



S E R V I C E

SERVICE MANUAL



HMM20-1STD MIXER

HMM20-1STD ML - 141157

31792

- 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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SERVICE UPDATES

SERVICE UPDATES PAGE

April 2019

- Updated TROUBLESHOOTING TABLE.

November 2018

- Released Service Manual

TIS DOCUMENT LIST - HMM20

SERVICE TAB	
Document Title	Document Type
HMM20-1STD MIXER	Service Manual
TOUCH UP PAINTING	Service Manual

SERVICE TAB (Multimedia)	
Document Title	Document Type
PLUGS AND RECEPTACLES SPECIFICATION SHEET	Specification Sheet

GENERAL

INTRODUCTION

The HMM20 is a 20 quart mixer with a heavy duty, 1/2 HP motor and GearSafe™ transmission. It has three fixed speeds plus a stir speed and is equipped with a digital timer. It has a removable, stainless steel bowl guard and large, easy to reach controls. Standard accessories include a 20 quart stainless steel bowl, 20 quart beater, 20 quart whip, and 20 quart dough hook.

SPECIFICATIONS

Motor

- 1/2 HP High Torque Motor.

Electrical

- 100-120/50/60/1 8.0 Amps.
- 200-240/50/60/1 5.0 Amps.
- UL Listed

Controls

- Magnetic contactor with thermal overload protection.
- 20-minute digital timer is standard.

Transmission

- Gear-driven.
- Gears are constant mesh heat-treated hardened alloy steel along with anti-friction ball bearings.

Gear	Agitator RPM
First (Low)	40
Second (Intermediate)	75
Third (High)	137

Attachment Hub

- Front-mounted Hobart standard #12 taper attachment hub.
- Use with Hobart #12 size attachments.

Dimensions

- 189 lbs. net; 204 lbs. domestic shipping.

TOOLS

Standard

- Standard set of hand tools.
- Metric set of hand tools.

- VOM with measuring micro amp current tester. Any VOM with minimum of CAT III 600V, CE certified. Sensitivity of at least 20,000 ohms per volt can be used. In addition, meter leads must also be a minimum of CAT III 600V.
- Clamp on type amp meter with minimum of NFPA-70E CAT III 600V, UL/CSA/TUV listed.
- Field service grounding kit.

Special

- (2x) 1/4"-20 x 2" bolts, fully threaded, preferably hardened, used as transmission cover jack bolts.
- Puller set, part # 528347 or equivalent.
- Torque wrench capable of measuring 470 inch-lbs.

ADDITIONAL RESOURCES

LUBRICATION MANUAL

REMOVAL AND REPLACEMENT OF PARTS

UPPER LID



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove screws from upper lid.

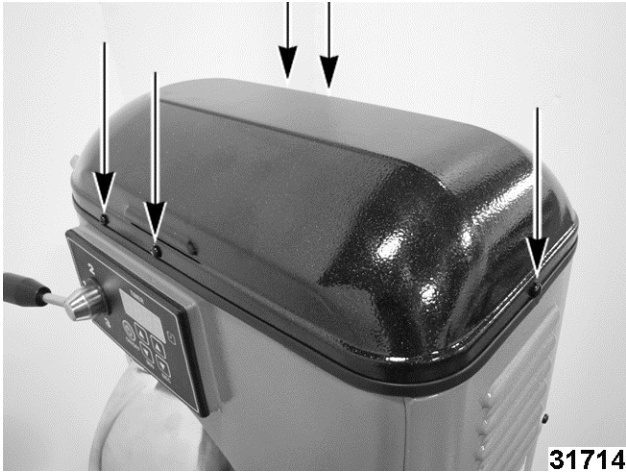


Fig. 1

2. Lift upper lid off of mixer.
3. Reverse procedure to replace.

PLANETARY



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove agitator, bowl, and bowl guard.
2. Remove rear splash guard by removing two screws.

NOTE: One screw on either side.

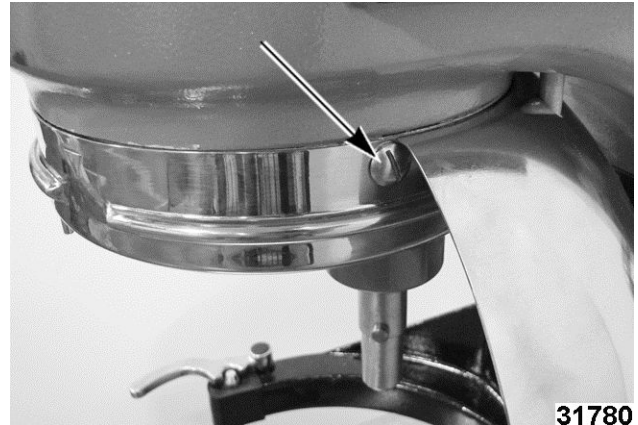


Fig. 2

3. Remove acorn nut and lock washer from planetary shaft.

NOTE: Support planetary while removing acorn nut and lock washer.

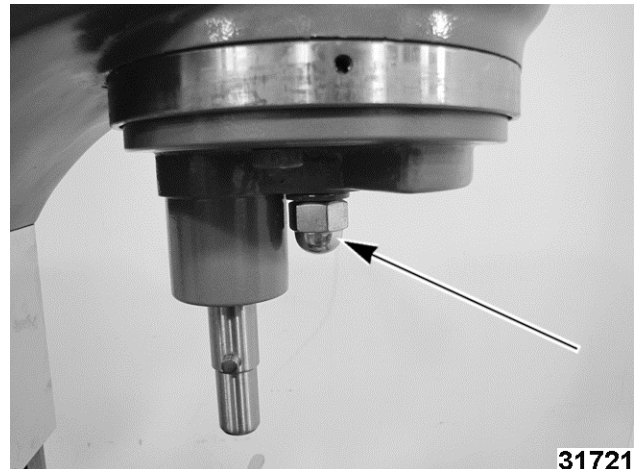


Fig. 3

4. Remove planetary shaft lower key (1, Fig. 4).

NOTE: Planetary shaft lower spacer (2, Fig. 4) may fall out with key (1, Fig. 4). If so, retain spacer.

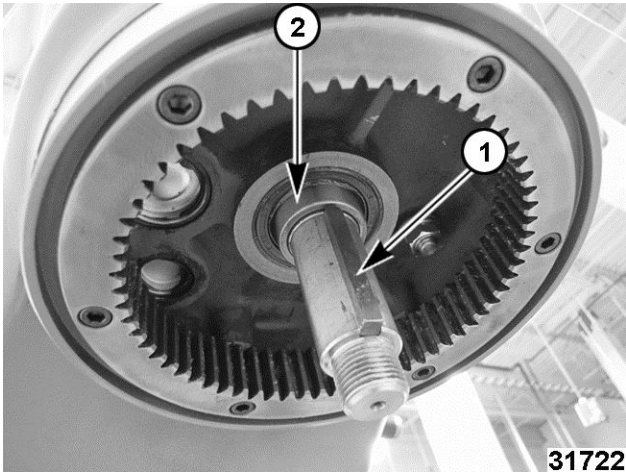


Fig. 4

- Reverse procedure to replace.

NOTE: Torque acorn nut to 372-415 in-lbs. (Approx. 31-34 ft-lbs.)

AGITATOR SHAFT



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Remove PLANETARY.
- Remove agitator shaft nut and washer.



Fig. 5

- Drive agitator shaft out of planetary from top side down.

NOTE: Replace agitator shaft nut so that nut and end of agitator shaft are flush. This will protect agitator shaft threads.



Fig. 6

- Remove pinion and key.

NOTE: Pinion shoulder (4, Fig. 7) is oriented toward bearing.

NOTE: Rounded side of key is oriented toward bearing.

- Drive upper planetary bearing (1, Fig. 7) from planetary.

NOTE: Open / unsealed side of bearing faces up.

- Pull off lower planetary bearing (2, Fig. 7)

NOTE: Open / unsealed side of bearing faces up.

- Remove oil seal (3, Fig. 7)

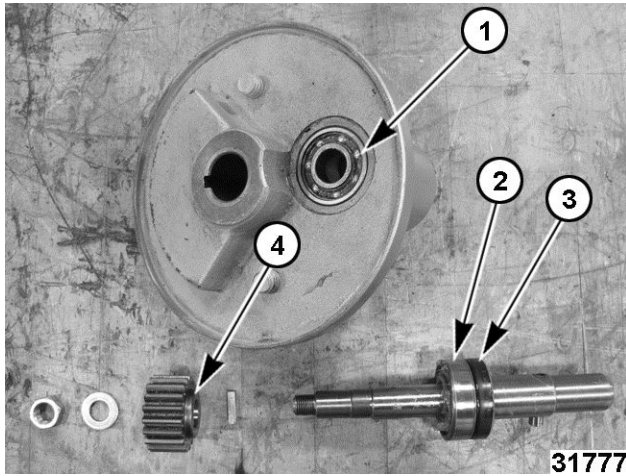


Fig. 7

- Reverse procedure to assemble.

NOTICE

Pack open bearings with FGL-2 lubricant upon reassembly.

INTERNAL GEAR



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Remove agitator, bowl, and bowl guard.
- Remove splash guard by removing two screws and gently pull down.
- Remove PLANETARY.
- Remove bolts from internal gear.

NOTE: Support internal gear while removing last bolt.



Fig. 8

- Pull internal gear downward.
- Reverse procedure to replace.

CONTROL PANEL



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Peel back control panel overlay at corners.



Fig. 9

- Remove screws from control panel.
- Pull control panel and gasket away from mixer.
- Disconnect speed shift switch cable (1, Fig. 10) and power board cable (2, Fig. 10) from control panel.

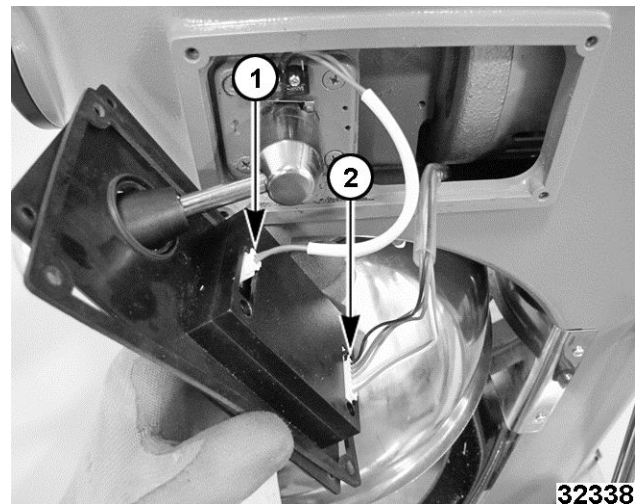


Fig. 10

- Reverse procedure to replace.

SHIFTER ASSEMBLY



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove CONTROL PANEL.
2. Remove shifter lever switch by removing screws (1, Fig. 11).

NOTE: Disregard gear numbers printed in shifter plate.

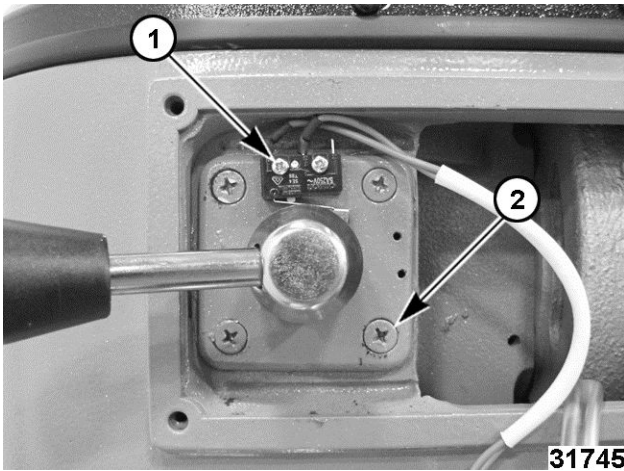


Fig. 11

3. Remove shifter lever by removing screws (2, Fig. 11).
4. Remove shifter lever from transmission case.

NOTE: Ensure shifter lever is in first gear.

5. Reverse procedure to install.

NOTE: Do not over tighten shifter switch screws.

ATTACHMENT HUB REMOVAL



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove attachment hub ring.

NOTE: Attachment hub ring has two tabs on either side that pass through notches in attachment hub. It may be necessary to spin attachment hub ring and align tabs with notches in order to remove.

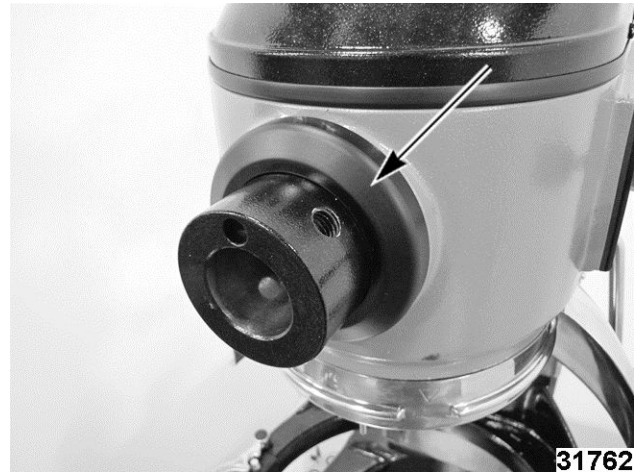


Fig. 12

2. Remove screws from attachment hub.



Fig. 13

3. Remove attachment hub.

NOTICE

Paint is easily chipped during this procedure.

