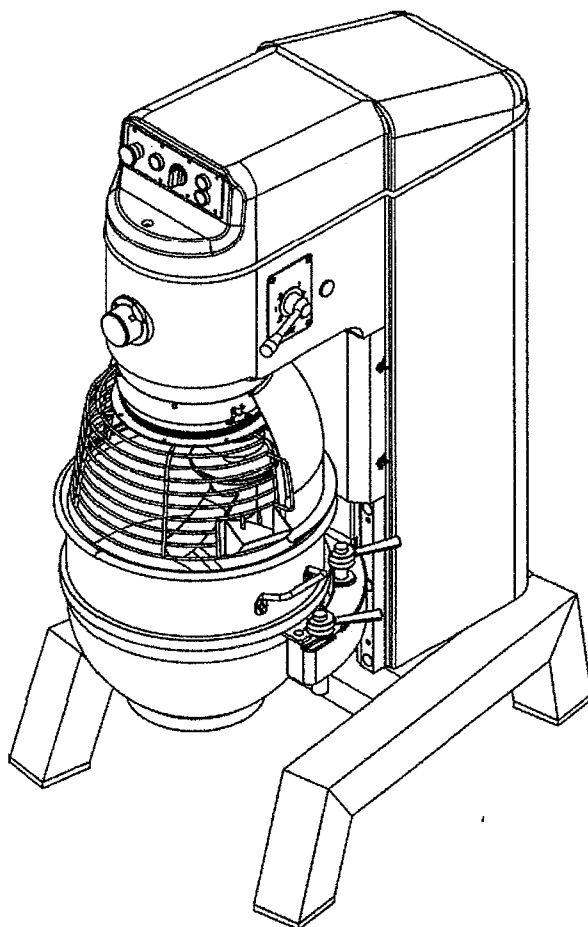


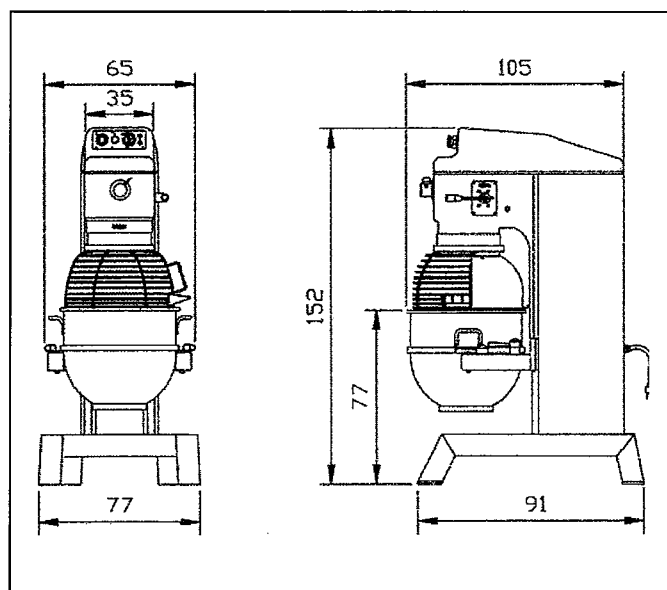
## METCALFE SP80 HI MIXING MACHINE

### OPERATING & MAINTENANCE INSTRUCTION



## METCALFE SP80HI PLANETARY MIXER

SPECIFICATION	
MODEL	SP80HI
BOWL SIZE	80 Litres (Quarts) (50cm ID x 46.8cm H x 2cm TH)
MOTOR	3 h.p.
MOTOR – POWER BOWL LIFT OPTION	1/8 h.p.
ELECTRICS	220v/380v/415v 50/60Hz 3 Phase
SPEEDS – AGITATOR	1 <sup>st</sup> Speed – 60 rpm (1) 2 <sup>nd</sup> Speed – 105 rpm (2) 3 <sup>rd</sup> Speed – 176 rpm (3) 4 <sup>th</sup> Speed – 310 rpm (4)
SPEEDS – ATTACHMENT HUB	1 <sup>st</sup> Speed – 67 rpm (1) 2 <sup>nd</sup> Speed – 118 rpm (2) 3 <sup>rd</sup> Speed – 198 rpm (3) 4 <sup>th</sup> Speed – 349 rpm (4)
DIMENSIONS	105cm D x 77cm W x 152cm H
DIMENSIONS (CARTON)	125cm D x 90cm W x 180cm H
WEIGHT	455 Kgs. Gross 550 Kgs. Nett
STANDARD EQUIPMENT	Beater, Whisk, Dough Hook and stainless steel Bowl. Bowl Truck, Attachment Hub and Bowl Guard *
OPTIONAL EQUIPMENT	Meat Mincer, Vegetable Preparation Attachment

