

SERVICE MANUAL for

KITCHENAID

STAND MIXER



Models	K45SS	KSM75
	KSM90	KSM103
	KSM110	KSM150
	KSM151	K5SS
	KSM5	KSM50P
	KSMC50	KPM5
	KPM50	KP50P

KITCHENAID

Stand Mixer Service Manual Lit4177310-C

2005 KITCHENAID

SAFETY FIRST

Safety Guidelines

SAFETY FIRST

This Service Manual is written for the Professional Service Technician who has familiarity with the KitchenAid Stand Mixer. The following Safety Guidelines should be adhered to when servicing this product.



SERVICE ENVIRONMENT

- The workplace will be dry and sanitary at all times and all units should be inspected for cleanliness before any work is started.
- Visually inspect the unit requiring service in a well luminated area.
- A mild, non-abrasive dishwashing soap solution and clean towel can be used to wash any unit requiring attention.
- The hands of the service technician should be clean at all times during service procedure.



ELECTRICAL CONSIDERATIONS

- The workplace for the stand mixer will have properly grounded AC outlets that adhere to all Local Electrical Codes that are applicable at the time of repair.
- The Stand Mixer Power Cord should always be inspected first before testing the mixer operation. Do NOT run the mixer if the Power Cord is damaged -- replace it.
- All disassembly and assembly procedures discussed in this manual should be conducted with the unit disconnected from the AC mains.
- Do NOT leave the unit unattended while running the mixer for speed range and bowl clearance checks. Always unplug the unit immediately after concluding these tests.



Technician

- The Service Technician should wear Protective Eyewear at all times when conducting a repair on the Stand Mixer.
- Loose fitting sweaters, shirts sleeves or bracelets should NOT be worn while servicing the Stand Mixer.

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K45SS KSM75 KSM90 KSM103 KSM110 KSM150 KSM151

K5SS KSM5 KSM50P KSMC50 KPM5 KPM50 KP50P

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Introduction

All KitchenAid Stand Mixers are well designed and carefully built. Normally they will give continual use year after year without service attention.

Careful records have been maintained over a period of years to determine and correct, through improved design, any troubles that might possibly develop.

An effort has been made in preparation of this manual to cover them all.

GENERAL INFORMATION

Normal Performance

The KitchenAid Stand Mixer is powered with a universal motor which will operate on 50 or 60 hertz, alternating current only.

The Voltage of the power supply should be within 10 volts either way of the voltage stamped on the mixer trimband and nameplate.

A mixer in good running condition will start turning slowly when the switch lever is moved from the "OFF" position to the "STIR" position.

As the switch lever is moved to successively higher positions, the speed of the beater increases until the #10 speed is reached.

At stir position, the planetary should turn at approximately 60 RPM; at the #10 position all models turn at approximately 255 RPM, with the exception of K45SS models built before May 6th, 2002 (WM19), which turn at approximately 280 RPM.

KITCHENAID STAND MIXER RPM

SPEED	*K45SS	OTHER MODELS
STIR	60 RPM	60 RPM
#10	255 RPM	255 RPM
Prior to May 6th, 2002,		
#10	280 RPM	

*Note: All models have similar RPM, except K45SS units built before May 6th, 2002, which run at 280 RPM in the #10 position.

The mixer will run quietly in the lower speed range; however, some noise can be expected on the higher speed settings due to hum of gears and the motor.

When the mixer is first turned to the stir position, there may be a slight clattering, irregular noise. This noise will disappear as the lubrication in the gearcase warms up.

The switch lever should move freely with the "feel" of definite positions for speed numbers stir, 2, 4, 6, 8 and 10. Speed numbers 3, 5, 7 and 9 do not have definite notches.

Power

A mixer will have full power on all speed settings. To check for full power, carefully hold the planetary with one hand and move the switch lever on and off with the other hand.

At the stir position, it should not be possible to stall the planetary except by a very great effort; nor should the planetary slow down noticeably when the retarding pressure is applied.

Heating

Under normal conditions, the mixer will not show any tendency to heat because of the built-in ventilating system in the motor.

Under heavy loads with extended mixing time periods, the head may heat up to the point of being uncomfortable to touch.

Speed Control

The speed control of the mixer is attained through the use of a governor assembly mounted at the rear of the control plate assembly.

The electrical circuit is made and broken by the action of the fly ball governor revolving against the control plate.

When the switch lever is moved to an ON position, the position of the control plate with respect to the governor is changed by the action of the switch lever.

Thus, when the control plate is set close to the governor, a relatively low speed of the motor causes the governor to make or break the mixer's electrical circuit through the control plate.

When the control plate is set farther away, a greater motor speed is required before the governor starts breaking the circuit.

The action of the governor is such that the speed of the motor will remain constant for a given setting of the control plate within certain loads.

After certain loads have been exceeded, the speed of the motor will drop to meet the torque requirements of the given load.

Speed is controlled by the governor and the control plate in conjunction with the phase control.

TRIAC RMS VOLTAGE

BOTH CONTACTS OPEN - 40 VOLTS

ONE CONTACT OPEN - 80 VOLTS

BOTH CONTACTS CLOSED - FULL VOLTAGE

NOTE: The triac regulates the power the motor sees depending on control board contacts.

A device called a triac is a part of the phase control circuit.

This device determines the amount of power the motor sees dependent upon the condition of the control board contacts.

If both contacts are open, about 40 volts RMS is applied to the motor and about 80 volts is applied when either contact is closed and the other is open.

SECTION 1

DISASSEMBLY OF THE GEARCASE AND PLANETARY

A. All solid state KitchenAid mixers have the same motor and control parts and the gears in the gearcase are alike, with one exception: "K45SS units built prior to May 6th, 2002."

Planetary parts are all the same, except that some early production K5SS had a lead weight.

Gearing and motor instructions are for both tilt head and bowl lift machines and any differences will be pointed out.

BOWL LIFT - Models K5SS, KSM5, KSM50, KSMC50, KPM5, KPM50, KP50. The bowl is raised and lowered into position.

TILT HEAD - Models K45SS, KSM45, KSM75, KSM90, KSM103, KSM110, KSM150, KSM151, KSM152. The mixer head is tilted up and down into position.

Bowl, column, base and bowl lift details are covered separately in section 7.

B. Before repairs are attempted on any KitchenAid mixer, a wattmeter test should be made. To make the test, set the wattmeter to the proper voltage.

Next, plug the cord from the mixer into the wattmeter. Turn on the current and run the mixer.



KitchenAid stand mixer shown with a digital wattmeter

If the wattmeter shows up to 135 watts, going from stir to #10 speed, the mixer is in good condition.

If the wattmeter reading is 175 to 400 watts, there is a problem.

High wattage mixer readings indicate either electrical or mechanical problems.

Check first for bearing/gear drag, then for motor/brush problems.

CAUTION: Always remove power cord from electrical outlet before servicing any part of the mixer.

When both contacts are closed, the triac is full on; consequently, full power is applied to the motor. In this way, the speed is controlled.

If the mixer motor begins to run too fast for a particular speed setting, one or both contacts open, which cuts back on the voltage the motor sees, thus slowing it up.

If the motor operation becomes too slow, one or both contacts will close, applying the needed voltage to the motor to sufficiently increase motor speed.

This is always accomplished through the triac.

The control plate contacts control the triac, and in turn, controls the amount of power supplied to the motor.

BEATER

The beater should fit freely on the beater shaft located in the planetary.

Power is transmitted from the motor to the center-bevel gear assembly by means of the worm gear.

The center-bevel gear assembly engages the beater pinion, located in the planetary, to turn the beater shaft.

The attachment hub bevel gear also meshes with the center-bevel gear assembly to transmit power when various attachments are being used.

LUBRICATION

Under normal service conditions, the mixer will not require lubrication for many years.

The gear case is lubricated with an ample supply of Benalene 930-2 grease (6 fluid ounces), which lubricates all the gears and shafts.

GEARCASE LUBRICATION

All KitchenAid Stand Mixer Gearcases are lubricated with 6 Fluid Ounces of:

BENALENE 930-2 GREASE (OR EQUIVALENT)

NOTE: Gearcases lubricated with this grease will not require lubrication for years.

The motor bearing and the beater shaft bearing are oil impregnated.

The rear motor bearing has a felt washer which has been presoaked in oil.

The front motor bearing in the mixer housing is a ball bearing.

C. Note: remove the bowl and any attachments before disassembly of unit.

Remove the #6-32x3/8" (tapered head) screw from the end cover (Fig. 1).



Fig. 1 The end cover is removed by removing the tapered head endcover screw.

Remove the two #6-32x3/16" screws that hold the trimband to the gearcase-motor housing (Fig. 2). With the screws removed, take the trimband off and set aside.



Fig. 2 The trimband can be removed after removing the trimband screws.

D. To save the paint, lay the unit in a padded cradle or on a cloth pad.

To remove the pedestal from the gearcase-bottom cover, turn the unit upside down in a padded cradle. Loosen the set screw with a screwdriver (Fig. 3)



Fig. 3 Loosen the hinge pin setscrew to remove the pedestal from the bottomcover.

Using a drift punch and hammer, drive out the hinge pin (Fig. 4) and lift the pedestal off the gearcase-bottom cover.



Fig. 4 A drift punch and hammer is used to drive out the hinge pin.

E. To remove the planetary, first remove the drip ring. Use a screwdriver on the upper edge of the drip ring and gently tap the screwdriver to remove the drip ring (Fig. 5).



Fig. 5 The Drip Cup fits tightly and must be started off by tapping it.

With a 5/32" drift punch, remove the groove pin that holds the planetary to the vertical center shaft (Fig. 6).



Fig. 6 Removal of the groove pin that holds the planetary to the vertical center shaft

With the pin out, the planetary can be removed from the center shaft. Using two (2) screwdrivers, pry the planetary up and off the shaft (Fig. 7).



Fig. 7 Use two screwdrivers to pry the planetary off the shaft.

F. Remove the power cord from the bottom cover by sliding the molded strain relief out of the slot in the bottom cover (Fig. 8).



Fig. 8 Pull back on the molded strain relief to remove the power cord from the slot in the bottom cover.

To remove the power cord with the Heyco strain relief used on older models, use a pair of pliers to squeeze the strain relief while pulling up (Fig. 9). Reverse this procedure to reinstall it.

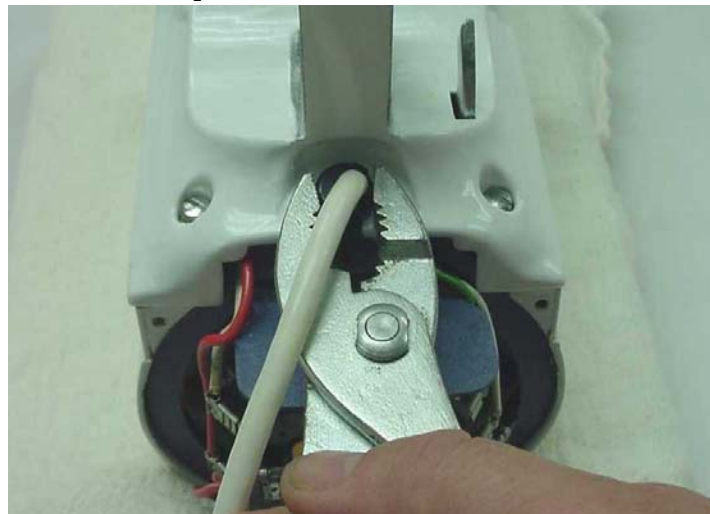


Fig. 9 Removal of Heyco strain relief using pliers.

G. To remove the bottom cover from the gearcase-motor housing, unscrew the five (5) #10-24 special screws (Fig. 10). These screws hold the internal gear into the bottom cover.

Next remove the four (4) filister head screws from the bottom cover (Fig. 11).



Fig. 10 Removal of the 5 special screws holding the internal gear in the bottom cover.



Fig. 11 The bottom cover is removed after removing the four #10-24 filister head screws.

To remove the bottom cover from the gearcase-motor housing, insert a drift punch through the hole in the center shaft and lift, while using a screwdriver to break the bottom cover loose.

Use the slots in the side of the gearcase to do this (Fig. 12).

Do **NOT** pry in the area of the transmission gasket, as this may prevent the gasket from sealing properly upon reassembly.

The transmission gears will come out with the bottom cover. Be careful not to allow any grease to fall into the motor area of the housing.

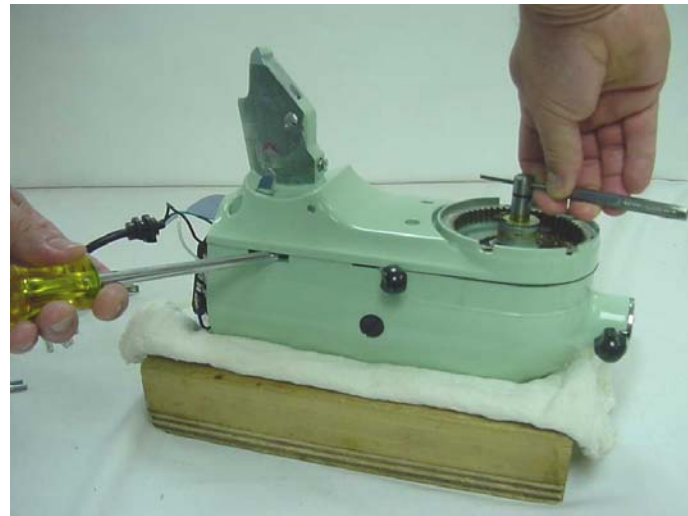


Fig. 12 While lifting up on the center shaft, use a screw driver to gently pry the bottom cover from the housing.

H. Remove the attachment hub bevel gear from the gearcase-motor housing.

This gear is removed by simply pulling it out of the attachment hub (Fig. 13). The gear will clear the worm of the motor's armature shaft and should be easy to remove.

Note: For clarity, the pictures in this manual have no grease shown in the gearcase. Normally the gearcase has 6 oz. of grease surrounding the gears.

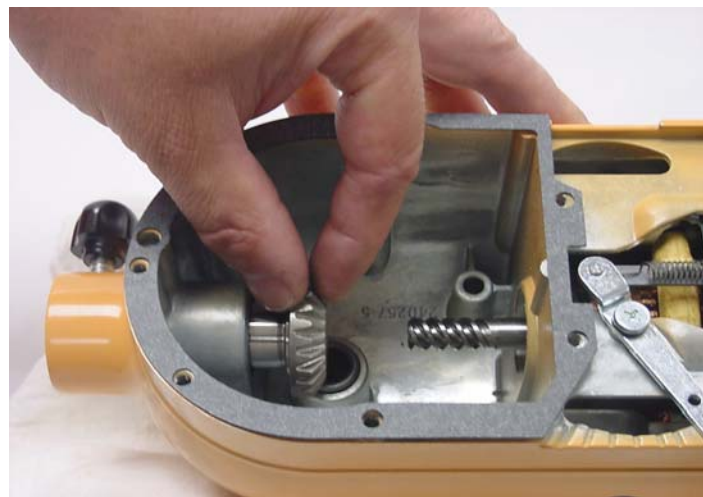


Fig. 13 The attachment hub bevel gear being removed from the mixer attachment hub bearing.

I. Clean out the gearcase and remove as much of the grease as possible.

The gearcase may be thoroughly cleaned when the motor has been removed.

SECTION 2

DISASSEMBLY OF STAND MIXER MOTOR AND CONTROL UNIT

Note: All service operations discussed here should be performed with the mixer disconnected from the A. C. mains.

A. Start the disassembly of the control unit by removing the cord flag terminals from the control board and the ground wire from the bearing bracket (Fig. 14).