NOTE: Use a rubber mallet to loosen attachment hub.



Fig. 14

- Reverse procedure to install.

NOTICE

Ensure weep hole (1, Fig. 14) in attachment hub face is oriented up.

ATTACHMENT HUB DISASSEMBLY



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Remove ATTACHMENT HUB.
- Pull bevel gear assembly from attachment hub.



Fig. 15

- Reverse procedure to assemble.

NOTE: Ensure o-ring stays seated in attachment hub when assembling.

TRANSMISSION DISASSEMBLY



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Remove UPPER LID.
- Remove transmission bearings cap by removing screws.

NOTE: Place a rag between motor and transmission cover to prevent screws from falling into motor.

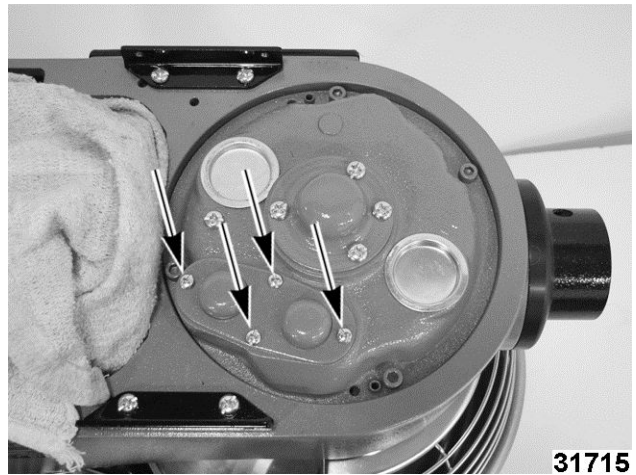


Fig. 16

- Remove planetary shaft upper bearing cap by removing screws.

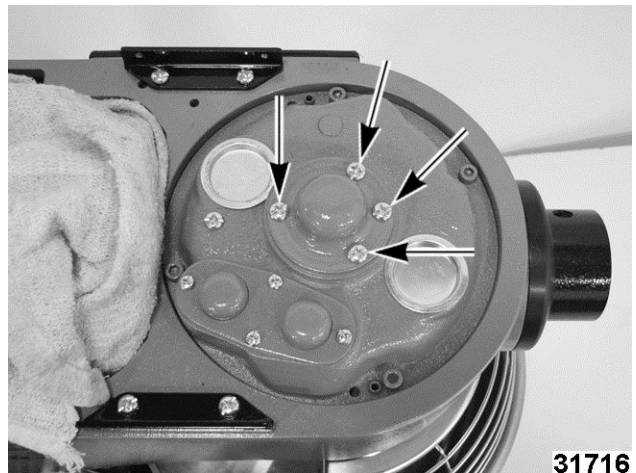


Fig. 17

- Remove transmission nuts and lock washers (1, Fig. 18).

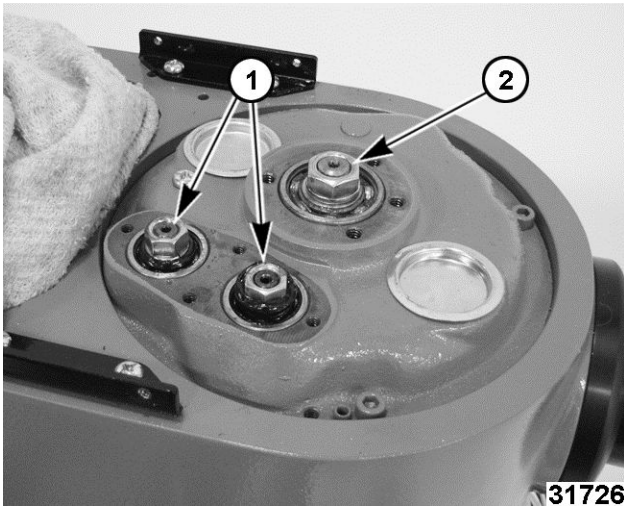


Fig. 18

5. Remove planetary shaft top nut and lock washer (2, Fig. 18).
6. Remove transmission cover screws.

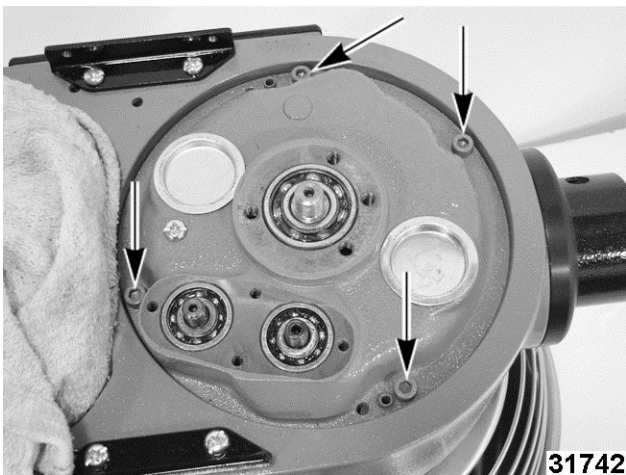


Fig. 19

7. Remove transmission cover using 1/4" x 20 bolts (preferably hardened) as jack screws.

NOTE: Alternate turning each jack screw 1-2 rotations each until transmission cover frees from transmission shafts.

NOTE: Ensure front and back sides of transmission cover raise evenly from transmission case.

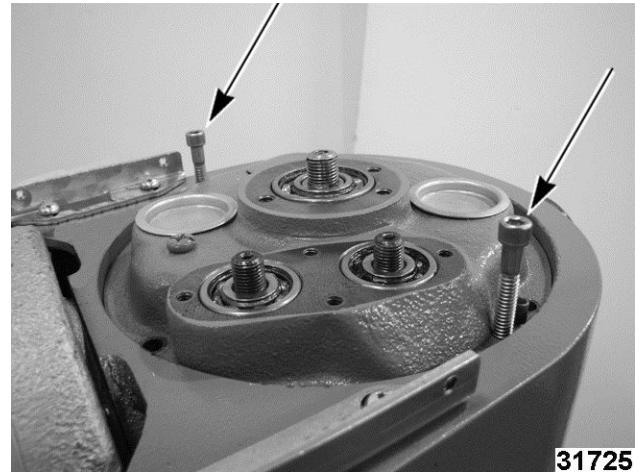


Fig. 20

NOTE: All transmission cover bearings are slip fit in transmission cover.

8. Remove upper shouldered spacer (1, Fig. 21).

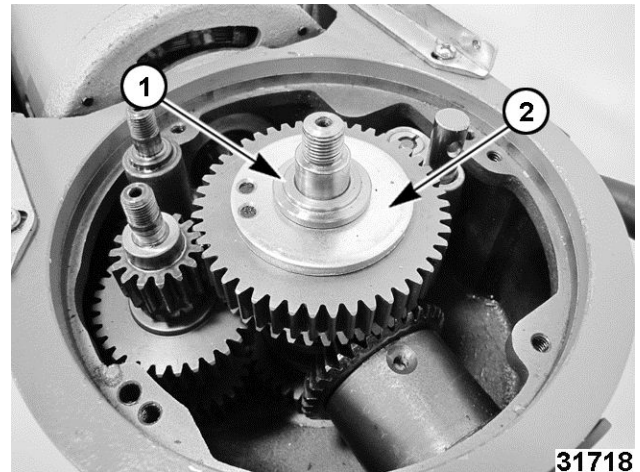


Fig. 21

9. Remove roller clutch spacer (2, Fig. 21).
10. Remove roller clutch assembly and bevel gear simultaneously.



Fig. 22

NOTE: Roller clutch assembly and bevel gear are press fit on planetary shaft.

NOTE: Remove together so roller clutch assembly does not fall apart.

NOTICE

Orientation of springs and rollers in roller clutch assembly is critical.

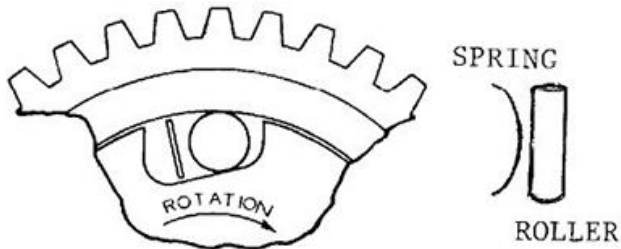


Fig. 23

11. Remove planetary shaft upper key (1, Fig. 24).

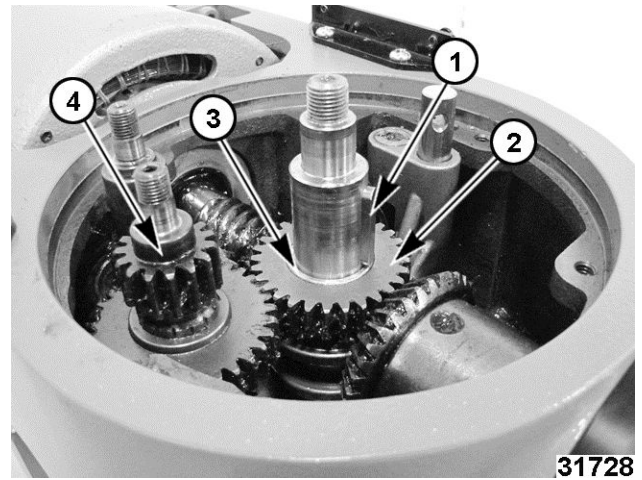


Fig. 24

12. Remove third gear and bushing (2,3, Fig. 24).

13. Remove transmission shaft assembly (4, Fig. 24).

14. Remove worm gear shaft assembly.

NOTE: Gently turn motor fan to aid in worm wheel shaft assembly removal.

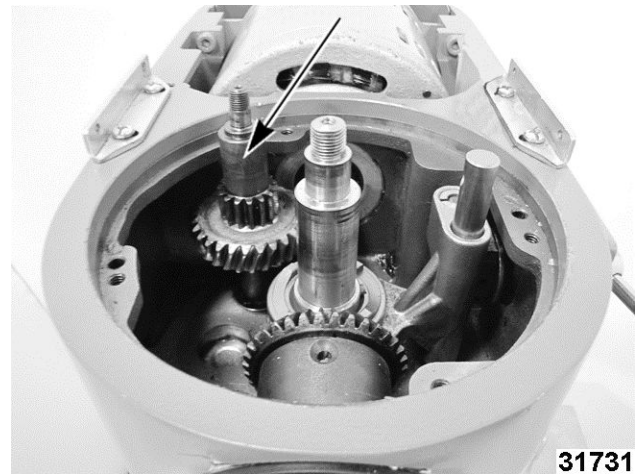


Fig. 25

15. Remove PLANETARY.

16. Remove SHIFTER ASSEMBLY.

17. Remove shifter rod nut.

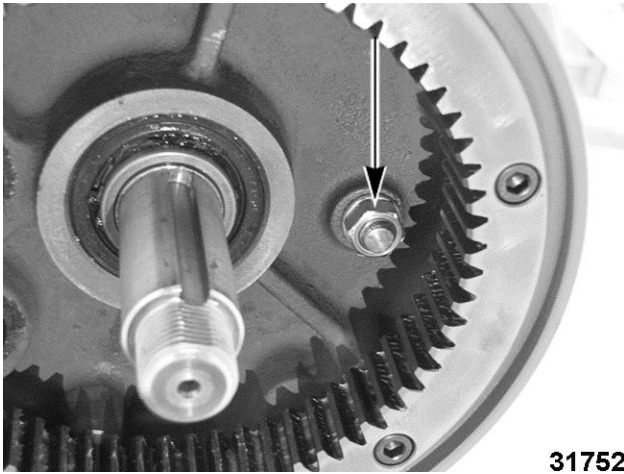


Fig. 26

18. Remove shifter rod (1, Fig. 27).

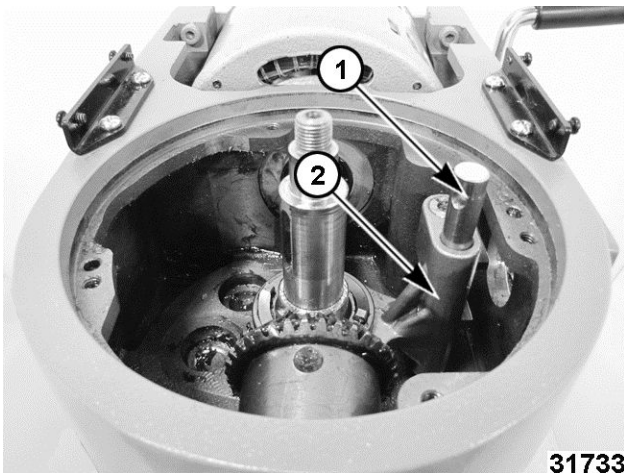


Fig. 27

19. Remove yoke assembly and clutch sleeve (2, Fig. 27).
 20. Remove ATTACHMENT HUB.
 21. Remove planetary shaft upwards from beneath transmission case.
- NOTE:** Planetary shaft lower spacer may fall out if not previously removed. Retain spacer.
22. Remove snap ring.