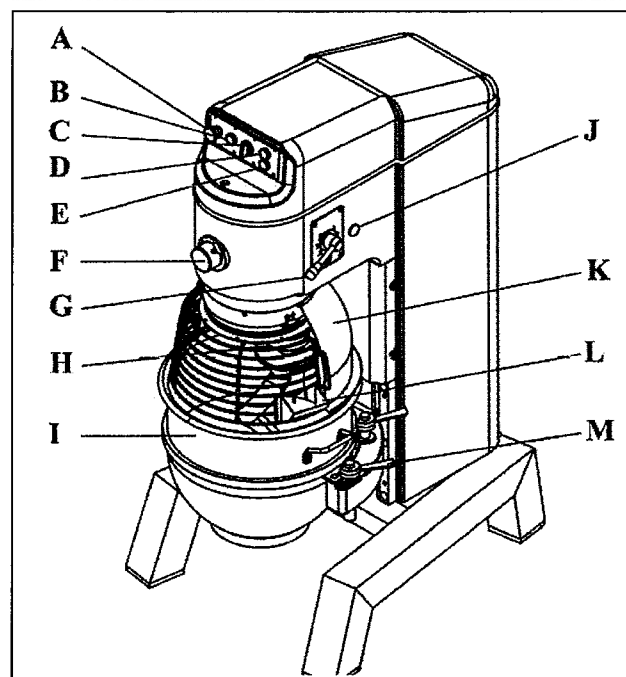


Because of continual improvements, strict accuracy of descriptions cannot be guaranteed.

**\*ATTACHMENT HUB, BOWL GUARD AND BOWL TRUCK ARE STANDARD ACCESSORIES WITH THE METCALFE SP80HI MIXER**

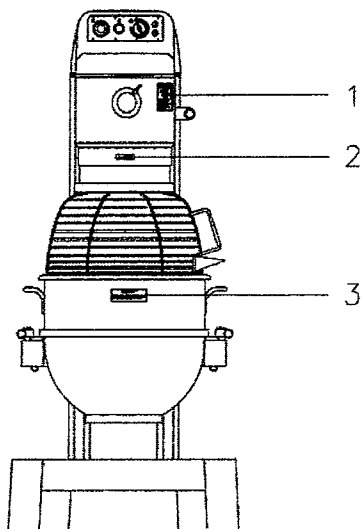
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- |                           |                     |
|---------------------------|---------------------|
| A – Emergency Stop Button | H – Planetary Shaft |
| B – Start Button          | I – Bowl            |
| C – Timer                 | J – Oil Gauge       |
| D – Bowl Raise Button     | K – Safety Guard    |
| E – Bowl Lower Button     | L – Feeder          |
| F – Attachment Hub        | M – Bowl Weld Clip  |
| G – Gear Arm              |                     |

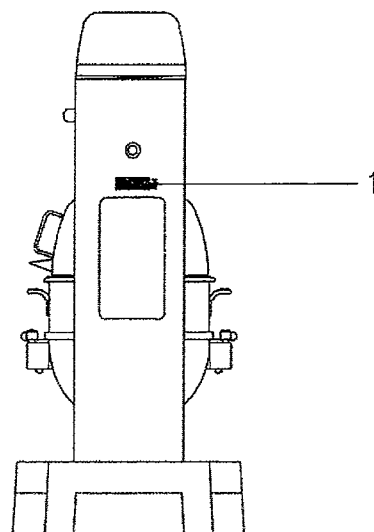
**Note: Parts could be different subject to different models**



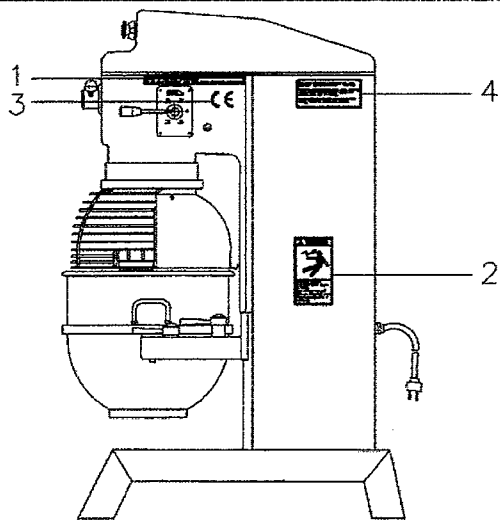
- (1)  Moving parts can crush and cut.  
Do not operate with guard removed.  
Follow lockout procedure before servicing.

