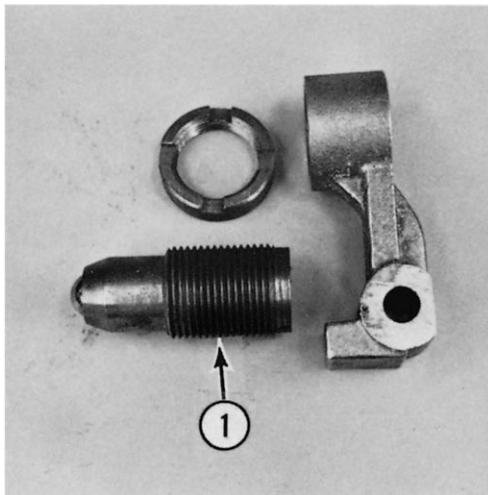
(2) With the motor running and the clutch disengaged, the planetary should try to creep forward slightly. (The brake will prevent it from creeping.) Check by grasping the planetary casting and pulling against the clutch drag.

(3) With the clutch engaged and the motor not running, visually check the clutch release springs (1, Fig. 7-6). They should not be fully compressed. (If they are fully compressed the pressure plate ears will break.)

**NOTE:** Do not adjust the ball operating spring tension (1, Fig. 7-7) in the clutch spring screw assemblies. The spring force on the ball is controlled by the hollow screw. The tension on this spring is preset at the factory. If you suspect this setting is incorrect, install a new clutch spring screw assembly (1, Fig. 7-8).

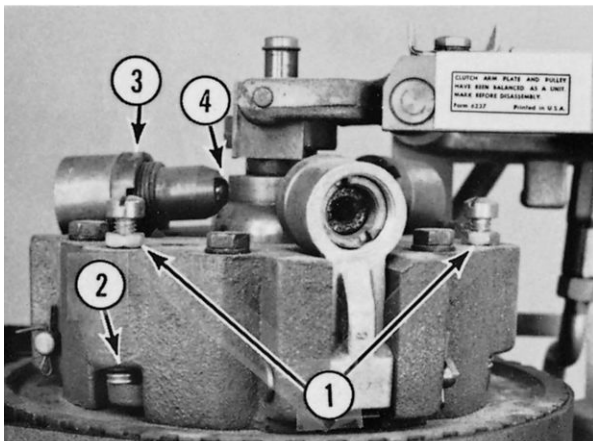


**Fig. 7-7**



**Fig. 7-8**

(3) Back off the three release spring screws (1, Fig. 7-9) until they no longer contact the release springs (2, Fig. 7 -9).



**Fig. 7-9**

(4) Loosen the three clutch spring screw locknuts (3, Fig. 7-9).

(5) Adjust the clutch spring screw to achieve a clearance of 9/64" between the ball and cam (4, Fig. 7-9). Use a 9/64" (.142) drill bit as the gauge.

(6) Lock the clutch spring screw with the locknut (3, Fig. 7-9).

(7) Repeat steps (5) and (6) on the other two clutch spring screws. Recheck the 9/64" clearance between the ball and cam on the three clutch arms.

**NOTE:** The clutch spring screws when adjusted correctly prevent clutch slipping.

(8) Turn the three release spring screws in until they just touch the spring discs.

**NOTE:** Visually check to make sure that the disc and springs are not wedged in the clutch housing.

(9) Advance each of the three release spring screws **EXACTLY** the same number of turns.

a. On the V-1401 mixer turn each of the release spring screws 3 - ½ turns and lock them with the lockouts.

b. On the —802 mixer turn each of the release spring screws 4 turns and lock them with the lockouts.

**NOTE:** When the motor is running, centrifugal force acting on the clutch arm assemblies tends to engage the clutch. This force is overcome by the clutch release springs. When adjusted properly, the springs do not cause the clutch to release completely, but allows the centrifugal force to produce enough drag to cause the backlash to be removed from the transmission gear train. With the backlash removed, the transmission will shift smoothly.

(10) Slowly engage the clutch (motor not running) while observing the clutch release springs (1, Fig. 7 -6). The springs must not be fully compressed when the clutch is engaged or the ears (2, Fig. 7 -6) on the pressure plate will break.

(11) If the springs are nearly fully compressed, recheck the release spring screw adjustment, steps (8) and (9).

(12) If the release spring screws are adjusted correctly and the springs are nearly fully compressed, the clutch disc are worn and must be replaced. (Refer to : Section 9, Clutch and Brake.)

(13) Check the clutch for proper operation. Refer to: Clutch " Checking for Correct Adjustment ".

(14) Check the "BRAKE ADJUSTMENT".

## 6. BRAKE ADJUSTMENT

A. Checking The Engaging Plate Position. The engaging plate (1, Fig. 7-10) should contact the lower portion of the brake arm stop (2, Fig. 7-10) with the clutch disengaged.

B. Adjusting the Engaging Plate Position.

(1) Remove the palnut (3, Fig. 7-10).

(2) Adjust the position of the engaging plate by tightening or loosening the upper jam nut (4, Fig. 7-10).

(3) When adjustment is complete, reinstall the palnut.

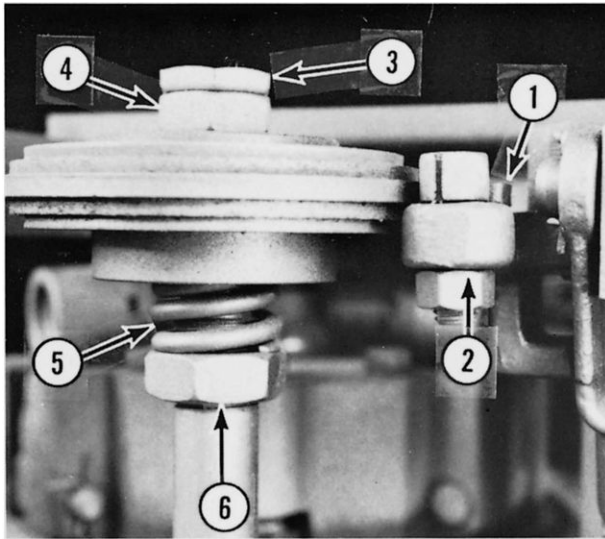


Fig 7-10

C. Checking the Braking Action. A properly adjusted brake is indicated by the following :

**NOTE:** If the clutch is not adjusted properly, the brake can appear to be out of adjustment. Before making any adjustments to the brake be sure the clutch is adjusted correctly.

- (1) With the motor running, clutch disengaged and the transmission in first speed, the brake unit should display sufficient braking action to overcome clutch drag.
- (2) With the mixer running in first speed disengage the clutch, the planetary should stop immediately at the time the clutch is disengaged.
- (3) With the mixer running, clutch disengaged and the transmission in first speed, you should be able to turn the planetary by hand in a clockwise direction. (Looking from the top of the mixer.)

**NOTICE**

When performing this test, grasp the cast part of the planetary. **DO NOT** grasp the agitator shaft.

D. Braking Action Adjustment.

**WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

The braking action is controlled by the compression of the spring (5, Fig. 7-10) located under the brake pressure plate and the lower hex nut.

- (1) Tighten or loosen the lower hex nut (6, Fig. 7-10) to attain the proper braking action.

**7. FLEXA-GEAR DRIVE BELT**

A. To Check Tightness.

**WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

It should be as tight as possible without binding.

- (1) A good gauge of tightness is that it should slide over the motor drive gear without turning either the driven gear or the motor drive gear.

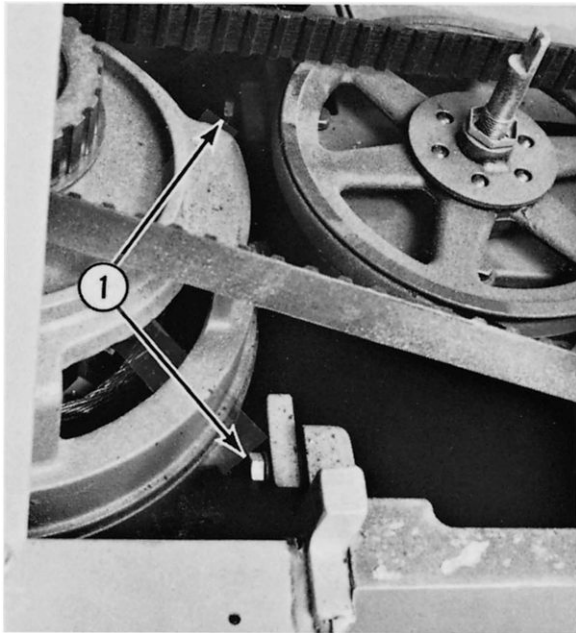
B. Adjustment.

**WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

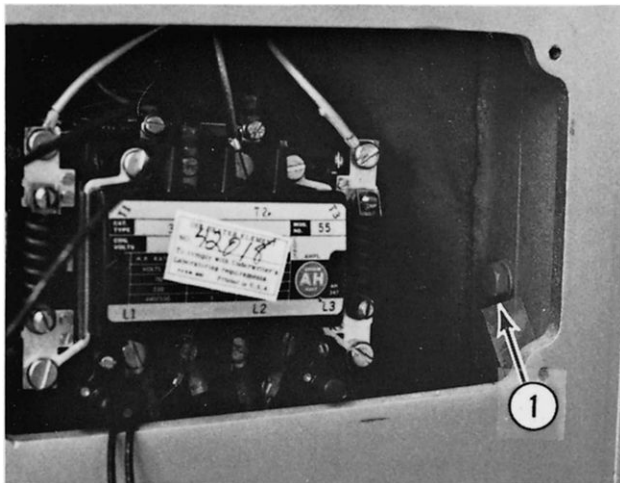
Loosen the four motor mounting bolts and add or remove shims to provide the correct tension.

- (1) The upper two bolts are reached from inside the mixer housing (1, Fig. 7-11). They enter tapped holes in the transmission housing.



**Fig. 7-11**

(2) One of the lower bolts (1, Fig. 7-12) is reached by removing the clutch handle and name plate. Also the contactor on non solid state machines.



**Fig. 7-12**

(3) The other lower bolt is reached through the area beneath the power bowl lift gear box. It enters a tapped hole in the motor base.

(4) Shims are **FULL LENGTH** with open notches. They can be removed or installed without completely removing the motor bolts.

(5) It is not necessary to use **EXACTLY** the same number of shims on each side as only one shim may provide the proper adjustment.

## SECTION 8 MOTOR

### 1. FLEXA-GEAR DRIVE BELT

The Flexa-Gear drive belt is a flexible internal gear. It consists of multiple twisted steel cables imbedded in neoprene. The surface is nylon. It has precision teeth which mesh exactly with the teeth on the motor drive gear and the driven gear. It is a toothed drive - there can be no slip.

#### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

A. To replace the Flexa-Gear drive belt, remove the cotter pin (1, Fig. 8-1) and the clevis pin (2, Fig. 8-1).

B. Remove the four hex head bolts (3, Fig. 8-1) and swing the clutch operating mechanism away from the clutch operating cam bearing.

C. Slide the Flexa-Gear drive belt up and off the motor drive gear and driven gear.

D. When installing the Flexa-Gear drive belt, slide it down on the motor pinion and driven gear.

E. Align the clutch yoke with the clutch operating cam bearing and slide it into place. Secure with the four bolts.

F. Install the clevis pin and cotter pin.

G. Check the adjustment. Refer to Adjustments, FLEXA-GEAR DRIVE BELT.

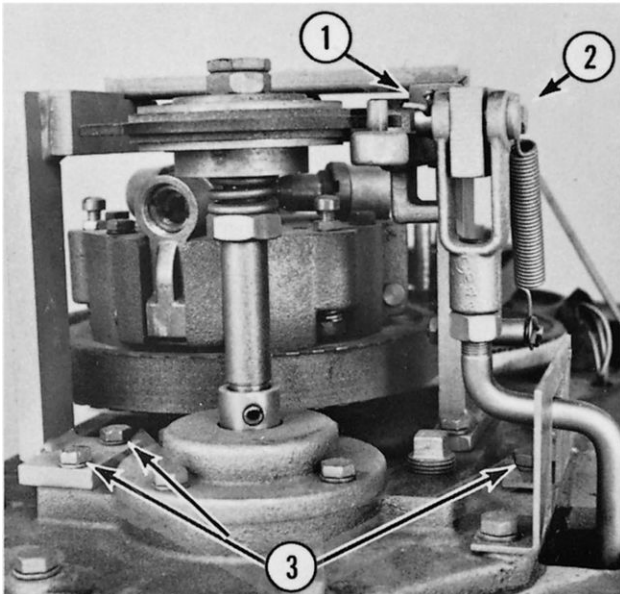


Fig. 8-1

### 2. SERVICING SINGLE PHASE STARTING COMPONENTS

(Split Phase, Capacitor Start).

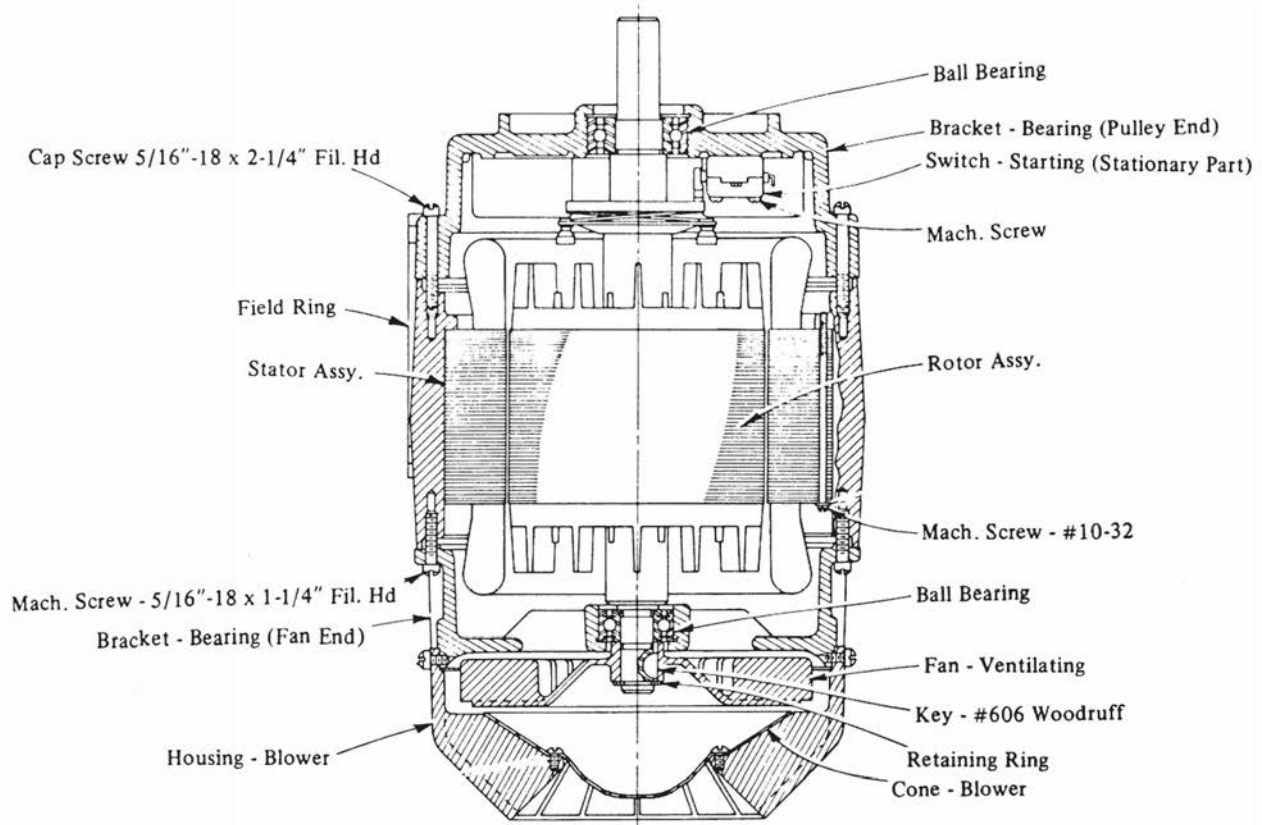


Fig. 8-2

Single phase motors (Fig. 8-2) have a starting circuit consisting of two start capacitors, centrifugal switch and start windings. The start windings assure rotation in the proper direction, and provides the needed torque to bring the motor up to speed. As the motor RPM increases to near its running speed, the start windings and capacitors are no longer needed and the centrifugal switch opens, removing power to the start windings. The motor then runs on the main windings.

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

A. Capacitors.

The best method to test a capacitor is to substitute a known good capacitor in its place.

B. Start Switch (Fig. 8-2). If it is determined that the start switch has a malfunction, it can be removed without removing the motor from the mixer. Use the following procedure.

- (1) Remove the solid state control panel. (Where appropriate.) [Refer to "Removing Motor (Solid State Controls)".]

- (2) Remove the FLEXA-GEAR DRIVE BELT from the drive pulley.

- (3) Remove the drive gear.

- (4) Remove the motor bearing bracket.

- (5) Disconnect the leads to the start switch and remove the start switch.

- (6) Reassemble in the reverse order of disassembly.

**3. REMOVING THE MOTOR (SOLID STATE CONTROLS).**

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- A. Disconnect the motor leads from the terminal board. If the mixer is not equipped with a terminal board, disconnect the motor leads from the contactor (1, Fig. 8-3).

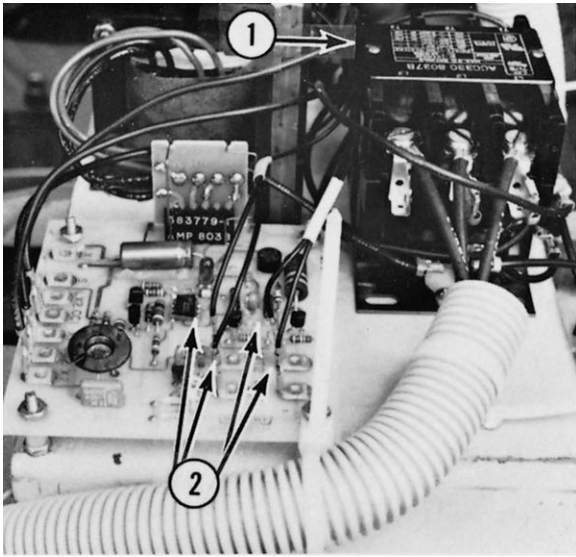


Fig. 8-3

- B. Disconnect the motor thermistor leads (2, Fig. 8-3) (MT1 and MT2) from the motor protector board.
- C. Disconnect the leads from the line side of the contactor (1, Fig. 8-3).
- D. Disconnect leads MPB-CC 1, MPB-X2 and 1 CON-C from the control panel.
- E. Loosen the four control panel mounting screws and remove the control panel.
- F. If the motor is single phase, remove the motor leads from the capacitors.
- G. Slip the FLEXA-GEAR DRIVE BELT off the motor drive gear.
- H. Remove the six switch plate mounting screws (1, Fig. 8-4).

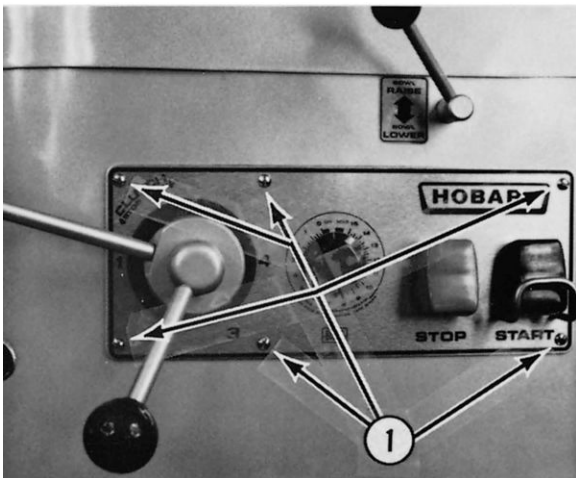


Fig. 8-4

- I. Remove the motor mounting bolt located behind the switch plate.

- J. Remove the motor mounting bolt located under the power bowl lift gear box.

- K. Loosen the two top motor mounting bolts (1, Fig. 8-5), and remove the shims. Note the location of each full shim as it should be reinstalled in the same position which it was removed.

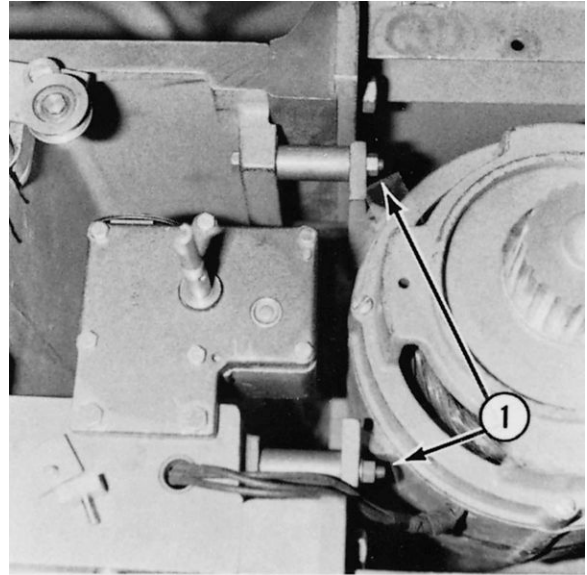


Fig. 8-5

- L. Support the motor while removing the two top motor mounting bolts.

- M. Remove the motor.

#### 4. REMOVING THE MOTOR (NON SOLID STATE CONTROLS)

##### **⚠ WARNING**

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- A. Remove the switch plate (1, Fig. 8-6). Do not lose the push buttons (1, Fig. 8-7).

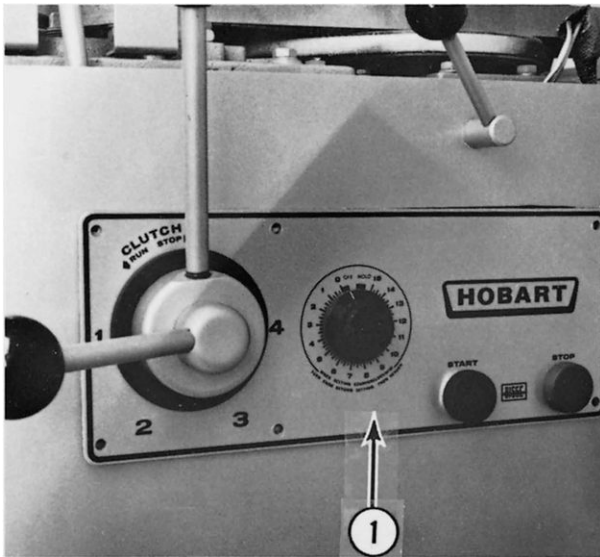


Fig. 8-6

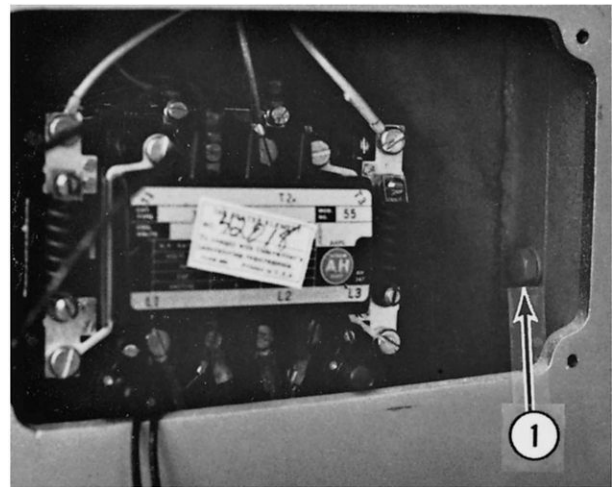


Fig. 8-8

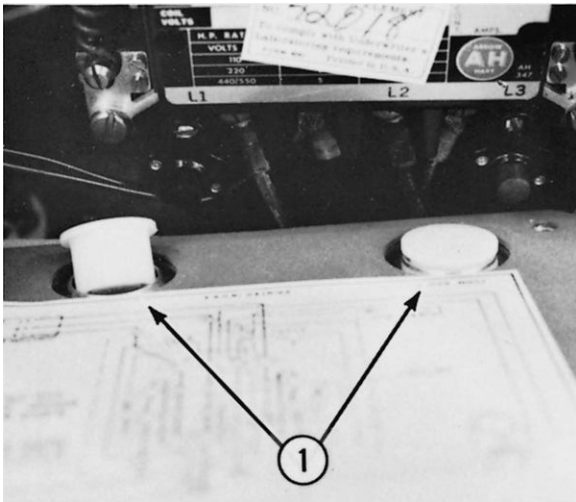


Fig. 8-7

- B. Disconnect the motor leads (T1-T2-T3) from the contactor and pull the leads out of the housing .
- C. Remove the contactor mounting screws and move the contactor to one side.
- D. Remove the motor mounting bolt (1, Fig. 8-8) located behind the switch plate.

E. Slip the FLEXA-GEAR DRIVE BELT off the motor drive gear.

F. Remove the motor mounting bolt located under the power bowl lift gear box.

G. If the motor is a single phase capacitor start type, remove the capacitor leads from the capacitors.

H. Loosen the two top motor mounting bolts (1 Fig. 8-9) and remove the shims. Note the location of each shim as they should be reinstalled in the same position which it was removed.

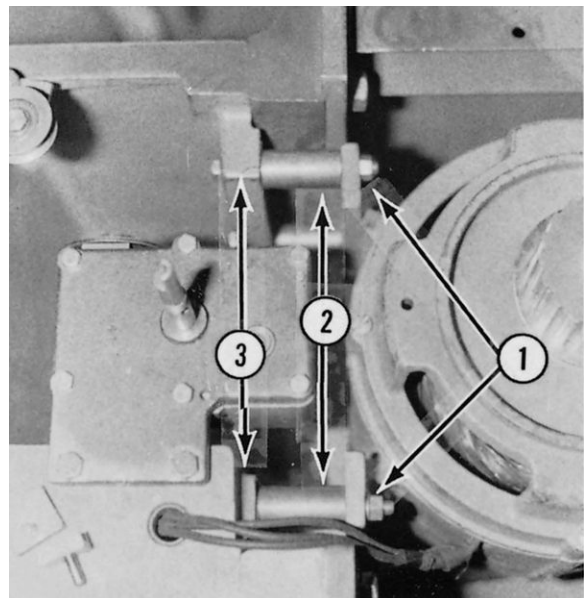


Fig. 8-9

I. Support the motor while removing the two top motor mounting bolts.

J. Remove the motor.



## 5. MOTOR DISASSEMBLY

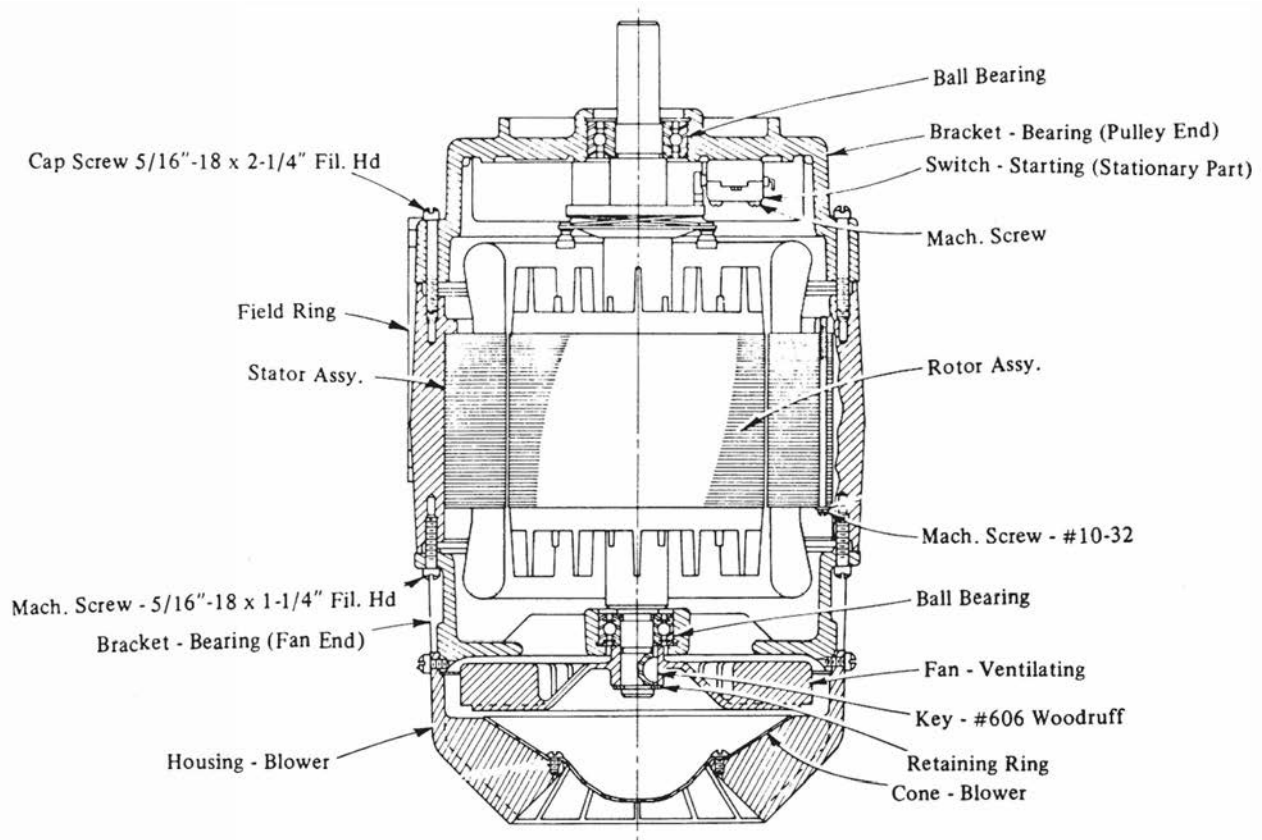


Fig. 8-2

- A. Remove the motor drive gear.
- B. Remove the blower housing.
- C. Remove the fan retaining ring, fan and woodruff key.
- D. Mark the bearing bracket and remove the four screws and take off the fan end bearing bracket.
- E. Carefully withdraw the rotor out of the stator.
- F. If necessary, the stator can be removed from the field ring by removing the motor through bolts.
- G. If necessary, the bearings can be removed from the rotor.

- C. If the bearings were removed, install the bearings on the rotor.
- D. Carefully insert the rotor into the stator.
- E. Install the fan end bearing bracket.
- F. Install the woodruff key and the fan. Secure with the retaining ring.
- G. Install the blower housing.
- H. Install the spacer (if used) and the motor drive gear.

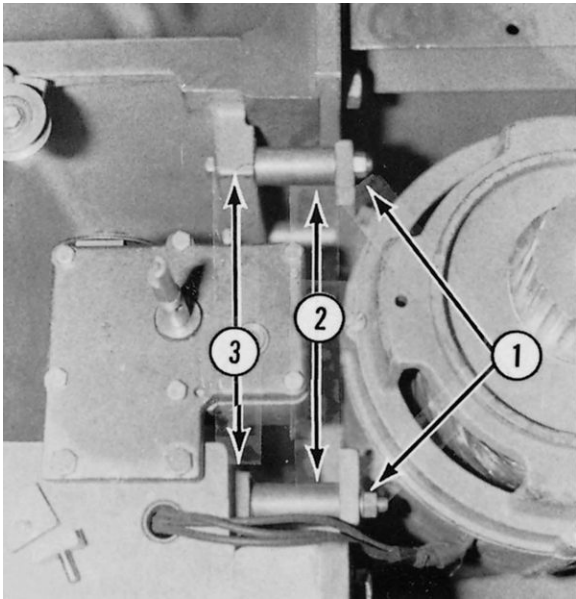
## 6. MOTOR REASSEMBLY

Fig.8-2

- A. If the stator was removed, install the stator into the field ring.
- B. If the pulley end bearing bracket was removed, install the pulley end bearing bracket onto the field rings.

## 7. INSTALLING THE MOTOR (SOLID STATE CONTROLS)

- A. Place the motor into the pedestal.
- B. Support the motor while installing the two top motor mounting bolts (1, Fig. 8-9). Do not tighten the bolts.



**Fig. 8-9**

**NOTE:** Install the motor spacers (2, Fig. 8-9) on the V-1401.

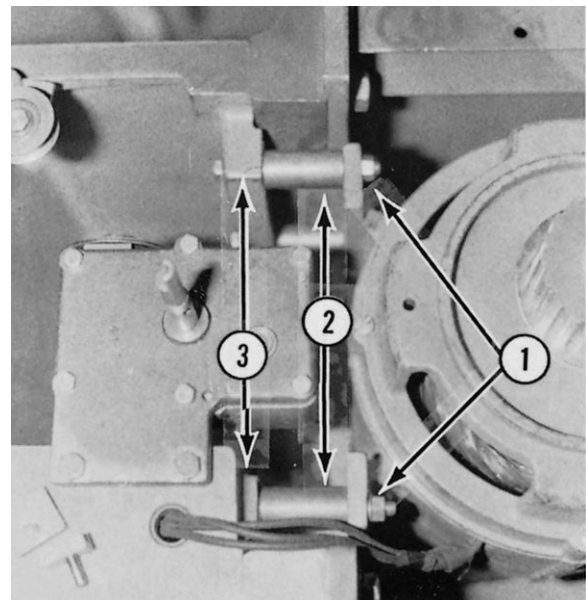
- C. Install, but do not tighten, the motor mounting bolt located under the power bowl lift gear box.
- D. Install, but do not tighten, the motor mounting bolt located behind the switch plate.

- E. Install the shims (3, Fig. 8-9) in the same position from which they were removed.
- F. Tighten the four motor mounting bolts.
- G. Install the FLEXA-GEAR DRIVE BELT. For adjustment procedure, refer to: Adjustments, FLEXA-GEAR DRIVE BELT.
- H. If the motor is single phase, connect the capacitor leads.
- I. Install the control panel and secure with the four panel mounting bolts.
- J. Connect line leads (L1-L2-L3) to the line side of the contactor.
- K. Connect the motor thermistor leads (MT1 and MT2) to the motor protector board.
- L. Connect leads MPB-CC1, MPB-X2 and 1CON-C1 on the control panel.
- M. Connect the motor leads to the terminal board as shown in MOTOR CONNECTION TO TERMINAL BLOCK to make the motor operate on the desired voltage. If the mixer is not equipped with a terminal board, connect the motor leads (T1 -T2-T3) to the load side of the contactor.

<b>MOTOR CONNECTION TO TERMINAL BLOCK (Terminal Block is Located Beside the Fuse Board)</b>						
<b>VOLTAGE</b>	<b>1TB-1</b>	<b>1TB-2</b>	<b>1TB-3</b>	<b>1TB-4</b>	<b>1TB-5</b>	<b>1TB-8</b>
230/60/6	T1, 1, 7	T2, 2, 8	T3, 3, 9		4, 5, 6	
460/60/3	T1, 1	T2, 2	T3, 3	4, 7	5, 8	6, 9

## 8. INSTALLING THE MOTOR (NON SOLID STATE)

- A. Place the motor into the pedestal.
- B. Support the motor while installing the two top motor mounting bolts (1, Fig. 8-9). Do not tighten the bolts.



**Fig. 8-9**

**NOTE:** Install the spacers (2, Fig. 8-9) on the V-1401.

C. Install, but do not tighten, the motor mounting bolt located under the power bowl lift gear box.

**NOTE:** If the motor has been replaced with a current production type motor see M802/V1401 REPLACEMENT 3 PHASE VENDOR MOTOR AND ASSOCIATED PARTS for service kits which are required when installing the new motor.

D. Install, but do not tighten, the motor mounting bolt located behind the switch plate.

E. Install the shims (3, Fig. 8-9) in the same position from which they were removed.

F. Tighten the four motor mounting bolts.

G. Install the FLEXA-GEAR DRIVE BELT. For adjustment procedure, refer to: Adjustments, FLEXA-GEAR DRIVE BELT.

H. If the motor is single phase, connect the capacitor leads.

I. Install the contactor.

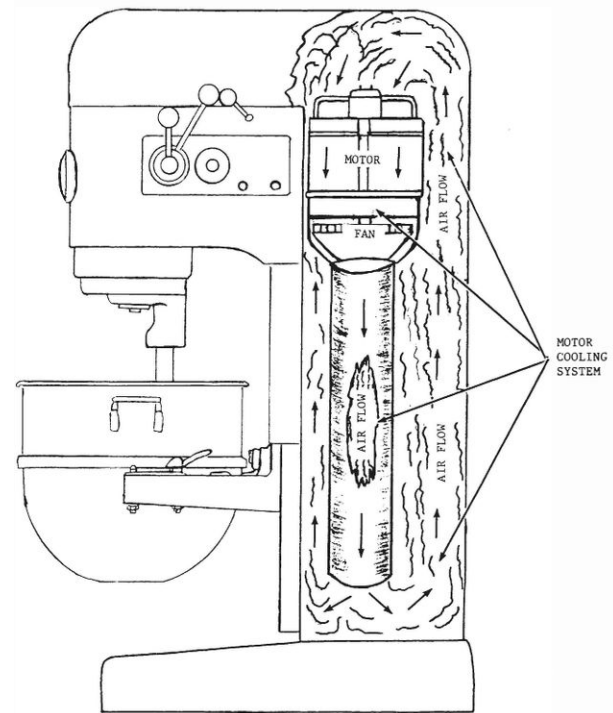
J. Position the motor leads through the wire channel and connect the motor leads (T1-T2-T3) to the contactor.

K. Install the switch plate.

**NOTE:** Be sure the push buttons are installed behind the switch plate.

L. If the motor is a replacement motor and has thermistors, tape the thermistor leads together to prevent them from being shorted or damaged.

## 9. MOTOR COOLING SYSTEMS



**Fig. 8-11**

The fan on the lower end of the motor re-circulates the air within the pedestal and housing cover with no openings to the outside. The motor is located over an air conductor which forces the air from the motor to the bottom of the pedestal. The air is cooled as it returns upward along the side of the pedestal.

# SECTION 9 CLUTCH AND BRAKE

## 1. BRAKE

The brake as well as the clutch is controlled by the clutch handle. The brake assembly is designed to hold the planetary motionless when the mixer motor is running and the clutch is disengaged. The brake arm assembly is so designed that it delays release of the brake until the clutch is completely engaged. The planetary will stop immediately if the operator releases the clutch handle. This insures that the operator has full control when the load is picked up gradually by slipping the clutch and brake at the same time.

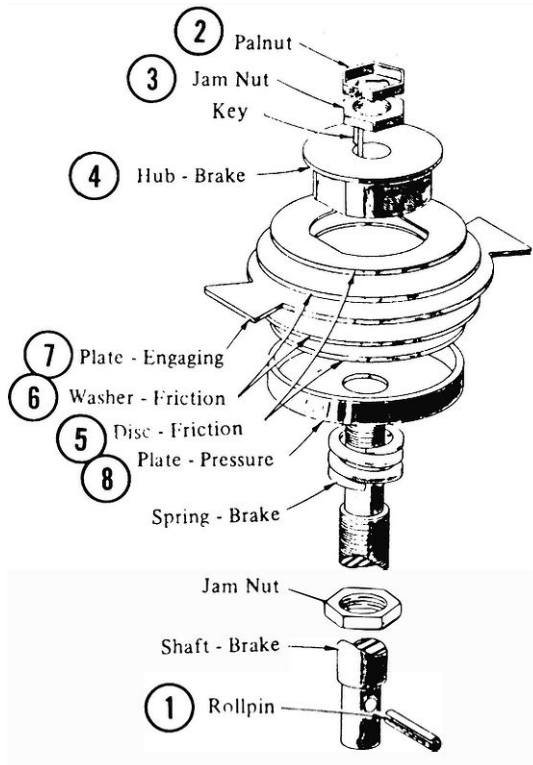
**⚠ WARNING**

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

TSB 526 Clutch & Brake Adjustment

A. Removal.

- (1) Drive out the pin (1, Fig. 9-1) and lift the brake assembly out of the planetary shaft.



**Fig. 9-1**

B. Disassembly. The brake can be disassembled while still mounted on the planetary shaft if desired.

- (1) Remove the palnut (2, Fig. 9-1) and the jam nut (3, Fig. 9-1).
- (2) Lift off the hub (4, Fig. 9-1) and key, friction discs (5, Fig. 9-1), friction washers (6, Fig. 9-1), engaging plate (7, Fig. 9-1) and the pressure plate (8, Fig. 9-1).
- (3) Inspect all parts. Replace any worn part and assemble in the reverse order of disassembly.
- (4) adjust the brake. Refer to: adjustments "Brake Adjustment".

## 2. CLUTCH

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

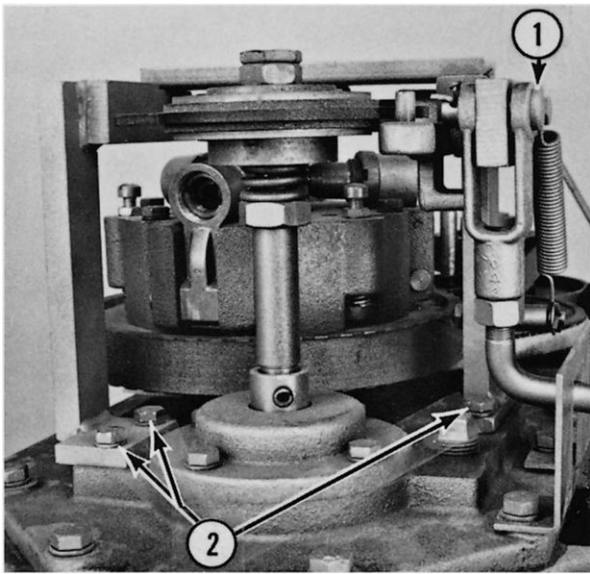
TSB 526 Clutch & Brake Adjustment

TSB 1073 - Clutch Handle Hub Assembly, Clutch Rod Assembly and Clutch Rod Kit

A. Removal of Clutch As A Unit.

If it is necessary to work on the transmission or the bowl lift gear box, remove the clutch as a unit. The clutch adjustments will not be disturbed, thus eliminating the need to readjust the clutch.

- (1) With the motor not running, move the clutch lever to the "RUN" position. (Engage the clutch.)
- (2) Disconnect the clevis by removing the clevis pin (1, Fig. 9-2).

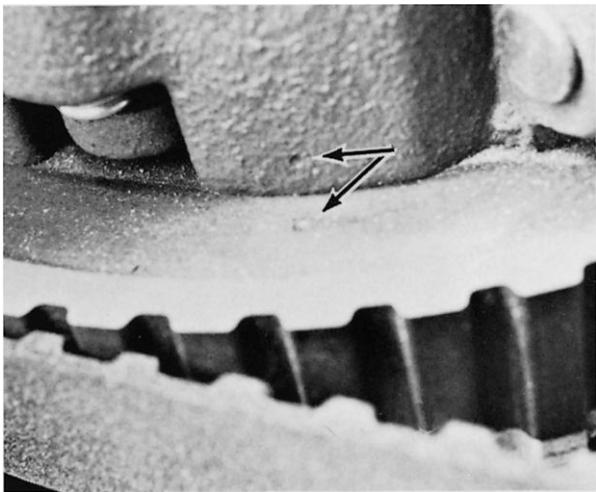


**Fig. 9-2**

(3) Remove the four bolts (2, Fig. 9-2) that hold the clutch support bracket.