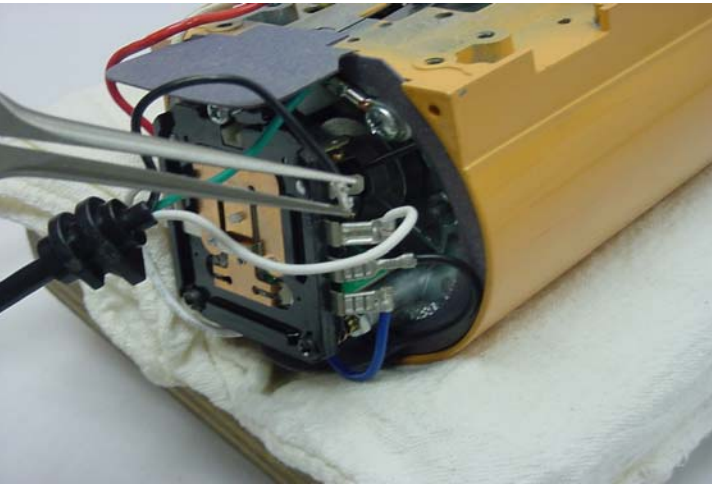


Fig. 14 Removal of the cord flag terminals and cord ground wire.

Remove the motor stator flag terminals from the control board (Fig. 15).

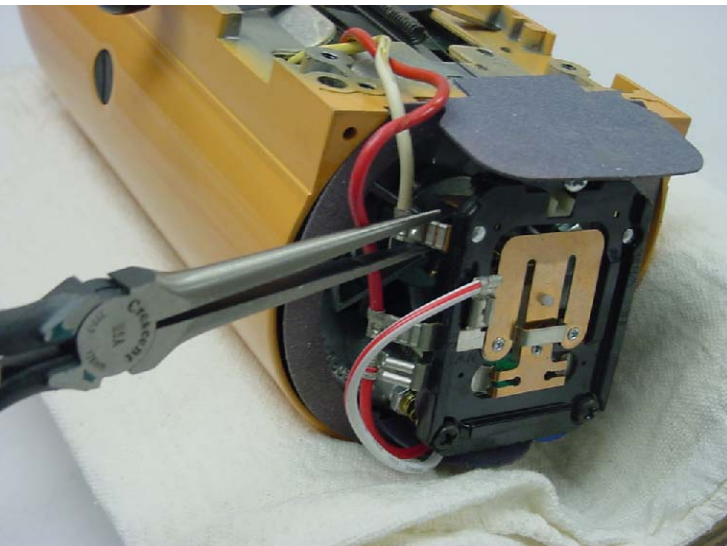


Fig. 15 The removal of the motor stator flag terminals from the control board.

Remove the end seal and disconnect the phase control flag terminals from the control board (Fig. 16).

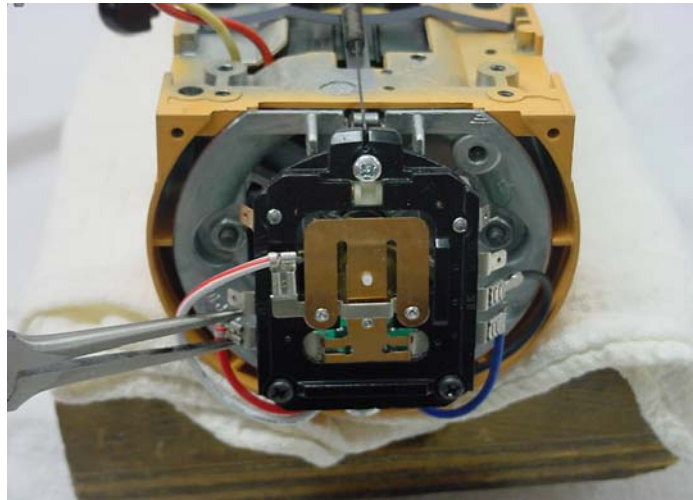


Fig. 16 After removing the end seal, remove the phase control flag terminals.

Unhook the control board spring at the bottom of the control board (Fig. 17).

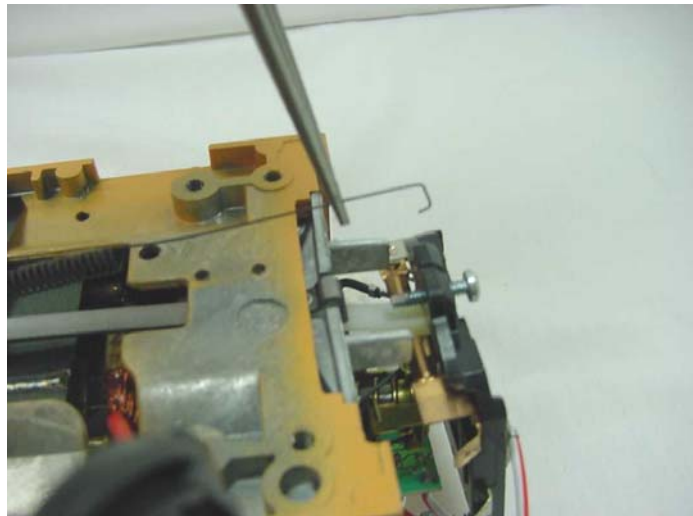


Fig. 17 Unhook the control board spring.

Unlock the two lock nuts on the control board and unscrew the two adjusting screws.

The mixer control board can now be removed and set aside for later evaluation (Fig. 18).

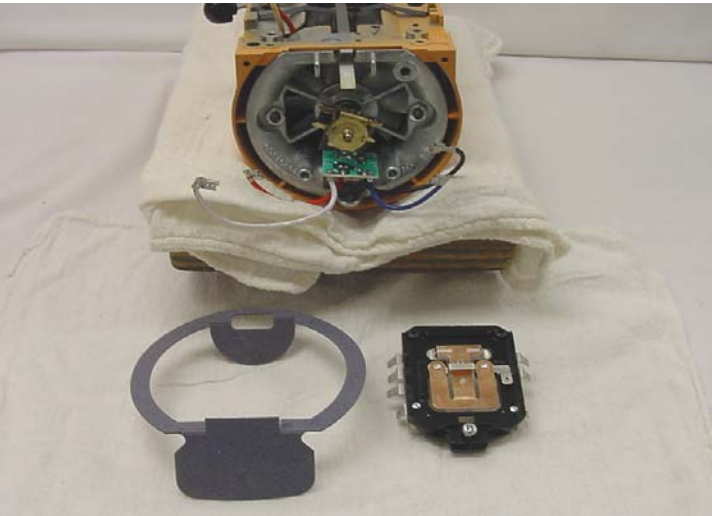


Fig. 18 Mixer housing with end seal and control board removed.

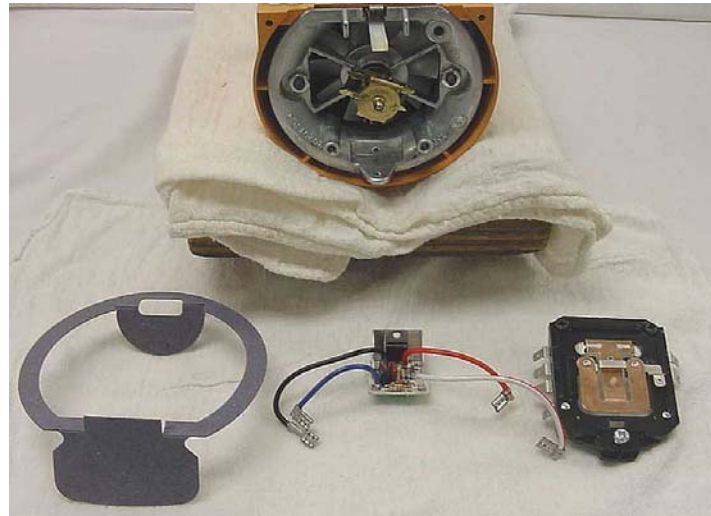


Fig. 20 Phase control or (triac) shown removed in lower center.

B. The phase control can now be disassembled from the bearing bracket, if necessary, by unscrewing the #4-40 x 1/4" pan head screw (Figs. 19 & 20).

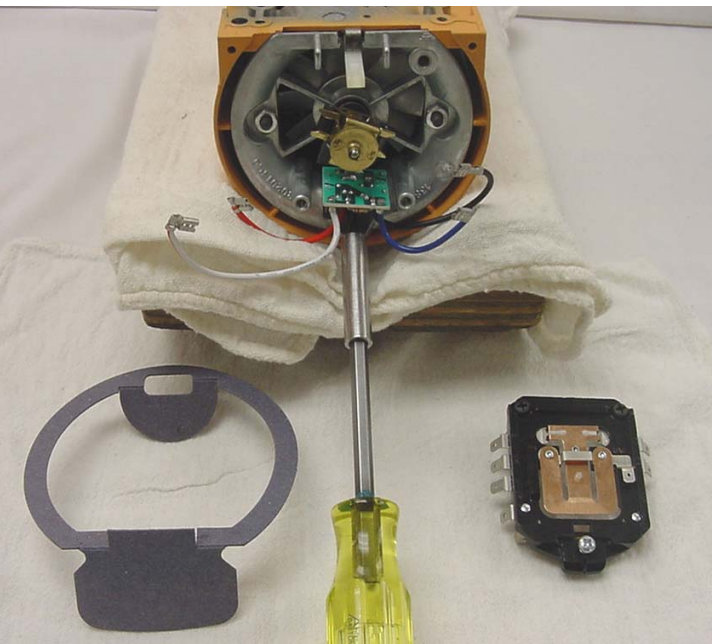


Fig. 19 Removal of the phase control (Triac) from the bearing bracket.

C. With a pair of needle nose pliers, carefully pry off the governor assembly. (Fig. 21) Do NOT bend.

Remove the governor drive pin and lay it aside so it will not be lost (Fig. 22).

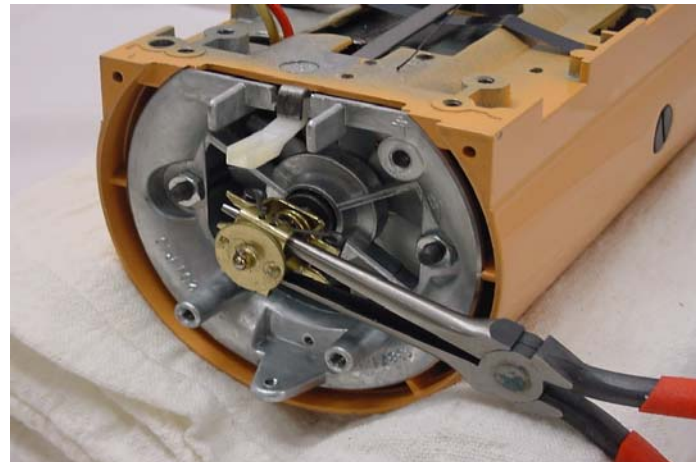


Fig. 21 Needle nose plier used to pry governor off the motor shaft.

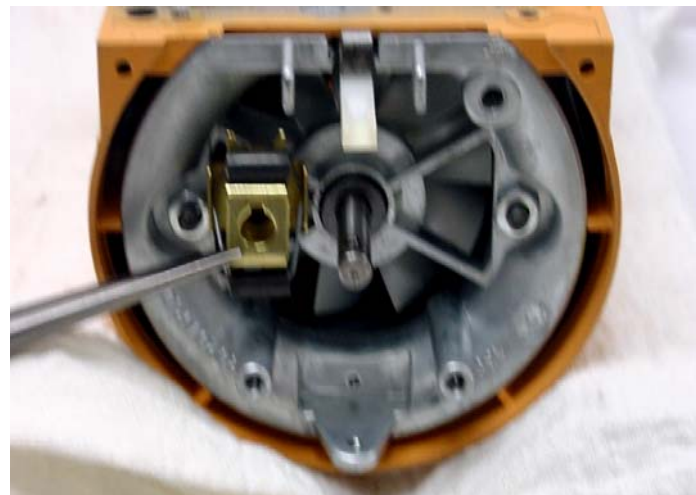


Fig. 22 Governor shown removed from the shaft of the motor.

D. To remove the speed control link and cam assembly, take out the pivot screw and tension washer (Fig. 24).

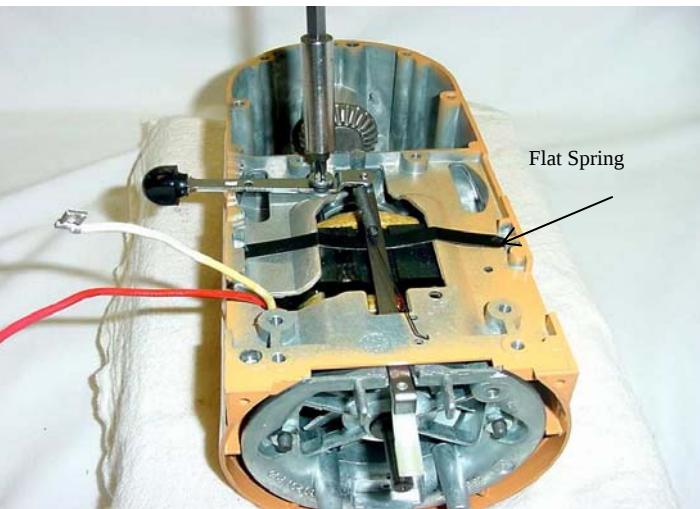


Fig. 24 The pivot screw and tension washer are removed with a phillips screwdriver.

Before removing the speed control link and cam assembly, remove the control board spring from the link.

The flat spring is removed as you remove the speed control link assembly.

The speed control link and cam assembly can be removed by pulling it out of the gearcase-motor housing (Fig. 25).

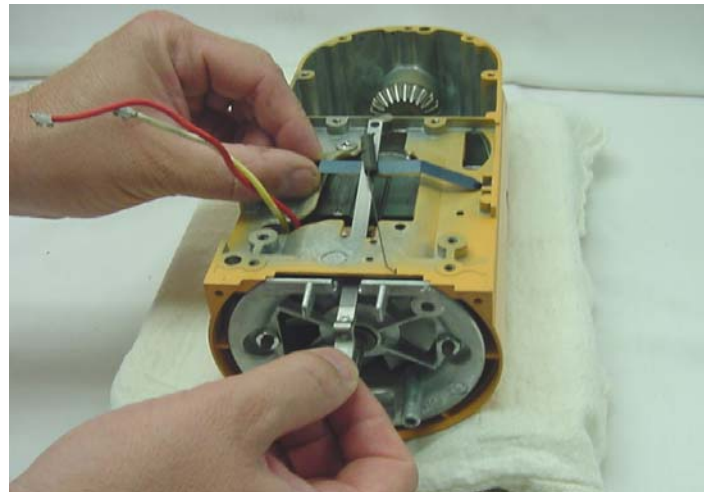


Fig. 25 Removing the speed control spring, flat spring and the speed control link assembly.

E. Unscrew and remove the two #10-24 nuts (Fig. 26).

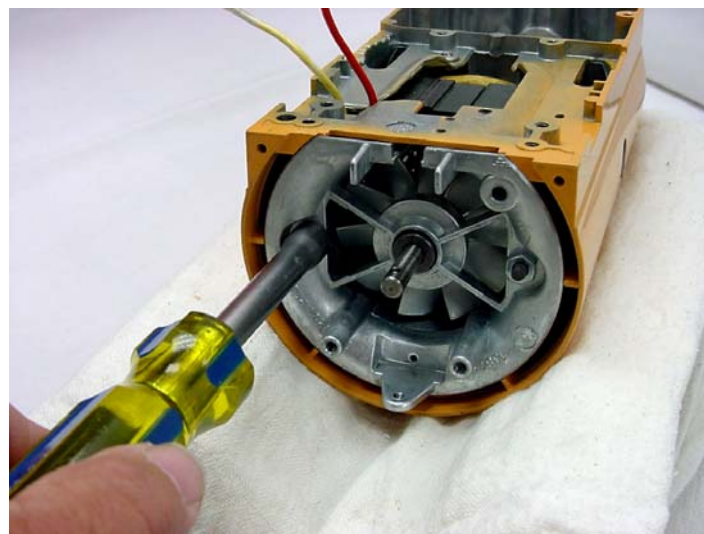


Fig. 26 Two 10-24 nuts are removed from the bearing bracket.

Remove the bearing bracket (Fig. 27).