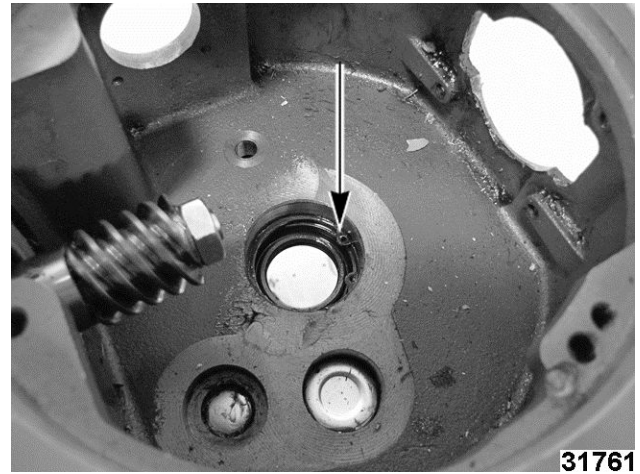


Fig. 28

23. Press oil seal out of transmission case from above.

TRANSMISSION ASSEMBLY



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Press oil seal into transmission case from underneath.

NOTICE

Ensure cupped side of oil seal faces up.

2. Replace snap ring.

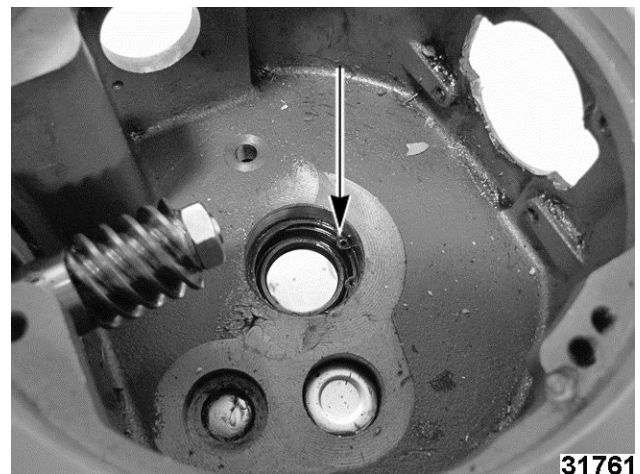


Fig. 29

3. Press planetary shaft assembly into transmission case from above.
4. Replace ATTACHMENT HUB.

5. Lower yoke assembly and clutch sleeve (2, Fig. 30) onto planetary shaft.

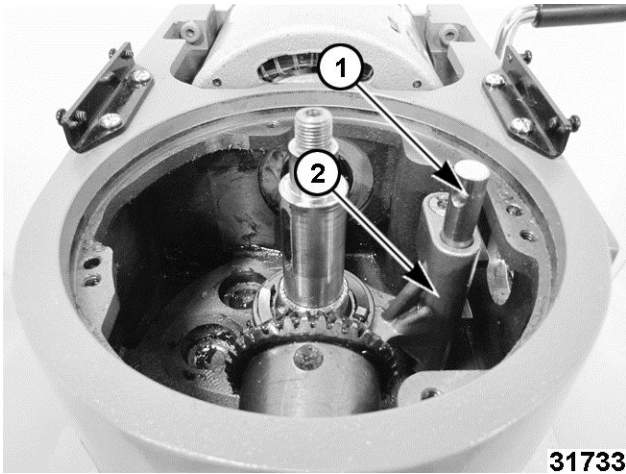


Fig. 30

6. Place shifter rod (1, Fig. 30) into yoke.
7. Replace shifter rod nut and washer.

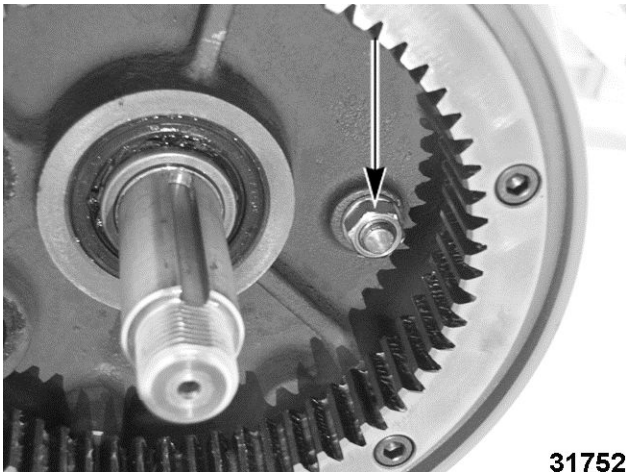


Fig. 31

8. Replace worm gear shaft assembly.

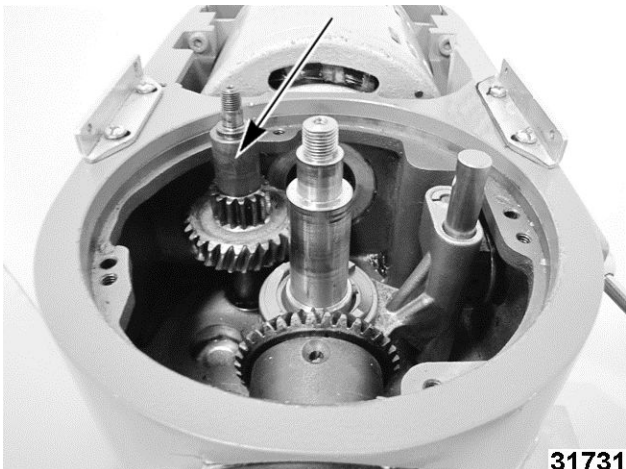


Fig. 32

9. Replace transmission shaft assembly (4, Fig. 33).

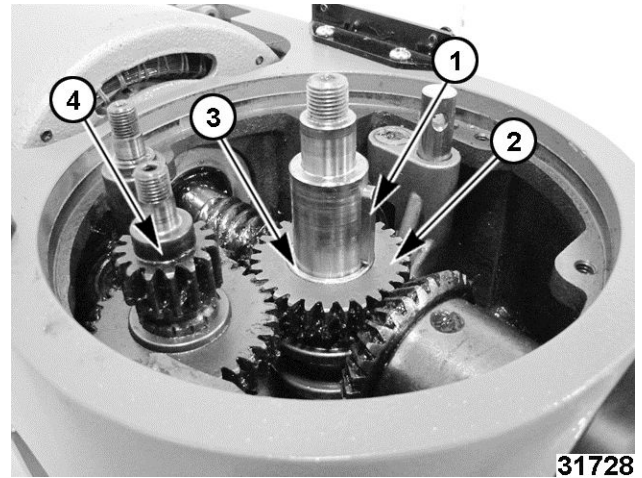


Fig. 33

10. Replace third gear and bushing (2,3, Fig. 33).

NOTE: Third gear notches face down.

11. Replace planetary shaft upper key (1, Fig. 33).

12. Replace bevel gear and roller clutch assembly.

NOTICE

Orientation of springs and rollers in roller clutch assembly is critical.

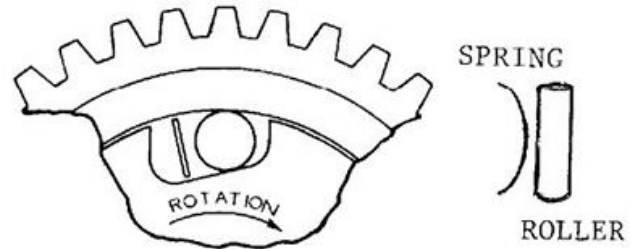


Fig. 34

NOTE: Shoulder of bevel gear faces down.

NOTE: Replace together so roller clutch assembly does not fall apart.

NOTE: Bevel gear and roller clutch assembly are press fit on planetary shaft. Attachment hub can be used as a pressing sleeve.

NOTE: Place a rag between attachment hub and roller clutch to prevent chipping paint. Shown without a rag for clarity.

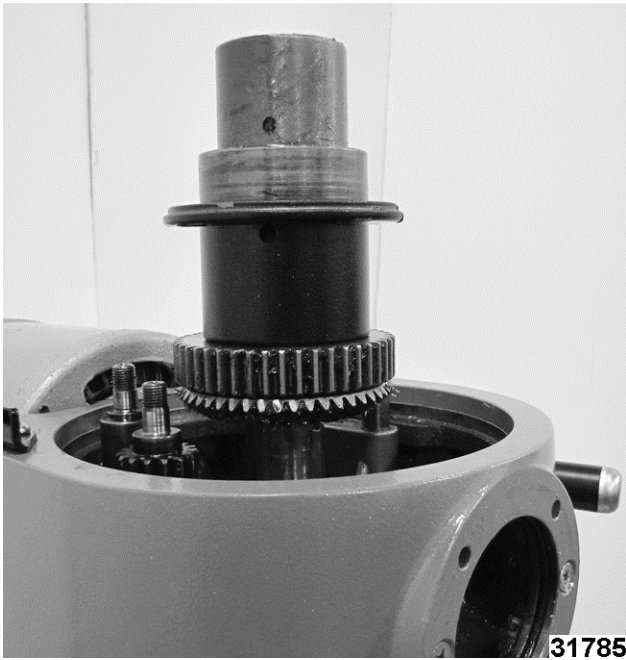


Fig. 35

13. Replace roller clutch spacer (2, Fig. 36) and upper shouldered spacer (1, _).

NOTE: Shoulder of spacer faces up.

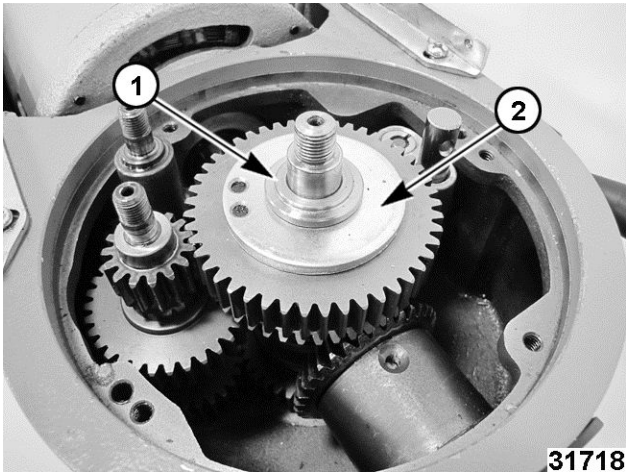


Fig. 36

14. Replace transmission cover.
15. Replace PLANETARY.
16. Replace transmission cover.
17. Replace transmission cover screws.

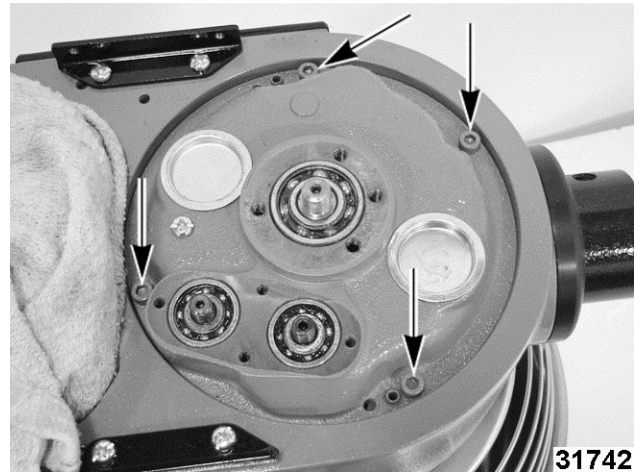


Fig. 37

18. Replace planetary shaft washer and top nut (2, Fig. 38).

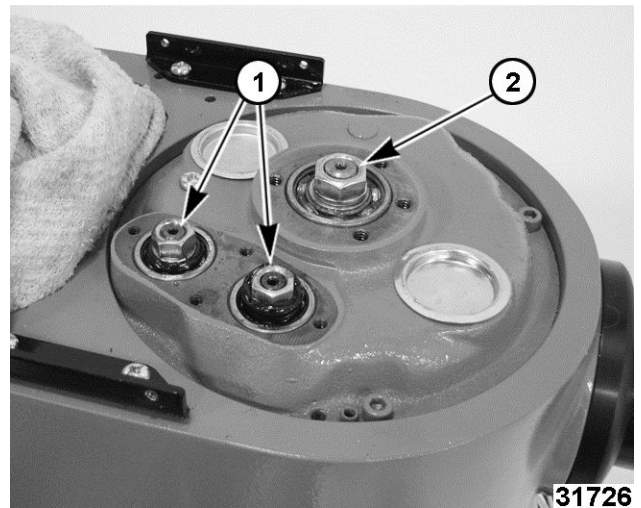


Fig. 38

19. Replace transmission shaft lock washers and nuts (1, Fig. 38).
20. Replace planetary upper bearing retainer and cap

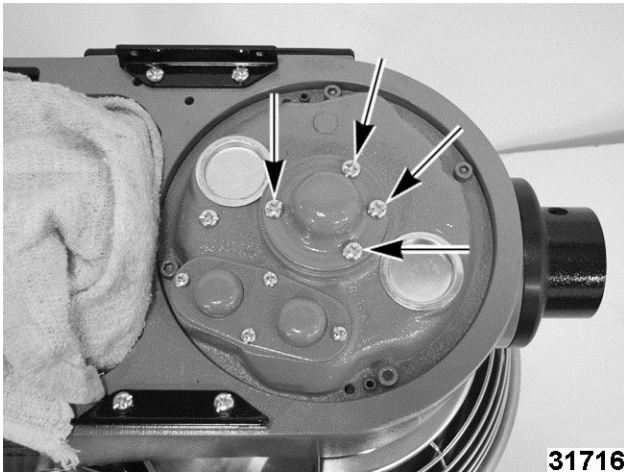


Fig. 39

21. Replace transmission shaft cap.

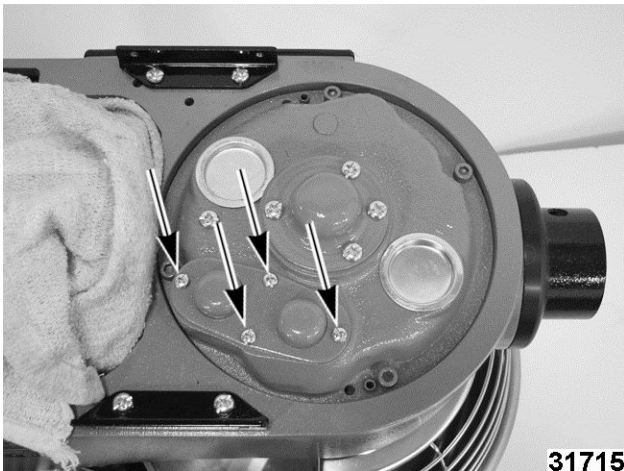


Fig. 40

22. Replace UPPER LID.
23. Check for proper operation.

SHIFT FORK ASSEMBLY



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Disassemble TRANSMISSION.