- (2) 


- (3) **CAUTION!**  
Please wash bowl thoroughly before  
first use with soap-based cleaner to  
remove polishing membrane



- (1) **Warning: Three-phase powered motor**  
YOU must check the rotation of the planetary immediately  
after connecting power supply. Planetary should move in same  
direction that arrow on front of mixer indicates. If the  
planetary moves in the opposite direction to arrow, disconnect  
power supply and switch the two live wires. FAILURE to  
follow these instructions will VOID WARRANTY.



- (1) **STOP MIXER** BEFORE CHANGING SPEED. DO NOT IMMERSE IN WATER.  
UNPLUG BEFORE CLEANING AND BEFORE ASSEMBLING OR REMOVING PARTS

- (2)  **WARNING**  
Hazardous voltage.  
Will cause severe injury or death.  
Turn off and lock out power at  
electrical panel before opening  
panel or servicing

- (3) **CE**

- (4) **DO NOT REMOVE SAFETY GUARD.**  
Removal of safety guard can result in serious bodily injury. Guard  
can only be removed while machine is shut down for cleaning.  
For three phase mixers check wiring if mixer runs slowly. This is not  
covered under warranty.

## GUARANTEE

METCALFE provides a one-year guarantee, from the date of supply. We will replace any defective parts resulting from faulty design, material or workmanship. In addition to this, any repair must be carried out by our authorised Service Agent. All defective parts, without any alteration or repair, can be returned to METCALFE or the nearest authorised representative, postage paid, within one year of warranty.

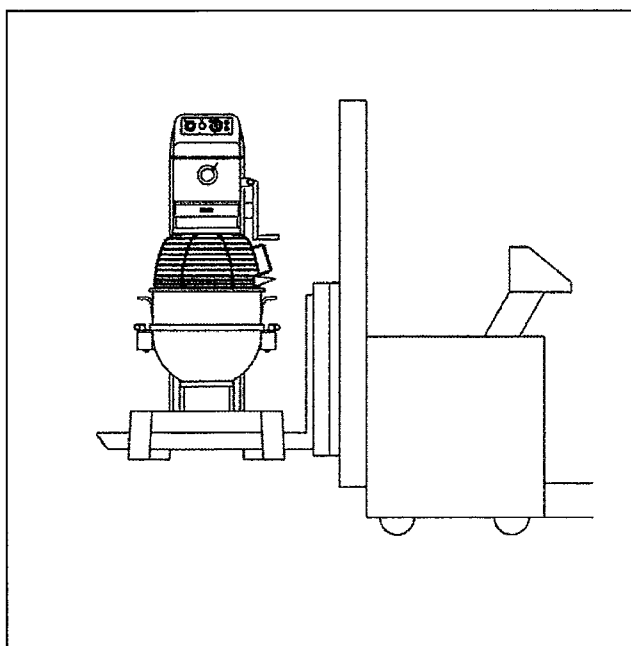
METCALFE SP80HI Mixing Machine is a floor standing Pedestal model unit designed for commercial use by the professional caterer. It has a total bowl capacity of 80 Litres (Quarts), combined with 4-speed gearbox to ensure that all mixing requirements can be met.

The intended use of the mixer is for the food processing industry, which does not include the pharmaceutical industry, chemical industry, printing etc.

## INSTALLATION

The installation of the mixer should be carried out by a technician.

The mixer is lubricated and ready to run, when it leaves the factory. During transportation or fitting, please do not lean over 35° to avoid the gear oil leaking from the gear oil container. Please use a forklift for transportation (please see **Figure 1**)



**Figure 1**

## ELECTRICAL CONNECTION

Before connecting the machine to the electrical supply, please check that the details on the rating plate (located on the rear of the mixer) corresponds to the details of your electrical connection.

The Mixer is supplied with a trailing lead fitted with a moulded plug. If the style of plug is unsuitable for the socket which you plan to use, the plug must be cut off and replaced with an appropriate plug. In terms of the 3 Phase unit, the mixer must be located and connected into an isolator - please make sure that the shaft turns clockwise. If the shaft turns anti-clockwise, please replace wires L1, L2 and L3. Replace the wires until the shaft turns clockwise.