Now remove the motor stud sleeve from the stator stud (Fig. 28).

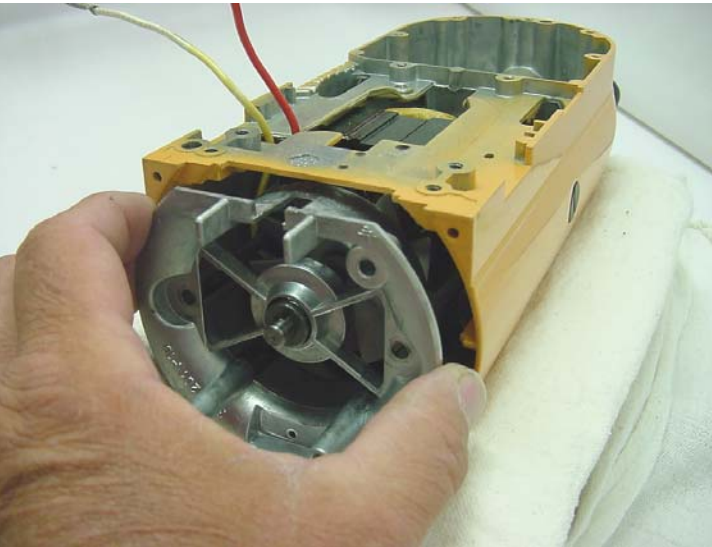


Fig. 27 Bearing bracket being removed after two #10-24 nuts have been removed.



Fig. 28 The motor stud sleeve is shown being removed after bearing bracket removal.

F. Unscrew the two brush holder screw caps and remove the brushes and springs (Fig. 29).

Viewing from the rear, mark the brushes right and left, and also the top of the brush, just as it was removed from the motor.



Fig. 29 the brush holder caps are loosened to access brushes for removal. Make sure to mark orientation.

G. The armature can now be removed.

With the attachment hub bevel gear removed, insert a drift punch through the attachment hub opening and gently tap the armature back through the stator using a block of wood to protect the shaft (Fig. 30).



Fig. 30 A block of wood is used to protect the motor shaft when removing the armature.

Remove the worm end bearing washer and the fan end spacer washer.

H. Pull the two wires from the rear of the stator through the slot in the gearcase-motor housing so they are inside the gearcase-motor housing and sticking out the back (Fig. 31).

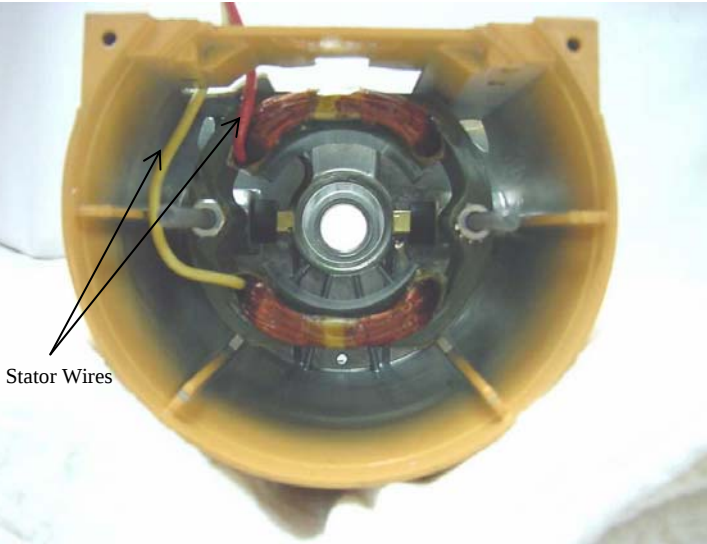


Fig. 31 Wire orientation inside the gearcase-motor housing

Using long pliers, pull the brush slips from the stator out of the brush holders. Note orientation of stator clip in brush holder.

Remove the two #10-24 nuts from the stator studs and carefully set aside for use during reassembly.

Unscrew one stator stud and pull out the stator (Fig. 32).

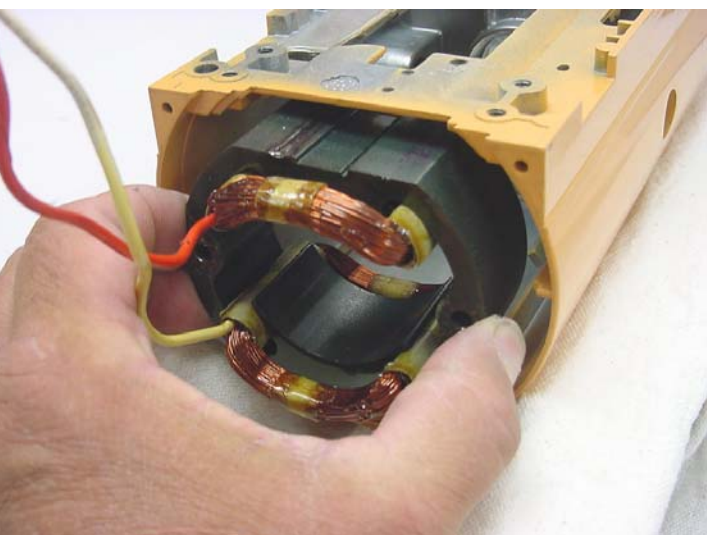


Fig. 32 The stator is shown being removed from the motor housing.

To pull the stator out, reach into the motor housing and grasp the stator and pull it out. **Caution: Do not nick or damage the copper coil wires on the motor.**

I. To remove the brush holder, it will be necessary to remove the other stator stud.

Under the stator studs are #10-24x1/4 cup point screws. To remove the set screws, use a 3/32" Allen wrench; older models may use a flat screwdriver (Fig. 33).



Fig. 33 Removing the brush holder set screws with an allen wrench.

Unscrew the set screws a few turns and (from inside the housing) push the brush holder out by hand. Note the orientation of the brush insert inside the brush holder.

SECTION 3

REPAIRS TO MOTOR AND CONTROL UNIT

A. Clean the brush holder with solvent and wipe them dry with a clean dry cloth.

Install the brush holder into the gearcase-motor housing so that the rim on the holder seats against the bore step in the motor housing.

B. Clean the brush holder inserts with solvent and wipe them dry with a clean dry cloth. Install the inserts into the brush holder.

They must be oriented, viewing the motor housing from the rear, as shown below in (Fig. 34).

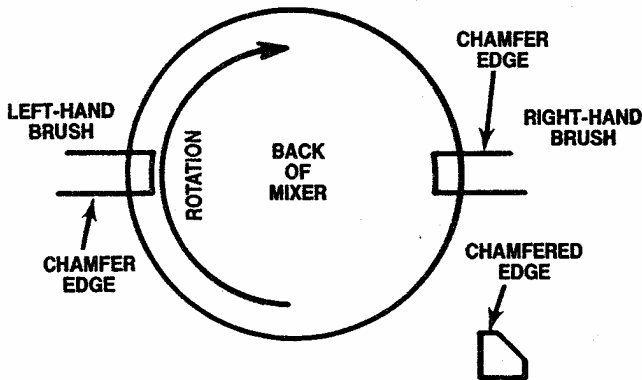


Fig. 34 The orientation of the brush holder inserts viewing from the rear of the motor housing.

Lock the brush holder with inset in place with the #10-24x1/4" cup point setscrews.

EARLY PRODUCTION SOLID STATE STAND MIXERS

The early production solid state stand mixers utilized a square brush and brush holder. Square brushes are no longer available.

Brushes with chamfered edges will fit into square brush holders.

C. Test the stator with an ohmmeter (Fig. 35). Set the ohmmeter on the 1X scale and be sure it is set at zero ohms when shorting the test leads.



Fig. 35 Test the two stator coils with an ohmmeter set on low scale.

In upper coil, connect one ohmmeter lead to the red wire and the other to the black wire of the coil.

If the ohmmeter shows a low resistance reading, the coil is good. Check the other coil in the same way.

If the needle on the ohmmeter deflects to zero or there is no deflection, the coil is bad and the stator must be replaced.

D. Assemble the two stator studs and tighten them by using long nose pliers.

Be sure the nose of the pliers is placed on the stator stud in the area that the stator seats so the threads will not be deformed.

Start the stator on the two stator studs and into the ribs of the motor housing (Fig. 36).

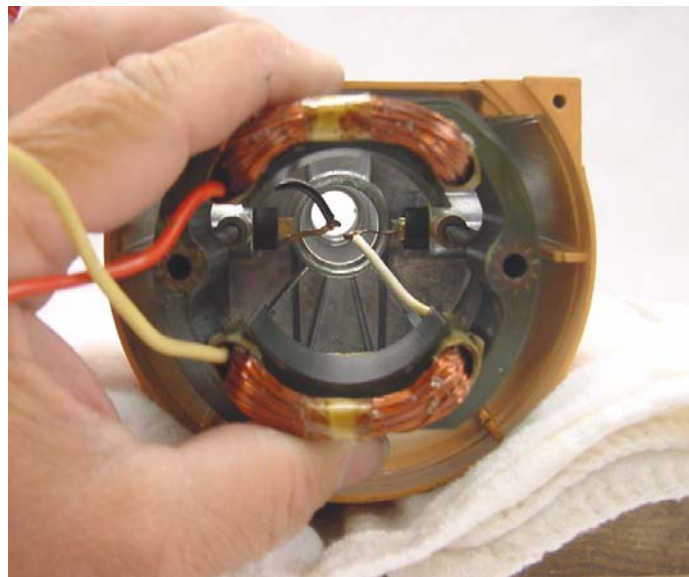


Fig. 36 Positioning the stator on the two stator studs and into the ribs of the motor housing.

The two long leads from the stator must be on the same side as the slot in the motor housing. Insert the stator brush clips between the brush holder housing and brush insert.

A slot is provided in the brush holder housing for this brush clip. Insure that the brush clips are pushed in all the way so the brush and commutator on the armature will clear them when assembled.

E. Push the stator back as far as it will go, then place the star washers and #10-24 nuts on each stator stud.

Tighten both nuts.

Put the long leads from the stator through the slot in the bottom of the motor housing (Fig. 37).

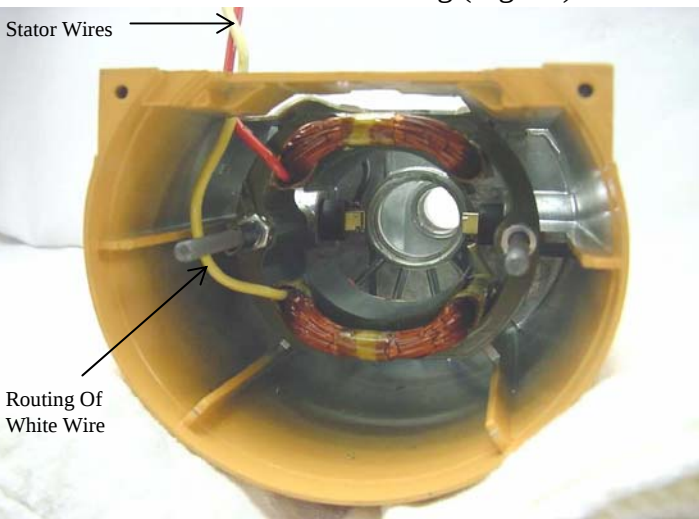


Fig. 37 Route the two stator wires through the slot in the motor housing.

Place the stator stud sleeve over the stator stud and route the white wire from the stator between the stud sleeve and the motor housing.

F. Check the armature on a growler or take the armature to a electric motor repair shop and let them test it.

If it is not in good condition, replace it with a new one.

G. Check the ventilating fan. Straighten the blades if they are bent (Fig. 38).

If the armature is replaced, move the washers from the old armature to the corresponding end of the new armature.

Add one drop of Locktite to the outer race of the ball bearing and install the armature in the motor housing (Fig. 39).

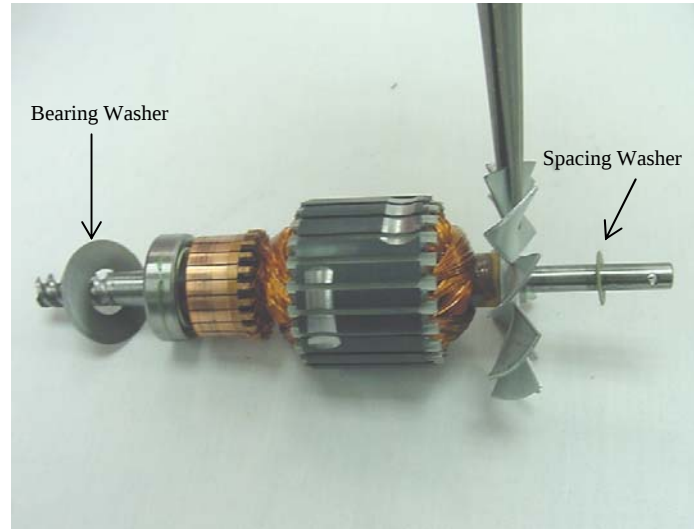


Fig. 38 Check the blades of the armature ventilating fan and straighten if bent.

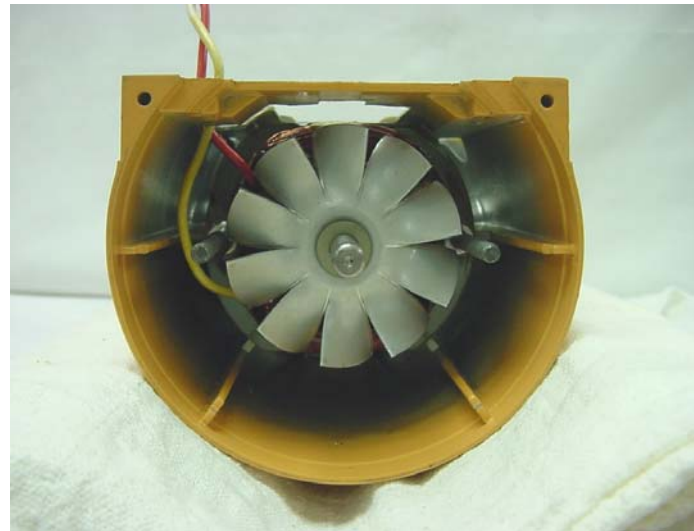


Fig. 39 Locating the armature into the gearcase-motor housing.

If necessary, tap the end of the armature shaft with a non-metallic mallet to seat the armature bearing into the gearcase-motor housing.

H. Check the bearing in the bearing bracket.

To replace the bearing, remove the retaining clip (Fig. 40).

Take out the felt washer and the old bearing.

Place the new bearing in cavity.

Soak the felt washer with oil and place in cavity.

Place the retainer on the bearing so that the tongue fits into the square notch and push the retainer clip in place.

On older models, to replace the bearing, remove the three #4-40x1/2 pan head screws and lift off the bearing retainer.

Take out the old bearing and felt washer.

Place new bearing in cavity with the square notch toward the top of the bracket.

Soak the felt washer in bearing cap with oil.

Place the retainer on the bearing and screw in place with the three #4-40x1/2" screws.

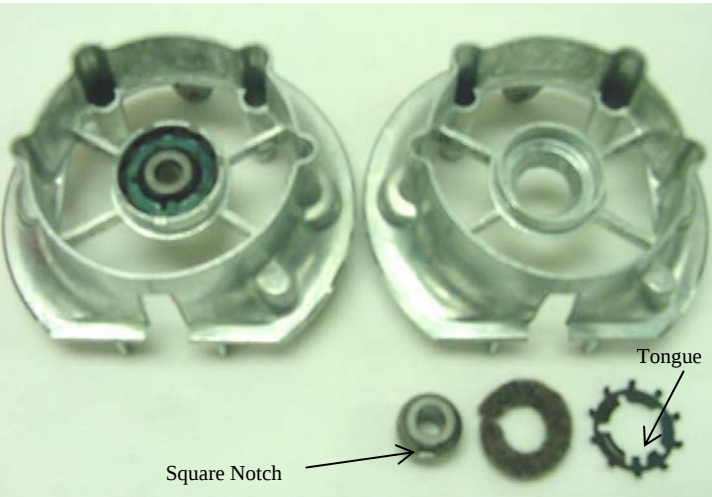


Fig. 40 Bearing bracket assembled & unassembled

I. Install the bearing bracket. Start bracket onto the two stator studs.

Push the bracket back until the stator studs are through the bracket and it seats into the ribs of the gear case.