NOTE: Remove only enough parts from transmission to remove yoke assembly.

MOTOR



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove UPPER LID.
2. Remove screws from rear head cover.

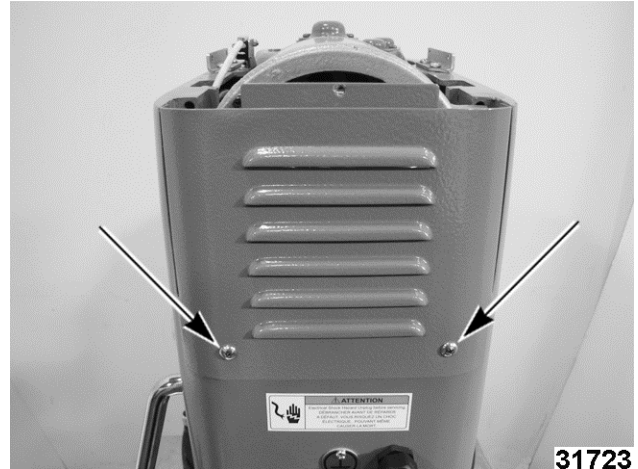


Fig. 41

3. Remove rear column cover.

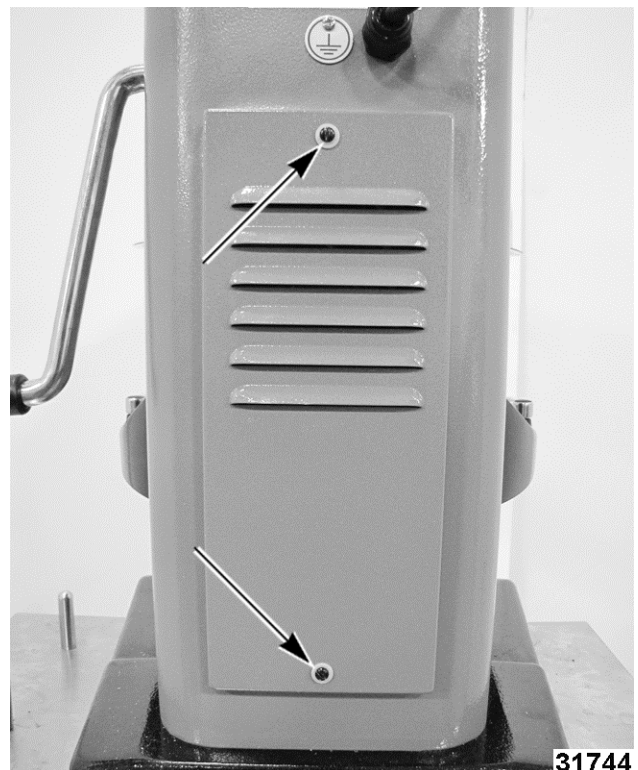


Fig. 42

4. Remove cable ties.

5. Disconnect motor lead wires.



Fig. 43

6. Disconnect ground wire.
7. Remove screws securing capacitor mounting plate.

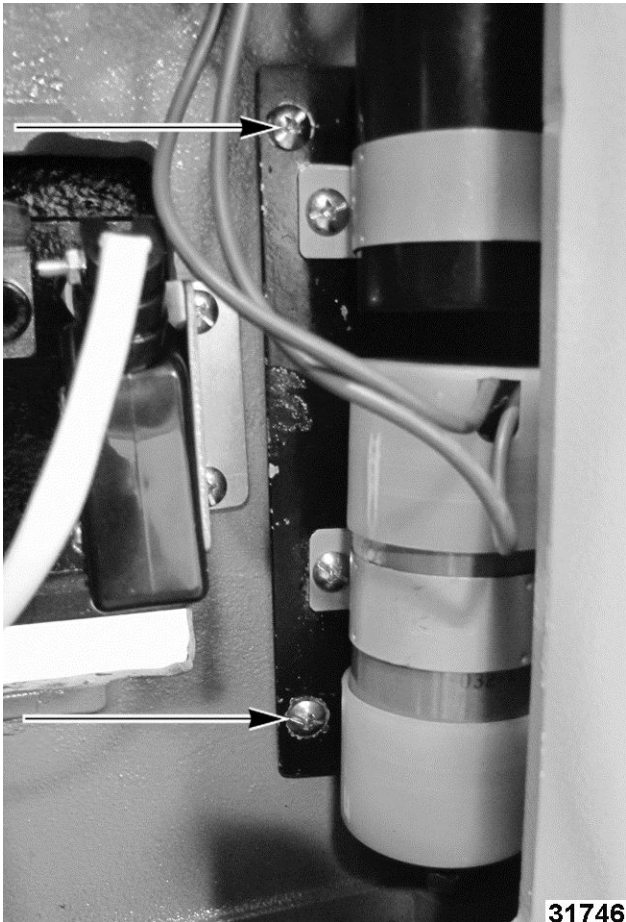


Fig. 44

8. Remove capacitor mounting plate.
9. Remove 40 MFD capacitor by loosening loop clamp screw.



Fig. 45

10. Discharge 500 MFD capacitor.
11. Disconnect 500 MFD capacitor leads.



Fig. 46

12. Dismount power board from column by removing screws.



Fig. 47

13. Position power board away from capacitor mounting plate.
14. Remove motor mounting screws (1, Fig. 48).

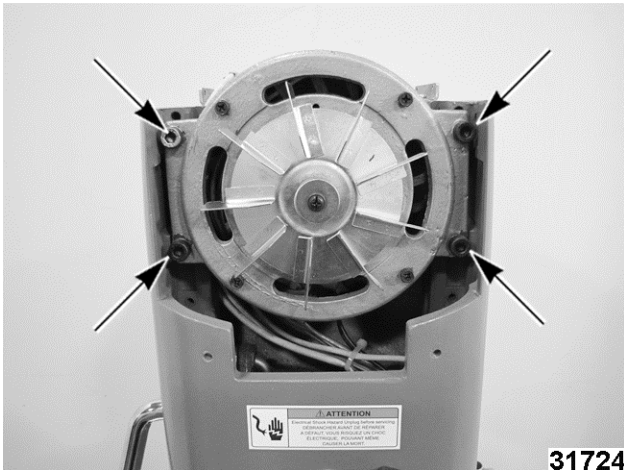


Fig. 48

15. Pull motor away from transmission case.
16. Carefully draw motor leads and 40 MicroFD capacitor out of column with motor.
17. Reverse procedure to install.

NOTE: Run 40 MicroFD capacitor down column before replacing motor.

POWER BOARD



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove rear column cover.

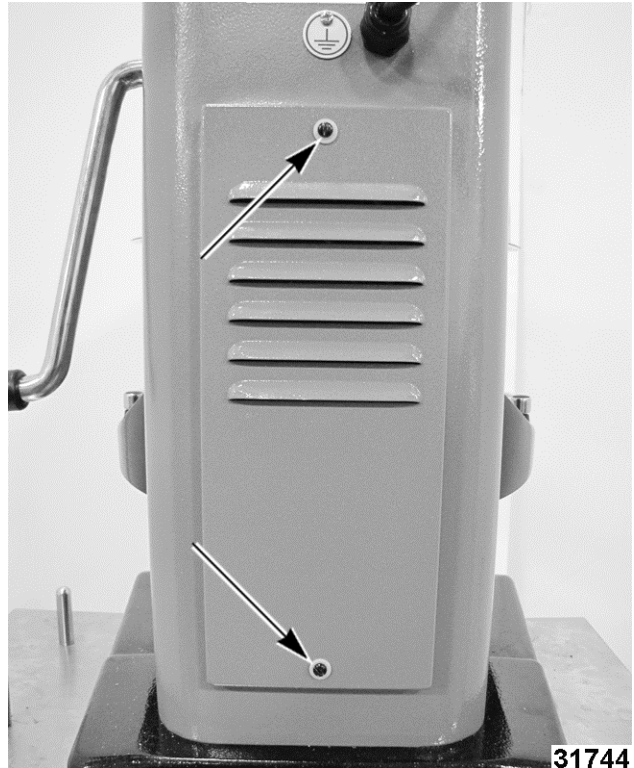


Fig. 49

2. Remove power leads (1, Fig. 50) and motor leads (2, Fig. 50) from bottom of power board.

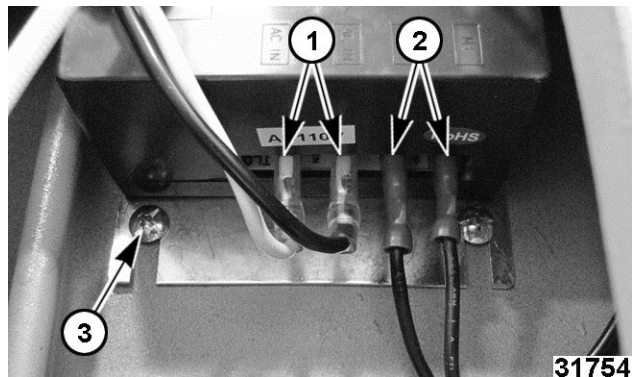


Fig. 50

3. Remove power board by loosening mounting screws (3, Fig. 50).
4. Remove harnesses (1,2,3, Fig. 51) from top of power board.

NOTE: Observe location of harnesses.

NOTE: It may be necessary to push power board up toward top of column to disconnect.

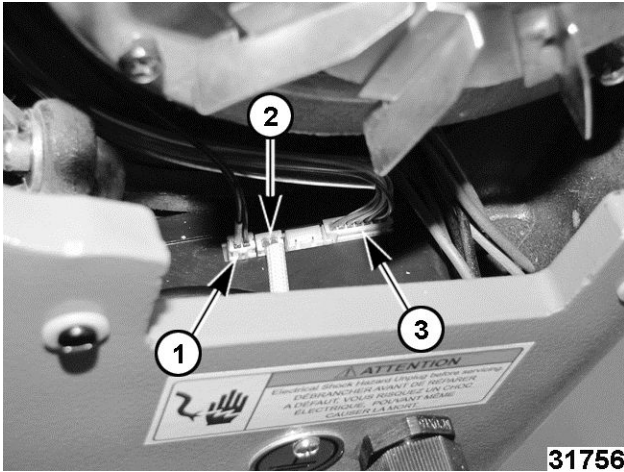


Fig. 51

- Reverse procedure to install.

BOWL IN SWITCH



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

- Remove UPPER LID.
- Remove rear head cover.

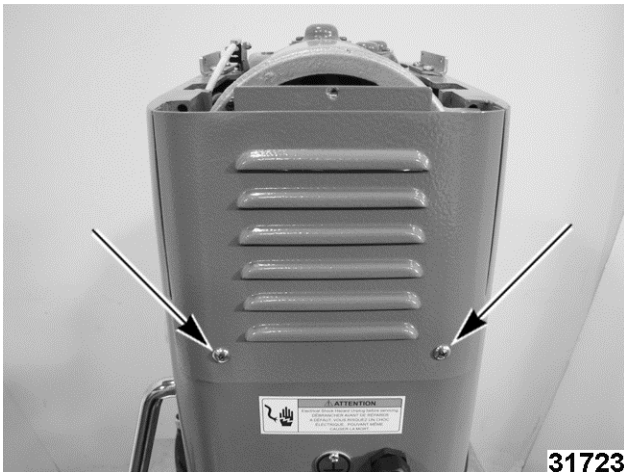


Fig. 52

- Remove rear column cover.