The mixer should be plugged into a switched socket which isolates all poles and has a minimum contact clearance of 3mm, and locates close to the mixer for use in an emergency and to facilitate servicing (max. 2 metres of cable). The machine must be incorporated into a potential equalisation system.

The leakage current for this appliance is no greater than 1mA/Kw. If the electrical supply cable to the machine becomes damaged, it must be replaced by a qualified electrician using cable which is 3.0 specification or higher and suitable for a 3 h.p. motor load. The earth wire is fixed to the machine and this connection must be kept intact.



**NOTE: The mixer MUST be earthed**

The minimum requirements for all electrical equipment is correct operation between air temperature of +5°C and +40°C.

Electrical equipment is capable of operating correctly when the relative humidity does not exceed 95% at a maximum temperature of +40°C.

Electrical equipment is capable of operating correctly at altitude of up to 1000m.

Electrical equipment is designed to withstand to be protected against the effects of transportation, and storage temperature within a range of -25°C to +55°C and for short periods not exceeding 24 hours at up to +70°C.

## BEFORE USING THE MIXER

Before using the mixer, please ensure that all users are familiar with the correct operation of the machine. In particular, care should be taken to ensure that the bowl and mixing tools are correctly fitted.

## SAFETY AT WORK

Never place your hand or any kitchen utensil in the bowl when the mixer is in operation. Isolate the machine from the electrical supply by removing the plug from the socket before cleaning or dismantling.

If any cover or guard on the machine removed, do not use.

Certain operator notice advising about the safe use of this mixer is attached to the machine.

## OFFICE, SHOPS & RAILWAY PREMISES ACT 1963

The above Act requires that this machine and attachments shall be operated only by a properly instructed person or by an employee who is under the supervision of a properly instructed person. The instruction shall include identification of the possible dangers arising and the precautions to be observed. The Act also requires that no person under the age of 18 shall clean a machine if this exposes them to risk of injury from a moving part of the machine or any adjacent machine.

## CORRECT USE OF THE MIXER

It is the responsibility of the operators to use the mixer correctly within the recommended limitations. Always follow the instructions on the side of the machine when changing speed. If the motor labours or the belt slips, stop the machine and reduce the size of the mix immediately. Damage resulting from the improper use is not covered by the METCALFE warranty. In terms of operator safety, the mixer is fitted with a bowl guard which is electrically interlocked to ensure that the mixer cannot operate unless the guard is correctly positioned and the bowl is raised.

For additional safety, the mixer has a no-volt release feature which means that in the event of a power failure, the machine will only restart after the control button has been pressed again. This arrangement ensures that when power is restored, the machine cannot restart on its own.

Carefully handle bagged products by minimising the height above the bowl base from which they are poured.

Carefully slit bags in the lower part of the bowl to allow dust-free discharge of flour.

Use temporary bowl covers to minimise openings through which flour may escape.

## GEAR OIL METER

Use the gear oil to lubricate the mixer and to prolong the life of the machine. Before using the mixer, please check the gear oil meter. Please see **Figure 2**. When the indicator of the gear oil meter is above the half of the red circle, the gear oil is full. Please fill the gear oil when the indicator is below the red circle.

## ANNUAL MAINTENANCE AND GEAR OIL RENEWAL

Please unscrew and drain the oil from the indicated oil-draining hole. After finishing the draining, screw back tightly with the anti-draining cover on the screw. Fill the gear oil to the indicated re-fill oil hole. We recommend that any servicing or maintenance work must be carried out by trained technicians from a METCALFE appointed distributor.

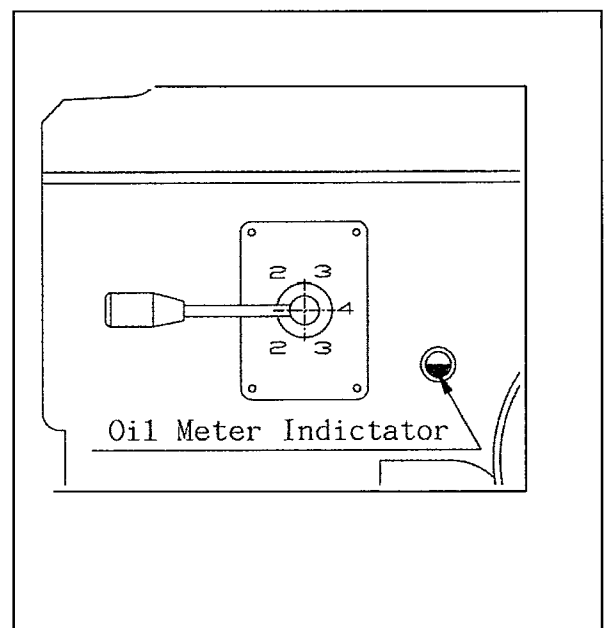
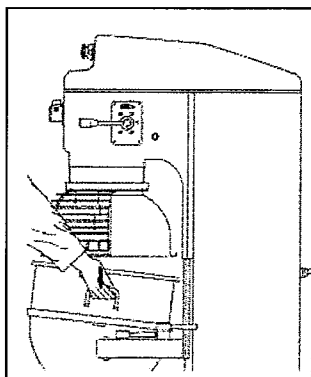