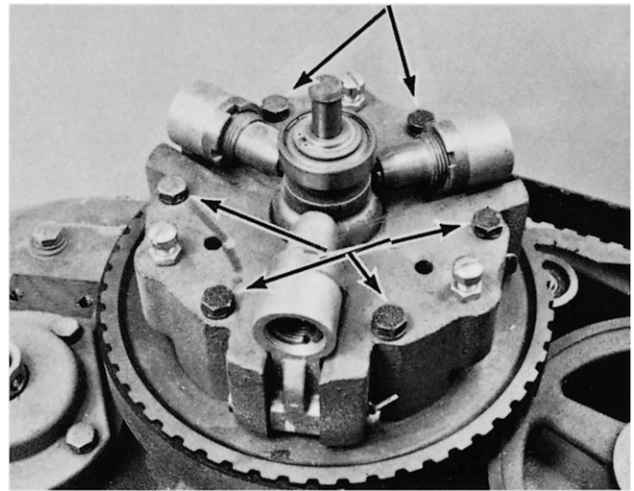
(4) Swing the clutch operating mechanism out of the way.

**NOTE:** The punch marks on the arm plate and the driven gear (Fig. 9-3) must be reassembled together. These parts are balanced as a unit. If the punch marks cannot be located, be sure to mark the arm plate and the driven gear before disassembly.

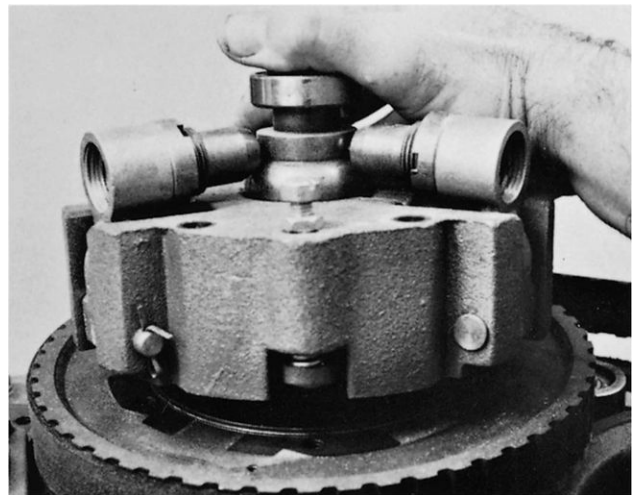


**Fig 9-3**

(5) Remove the six hex head bolts (Fig. 9-4) and lift the clutch arm plate (Fig. 9-5) off the driven gear.

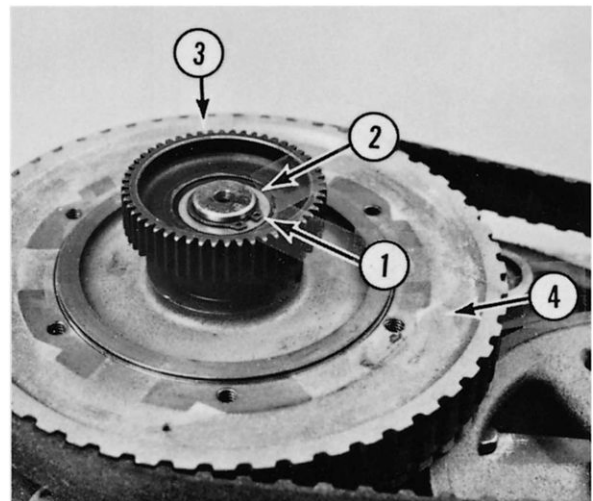


**Fig. 9-4**



**Fig. 9-5**

(6) Remove the retaining ring (1, Fig. 9-6) and shims (2, Fig. 9-6).

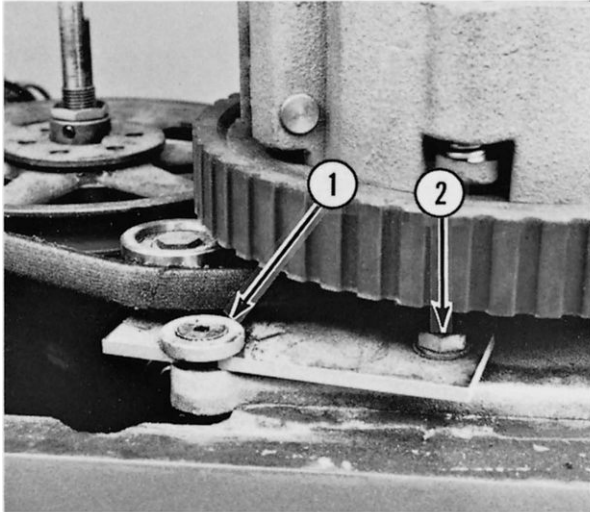


**Fig. 9-6**

(7) Remove the splined hub (3, Fig. 9-6) and key.

(8) Remove the FLEXA-GEAR DRIVE BELT.

(9) Loosen the holding screw (1, Fig. 9-5A) and pivot screw (2, Fig. 9-5A) and move the belt tightener mounting plate and remove the bowl lift "V" belt.



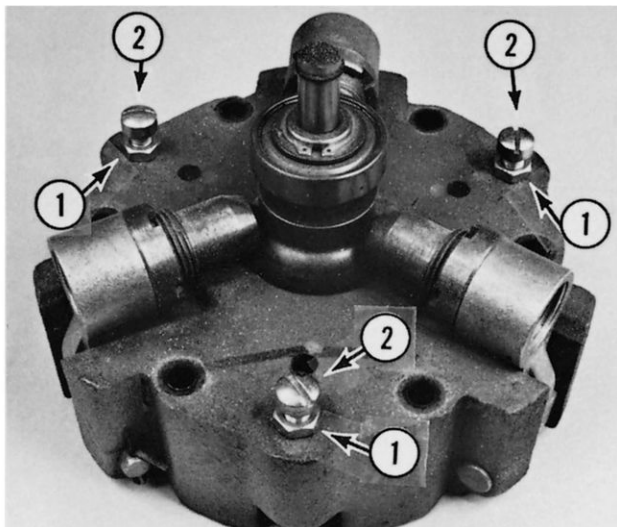
**Fig. 9-5A**

(10) Remove the driven gear (4, Fig. 9-6).

**B. Clutch Disassembly.**

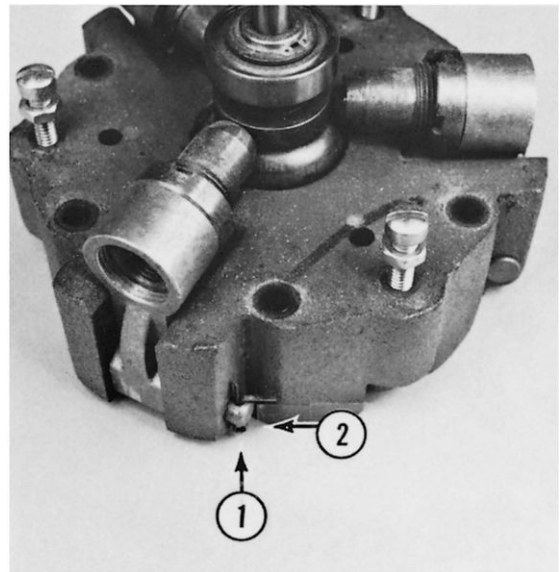
(1) Remove the clutch as described in "Removal of Clutch As A Unit" except the clutch should not be engaged.

(2) Loosen the locknuts (1, Fig. 9-7) and back out the three release spring screws (2, Fig. 9-7).



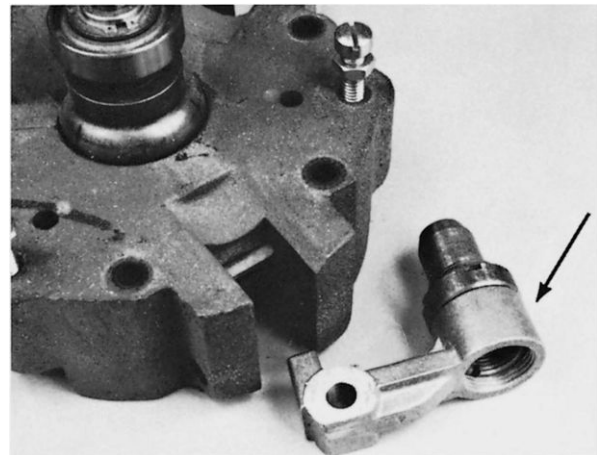
**Fig. 9-7**

(3) Remove the cotter pins (1, Fig. 9-8) and take off the pivot pins (2, Fig. 9-8).



**Fig. 9-8**

(4) Lift off the three clutch arms (Fig. 9-9).



**Fig. 9-9**

(5) Remove the pressure plate (1, Fig. 9-10), steel discs (1, Fig. 9-11) and inner discs (2, Fig. 9-11).

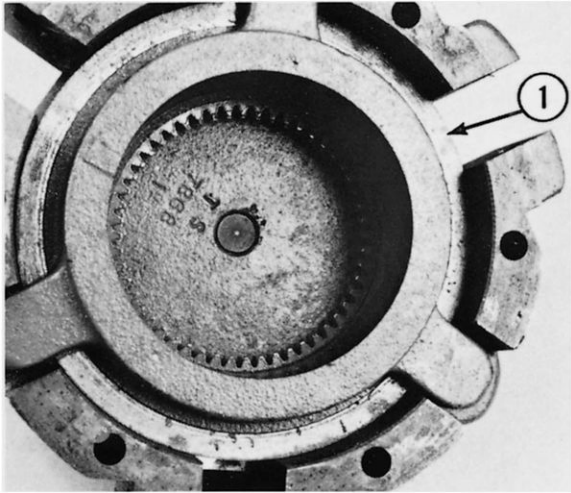


Fig. 9-10

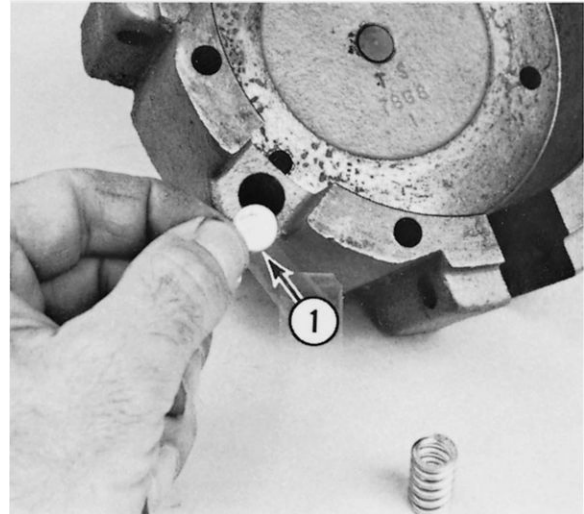


Fig. 9-12

(3) Insert the three clutch release springs (1, Fig. 9-13).

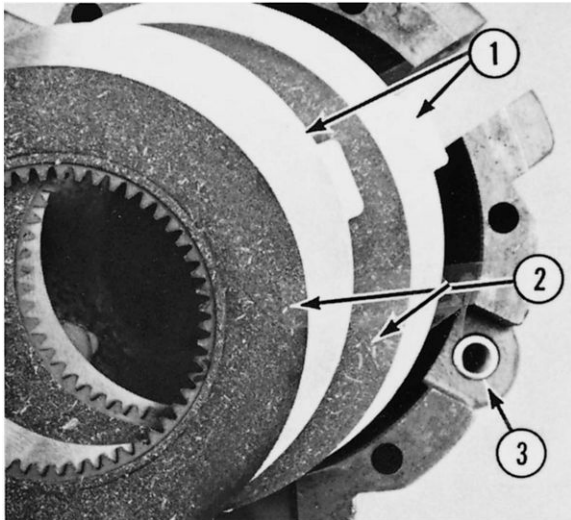


Fig. 9-11

**NOTE:** The V-1401 clutch has three steel discs and three inner discs. The —802 clutch has two steel discs and two inner discs.

(6) The three release springs (3, Fig. 9-11) and spring discs can now be removed.

C. Clutch Assembly.

(1) Clean each part with a clean cloth. Do not use any cleaning solvent on the clutch parts because the solvent may cause the clutch to slip. Inspect the molded disc, steel disc and pressure plate for wear and replace if necessary. (Normally the molded inner disc only needs to be replaced.)

(2) With the clutch arm plate inverted on a work bench, insert the three spring discs (1, Fig. 9-12).

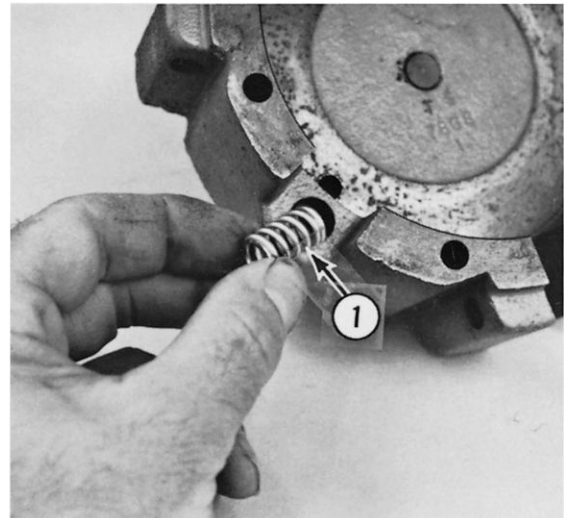
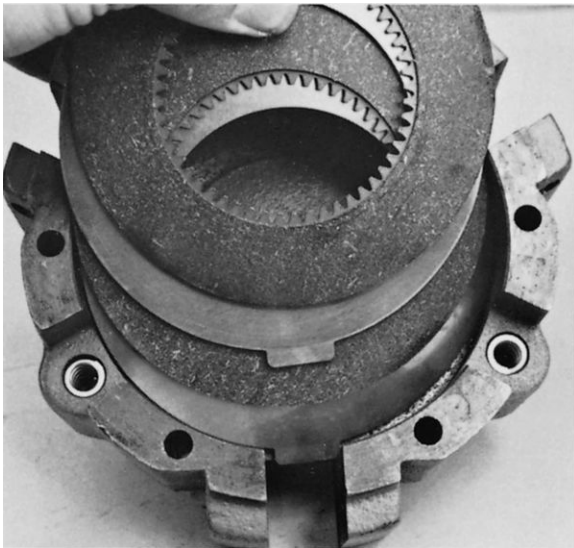


Fig. 9-13

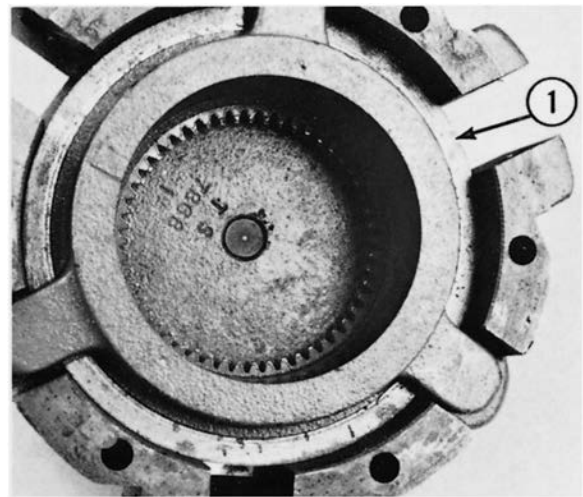
(4) Install the steel outer disc and the molded inner disc as shown in Fig. 9-14 and Fig. 9-15.

- a. The —802 clutch has two steel outer discs and two molded inner discs.
- b. The V-1401 clutch has three steel outer discs and three molded inner discs.



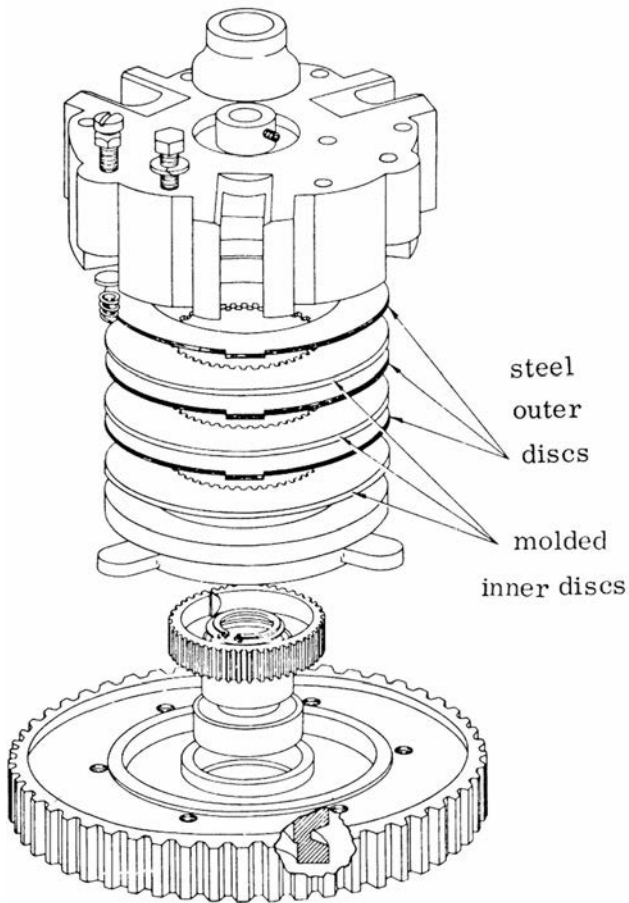


**Fig. 9-14**



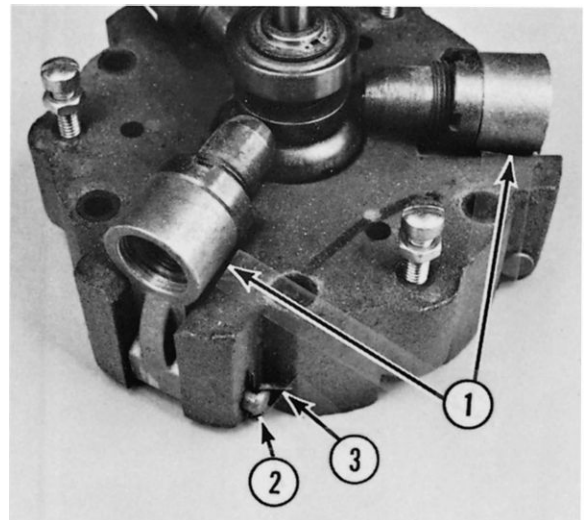
**Fig 9-16**

(6) Install the three clutch arm assemblies (1, Fig. 9-17).



**Fig 9-15**

(5) Install the pressure plate (1, Fig. 9-16).

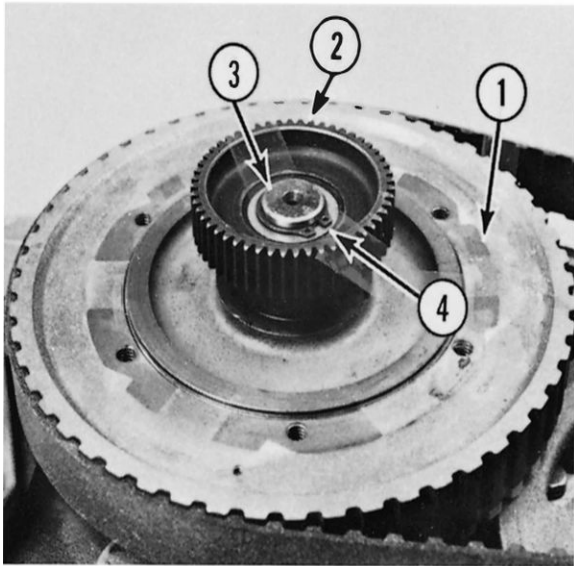


**Fig. 9-17**

(7) Install the pin (2, Fig. 9-17) and cotter pin (3, Fig. 9-17).

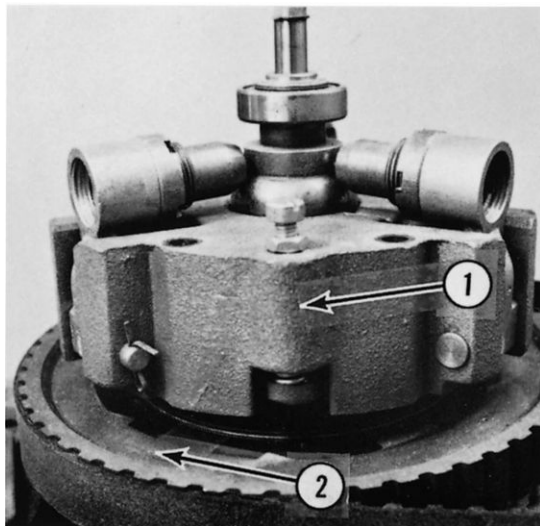
D. Installing The Clutch.





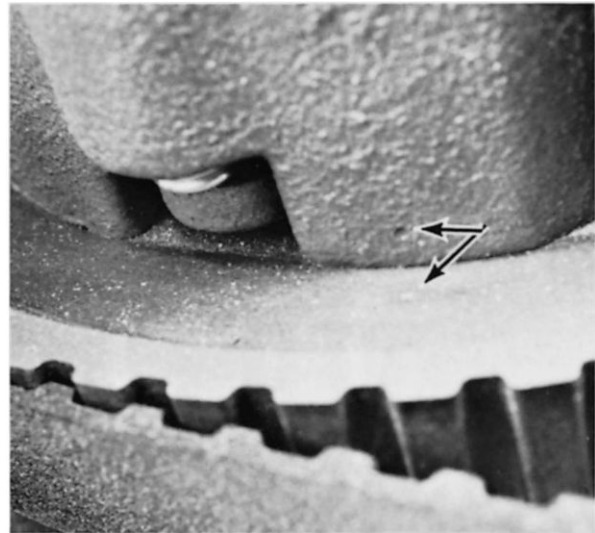
**Fig 9-18**

- (1) Install the driven gear (1, Fig. 9-18).
- (2) Install the key and splined hub (2, Fig. 9-8).
- (3) Install the shims (3, Fig. 9 -18) and retaining ring (4, Fig. 9-18).
- (4) Install and adjust the bowl lift "V" belt. Refer to : Adjustments "Bowl Lift "V" Belt".
- (5) Install the FLEXA-GEAR DRIVE BELT.
- (6) Place the clutch arm plate assembly (1, Fig. 9-19) on the driven gear (2, Fig. 9-19), being careful to align the molded disc teeth with the teeth on the splined hub.



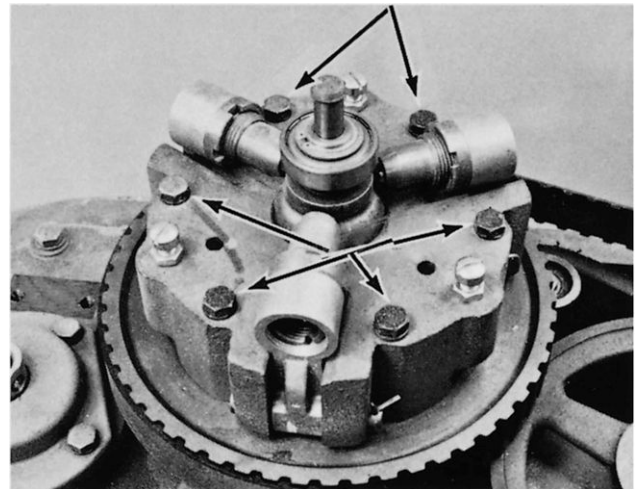
**Fig. 9-19**

- (7) Rotate the clutch arm plate assembly and align the balance mark with the balance mark on the driven gear (Fig. 9-20).



**Fig. 9-20**

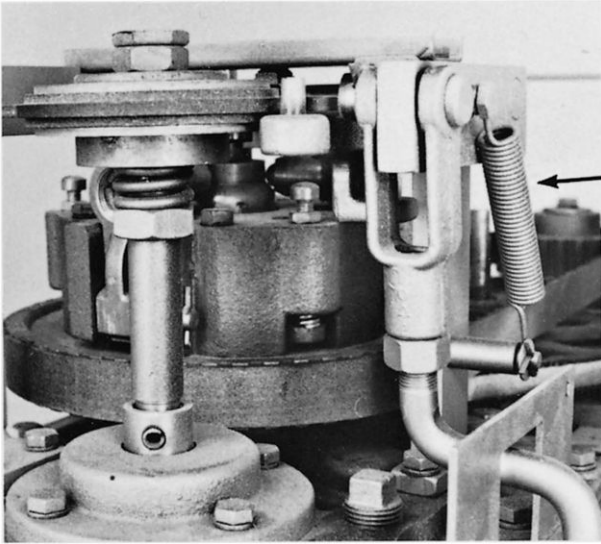
- (8) Install the six hex bolts (Fig. 9-21).



**Fig 9-21**

- (9) Install the clutch operating mechanism and secure with the four bolts.
- (10) Connect the clevis pin and secure with a cotter pin.
- (11) Adjust the clutch. Refer to: Adjustments "Clutch".

E. Clutch Linkage Spring (Fig. 9-22). The clutch linkage spring returns the clutch and brake arm to its top position when the clutch handle is released. In the top position the brake is engaged and the clutch is disengaged.



**Fig. 9-22**

## SECTION 10 PLANETARY

### 1. AGITATOR SHAFT PIN REPLACEMENT

#### **⚠ WARNING**

DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.

A. Remove the agitator shaft plug (1, Fig. 10-1).

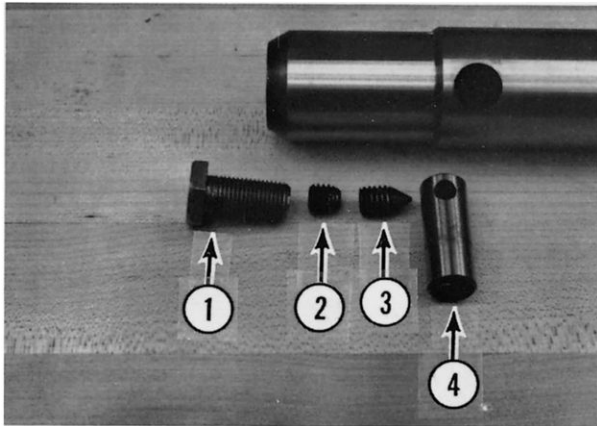


Fig 10-1

B. Remove the locking set screw (2, Fig. 10-1) and the cone point set screw (3, Fig. 10-1).

**NOTE:** Set screws may be socket head type.

C. Remove the agitator shaft pin (4, Fig. 10-1), use a punch to drive the pin from the back side of the shaft.

**NOTE:** Some agitator shafts do not have a driving hole drilled through the back side. If the agitator shaft pin cannot be removed it will be necessary to replace the agitator shaft.

D. Install the agitator shaft pin so that the cone point set screw will fit into the counter sunk hole.

E. Install the locking set screw, and the agitator shaft plug.

### 2. REMOVAL OF PLANETARY

#### **⚠ WARNING**

DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.

A. Remove the bowl and beater.

B. Remove the drip cup (1, Fig. 10-2).

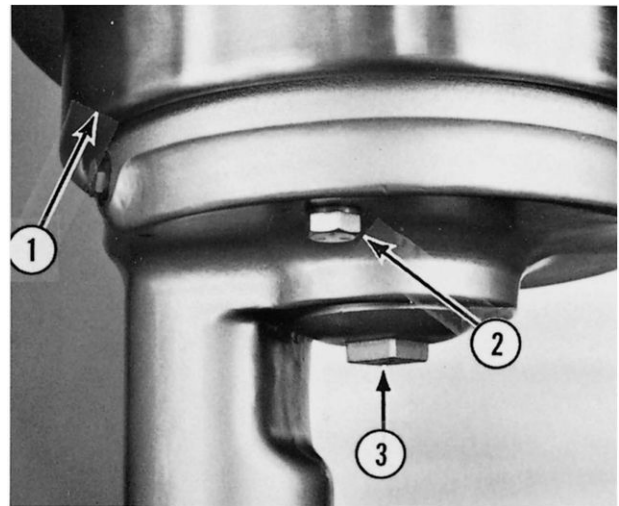


Fig. 10-2

C. Drain the oil from the planetary. Remove the drain plug (2, Fig. 10-2).

D. If V-1401, remove the bearing plate cover (1, Fig. 10-3).

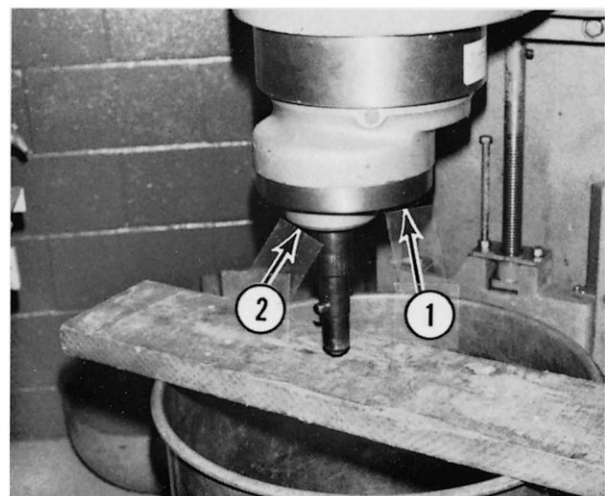


Fig. 10-3

E. If V-1401, remove the six hex head bolts and remove the bearing plate (2, Fig. 10-3).

F. Install the bowl and place a 2" x 4" board across the bowl.

G. Raise the bowl to support the weight of the planetary (Fig. 10-3).

H. Remove the seal cap (3, Fig. 10-2).

I. Remove the special cap screw (1, Fig. 10-4).

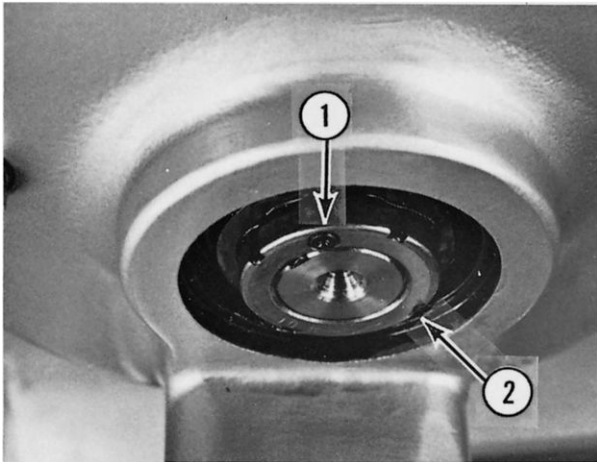


Fig. 10-4

J. Remove the locknut (2, Fig. 10-4), tongue washer (1, Fig. 10-5) and the lower roller bearing (2, Fig. 10-5).

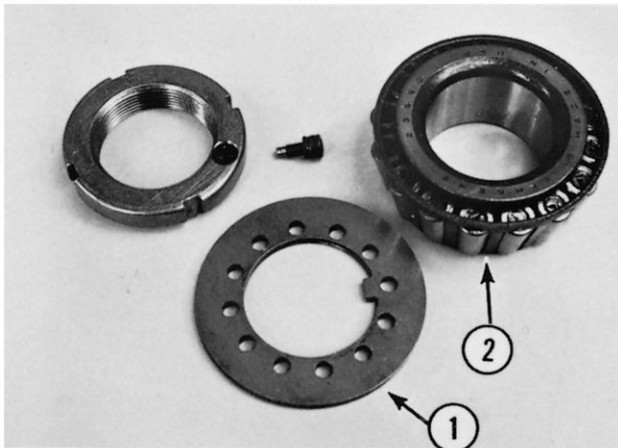


Fig. 10-5

K. Lower the bowl (support the planetary) and remove the planetary off the planetary shaft.

### 3. AGITATOR SHAFT REMOVAL

A. With the planetary removed from the mixer, remove the two socket head screws (1, Fig. 10-6), and the bearing cap (2, Fig. 10-6) and bearing cup (3, Fig. 10-6).

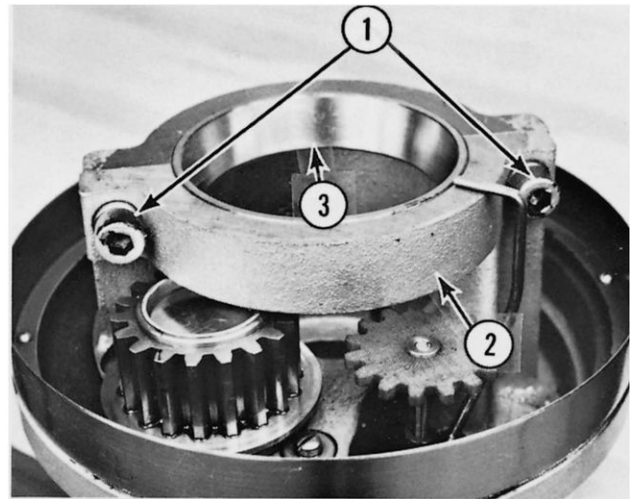


Fig. 10-6

B. Pry out the oil retaining cap (1, Fig. 10-7).

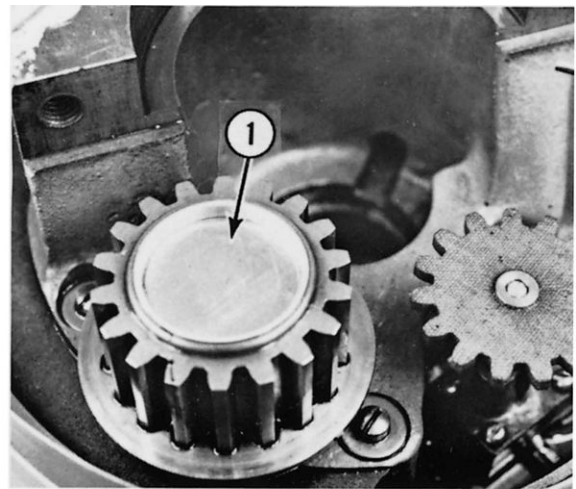


Fig. 10-7

C. Remove the retaining ring (1, Fig. 10-8) and the pinion (2, Fig. 10-8) and key.

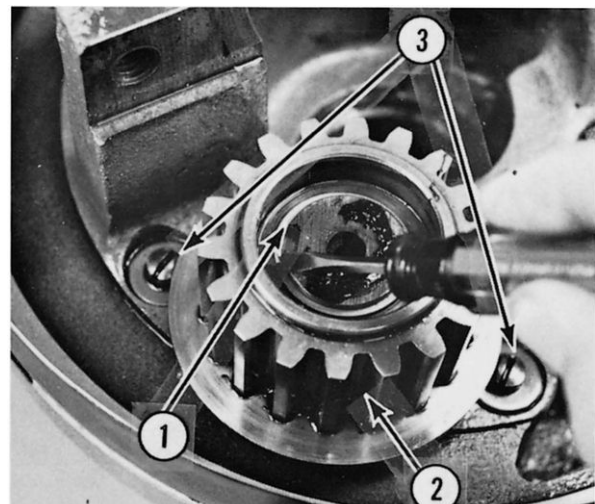
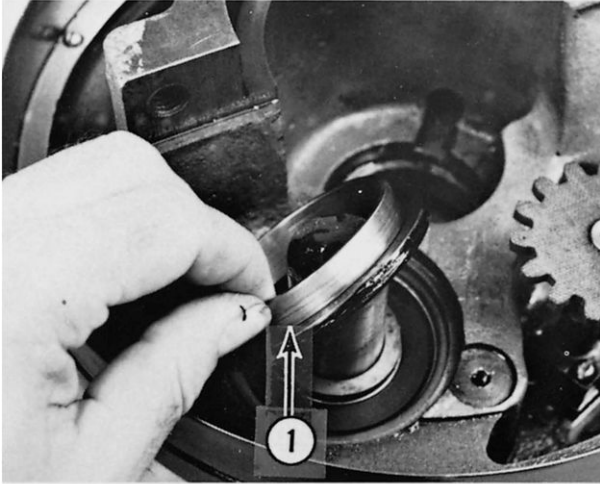


Fig. 10-8

**NOTE:** If an internal pinion shim has been used it will be under the pinion. It must be reassembled exactly as found.

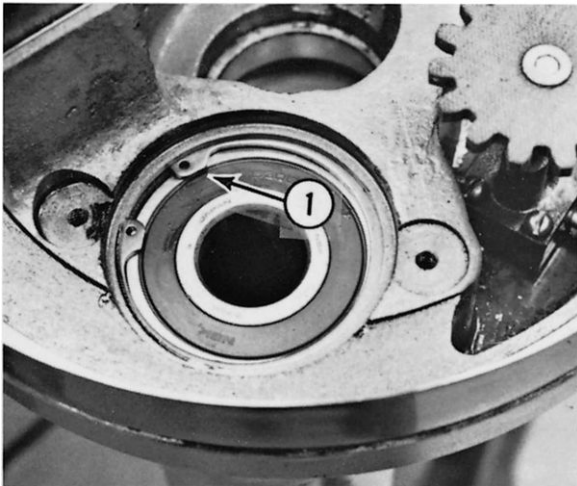
D. Remove the two machine screws (3, Fig. 10-8) and lift out the planetary oil baffle (1, Fig. 10-9).



**Fig. 10-9**

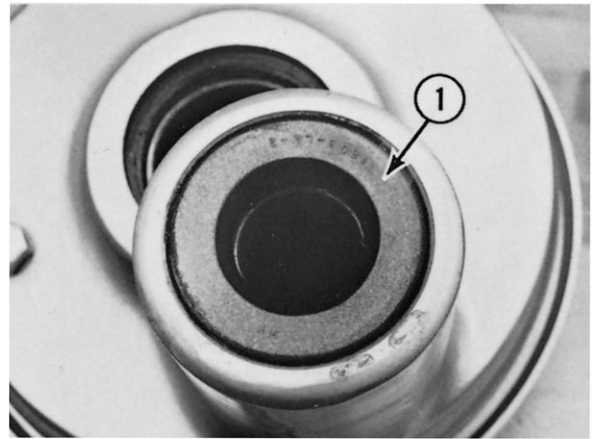
E. Use a rubber mallet and force the agitator shaft down through the upper bearing.

F. Remove the retaining ring (1, Fig. 10-10) and lift out the upper agitator shaft bearing.



**Fig. 10-10**

G. Remove the seal (1, Fig. 10-11), located at the bottom of the planetary.



**Fig. 10-11**

**NOTE:** The seal and lower bearing on the V-1401 planetary is located in the bearing plate cover.

H. Remove the retaining ring, if servicing a V-1401 and remove the bottom bearing.

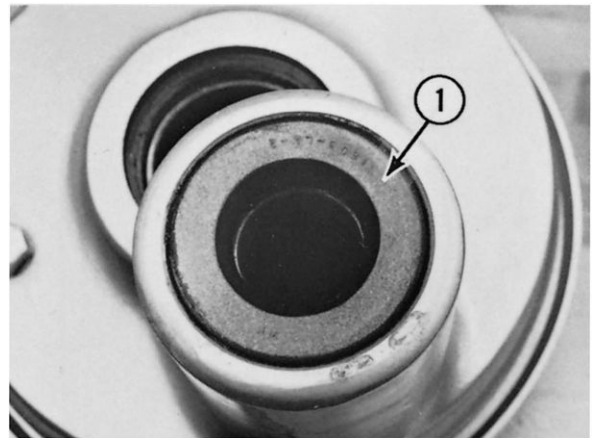
#### 4. INSTALLING THE AGITATOR SHAFT

A. Clean, inspect and replace if necessary, the bearings, seals and shaft.

B. Install the lower planetary bearing.

C. Install the retaining ring, if V-1401.

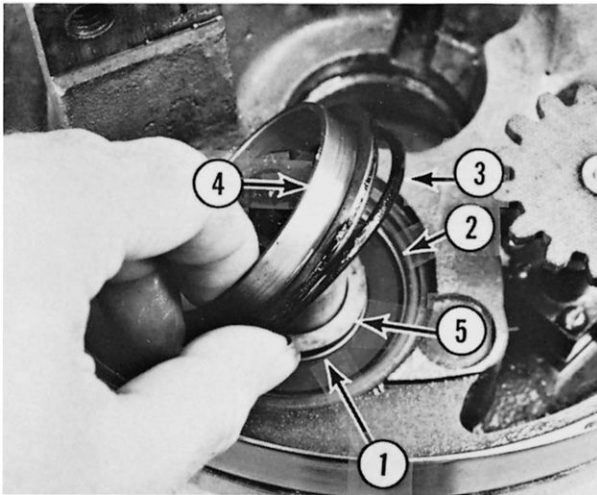
D. Carefully install the lower seal (1, Fig. 10-11).



**Fig. 10-11**

E. Insert the agitator shaft into the lower seal and bearing.

F. Install the agitator shaft spacer (V-1401) and the upper bearing (1, Fig. 10-12) and the retaining ring (2, Fig. 10-12).

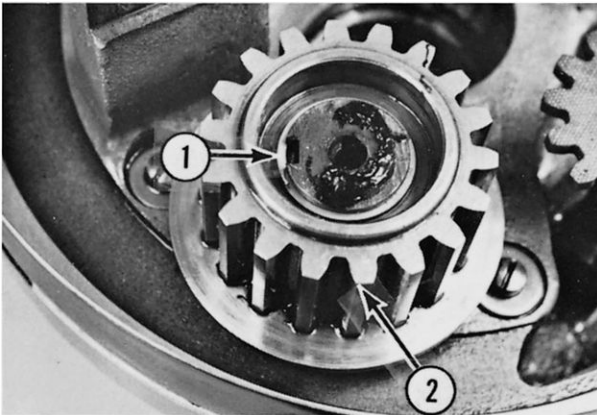


**Fig. 10-12**

G. Lightly coat the "O" ring with Permatex #2, and install the "O" ring (3, Fig. 10-12) and oil baffle (4, Fig. 10-12). Secure with the two screws.

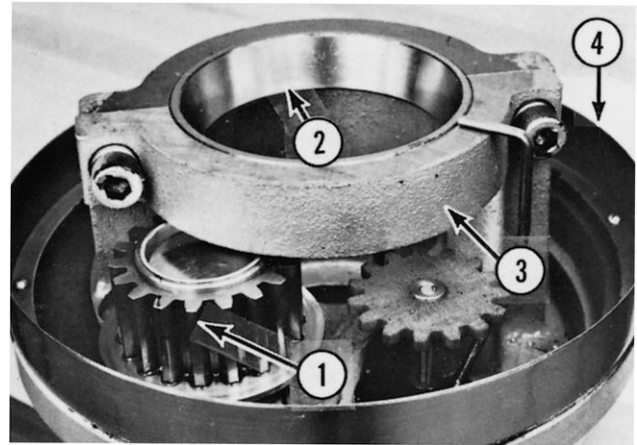
H. M-802 only. Install the agitator shaft spacer and internal pinion shim (5, Fig. 10-12).

I. Install the key (1, Fig. 10-13), pinion (2, Fig. 10-13) and the retaining ring.



**Fig. 10-13**

J. Seal the retaining cap with Permatex #2 and install it into the pinion (1, Fig. 10-14).

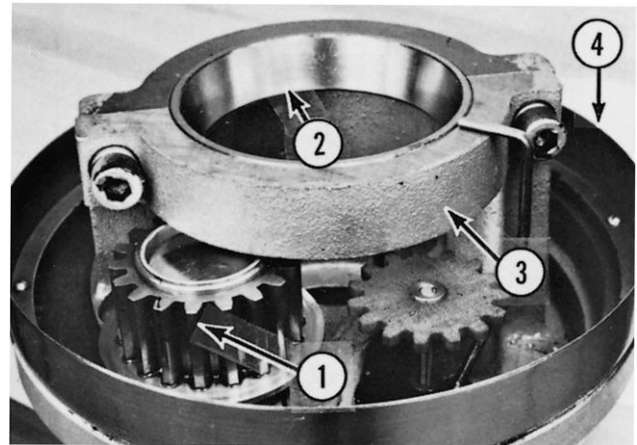


**Fig. 10-14**

K. Install the bearing cup (2, Fig. 10-14) and bearing cap (3, Fig. 10-14) using the two socket head screws.

## 5. PLANETARY UPPER EXTENSION

If it is necessary to remove the upper extension (4, Fig. 10-14), be sure to seal the gasket with Permatex #2 when reassembling.