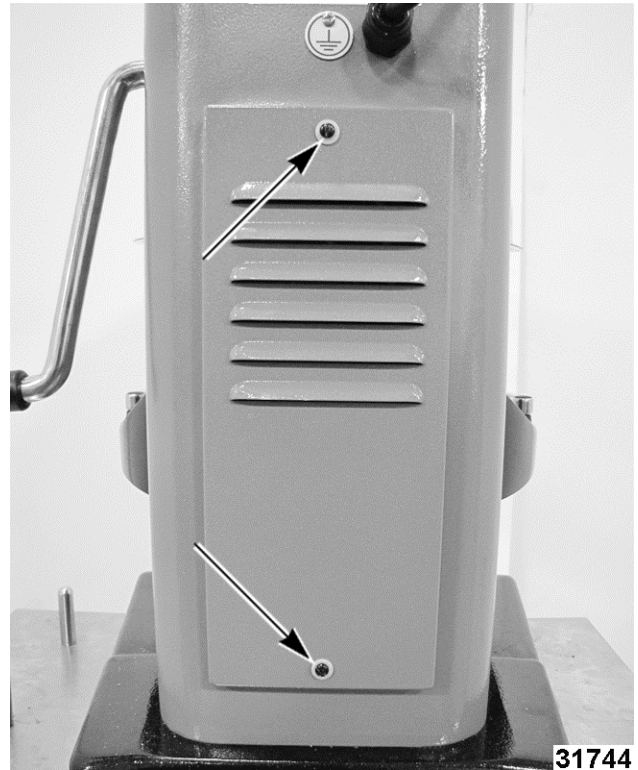


Fig. 53

- Disconnect bowl in micro switch (2, Fig. 54) from power board.

NOTE: It may be necessary to loosen power board mounting screws and push power board up toward top of column to disconnect.

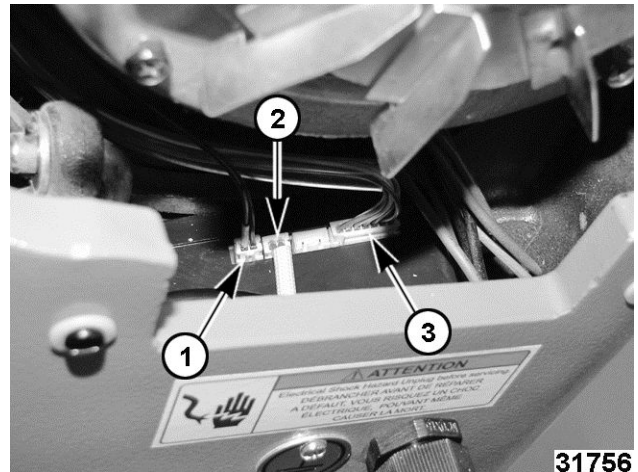


Fig. 54

- Remove bowl in micro switch by removing screws.



Fig. 55

6. Reverse procedure to install.
7. Check for proper operation.

BOWL GUARD SWITCH



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove UPPER LID
2. Remove rear head cover.

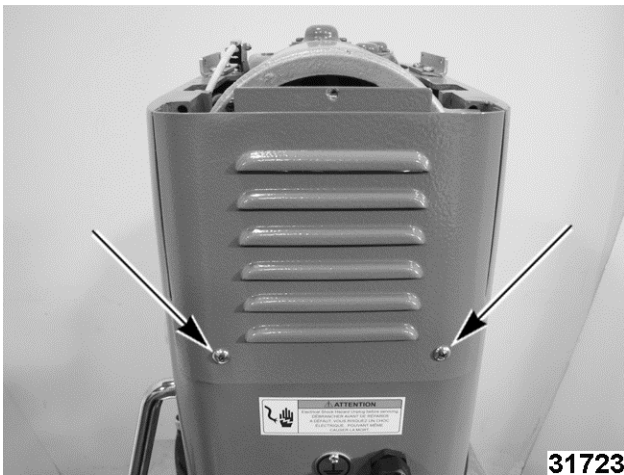


Fig. 56

3. Disconnect bowl guard switch (1, Fig. 57) from power board.

NOTE: It may be necessary to loosen power board mounting screws and push power board up toward top of column to disconnect.

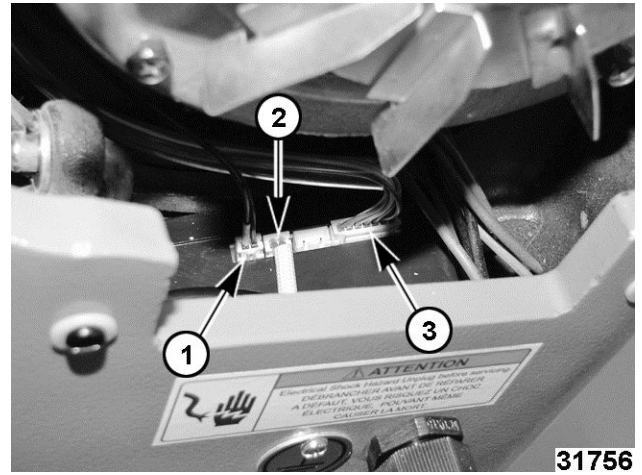


Fig. 57

4. Remove control panel.



Fig. 58

5. Remove jam nut from bowl guard switch.



Fig. 59

6. Unscrew bowl guard switch from outside and pull switch through.

NOTE: It may be necessary to remove bowl safety cover.

7. Reverse procedure to install.
8. Verify bowl guard switch function:
 - A. Machine operates when bowl guard is closed.
 - B. Machine stops when bowl guard is opened.

SPEED SHIFT SWITCH



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove control panel by removing screws.



Fig. 60

2. Disconnect speed shift micro switch from control panel (1, Fig. 61).

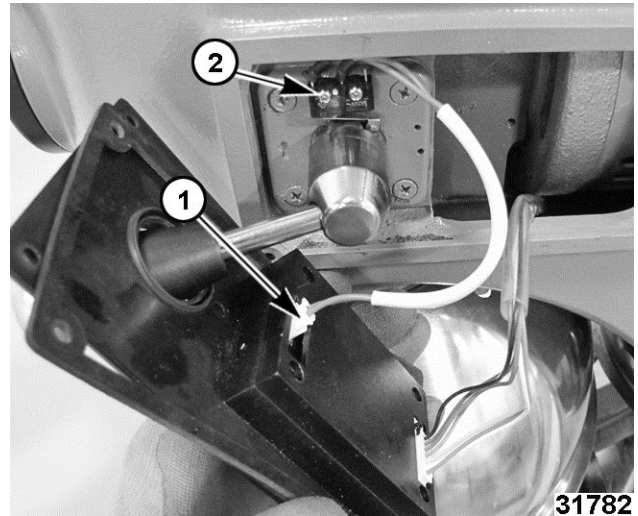


Fig. 61

3. Remove speed shift micro switch by removing screws (2, Fig. 61).
4. Reverse procedure to install.

NOTICE

Do not overtighten speed shift switch screws.

5. Check for proper operation.

SERVICE PROCEDURES AND ADJUSTMENTS

BOWL GUARD TAB ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

Bowl guard shoes are properly adjusted when:

- Up and down movement of bowl guard is no more than 2mm when guard is closed.
- Up and down movement of bowl guard is no more than 3mm when guard is open.
- Left and right movement of bowl guard is no more than 1mm when guard is closed.

1. Remove bowl guard.
2. Loosen Tab B screws.

NOTE: Tab B is attaches to the safety guard ring holder.

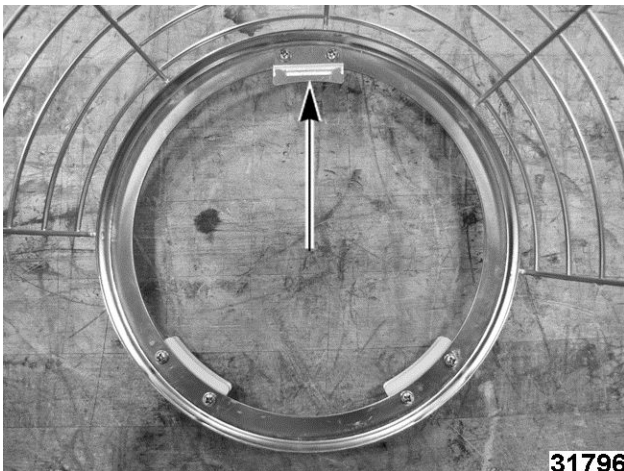


Fig. 62

3. Press Tab B completely inboard (towards Tabs A and C).
4. Tighten Tab B screws.
5. Replace bowl guard.
6. Open bowl guard enough to access Tabs A and C.
7. Repeat above procedure for Tabs A and C until bowl guard does not rattle and above specifications are met.

BOWL GUARD SWITCH ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove control panel by removing screws.



Fig. 63

2. Loosen jam nut from bowl guard switch.



Fig. 64

3. Adjust height of switch to allow a 2-4mm gap between switch and magnet.



Fig. 65

4. Tighten jam nut.
5. Reassemble in reverse order.
6. Check mixer for proper operation.

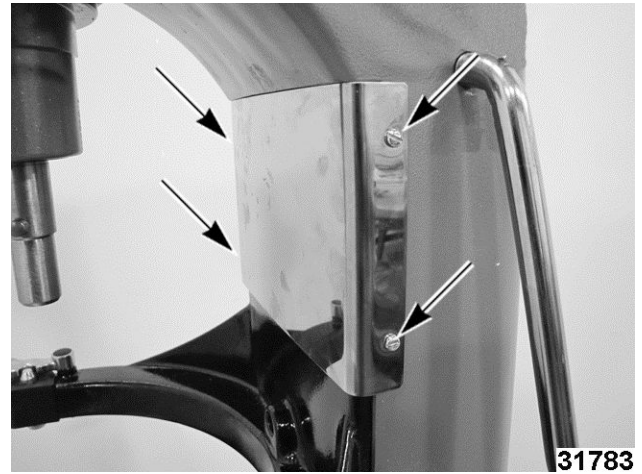


Fig. 67

4. Remove safety guard.
5. Replace bowl and agitator.
6. Loosen jam nut (1, Fig. 68).

BOWL TO BEATER CLEARANCE ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove agitator, bowl, and bowl guard.
2. Remove bowl safety cover by removing two screws and gently pull down.

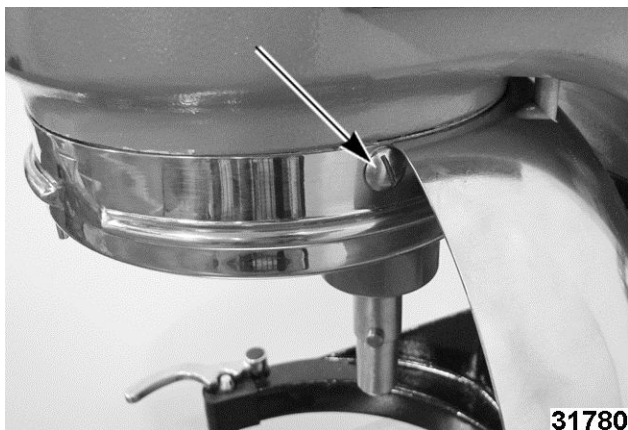


Fig. 66

3. Remove front column cover.

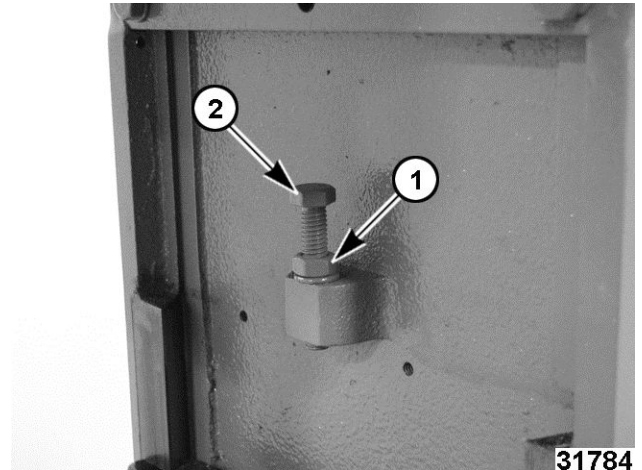


Fig. 68

7. Adjust bowl lift stop screw (2, Fig. 68) until bowl to beater clearance of 0.054" - 0.115" is achieved.

NOTE: Bowl to beater clearance should be conducted with 20 quart beater.

8. Tighten jam nut.
9. Reassemble mixer.
10. Check for proper operation.

NOTE: If bowl lift no longer locks, perform BOWL LOCK ADJUSTMENT.

BOWL LOCK ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove rear column cover.