Start the two nuts on the stator studs and turn them until the bearing bracket is seated (Fig. 41).

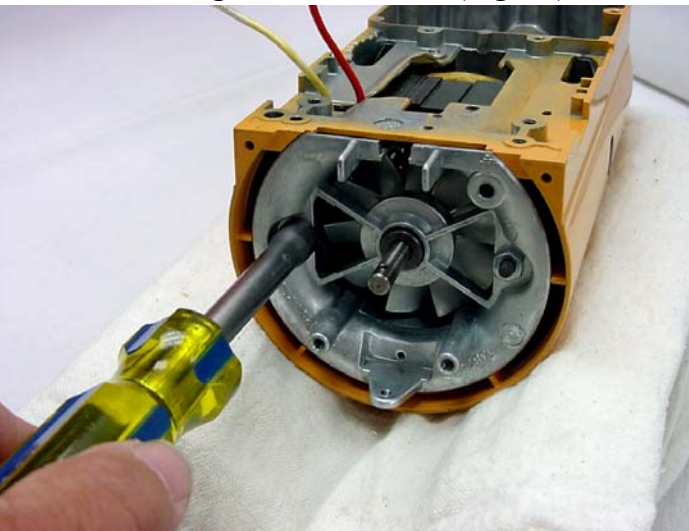


Fig. 41 Tighten the two nuts on the stator studs to seat the bearing bracket.

J. The armature should always be checked for end play. Armature should turn freely with minimal end play.

On older models - after the thrust bearing assembly has been seated properly and proper amount of spacing washers placed at the rear, there should only be a perceptible amount of end play to assure free operation of the armature.

If there is too much end play, add another thin washer.

To do this, remove the bearing bracket and add the washer to the armature shaft, then reassemble the bearing bracket into the gear case-motor housing.

K. If the old brushes are more than 5/16" long, assemble them in the brush holders.

From the back of the unit, put the brush marked "right" in the right side of brush holder. Be sure the side marked "up" is at the top.

Push the brush in and lock it in place with a brush holder screw cap (Fig. 42).

Put left hand brush in the mixer in the same way.

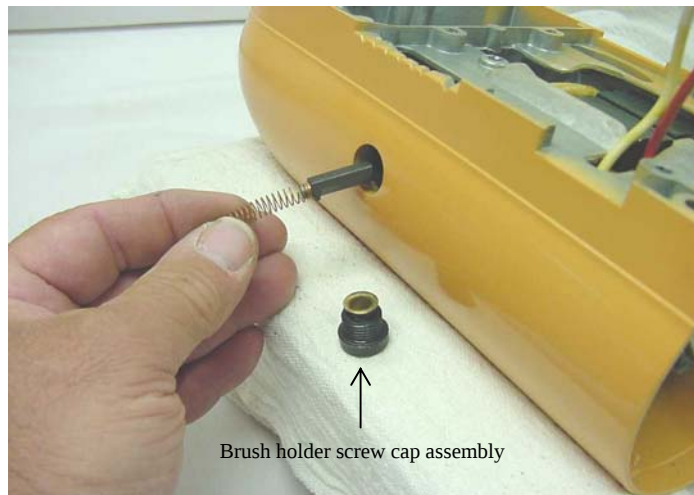


Fig. 42 Placing one of the brushes into the mixer brush holder.

L. Place the speed control link and cam assembly through the slot in the bearing bracket with the cam portion of the speed control link and cam assembly toward the top of the gearcase-motor housing.

Place the flat spring in position and slide the mixer speed link and cam assembly over the flat spring; attach the speed control spring on the speed control link and cam assembly (Fig. 43).

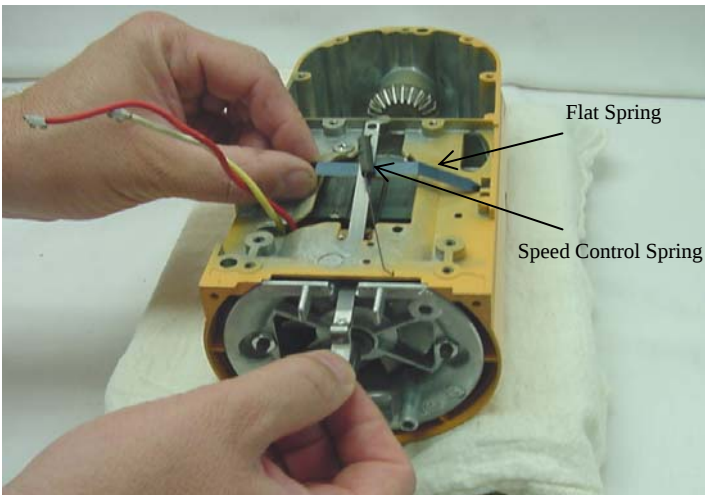


Fig. 43 Slide the speed control link over the flat spring and attach the speed control spring to the link.

Place the stud on the speed lever through the hole in the speed control link.

Place the tension washer on the pivot screw and screw it into the gearcase-motor housing until tight (Fig. 44).

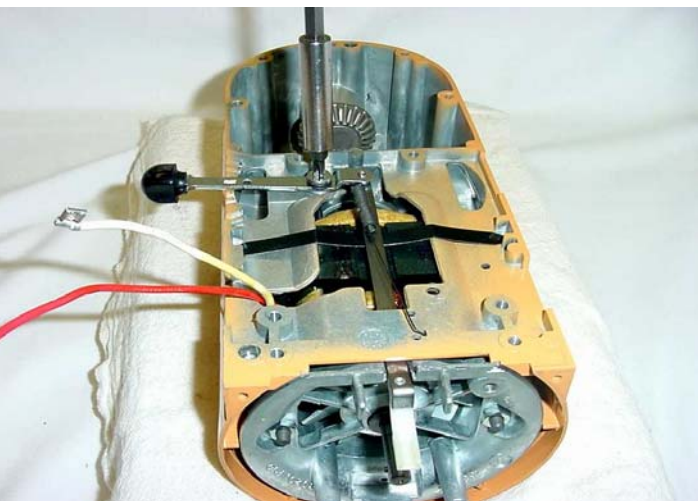


Fig. 44 Securing the pivot screw to the gearcase after placing the tension washer.

M. If the spring in the governor is rusty, replace the governor assembly.

Place the governor drive pin in the armature shaft.

With drive pin at top of the shaft, place the governor on the shaft with the keyway up (Fig.45).

Push the governor onto the shaft as far as it will go.

NOTE: Never attempt to take the governor apart. The purpose of this picture is to show where governor seats on drive pin (Fig. 46).

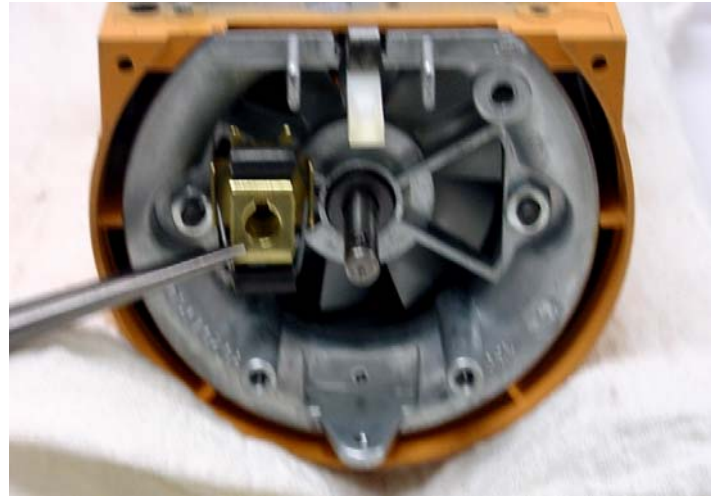


Fig. 45 The governor shown before being placed on the motor shaft.

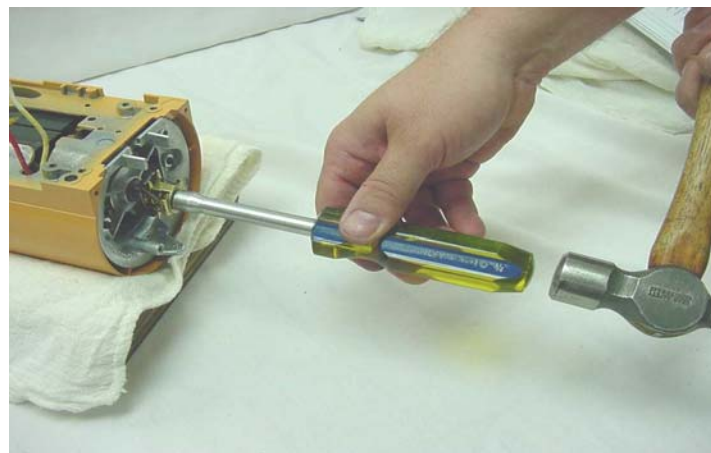


Fig. 47 Using a 3/8" nut driver to seat the governor. Tap gently. Never drive directly against governor ball.

N. If the phase control was removed or has been replaced, make sure the heat sink on the triac unit has sufficient amount of thermal conductive compound applied to that surface before assembly.

Place the #4-40x1/4" pan head screw through the hole in the triac and screw it into the bearing bracket (Fig. 48) until it is tight (4 - 5 in. lbs.).

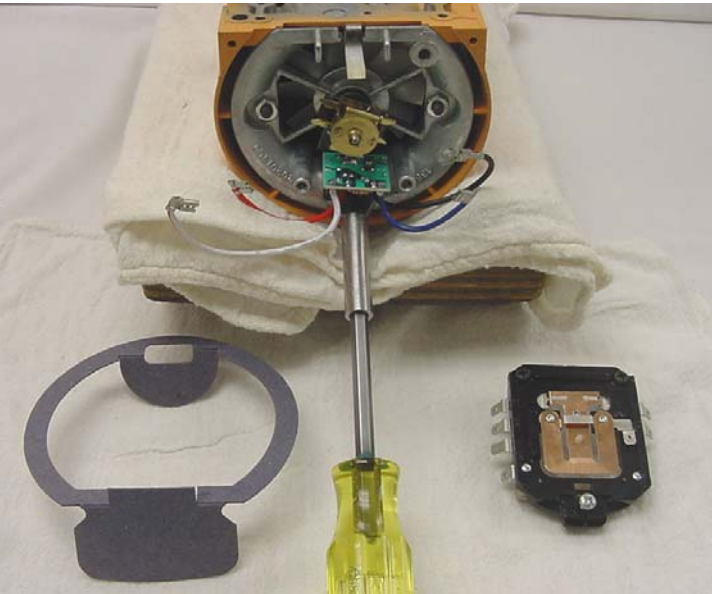


Fig. 48 The triac is shown being secured to the bearing bracket.

CAUTION: Do not attach the phase control excessively tight, as this pressure could deform the heat sink, resulting in damage to the control.

O. Place the control plate on the bearing bracket with the adjusting screws at the top (Fig. 49).

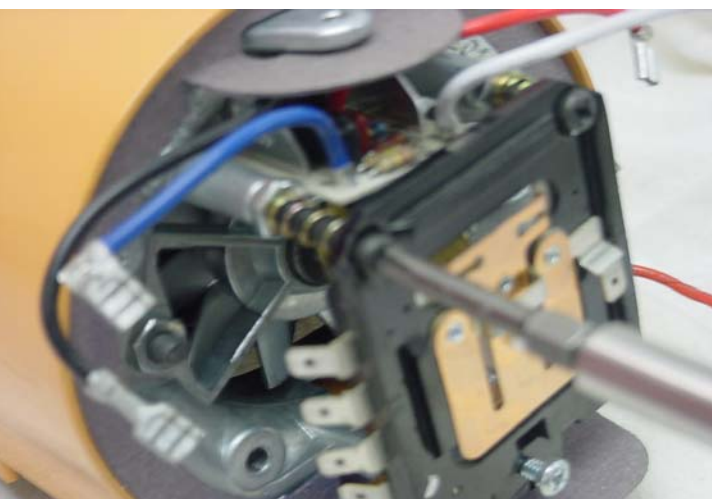


Fig. 49 Placing the control board on the bearing bracket.

Turn in the screws until 3/8" of the screw remains.

Have both screws turned in evenly so the opposite end of the control plate rests squarely on the extensions of the bearing bracket.

With long nose pliers, hook the control plate spring into the hole on the bottom part of the control plate (Fig. 50).

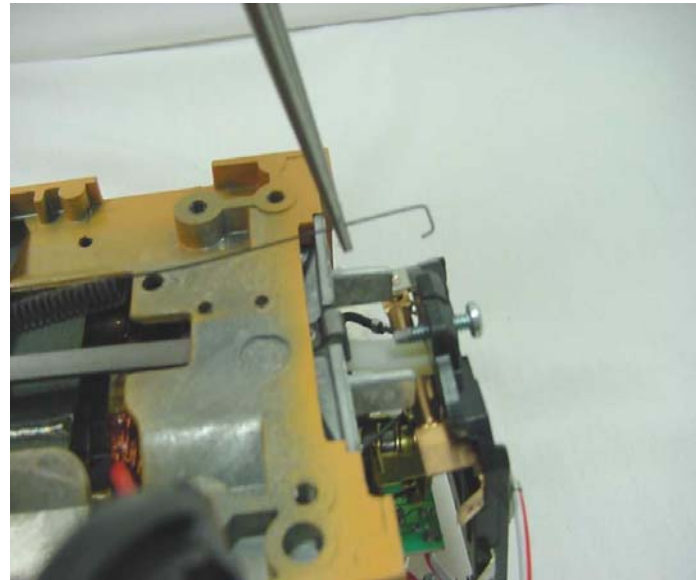


Fig. 50 The control plate spring being grasped with pliers and positioning the hook into the hole at the bottom.

Place the end seal onto the mixer.

Connect the two flag terminals from the stator and the four flag terminals from the phase control to the control plate.

Refer to the wiring diagram for proper terminal connections.

Be certain flag terminal connections to control plate are tight.

If necessary, crimp the terminals with a needle nose pliers.

Note: Leave the control unit. It is now ready for timing, but a better job can be done when mixer is completely reassembled.

SECTION 4

REPAIRS TO GEARCASE AND PLANETARY

NOTE: Grease is not shown in these pictures.

A. Examine the bearings in the attachment hub area and top of the gearcase.

These bearings are cast into the gearcase-motor housing.

If they are worn badly, the entire housing must be replaced.

However, shafts turn slowly in these bearings and the bearings have a long life.

B. Examine the attachment hub bevel gear.

If it shows wear in the teeth, it should be replaced. If the gear is replaced, coat the shaft of the bevel gear with a light grease.

Push it into the attachment hub bearing from the inside of the gearcase (Fig. 51). It does not have a washer, so push it in as far as it will go.

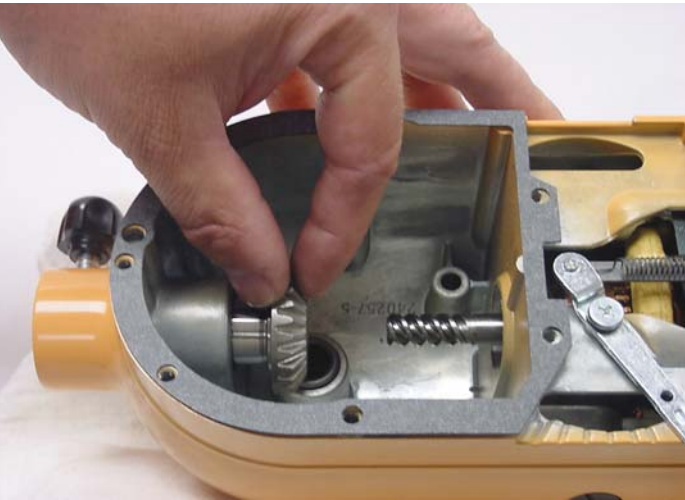


Fig. 51 The attachment hub bevel gear being pushed into the attachment hub bearing from inside the gearcase.