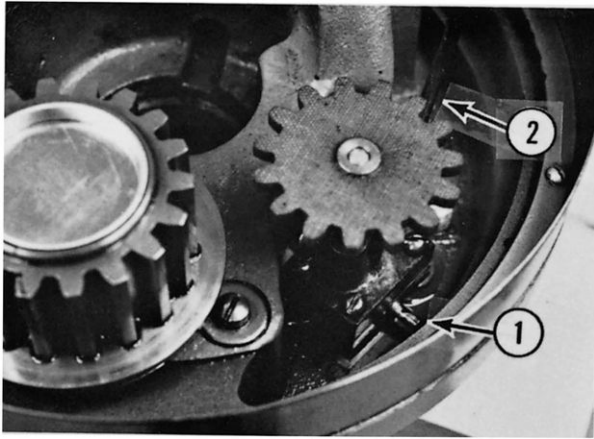


**FIG. 10-14**

## 6. PLANETARY OIL PUMP

The oil pump provides lubrication to the internal gear, pinion and to the upper planetary bearing. Check the oil pump inlet (1, Fig. 10-15) and outlet (2, Fig. 10-15) holes to see that they are not clogged. With oil in the planetary cavity a small amount of it should flow from the outlet tube when the drive gear is turned counterclockwise by hand.

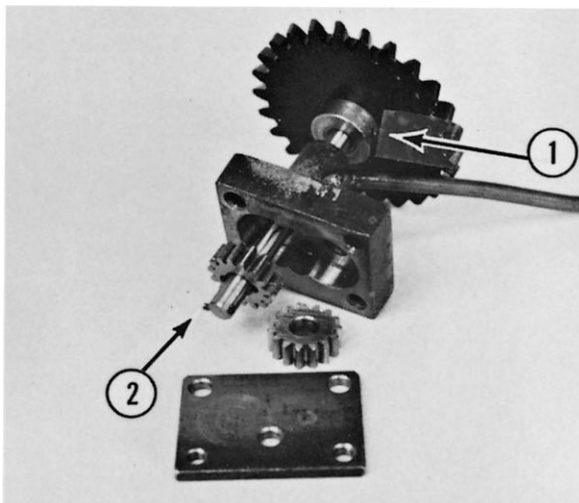




**FIG. 10-15**

Should it be necessary to disassemble the oil pump, use the following procedure.

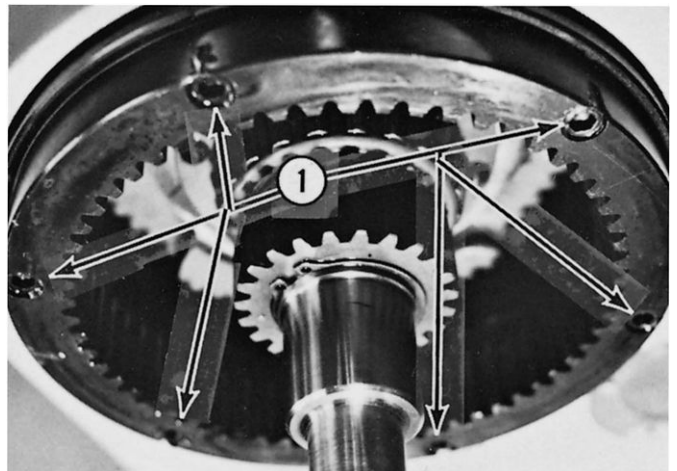
- A. Remove the oil pump by removing the two mounting screws.
- B. Remove the two screws that hold the top plate, body and bottom plate together.
- C. Drive the pin (1, Fig. 10-16) from the shaft if it is necessary to remove the gear.
- D. Drive the pin from the hub (2, Fig. 10-16) of the drive gear if it is necessary to replace the drive gear.
- E. Clean all parts before reassembling the oil pump.
- F. Assemble the top plate, body and bottom plate as shown (Fig. 10-16). Oil pump inlet (1, Fig. 10-15) must point toward the outside of the planetary.
- G. Install the oil pump in the planetary.



**FIG. 10-16**

## 7. INTERNAL GEAR

- A. With the planetary removed from the mixer, loosen the six socket head screws (1, Fig. 10-17) that holds the internal gear in the transmission case.
- B. Remove the internal gear.
- C. Before installing the internal gear be sure that the housing gear seat is clean.
- D. Coat the top side of the internal gear with a thin coat of Permatex.
- E. Install the gear so the two drip cup retaining screw holes are located at the sides of the mixer.
- F. Install the six socket head screws.



**FIG. 10-17**

## 8. INSTALLING THE PLANETARY

- A. Install the bowl and place a 2" x 4" board across the top of the bowl.

**NOTE:** Position the oil pump outlet as shown in (1, Fig. 10-18).

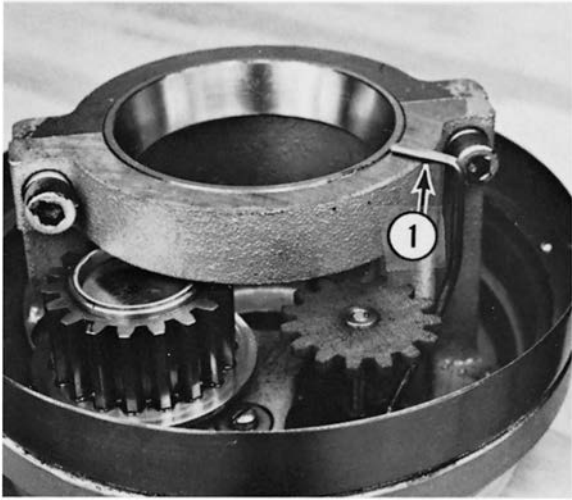


FIG. 10-18

B. Support the planetary on the 2" x 4" board (Fig. 10-19) and slowly raise the bowl. Carefully mesh the fiber oil pump drive gear with the internal gear to prevent damage to the fiber gear.



FIG. 10-19

**NOTE:** The agitator pinion must mesh with the internal gear and sun gear.

C. Install the bearing (1, Fig. 10-20), tongue washer (2, Fig. 10-20) and the locknut (3, Fig. 10-20).

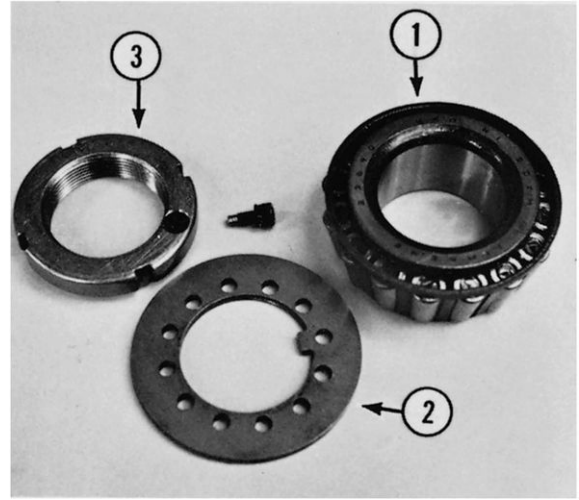


FIG. 10-20

D. With the planetary fully up, tighten the locknut . There should be a slight amount of end play.

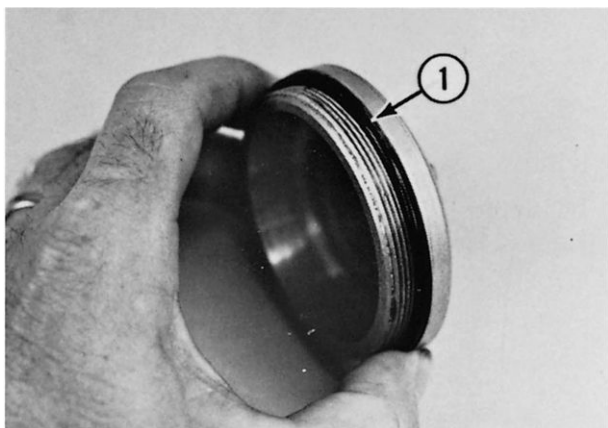
E. Position the locknut so the dog point of the special socket head screw will enter one of the holes in the tongue washer. Tighten the special socket head screw (1, Fig. 10-21).



FIG. 10-21

F. Inspect the "O" ring (1, Fig. 10-22) on the seal cap, replace if necessary. Install the "O" ring and seal cap.



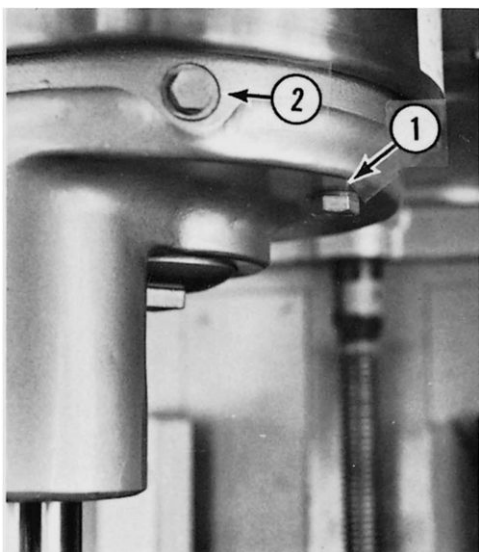


**FIG. 10-22**

G. If V-1401, install the bearing plate and tighten the six hex head bolts.

H. If V-1401, install the bearing plate cover.

I. Install the drain plug (1, Fig. 10-23) and remove the fill plug (2, Fig. 10-23). Service the planetary with oils (Refer to the LUBRICATION for the correct type of oil). Planetary is full when the oil just runs back out the fill hole. Install the fill plug.



**FIG. 10-23**

J. Install the drip cup.

# SECTION 11 TRANSMISSION

## 1. DISASSEMBLING THE TRANSMISSION

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

A. Drain the oil from the transmission and the planetary. Refer to LUBRICATION for instructions.

B. Remove the planetary. Refer to Section 10 "Planetary" for instructions.

**NOTE:** The planetary only needs to be removed if the planetary shaft is to be removed.

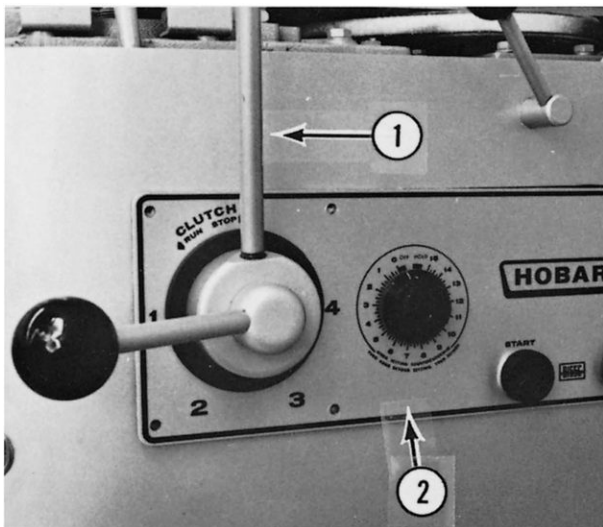
C. Remove the brake assembly. Refer to Section 9 "Clutch and Brake" for instructions.

D. Remove the clutch as a unit. Refer to Section 9 "Clutch and Brake" for instructions.

E. Remove the bowl lift "V" belt.

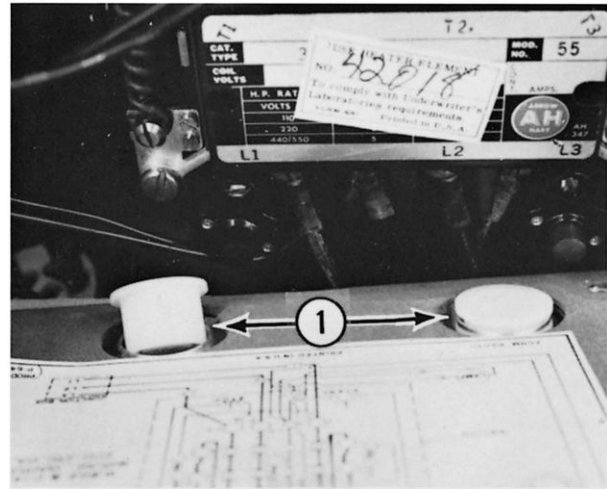
F. Remove the driven gear.

G. Unscrew the clutch handle (1, Fig. 11-1).



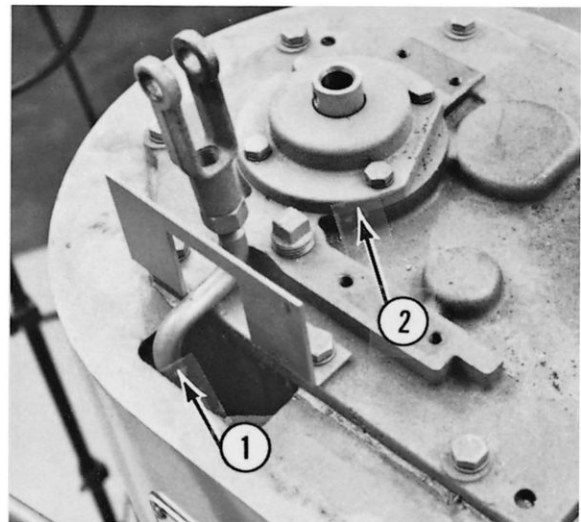
**Fig. 11-1**

H. Remove the switch plate (2, Fig. 11-1). Do not lose the switch push buttons (1, Fig. 11-2).



**Fig. 11-2**

I. Disconnect the clutch rod (1, Fig. 11-3) from the hub.

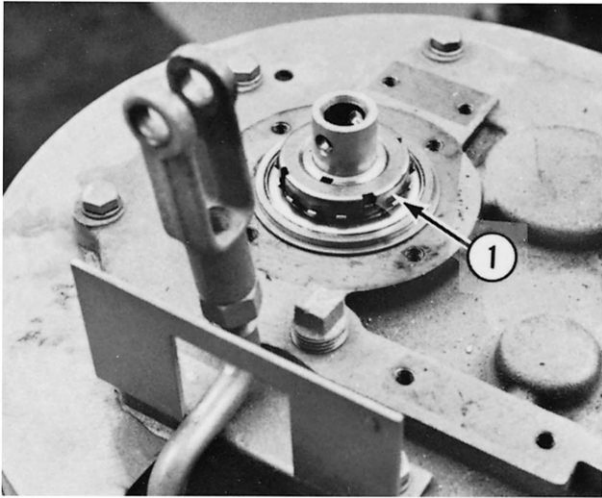


**Fig. 11-3**

J. Remove the four screws and take out the shifter unit.

K. Remove the upper bearing retainer (2, Fig. 11-3).

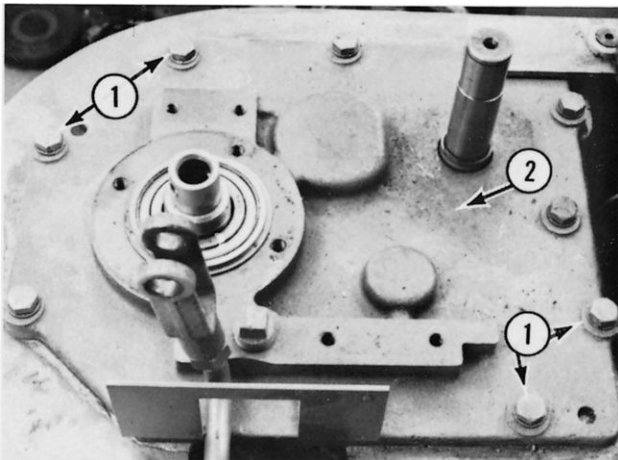
L. With a punch, disengage the locking tab from the locknut (1, Fig. 11-4) on the planetary shaft.



**Fig. 11-4**

M. Remove the locknut and the lockwasher.

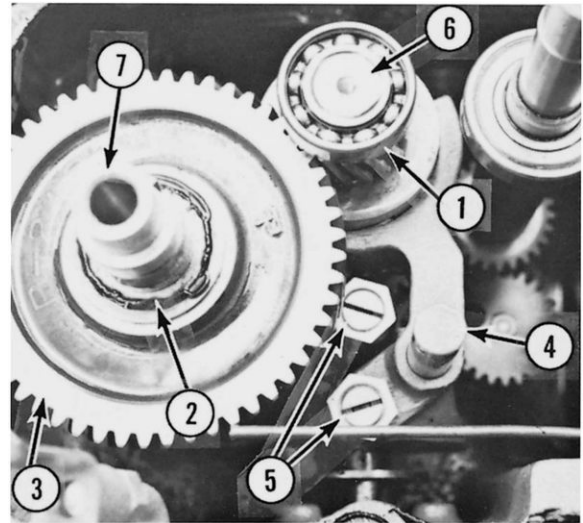
N. Remove the eleven hex head transmission cover mounting bolts and washers (1, Fig. 11-5).



**Fig. 11-5**

O. Carefully pry off the transmission case cover (2, Fig. 11-5).

P. Remove the bearing from the clutch shaft (1, Fig. 11-6).



**Fig. 11-6**

Q. Lift off the spacer (2, Fig. 11-6), upper planetary gear (3, Fig. 11-6) and key.

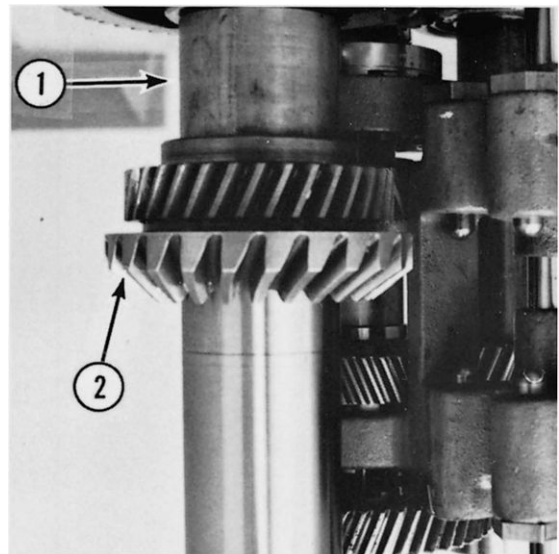
**NOTE:** It should be noted that although the upper planetary gear is reversible, it should be reinstalled with the same side up. Mark the top side of the gear before removing it.

R. Insert a punch through the hole in the shifter shaft (4, Fig. 11-6) and pull the shaft up to remove it.

S. Remove the shifters (5, Fig. 11-6).

T. Remove the clutch shaft assembly (6, Fig. 11-6) and main shaft assembly (7, Fig. 11-6) at the same time.

U. Remove the spacer (1, Fig. 11-7) and gear cluster (2, Fig. 11-7) from the planetary shaft.



**Fig. 11-7**

V. Remove the six screws (1, Fig. 11-8) from the lower planetary shaft bearing retainer. Do not let the planetary shaft fall out the bottom of the mixer.



**Fig. 11-8**

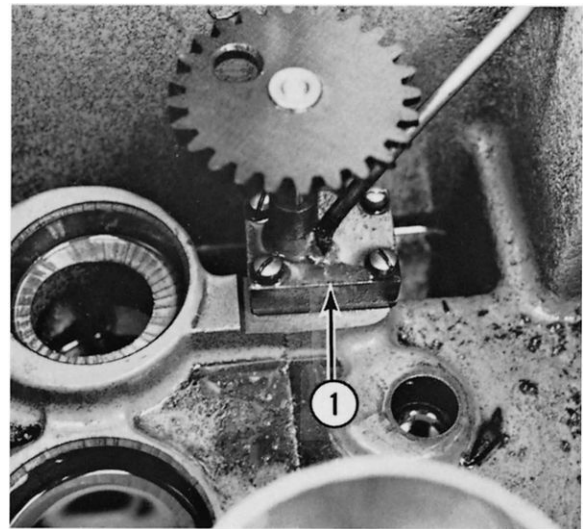
W. Remove the planetary shaft down through the housing.

X. The chimney (1, Fig. 11-9) can now be removed.



**Fig. 11-9**

Y. The oil pump (1, Fig. 11-10) can be removed if necessary.



**Fig. 11-10**

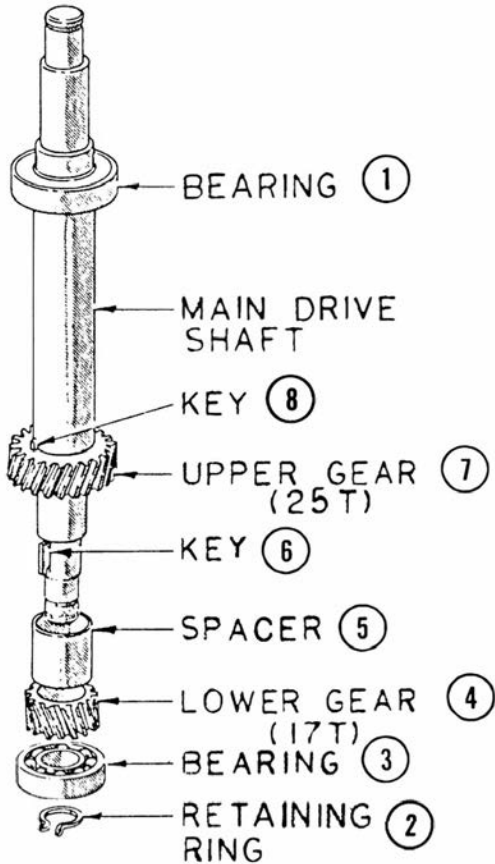
Z. The attachment hub bevel pinion and square drive sleeve assembly can be removed after the chimney has been removed.

## 2. MAIN DRIVE SHAFT DISASSEMBLY

**NOTE:** Although the gears are reversible, they should be reinstalled with the same side up; mark the top side of the gears when taking them off.

A. The upper ball bearing (1, Fig. 11-11) can be removed from the top of the shaft if necessary.

# MAIN DRIVE SHAFT



**Fig. 11-11**

- B. To remove the gears, take off the retaining ring (2, Fig. 11-11) from the lower end of the shaft.
- C. Remove the lower bearing (3, Fig. 11-11).
- D. Slip off the 17T lower gear (4, Fig. 11-11), spacer (5, Fig. 11-11) and woodruff key (6, Fig. 11-11).
- E. Remove the 25T upper gear (7, Fig. 11-11) and woodruff key (8, Fig. 11-11).

## 3. MAIN DRIVE SHAFT ASSEMBLY

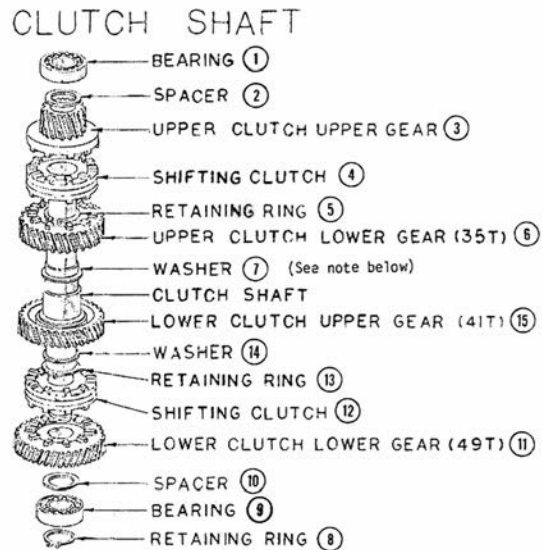
- A. Carefully clean and inspect each part. Replace any worn parts.
- B. Install the upper woodruff key (8, Fig. 11-11).
- C. Install the 25T upper gear (7, Fig. 11-11) with the same side up as when it was removed.
- D. Install the spacer (5, Fig. 11-11) and the lower woodruff key (6, Fig. 11-11).

E. Install the 17T lower gear (4, Fig. 11-11) with the same side up as when it was removed.

F. Install the bearing (3, Fig. 11-11) and the retaining ring (2, Fig. 11-11).

G. Install the upper bearing (1, Fig. 11-11), if it was removed.

## 4. CLUTCH SHAFT DISASSEMBLY



**Fig. 11-12**

**NOTE:** Some of the gears and clutches can be reinstalled in different locations and with the opposite side up. Mark the top side of the gears and clutches and also note the location from which they were removed. When reinstalling the gears and clutches they should be returned to their original position.

- A. Remove the upper ball bearing (1) and spacer (2).
- B. Remove the upper clutch upper gear (3).
- C. Remove the shifting clutch (4).
- D. Remove the retaining ring (5).
- E. Remove the upper clutch lower gear (35 T) (6) and washer (7).
- F. Remove the retaining ring (8), ball bearing (9) and the spacer (10).
- G. Remove the lower clutch lower gear (49T) (11).
- H. Remove the shifting clutch (12).
- I. Remove the retaining ring (13), washer (14) and the lower clutch upper gear (41T) (15).

## 5. CLUTCH SHAFT ASSEMBLY

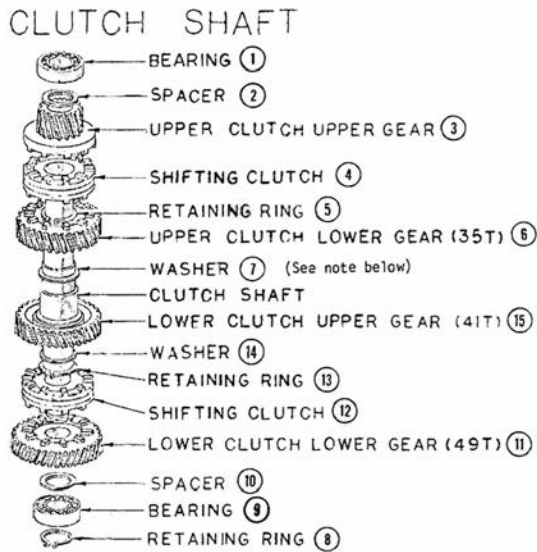
### TSB 852 - Oil Leak and/or BB-18-22 Bearing Failure

A. Carefully clean and inspect each part. Replace any worn parts.

**NOTE:** Using Gearep #140, lightly lubricate the clutch shaft, clutch splines and gears before starting reassembly.

B. Install the lower clutch upper gear (41T) (15), washer (14) and retaining ring (13) on the lower end of the clutch shaft.

**NOTE:** Lower end of the clutch shaft has a retaining ring groove.



**Fig. 11-12**

C. Install the lower shifting clutch (12). The shifting clutch should be installed with the same side up as when it was removed.

**NOTE:** The shifting clutch should be free to slide up and down on the spline. Should a shifting clutch seem to bind, take it off, turn it to a new position and check it again.

D. Install the lower clutch lower gear (49T) (11), spacer (10), bearing (9) and the retaining ring (8).

E. Install the (special) washer (7).

**NOTE:** The washer has a groove cut into the lower side and must be put on the shaft with the groove next to the shoulder on the shaft.

F. Install the upper clutch lower gear (35T) (6).

G. Install the retaining ring (5).

H. Install the upper shifting clutch (4). The shifting clutch should be reinstalled with the same side up as when it was removed.

**NOTE:** The shifting clutch should be free to slide up and down on the splines. Should a shifting clutch seem to bind, take it off, turn it to a new position and check it again.

I. Install the upper clutch upper gear (3) and spacer (2).

J. Put the bearing (1) aside, it will be installed after the clutch shaft has been installed in the transmission case.

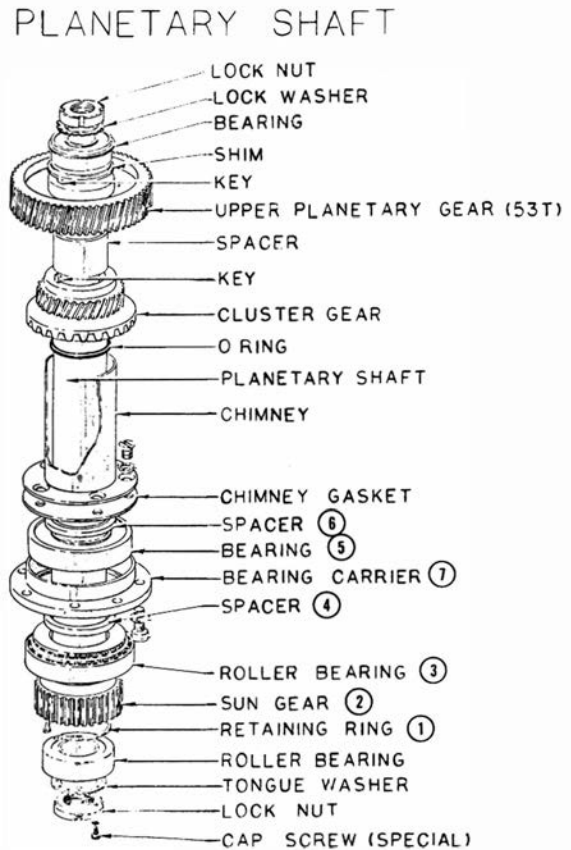
## 6. PLANETARY SHAFT DISASSEMBLY

A. Remove the retaining ring (1, Fig. 11- 13).

B. Remove the sun gear (2, Fig. 11-13) and the key.

C. Remove the roller bearing (3, Fig. 11-13) and the lower bearing lower spacer (4, Fig. 11-13).

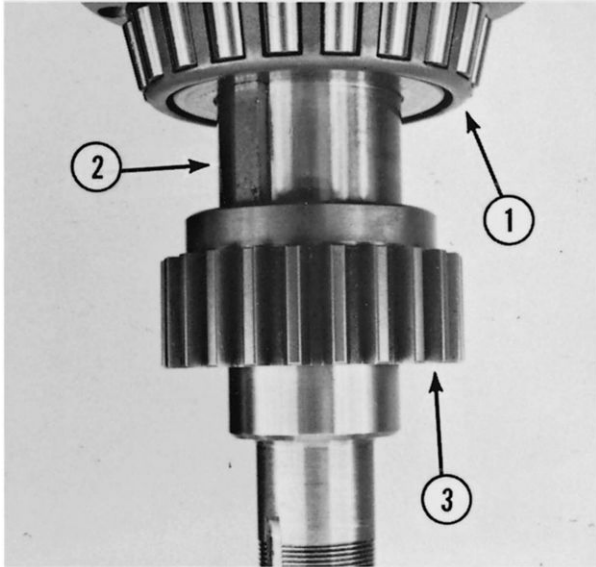
D. Remove the ball bearing (5, Fig. 11-13) and the lower bearing upper spacer (6, Fig. 11-13).



**Fig. 11-13**

## 7. PLANETARY SHAFT ASSEMBLY

- A. Clean and inspect each gear and bearing, replace if necessary.
- B. Install the lower bearing upper spacer (6, Fig. 11-13).
- C. Install the ball bearing (5, Fig. 11-13) and the bearing carrier (7, Fig. 11-13).
- D. Install the lower bearing lower spacer (4, Fig. 11-13) and the roller bearing (1, Fig. 11-14).

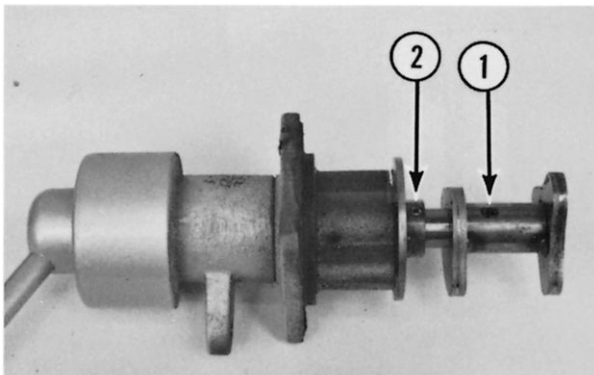


**Fig. 11-14**

- E. Install the key (2, Fig. 11-14) and the sun gear (3, Fig. 11-14). (Collar toward the bearing.)
- F. Install the retaining ring (1, Fig. 11-13).

## 8. SPEED SELECTOR DISASSEMBLY

- A. Drive the rollpin out of the cam assembly (1, Fig. 11-15).

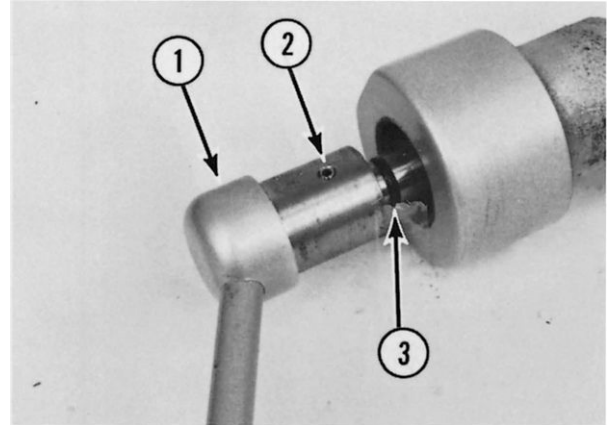


**Fig. 11-15**

- B. Drive the rollpin out of the hub and cam assembly (2, Fig. 11-15).

- C. Remove the hub and cam assembly. Do not lose the two balls and detent springs.

- D. Remove the gear shift handle and shaft (1, Fig. 11-16) from the bracket.



**Fig. 11-16**

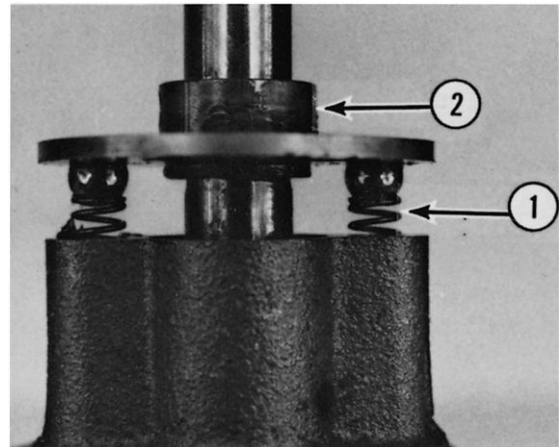
- E. If necessary, the handle can be removed from the shaft by driving out the rollpin (2, Fig. 11-16).

## 9. ASSEMBLY

- A. Inspect, and replace if necessary the "O" ring (3, Fig. 11-16).

- B. Insert the gear shift handle and shaft into the clutch hub and bracket as shown in (Fig. 11-16).

- C. Place the springs in the holes and place the detent balls on the springs (1, Fig. 11-17).



**Fig. 11-17**

- D. Install the cam assembly (2, Fig. 11-17) and secure with the rollpin.



E. Install the cam as shown in Fig. 11-18 and secure with the rollpin. [Handle (1, Fig. 11-18) to the right and the high side of the cam (2, Fig. 11-18) facing up.]

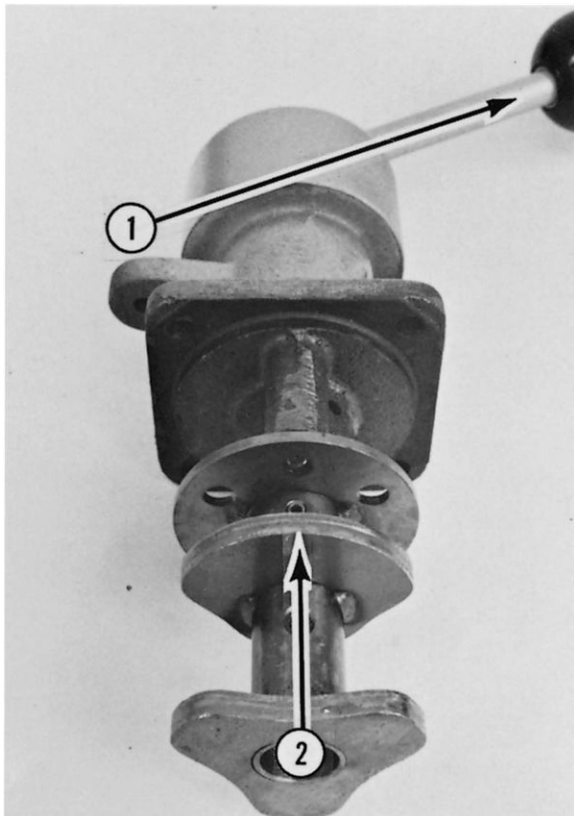


Fig. 11-18

## 10. SHIFTING YOKE

The upper and lower shifting yokes each have two adjustable spring loaded plungers that provide flexible shifting. When the adjustment is not correct and the shifter handle is moved to a different speed, the clutches will "hang" in the previous speed. Should adjustment of the plungers be required, use the following steps. Check all four plungers.

A. Loosen the locknut (1, Fig. 11-19). [Remove the cotter pin (2, Fig. 11-19) on bottom of lower yoke.]

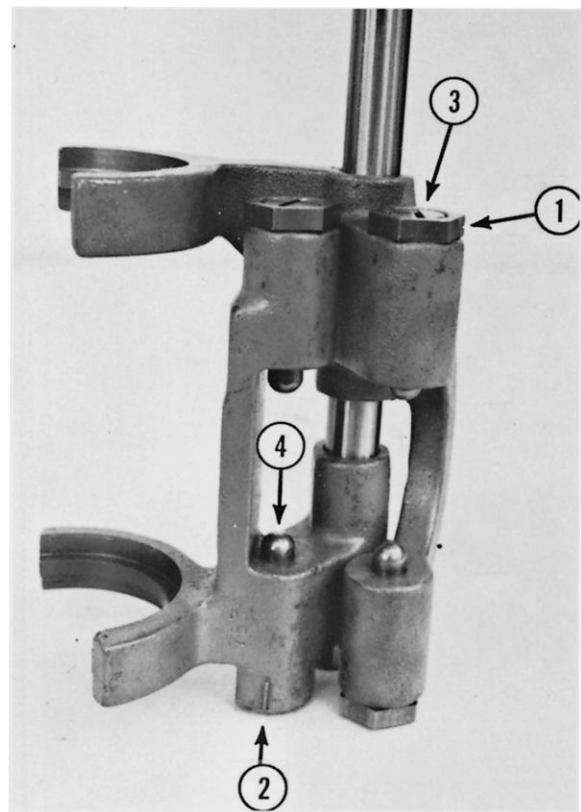


Fig. 11-19

B. Adjust the screw (3, Fig. 11-19) so the total movement of the plunger (4, Fig. 11-19) is between 1/4" to 7/32" and tighten the locknut or replace the cotter pin.

C. Repeat the adjustment procedure on the other three plungers.

## 11. OIL PUMP

The oil pump provides lubrication to the bearings, gears and clutches in the transmission. Check the oil pump inlet and delivery tubes holes to see that they are not clogged. Place the oil pump in a pan of oil with the oil level above the inlet tube. Rotate the driven gear counterclockwise, oil should flow from the delivery tubes.

Should it be necessary to disassemble the oil pump, use the following procedure.

A. Remove the two screws that holds the top plate, body and bottom plate together.

B. Remove the pin (1, Fig. 11-20) from the shaft if it is necessary to remove the gear.



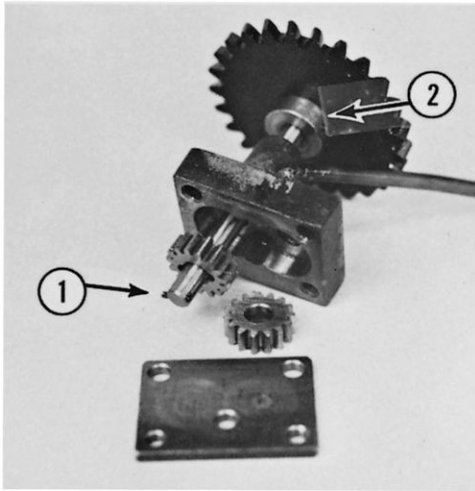


Fig. 20

C. Drive the pin from the hub (2, Fig. 11-20) of the drive gear if it is necessary to replace the drive gear.

D. Clean all parts before reassembling the oil pump.

E. Assemble in the reverse order of disassembly.

**NOTE:** When installing the oil pump in the transmission gear case, check that the oil pump delivery tube is positioned above, but not touching the upper planetary gear.

## 12. ATTACHMENT HUB (Optional)

### M-802/U & V1401/U FIELD INSTALLATION OF #12 ATTACHMENT HUB

A. To remove the attachment hub, remove the four bolts, and withdraw the unit out through the front of the mixer.

**NOTE:** The shim washer provides correct meshing of the bevel pinion and the cluster bevel gear. Save the shim washer for reassembly.

## 13. ASSEMBLING THE TRANSMISSION

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

### TSB 1147 M802 - Chimney Change

Before reassembling the transmission, thoroughly clean the gear case. If there has been breakage or wear of any parts, be especially careful with the

cleaning. Bearing seats in both the case and the case cover must be clean.

Clean each gear, spacer, key, retaining ring and bearing. Reassemble the main drive shaft, clutch shaft, planetary shaft, shifting yokes, oil pump and attachment hub. Lay the assembled units on a clean cloth.

A. Assuming that the transmission has been completely disassembled, coat the attachment hub sealing surface with Permatex #2.

B. Install the attachment hub (4 screws).

C. Coat the chimney gasket with Permatex (both sides) and place it on the transmission housing. Install the chimney (1, Fig. 11-21) (5 screws).



Fig. 11-21

D. Install the oil pump (1, Fig. 11-22).

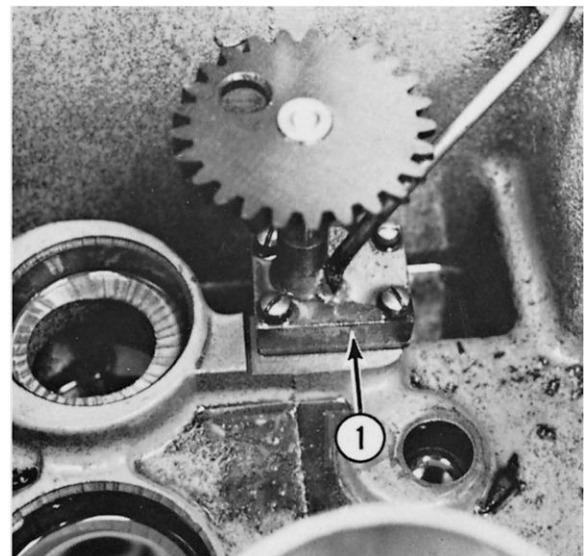
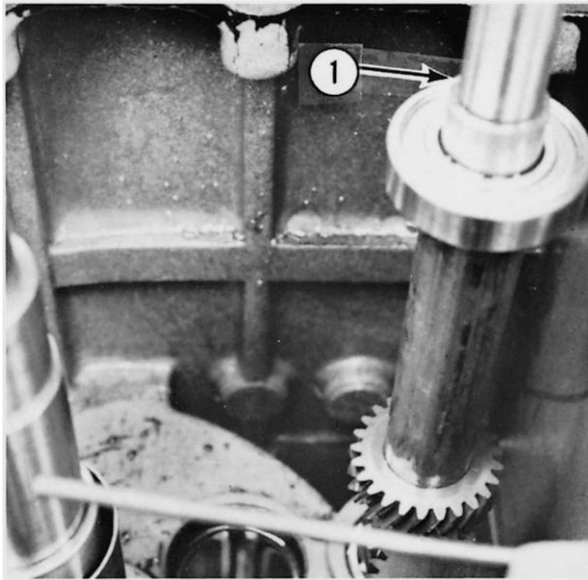


Fig. 11-22

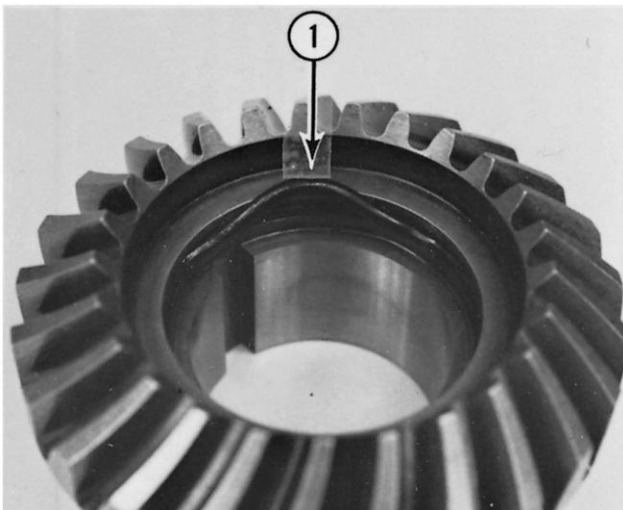
E. Insert the partially assembled planetary shaft from the bottom of the transmission case. Secure with the six Allen head screws.