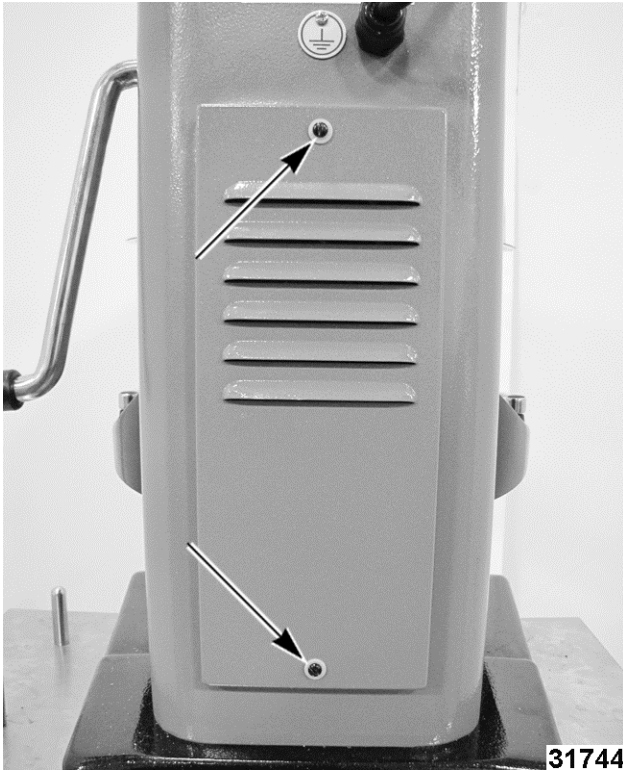


Fig. 69

2. Loosen jam nut (1, Fig. 70).

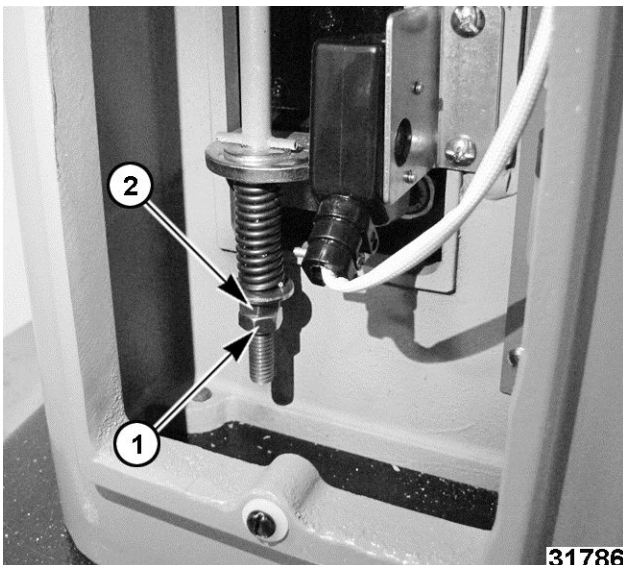


Fig. 70

3. Adjust compression spring tension.
 - A. If bowl lock is too loose, turn bowl lock nut (2, Fig. 70) CCW (as seen from above) until proper locking action is achieved.
 - B. If bowl lock is too tight, turn bowl lock nut CW (as seen from above) until proper locking action is achieved.
4. Tighten jam nut.
5. Replace rear column cover.

BOWL IN SWITCH ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

Bowl in switch is properly adjusted when:

- Switch actuator is always in contact with bowl switch bushing.

NOTE: Bowl switch bushing pin should be inset approximately 2-4mm from surface of housing (where bowl contacts bushing pin).

- Switch is un-actuated when bowl is removed.
- Switch is actuated when bowl is in place.
- Switch actuator does not deform or overtravel when bowl is in place.

1. Remove rear column cover.

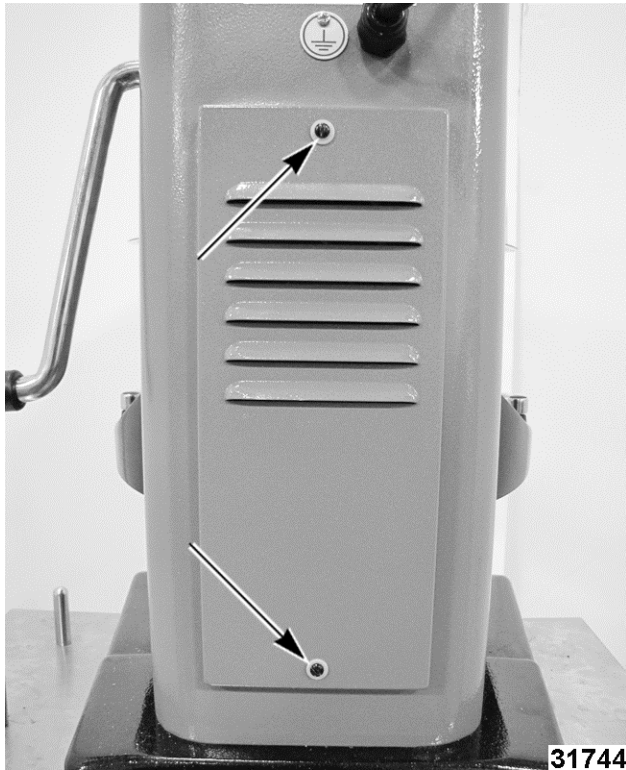


Fig. 71

2. Verify bowl switch bushing depth is between 2-4mm.
 - A. If bushing is too shallow, turn bushing counterclockwise.
 - B. If bushing is too deep, turn bushing clockwise.



Fig. 72

3. Install bowl.
4. Loosen bowl in switch screws.

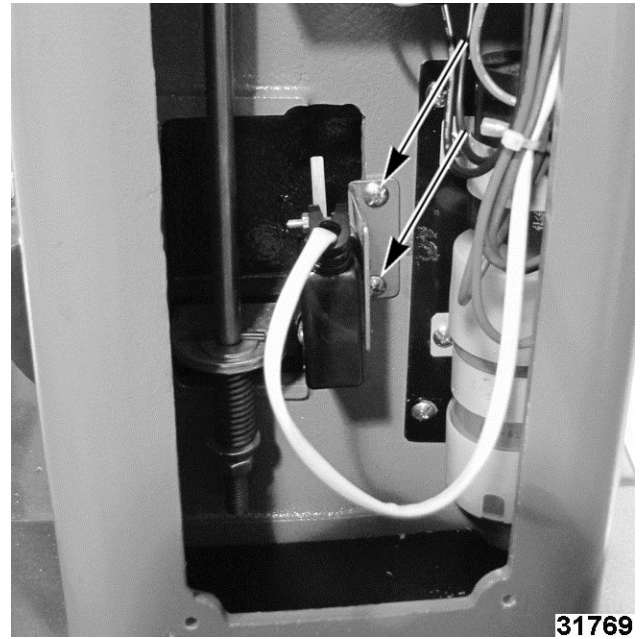


Fig. 73

5. Adjust bowl in switch so that actuator arm actuates switch when bowl is installed and bowl lift is raised.

NOTE: Verify actuator arm does not bend or deform during actuation.

6. Replace in reverse order.
7. Check mixer for proper operation.

SPEED SHIFT SWITCH ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

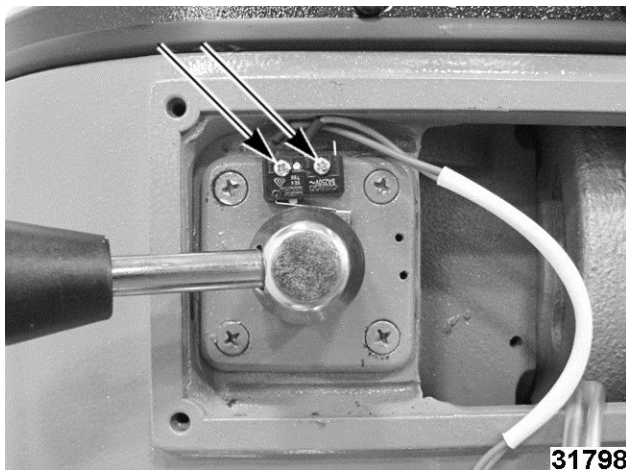
1. Remove control panel.



31740

Fig. 74

2. Place speed selector in first speed.
3. Loosen speed shift switch screws.



31798

Fig. 75

4. Adjust switch so that actuation occurs between grooves in shifter, but actuator arm does not bend or deform.

NOTE: Verify switch fully un-actuates when actuator arm settles into grooves in shifter.

5. Tighten speed shift switch screws.
6. Replace in reverse order.
7. Check mixer for proper operation.

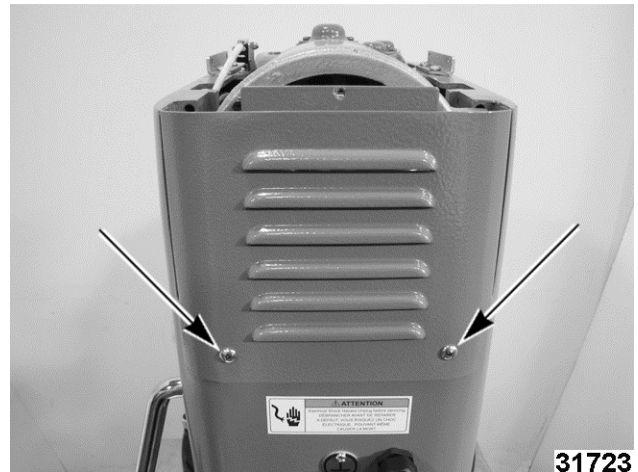
MOTOR CENTRIFUGAL SWITCH ADJUSTMENT



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

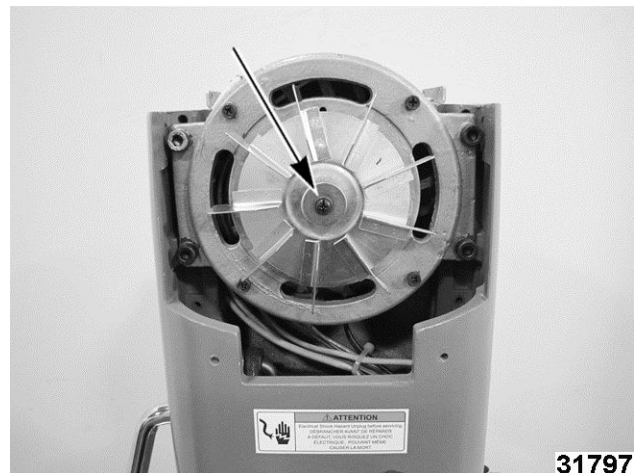
1. Remove UPPER LID.
2. Remove rear head cover.



31723

Fig. 76

3. Remove screw and washer from motor fan.



31797

Fig. 77

4. Remove motor fan by loosening set screws.
5. Set governor switch as close to governor switch plate as possible.

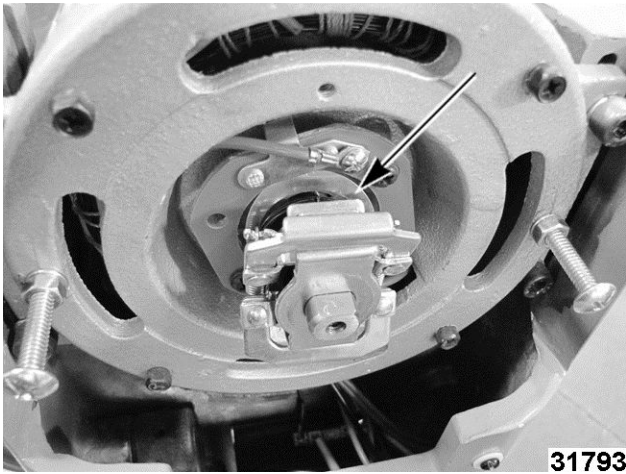


Fig. 78

6. Press fan onto shaft until fully seated against governor switch.
7. Tighten set screws.

NOTE: Ensure one set screw is tightened against the flat of motor shaft.

8. Replace remaining parts in reverse order.
9. Check mixer for proper operation.

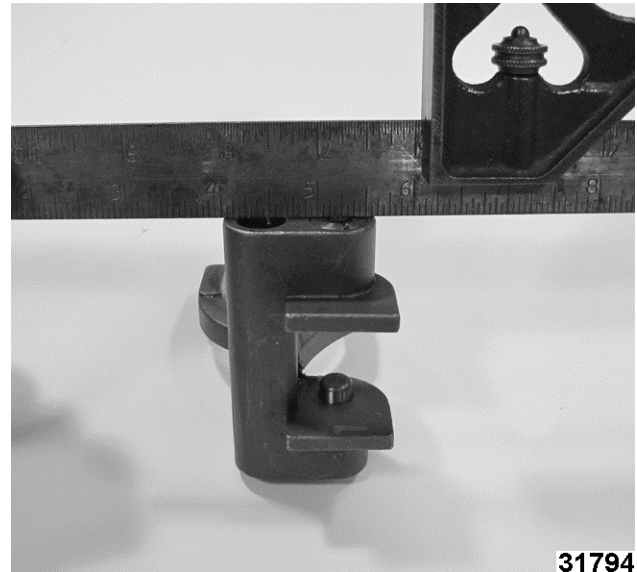


Fig. 79

3. Replace shift fork.
4. Assemble transmission. Refer to TRANSMISSION ASSEMBLY.
5. Check mixer for proper operation.

SHIFT FORK PLUNGERS ADJUSTMENT



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Disassemble TRANSMISSION.

NOTE: Remove only enough parts from transmission to remove shift fork.

2. Set lock screws flush with shift fork.

ELECTRICAL OPERATION

COMPONENT FUNCTION

Centrifugal Start Switch	Removes power from start windings when motor reaches operating speed.
Bowl In Switch	Ensures the bowl is fully inserted into bowl support and bowl support is fully raised before mixer will run.
Bowl Guard Switch ...	Prevents operation of agitator and attachment hub when bowl guard is open.
Speed Shift Switch ...	When operated, turns motor off to allow smooth shifting between gears.
Start Capacitor	The capacitor shifts electrical phase between the motor start winding and run winding so the motor will start in the proper direction.
Run Capacitor	Creates a rotating magnetic field to improve performance of motor operation while running.
Motor	Drives transmission.
Timer Control Panel	Allows time input and start and stop function. Also controls power board operation.
Power Board	Receives input from Timer and directly controls power to motor.