C. With a phillips head screwdriver, remove the three #10-24x7/16" phillips filister head screws and lock washer assemblies and lift up on the worm gear bracket bearing and pin assembly to remove (Fig. 52).



Fig. 52 Worm gear bracket bearing and pin assembly.

D. Remove the center bevel gear and vertical center shaft.

Push the vertical center shaft upward, exposing the pin (Fig. 53), and remove the pin.



Fig. 53 Remove pin after pushing vertical center shaft up.

Pull out the vertical center shaft with your fingers and remove the shaft from the the bottom of the gear case bottom cover (Fig. 54).

Check the shaft for bearing wear.

Dark gray or indented surfaces indicate shaft should be replaced.

Lift gears from case for inspection (Fig. 55).



Fig. 54 Removal of vertical shaft from bottom cover.



Fig. 55 Bevel center gear being lifted for inspection.

E. Check the lower center bearing for wear.

This is an oilless bearing and should be in good condition.

If it is worn, the gearcase bottom cover will have to be replaced, since the bearing is an integral part.

F. If the attachment hub bevel gear was replaced, then the bevel center gear on the bottom cover must also be replaced.

G. Place the same washer on lower center bearing.

Place the gear assembly on top of the center bearing. Insert the end of the vertical center shaft opposite the "O" ring into the bottom cover (Fig. 54).

Push shaft upward and insert the pin (Fig. 53).

Center pin in shaft and lower shaft into gear assembly.

Turn shaft until pin seats in gears, and gears and shaft turn together. Wipe all excess lubricant from bottom of vertical shaft on "O" ring.

H. Check the worm gear and pinion gear (Fig.56).

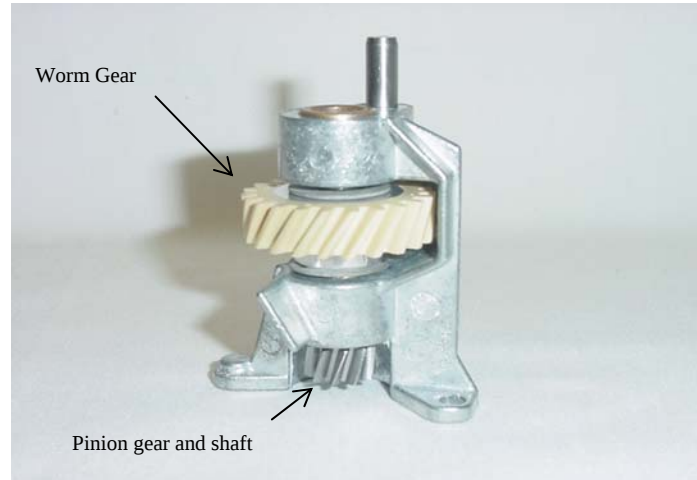


Fig. 56 Check worm gear and pinion before reassemble.

To replace these gears, drive out the groove pin (Fig. 57).

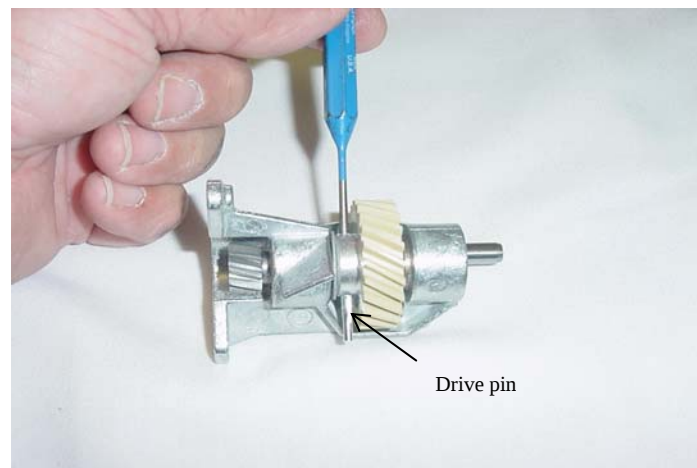


Fig. 57 The drive pin must be removed to change the gears.

Make a note of the positions of fiber washers.

They will be installed the same way with the new gears. From the top of the worm gear bracket, drive out the pinion shaft.

NOTE: The pinion on pre May 6th, 2002, K45SS models, have 11 teeth. On all other units the pinion has 10 teeth.

I. Start a new pinion gear and shaft from the bottom of the bracket. Before the shaft emerges from the lower bearing, place a washer on the bearing and start the shaft into the washer.

Place a new worm gear next and push the shaft up into it. Place the second washer on top of the worm gear and push the pinion shaft up into the upper bearing.

Line up the drive pin holes in the shaft and worm gear and drive in the groove pin.

J. Place the worm gear assembly and bearing bracket on the bottom cover so that the two dowels will fit into the base of the bearing bracket (Fig. 58).

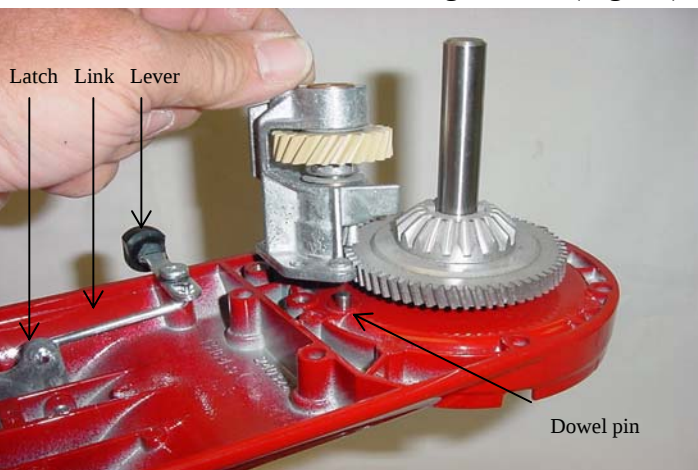


Fig. 58 The two dowels must fit into the base of the worm gear bracket.

Place the three lock washer screw assemblies in the holes and screw them into the bottom cover (Fig. 59). Be sure screws are tight. (18 - 23 in/lbs.)



Fig. 59 Secure the three lock washer screw assemblies into the bottom cover.

K. Check the latch, link and lever assembly. There should be no wear or trouble with this assembly (Fig. 58).

L. Use 6 oz. of Benalene 930-2 lubricant and lubricate around the gears when filling the gear case.

This product is available through your nearest authorized distributor.

Try to keep the bearing in the top of the gear case open. It will help when assembling the bottom cover and gearcase motor housing together.

M. Clean the gasket surface of the gear case.

Place a new gasket on the gearcase, over the dowel pin, and press it down so it will stay in position.

N. Check the cord and plug.

If it is drying and cracking - Replace it.

O. Lock the latch lever and hold the bottom cover in position over the gearcase-motor housing and start joining them together (Fig. 60).

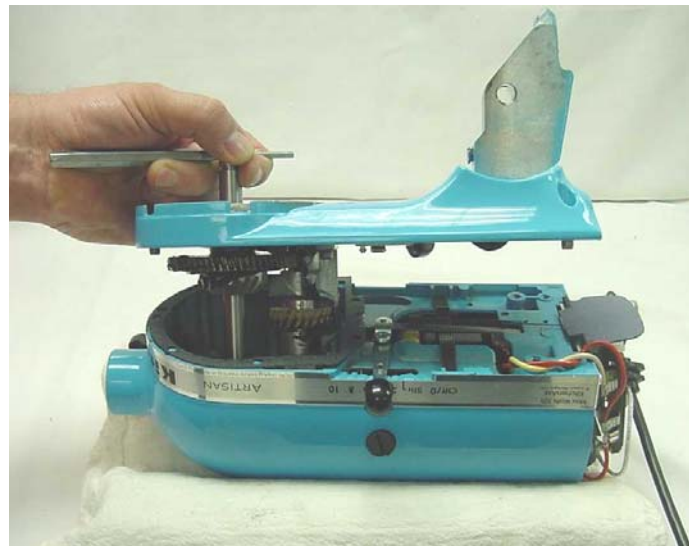


Fig. 60 Initial mating of bottom cover to gearcase - motor housing.

Start the shaft into the upper bearing and slowly push the parts together. Insert a punch into the center shaft, turning back and forth, while pressing down on the bottom cover, to align the gears.

CAUTION: Under no circumstances should you force the gearcase and bottom cover together.

If the gears are properly aligned, these two parts will assemble with little or no force required.

P. If necessary to replace the internal gear, pry it from the bottom cover (Fig. 61).



Fig. 61 Internal gear can be pried from the bottom cover and replaced if necessary.

When installing new gear, start with beveled side down; align notches with holes in gear case and tap evenly into place using a non-metallic mallet.

Insert and tighten the five special screws evenly (Fig. 62) to 18 - 20 in. lbs. torque.

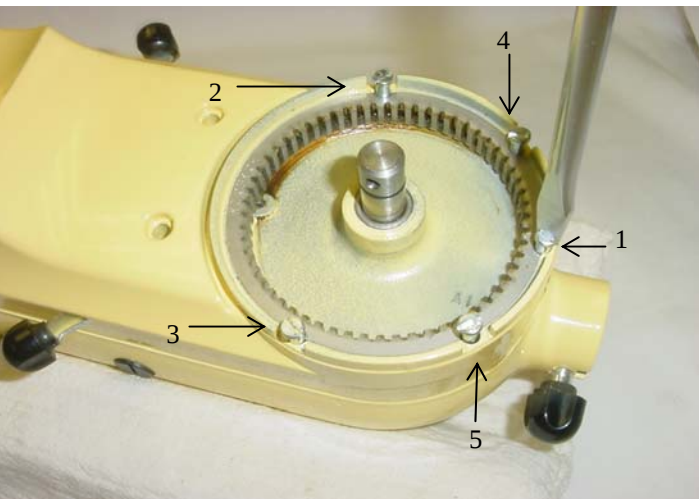


Fig. 62 Tighten the five special screws evenly to 18-20 in. lbs.. torque using the sequence shown.

Insert the four #10-24x1" fillister head screws into the bottom cover making sure they are tight (Fig. 63) (18 - 20in/lbs.).

Q. Place a small amount of Benalene 930-2 lubricant on the teeth of the internal gear.

R. Check the condition of the planetary. If there is any play in the agitator shaft and the bearing (not shown), replace the planetary and the shaft.

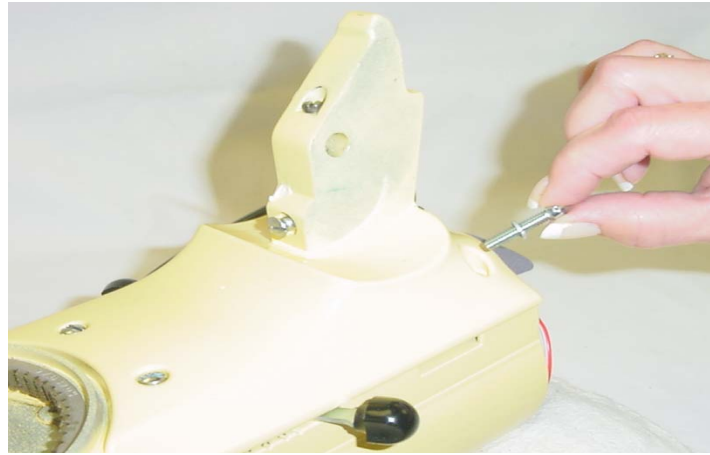


Fig. 63 Secure the four fillister head screws.

The bearing is an integral part of the planetary. Hold the agitator shaft firmly and remove the pinion retaining clip (Fig. 64).

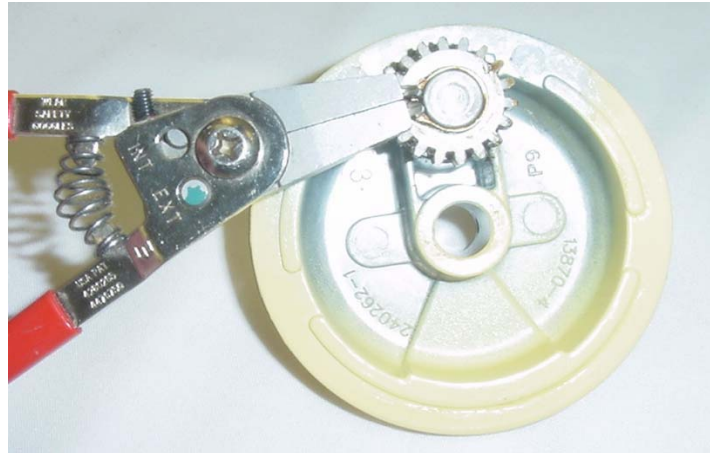


Fig. 64 Hold the agitator shaft and remove the retaining clip.

Lift off the pinion. Take out the pin and remove the washer (Fig. 65). Pull the agitator shaft out.



Fig. 65 Lift the pinion off and take out the pin and remove the washer; then pull out the shaft.

S. The agitator shaft is complete as an assembly. Lubricate the shaft and push it up into the bearing as far as it will go. Place the washer(s) on the shaft. Insert the pin through the shaft. Set the pinion gear on the shaft so that the notches in the pinion align with the pin in the shaft. Install the retaining clip in the groove on the shaft (Fig. 64).



Fig. 66 The planetary components are shown disassembled.

T. Place the washer(s) on the vertical shaft. Be sure the planetary pinion and the internal gear have a light coat of grease (Benalene 930-2) on them. Place the planetary on the shaft and push it down. Line up the holes in the planetary and shaft. It may be necessary to use an awl or pointed punch to align the holes (Fig. 67).



Fig. 67 A pointed punch can be used to align the holes of the shaft with the planetary.

U. Drive the groove pin into the shaft (Fig. 68). There should be a very small amount of end play.



Fig. 68 Carefully drive the groove pin into the shaft of the planetary.

V. Place the drip cup on the bottom cover. Tap it down into place using a non-metallic hammer.

W. Check the beater height adjusting screw (Fig. 69).

This screw is slotted and has a nylon insert.

As it is screwed in, threads are cut in the nylon and hold the screw tight.

Replace this adjusting screw if it is loose in the threads.



Fig. 69 The adjusting screw has a nylon insert and should not be loose in the threads.

. SECTION 5

REPAIRS TO TILT HEAD PEDESTALS

A. If pedestal is removed, check the hinge pin. If it is galled from failure to loosen the set screw, replace it (Fig. 70).

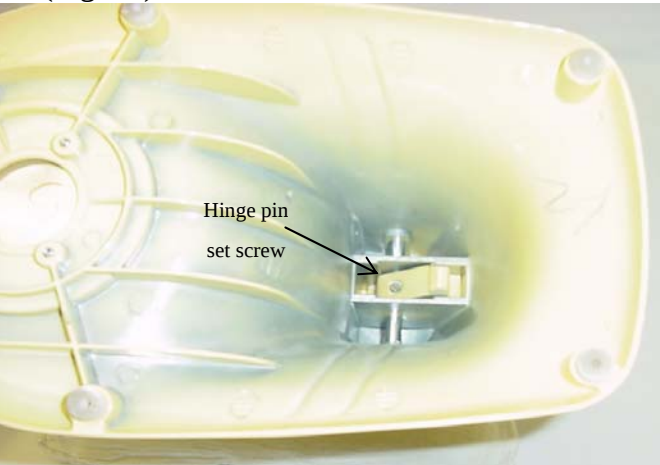


Fig. 70 The set screw in the bottom of the pedestal should clear the hinge pin.

Loosen the set screw so that it will clear the hinge pin. Place the new hinge pin in the pedestal, but do not drive it in.

B. Check the rubber feet. If they are worn or softened from grease, replace them.

Twist the old feet out (Fig. 71). Clean the holes with solvent and dry them with a clean cloth.