F. Install the main drive shaft (1, Fig. 11-23).



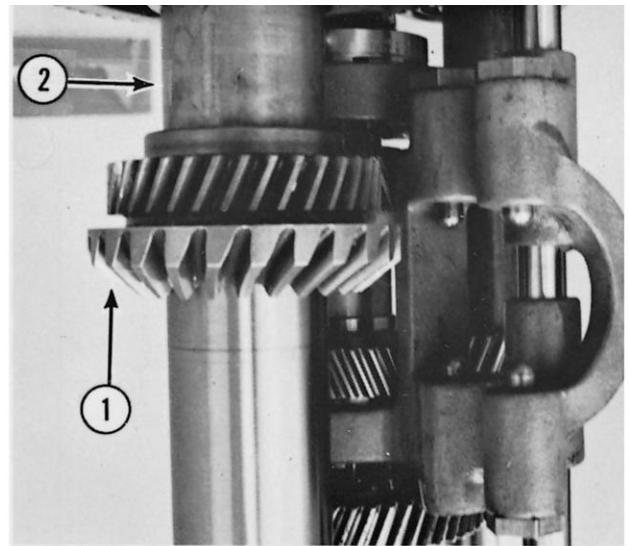
**Fig. 11-23**

G. Inspect the "O" ring (1, Fig. 11-24) in the gear cluster, replace if worn.



**Fig. 11-24**

H. Install the key, gear cluster (1, Fig. 11-25) and spacer (2, Fig. 11-25).



**Fig. 11-25**

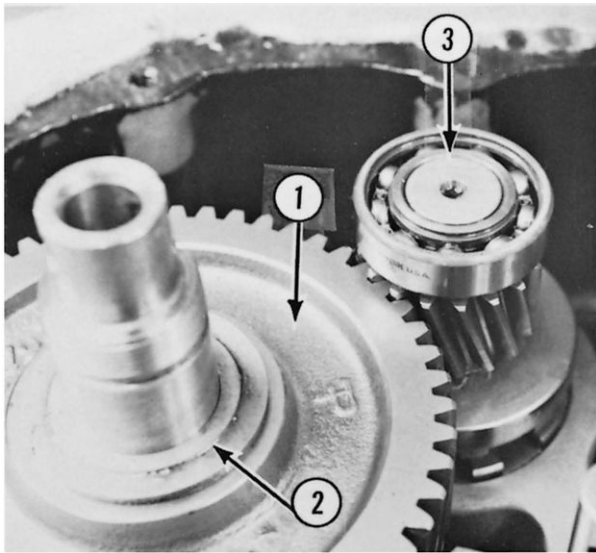
I. Raise the main drive shaft slightly and install the clutch shaft. Both shafts can now be lowered into place.

J. Install the upper and lower shifting yokes and insert the shifter shaft (1, Fig. 11-26).



**Fig. 11-26**

K. Install the key and the upper planetary gear (1, Fig. 11-27) with the top (marked) side up.

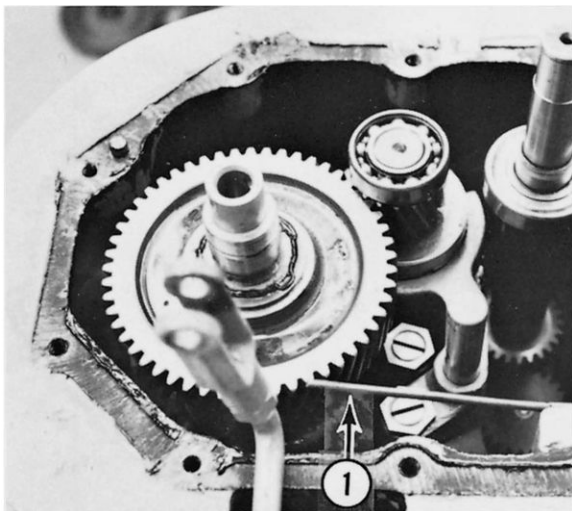


**Fig. 11-27**

L. Install the shim (2, Fig. 11-27) with the shoulder side up.

M. Install the spacer and the upper ball bearing (3, Fig. 11-27) on the clutch shaft.

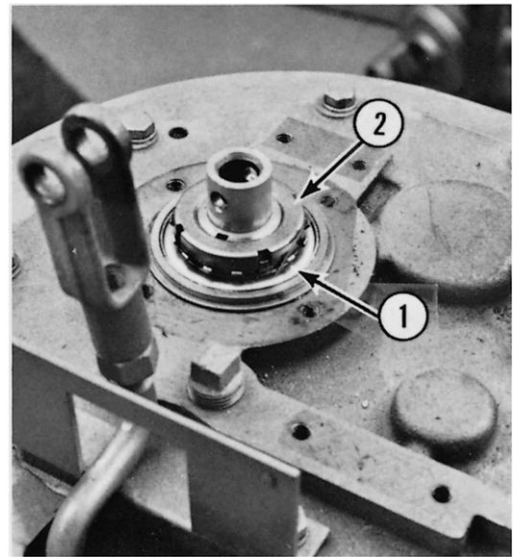
**NOTE:** Before replacing the top cover, check that the oil pump delivery tube (1 Fig. 11-28) is positioned above, but not touching the upper planetary gear.



**Fig. 11-28**

N. Apply Permatex #2 to the sealing surface on the top cover and carefully seat the top cover over the two dowels that locate it on the housing and install the 11 bolts.

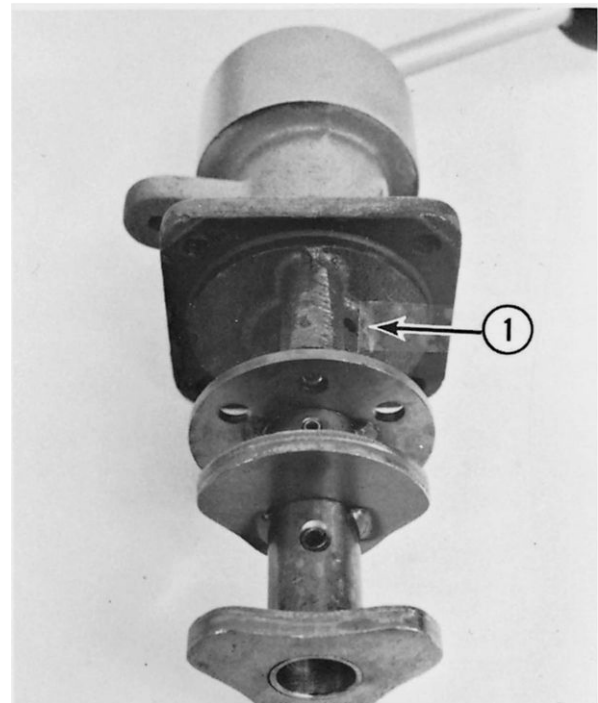
O. Install the lockwasher (1, Fig. 11-29) and locknut (2, Fig. 11-29). Tighten the locknut and lock the position with a tab on the lock washer.



**Fig. 11-29**

P. Install the upper bearing retainer.

Q. Place the gear shift handle to the 3rd speed position. Locate the bracket with the oil hole (1, Fig. 11-30) in the up position.



**Fig. 11-30**

R. Apply Permatex #2 to the sealing surface and install the shifter unit.

S. Connect the clutch rod to the hub.

T. Place the push buttons (1, Fig. 11-31) in the switch plate, and install the switch plate.

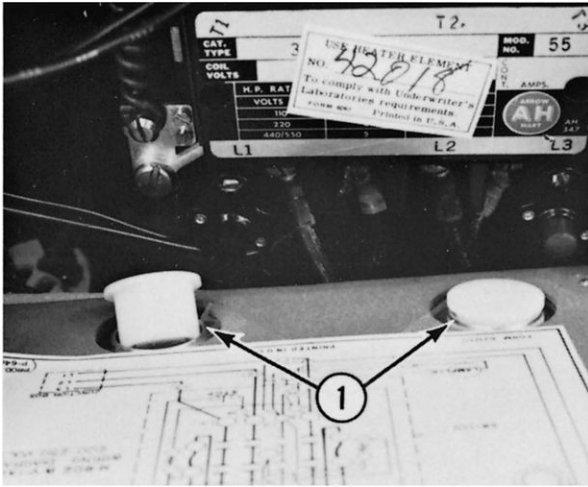


Fig. 11-31

U. Install the clutch handle.

V. Install the driven gear and spline hub. Use the same size and number of shim washers as was removed and secure with the retaining ring.

W. Install the bowl lift "V" belt and the FLEXA-GEAR DRIVE BELT. Refer to SECTION 7 ADJUSTMENTS.

X. Install the clutch. Refer to Section 9 "Clutch and Brake" for instructions.

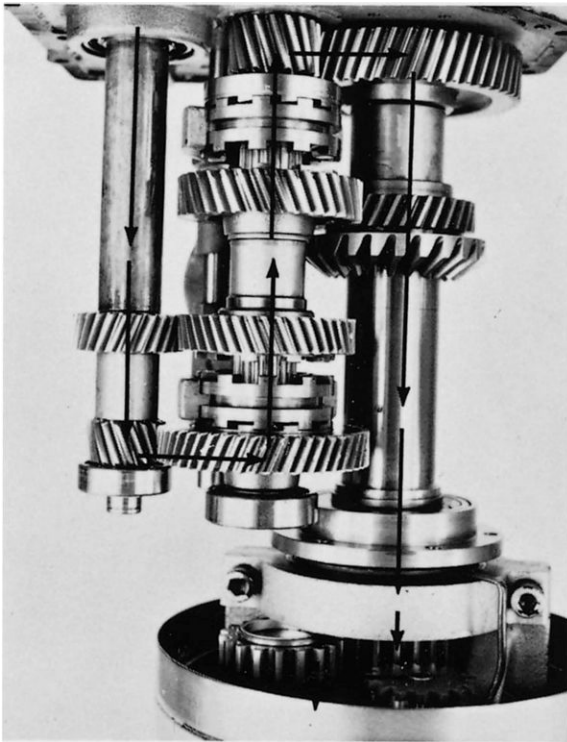
Y. Install the brake. Refer to Section 9 "Clutch and Brake" for instructions.

Z. Install the planetary. Refer to Section 10 "Planetary" for instructions.

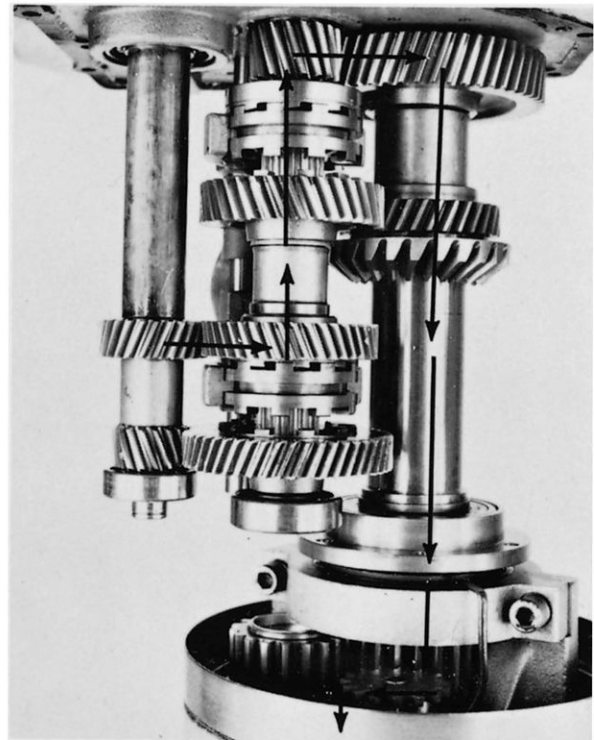
AA. Service the planetary and transmission with oil. Refer to LUBRICATION for instructions.

AB. Test the operation of the mixer and reinstall the cover.

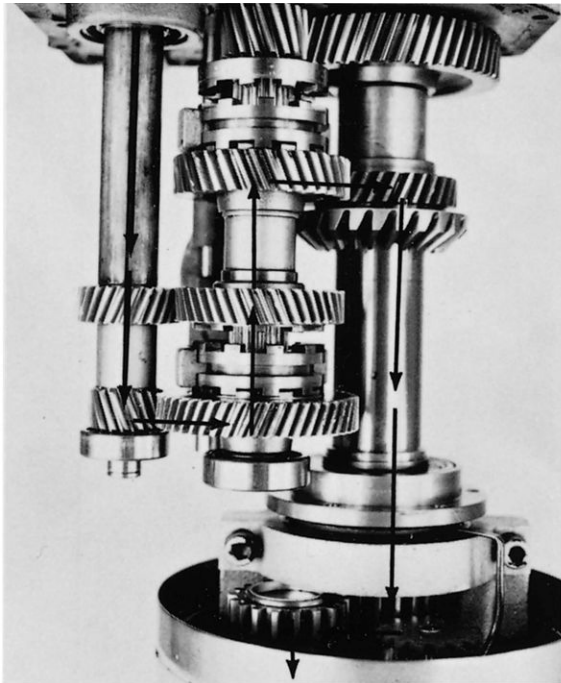
## 14. POWER FLOW



1st Speed

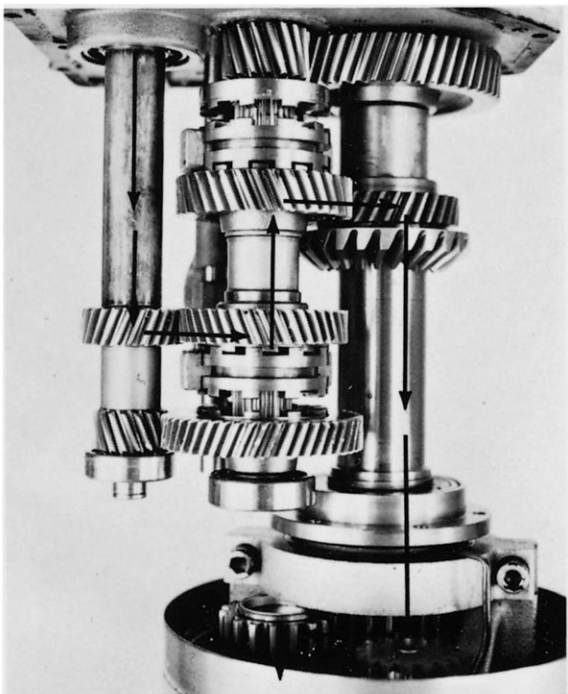


2nd Speed



3rd Speed

Fig. 11-32



4th Speed

# SECTION 12 POWER BOWL LIFT

M802/V1401 POWER BOWL LIFT UNIT IMPROVEMENTS

MODEL M802 AND V1401 - BOWL GUARD INFORMATION

M802 BOWL INTERLOCK KIT PART NO. 270635

TSB 818 - Mixer Bowl Scraper Adjust. to Reduce Product Buildup

## 1."V" BELT REPLACEMENT

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

A. Remove the cotter pin (1, Fig. 12-1) and clevis pin (2, Fig. 12-1) from the brake and clutch arm.

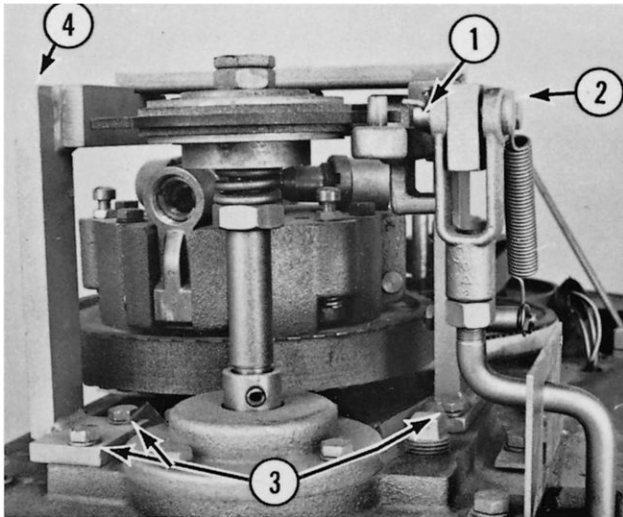


FIG. 12-1

B. Remove the four bolts (3, Fig. 12-1) and lift the clutch shaft support (4, Fig. 12-1) from the mixer.

C. Remove the FLEXA-GEAR DRIVE BELT.

D. Loosen the holding screw (1, Fig. 12-2) and the pivot screw (2, Fig. 12-2). Release the belt tension.

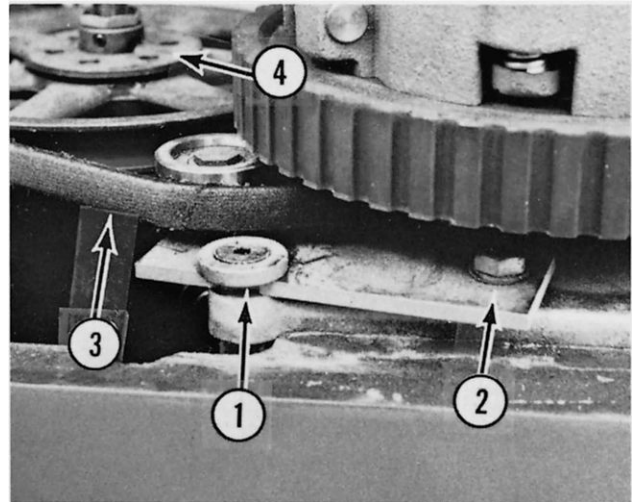


FIG. 12-2

E. Remove the "V" belt (3, Fig. 12-2).

F. Install the new "V" belt and reassemble in the reverse order of disassembly. Adjust the "V" belt tension as described in Adjustments. "Bowl Lift "V" Belt"

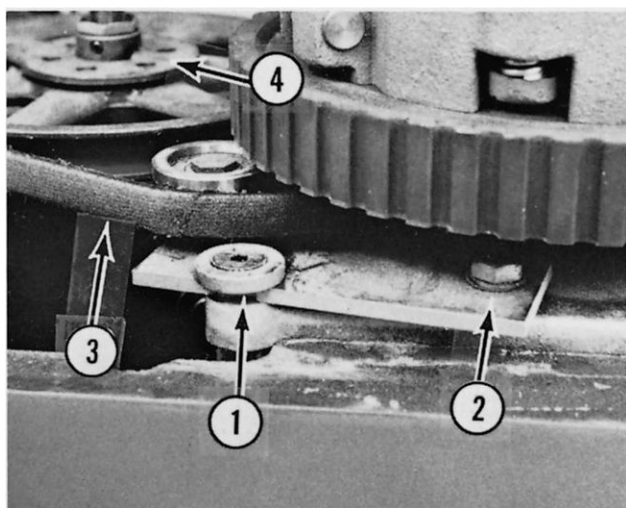
## 2. OVERLOAD SLIP CLUTCH

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

The overload slip clutch is designed so that it will slip when the end of the bowl lift travel (either up or down) is reached.





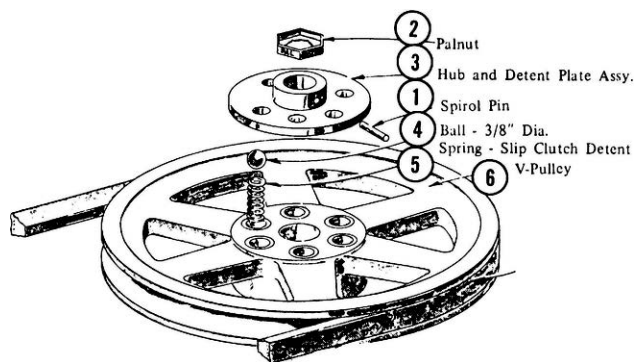
**Fig. 12-2**

**A. Removal.**

- (1) (V-1401) Remove the FLEXA-GEAR DRIVE BELT.

**NOTE:** For M-802 models, remove the clutch. Refer to: 2. CLUTCH.

- (2) (V-1401) Loosen the holding screw (1, Fig. 12-2) and the pivot screw (2, Fig. 12-2). Release the " V " belt tension.
- (3) (V-1401) Remove the "V" belt (3, Fig. 12-2) from the driven pulley.
- (4) Drive out the spirol pin (1, Fig. 12-3).



**Fig. 12-3**

- (5) Slowly remove the palnut (2, Fig. 12-3).
- (6) Carefully lift off the detent plate (3, Fig. 12-3) and the balls (4, Fig. 12-3) and springs (5, Fig. 12-3).
- (7) Lift off the "V" pulley (6, Fig. 12- 3).

**B. Installing.**

- (1) Place the V-pulley (6, Fig. 12-3) on the bowl lift gear box output shaft.

- (2) Place the springs (5, Fig. 12-3) into the holes in the V-pulley. Place a ball (4, Fig. 12-3) on each spring.
- (3) Inspect the detent plate (3, Fig. 12-3), replace it if it is worn.
- (4) Carefully lower the detent plate (3, Fig. 12-3) to rest on the balls and springs.
- (5) Install the palnut (2, Fig. 12-3) and turn it until the holes in the detent plate and input shaft are aligned.
- (6) Drive in the spirol pin (1, Fig. 12-3).
- (7) (M-802) Install the drive gear.
- (8) Install the "V" belt.
- (9) Adjust the "V" belt. Refer to: Adjustments "Bowl Lift "V" Belt".
- (10) Install the FLEXA-GEAR DRIVE BELT.
- (11) (M-802) Reinstall the clutch. Refer to: Section 9 "Clutch and Brake".

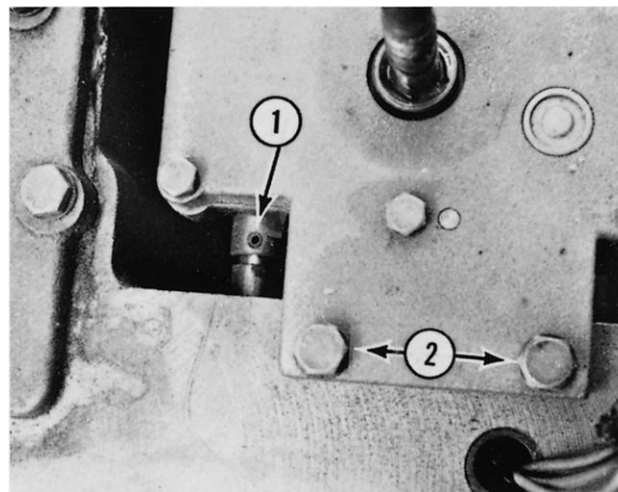
### 3. BOWL LIFT GEAR BOX

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

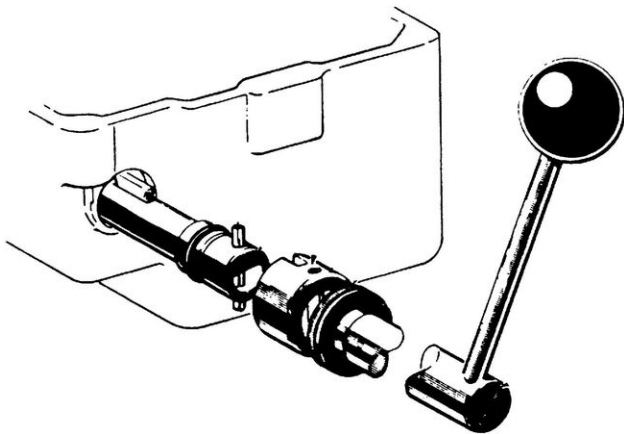
**A. Removal.**

- (1) Remove the overload slip clutch. Refer to: Overload Slip Clutch "Removal".
- (2) Drive the spirol pin (1, Fig. 12-4) out of the yoke shaft.



**Fig. 12-4**

**NOTE:** Some mixers have a connector sleeve (Fig. 12-6) which does not require that the spirol pin be removed.

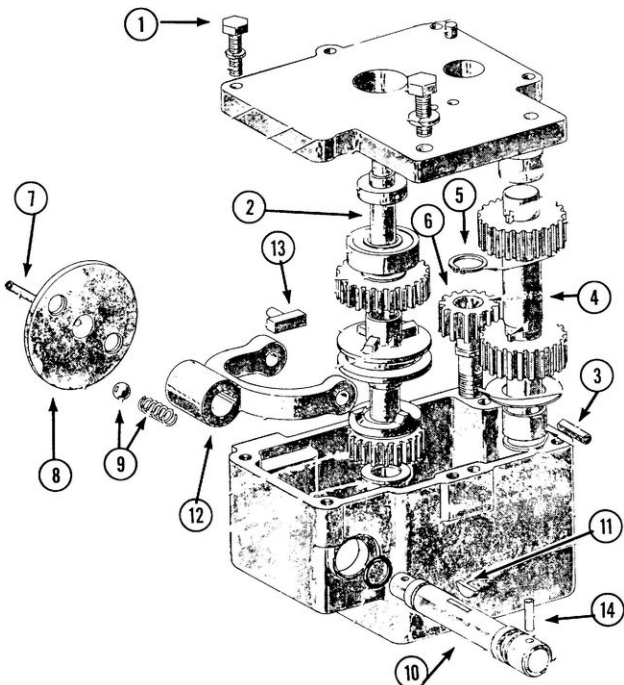


**Fig. 12-6**

(3) Remove the two hex head bolts (2, Fig. 12-4) and lift the gear box out of the mixer.

**B. Disassembly.**

(1) Remove the six hex head bolts (1, Fig. 12-5).



**Fig. 12-5**

(2) Lift the cover off the gear box. (There are two dowels.)

(3) Lift the input shaft (2, Fig. 12-5) out of the gear box.

(4) Drive out the spirol pin (3, Fig. 12-5) from the output shaft.

(5) Remove the output shaft assembly (4, Fig. 12-5).

(6) Remove the retaining ring (5, Fig. 12-5) and remove the idler gear (6, Fig. 12-5).

(7) Drive the spirol pin (7, Fig. 12-5) out of the detent plate (8, Fig. 12-5). Hold the detent plate while driving the pin to prevent the springs and balls (9, Fig. 12-5) from being lost.

(8) Move the yoke shaft (10, Fig. 12-5) to the side, and remove the woodruff key (11, Fig. 12-5).

(9) Withdraw the yoke shaft out of the gear box, while holding the yoke (12, Fig. 12-5).

**C. Assembly.**

(1) Clean and inspect each gear, bearing, "O" ring, shoe and the gear box, replace if necessary.

(2) Insert the yoke shaft (10, Fig. 12-5) into the yoke (12, Fig. 12-5) and the gear box.

(3) Move the yoke shaft (10, Fig. 12-5) to one side and install the woodruff key (11, Fig. 12-5).

(4) Install the two springs and two balls (9, Fig. 12-5).

(5) Place the detent plate (8, Fig. 12-5) in place and hold while installing the spirol pin (7, Fig. 12-5).

(6) Install the idler gear (6, Fig. 12-5) and secure with the retaining ring (5, Fig. 12-5).

(7) Assemble the output shaft (4, Fig. 12-5).

(8) Install the output shaft (4, Fig. 12-5).

(9) Drive the spirol pin (3, Fig. 12-5) into the output shaft.

(10) Install the shoes (13, Fig. 12-5) into the yoke.

(11) Assemble the input shaft (2, Fig. 12-5).

(12) Install the input shaft. The shoes on the yoke must be aligned with the groove in the clutch as the input shaft is installed.

(13) Pack the gear box with grease. Refer to LUBRICATION for the amount and type of grease.

(14) Apply Permatex #2 to the gear box cover.



(15) Install the cover and secure with the six bolts and washers (1, Fig. 12-5).

D. Installing.

(1) Align the bowl lift gear box output shaft spirol pin with the groove in the lift screw extension.

(2) Lower the bowl lift gear box into place and secure with the two hex head bolts (2, Fig. 12-4).

**NOTE:** If the mixer is equipped with a connector sleeve like shown in Fig. 12-6 it will be necessary to align the spirol pin in the yoke shaft with the groove while lowering the gear box into place.

(3) Push the lift control handle into place and drive the spirol pin (1, Fig. 12-4) into the shaft.

(4) Install the overload slip clutch. Refer to: Overload Slip Clutch "Installing"

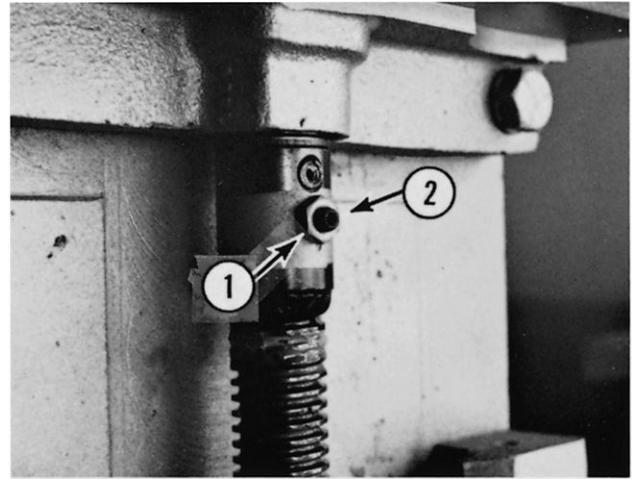


Fig. 12-8

E. Remove the bowl lift gear box. Refer to: Bowl Lift Gear Box "Removal".

F. Remove the lift screw extension shaft (Fig. 12-9) from the mixer.

## 4. BOWL LIFT SCREW EXTENSION

**⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON**

- A. Remove the stainless steel apron.
- B. Lower the bowl lift to the lower stop.
- C. Drive out the spirol pin (1, Fig. 12-7) on the bowl lift screw.

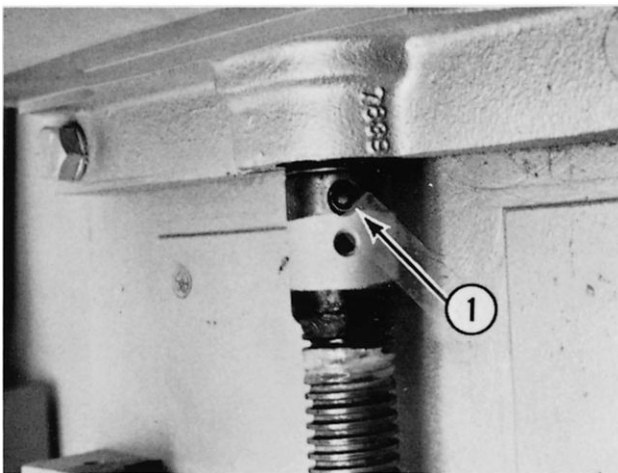


Fig. 12-7

D. If the mixer is equipped with a safety screw, loosen the jam nut (1, Fig. 12-8) and back out the stop screw (2, Fig. 12-8).

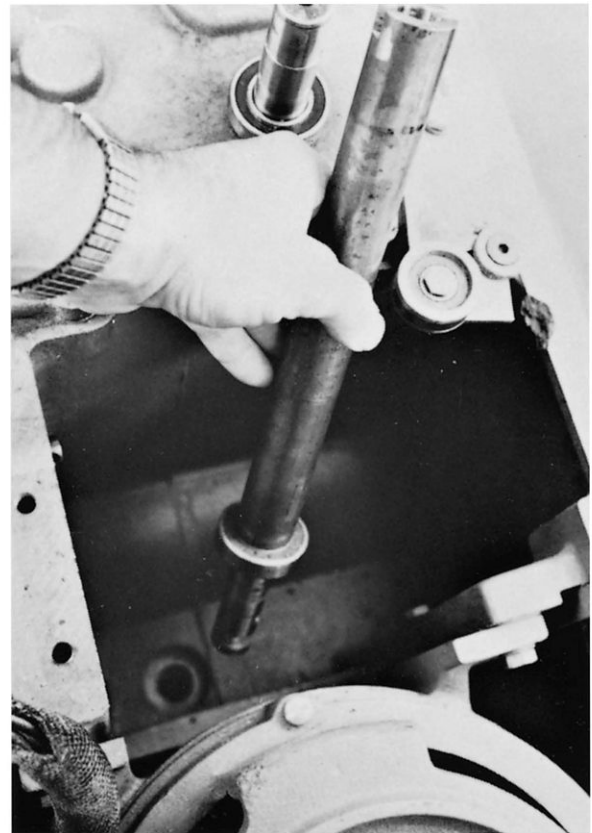


Fig. 12-9

G. The thrust bearing (Fig. 12-10) can be removed from the top of the bowl lift screw.

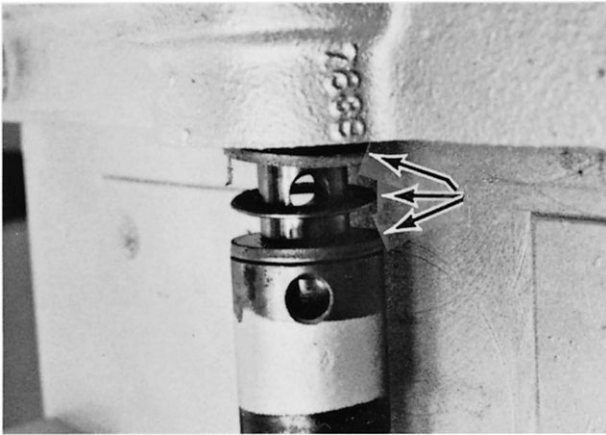


Fig. 12-10

**NOTE:** The thrust bearing is used to take the upward thrust of the bowl lift screw.

H. Replace in reverse order of disassembly.

## 5. BOWL LIFT SCREW

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

TSB 224 -Thrust Bearing for Bowl Lift Nut

TSB 975 - Incorrect Location of Bowl Lift Screw Extension Thrust Washers & Needle Bearing

- A. Lower the bowl support to the lower stop.
- B. Remove the stainless steel apron.
- C. Drive the spirol pin (Fig. 12-7) out of the bowl lift screw.

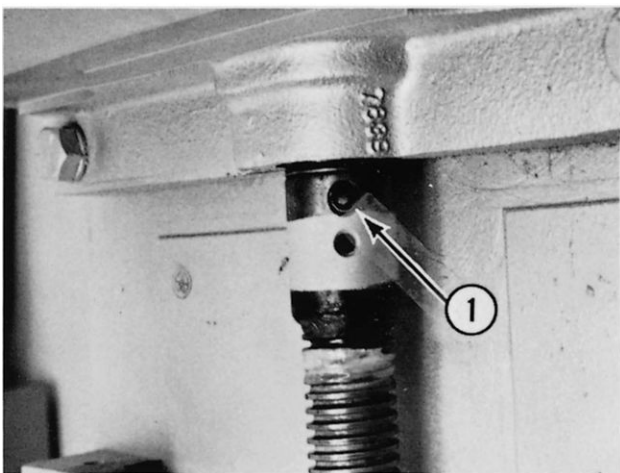


Fig.12-7

D. If the mixer is equipped with a safety screw, loosen the jam nut (1, Fig. 12-8) and back out the stop screw (2, Fig. 12-8).

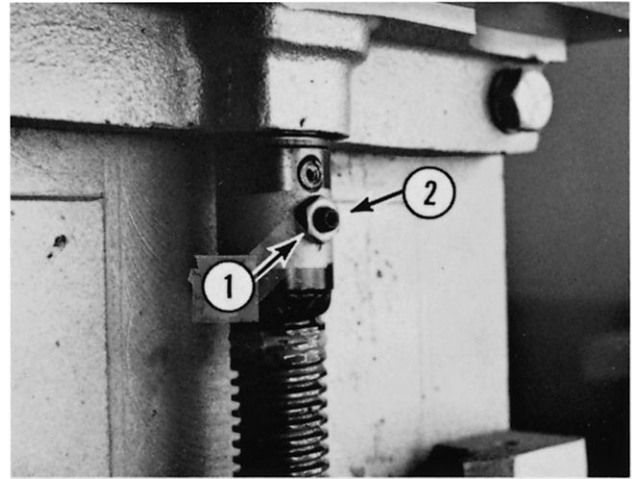


Fig. 12-8

E. Rotate (by hand) the bowl lift screw a few turns to clear the lift screw extension and remove the thrust bearing (Fig. 12-10).

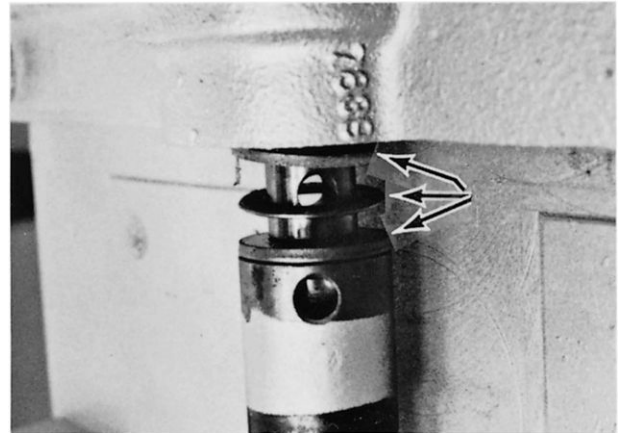


Fig. 12-10

F. Remove the two bolts (1, Fig. 12-11) in the nut retainer (2, Fig. 12-11).

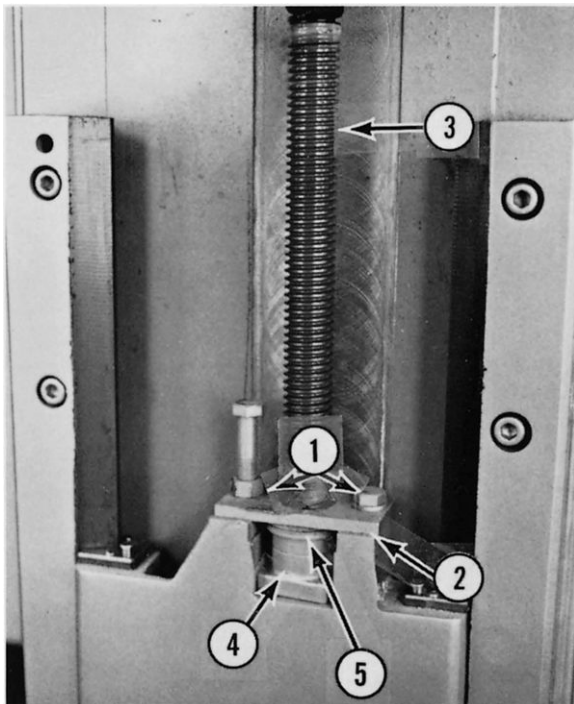


Fig. 12-11

G. Remove the bowl lift screw (3, Fig. 12-11), the bowl lift nut (4, Fig. 12-11) and thrust bearing (5, Fig. 12-11).

H. Reassemble in the reverse order of disassembly. Adjust the bowl to beater clearance. Refer to: Adjustments "Bowl to Beater Clearance".

## 6. BOWL SUPPORT

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

#### A. Removal.

To remove the bowl support it is necessary to take off the right-hand slideway. Proceed as follows :

- (1) Remove the stainless steel apron.
- (2) Break the paint and body putty covering the heads of the three lower screws (A, B, C, Fig. 12-12) (Locate by dimensions given).

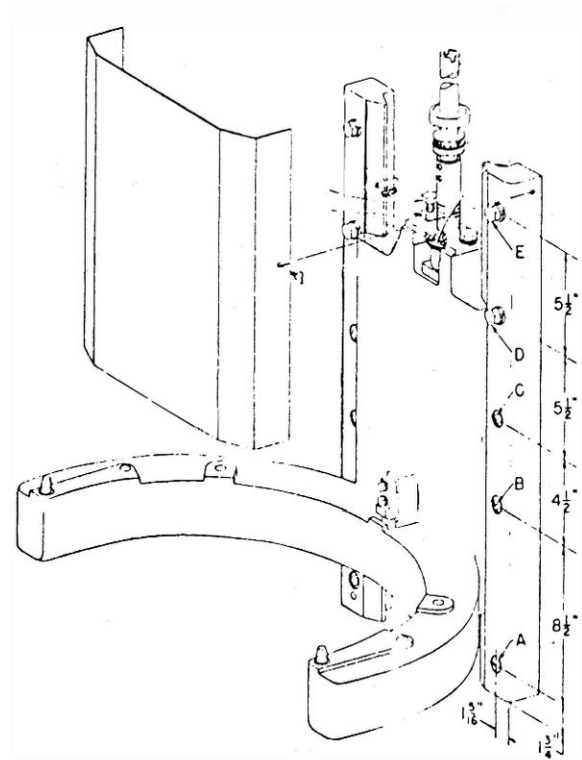


Fig. 12-12

(3) Run the bowl support all the way down and remove the bowl lift nut retainer (1, Fig. 12-11). Then run the nut back up the screw.

(4) Take out the five screws (A, B, C, D, E, Fig. 12-12) and remove the right-hand slideway. The bowl support will then be clear of the bowl lift screw.

#### B. Installing.

- (1) If a new casting is installed, the fittings such as bowl clamps, locating studs and bowl retainer can be transferred from the discarded casting.
- (2) Clean and lubricate the grooves on the bowl support that fit into the slideways.
- (3) Lift the bowl support in place, with the groove in the left-hand slideway.
- (4) Install the right-hand slideway using bolt at the top (E, Fig. 12-12) and bottom (A, Fig. 12-12).
- (5) Install the remaining bolts, but do not tighten at this time.
- (6) Align the bowl lift nut in the bowl support and install the bowl lift nut retainer (1, Fig. 12-11).
- (7) Adjust the slideways. Refer to Adjustments "Slideways".

(8) Install the stainless steel apron.

# SECTION 13 TRANSMISSION HOUSING, PEDESTAL, BASE

## 1. TRANSMISSION HOUSING

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

Should the transmission housing become broken or cracked, the housing must be replaced. In order to replace the housing, the mixer motor, bowl lift gear box, lift screw extension, transmission unit, internal gear, planetary and controls mounted on the housing must be removed. The transmission housing has two locating dowels and is held to the pedestal by five mounting bolts. Shims located behind the mounting bolts are used to align the transmission housing. Save all shims when removing the old transmission housing for use in aligning the new housing.

After the new transmission housing has been installed with the shims in place and the mounting bolts tight, check the clearance between the side of bowl and beater using the following procedure.

- A. Install the planetary shaft assembly.
- B. Install the transmission case cover and the planetary shaft upper locknut. Tighten the locknut to pull the planetary up to its normal position.
- C. Install the planetary.
- D. Place a bowl on the bowl support and install a "B" beater on the agitator shaft.
- E. Raise the bowl to the extreme up position and rotate the planetary by hand while checking the clearance between the side of the bowl and the beater. The clearance should be even at all points. Shims can be added or removed from between the transmission housing and pedestal to correctly align the transmission case.
- F. Complete installation of the assemblies removed from the mixer and recheck the alignment.

## 2. PEDESTAL

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

Remove the transmission housing. Refer to "Transmission Housing". The pedestal is fastened to the base by four bolts and after removal of the transmission housing, it must be carefully laid on its side to remove the base. When reassembling, be sure the base is squared with the pedestal.

## 3. BASE

### **⚠ WARNING**

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

- A. When removal or replacement of the base is necessary, carefully lay the mixer on its side, opposite the controls.
- B. Elevate the lower part of the pedestal.
- C. Remove the four base mounting bolts and remove the base.
- D. Install the new base in the reverse order of disassembly.