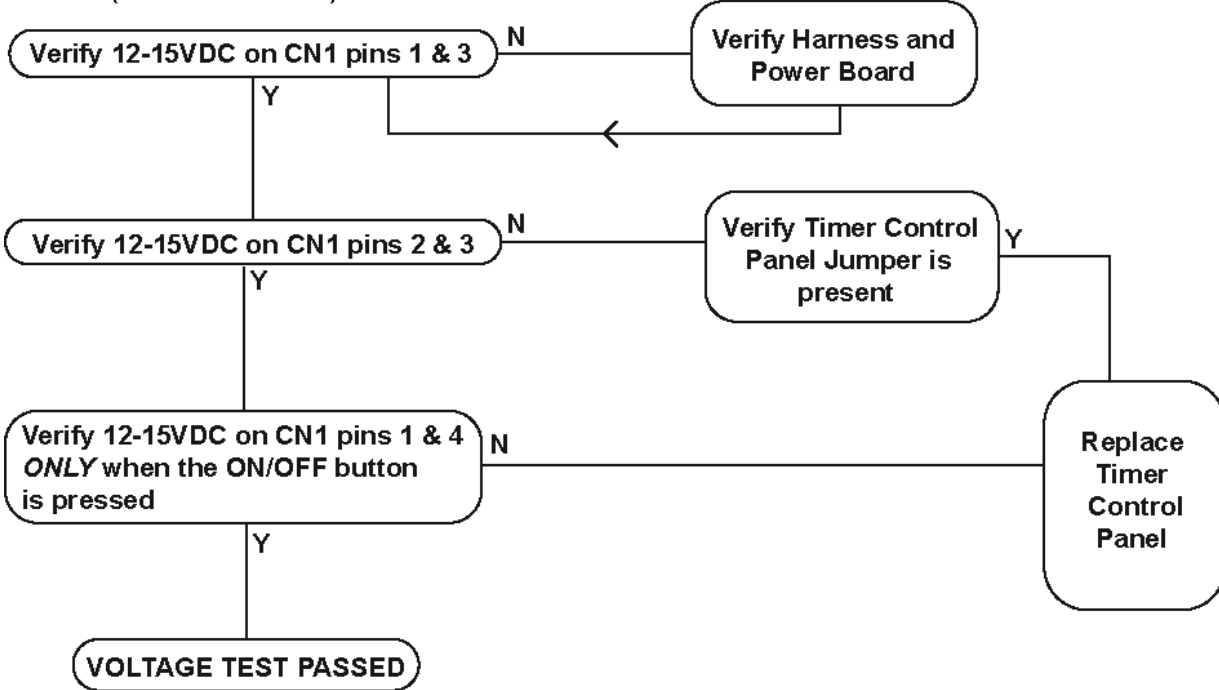
ELECTRICAL TESTS

⚠ WARNING

CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER AND FOLLOW LOCKOUT / TAGOUT PROCEDURES, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

TIMER CONTROL VOLTAGE TEST

START (120VAC to Mixer)



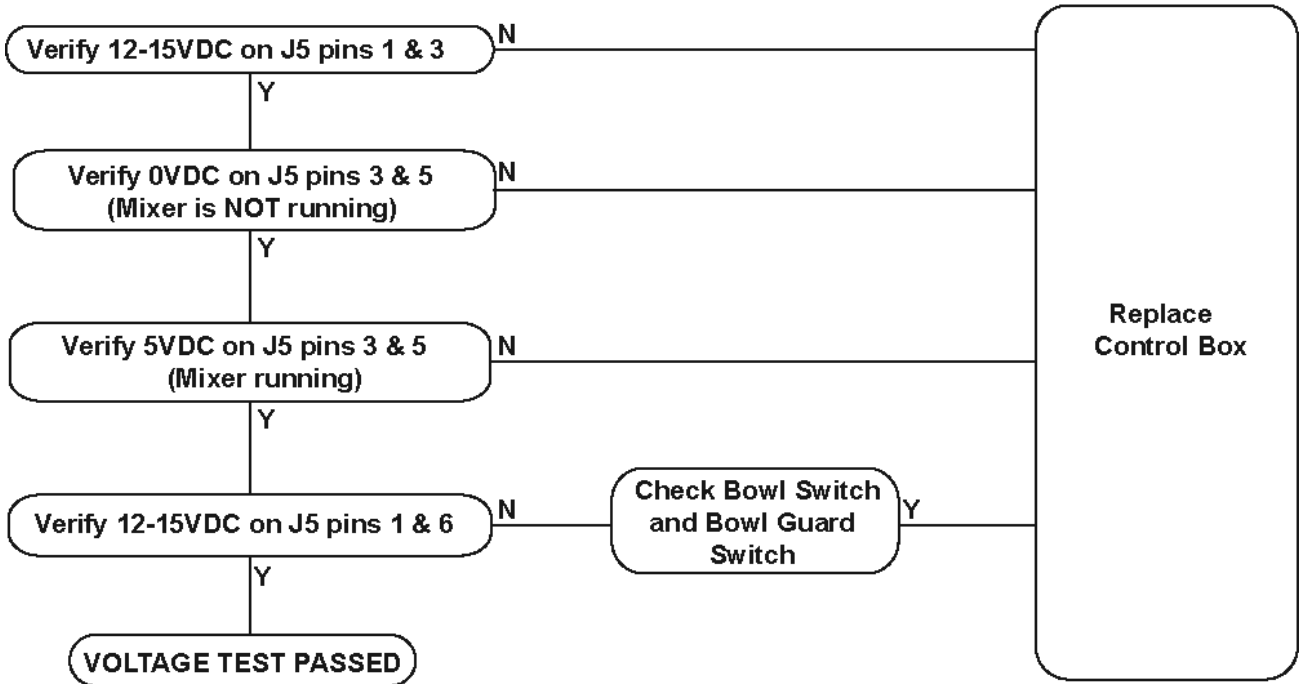
NOTE: Voltage checks are to determine that proper operating potentials are present for operation. Due to the nature of the design, it is possible to have proper voltages and still be defective. Voltage checks should be used to determine base signal functionality and is not an indication of proper digital operation.

AI4907

Fig. 80

POWER BOARD VOLTAGE TEST

START (120VAC to Mixer)



NOTE: Voltage checks are to determine that proper operating potentials are present for operation. Due to the nature of the design, it is possible to have proper voltages and still be defective. Voltage checks should be used to determine base signal functionality and is not an indication of proper digital operation.

AI4908

Fig. 81

ELECTRICAL DIAGRAMS

CONNECTION DIAGRAM

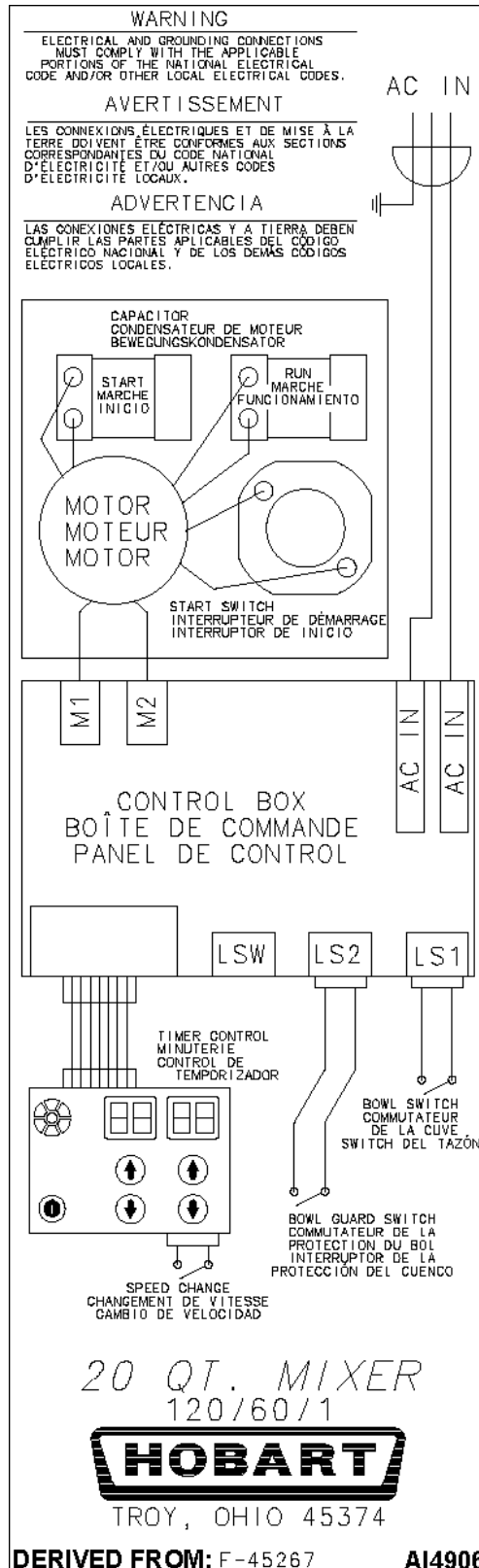


Fig. 82

SCHEMATIC

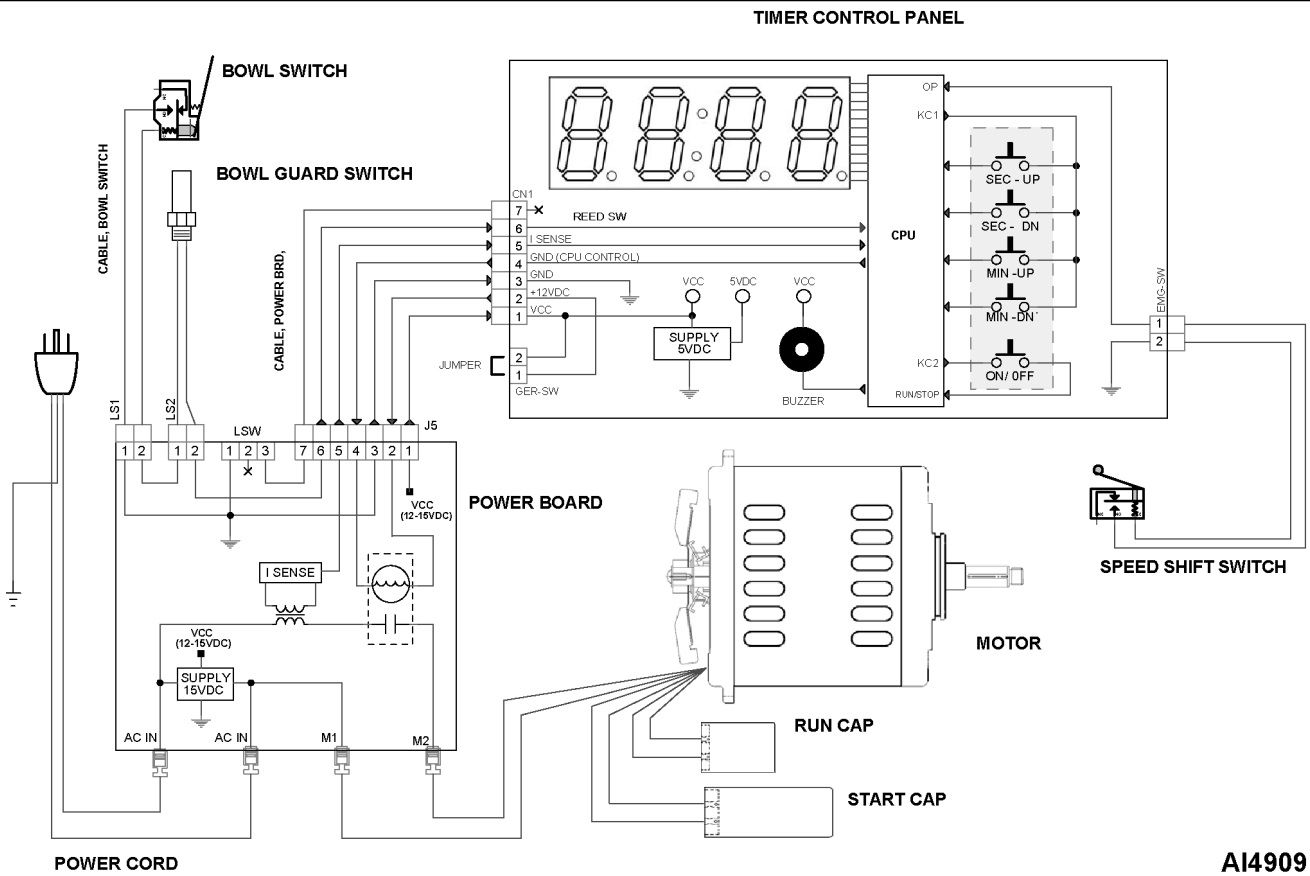


Fig. 83

AI4909

TROUBLESHOOTING

POWER FLOW

First Speed

Clutch sleeve is in neutral / low speed position. Roller clutch (low speed gear) is driven.