Fig. 71 The pedestal feet should be replaced on older mixers.

Moisten the part of the foot that will go into the hole and twist the new foot in or tap with a mallet.

Be sure all feet are penetrating the pedestal an equal distance to maintain a level foundation.

C. If the bowl screw cap has worn out, be sure to replace it.

To remove the old cap, take out the three #10-24x1/2" flat head screws and lift out the old cap.

Put the new cap in place and screw it down tight with the three screws (Fig. 72)(24- 32 in/lbs.).



Fig. 72 The new cap is secured to the pedestal with three screws.

D. While in the cradle, place the pedestal on the bottom cover.

Line up the holes for the hinge pin and tap it in so that an equal amount of the pin extends on each side of the pedestal (Fig. 73).



Fig. 73 Use a rubber or rawhide mallet to tap the hinge pin into the pedestal.

E. Using a flat blade screwdriver, tighten the hinge pin set screw up inside of the pedestal (Fig. 70).

F. On international export models shown (Fig. 74), a plastic head lock foot has been riveted to the pedestal to permit the locking of the motor housing in the “inclined” position.

The lock lever on these models is spring loaded and the locking action is obtained by removing tension from the lever after the motor housing has been put in the “inclined” position (Fig. 74).



Fig. 74 A plastic headlock has been riveted to the pedestal of international export models. An international model is shown locked in the “inclined” position. This is obtained by the action of the spring loaded lock lever used on these models.

The small circuit board shown (Fig. 75) is an RF filter used on international models that is held to the bottom cover with a single round head screw.

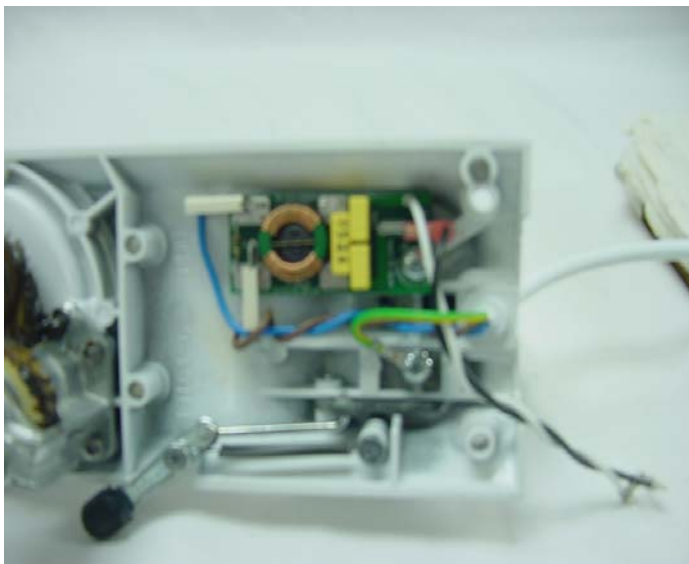


Fig. 75 International model bottom cover with R F filter and spring loaded lock lever.

SECTION 6

ADJUSTING THE CONTROL UNIT

NOTE: When replacing a control plate, a cloth, (Fig. 76), hooked over the control plate spring, will keep the spring accessible, not allowing it to “snap” between the upper and lower gear case and become “lost.”

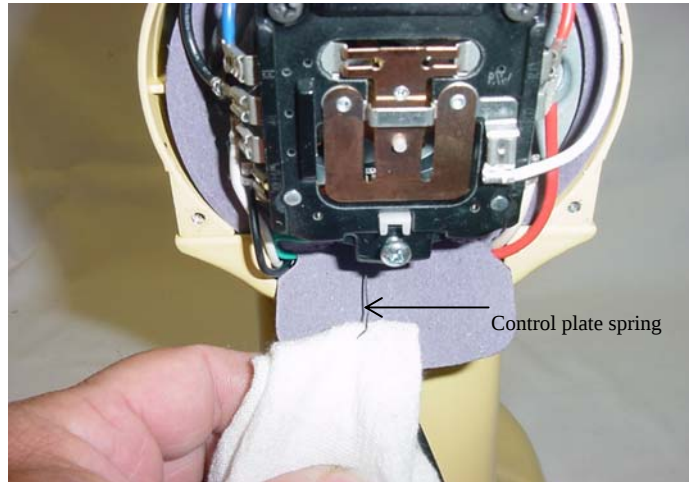


Fig. 76 Hold the control plate spring with a cloth to retain access for reassembly.

A. After installing new parts in the control unit, the control plate must be adjusted so that all speeds will be the same as they were when the mixer was new.

B. Make sure that all of the wire leads are properly connected and that they are locked in position properly.

Plug the cord into a receptacle having the proper voltage.

C. To adjust the speeds, move the switch lever to stir.

This may or may not start the motor.

If motor did not start, turn out the two adjusting screws evenly and stop when planetary turns about 60 revolutions per minute.

To test the speed, hold a finger of the right hand at the planetary.

Let the beater shaft hit the finger (Fig. 77).

Count the number of times the finger is touched in 15 seconds.

Adjust the two screws until the shaft touches the finger about 15 times in 15 seconds.

D. When proper speed has been set, lock the two lock nuts using a 11/32” wrench (Fig. 78) and check the speed again.



Fig. 77 Carefully let the planetary touch your finger to test speeds.



Fig. 78 Once proper speed setting has been obtained, lock the two 11/32" lock nuts.

If a small correction must be made, make it without loosening the lock nuts.

Test speeds as before, and, when correct, it will not be necessary to disturb the lock nuts.

E. Move the switch lever to speed #6. At this setting, the planetary must turn at 180 revolutions per minute.

Check the speed as was done for stir speed.

The planetary should touch your finger 45 times in 15 seconds.

If the planetary touches the finger less than that, turn the adjusting screw at the bottom of the control plate (Fig.79).

Check the revolutions again and keep adjusting the screw at the bottom until the right speed is reached.

There is no locking of this screw.



Fig. 79 Adjusting screw at the bottom of the control plate for speed # 6.

F. Try all mixer speeds from stir to #10.

If stir and #6 are properly adjusted, the other speeds should automatically be correct.

If there is a definite change in speed between #8 and #10, the control unit is correctly adjusted.

G. A digital speed device (Fig. 80) is available to adjust the planetary speed settings on all KitchenAid mixers.

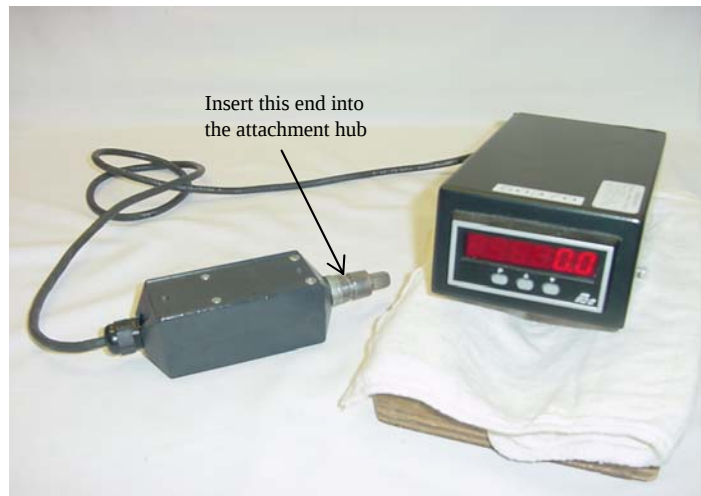


Fig. 80 Electronic speed measuring device, with numerical display for setting speeds on KitchenAid mixers .

To use this device, the main control box needs to be plugged into a 120 volt power source.

Insert the tapered metal end of the speed sensing unit into the attachment hub of the mixer. The tapered hub is machined the same as all mixer attachments. Secure it in place by tightening the thumb screw.

The control plate is spaced $\frac{3}{8}$ " from the mounting bracket for the proper speed setting "Starting Point."

Plug the mixer into a watt meter set at the proper voltage.

Turn the mixer to "Stir Speed." The mixer may or may not start. If not, turn the two mounting screws out evenly until mixer starts. Adjust both screws evenly until a speed setting of 40 (40 - 64) is attained.

Turn mixer to speed #6. The single screw at the bottom of the control plate is used to control this speed; adjust to attain a speed of 150 (141 - 170).

Turn speed control to speed #8, pause, then turn to speed #10. There should be a noticed speed increase between #8 and #10 speeds. If not, back speed #6 down slightly until there is at least a minor speed change between #8 and #10.

The #10 speed should be at least 185 (185 - 250).

When proper speeds have been set, lock the two lock nuts on the upper mounting screws using an $\frac{11}{32}$ " wrench.

Be careful not to move the mounting screws in or out during the locking process.

Recheck speeds after locking the nuts, and if a fine adjustment is needed, it can be done without loosening the locking nuts.

G. Place the trimband (Fig. 81) on the gearcase - motor housing, and with the two # 6-32 x $\frac{3}{16}$ " screws, fasten it to the housing.

Tuck in all the wire leads- insure no wires are pinched - and place the end cover on the end of the motor housing and secure it with the # 6-32 x $\frac{3}{8}$ " oval head screw (Fig. 82).

H. With the end cover on the machine, test the speeds again to make sure no change took place in the control plate.

With mixer working correctly, place the bowl on the bowl screw cap.

Place the flat beater on the agitator shaft.

There should be approximately $\frac{1}{16}$ " clearance between the bowl and beater.

If the beater is too close to the bowl, turn the beater height adjusting screw "out" or "in" if it is too far away (Fig. 83).

The mixer is now ready for operation.

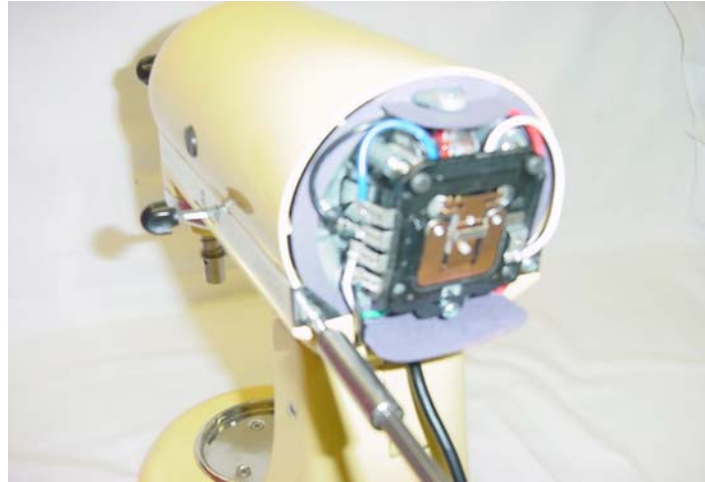


Fig. 81. Replace the trim band on the gearcase after speeds have been set.



Fig. 82. The end cover is secured to the mixer with a tapered head screw.



Fig. 83 The beater height adjustment screw used to set the $\frac{1}{16}$ " clearance between the bowl and beater.

SECTION 7.

REPAIRS TO BOWL LIFT ASSEMBLIES ON BOWL LIFT MODELS

A. The bowl lift models of KitchenAid mixers have a different type of bowl and are different in size.

On the tilt head models, the bowl is held stationary by mechanical means at the bottom of the mixer pedestal; whereas, on bowl lift models, the bowl support slides up and down gibs on the column.

B. Should the mixer be tipped over or knocked off the table or counter, the unit's bowl support assembly may be broken. To repair it, it will be necessary to replace the bowl support.

C. To replace the bowl support, remove the four 5/16"-18 x 3/4" round Phillips head screws (Fig. 84) and lift the column and base assembly off the bottom cover (Fig. 85). KSMC50 models use 5/16"-18 x 3/4" hex head screws.



Fig. 84 Four round Phillips head screws must be removed to replace the bowl support assembly.

D. With the bowl lift assembly on the bench, lay it on its back and then remove the four 5/16"-18 x 3/4" round head screws (Fig.# 86) from the base and set the base aside.

E. Remove the two #10-24x1/2" flat head screws from the bowl support (Fig. 87) and slide the bowl support down and off the column (Fig. 88).

F. Examine the bowl lift arm. This part is held on the bowl lift handle with a tapered pin.

If the arm is cracked at the pin hole, replace it.

If there is any fault with the column, replace it at this time.



Fig. 85 Lift the column and bowl support assembly off of the bottom cover.



Fig. 86 Remove the four round head screws from the base to remove the bowl lift assembly.

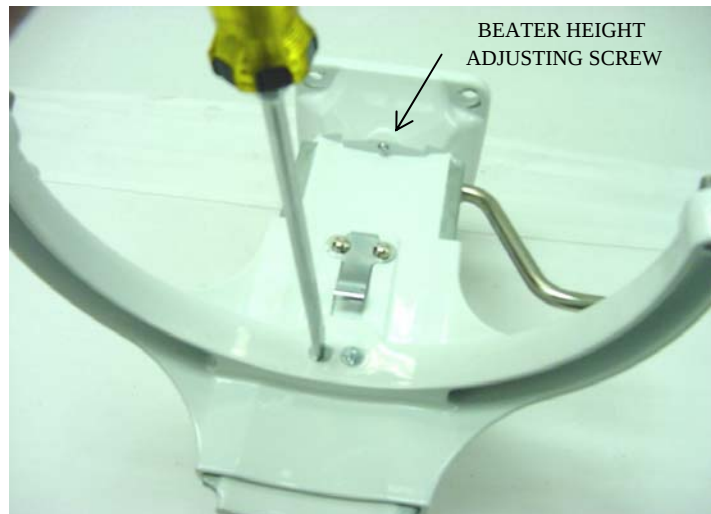


Fig. 87 Two flat head screws hold the bowl support to the bowl lift assembly.

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Fig. 88 Slide the bowl support down and off the column to replace the bowl lift assembly.

G. To install the new bowl lift arm, drive out the roll pin (Fig. 89).

With the roll pin out, remove the bowl lift handle (Fig. 90).

The bowl lift arm can now be removed along with the bowl lift mechanism.

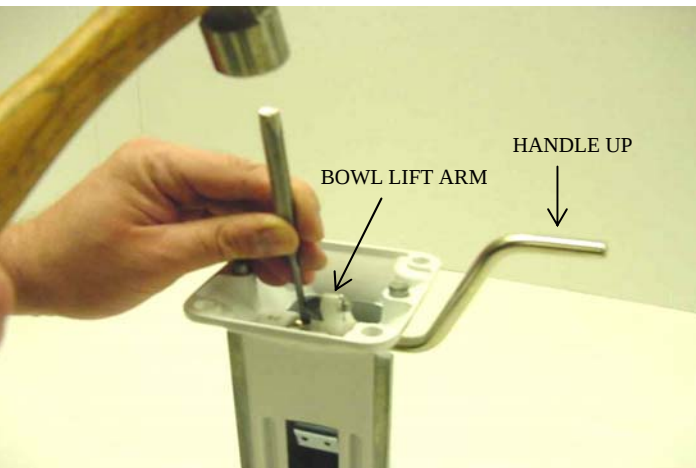


Fig. 89 Drive out the roll pin to remove the bowl lift arm.

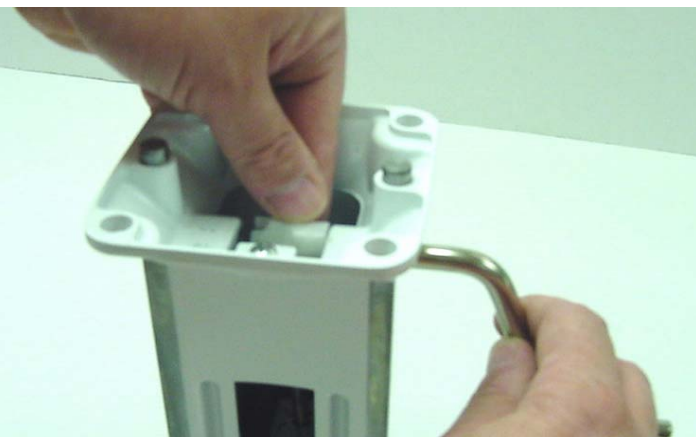


Fig. 90 With the roll pin removed, pull out the handle.