# SECTION 14 ELECTRICAL CONTROLS (SOLID STATE)

## 1. OPERATION CONTROLS

A. Stop Switch (1PB) (1, Fig. 14-1).

TSB 1186 M802 & V1401 Mixers Switch Change

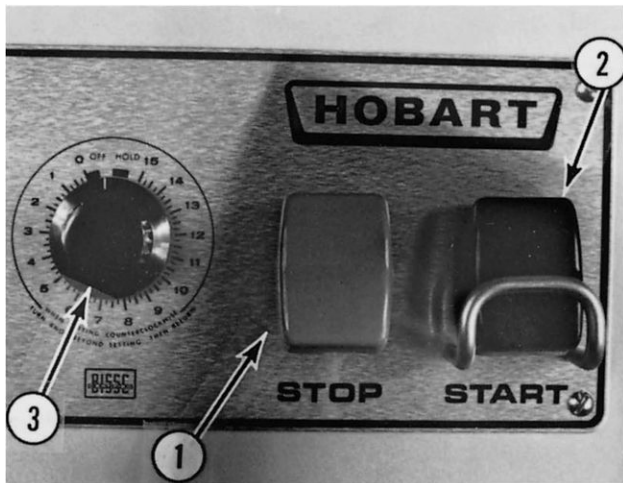


Fig. 14-1

The stop switch is a magnetically operated reed switch. When the stop switch is in its normal position (not actuated) the reed switch on 1RMB (1, Fig. 14-2) behind the switch plate is held closed by the magnet and allows the machine to be started. When the stop switch is pressed, the magnet is pivoted away from the reed and the reed switch opens, causing the motor to be shut off.

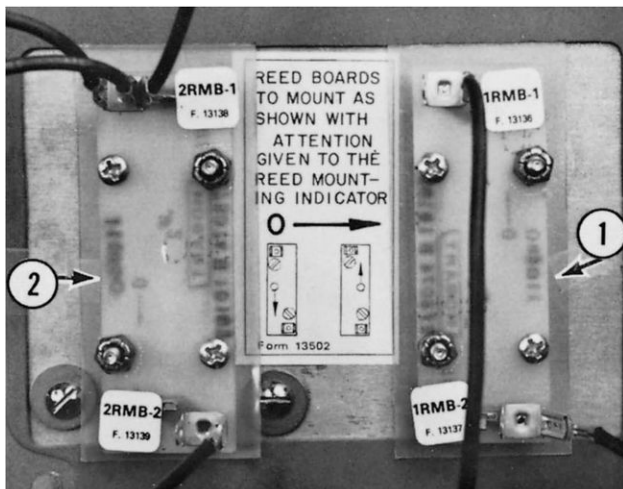


Fig. 14-2

B. Start Switch (2PB) (2, Fig. 14- 1).

The start switch is a magnetically operated reed switch. When the start switch is in its normal position (not actuated) the reed switch on 2RMB (2, Fig. 14-2) behind the switch plate is open. When the switch is pressed to the START position, a magnet is positioned over the reed switch, thereby closing the contacts. The start switch is spring loaded (momentary) and will return to the open position when released.

C. Timer (3, Fig. 14- 1).

### M802/V1401 SOLID STATE MIX. TIMER REPLACEMENT

The timer is mounted on the switch plate. It permits either continuous operation (Hold position) or up to 15 minutes of timed operation with automatic shut-off of the machine after the time set has elapsed. Timers with up to 60 minutes of timed operation are also available.

## 2. ELECTRICAL SERVICE CONNECTION

The electrical service is connected at the junction box located on the rear of the pedestal.

## 3. MOTOR CONTACTOR

Leads L1 and L2 (and L3 if 3 Phase) from the junction box are connected to terminals L1 and L2 (and L3 if 3 Phase) on the contactor.

Leads T1 and T2 (and T3 if 3 Phase) from the contactor connect to the motor.

When the contactor is energized by the control circuit, contacts L1-T1, L2-T2 (and L3-T3 if 3 Phase) close and supply line voltage to the motor.

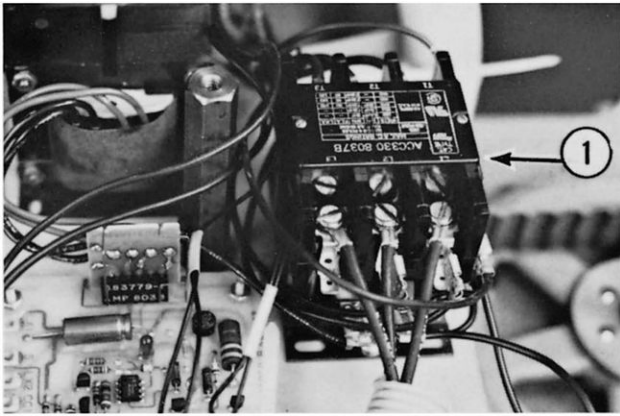


Fig. 14-3

## 4. MOTOR

### M802/V1401 VENDOR MOTOR INTRODUCTION 200/60/3 PHASE

### M802/V1401 REPLACEMENT 3 PHASE VENDOR MOTOR AND ASSOCIATED PARTS

### M802/V1401 REPLACEMENT SINGLE PHASE VENDOR MOTOR AND ASSOCIATED PARTS

The V-1401 mixer uses a 5 hp Hobart built motor and the M-802 mixer used a 3 hp Hobart built motor.

The direction of rotation of the motor is clockwise as viewed from the pulley end of the motor.

A. Single Phase Motor. The single phase motors are capacitor start type motors.

B. Three Phase Motor. The three phase motors are squirrel cage induction type motors.

## 5. FUSE BOARD

A. 60 Hz. (1, Fig. 14-4)

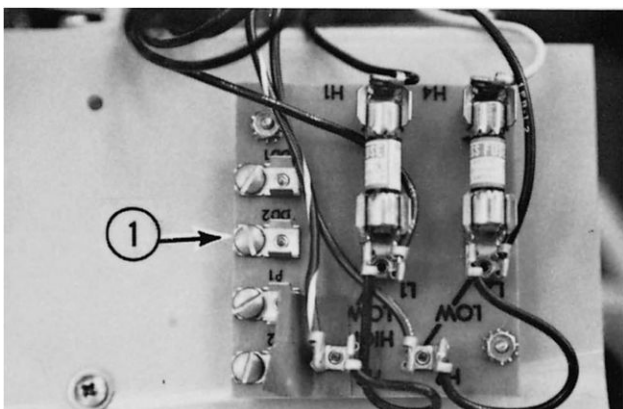


Fig. 14-4

Power is applied to L1 and L2 of the fuse board from terminals L1 and L2 on contactor 1CON. The fuses, 1FU and 2FU, protect the control transformer. On 60 Hz. machines the fuse board terminals H2 and H3 are for the jumper wires which properly connect the transformer primary to the input voltage.

(1) Low voltage (200-230). When the line voltage is 200 or 230 volts, a jumper is connected between L1 and H3. Another jumper connects L2 and H2.

(2) High voltage (460). When the line voltage is 460 volts, a single jumper is connected between H2 and H3.

## 6. TRANSFORMER AND POWER INPUT BOARD ASSEMBLY

A. Transformer (1, Fig.14-5).

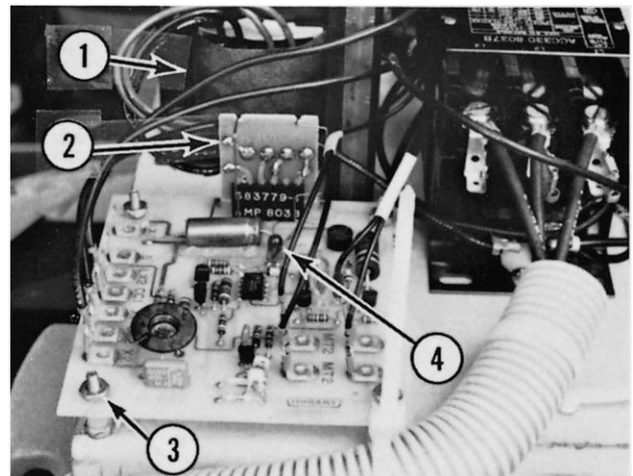


Fig. 14-5

(1) 60 Hz. power is supplied through fuses 1FB and 2FB on the fuse board to the primary windings of the transformer. The transformer secondary windings provide 20V AC to the motor protector circuit and 120V AC to the control circuit.

(2) 50 Hz. On 50 Hz. machines, the transformer has quick connect terminals for high and low voltage connections. Terminals H2 and H3 on the fuse board are not used.

a. Low voltage 50 Hz. (220/50/3). When the line voltage is 220/50/3, a jumper connects L1 on the fuse board to H2B on the transformer. Another jumper connects L2 on the fuse board to H3B on the transformer.

b. High voltage 50 Hz. (380-415/50/ 3).  
When the line voltage is between 380-415/50/3 a single jumper is connected between H2A and H3A on the transformer.

**B. Power Input Board (2, Fig.14-5).**

(1) The output voltages of the transformer are connected to the motor protector board through the power input board which plugs into a six pin connector on the motor protector board.

(2) The power input board has a 3 amp fuse (3FU) in the 20 volt line to protect the motor protector circuit.

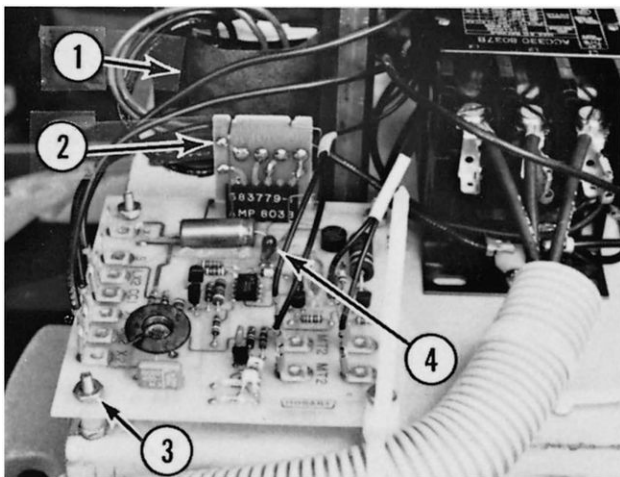
C. If the motor is overloaded it will draw excessive current through its windings and the windings will become hotter. If the motor temperature should reach 285°F (140°C) the decreased voltage between the MT1 (or MT2) terminals will activate the motor protector circuit. The motor protector circuit then turns off the triac (electronic switch) located on the motor protector board, and the voltage is removed from the control circuit.

D. Anytime an overheated motor is sensed the light emitting diode (LED) (4, Fig. 14-5) on the motor protector board will light.

E. When the motor temperature drops to 257°F (125°C) the motor protector circuit will turn on the triac and allow the motor to be restarted. The LED will go out.

**7. MOTOR PROTECTOR BOARD**

Motor Protector Board (3, Fig. 14-5).



**Fig. 14-5**

If the motor should become overheated, the motor protector board will cause the contactor to de-energize and shut off the motor.

A. There are two temperature sensors (thermistors) located in the motor windings. Thermistors change their resistance as the temperature around them changes.

B. Thermistor 1QTM is connected between the two MT1 terminals on the motor protector board. 2QTM is connected between the MT2 terminals. As the motor temperature increases, the voltage across the MT1 (and MT2) terminals will decrease.

**8. ELECTRICAL SEQUENCE OF OPERATION**

**NOTE:** Refer to the electrical diagram on the machine when servicing a mixer with a voltage other than shown. Anytime that electrical power is connected to the machine, 120V AC from the transformer is present across terminals MPB-X1 and MPB-X2 (MPB-X2 is connected to 1CON-C3 through the triac on the MPB). 20V AC from the transformer is present across terminals LX1 and LX2 for use by the motor protector circuit. With time dialed into the timer, 1TM 6-7 is closed.

**A. SET TIMER.**

Timer motor and bowl light energized.

**B. PRESS THE START SWITCH (2PB).**

A completed circuit to the motor contactor coil (1CON) now exists through the switches 1PB, 1TM and 2PB. The contactor 1CON is energized.

**C. 1CON ENERGIZES.**

1CON contacts in the motor circuit close, applying line voltage to the motor and the motor starts. The 1CON side switch contacts (NO-C) also close. This provides an alternate circuit (locking circuit) to keep 1CON energized. The locking circuit is through the switches 1PB, 1TM and 1CON side switch. The start switch can now be released. The motor will continue to run until the stop switch is pressed, or the timer contacts open.

**D. PRESS THE STOP SWITCH.**

1PB contacts open, interrupting the 120V AC circuit to the coil of 1CON and 1CON is de-energized.



E. 1CON DE-ENERGIZES.

1CON contacts in the motor circuit open, removing power to the motor. The 1CON side switch (NO-C) also opens which disables the locking circuit and makes it necessary to press the start switch to resume operation.

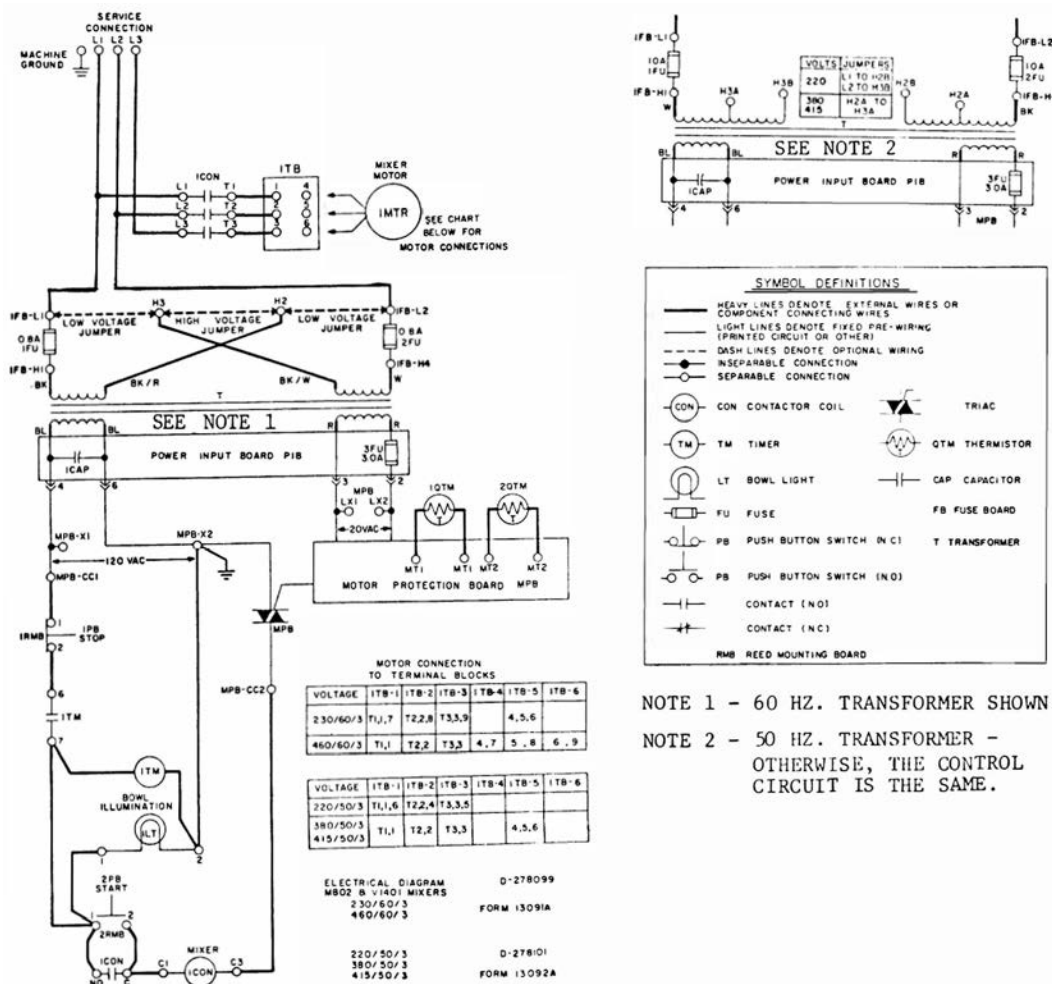


Fig. 14-6

## 9. ELECTRICAL TROUBLESHOOTING

A. General.

The following procedures, when applied exactly, are designed to enable the technician to service this machine as quickly and effectively as possible. Never substitute electrical components without first analyzing the problem as this could result in damage to other components or only temporarily correcting the problem.

B. Check for Proper Voltages.

Several of the symptoms listed in this section can be caused by incorrect line voltages. Intermittent and/or unusual symptoms are often caused by incorrect voltages. It is good practice to check these voltages before troubleshooting components. If any of the following checks fail, see either "Testing the Transformer" for further instructions.

(1) Check for 120V AC between terminals MPB-X1 and MPB-X2 on the motor protector board. Voltage should be between 105 volts and 130 volts.

(2) Check for 20V AC between terminals MPB-X1 and MPB-X2 on the motor protector board. Voltage should be between 18 and 22 volts.

C. Symptoms.

(1) Electrical service circuit breakers kicking out when start switch is pressed.

- a. Check for proper sizing of circuit breakers or line fuses and incorrect wiring to the machine.
- b. Motor windings shorted. See "Testing Motor Field Windings".
- c. Three phase motor single phasing. Check that all 3 legs of 3 phase power are present at terminals T1, T2 and T3 on 1CON when 1CON is energized.
- d. Single phase motor has open start circuit. Check the start winding, start switch and capacitor in the motor.
- e. Mechanical motor bind.

d. Start switch, capacitor, or start windings on single phase motor.

e. Motor field windings.

(2) Machine won't start.

- a. No power to machine from electrical service.
- b. Fuses 1FU and/or 2FU blown.
- c. Fuse 3FU (on PIB) blown. If after replacing F3, it blows again, replace the motor protector board.
- d. Test transformer. See "Testing the Transformer".
- e. Overheated motor (LED on motor protector board lit). See "Testing Motor Current".
- f. Motor protector board malfunctions. See "Testing the Motor Protector Circuit".
- g. Check reed switches 1PB, 2PB and timer contacts (1TM).
- h. Motor contactor coil 1CON open.

(3) Machine starts when START switch is pressed but stops when START switch is released.

- a. 1CON side switch not closing.

(4) Motor hums (won't rotate).

- a. Motor single phasing (3 Phase). Check that all 3 legs of 3 phase power are present at terminals T1, T2, T3 on 1CON when 1CON is energized.
- b. Motor bearings frozen.
- c. Terminal block 1TB not wired correctly.

# SECTION 15 ELECTRICAL CONTROLS (NON SOLID STATE)

## 1. OPERATING CONTROLS

A. Stop Switch (1, Fig. 15-1).

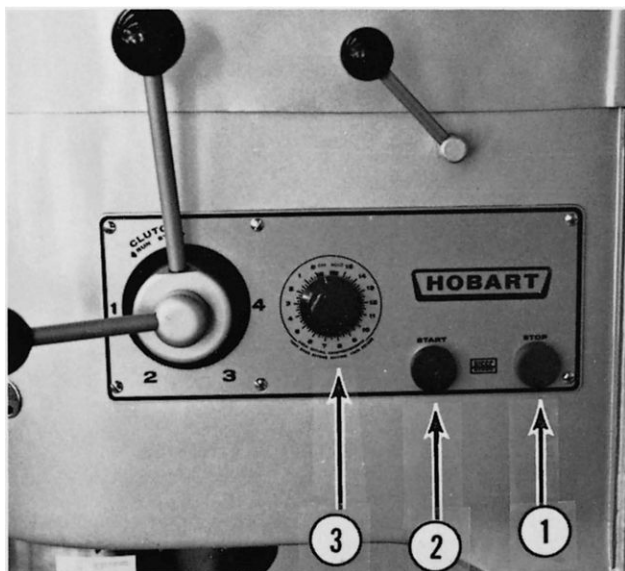


Fig. 15-1

The STOP switch is a normally closed momentary switch. It is mounted on the contactor (right side) and is operated by depressing the stop button. When the mixer is running, depressing the STOP switch removes power to the control circuit.

B. Start Switch (2, Fig. 15-1).

The START switch is a normally open momentary switch. It is mounted on the contactor (left side) and is operated by depressing the start button. When the START switch is depressed, the contactor coil energizes.

C. Timer (3, Fig. 15-1).

### M802/V1401 MIXER NON SOLID STATE TIMER REPLACEMENT

The timer is mounted on the switch plate. It permits either continuous operation (Hold position) or up to 15 minutes of timed operation with automatic shut-off of the machine after the time set has elapsed. Timers with up to 60 minutes of timed operation are also available.

## 2. ELECTRICAL SERVICE CONNECTION

The electrical service is connected at the junction box located on the rear of the pedestal.

## 3. MOTOR CONTACTOR

### MODELS M802/V1401, STARTER SERVICE

Leads L1 and L2 (and L3 if 3 Phase) from the junction box are connected to terminals L1 and L2 (and L3 if 3 Phase) on the contactor.

Leads T1 and T2 (and T3 if 3 Phase) from the motor contactor connect to the motor.

When the contactor is energized by the control circuit, contacts L1-T1, L2-T2 (and L3-T3 if 3 Phase) close and supply line voltage to the motor.

The start switch and stop switch are also mounted on the contactor.

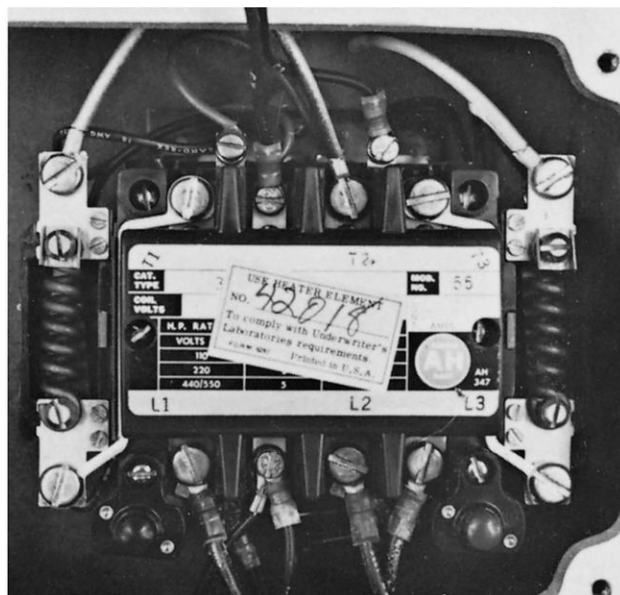


Fig. 15-2

## 4. MOTOR

### M802/V1401 VENDOR MOTOR INTRODUCTION 200/60/3 PHASE

### M802/V1401 REPLACEMENT 3 PHASE VENDOR MOTOR AND ASSOCIATED PARTS

## M802/V1401 REPLACEMENT SINGLE PHASE VENDOR MOTOR AND ASSOCIATED PARTS

The V-1401 mixer used a 5 hp Hobart built motor and the M-802 mixer uses a 2 hp Hobart built motor.

The direction of rotation of the motor is clockwise as viewed from the pulley end of the motor.

### **5. TRANSFORMER**

For voltage above 250V a reduced voltage pilot circuit transformer is supplied and is mounted below the contactor. TSB 613 - 460/230/60/3 Voltage Conversion

### **6. SEQUENCE OF OPERATION**

The schematic diagram, terminal and component locations are found on Fig. 15-3. Use the schematic in conjunction with the sequence of operation and also when troubleshooting the mixer. The wiring diagrams, such as Fig. 15-4 and Fig. 15-5 are found inside the top cover. They are normally used for point to point wire locations.

Anytime that the plug is connected to the electrical service outlet, power is applied to the control cased. With the timer set to Hold or time set on the dial, the timer contacts (1TM) are closed.

A. PRESS THE START SWITCH.

A completed circuit to the motor contactor coil (1CON) lamp and timer motor, now exists through the stop switch, timer and the start switch. The contactor 1CON is energized.

B. 1CON ENERGIZES.

1CON contacts in the motor circuit close, applying line voltage to the motor and the motor starts. The 1CON C2 and C3 contacts also close. This provides an alternate circuit (locking circuit) to keep 1CON energized. The start switch can now be released. The motor will continue to run.

C. PRESS THE STOP SWITCH.

The stop switch contacts open interrupting the voltage to the coil of 1CON and 1CON de-energize.

**NOTE:** When time has expired on the timer, the timer contacts will open. This will also interrupt the voltage to the coil of 1CON.

D. 1CON DE-ENERGIZES.

1CON contacts in the motor circuit open, removing power to the motor. The 1CON auxiliary contacts also open which disables the locking circuit and makes it necessary to press the start switch to resume operation.

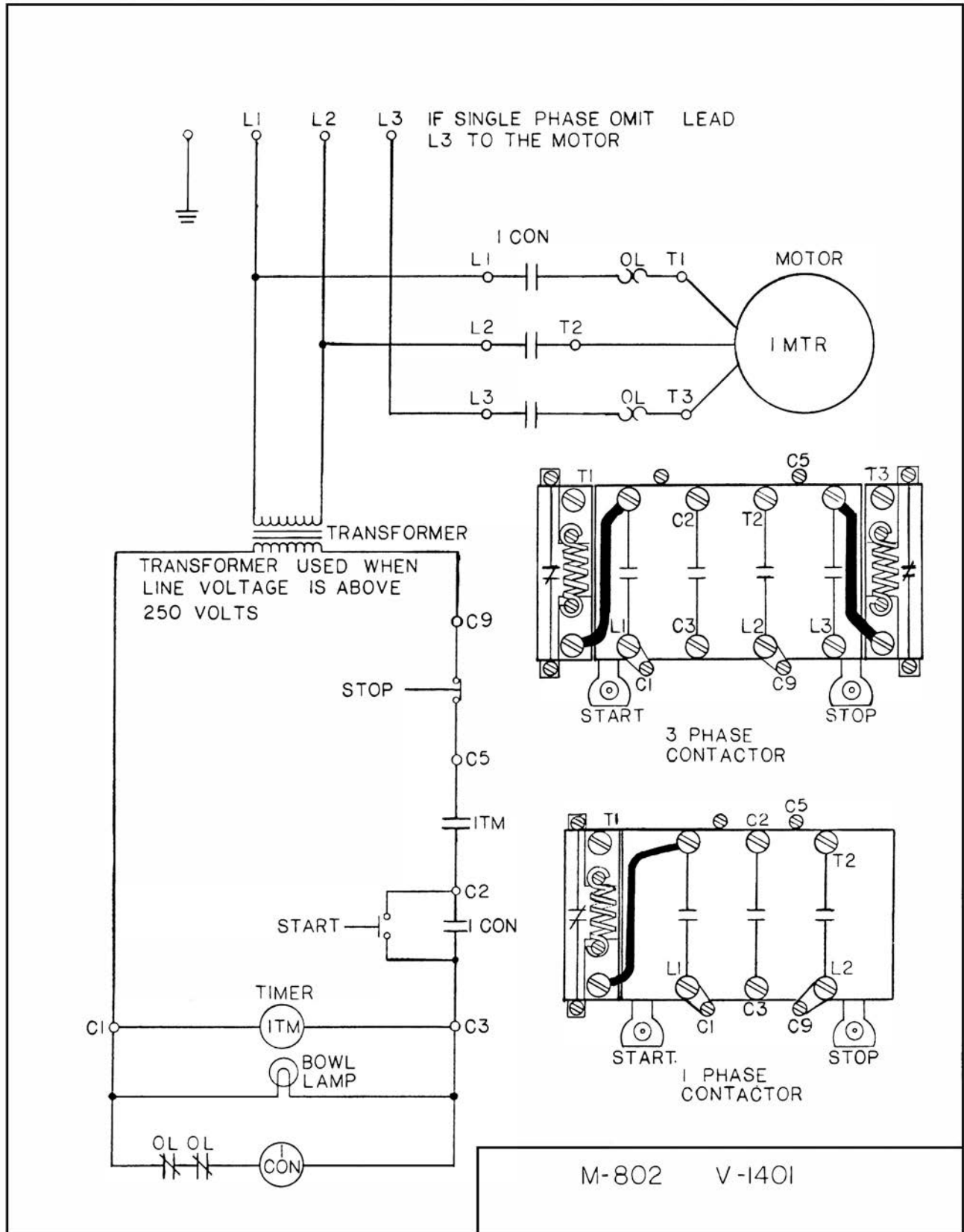


Fig. 15-3

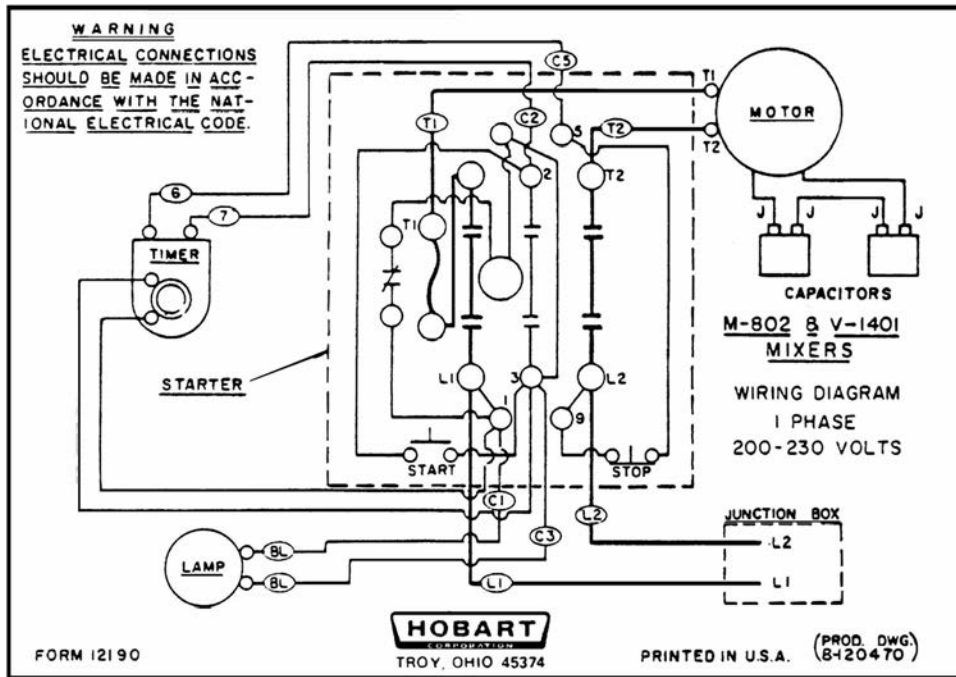


Fig. 15-4

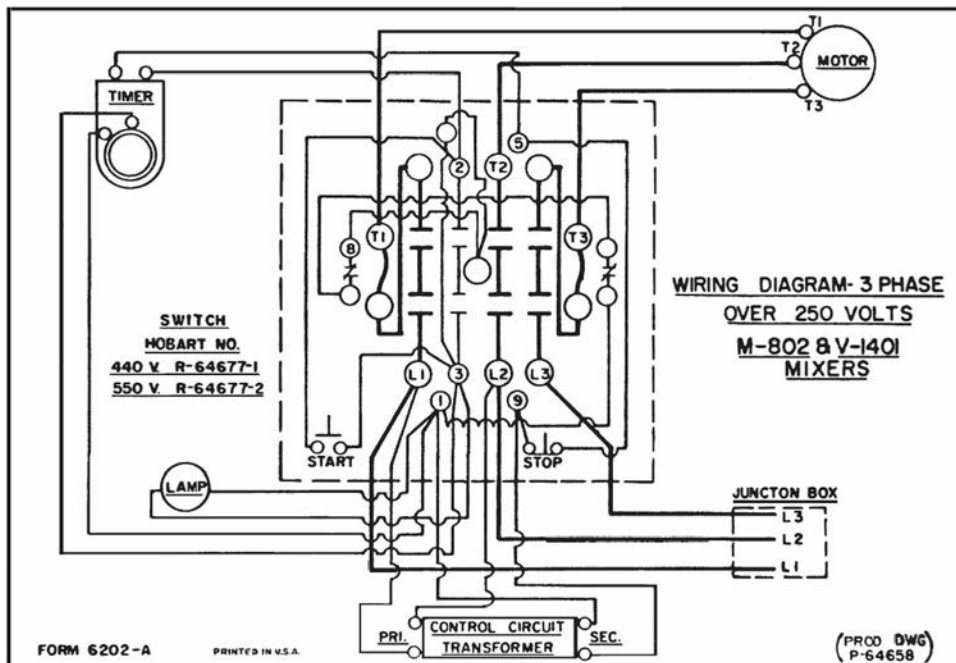


Fig. 15-5

## 7. ELECTRICAL TROUBLESHOOTING

### A. General.

Never substitute electrical components without first analyzing the problem as this could result in damage to other components or only temporarily correcting the problem.

### B. Check for Proper Line Voltage.

Several of the symptoms listed in this section can be caused by incorrect line voltage. Intermittent and/or unusual symptoms are often caused by incorrect voltages. It is good practice to check the line voltage before troubleshooting components.

### C. Symptoms.

- (1) Electrical service circuit breakers kicking out when start switch is pressed.

a. Check for proper sizing of circuit breakers or line fuses and incorrect wiring to the machine.

b. Motor windings shorted. See "Testing Motor Field Windings".

c. Three phase motor single phasing. Check that all 3 legs of 3 Phase power are present at terminals T1, T2 and T3 on 1CON when 1CON is energized.

d. Single phase motor has open start circuit. Check the start windings, start switch and capacitor in the motor.

e. Mechanical motor bind.

(2) Machine won't start.

a. No power to machine from electrical service.

b. Overloaded motor. (Overload relay tripped.) See "Testing Motor Current".

c. Check stop switch, timer and start switch.

d. Motor contactor coil 1CON open.

e. Test transformer (if equipped). (Proper voltage between C1 and C9 on contactor.)

(3) Machine starts when START switch is pressed but stops when switch is released.

a. 1CON C2/C3 contacts not closing.

(4) Motor hums (won't rotate).

a. Motor single phasing (3 Phase). Check that all 3 legs of 3 Phase power are present at terminals T1, T2, T3 on 1CON when 1CON is energized.

b. Motor bearings frozen.

## SECTION 16 TESTING

### 1. TESTING THE TRANSFORMER (SOLID STATE MIXER)

A. The transformer provides the necessary voltage to power the control circuits.

(1) 120V AC to power the motor contactor coil, timer motor and the bowl light.

(2) 20V AC to power the motor protector circuit.

B. Check the input voltage to the transformer primary between terminals L1 and L2 (1, Fig. 16-1) on the fuse board.

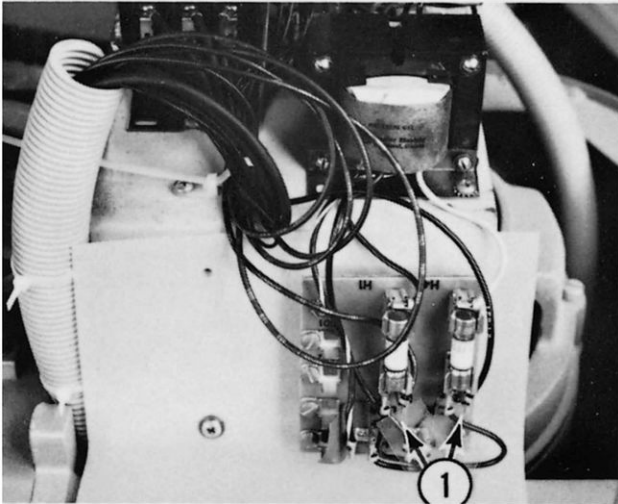


Fig. 16-1

(1) The transformer input voltage should agree with the line voltage which is specified on the machine data plate.

C. Check the transformer output voltage.

(1) Check for 120V AC (105 to 130V AC) between terminals X1 and X2 (1, Fig. 16-2) on the motor protector board.

(2) Check for 20V AC (18 to 22V AC) between terminals LX1 and LX2 (2, Fig. 16-2) on the motor protector board.

D. Testing for incorrect transformer output voltage. (Input voltage reading is correct.)

(1) BOTH OUTPUT VOLTAGE READINGS (120V AC X1 and X2, 20V AC LX1 and LX2) ARE INCORRECT.

a. Check fuses 1FU and 2FU. (Remove the fuses and check for continuity.)

b. Check that HIGH or LOW jumpers on the fuse board are connected properly.

c. If the jumpers are connected properly, replace the transformer.

(2) 120V AC (between X1 and X2) IS NOT CORRECT. 20V AC (between LX1 and LX2) IS CORRECT.

a. Replace the transformer.

(3) 20V AC (between LX1 and LX2) IS NOT CORRECT. 120V AC (between X1 and X2) IS CORRECT.

a. Disconnect the power cord, unplug the power input board (3, Fig. 16-2) and check the fuse (3FU) on the power input board with an ohmmeter.

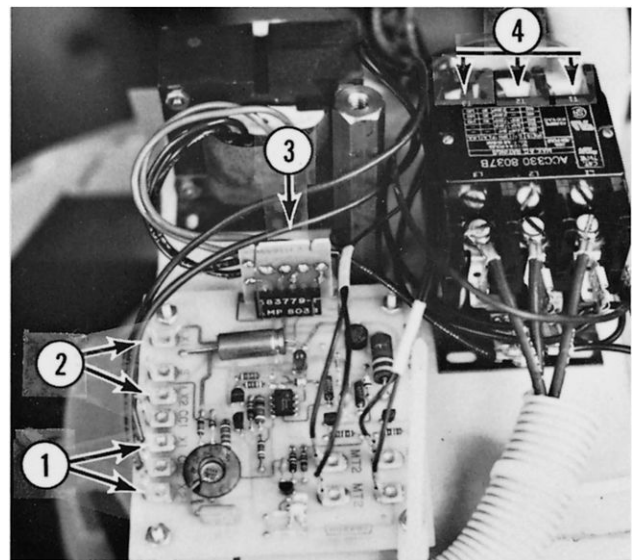


Fig. 16-2

b. If the fuse is open, replace it. Plug the power input board back into the motor protector board and reconnect the power cord. Run the machine. If the fuse should blow again, replace the motor protector board and the fuse.

c. If the fuse on the power input board checked good, and the 20V AC reading is not correct, replace the transformer.

### 2. TESTING THE MOTOR CURRENT

A voltage check should always be made before attempting to test the motor current. To check the



voltage and motor current, use a Triplett Model 630 H volt ohmmeter and a Model 10 AC amp adapter, or similar tester.

**NOTE:** If the motor will not run, refer to Electrical Troubleshooting "Machine Won't Start" and check the switches 1B, 2PB, 1TM and contactor 1CON.

If the LED on the motor protector board is lit, refer to "Testing The Motor Protector Circuit".

A. Start the mixer and test the voltage on the load side of the contactor (4, Fig. 16-2) solid state mixers and (1, Fig. 16-3) non solid state mixers, between terminals:

- |         |                    |
|---------|--------------------|
| 1 Phase | 3 Phase            |
| T1-T2   | T1-T2, T1-T3 T2-T3 |

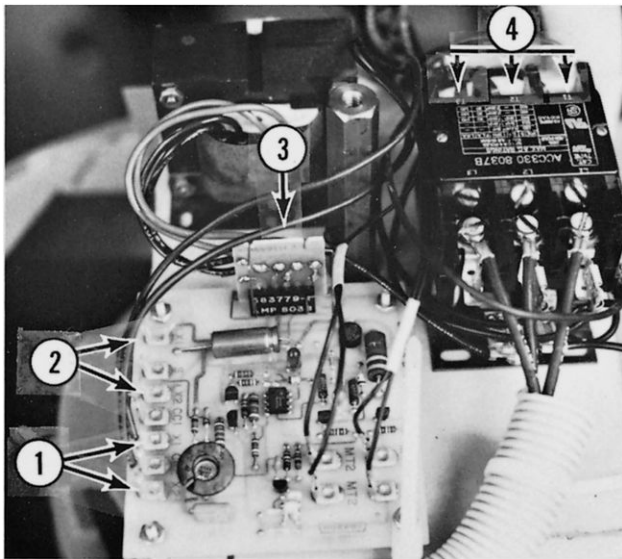


Fig. 16-2

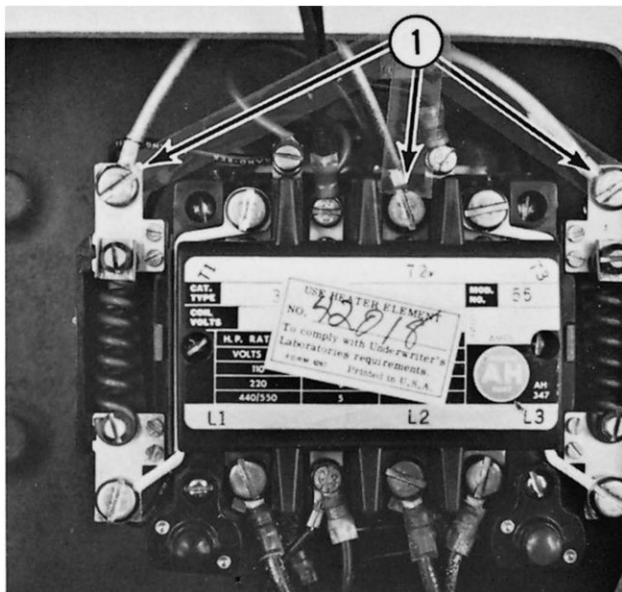


Fig. 16-3

B. The voltage readings should be the same values as specified on the machine data plate. If they are not, the contactor or the line voltage has a malfunction and must be corrected before proceeding.

**NOTE:** The voltage must be correct before proceeding with the current (amp) check.

C. Clamp the amp tester around motor lead T1. (See 4, Fig. 16-2 if solid state or 1, Fig. 16-3 if non solid state.)

D. Set the amp tester to the 60 amp range.

E. Start the machine and take a reading. If the mixer is 3 phase, check the other two motor leads (T2-T3) in the same way. It may be necessary to select a lower setting on the meter to get a more accurate reading.

F. The rated motor current is:

**NOTE:** Because of various methods used to rate motor horsepower, the —802 motor rating has been changed from 2 hp to 3 hp. The motor performance is the same.

60 Hz.					
	1 Phase		3 Phase		
	200V	230V	200V	230V	460V
—802 (2 hp)	16.0	14.5	7.9	7.5	3.7
—802 (3 hp)	21.0	18.0	10.5	8.8	4.5
V-1401 (5 hp)	31.0	27.5	14.4	13.6	6.8

50 Hz.			
	220V	380V	415V
—802 (2 hp)	6.0	3.9	3.6
—802 (3 hp)	10.2	5.9	5.4
V-1401 (5 hp)	13.5	7.8	7.2

Intermittent, short term overload current no greater than 20% of the rated current is acceptable.

Continuous current above the rated current and intermittent overload current greater than 20% of the rated current indicates an overloaded or malfunctioning motor.

It should also be noted that when an amp test is being made on a mixer which is pulling no load, the current will be less than the rated current.

### 3. TESTING MOTOR FIELD WINDINGS

Due to the many different types of motors used in these mixers, it is not practical to list all the various resistance readings. Generally, when checking windings for resistance, you should obtain a reading between 0.2 (2/10) and 5 ohms. When checking between any lead and chassis, any reading above 500,000 ohms is acceptable.

**⚠ WARNING**

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.**

A. Disconnect the motor leads.

**NOTE:** On single phase capacitor start motors it will be necessary to remove the bearing bracket to check the start windings.

B. With an ohmmeter, check the windings for proper resistance. Refer to Fig. 16-4 Single Phase Capacitor Start. Fig. 16-5 Three Phase Capacitor Start. Fig. 16-5 Three Phase (Single Voltage 60 Hz.). Fig. 16-6 Three Phase (Dual Voltage 60 Hz.).

C. If readings are unacceptable, refer to parts catalog for necessary repair parts.

D. Connect the motor leads as described in the Mechanical Service Section 7. INSTALLING THE MOTOR (SOLID STATE CONTROLS) or 8. INSTALLING THE MOTOR (NON SOLID STATE).