Figure 2

## FITTING THE BOWL

1. Please lower the Bowl cradle by pressing the bowl lower button on the control panel to the lowest position
2. Lift the bowl by the side handles and (a) slowly position locking pin (located on the rear of the bowl) into the hole in the middle rear of the cradle; (b) fit the two pins on opposite sides of the cradle into the two side holes (each hole is located under each of the side handles) onto pins on the opposite sides of the cradle.
3. Once the bowl is seated correctly on the cradle, please secure the bowl by folding both steady hooks (locking latches) inward until locked tight.



**NOTE: PLEASE USE BOWL TRUCK TO LOAD AND UNLOAD BOWL CONTAINING MORE THAN 50 lbs. PER BATCH**

## BOWL LIFT & BOWL GUARD

The bowl cradle and bowl guard are electrically interlocked so that the machine will only operate with the bowl cradle in the raised position. In addition to this, the bowl guard must be locked into place by sliding it into position across the top of the bowl to the point where it will slide no further.

Only once the bowl is raised and the bowl guard locked, the machine can be operated. Thus this ensures complete user safety at all times.

Once the guard has been opened or the bowl lowered, the mixer will stop. If this happens, please close the bowl guard, raise the bowl lift and then press the **START BUTTON**.

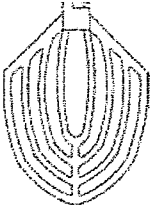

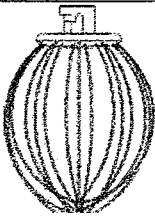
During the mixing process, additional ingredients can be added by means of the chute located on the right hand side of the bowl guard.

## POWER BOWL LIFT OPTION

Powered by a 1/8 h.p. motor, the bowl may be raised or lowered by fingertip control through the conveniently located switches. The bowl will remain in position until the switch is activated.

## TOOL SELECTION

The beater, whisk and dough hook are meant for the work implied by their names. Do not use the beater for dough making or the whisk for anything other than whisking, aerating or mixing light mixtures. **Figure 3** shows the typical use for each of the tools.

	<b>BEATER</b> – Firm mixes such as light pastry, cakes, biscuits, icings, fillings and mashed vegetables.
	<b>DOUGH HOOK</b> – Heavy mixes such as dough, pie pastry etc.
	<b>WHISK</b> – Light mixes such as whipped cream, mayonnaise, egg whites, pancakes and soufflés.

**Figure 3**



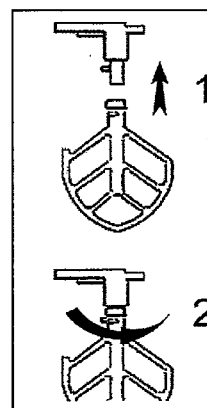
**NOTE: Install bowl before fitting tools**

## FITTING THE MIXING TOOLS

Slide the bayonet fitting of the tool onto the drive shaft and twist clockwise to secure it in position. To remove the mixing tool, slide the tool up the shaft slightly and twist counter-clockwise.

Please see **Figure 4**.

Please refer to **CAPACITY & RECOMMENDED TOOL CHART** for tool selection and optimum performance



**Figure 4**



**NOTE: Tools should always rotate in a clockwise direction around the bowl. If tools move counter-clockwise, please contact licensed electrician immediately to remedy incorrect wiring.**