H. With the bowl lift handle down, push it through the column, through the new arm and into the bearing hole in the column.

Place the roll pin in the arm and drive it through the lift handle until it is almost flush with the arm (Fig. 91). Be sure the pin is tight.

Check the beater height adjusting screw; replace if missing (Fig. 91).

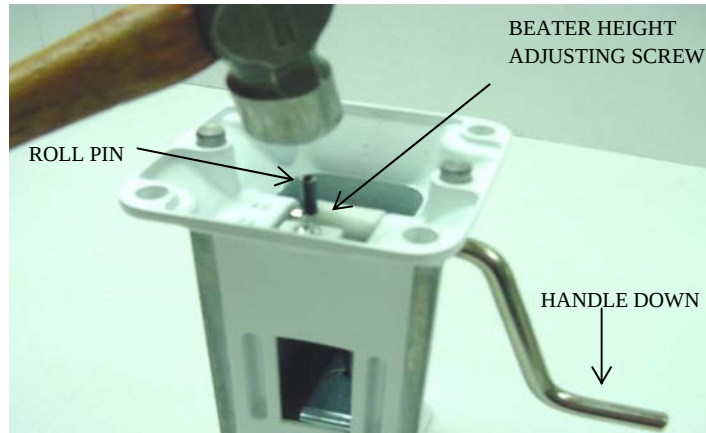


Fig. 91 The roll pin is driven in until it is almost flush with the arm. While the adjusting screw is replaced from this side, it is adjusted from the other.

I. Slide the new bowl support assembly on the column (Fig.88).

Place the bowl lift bracket in place and screw in the two #10-24x1/2" flat head screws (Fig. 87).

These screws must be very tight.

Check the castle nut so that the tension will be great enough to snap the rod into the arm and hold it there (Fig. 92).



Fig. 92 Check the castle nut for proper tension on the bowl lift bracket.

J. Place the base on the bottom of the column and screw in the four 5/16"-18x3/4" round head screws (Fig. 86). Tighten these screws to 70 - 90 in. lbs. of torque.

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K. If the mixer base feet are worn, replace them.

To replace the mixer base feet, pull them out, using pliers and a twisting motion. Older models require the removal of four # 8-32 x 1/2" round head screws to remove the feet (Fig. 93).



Fig. 93 Remove the four round head screws to remove the feet from older models.

Install new feet by pushing the tapered end into the foot supports with a twisting motion (Fig. 94).

Older models place the screws in the new feet and screw the feet to the base. Do not tighten so much as to push the screw through the rubber (Fig. 93).



Fig. 94 Push tapered end of foot into foot support with twisting motion until seated.

L. The bowl spring latch must be removed from the old bowl support and placed on the new bowl support to complete the bowl support repair.

To remove the bowl spring latch, unscrew the two #10-24 x 1/4" screws.

Replace with new if rusted or broken.

The function of the bowl spring latch is to hold down the rear of the bowl.

Hold the bowl spring latch on the bowl support and insert the two #10-24 x 1/4" round head screws into the bowl support and tighten (Fig. 87).



Fig. 95 Two #10-24 x 1/4" screws hold the bowl spring latch in place.

M. Place the column on the bottom cover (Fig. 85) and screw in the four 5/16"-18 x 3/4" round head screws (Fig. 86).

These screws must be tightened to 70 to 90 in. lbs. of torque. The mixer is now ready for operation.

N. To attach the bowl to the support, place the bowl support tabs on the bowl over the locating pins (Fig. 96). Press down on back of bowl, until bowl pin on back of bowl snaps into spring latch.



Fig. 96 Method used to attach bowl to bowl support.

O. To adjust beater to bowl clearance, attach the beater to the beater shaft and raise the bowl into the mixing position.

Beater should be within 1/16" from bottom of bowl.

SECTION 8

TROUBLESHOOTING THE BOWL LIFT STYLE ASSEMBLY

NOTE: Newer models have an adjusting screw located on the top center of the column for adjusting the bowl to beater clearance.

A. If the beater rubs the bottom of the bowl, it can be corrected by turning the adjusting screw out.

If the unit has no adjusting screw, it can be corrected by tapping the yoke arms down evenly with a mallet.

There should be 1/16" clearance between the bowl and beater.

B. If too much clearance between beater and bowl, adjust the screw in until the 1/16" beater to bowl clearance is met.

If unit has no adjusting screw, use a mallet to tap both sides of the yoke up evenly until the 1/16" beater to bowl clearance is met.

If beater to bowl clearance is not met, you will have to change the bowl support.

NOTE: The 1/16" clearance can be determined by dropping a dime in the bowl. The flat beater should just "touch" the coin as the beater rotates.

C. If the bowl rocks on the bowl support, this is caused by a broken bowl spring latch.

Remove the two screws and place a new latch in position.

Screw in the two screws tightly. (Fig. 95)

D. If the bowl retaining pins are worn, the bowl will move on the pins and the beater will hit the sides of the bowl.

To replace the pins, twist and pull up at the same time. They are not difficult to remove.

To install the new pins in the bowl support, place pins in holes, support the end of the arms with a heavy object, and drive the pins down gently.

Be careful not to bend the arms of the bowl support.



Fig. 97 Adjusting the beater to bowl height using the adjusting screw.

Q. Both "Bowl Lift" and "Tilt Head" international export models require an "R F" filter that is mounted to the bottom cover of the motor housing with a single round head screw (Fig. 75).

APPENDIX

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Tools Required for Stand Mixer Service



A - 7"

B - 11"

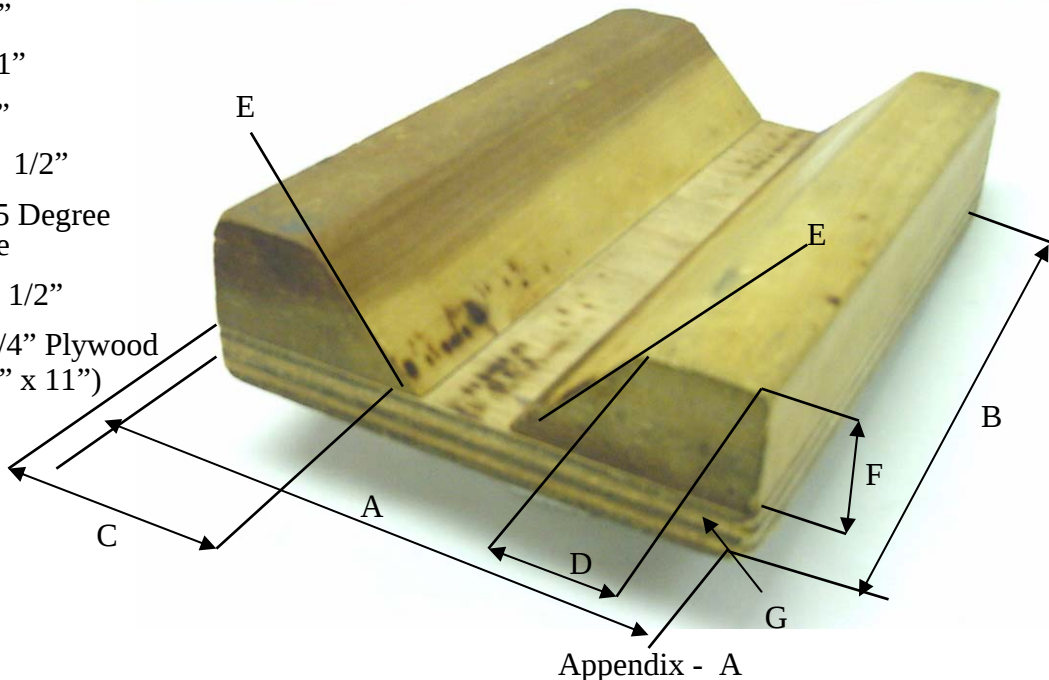
C - 3"

D - 1 1/2"

E - 45 Degree Angle

F - 1 1/2"

G - 3/4" Plywood (8" x 11")



Cradle - Make your own from wood, cushion with cloth to avoid damage to finish of mixer.

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PROBLEM SOLVING QUICK REFERENCE GUIDE

MIXER PROBLEM	MOST LIKELY CAUSE(S)	WHAT TO DO / CHECK
Switch lever clicks, but mixer will not run or buzz.	Open electrical circuit.	Faulty plug.
		Faulty power cord.
		Faulty speed control plate.
		Wire loose from brush holder.
		Bad connection between field and cord.
		Open circuited armature.
		Open circuited field.
		Faulty switch ON/OFF.
		Bad phase control.
		Dirty contacts.
		Incorrect brush orientation.
Mixer will not shut off with switch.	ON/OFF switch not correctly adjusted with switch control link	Check switch control link lever.
Bowl not held firmly on pedestal	Loose clamp disc screws.	Tighten the screws.
	Bent bowl screw cap.	Replace bowl screw cap.
		If none available, bend the four lugs or lips back into position.
Beater strikes bowl or too much clearance.	Adjusting screw on tongue of bottom cover improperly set.	Turn the adjusting screw slightly to right or left to adjust clearance. Clearance should be 1/16"
Planetary turns - beater does not revolve.	Pinion gear drive pin broken.	Remove planetary and take off the pinion gear.
		Replace the drive pin.
Mixer runs with a raspy, bumpy noise at the planetary.	Bottom cover internal gear teeth worn or broken.	Remove the planetary & bottom cover. NOTE: The complete bottom cover assembly must be replaced.
Mixer runs with bad vibration rumbling noise and goes to higher speeds.	Faulty governor.	Replace the governor.
		Control plate contacts not going closed.
		Adjust the control plate.
	Bad phase control.	Replace the phase control.
Mixer runs on low speed, but has no power.	Bad electrical connections.	Check the connections to the control plate.
		Repair any loose connections.
		Replace the control plate assembly.
Mixer has no power on low speed but OK on high speed.	"Stir" speed improperly set	Remove end cover and reset "stir" speed.
		The planetary should revolve at 60 RPM on "stir"
	Faulty governor.	Turn switch lever to # 10 position and hold out the control plate as far as possible. Turn the switch lever to "OFF". Watch the governor as it recedes when the armature slows down. If faulty, replace it.
Repeated worm gear failures.	Galled attachment gear.	Replace attachment hub gear.
	Attach hub bearing galled.	Replace gear case - motor housing.

FASTENER REQUIREMENTS

A. FASTENER AND TORQUE VALUES

LISTED BELOW ARE THE FASTENERS AND TORQUE VALUES USED IN THE ASSEMBLY OF THE KITCHENAID.

DESCRIPTION	TORQUE IN LBS.
BASE & COLUMN MOUNTING SCREWS (4)(K45)	125/150
BEARING BRACKET ASSEMBLY RETAINING NUTS (2)	15/20
BOWL SCREW CAP RETAINING SCREWS (3)(K45)	24/32
BOWL SPRING MOUNTING SCREWS (2)(K5)	18/23
BOWL SUPPORT MOUNTING SCREWS (2)(K5)	18/23
BRUSH HOLDER CAPS (2)	4/6
BRUSH HOLDER SET SCREWS (2)	3/5
*CONTROL LEVER (SPEED) PIVOT SCREW (1)	18/23
CONTROL PLATE LOCKING NUTS (2)	MIN 9
ELECTRIC CORD GROUNDING SCREW (1)	18/23
END COVER RETAINING SCREW (1)	4/7
FEET MOUNTING SCREWS (4)(K5)	4/6
**GEAR CASE RETAINING SCREWS (9)	18/20
LOCK WASHER UNDER 1 GEAR CASE MOUNTING SCREW (K45)(REAR)	
LOCK WASHER UNDER 1 BASE MOUNTING SCRW (KSMC50 ONLY)	
LOWER GEAR CASE AND COLUMN MOUNTING SCREW (4)(K5)	125/150
AGITATOR SHAFT BEATER DRIVE PIN (1)(KSMC50)	30/40
*GUARD PIN (1)(KSMC50)	HAND TIGHT
CIRCUIT BREAKER NUT (1)	HAND TIGHT
HEAD LOCK PIVOT SCREW (1)(K45)	18/23
HINGE PIN LOCKING SCREW (1)(K45)	24/33
***STATOR RETAINING NUTS (2)	MIN 30
PHASE CONTROL RETAINING SCREW (1)	4/5
PLANETARY GEAR RETAINING SCREW (1)(KSMC50)	18/23
TRIM BANDMOUNTING SCREW (2)	8/10
EUROPEAN GROUND AND FILTER MOUNTING SCREWS	MIN 18
STATOR STUD	3/5
*** IF TORQUE GUNS RE SET AT 15/20 LBS.,NUTS MUST BE HAND TORQUED AT LEAST 1/4 OF A TURN WITH A HAND NUT RUNNER	
WORM GEAR BRACKET MOUNTING SCREWS (3)	18/23
BOWL ADJUSTMENT SCREW (K5)	10/12
* BEFORE ASSEMBLY, DIP SPEED CONTROL LEVER PIVOT SCREW AND GURAD PIN INTO A LOCKTITE #271 SOLUTION	

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PROBLEM SOLVING QUICK REFERENCE GUIDE

MIXER PROBLEM	MOST LIKELY CAUSE(S)	WHAT TO DO / CHECK
Mixer runs only on high speed.	Control plate spring unhooked.	Remove end cover and check control plate spring. If unhooked, reattach to bottom of the control plate (check hook on end - rebend if necessary).
	Phase control shorted.	With the line cord disconnected, pull the T-bar contacts open and insert a piece of paper between them so they can not close. Reapply power; the mixer should just run or buzz trying to run. If it operates at full speed, the phase control is defective.
	Wires connected wrong.	Check wiring.
Mixer runs with a jerking clattering noise on low speed.	Loose connections on the control board.	Check connections on the control board to make certain they are tight.
Tight shim on vertical shaft between planetary and lower gear case. See item "V" - Section 4	Tight bearing.	First remove the planetary to check the beater shaft bearing in the planetary. If the beater shaft can be easily moved back and forth with a twisting effort, it is satisfactory. If it binds, replace the planetary. If it checks okay, recheck the mixer without it. If the mixer still uses excessive watts, it must be disassembled and the other bearings checked.
Loud rumbling or howling noise.	Worn spherical bearing on the end of the armature shaft.	Remove bearing bracket and replace.
	Worn armature thrust bearing.	Replace the thrust ball bearing on the armature.
Mixer runs, but will not come up to high speed. Has power, but labors and uses excessive watts.	Tight bearing, if no smoke is apparent.	First remove the planetary to check the beater shaft bearing in the planetary. If the beater shaft can be easily moved back and forth with a twisting effort, it is satisfactory. If it binds, replace the planetary. If it checks okay, recheck the mixer without it. If the mixer still uses excessive watts, it must be disassembled and the other bearings checked.
Armature shimmed too tight. See item "J" - Section 3	Overheated armature, if the mixer smokes.	Disassemble the motor and replace the armature assembly.
Mixer will not shut off with switch lever.	Switch not correctly adjusted with	Bend the fixed contact on the control board until the

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PROBLEM SOLVING QUICK REFERENCE GUIDE