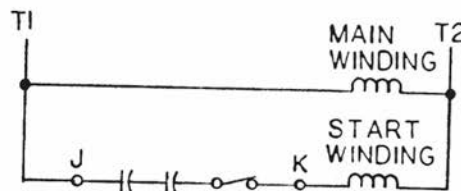
#### SINGLE PHASE CAPACITOR START

M-802		V-1401	
200/60/1	ML-31405-B	200/60/1	ML-31406-B
230/60/1	ML-31405-C	230/60/1	ML-31406-C
200/60/1	ML-40508-B	200/60/1	ML-40507-B
230/60/1	ML-40508-C	230/60/1	ML-40507-C

RESISTANCE OF WINDINGS TEST

With ohmmeter set on RX1, check for resistance between leads:

- T1-T2
- K-T2



GROUNDING STATOR TEST

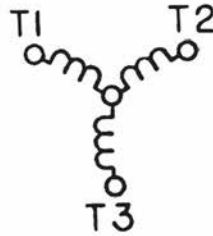
With ohmmeter set on RX 100,000, check for short between:

- T1-Chassis
- T2-Chassis

Fig. 16-4

THREE PHASE (SINGLE VOLTAGE 60 HZ)

M-802	
200/60/3	ML-31405-F
230/60/3	ML-31405-G
460/60/3	ML-31405-H
220/50/3	ML-31405-N
380/50/3	ML-31405-P
575/60/3	ML-31405-AG
415/50/3	ML-31405-AD
200/60/3	ML-40508-F
575/60/3	ML-40508-AG



V-1401	
200/60/3	ML-31406-F
230/60/3	ML-30406-G
460/60/3	ML-31406-H
220/50/3	ML-31406-N
380/50/3	ML-31406-P
575/60/3	ML-31406-AG
415/50/3	ML-31406-AD
200/60/3	ML-40507-F
575/60/3	ML-40507-AG

RESISTANCE OF WINDINGS TEST

With ohmmeter set on RX1, check for resistance between leads:

- T1-T2
- T1-T3
- T2-T3

GROUNDING STATOR TEST

With ohmmeter set on RX 100,000, check for short between:

- T1 - Chassis
- T2 - Chassis
- T3 - Chassis

Fig. 16-5

THREE PHASE (DUAL VOLTAGE 60 HZ)

M-802  
230/460/60/3 ML-40508-DB

V-1401  
230-460/60/3 ML-40507-DB

RESISTANCE OF WINDINGS TEST

With ohmmeter set on RX 1, check for resistance between leads:

- T1-T4
- T2-T5
- T3-T6
- T7-T9
- T7-T8
- T8-T9

GROUNDING OR SHORTED STATOR TEST

With ohmmeter set on RX 100,000, check for short between:

- T1-T2
- T1-T3
- T2-T3
- T1-T7
- T2-T7
- T3-T7
- T1 - Chassis
- T2 - Chassis
- T3 - Chassis
- T7 - Chassis

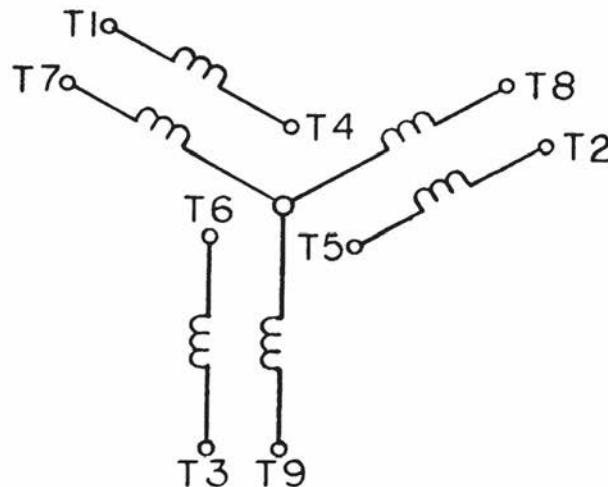


Fig. 16-6

**4. TESTING MOTOR PROTECTOR CIRCUIT (SOLID STATE MIXER)**

A. The normal functions of the motor protector circuit are:

- (1) Allows current to flow to the contactor coil (1CON). (LED not lit.)
- (2) Interrupts the current to the contactor coil (1CON) if the motor becomes too hot. (LED will light.)
- (3) Interrupts the output current to the contactor coil (1CON) if a motor thermistor becomes open or shorted. (LED will light.)

B. Testing the normal functions of the motor protector board.

If any of the following checks fail. replace the motor protector board.

**NOTE:** Current production machines have a ground wire connected between terminal MPB-X2 (in addition to the existing MPB-X2 wire) and one of the four motor protector board mounting bolts (machine ground). Early production machines without the ground wire may give a false indication or the motor protector board may be damaged when the following tests are performed. If the machine which you are servicing is an early production unit, install the ground wire (using # 16 AWG wire, green with yellow stripe, 600 V AC 105°C insulation 4" long with #6 stud ring terminal on one end and 3/16" piggy-back quick terminal connect on the other) before proceeding with "Testing The Motor Protector Circuit".

- (1) Start the machine.

(2) Short across the two MT1 terminals with a jumper wire. The motor should stop and the LED should light.

(3) Restart the machine and short across the two MT2 terminals. The motor should stop and the LED should light.

(4) Restart the machine and open the MT1 circuit by disconnecting a lead to one of the MT1 terminals. The motor should stop and the LED should light. Reconnect the lead.

(5) Restart the machine and open the MT2 circuit by disconnecting a lead to one of the MT2 terminals. The motor should stop and the LED should light. Reconnect the lead.

C. Testing for a motor protector circuit malfunction. (LED lit, motor will not run.) Be sure that the LED is not lit due to the mixer being overloaded.

Tools required are:

Two 10,000 ohm 1/4 watt resistors with spade lugs attached to the leads.

Amp meter.

(1) Before making the following tests make sure the transformer output voltages are correct. Refer to: "Testing Transformer".

(2) Substitute 10,000 ohm resistors for 1QTM and 2QTM thermistors.

a. Disconnect the leads from the two MT1 terminals and the two MT2 terminals on the motor protector board.

b. Connect a 10,000 ohm resistor across the two MT1 terminals and a 10,000 ohm resistor across the two MT2 terminals on the motor protector board.

(3) If the LED did not go out, replace the motor protector board (MPB).

(4) If the LED went out, perform a motor current test to determine if the motor is operating properly. Replace the motor as required if the amperage is not within limits. Do not operate the motor any longer than necessary when performing the current test. Refer to: "Testing Motor Current".

(5) If the motor current is within limits, shut off the mixer and turn off power to the machine.

(6) With an ohmmeter, test the resistance of 1QTM and 2QTM motor temperature sensors (thermistors).

(7) Refer to the chart and determine if the thermistor resistance is correct. Both thermistors should have approximately the same resistance reading. The temperature of the stator windings (where the thermistors are located) will usually be higher than the outside temperature of the stator.

MOTOR TEMPERATURE		THERMISTOR RESISTANCE
77°F	=	100,000 ohms
100°F	=	56,000 ohms
120°F	=	35,000 ohms
140°F	=	22,500 ohms
160°F	=	14,500 ohms
180°F	=	10,000 ohms
200°F	=	6,800 ohms
220°F	=	4,800 ohms
240°F	=	3,400 ohms
260°F	=	2,500 ohms
280°F	=	1,850 ohms
300°F	=	1,360 ohms

(8) If the thermistor(s) resistance is not correct, replace the stator.

(9) Remove the 10,000 ohm resistors from the motor protector board and reconnect the thermistor leads.



SERVICE

MISCELLANEOUS

VOL. 1 NO. 550B

April 20, 2005

# TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

## MACHINE DATE CODE INFORMATION

### Introduction

Since January 1, 2002, all Hobart equipment, *except* microwave ovens, has 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). The 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, was 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.

- The 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.

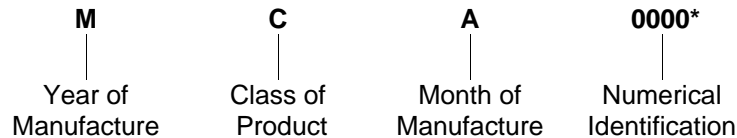
MANUFACTURING DATE CODES AFTER JANUARY 1, 2002					
*First Letter = Month	*Second and Third Letters = Year				
A = JAN	AA = 2001	AN = 2013	BB = 2025	BP = 2037	CC = 2049
E = FEB	AB = 2002	AP = 2014	BC = 2026	BR = 2038	CD = 2050
R = MAR	AC = 2003	AR = 2015	BD = 2027	BS = 2039	CE = 2051
P = APR	AD = 2004	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).

MANUFACTURING DATE CODES BETWEEN JANUARY 1985 AND JANUARY 2001					
*First Letter = Month		*Second Letter = Year			
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.



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

YEAR OF MANUFACTURE		YEAR OF MANUFACTURE		CLASS OF PRODUCT		MONTH OF MANUFACTURE	
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	GG0000	HG0000
Food Warmers			BF0000	EF0000	CF0000	DF0000	GF0000	HF0000
Fry Kettles			BK0000	EK0000	CK0000	DK0000	GK0000	HK0000
Waffle Bakers			BW0000	EW0000	C0000	DW0000	GW0000	HW0000
<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.							





# TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

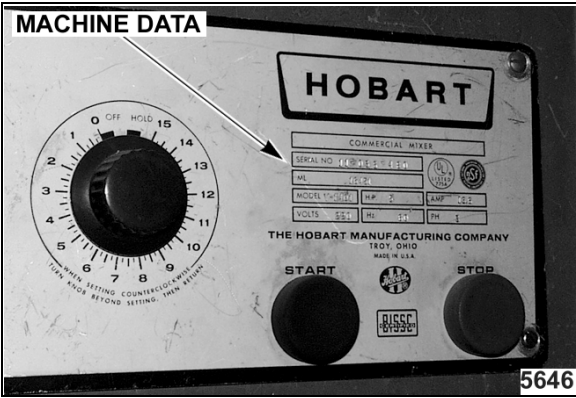
## MODELS M802/V1401, STARTER SERVICE

### Purpose

Arrow Hart is no longer one of our starter vendors. We have found suitable replacements from other manufacturers.

These changes require service kits to adapt new components to older existing machines.

Installation of a kit requires replacement of the original switch plate assembly. Units built prior to 1972 had the machine data stamped onto the switch plate. **In order to keep this information with the machine, the original switch plate must be retained, resized and attached to the machine as outlined in this bulletin.**



### Parts Information

If you encounter an M802 or V1401 that does NOT have solid state controls, which requires replacement of the starter, order and install the appropriate service kit AND the appropriate thermal overload heater elements as listed below.

#### SERVICE KIT

<b>Mixer Voltage</b>	200/60/1 208/60/1 230/60/1	200/60/3 208/60/3 460/60/3	220/50/3 380/50/3 415/50/3	575/60/3
<b>Part Number</b>	292148-5	292148-6	292148-7	292148-8

#### THERMAL OVERLOAD HEATER

Part No.	Voltage	Qty.	Model
112235-32	460/60/3	3	M802 STD
112235-35	380/50/3	3	M802 STD
112235-35	415/50/3	3	M802 STD
112235-46	200/60/1	1	M802 STD
112235-45	230/60/1	1	M802 STD
112235-41	200/60/3	3	M802 STD
112235-39	230/60/3	3	M802 STD
112235-40	220/50/3	3	M802 STD
112235-30	460/60/3	3	M802 CAN
112235-28	575/60/3	3	M802 CAN
112235-43	230/60/1	1	M802 CAN
112235-38	230/60/3	3	M802 CAN
112235-44	208/60/1	1	M802 CAN
112235-38	208/60/3	3	M802 CAN

Part No.	Voltage	Qty.	Model
112235-37	460/60/3	3	V1401 STD
112235-38	380/50/3	3	V1401 STD
112235-38	415/50/3	3	V1401 STD
112235-50	200/60/1	1	V1401 STD
112235-49	230/60/1	1	V1401 STD
112235-43	220/60/3	3	V1401 STD
112235-43	230/60/3	3	V1401 STD
112235-43	220/50/3	3	V1401 STD
112235-37	460/60/3	3	V1401 CAN
112235-34	575/60/3	3	V1401 CAN
112235-49	230/60/1	1	V1401 CAN
112235-43	230/60/3	3	V1401 CAN
112235-49	208/60/1	1	V1401 CAN
112235-43	208/60/3	3	V1401 CAN

The service kit consists of the following:

----- Not a service part.

Part Number	Description	Quantity	
		3 Phase	1 Phase
294657-1	Wiring Harness	1	1
65890-23	Connector	1	1
65890-85	Line Splice	1	1
-----	Wiring Diagram F-15377 3 Ph.	1	
-----	Wiring Diagram F-15378 1 Ph.		1
-----	Control Panel Assembly	1	1
-----	Switch Plate Assembly	1	1

The Kit Control Panel Assembly consists of the following parts for the specified voltage.

	200/60/1 208/60/1 230/60/1	200/60/3 208/60/3 230/60/3 460/60/3	220/50/3 380/50/3 415/50/3	575/60/3
Contactors	87713-37-2	121916-2	121926-2	121926-2
Overload Relay	88196-6-1	88196-5-1	88196-5-1	88196-5-1
Transformer	120907-1	120907-1	120908-1	121950

The following parts common to all voltages.

Part Number	Description	Qty.
FE 16-30	Fuse	2
114707	Fuse Board	1
124674	Cable Tie	2
124676	Control Panel	1
124655	Support	1
290376	Controls Cover	1
SC 008-10	Machine Screw	4
SC 019-33	Machine Screw	2

Part Number	Description	Qty.
SC 036-14	Machine Screw	1
SD 015-20	Self Tapping Screw	10
NS 009-12	Nut	2
NS 009-22	Nut	4
WL 007-07	Washer	2
WL 003-38	Washer	1
WL 010-06	Washer	4

The Kit Switch Plate Assembly consists of the following parts.

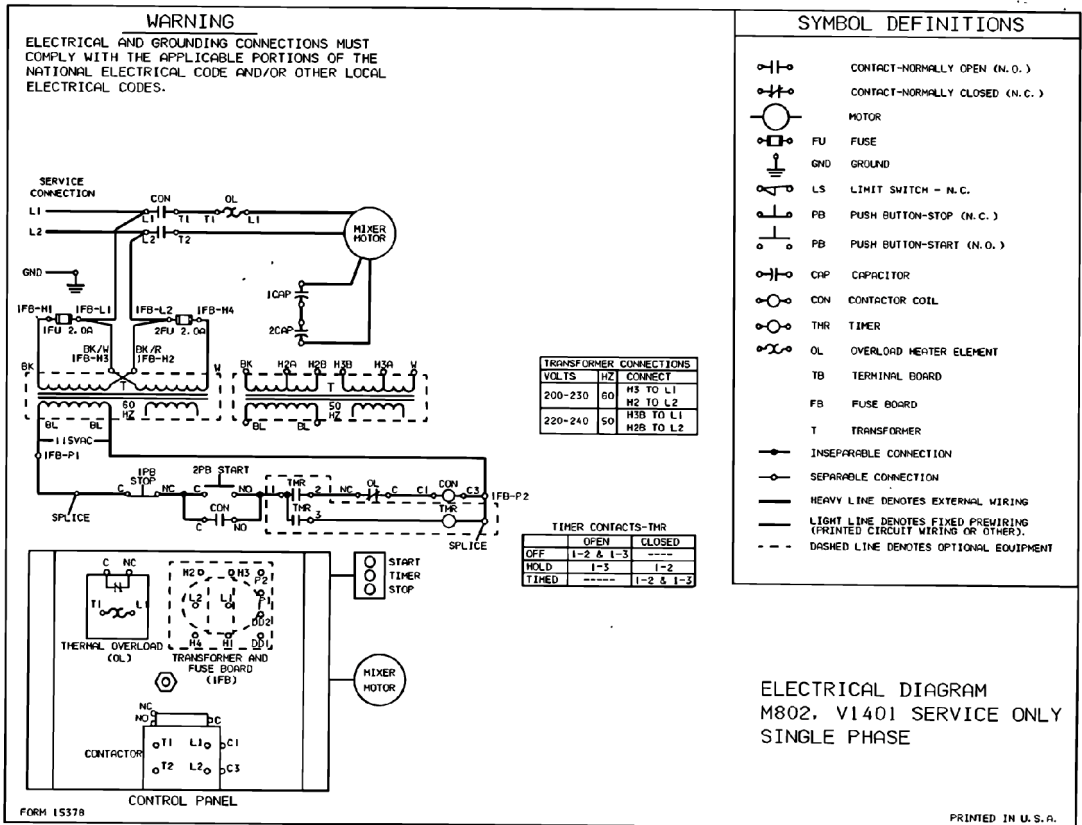
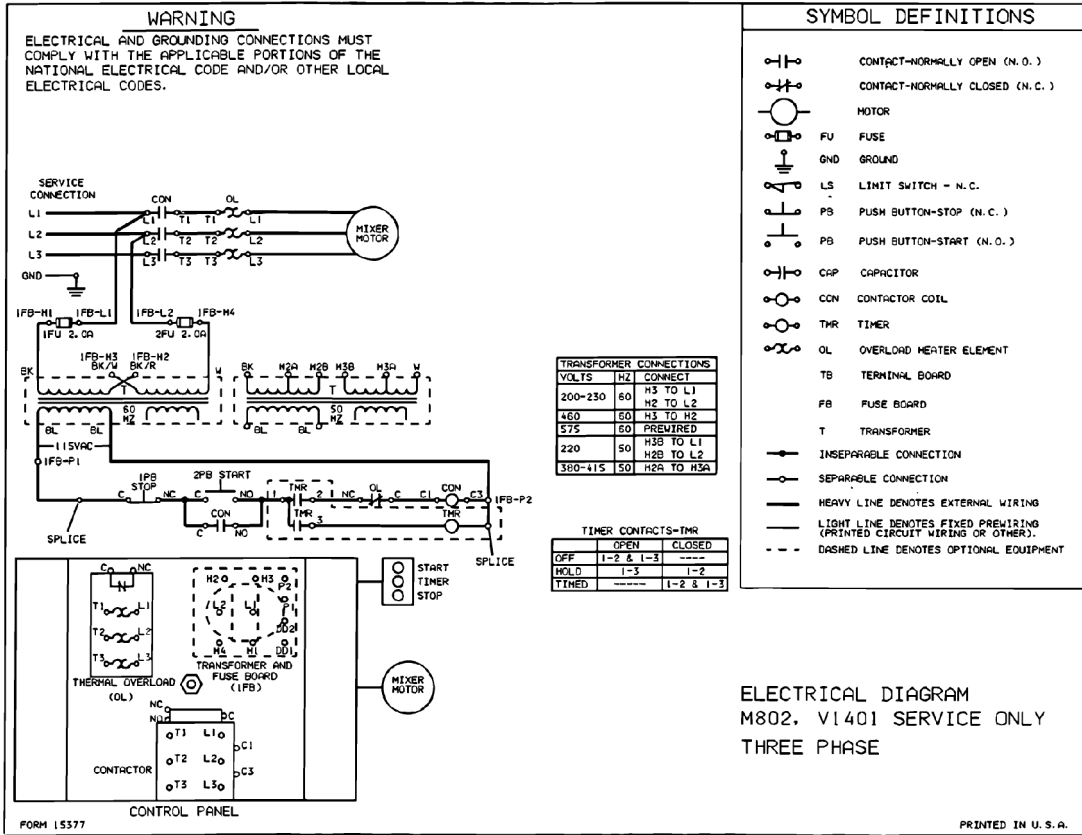
Part Number	Description	Qty.
292348	Switch Plate	1
87711-183-1	Start Switch	1
87711-183-2	Stop switch	1
294650-4-3	Timer 50 HZ or	1
294650-4-1	Timer 60 HZ	1

Part Number	Description	Qty.
291748	Timer Knob	1
291746	Insulator	1
102467-1	Black Switch Cap	1
102467-2	Red Switch Cap	1
SC 13-07	Screw	2

If the original switch plate includes the machine data, four drive screws part no. 121676-4 must be ordered to reinstall the resized plate.



# Wiring Diagrams





## TECHNICAL SERVICE BULLETIN

NATIONAL SERVICE DEPARTMENT

TROY, OHIO 45374

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M-802/V-1401 MIXERS NON SOLID STATE TIMER REPLACEMENT

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The old style, spring driven timers, listed below are being discontinued. The new timer is a 15 minute motor driven timer. If it becomes necessary to replace one of these older timers, order and install Service Kit P/N 292165-1.

103470 (15 Minute) - Discontinued  
103471 (30 Minute) - Discontinued  
103472 (60 Minute) - Discontinued  
122788 (18 Minute) - Discontinued

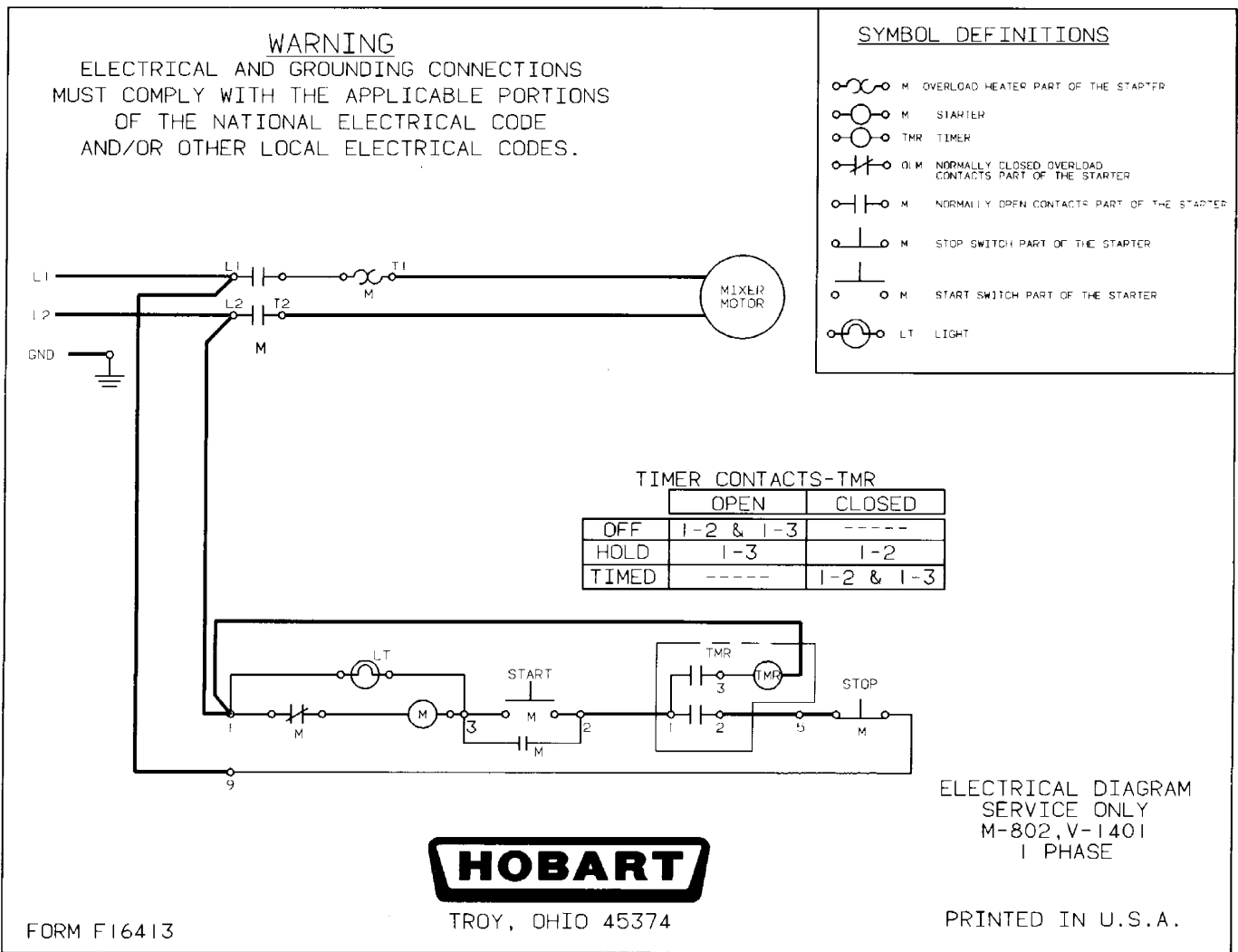
The Service Kit Part # 292165-1 contains the following parts:

<u>Part No.</u>	<u>Description</u>	<u>Qty.</u>
294650-4-6	Timer (15 Minute)	1
291746	Insulator	1
87532-155	Lead Wire (TMR-2 M5)	1
87532-156	Lead Wire (TMR-1 M2)	1
291748	Knob	1
291829	Dial Plate	1
SC-13-7	Machine Screw #5-40x1/4"	2
F-16413	Wiring Diagram 1 Phase	1
F-16414	Wiring Diagram 3 Phase	1

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING WORKED ON.

1. Remove the Switch Plate.
2. Disconnect the following leads:
  - A. Disconnect timer lead C1 from the contactor. Reinstall the remaining leads and secure with the screw.
  - B. Disconnect timer lead C3 from the contactor. Reinstall the remaining leads and secure with the screw.
  - C. Disconnect timer lead C2 from terminal C2 on the contactor and install the lead marked M2, from the Service Kit, to terminal C2 on the contactor.
  - D. Disconnect timer lead C5 from terminal C5 on the contactor, and install the lead marked M5 and the timer motor lead with the ring terminal to terminal C5 on the contactor.
3. Remove the timer knob.
4. Remove the old Timer from the Switch Plate.
5. Install the new Timer, Insulator, Dial Plate and Knob into the Switch Plate as described:
  - A. Timer terminals should face the rear of the mixer.
  - B. Insulator must be shaped to cover the timer terminals and installed between the Timer and Switch Plate.










- C. Install the 15 minute Dial Plate over the markings on the Switch Plate.
  - D. Secure with the two screws.
  - E. Install the Timer Knob.
6. Connect the following leads.
    - A. Connect lead TMR-1 to terminal 1 on the timer.
    - B. Connect lead TMR-2 to terminal 2 on the timer.
    - C. Connect one brown timer motor lead to terminal 3 on the timer.
    - D. Connect the other brown timer motor lead to terminal 1 on the contactor.
  7. Reinstall the Switch Plate.
  8. Remove backing and install the appropriate wiring diagram in the top cover.
  9. Connect electrical power and test for proper machine operation.

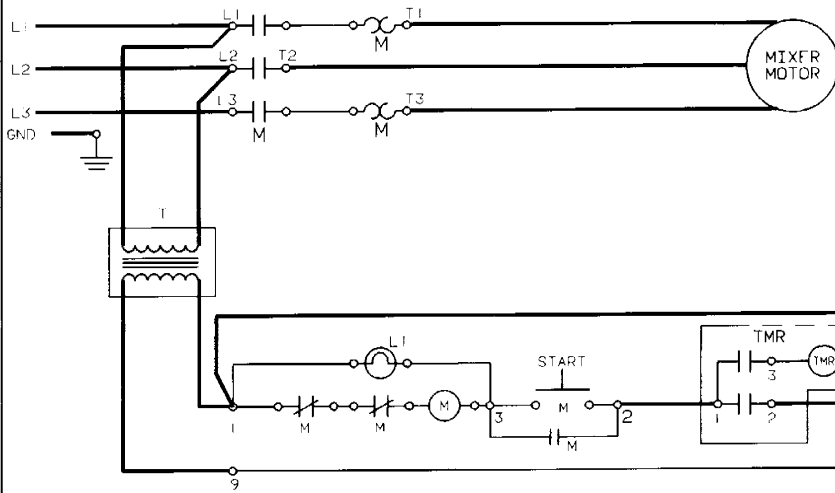


**WARNING**

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

**SYMBOL DEFINITIONS**

-  M OVERLOAD HEATER PART OF THE STARTER
-  M STARTER
-  TMR TIMER
-  M NORMALLY CLOSED OVERLOAD CONTACTS PART OF THE STARTER
-  M NORMALLY OPEN CONTACTS PART OF THE STARTER
-  M STOP SWITCH PART OF THE STARTER
-  M START SWITCH PART OF THE STARTER
-  LT LIGHT
-  I TRANSFORMER - USED ONLY ON MACHINES ABOVE 250V



**TIMER CONTACTS-TMR**

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



ELECTRICAL DIAGRAM  
SERVICE ONLY  
M-802, V-1401  
3 PHASE

FORM F16414

TROY, OHIO 45374

PRINTED IN U.S.A.







Mixer  
**VOL. 1**    **NO. 706B**  
**DATE** January 4, 1988  
(Supersedes TSB-706A  
dated October 12, 1987)

# TECHNICAL SERVICE BULLETIN

**NATIONAL SERVICE DEPARTMENT**

**TROY, OHIO 45374**

M802 BOWL INTERLOCK KIT (PART NO. 270635)

**Purpose**                      A service kit is available to provide for stopping the mixer if the bowl is lowered while the mixer is mixing.

**Parts List**                      The service kit consists of the following parts.

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
87711-221	Switch (1LS)	1
133289	Switch (2LS)	1
270633	Clutch Arm Stop Plate	1
270631	Screw Adjustment Plate	1
87532-170	Lead Wire (1LS-C, 1RMB-2)	1
87532-171	Lead Wire (1LS-NO, TMR-1)	1
87532-172	Lead Wire (1LS-C, C5)	1
87532-173	Lead Wire (1LS-NO, TMR-6)	1
294853-13	Cable, 2 Conductor	1
270632	Snap Bushing	1
FE-15-10	Strain Relief	1
83376	Wire Tie	10
SC-9-64	Screw 6-32 x 1	2
NS-9-7	Nut 6-32	2
WL-14-3	Washer	2
WL-14-7	Washer, Toothed	2
SC-60-76	Screw 10-24 x 1-1/2	2
270853	Washer, Flat	2
SC-60-69	Screw, 8-32 x 1	2
SC-9-61	Screw, 8-32 x 1/2	2
WL-10-1	Washer	2
F-16620	Template	1
F-16617	Electrical Diagram	1
F-16623	Electrical Diagram	1
F-16624	Electrical Diagram	1
F-16625	Electrical Diagram	1
F-16626	Electrical Diagram	1
F-16637	Electrical Diagram	1
F-16638	Electrical Diagram	1
F-16639	Electrical Diagram	1

Mixer Styles  
Covered

For explanation purposes, the mixers will be referred to as Style No. 1, Style No. 2 and Style No. 3 in the installation instructions. They can be identified as follows.

Style No. 1 - Has round push button start and stop switches. Clutch lever is up for "Stop" and down for "Run".

Style No. 2 - Has square rocker start and stop switches. Clutch lever is up for "Stop" and down for "Run".

Style No. 3 - Has square rocker start and stop switches. Clutch lever is down for "Stop" and up for "Run".

NOTE: Styles 2 and 3 may or may not have a hold position on the timer. Refer to proper electrical diagram for your mixer. If you have a mixer with specifications that are not covered by these instructions, call the National Service Department (Field Engineering) (513) 332-2474 or 2091, Troy, Ohio for assistance.

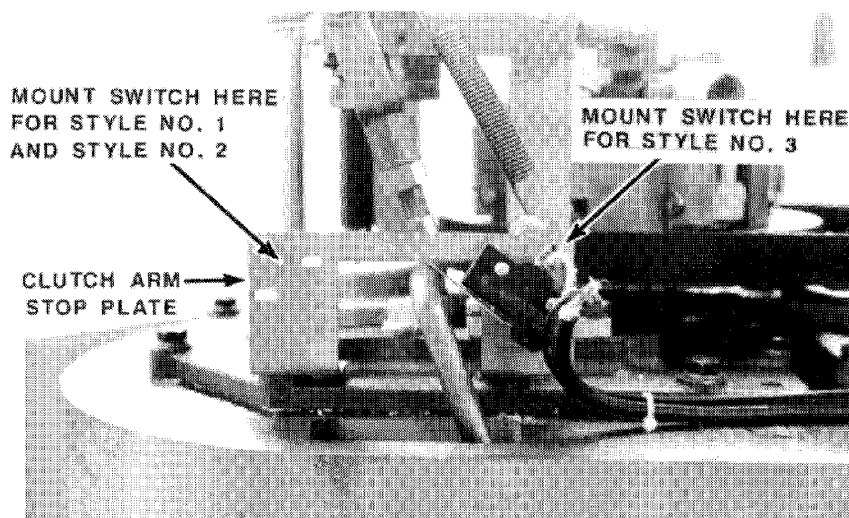
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Installation  
Instructions

1. Raise bowl support to its highest position. Check bowl to beater clearance and adjust if necessary.

WARNING: 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.

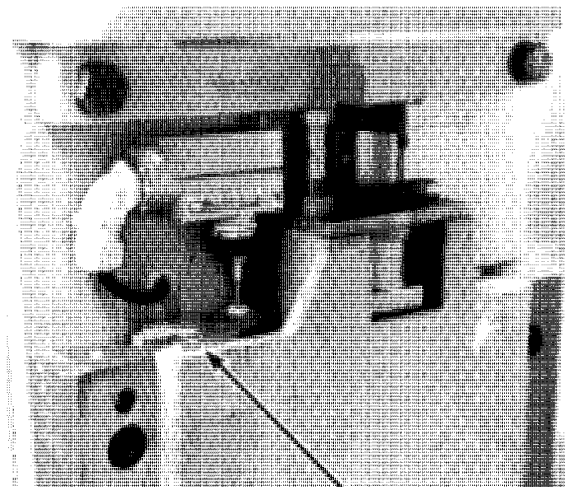
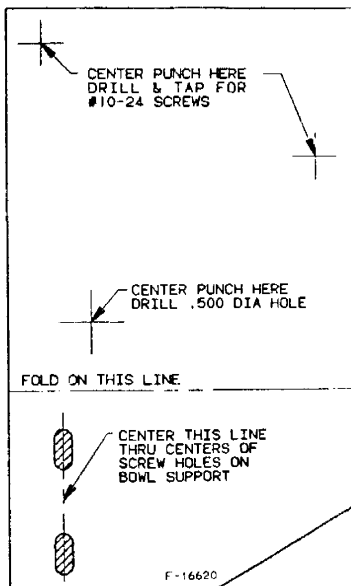
2. Remove top cover assembly.
3. Remove clutch arm stop plate and install new plate from service kit.
4. Install switch (1LS) to clutch arm stop plate with screws (SC-9-64), nuts (NS-9-7) and washers (WL-14-3) provided in kit.



Continued on  
next page

Installation  
Instructions  
(Continued)

5. With clutch arm in the "Stop" position, adjust the switch (position switch in mounting holes) so that the actuating arm is fully depressed. Tighten mounting screws.
6. Remove switch plate from mixer. Locate and remove the following lead wire.
  - A. Style No. 1 - Contactor (C5) to timer (1TM).
  - B. Style No. 2 and 3 - Reed mounting board (1RMB-2) to timer (TMR-1) if timer has hold position. Reed mounting board (1RMB-2) to timer (TMR-6) if timer does not have hold position.
7. Install the following lead wires from kit.
  - A. Style No. 1.
    - (1) Contactor (C5) to switch ILS common (1LS-C).
    - (2) Switch ILS normally open (1LS-NO) to timer (TMR-1).
  - B. Style No. 2 and 3.
    - (1) Reed mounting board (1RMB-2) to switch ILS common (1LS-C).
    - (2) Switch ILS normally open (1LS-NO) to timer (TMR-1) for timers with hold position or switch ILS normally open (1LS-NO) to timer (TMR-6) for timers without hold position.
8. Remove apron from mixer pedestal.
9. If mixer has wiper assemblies for the slideways, remove the left one (facing front of mixer).
10. Fold template and tape into position as shown below.



POSITION TEMPLATE HERE WITH BOWL SUPPORT AT HIGHEST POSITION

11. Drill and tap the two mounting holes using a No. 25 drill and 10-24 tap. Drill hole for bushing with a 1/2" drill.
12. Insert bushing from service kit into 1/2" hole. This is a tight fit, use rubber or plastic hammer if necessary.

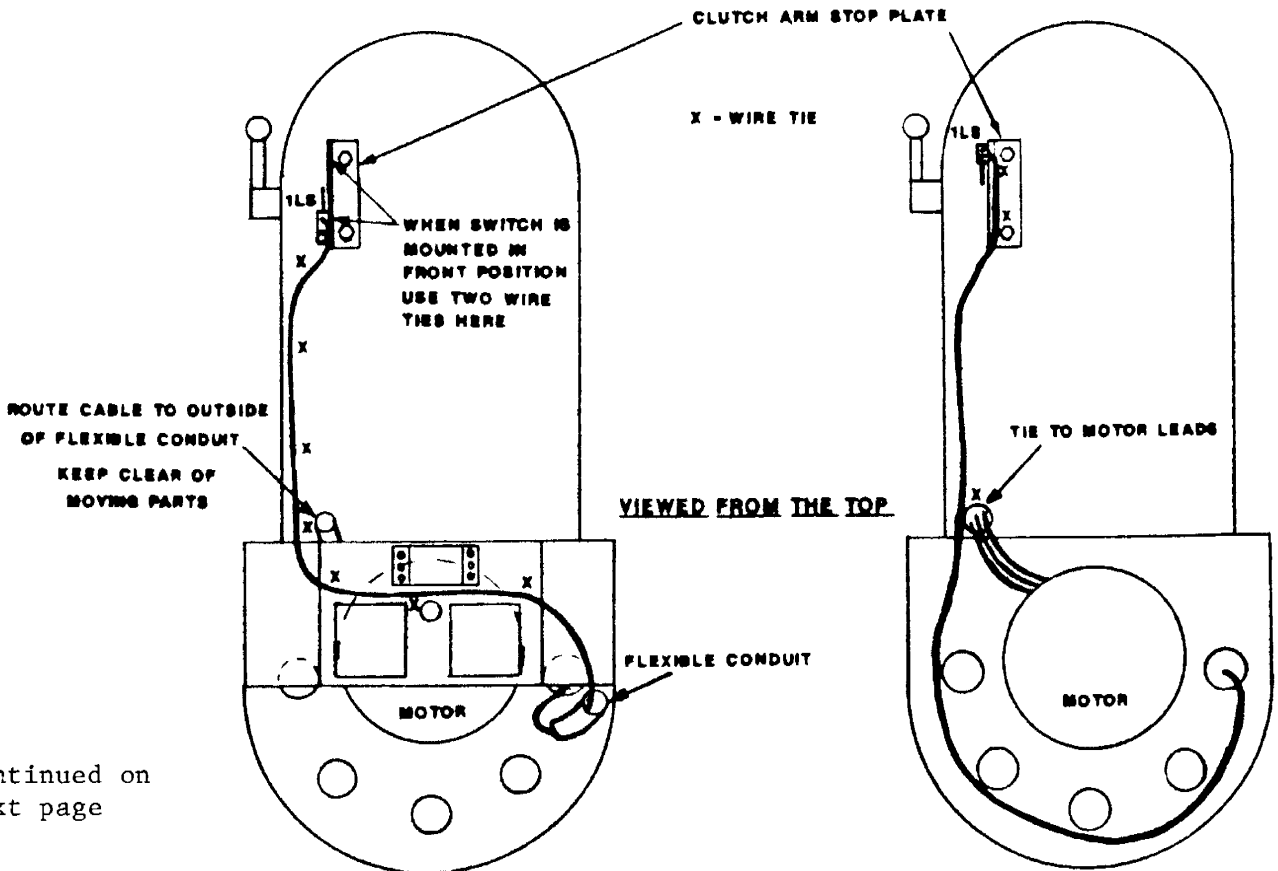
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Installation  
Instructions  
(Continued)

13. Assemble switch (2LS), strain relief and 2 conductor cable from service kit.
  - A. Insert 2 conductor cable through strain relief.
  - B. Connect leads to switch as indicated by branding. Tighten securely.
  - C. Attach and tighten strain relief to switch.
14. Mount switch (2LS) to mixer pedestal with screws (SC-60-76), spacers (270853) and lockwashers (WL-14-7) provided in the service kit.
 

NOTE: Lockwashers must be installed between the screw heads and the body of the switch to assure that switch body will be grounded.
15. Insert cable through bushing. Route cable up through mixer baffle plate (use a coat hanger to fish up through baffle hole).
  - A. Style No. 1 - Continue to route cable around motor as shown below, making sure cable is clear of moving parts.
  - B. Style No. 2 and 3 - Route cable through flexible conduit and across mixer control panel between components as shown below.

From this point route to switch (1LS) and connect as indicated by branding.