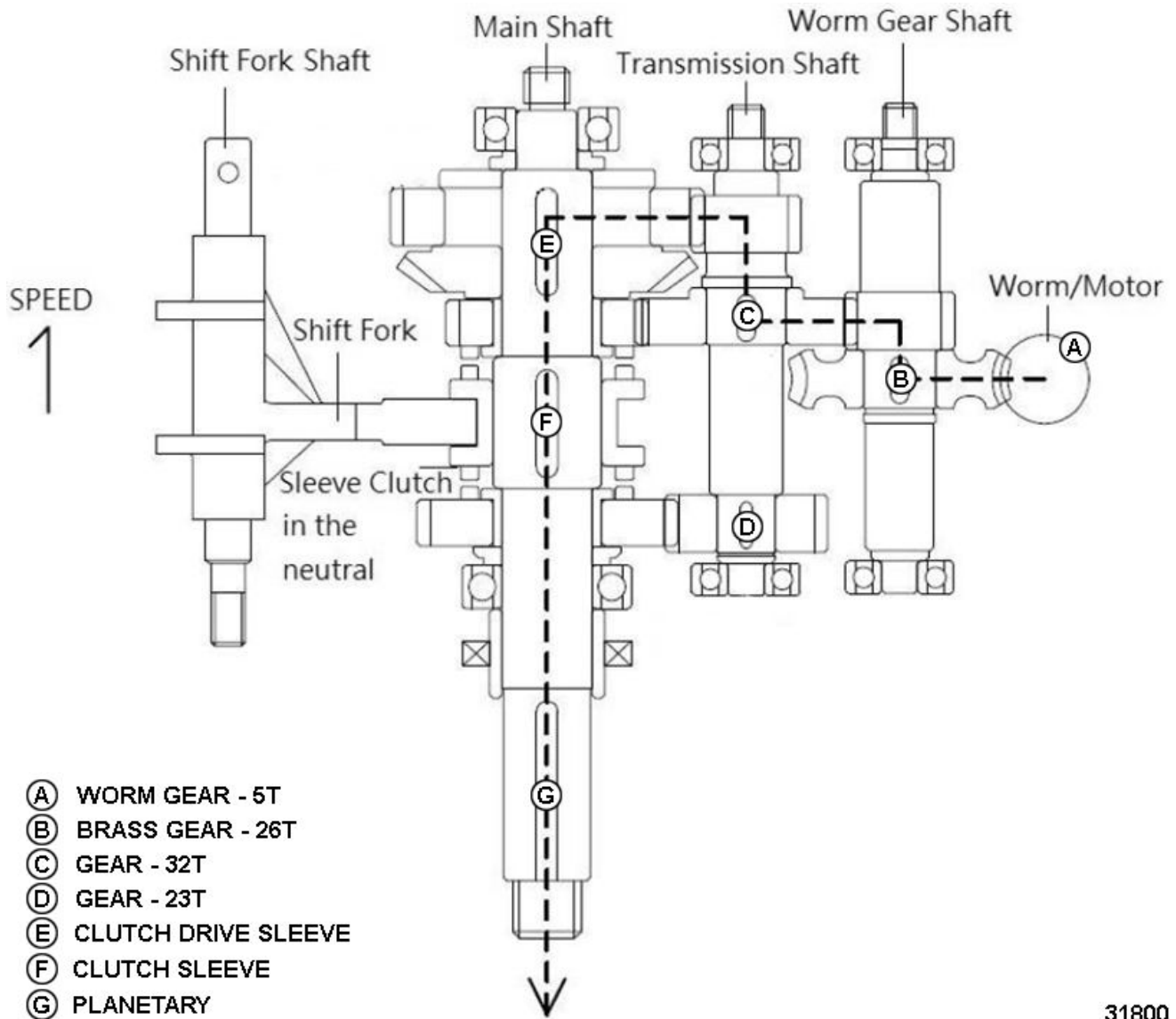


Fig. 84

31800

Second Speed

Clutch sleeve is in down / second speed position and engages second gear.

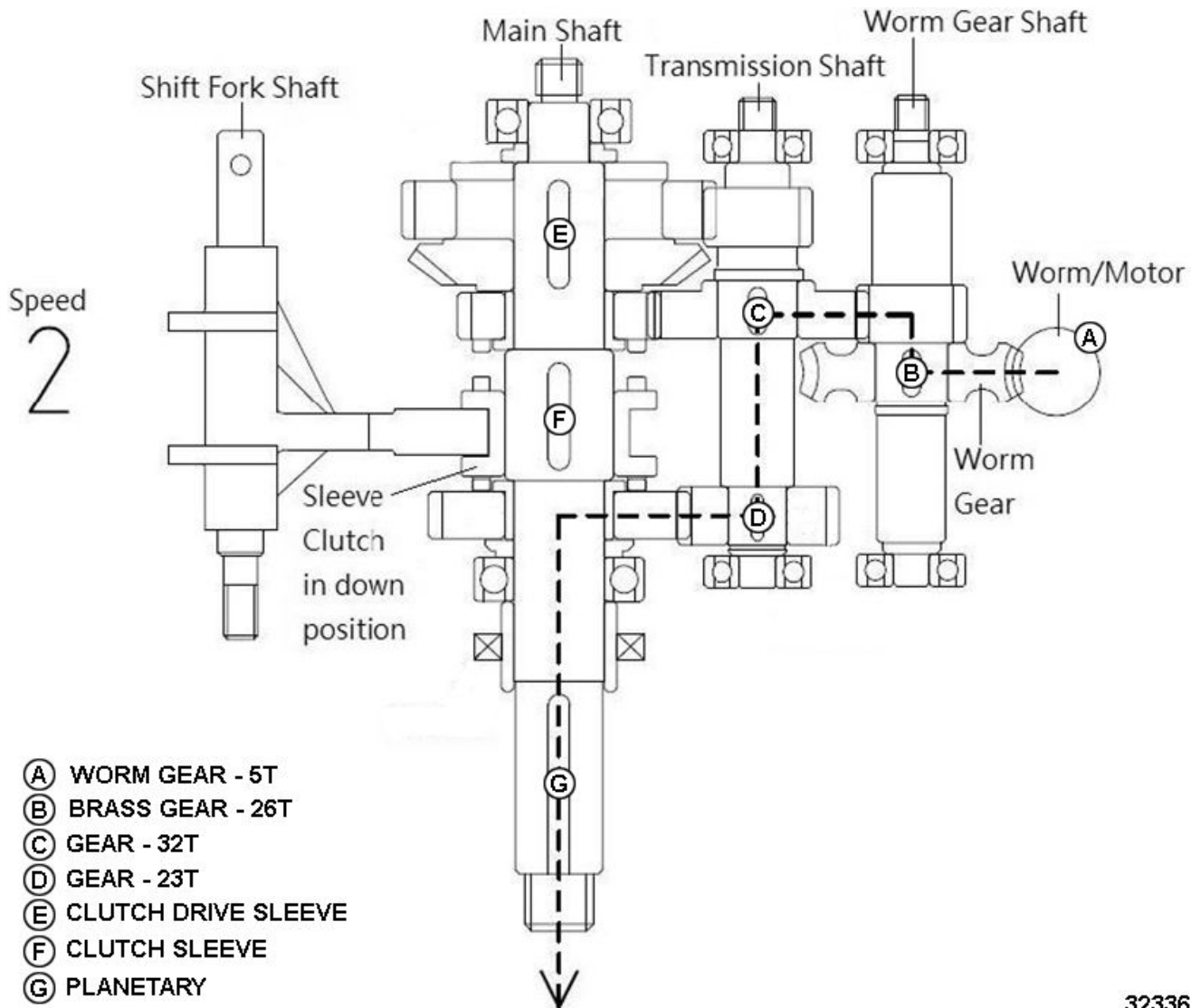


Fig. 85

32336

Third Speed

Clutch sleeve is in up / third speed position and engages third gear.

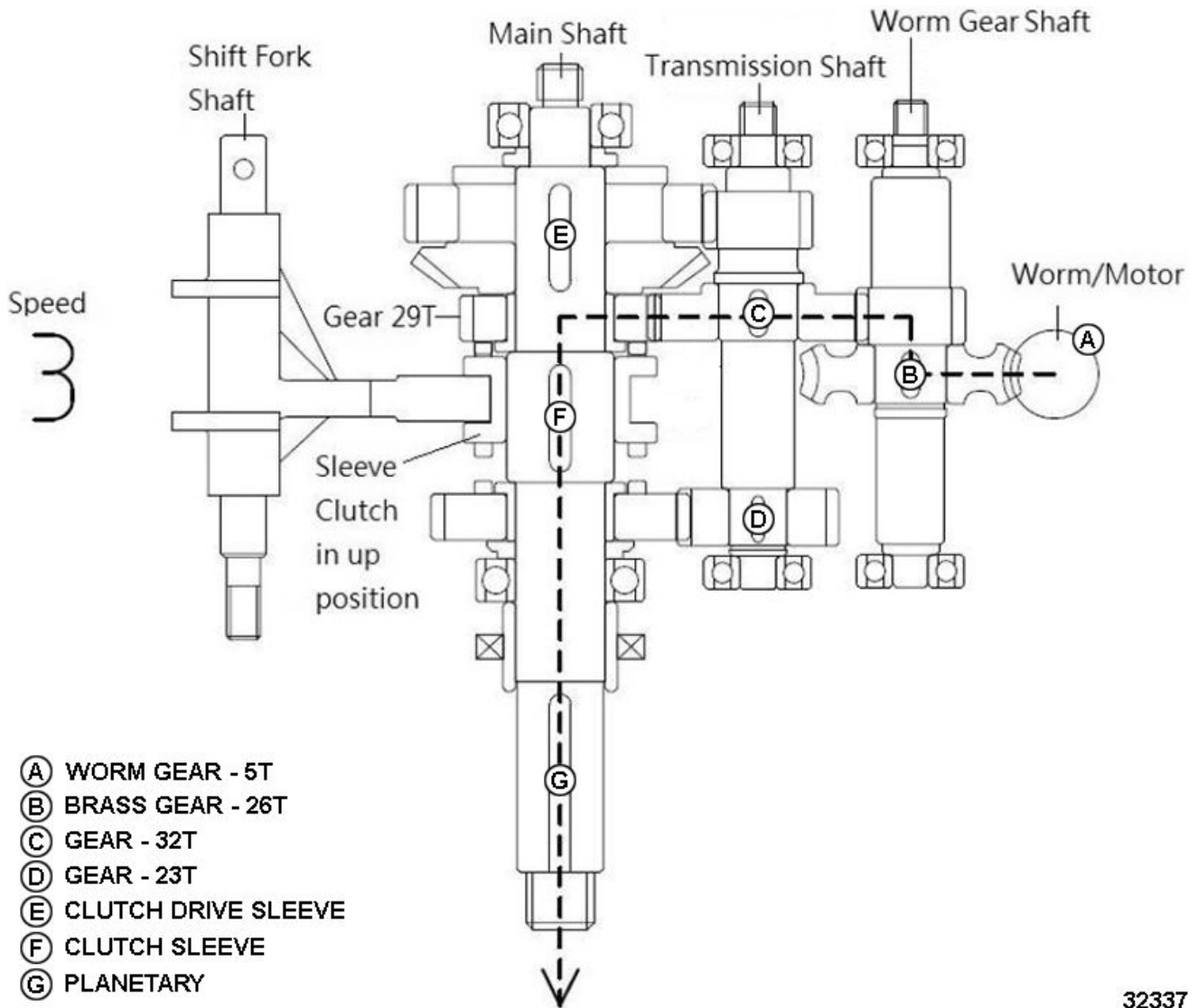


Fig. 86

32337

TABLE

SYMPTOM	POSSIBLE CAUSES
Noise in transmission.	<ol style="list-style-type: none"> 1. Worn or damaged gears. 2. Improperly meshed gears. 3. Worn or broken keys. 4. Worn bearings.

SYMPTOM	POSSIBLE CAUSES
Planetary does not turn in any speed.	<ol style="list-style-type: none"> 1. Key sheared. <ol style="list-style-type: none"> A. Worm Gear - 5T B. Brass Gear - 26T C. Gear - 32T D. Planetary 2. Shaft broken.
Agitator will not turn, planetary does turn.	<ol style="list-style-type: none"> 1. Key sheared at pinion gear on agitator shaft.
Attachment drive does not turn.	<ol style="list-style-type: none"> 1. Key sheared. <ol style="list-style-type: none"> A. Clutch Drive Sleeve.
Grease leaking from planetary.	<ol style="list-style-type: none"> 1. Lower Seal. 2. Gear Case overfilled.
Grease leaking from attachment hub.	<ol style="list-style-type: none"> 1. O-ring in attachment hub. 2. Gear Case overfilled.
Grease leaking from shifter assembly	<ol style="list-style-type: none"> 1. O-ring on shifter handle. 2. Gear Case overfilled.
Will not run, but motor hums.	<ol style="list-style-type: none"> 1. Start capacitor. 2. Centrifugal start switch. 3. Motor.
Will not run, no Control Panel Display.	<ol style="list-style-type: none"> 1. No voltage to machine. 2. Wiring harness connections loose or damaged. 3. Power Board. 4. Control Panel.
Will not run, Control Panel has Display.	<ol style="list-style-type: none"> 1. Bowl Guard Switch. 2. Bowl Switch. 3. Wiring harness connections loose or damaged. 4. Speed Shift Switch. 5. Power Board. 6. Control Panel.
Display reads "OP".	<ol style="list-style-type: none"> 1. Speed Shift Switch. 2. Control Panel.
Mixer will not stay running when On/Off button is released.	<ol style="list-style-type: none"> 1. Control Panel.