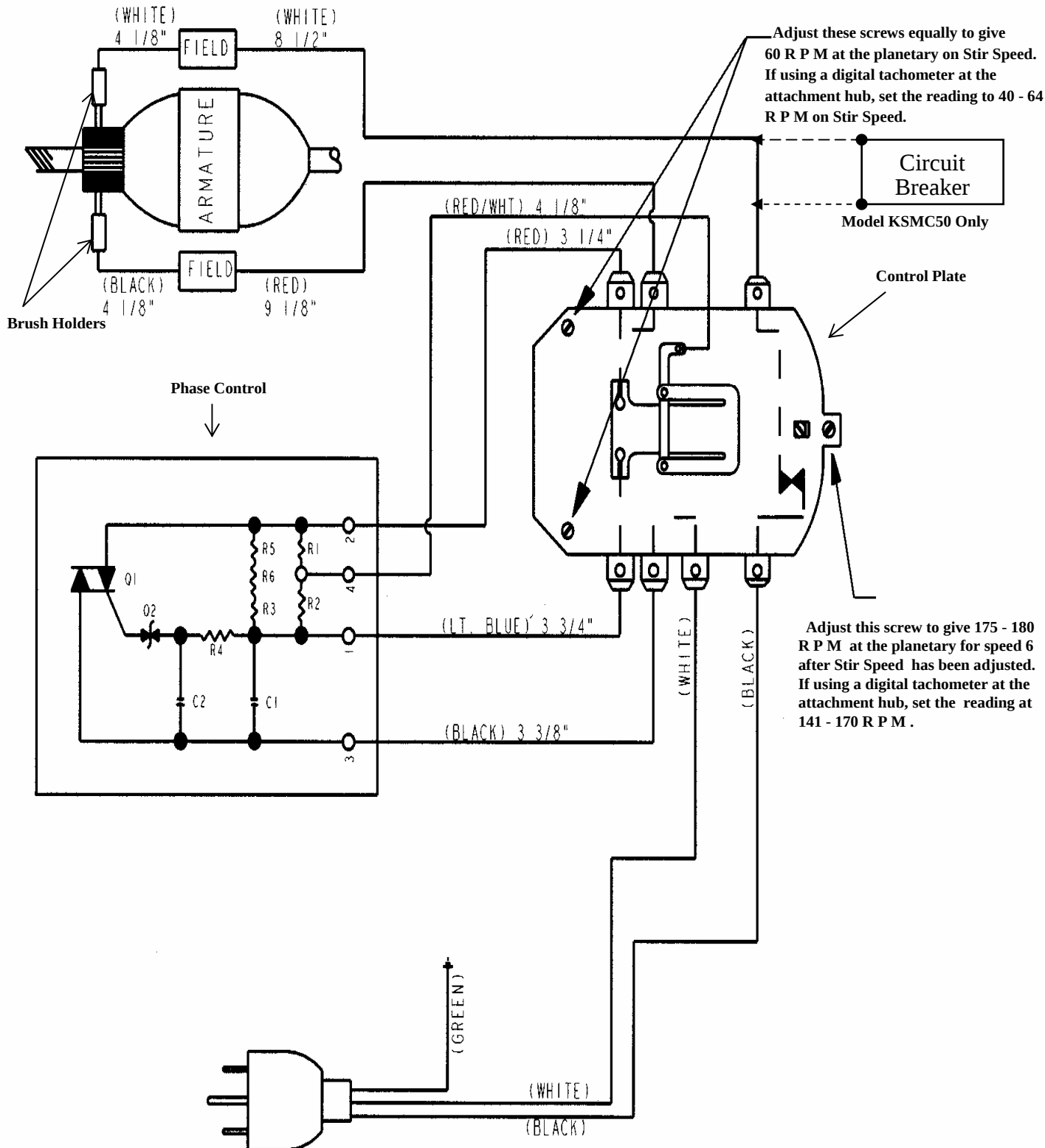
MIXER PROBLEM	MOST LIKELY CAUSE(S)	WHAT TO DO / CHECK
Switch lever clicks, but mixer will not run or buzz.	Open electrical circuit.	Progressively disassemble the speed control mechanism plus the motor and perform the following checks until the open circuit is found.
		Look for:
		Faulty plug on power cord.
		Faulty power cord.
		Bad connection in speed control plate.
		Faulty speed control plate.
		Wire lead clip detached from brushholder.
		Bad connection between field and cord.
		Open circuited armature.
		Open circuited field
		Incorrect brush orientation.
Electrical shock to operator.	Bare lead touching the inside of the motor housing.	Disconnect from power source. Turn the switch on and check for ground with a test lamp. Touch one lead of the test lamp to a prong on the plug on the power cord and the other lead to an unpainted surface on the motor housing. If the lamp lights, the mixer is grounded. Examine all the wiring in the order of its accessibility, until the grounded wire is found. If the mixer has a radio interference, condenser wired between a stator lead and power cord lead, remove it from the circuit.
Mixer will not run although switch clicks, motor buzzes and smokes.	Frozen bearing.	Examine all the bearings in the order of their accessibility, until the frozen bearing is found.
Bad sparking at contact points or burned contacts on switch.	Wired wrong.	Check wiring.
	Faulty Phase control.	Replace phase control.
Bad sparking at motor brushes.	Worn motor brushes.	Remove motor brushes and check that they are not worn to less than 5/16". Replace with new brushes if excessively worn.
	Rough commutator.	Remove and replace armature. Check brushes for wear.
	Faulty armature or shorted field.	Dissemble and check motor.
Mixer runs on high speed only.	Phase control defective.	Replace phase control.

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STAND MIXER WIRING DIAGRAM DOMESTIC MODELS

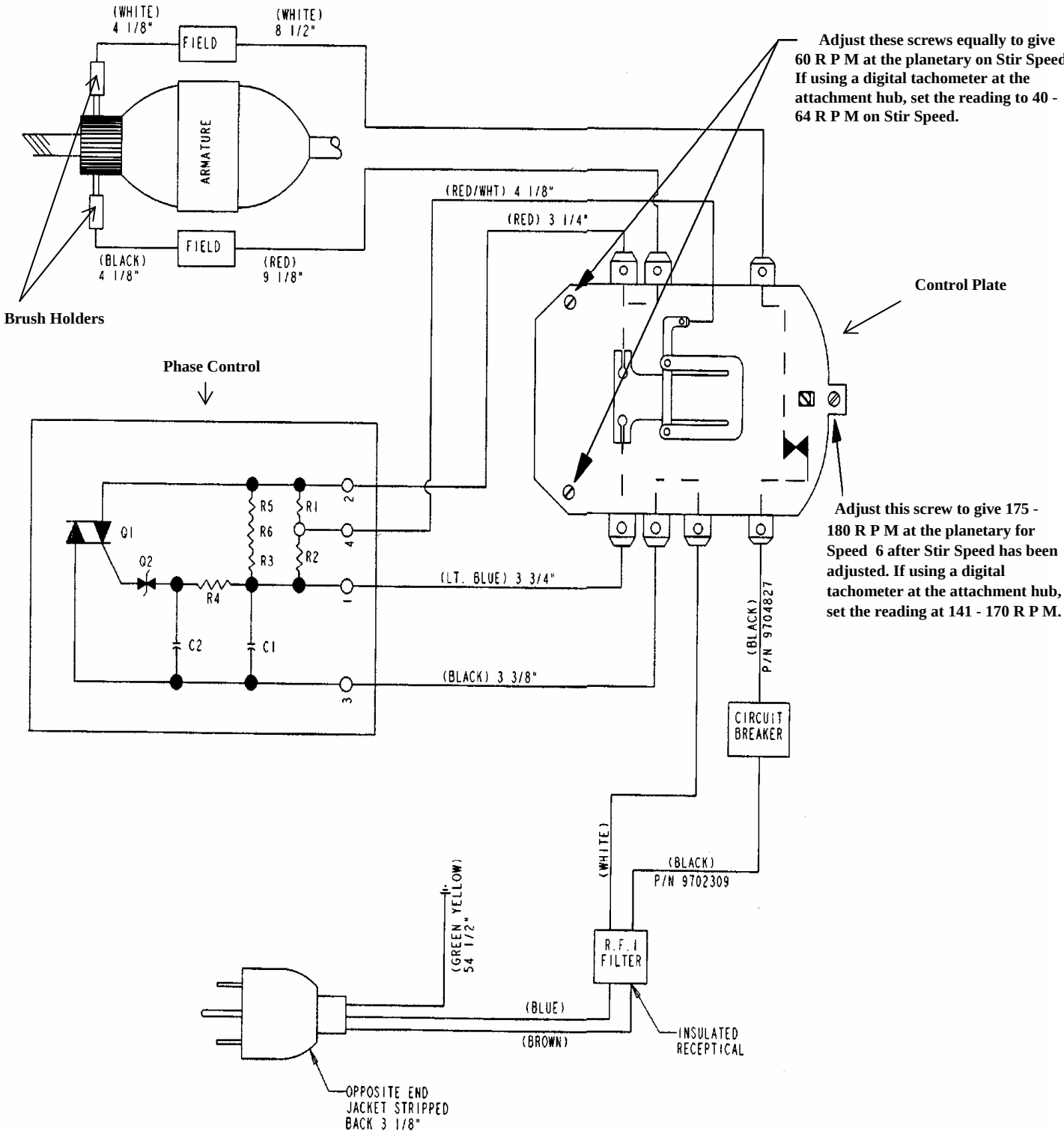


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STAND MIXER WIRING DIAGRAM INTERNATIONAL MODELS - R F FILTER



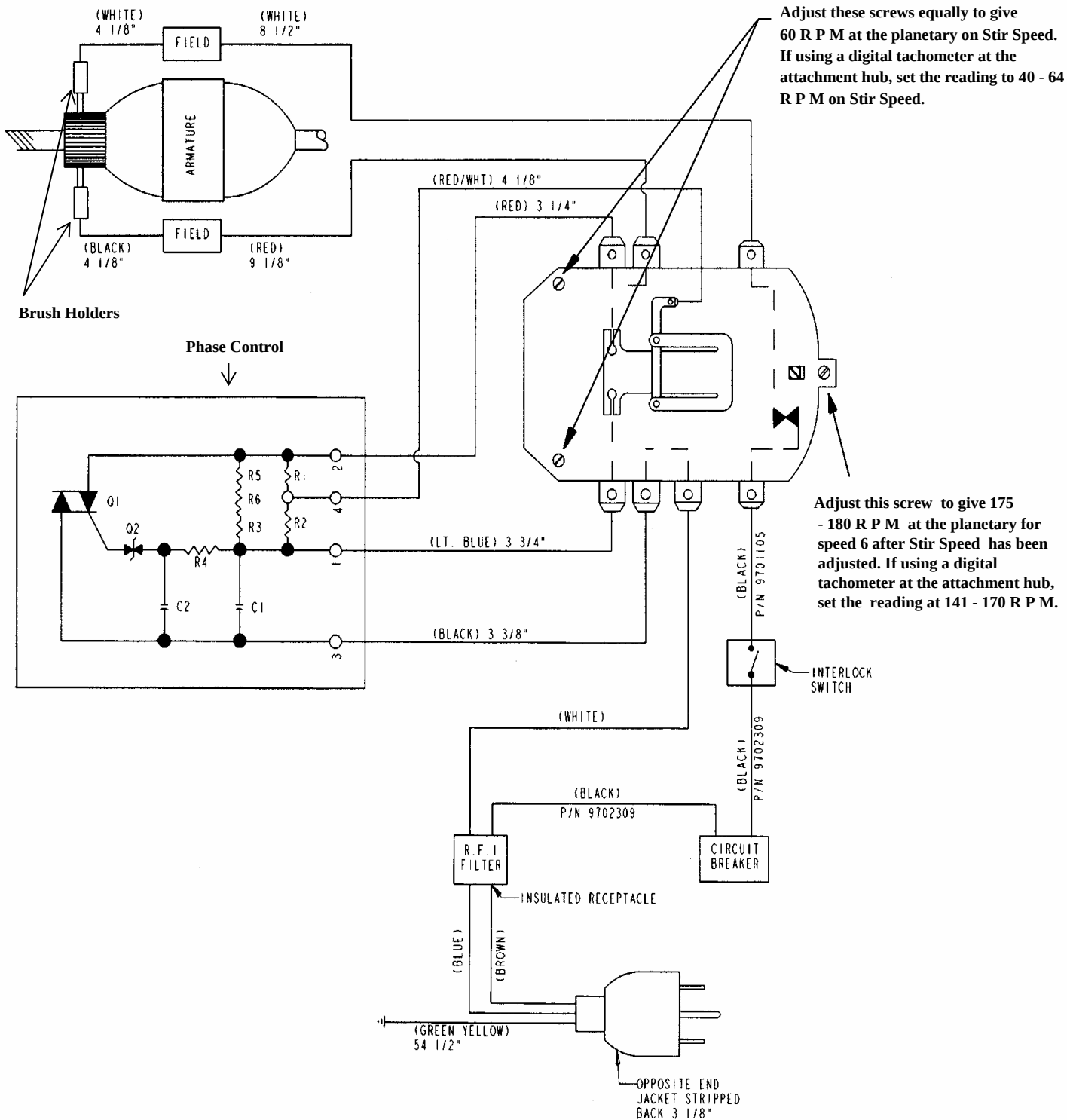
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STAND MIXER WIRING DIAGRAM

INTERNATIONAL MODELS - BOWL LIFT and R F FILTER



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STAND MIXER SERIAL NUMBERS

SERIAL NUMBER	W	H	03	01234
MANUFACTURING DIVISION				
W = Greenville, OH				
YEAR CODE (See Below)				
WEEK MANUFACTURED CODE (See Below)				
SERIAL NUMBER CODE (See Below)				

YEAR CODE

The single position that represents the year of manufacture follows the manufacturing Division. This coding structure would continue to be recycled every thirty (30) years following the example below.

0	1980 - 2010 - 2040	X	1990 - 2020 - 2050	K	2000 - 2030 - 2060
1	1981 - 2011 - 2041	A	1991 - 2021 - 2051	L	2001 - 2031 - 2061
2	1982 - 2012 - 2042	B	1992 - 2022 - 2052	M	2002 - 2032 - 2062
3	1983 - 2013 - 2043	C	1993 - 2023 - 2053	P	2003 - 2033 - 2063
4	1984 - 2014 - 2044	D	1994 - 2024 - 2054	R	2004 - 2034 - 2064
5	1985 - 2015 - 2045	E	1995 - 2025 - 2055	S	2005 - 2035 - 2065
6	1986 - 2016 - 2046	F	1996 - 2026 - 2056	T	2006 - 2036 - 2066
7	1987 - 2017 - 2047	G	1997 - 2027 - 2057	U	2007 - 2037 - 2067
8	1988 - 2018 - 2048	H	1998 - 2028 - 2058	W	2008 - 2038 - 2068
9	1989 - 2019 - 2049	J	1999 - 2029 - 2059	Y	2009 - 2039 - 2069

WEEK MANUFACTURED CODE

Two positions represent the week (00 to 52) of the year. The first Monday of the calendar year will begin with week 01. Small production products can use 00 for the week if authorized by Corporate Information Services.

SERIAL NUMBER CODE

The assigned serial number will begin with 01001 or 10001 and will be incremented by one for each unit produced until 99999 which will revert to the beginning assignment. Serial numbers may be sequenced through several model numbers.

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SAFETY FIRST

Safety Guidelines

SAFETY FIRST

This Service Manual is written for the Professional Service Technician who has familiarity with the KitchenAid Stand Mixer. The following Safety Guidelines should be adhered to when servicing this product.



SERVICE ENVIRONMENT

- The workplace will be dry and sanitary at all times and all units should be inspected for cleanliness before any work is started.
- Visually inspect the unit requiring service in a well luminated area.
- A mild, non-abrasive dishwashing soap solution and clean towel can be used to wash any unit requiring attention.
- The hands of the service technician should be clean at all times during service procedure.



ELECTRICAL CONSIDERATIONS

- The workplace for the stand mixer will have properly grounded AC outlets that adhere to all Local Electrical Codes that are applicable at the time of repair.
- The Stand Mixer Power Cord should always be inspected first before testing the mixer operation. Do NOT run the mixer if the Power Cord is damaged -- replace it.
- All disassembly and assembly procedures discussed in this manual should be conducted with the unit disconnected from the AC mains.
- Do NOT leave the unit unattended while running the mixer for speed range and bowl clearance checks. Always unplug the unit immediately after concluding these tests.



Technician

- The Service Technician should wear Protective Eyewear at all times when conducting a repair on the Stand Mixer.
- Loose fitting sweaters, shirts sleeves or bracelets should NOT be worn while servicing the Stand Mixer.