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next page

**SOLID STATE CONTROLS**  
(STYLE NO. 2 & 3)

**NON-SOLID STATE CONTROLS**  
(STYLE NO. 1)

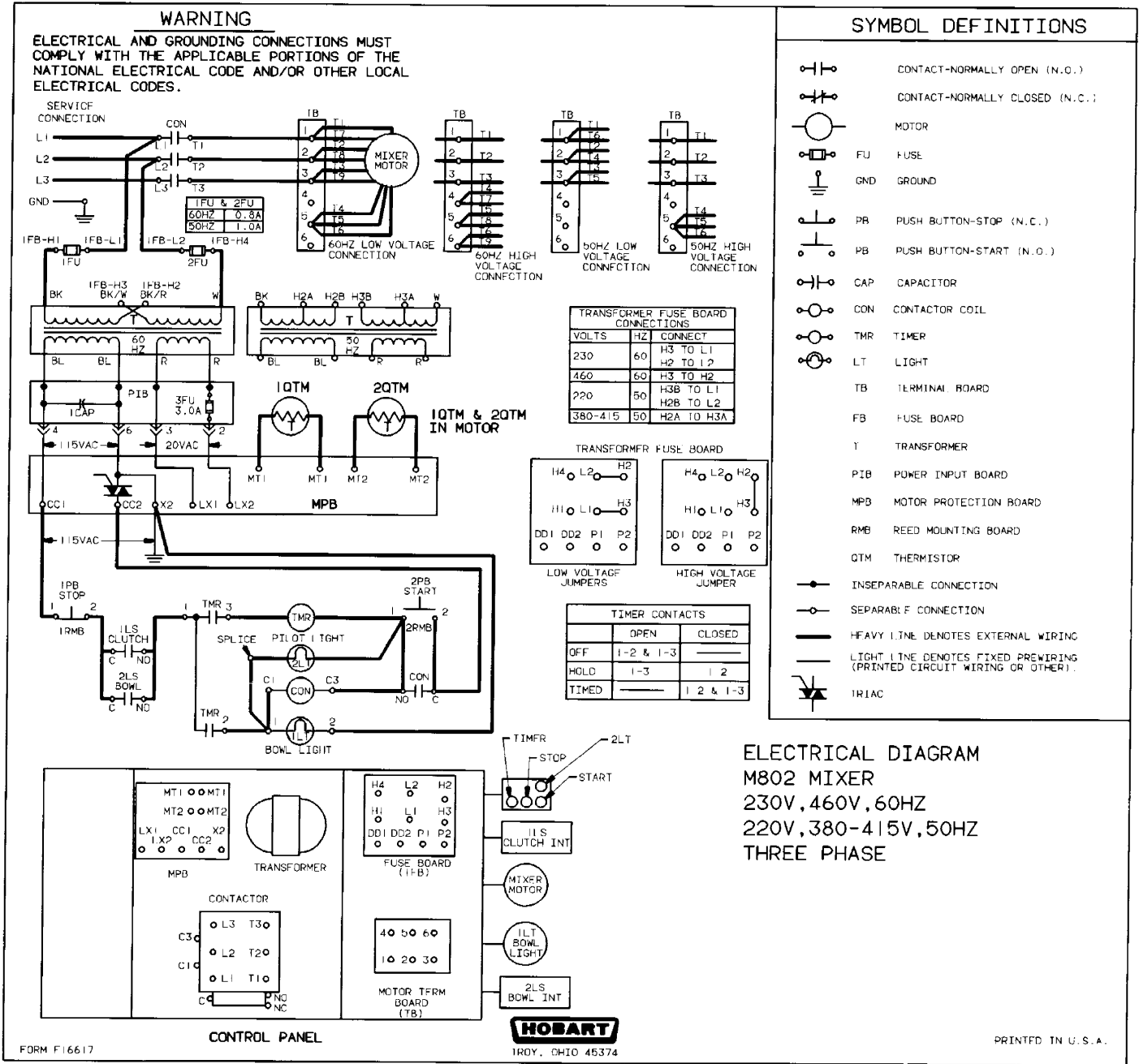
Installation  
Instructions  
(Continued)

16. Using wire ties provided in service kit, secure all wiring.
  17. Install screw adjustment plate from service kit using mounting holes for wiper assembly. Install wiper assembly on top of adjustment plate if equipped. Use screws (SC-60-69 or or SC-9-61) and washers (WL-10-1) from service kit.
  18. With the bowl support in the fully raised position, adjust screw for switch 2LS until switch just operates and then turn screw 1/2 turn farther. Tighten locknut.  
CAUTION: Too high adjustment of screw will damage switch.
  19. Apply power to mixer.
  20. Test mixer.
    - A. With bowl support in raised position start mixer and move clutch lever to "Run" position. Mixer should operate normally.
    - B. Lower bowl support with mixer running. Mixer should stop.
    - C. Move clutch lever to "Stop" position and press start button. Motor will run and bowl lift will operate.
  21. Install appropriate wiring diagram from service kit inside top cover and replace all covers.
- 

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next page

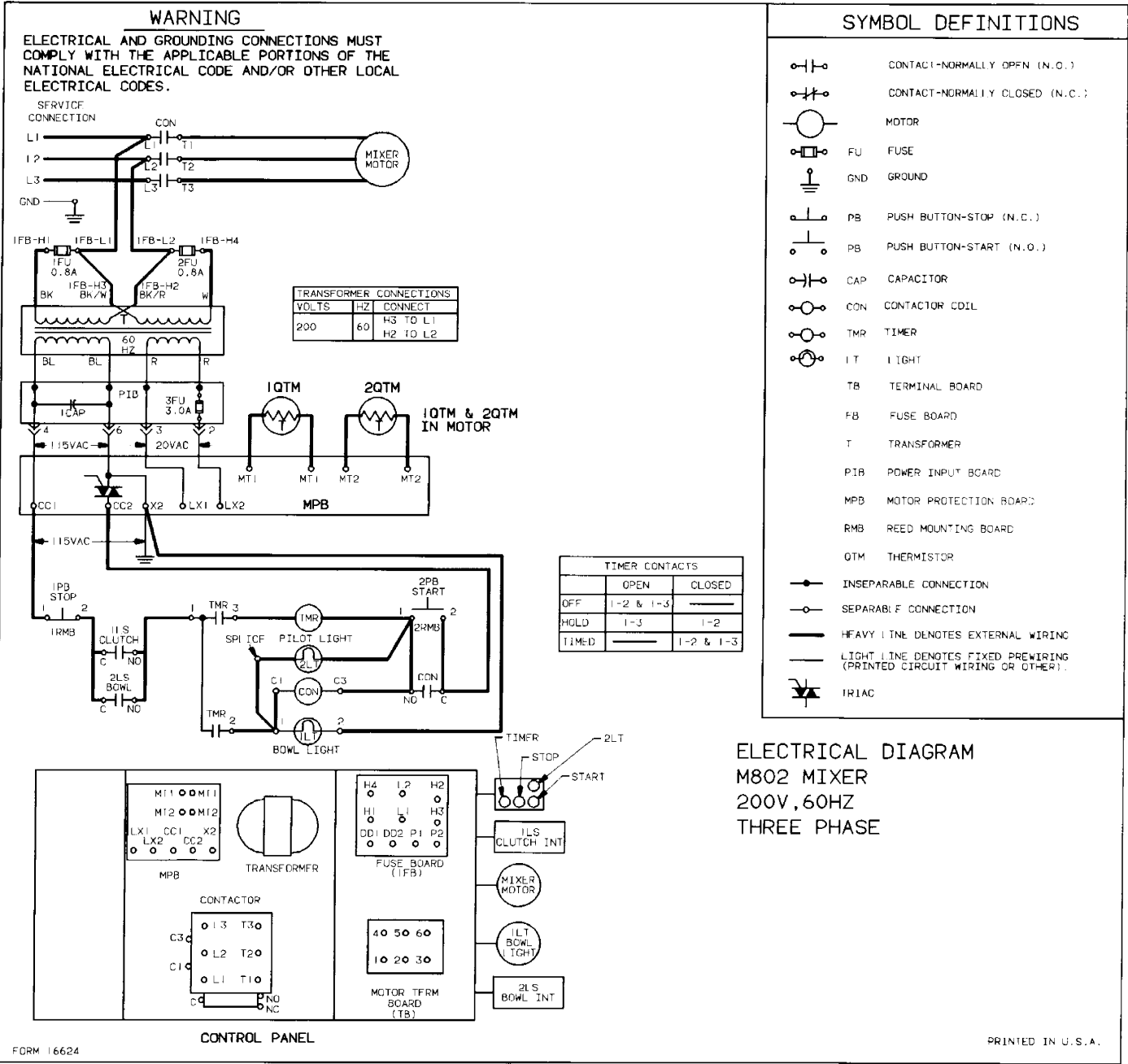
Electrical  
Diagrams

230/460/60/3  
220/380-415/50/3  
(Solid State  
Controls - Timer  
With Hold Position)



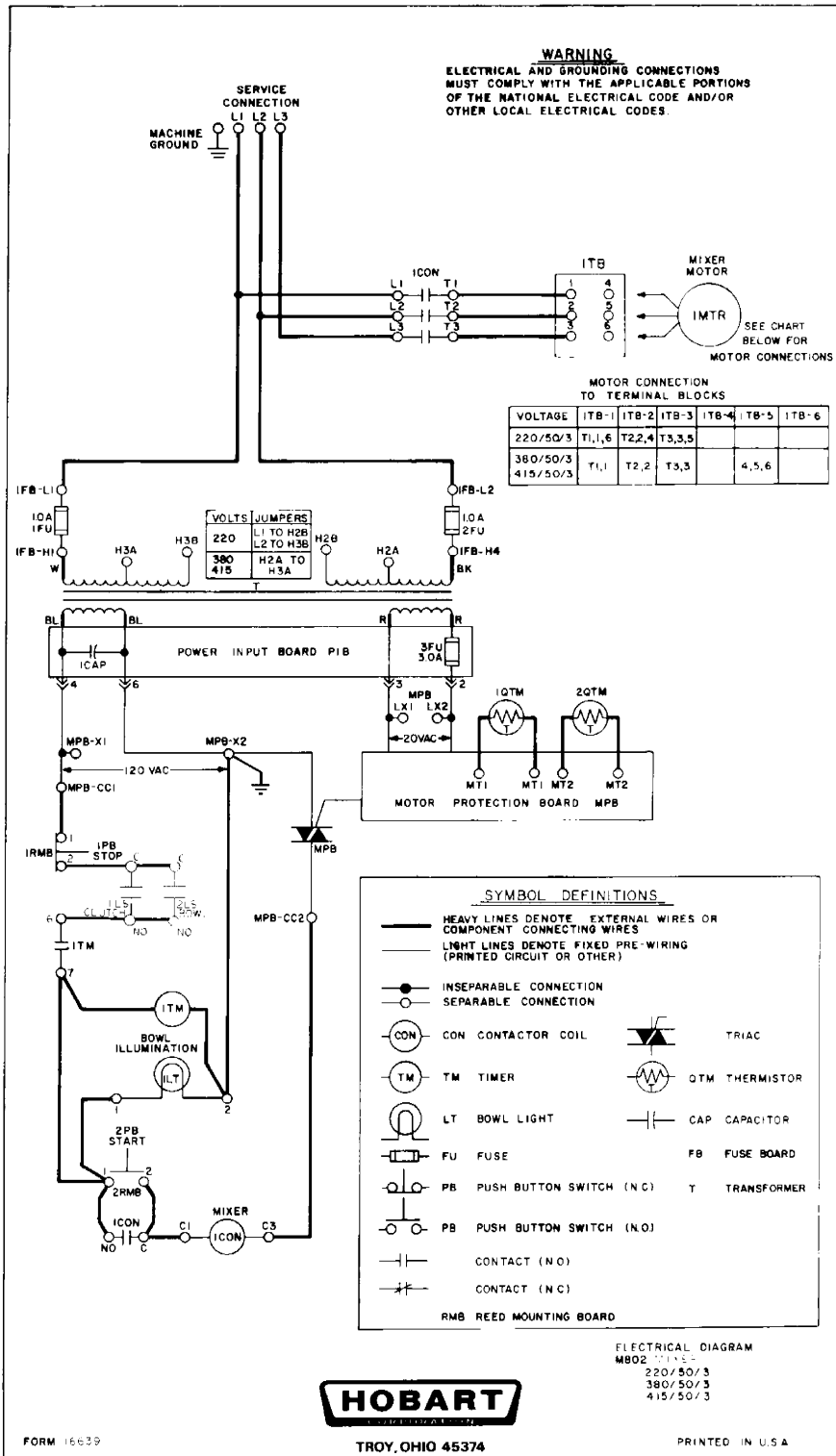
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200/60/3  
 (Solid State  
 Controls - Timer  
 With Hold Position)



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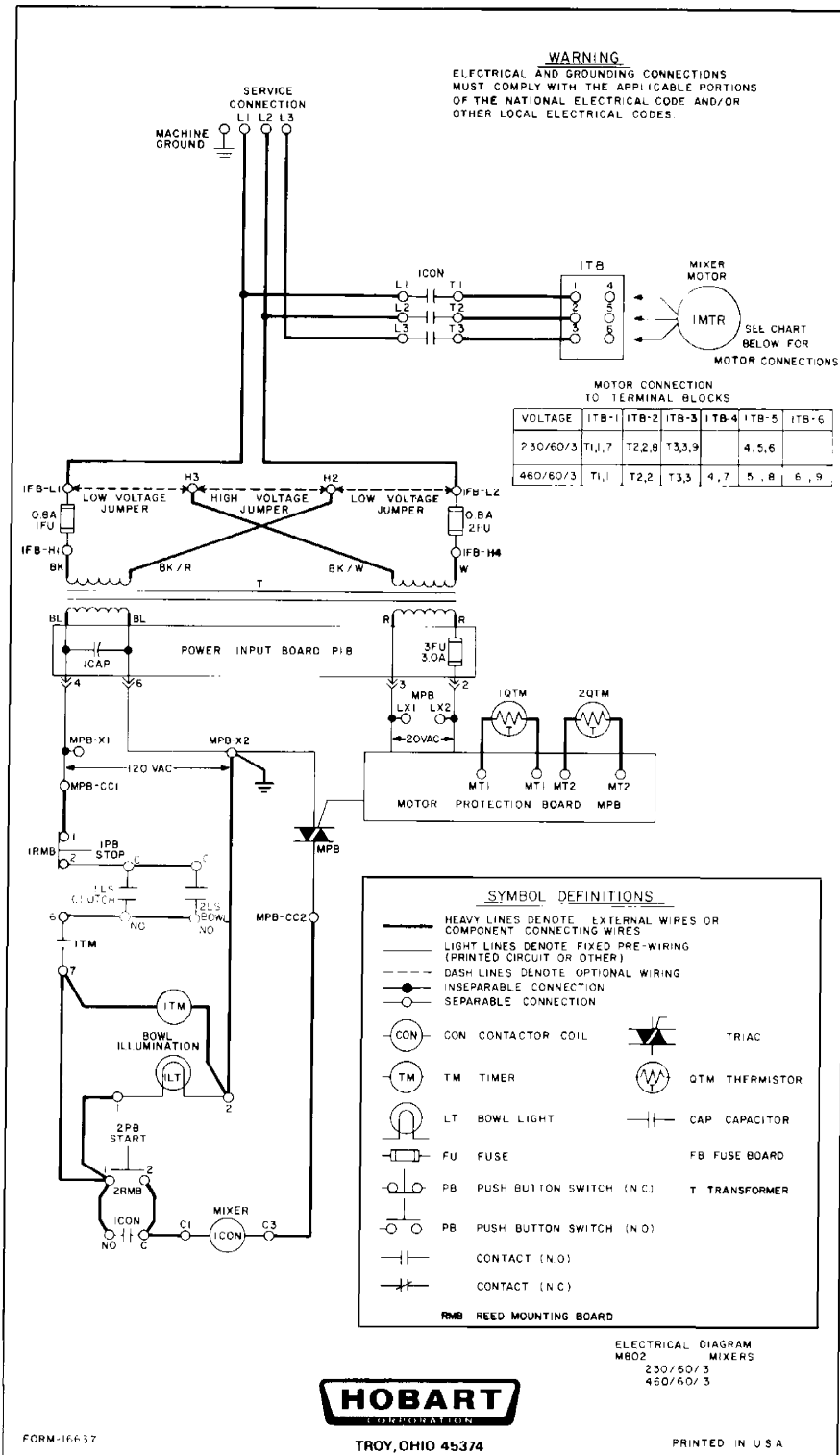
220/380-415/50/3  
 (Solid State  
 Controls-Timer  
 Without Hold Position)



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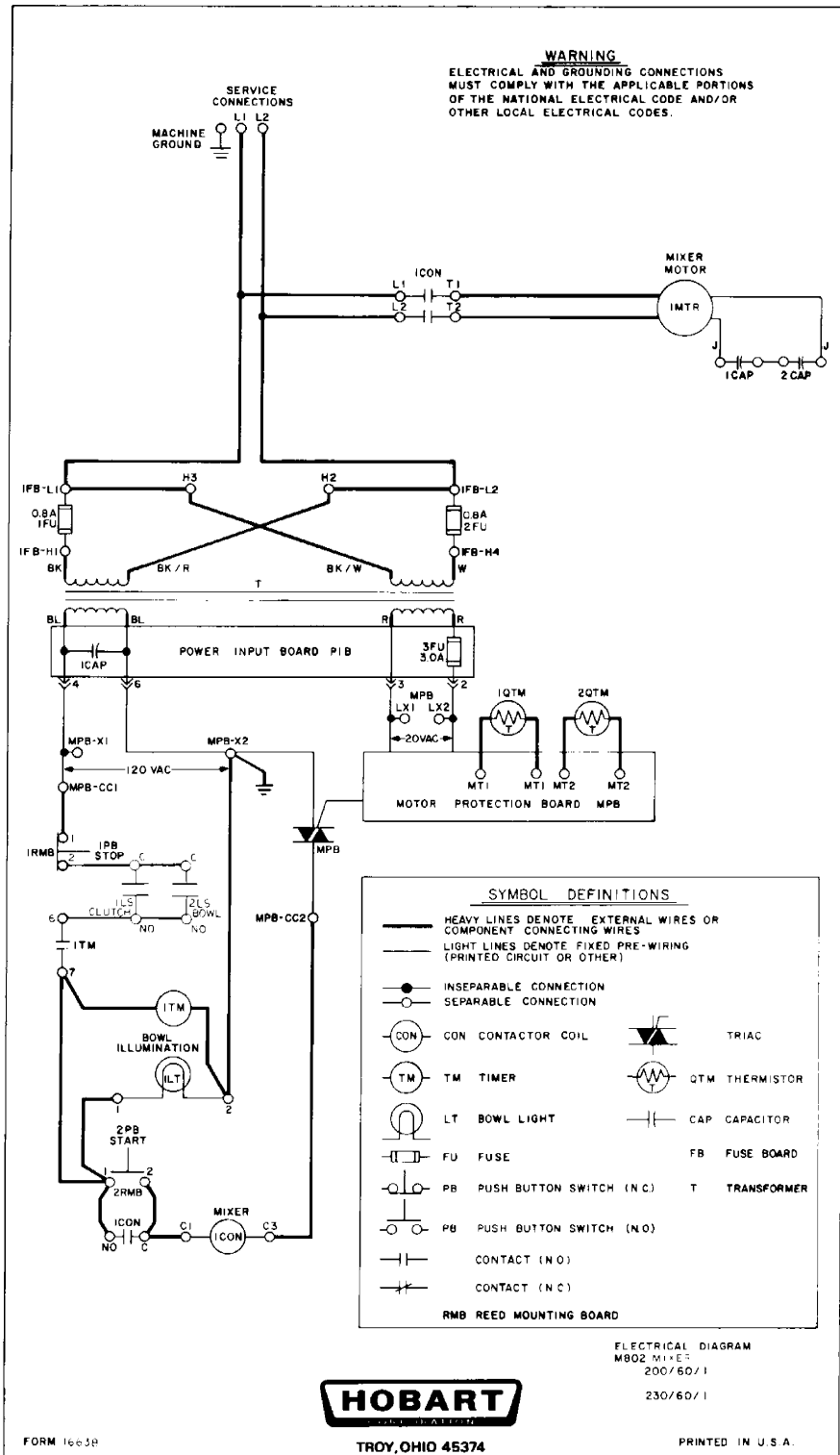


230/460/60/3  
 (Solid State  
 Controls - Timer  
 Without Hold Position)



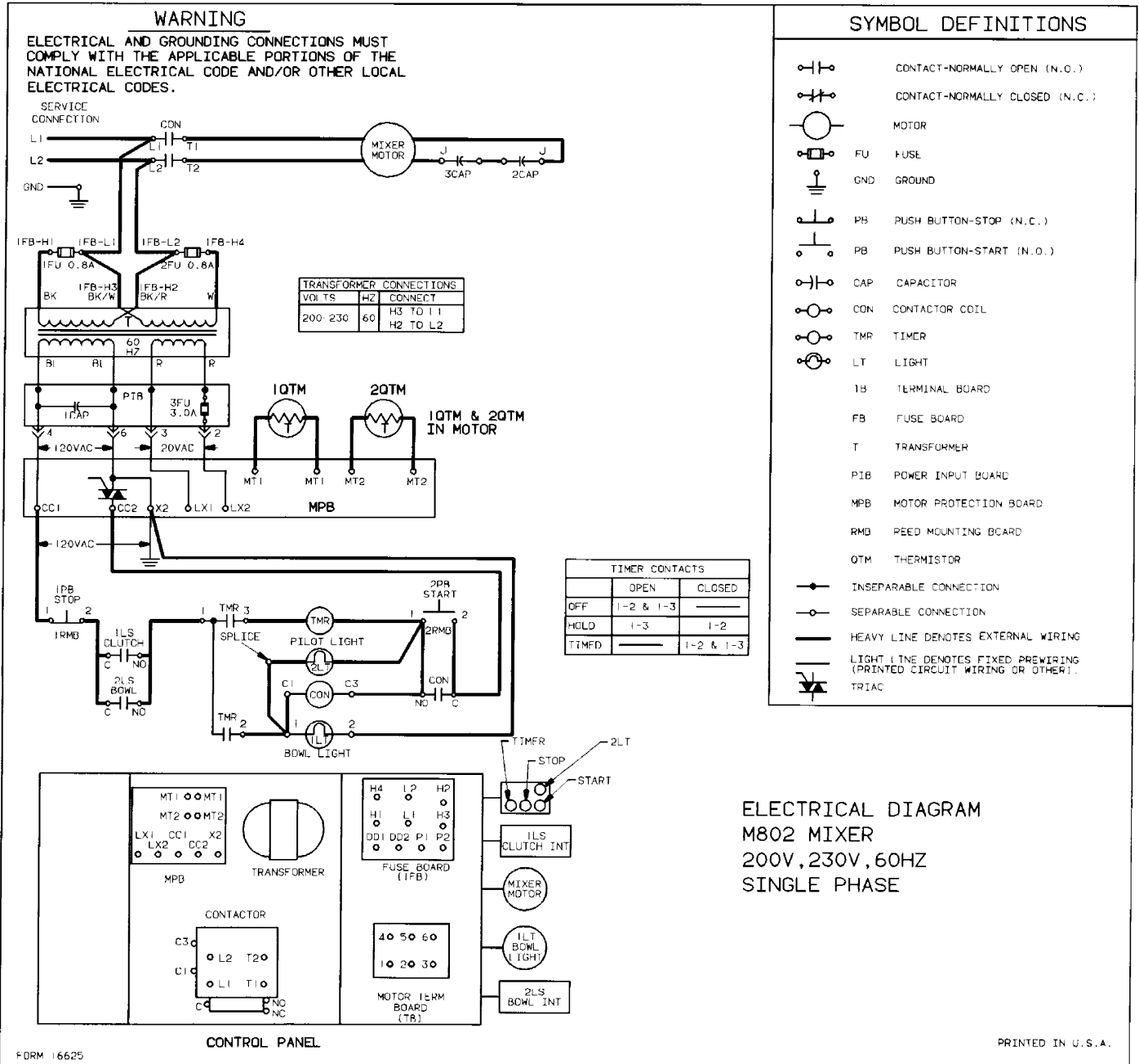
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200/230/60/1  
 (Solid State  
 Controls -Timer  
 Without Hold Position)



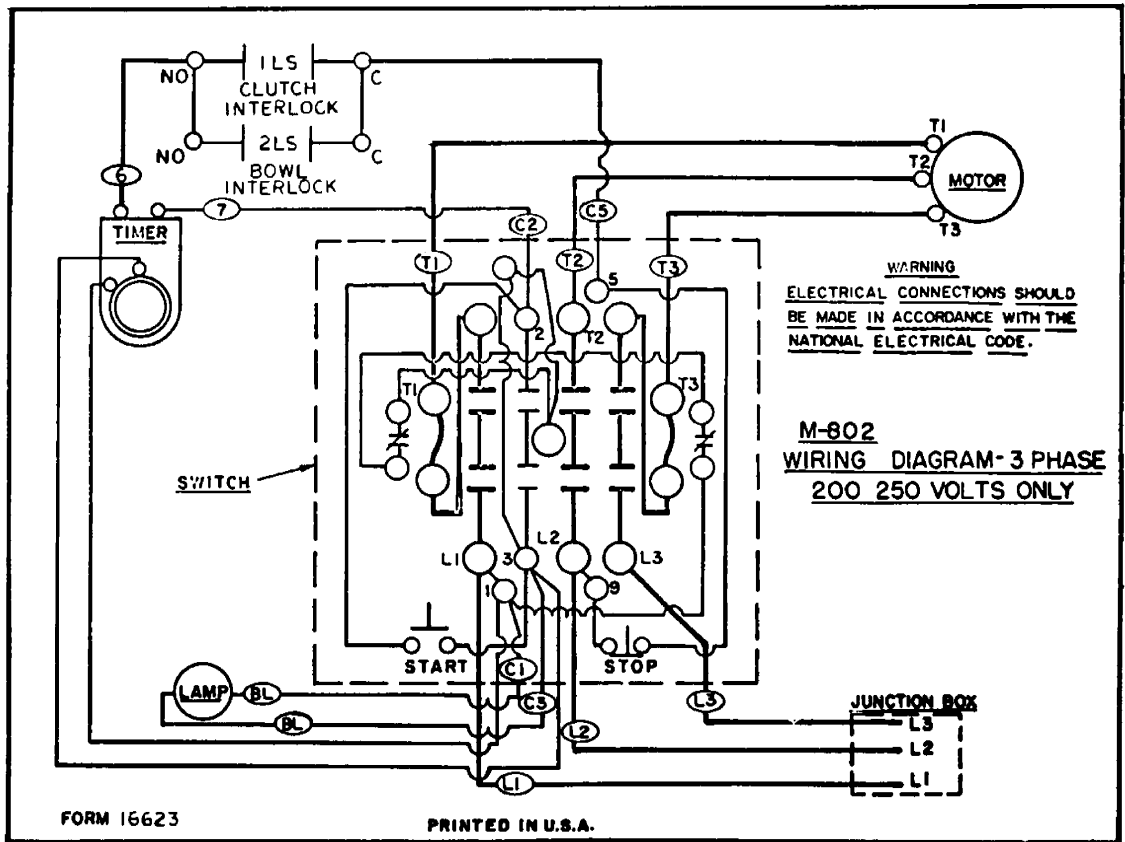
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200-230/60/1  
 (Solid State  
 Controls - Timer  
 With Hold Position)

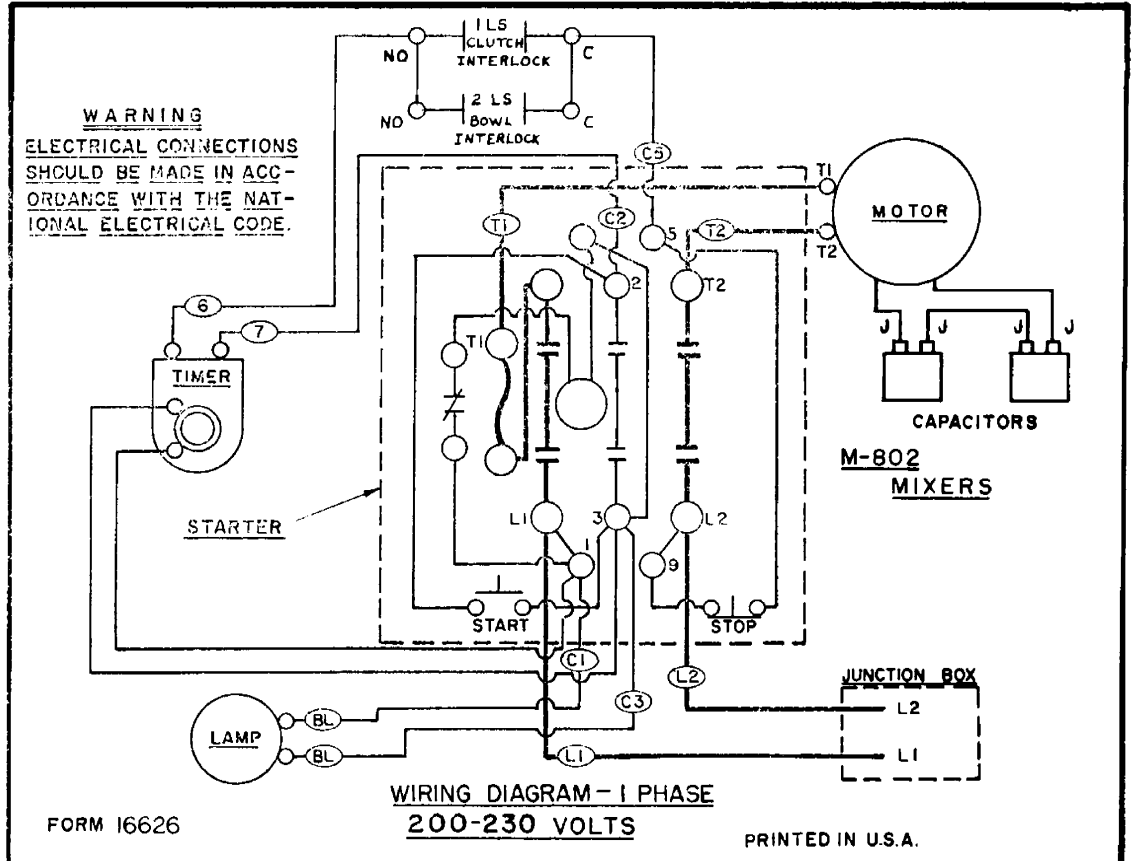


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200-250 Volts,  
3 Phase  
(Non-Solid  
State  
Controls)



200-230 Volts,  
Single Phase  
(Non-Solid  
State  
Controls)



## TECHNICAL SERVICE BULLETIN

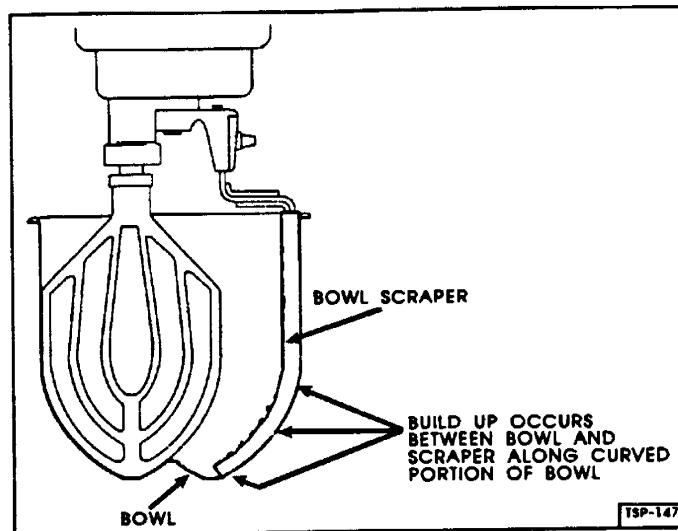
PRODUCT SERVICE DEPARTMENT

TROY, OHIO 45374

### M802/V1401 MIXER BOWL SCRAPER ADJUSTMENT TO REDUCE PRODUCT BUILDUP

#### Purpose

To alert the field of a possible build up of product between the bowl scraper and bowl in the location shown in the following illustration. This build up is predominate on M802 mixers using 60 or 40 quart bowls and V1401 mixers using 80, 60 or 40 quart bowls. A shim between the mounting plate and the bowl scraper bracket assembly may be needed.



#### Checks

NOTE: Before shimming, check the following and adjust as needed.

WARNING: 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. Be sure the bowl to beater clearance is correct. Refer to the service manual.
2. Be sure bowl clamps are being used. Refer to the service manual for adjustment.
3. Be sure the slideways are adjusted as explained in the service manual.

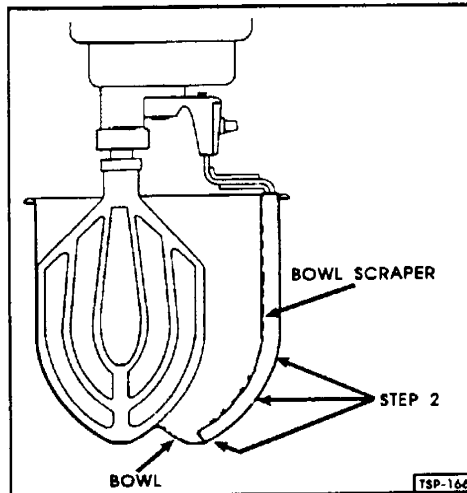
#### Shim Installation

1. Assemble the bowl scraper according to the MIXER BOWL SCRAPER ATTACHMENT INSTRUCTIONS Form 17963.

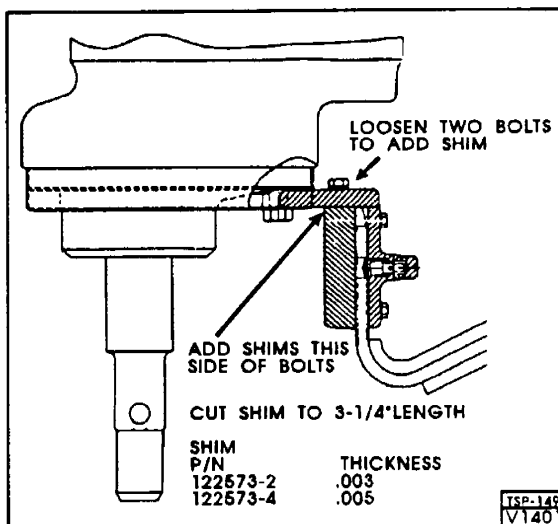
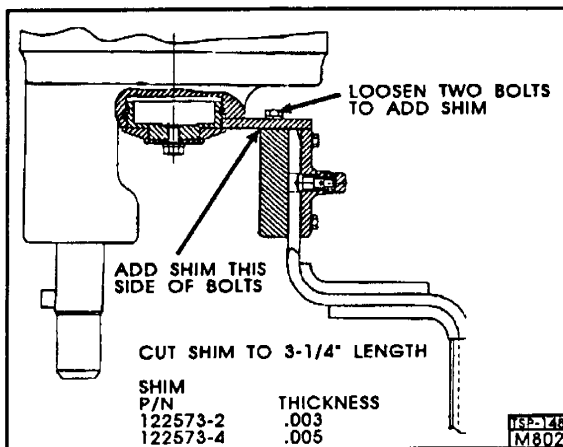
Continue Shim Installation

## Shim Installation Continued

2. With the bowl in the fully raised position, slide a dollar bill between the bowl and bowl scraper along the curved portion.



- A. Release the bill at different points. If the bill stays in position with out being held, the bowl scraper is positioned properly.
- B. If the bill falls when released, add a shim as shown.



3. After shimming:
  - A. Test with the dollar bill as in step 2.
  - B. Be sure the bowl scraper can be removed.
  - C. Where customers use various size bowls and scrapers, check these combinations for proper fit.

## TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

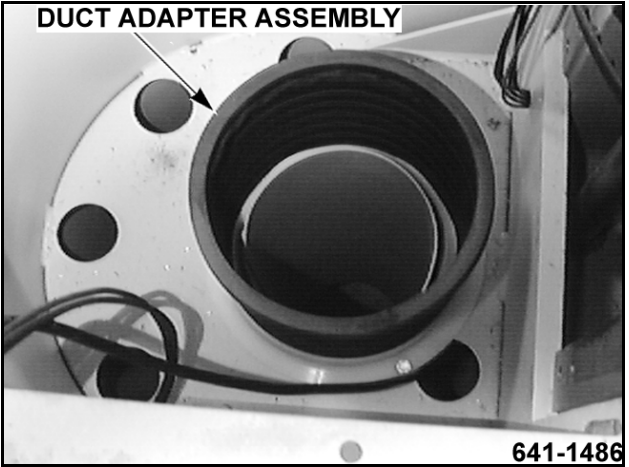
TROY, OH. 45374-0001

**M802/V1401 VENDOR MOTOR INTRODUCTION 200/60/3 PHASE**

**Introduction**

The models with the ML numbers shown and 200/60/3 on the machine data plate, have a vendor built motor. Overload protection is provided by a thermal overload relay with heater elements. A timing pulley and taper bushing are used on the motor shaft. A duct adapter assembly channels air to the rear of the motor.

Model-Description	ML No.
M802 Standard	104687
M802 14" Higher than Std.	104694
M802U (U.S.D.A.)	104696
M802U 14" Higher than Std.	104695
V1401 Standard	104674
V1401 17" Higher than Std.	104686
V1401U (U.S.D.A.)	104683
V1401U 17" Higher than Std.	104681
V1401DD (Dunkin Donuts)	104675



**Parts Information**

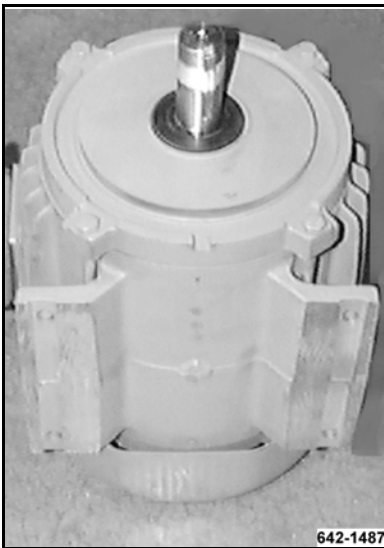
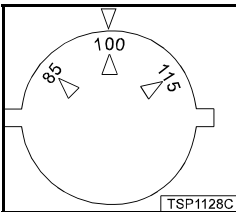
Refer to M802/V1401 Parts Catalog F-18915 (Rev. A, 5/97).

**Service Information**

The mixers can be serviced by using M802/V1401 Service Manual F-6284A (Rev. 3/82) and previously issued TSBs, with the following exceptions.

**THERMAL OVERLOAD RELAY**

The replacement relay should be set to operate in the automatic reset mode. There is a  $\pm 15\%$  adjustment of the trip amps by turning a knob. The trip amp adjustment should be set in the middle of the range (100).



**TESTING G.E. MOTOR FIELD WINDINGS**

With the motor wired for low voltage (200/60/3) the winding resistance at room temperature is:

M802, 1.35 ohms.  $\pm 20\%$ .

V1401, 0.82 ohms.  $\pm 20\%$ .

Measure at:

T1 (T1, T7) to T2 (T2, T3)

T2 (T2, T8) to T3 (T3, T9)

T1 (T1, T7) to T3 (T3, T9)

T4, T5 and T6 tied together.

# MOTOR REPLACEMENT

**WARNING:** 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.

## Removal

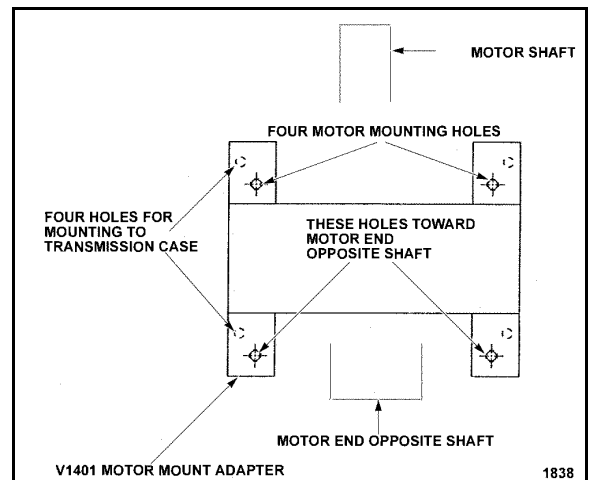
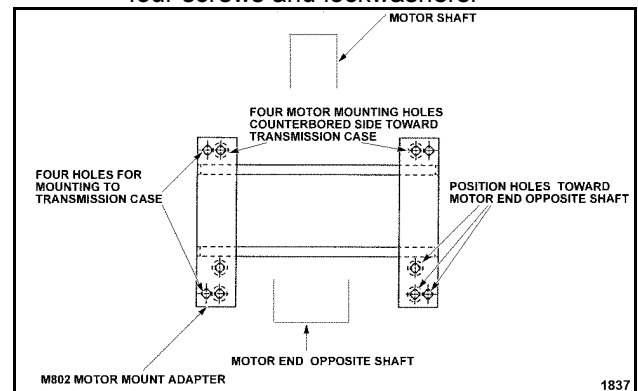
1. Remove the top cover.
2. Disconnect the motor leads from overload terminals (T1, T2 & T3).
3. Remove four control panel mounting screws.
  - A. Free the wires from the P clamps.
  - B. Place the control panel to the operator side to access the motor.
4. Slip the Flexa-gear off the driven gear and clutch arm plate, then the timing pulley.
5. Remove the timing pulley, taper bushing and key from the motor shaft.
  - A. Remove the two hex head bolts from the taper bushing and install in the tapped removal holes.
  - B. Turn the bolts in to loosen the bushing.
6. Remove the two lower screws and lockwashers holding the motor/motor mount adapter assembly to the transmission case.
  - A. Loosen the two top screws.
  - B. Note the location and number of shims between the motor mount adapter and the transmission case and remove them.
  - C. Support the motor/motor mount adapter assembly while removing the two top screws and lockwashers.
  - D. Remove the motor/motor mount adapter assembly by pulling upward, away from the duct adapter assembly.
7. Remove the motor mount adapter from the motor.
  - A. M802: Remove the four nuts and lockwashers holding the motor to the motor mount adapter.
  - B. V1401: Remove the four screws and lockwashers holding the motor to the motor mount adapter.

## Installation

1. Grasp the lip of the duct adapter assembly and pull it upward.

**NOTE:** The M802 motor mount adapter has two sets of tapped holes on one end to accommodate different vendor motor bases.

2. Assemble the motor mount adapter to the motor orienting them as shown below.
  - A. M802: Install four screws and lockwashers with the screw heads and washers in the counterbore holes of the adapter.
    - 1) Fasten adapter to motor feet using four nuts and lockwashers.
  - B. V1401: Fasten adapter to motor feet using four screws and lockwashers.

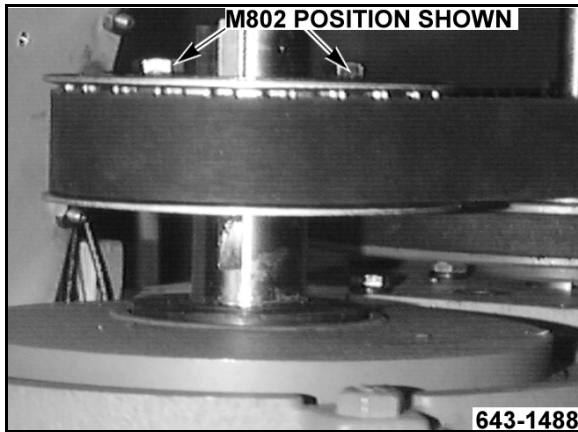


3. Place the motor/motor mount adapter assembly in position over the duct adapter assembly, supporting the assembly while installing the two top mounting screws and lockwashers. Do not tighten the screws.
  - A. Install the two lower mounting screws and lockwashers. Do not tighten the screws.



# FLEXA-GEAR TRACKING AND TENSION ADJUSTMENTS

- B. Install the shims in the quantity and locations noted in removal step 6B.
  - C. Tighten the four mounting screws.
  - D. Reach under the motor and determine if the duct adapter assembly is against the bottom of the motor. If it is not, reposition it against the motor.
4. Install the timing pulley, taper bushing and new key on the motor shaft.
- A. On Model M802, install pulley with bushing flange and tightening screws with heads facing up (toward control panel).  
On Model V1401, install pulley with bushing flange and tightening screws with heads facing down (toward motor).
  - B. Refer to "Flexa-gear tracking and tension adjustments" and position the timing pulley properly on the motor shaft.



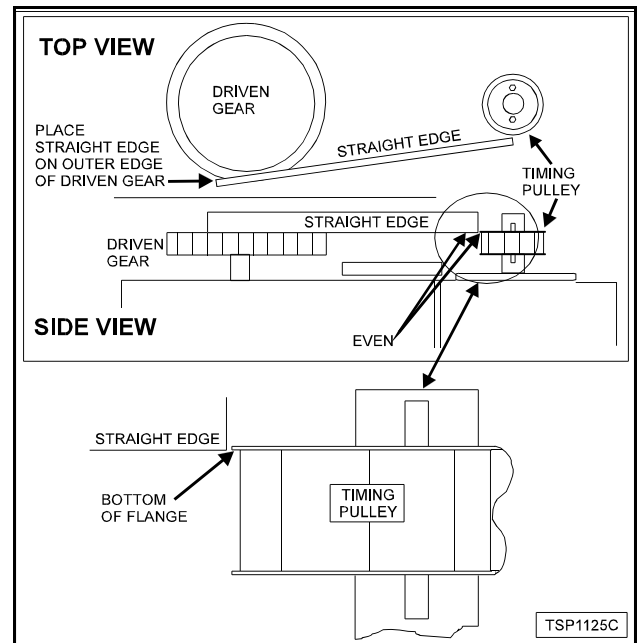
5. Install the Flexa-gear on the timing pulley, driven gear and clutch arm plate.
- A. Refer to "Flexa-gear tracking and tension adjustments" and check for proper Flexa-gear tension.
6. Connect the motor leads to the overload terminals and reinstall the control panel.
- A. Position the crimped points of the motor wires and the wires away from the motor and wire tie them to the mixer casting.
  - B. Reclamp the wires with the P clamps.
7. Power mixer and check for proper rotation, Flexa-gear tracking and operation.
8. Reinstall top cover.

## Tracking

**WARNING:** 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.

Flexa-gear tracking is correct when it tracks with no more than 1/16" above or below the driven gear.

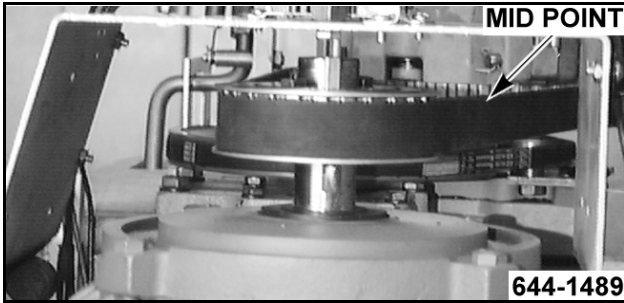
1. Remove top cover
2. Using a straight edge from the driven gear to the bottom of the flange on the timing pulley as shown, adjust the position of the timing pulley on the motor shaft.



3. Power unit and check Flexa-gear tracking. Flexa-gear tracking is correct when it tracks with no more than 1/16" above or below the driven gear.
4. Repeat steps 2 and 3 as required.
5. Reinstall top cover.

## Tension

The Flexa-gear tension is correct when pressing with a force of 5 lbs. (M802), 8-1/2 lbs. (V1401), at the mid point between the driven gear and the timing pulley results in 1/4" deflection of the Flexa-gear. To adjust:



**WARNING:** 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

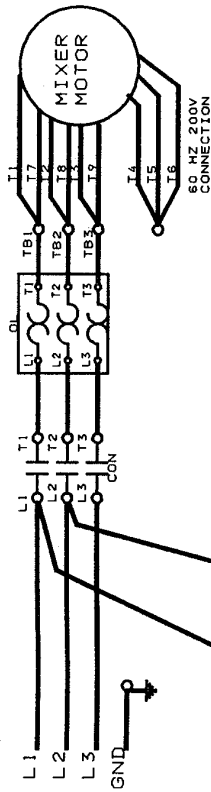
1. Remove top cover.

**NOTE:** It is not necessary to use exactly the same number of shims on each side as only one shim may provide the proper adjustment.

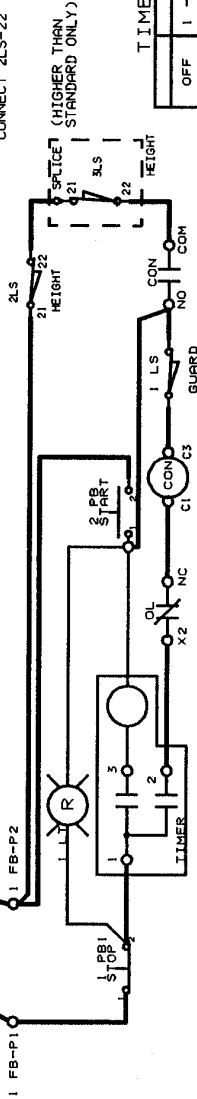
2. Loosen the four screws holding the motor mount adapter to the transmission case and add or delete shims.
  - A. Tighten screws.
  - B. Check for 1/4" deflection of Flexa-gear.
3. Repeat steps 2, 2A and 2B as required.
4. Reinstall top cover.

**WARNING**

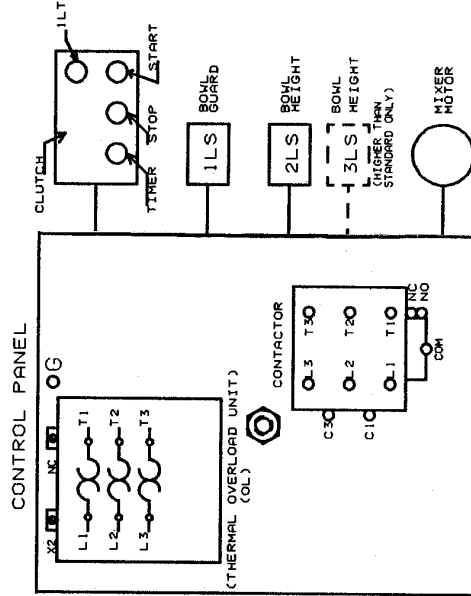
ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH THE APPLICABLE PORTIONS OF THE NATIONAL ELECTRICAL CODE AND/OR OTHER LOCAL ELECTRICAL CODES.



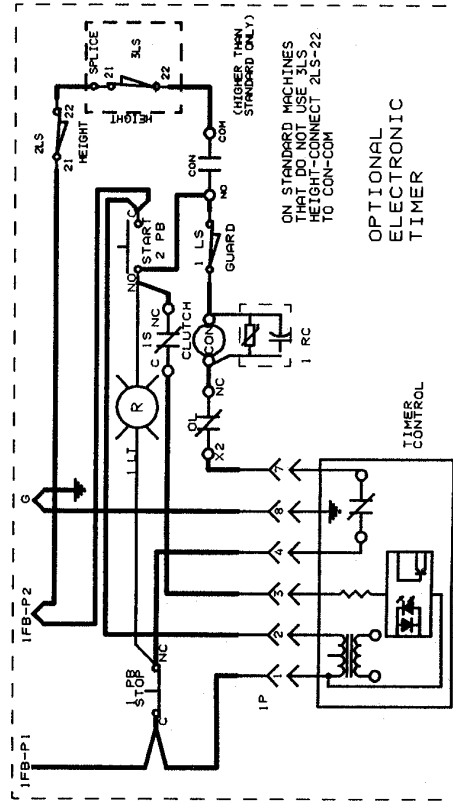
ON STANDARD MACHINES THAT DO NOT USE 3LS HEIGHT CONNECT 2LS-22 TO CON-COM



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



THERMAL OVERLOAD UNIT SETTING  
 -SET ADJUSTMENT TO THE CENTER POSITION  
 -SET RESET TO THE AUTO POSITION



DERIVED FROM F-33770

200 V - 60HZ  
 THREE PHASE  
 ELECTRICAL DIAGRAM  
 M802 & V1401 MIXERS



## TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

### M802/V1401 REPLACEMENT 3 PHASE VENDOR MOTOR AND ASSOCIATED PARTS

#### Introduction

The Hobart built M802 and V1401 3 phase motors, when supplies are depleted, will be replaced with a vendor motor. In order to mount, cool and provide the proper control parts for the vendor motor, these additional parts must be ordered. The control parts required will be based on the type of control present on the unit.

#### Parts Information

To select the proper replacement motor, the line voltage to the motor, hertz and phase must be determined.

**Refer to the thermal overload heater chart for the part no. of the heaters required for motor overload protection.**

Line Voltage, Hertz and Phase	Model M802 Motor Part No.	Model V1401 Motor Part No.
200-208/60/3	478380-1	478380-2
230/60/3	478589-2	478589-4
460/60/3	478589-1	478589-3
575/60/3	478588	N/A
220/50/3	478589-2	478589-4
380/400/415/50/3	478380-3	478380-4

#### Additional parts required to mount and cool the motor.

Part Description	Part No.	Model M802	Model V1401	Qty. Required
Motor Mounting Adapter	478316-1	X		1
Motor Mounting Adapter	478226-1		X	1
Flexible Duct Assembly	478245-1	X	X	1
Duct Adapter Base	478246	X	X	1
Drive Screw 10-32 x 1/2	SD-032-04	X	X	3
Timing Pulley 60 Hz. 24T	478237	X		1
Timing Pulley 50 Hz. 27T	478238	X		1
Timing Pulley 60 Hz. 20T	478239		X	1
Timing Pulley 50 Hz. 23T	478240		X	1
Taper Bushing	478236	X	X	1
Shims	478323	X	X	8

Part Description	Part No.	Model M802	Model V1401	Qty. Required
Cap Screw (grade 5) 3/8 -16 x 1-1/2	SC-116-83	X	X	4
Lockwasher	WL-004-02	X	X	8
Socket Head Cap Screw 3/8-16 x 1-3/4	SC-123-82	X		4
Lockwasher	WL-004-01	X		4
Hex Nut 3/8-16	NS-013-22	X		4
Cap Screw (grade 5) 3/8-16 x 1-1/2	SC-123-83		X	4

**NOTE:** If the mixer has an electronic timer, also order 1/4" straight terminal P/N 65890-10 qty. 2 and ring terminal P/N 65890-4 qty. 1.

**Additional control parts required.**

Control Type Present	Description	Part No.	Model M802	Model M802HTS	Model V1401	Model V1401HTS
			Quantity			
Arrow Hart Starter	Cable Tie Ring Terminal	539847 65890-21	2	2	2	2
			3	3	3	3
Motor Protection Board	Overload Relay	88196-25-1	1	1	1	1
	Overload Heater	See Chart	3	3	3	3
	Wiring Diagram	F-33839A	1	1	1	1
	1/4" Straight Terminal	65890-10	1	1	1	1
	Drive Screw 10-24 x 3/8	SD-015-20	2	2	2	2
	Lockwasher	WL-007-12	2	2	2	2
Overload Relay Part No. 88196-5-1 (Green Reset Button)	Overload Relay Overload Heater	88196-25-1 See Chart	1 3	1 3	1 3	1 3

**Thermal Overload Heater Chart for Vendor Motor**

Thermal Overload Heater Part No.	Voltage/Hz./Phase	Required Qty.	Model
112235-59	200-208/60/3	3	M802
112235-38	230/60/3	3	M802
112235-30	460/60/3	3	M802
112235-28	575/60/3	3	M802
112235-38	220/50/3	3	M802
112235-32	380/50/3	3	M802
112235-32	400/50/3	3	M802
112235-32	415/50/3	3	M802
112235-44	200-208/60/3	3	V1401
112235-43	230/60/3	3	V1401
112235-37	460/60/3	3	V1401
112235-43	220/50/3	3	V1401
112235-38	380/50/3	3	V1401
112235-38	400/50/3	3	V1401
112235-38	415/50/3	3	V1401

# TOOLS

## Tools Required

Compact Electric Hand Drill or Right Angle Electric Drill  
11/64" Drill Bit  
13/32" Drill Bit (M802 only)

# MOTOR AND CONTROL INSTALLATION

**NOTE:** The removal of the Hobart motor and control should be done using Service Manual F-6284A (Rev. 3/82).

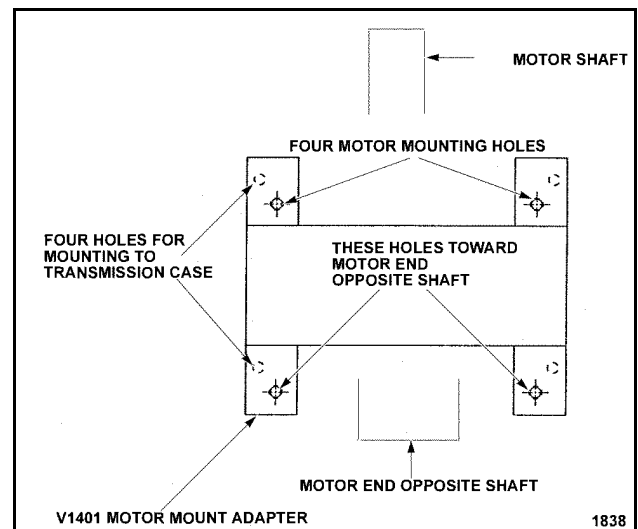
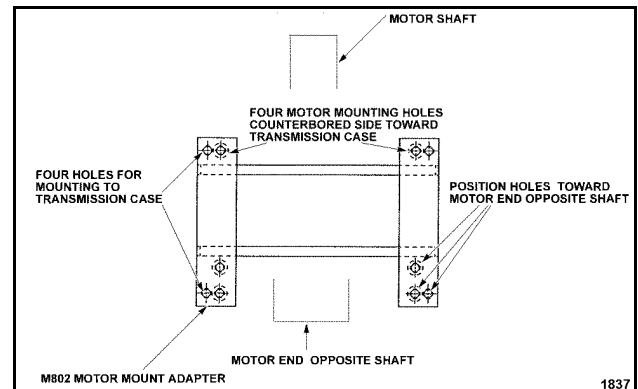
## Replacing Hobart Motor with Arrow Hart Contactor Present

**WARNING:** 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.

- Free the switch plate assembly and place to the side.
- Before removing the motor note the quantity and location of the shims.
- Remove the motor. Discard the motor and anything that was on the motor shaft. Save the shims.
- If the unit is a Model V1401 skip to step 5. Model M802, using a 13/32" drill bit, drill out the top two tapped holes in the transmission case where the motor was mounted.
- Assemble the flexible duct assembly to the duct adapter base by aligning the parts and screwing the flexible duct into the base.
- Using the cooling duct assembly as a guide, visually center the hole in the pedestal baffle in the duct assembly and mark the three holes for drilling.
  - Drill three 11/64" holes through the pedestal baffle.
  - Mount the duct assembly to the baffle using three 10-32 x 1/2 drive screws.
  - Grasp the lip of the duct adapter assembly and pull it upward.

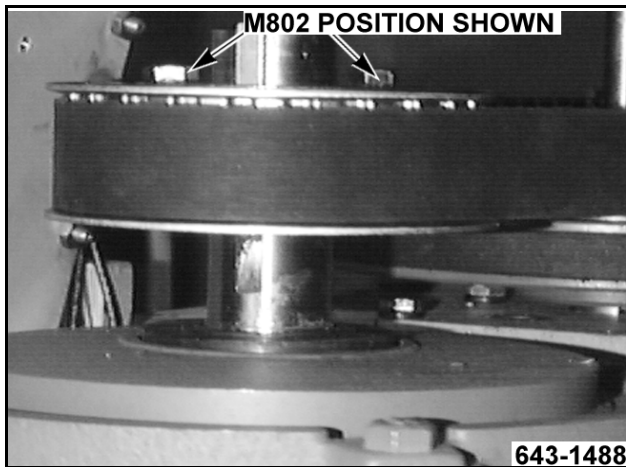
**NOTE:** The M802 motor mount adapter has two sets of tapped holes on one end to accommodate different vendor motor bases.

- Assemble the motor mount adapter to the motor orienting them as shown below.
  - M802: Install four socket head cap screws 3/8-16 x 1-3/4 and lockwashers with the screw heads and washers in the counterbored holes of the adapter.
    - Fasten adapter to motor feet using four nuts and lockwashers.
  - V1401: Fasten adapter to motor feet using four cap screws 3/8-16 x 1-1/2 and lockwashers.



- Place the motor/motor mounting adapter assembly over the cooling duct assembly, supporting the assembly while installing the two top mounting screws (grade 5 cap screw, 3/8-16 x 1-1/2) with heads inside transmission case and a lockwasher under head. Do not tighten screws.
  - Install the two lower mounting screws and lockwashers. Do not tighten the screws.

- B. Install the shims in the quantity and locations noted in step 2.
  - C. Tighten the four mounting screws.
  - D. Reach under the motor and determine if the cooling duct adapter assembly is against the bottom of the motor. If it is not, reposition it against the motor.
9. Install the timing pulley, taper bushing and new key on the motor shaft.
- A. On Model M802, install pulley with bushing flange and tightening screws with heads facing up (toward control panel). On Model V1401, install pulley with bushing flange and tightening screws with heads facing down (toward motor).
  - B. Refer to "Flexa-gear tracking and tension adjustments" and position the timing pulley properly on the motor shaft.



10. Install the Flexa-gear on the timing pulley, driven gear and clutch arm plate.
- A. Refer to "Flexa-gear tracking and tension adjustments" and check for proper Flexa-gear tension.
11. Cut the connector from the end of the three motor leads.
- A. Strip the leads back 1/4".
  - B. Install ring terminals on the leads.
12. Route and connect the motor leads to the starter.
13. Drill two holes in the top of the pedestal for cable ties.
- A. Make sure all leads are away from any moving parts and tie with cable ties to pedestal.
14. Install the switch panel.

15. Power mixer and check for proper rotation, Flexa-gear tracking and operation.
16. Reinstall top cover.

### Replacing Hobart Motor With Motor Protection Board Present

**WARNING: 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 and discard the motor protection board.
2. On units without an electronic timer, remove the terminal from control cable wire branded "MPB-CC2" and strip the wire back 3/16"
  - A. Install 1/4" straight terminal on wire and mark "1FB-P2".
  - B. On units with an electronic timer, remove the terminals from wiring harness wires branded "MPB-CC1", "MPB-CC2" and "Ground". Strip the wires back 3/16".
    - 1) Install 1/4" straight terminals on wires branded "MPB-CC1" and "MPB-CC2".
    - 2) Install ring terminal on "Ground" wire.
    - 3) Change marking on wire "MPB-CC1" to "1FB-P1".
    - 4) Change marking on wire "MPB-CC2" to "1FB-P2".
3. Mount the overload relay to the control panel using two drive screws 10-24 x 3/8 and lockwashers.
  - A. Set the relay to operate in the automatic reset mode.
  - B. Turn the trip amp adjustment knob to 100 (middle of range).
  - C. Install the heater elements.
4. Remove the control panel mounting screws.
  - A. Free the wires from the P clamps.
  - B. Place the control panel to the operator side to access the motor.
5. Perform steps 2 - 10A of "Replacing Hobart Motor with Arrow Hart Contactor Present".
6. Using the wiring diagram connect the motor leads to the control panel.
7. Reinstall control panel and P clamps.
8. Install the wiring diagram over the original diagram in the top cover.
9. Power unit and check for proper rotation, Flexa-gear tracking and operation.
10. Reinstall top cover.

## Replacing Hobart Motor With Overload Relay 88196-5-1 (Green Reset Button) Present

**WARNING:** 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 overload relay (Green Reset Button) from the control panel and discard.
2. Perform steps 3-7 of "Replacing Hobart Motor With Motor Protection Board Present".
3. Power unit and check for proper rotation, Flexa-gear tracking and operation.
4. Reinstall top cover.

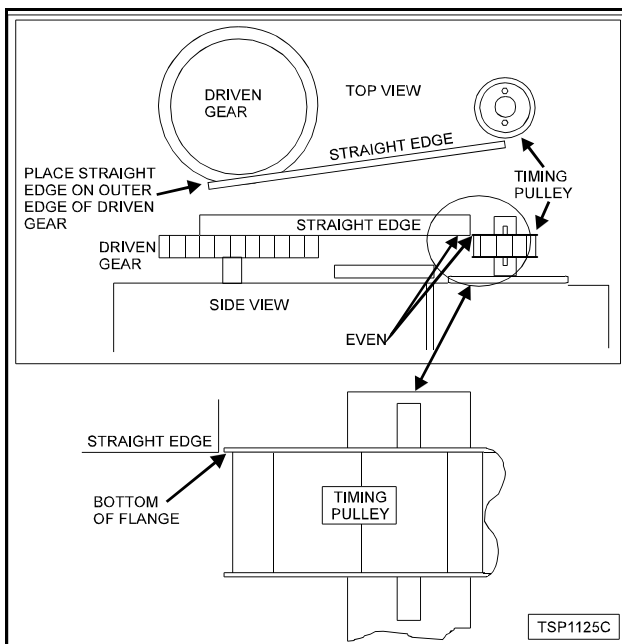
## FLEXA-GEAR TRACKING AND TENSION ADJUSTMENTS

### Tracking

**WARNING:** 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.

Flexa-gear tracking is correct when it tracks with no more than 1/16" above or below the driven gear.

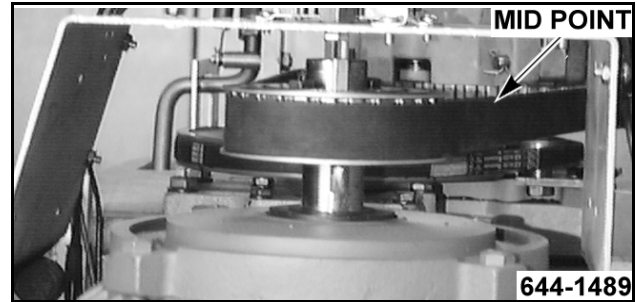
1. Remove top cover
2. Using a straight edge from the driven gear to the bottom of the flange on the timing pulley as shown, adjust the position of the timing pulley on the motor shaft.



3. Power unit and check Flexa-gear tracking. Flexa-gear tracking is correct when it tracks with no more than 1/16" above or below the driven gear.
4. Repeat steps 2 and 3 as required.
5. Reinstall top cover.

### Tension

The Flexa-gear tension is correct when pressing with a force of 5 lbs. (M802), 8-1/2 lbs. (V1401), at the mid point between the driven gear and the timing pulley results in 1/4" deflection of the Flexa-gear. To adjust:



**WARNING:** 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 top cover.

**NOTE:** It is not necessary to use exactly the same number of shims on each side as only one shim may provide the proper adjustment.

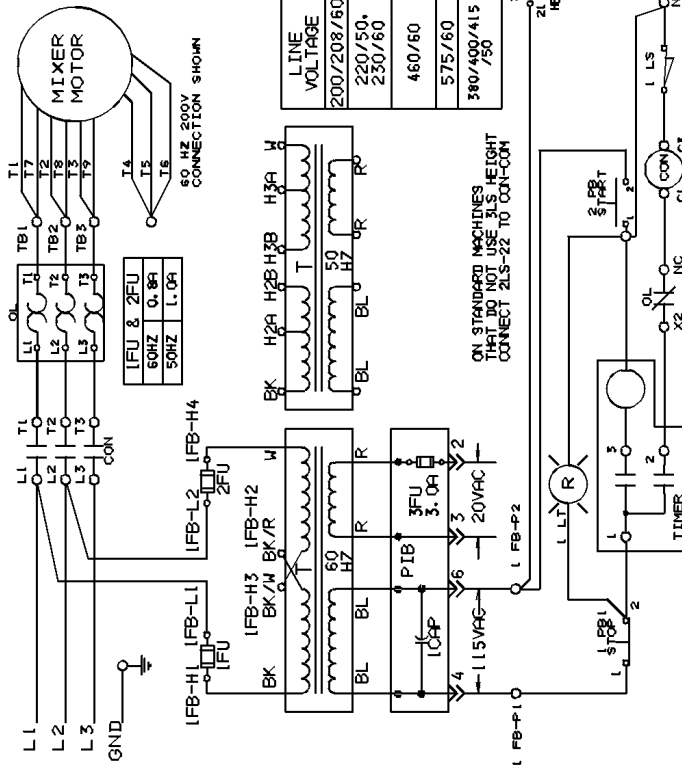
2. Loosen the screws holding the motor mount adapter to the transmission case and add or delete shims.
  - A. Tighten screws.
  - B. Check for 1/4" deflection of Flexa-gear.
3. Repeat steps 2, 2A and 2B as required.
4. Reinstall top cover.



**WARNING**

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

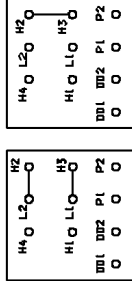
50/60HZ 3 PHASE



TRANSFORMER FUSE BOARD CONNECTIONS

VOLTS	HZ	CONNECT
200-230	60	H3 TO L1 H2 TO L2
460	60	H3 TO #2 H2 TO #2
220	90	H3B TO L1 H2B TO L2
380 - 415	90	H3A TO H3A

TRANSFORMER FUSE BOARD



LOW VOLTAGE JUMPERS



MOTOR LEAD CONNECTION

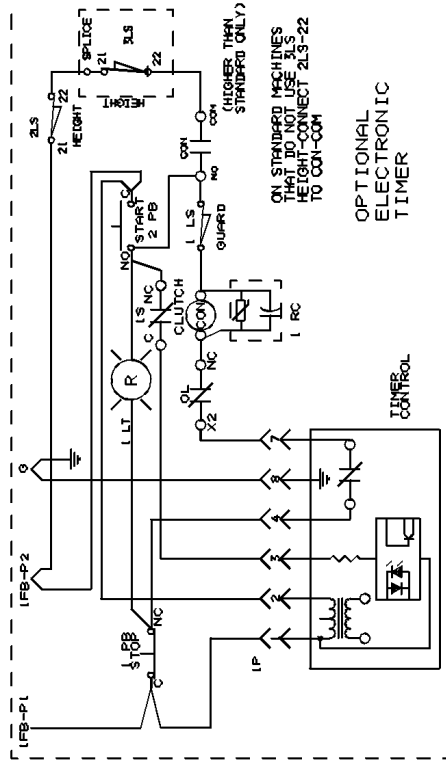
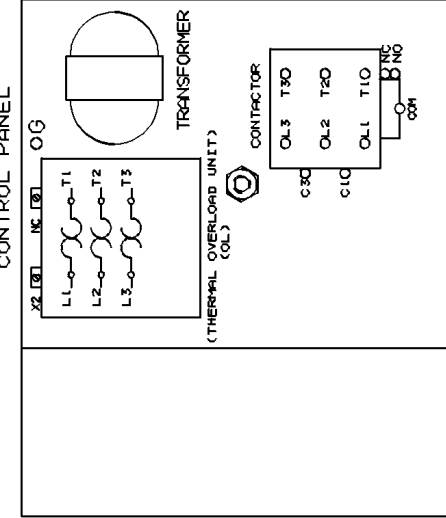
LINE VOLTAGE	TB1	TB2	TB3	TIE TOGETHER
200/208/60	T1-T7	T2-T8	T3-T9	T4-T5-T6
220/50, 230/60	T1-T7	T2-T8	T3-T9	T4-T5-T6, 10-T11-T12
460/60	T1	T2	T3	T4-T7, T5-T8, T6-T9, T10-T11-T12
575/60	T1	T2	T3	T4-T7, T6-T9
380/400/415/90	T1	T2	T3	T4-T7, T6-T9

TIMER CONTACTS

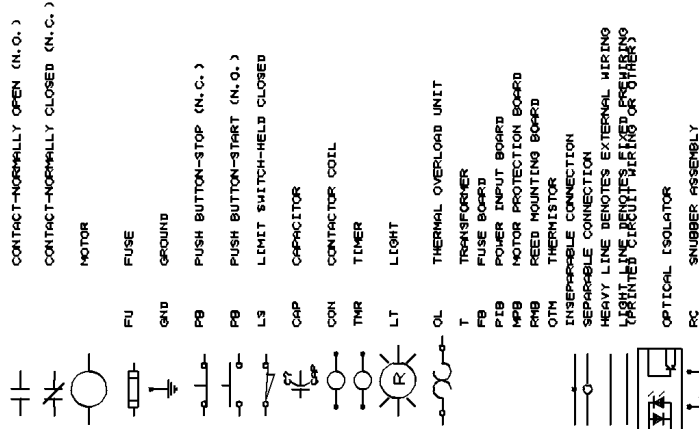
OFF	HOLD	TIMED	OPEN	CLOSED
1-2 & 1-3	1-3	1-2 & 1-3	1-2 & 1-3	1-2 & 1-3

ELECTRICAL DIAGRAM M802 & V1401 MIXERS

CONTROL PANEL



SYMBOL DEFINITIONS



ELECTRICAL DIAGRAM M802 & V1401



THE THERMAL OVERLOAD UNIT SETTING -SET ADJUSTMENT TO THE CENTER POSITION -SET RESET TO THE AUTO POSITION



## TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

### MODELS M802 AND V1401 - KITS TO UPGRADE TO THE ELECTRONIC TIMER

**Introduction** An upgrade kit to add the electronic timer is available for installation on M802 and V1401 Mixers built since 1984, including the following ML numbers.

ML-19663	ML-19920	ML-33482	ML-33488	ML-104067	ML-104073
ML-19664	ML-19921	ML-33483	ML-33489	ML-104068	ML-104074
ML-19665	ML-19923	ML-33484	ML-33490	ML-104069	ML-19922
ML-19666	ML-19924	ML-33485	ML-33491	ML-104070	ML-33492
ML-19667	ML-19925	ML-33486	ML-33494	ML-104071	ML-33493
ML-19672		ML-33487	ML-33495	ML-104072	

### Parts Information

To select the proper kit first determine if the unit is standard height, higher than standard, with or without a transformer.

KIT #	APPLICATION
439677-1	Std. height unit with transformer
439677-3	Higher than standard unit with transformer
439677-5	Std. height without transformer
439677-7	Higher than standard unit without transformer

The kits consist of:

Part Number	Description	Kit No.				Qty.
		439677-1	439677-3	439677-5	439677-7	
438380-1	Switch Plate Assembly (includes Buzzer Assy. And Snubber Assy.)	X				1
438380-3	Switch Plate Assembly (includes Buzzer Assy. And Snubber Assy.)		X			1
438380-5	Switch Plate Assembly (includes Buzzer Assy. And Snubber Assy.)			X		1
438380-7	Switch Plate Assembly (includes Buzzer Assy. And Snubber Assy.)				X	1
65890-10	Female Straight Terminal	X	X	X	X	2
65890-4	#8 Ring Terminal	X	X	X	X	3
SC-009-56	Screw 8-32 x 3/8	X	X	X	X	1
WL-003-14	Lockwasher	X	X	X	X	1
NS-009-12	Hex Nut 8-32	X	X	X	X	1
87711-248	Switch	X	X	X	X	1
SC-060-40	Screw 4-40 x 5/8	X	X	X	X	2
WL-007-39	External Lockwasher	X	X	X	X	2
438492	Clutch Switch Bracket	X	X	X	X	1
--	F-33949A Supplemental Wiring Diagram	X	X	X	X	1
--	F-19121 Operation Instructions	X	X	X	X	1
539847	Wire Tie	X	X	X	X	2

Once a kit is installed refer to parts manual F-18915 for replacement parts information.

**Special Tools**

Anti-static kit, Part No. TL-84919.  
Suggested crimping tool T & B No. WT-111-M or  
Amp No. 47386

**Reference Material**

TSB-920 for service information.  
M802 and V1401 Service Manual F-6284A  
(Rev.3-82)

**Kit Installation Instructions**

**WARNING:** 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.

**CAUTION: The switch plate assembly is subject to damage due to electrostatic discharge. The anti-static kit must be used when handling this assembly.**

1. Remove top cover assembly by removing two screws.
2. Free switch plate assembly from transmission case by removing six screws, save screws.
  - A. Disconnect wiring and discard switch plate assembly.

**NOTE:** If a bowl height sensing switch is present, you must disconnect the switch wires from the contactor before moving the control panel.

3. Free the control panel from above the motor and move to the side.
4. Pull the wires from the switch cavity to the control panel components.
5. Disconnect the switch cavity wires from the control panel components and discard wires.
6. Feed the kit wiring harness from the switch cavity through the hole in the transmission case and up the outside of the conduit at the front of the control panel.



- A. Reinstall the control panel over the motor.
- B. Wire the control panel components per the branding on the wiring harness wires and the supplemental wiring diagram from the kit.
  - 1) If a motor protection board is present, find the kit harness ground wire with the straight terminal and replace it with a kit ring terminal. Install this ground wire at stud on board. Remove ground wire from X2 terminal and install on piggyback terminal of harness ground wire and reinstall at X2 terminal.
  - 2) If a furnas overload relay is present, remove the terminals from the harness ground wires and re-terminate using kit ring terminals. Locate hole in control panel next to relay and fasten the harness ground wires to panel using kit nut, lockwasher and 8-32 x 3/8 screw.

7. Install snubber assembly between C1 and C3 on contactor using two kit straight terminals.

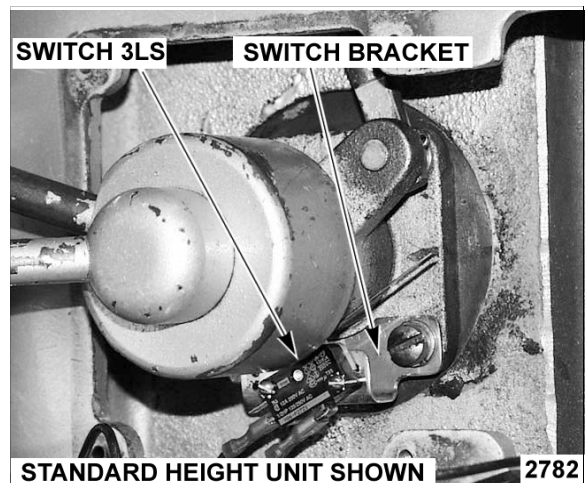
**NOTE:** Before the clutch switch 3LS is mounted to the clutch switch bracket, determine if the unit is standard height or higher than standard. Refer to the photos for proper mounting of the switch to the switch bracket.



8. Mount the clutch switch to the switch bracket using two kit external lockwashers and two kit



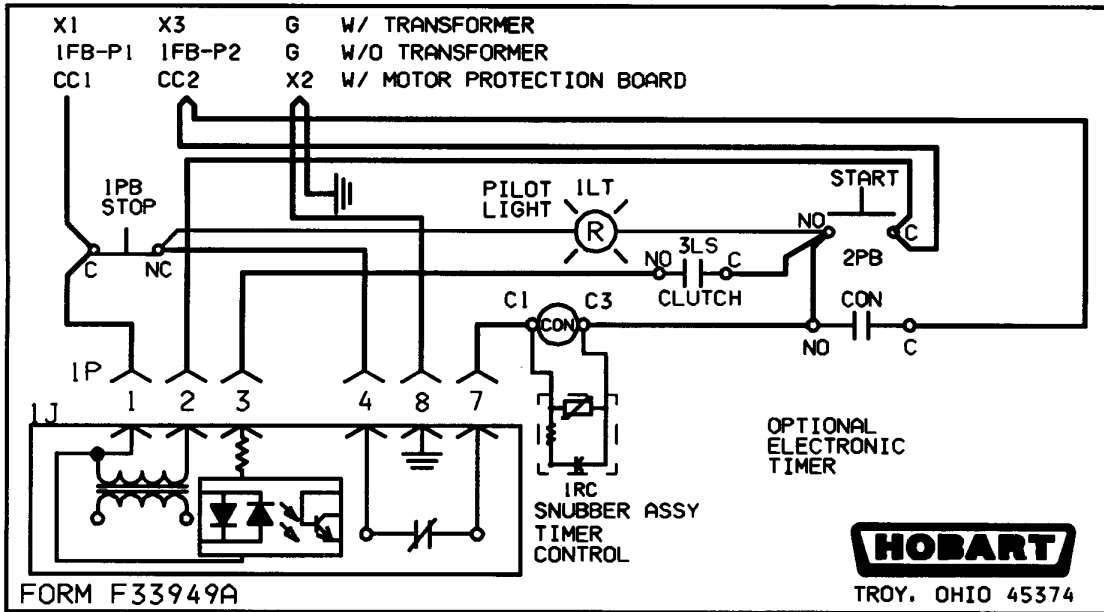
- 4-40 x 5/8 screws.
9. Remove the lower two screws and lockwashers from the gear shift bracket.
  - A. Install the clutch switch/bracket assembly to the gear shift bracket using the two screws and lockwashers.



10. Plug the wiring harness into the switch plate assembly, main circuit board.

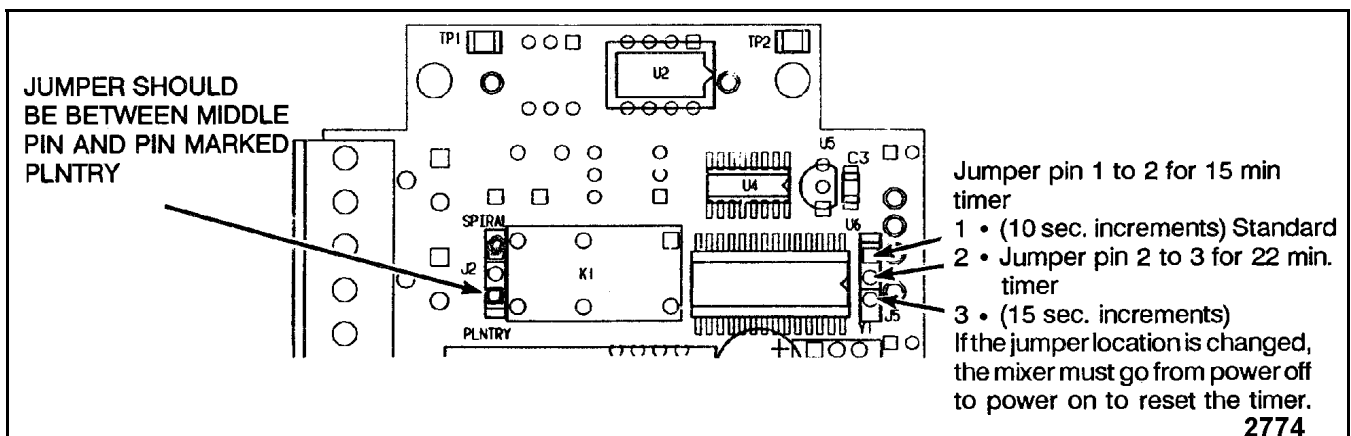
A. Wire the switch plate assembly and 3LS clutch switch per the branding on the wiring harness and the supplemental wiring diagram F-33949 from the kit.

- 1) Remove the nut from stud on switch plate assembly and fasten harness ground wire using nut.
- 2) Install kit splice on one pilot light wire and install harness wires marked splice.



11. Discuss with the customer if they want a 15 min. or 22 min. timer, 10 sec. or 15 sec. increments and locate the jumpers as shown.
12. Install the switch plate assembly to the transmission case using six screws saved in step 2.
13. Fasten the wiring harness kit wires to the outside of conduit at control panel with wire tie.
14. Peel the backing from the supplemental wiring diagram and place next to the original wiring diagram in the top cover assembly.
15. Reinstall the top cover assembly using two screws.
16. Read the operating instructions F-19121.
17. Power the mixer and check for proper operation.
18. Leave the operating instruction F-19121 with the customer.

### Main Circuit Board



## TECHNICAL SERVICE BULLETIN

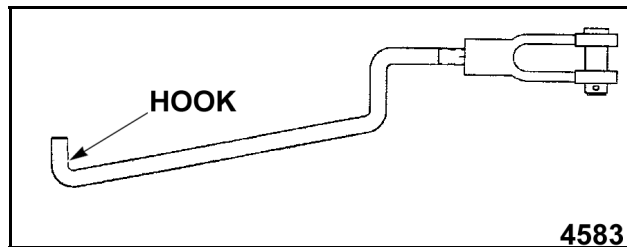
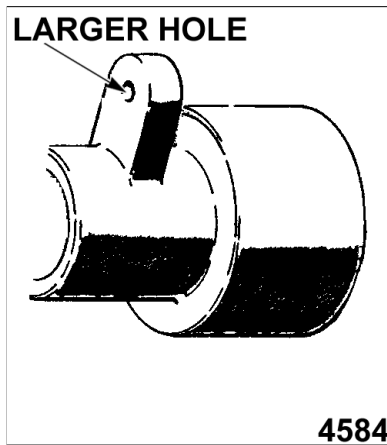
PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

### MODELS M802 AND V1401 - CLUTCH HANDLE HUB ASSEMBLY, CLUTCH ROD ASSEMBLY AND CLUTCH ROD KIT INFORMATION

#### Purpose

The clutch handle hub assembly and clutch rod assembly, along with the clutch rod stop have been re-configured for ease of assembly. The rod assembly is no longer pinned to the hub assembly. The rod assembly now has a hook on the end for insertion into a larger hole in the hub assembly.



The new configuration required changing the clutch rod stop for proper operation.

These changes are now on current production units of these models.

The previous design parts have been replaced by kits. The proper replacement kit must be determined by knowing the clutch operation of the unit and finish of the clutch handle hub (painted or chrome). If the clutch handle is pulled down for run, this is old style. If the clutch handle is pushed up for run, this is new style.

#### Parts Information

**NOTE:** To determine if the new design is present, remove the top cover and look for the clutch rod hook inserted into the hub assembly. Current production units and the parts in the kits are the same.

There are four clutch rod kits as listed below:

Kit Part No.	Clutch Operation and Hub Finish
873100-1	Old Style - Painted
873100-2	Old Style - Chrome
479037-1	New Style - Painted
479037-2	New Style - Chrome

The kits consist of the following parts:

Once the kit is installed the individual parts shown can be ordered for service.

Part No.	Description	Kit Part No. 873100-1	Kit Part No. 873100-2	Kit Part No. 479037-1	Kit Part No. 479037-2
*479026	Clutch Rod Assembly	X	X	X	X
479034	Clutch Rod Stop	X	X	X	X
PC 003-34	Cotter Pin	X	X	X	X
873410-1	Clutch Handle Hub Assembly	X			
873410-2	Clutch Handle Hub Assembly		X		
873096-4	Clutch Handle Hub Assembly			X	
873096-3	Clutch Handle Hub Assembly				X

\* The following parts that make up the clutch rod assembly, part number 479026, are also available.

Part No.	Description
479025	Clutch Rod
479027	Adjustable Yoke
479032	Clevis Pin

When replacement of the following parts are required, one of the kits listed on page 1 must be ordered.

Part No.	Description
19173-1	Adjustable Yoke End For Clutch Link
19173-2	Adjustable Yoke End For Clutch Link
19256-1	Yoke and Rod End Pin
64632	Connector Pin for Clutch Rod
73488	Clutch Arm Stop
105710-1	Clutch Handle Hub Assembly
105710-3	Clutch Handle Hub Assembly
106114-1	Clutch Handle Hub Assembly
106114-2	Clutch Handle Hub Assembly
106900	Clutch Rod

### Service Information

M802 & V1401 Service Manual F-6284A (Rev. 3-82) can be used for kit installation, servicing and adjustment of a unit with the current design parts.

## TECHNICAL SERVICE BULLETIN

PRODUCT SERVICE DEPARTMENT

TROY, OH. 45374-0001

### M802 - CHIMNEY CHANGE

#### Purpose

The design of the chimney on production M802 mixers has changed and requires an installation procedure that differs from that of the flanged chimney of earlier mixers.

#### Serial Number Cutoffs

M802 mixers starting with Serial No. 31-1241-981 and higher use the new style chimney and "O" ring.

#### Parts Information

The new chimney will not fit older mixers. Order chimney replacement parts by mixer serial number from the list below.

M802 Chimney and Related Parts			
Serial No.	Part No.	Description	Qty.
31-1241-980 and lower	64427	Chimney and Flange Assembly	1
	64623	Chimney Gasket	1
	67500-102	"O" Ring	1
	SC-014-75	Mach. Screw	5
	WL-009-08	Lock washer	5
31-1241-981 and higher	873473	Chimney	1
	67500-142	"O" Ring	1

#### Reference Material

Refer to Service Manual Model M802 & V1401 F-6284 (Rev. A, 3/82) and the information contained in this Technical Service Bulletin.

#### Service Information

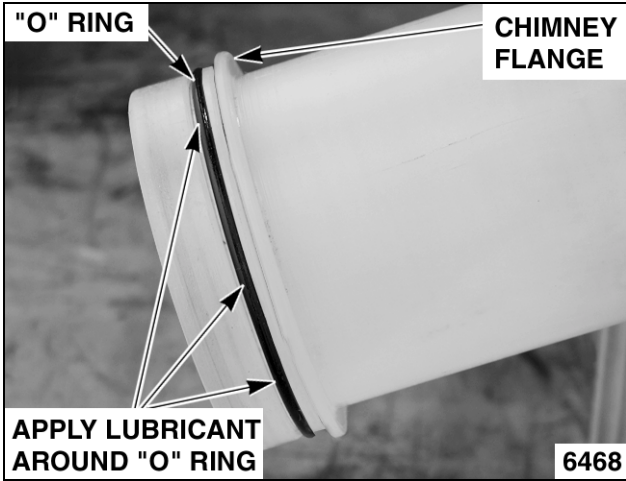
**WARNING:** DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

#### Removal and Replacement of Chimney, Part No. 873473

1. Remove top cover.
2. Access chimney as outlined in "SECTION 11 - TRANSMISSION" of the service manual.
3. Remove chimney using a slight rocking and twisting motion to release the "O" ring from planetary shaft opening of transmission case.
4. Clean planetary shaft opening thoroughly.

**NOTE:** Use a new "O" Ring whenever installing chimney into transmission case.

5. Lubricate "O" Ring before installing onto chimney with transmission lubricant, Part No. 102973-71.
6. Install "O" ring into groove on chimney.
7. Apply a light coat of transmission lubricant to chimney around entire "O" ring.





- Using downward pressure and a twisting motion, seat chimney assembly into planetary shaft opening of transmission case.

**NOTE:** When properly seated, the top of flange will extend slightly above the bottom of transmission case ( $0.015" \pm 0.005"$ ).

- Reassemble "TRANSMISSION" as outlined in the service manual.

- Fill planetary and transmission with lubrication as outlined in the service manual.

- Check machine for proper operation.

- Install top cover.