**NOTE: Always wash tools with mild soap and apply light quantity of mineral oil to planetary shaft after cleaning.**

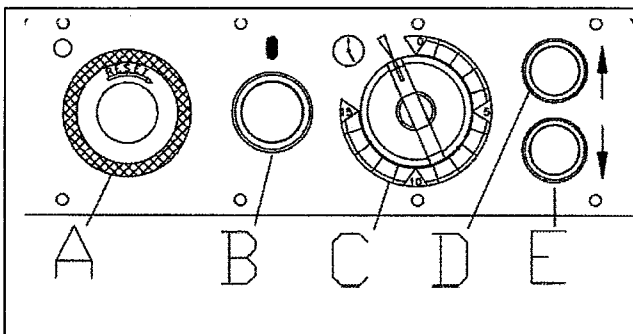
## SPEED SELECTION

Before changing speed, the mixer must always be stopped by pressing the red stop button. The necessary speed can then be selected before restarting the machine by pressing the green start button. The speed selected depends largely on the quantity and consistency of the product. It is recommended that mixing is always started at the lowest speed and progressively increased to the desired setting. In an emergency situation, always use the red emergency stop button to stop the machine. **Table 1** shows the recommended speeds for the range of tools.

RECOMMENDED SPEED				
	1 <sup>st</sup> gear	2 <sup>nd</sup> gear	3 <sup>rd</sup> gear	4 <sup>th</sup> gear
Whisk	→			
Beater	→			
Hook	→			

**Table 1**

## CONTROLS



### A. EMERGENCY STOP BUTTON (RED BUTTON)

To operate mixer, please check that the EMERGENCY STOP BUTTON (red button) is not pressed in. To stop the machine at any time press the EMERGENCY STOP BUTTON located at the left hand side of the control panel.

### B. START BUTTON (GREEN BUTTON)

Press the START BUTTON (green button) located at the middle of the control panel to start mixing.

## C. TIMER

The METCALFE SP80HI Mixer is equipped with a 15-minute timer. In terms of timing operation, the timer must be set to at least 5 minutes. The machine will automatically stop once the set time has expired.

### a) Timing Operation:

Turn timer knob in a clockwise direction for at least 5 minutes past "0" to the desired time. Push the green button to start the machine. If you want to set a time less than 5 minutes, before pushing the start button, please turn the timer knob clockwise to 6 minutes and then turn it counter-clockwise back to the desired time. Push the green button to start the machine.

### b) Manual Operation:

Turn timer knob in a counter-clockwise direction until it stops. Push green button to start the machine. The mixer will now run indefinitely. Push the red button to top the mixer.

## D. BOWL RAISE BUTTON

The bowl and bowl support can be raised by fingertip control through the conveniently located button at the upper right hand side of the control panel. The bowl will remain in position until the button is activated.

## E. BOWL LOWER BUTTON

The bowl and bowl support can be lowered by fingertip control through the conveniently located button at the lower right hand side of the control panel. The bowl will remain in position until the button is activated.



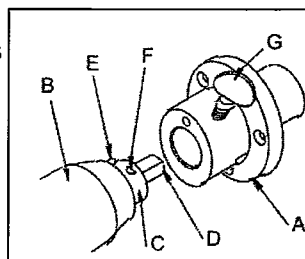
**NOTE: The Mixer will not operate unless the bowl cradle is raised in the uppermost position. Please ensure the cradle is raised until it stops.**



**NOTE: For additional safety, the mixer has a no-volt release feature. In the event of power failure, the machine will only restart by pressing the green start button after the power has been restored.**

## ATTACHMENTS

The range of attachments which can be operated from the attachment hub are listed below. When using an attachment, please lubricate the **(D) DRIVE END** by using a food quality grease or oil. Please refer to **FIGURE 5** to assemble an attachment.



**Figure 5**

Release the **(G) THUMBSCREW** and slide the shaft of the attachment into the hub. Please ensure that the **(D) DRIVE END** engages in the socket within the hub. Rotate the attachment to line up with the **(E) LOCATION PEG** with its mating hole in the hub and push firmly home. Finally tighten the **(G) THUMBSCREW** to secure.

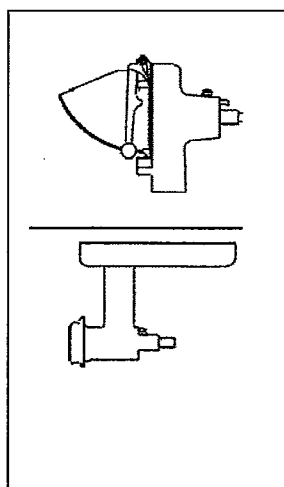


**NOTE: Only fit attachments when the mixer is stationary. Never fit any Attachments when the mixer is in operation. Do not use any attachments when the machine is mixing.**

**Table 2** shows the recommended speed range for some of the available attachments.

RECOMMENDED SPEEDS				
	1 <sup>st</sup> gear	2 <sup>nd</sup> gear	3 <sup>rd</sup> gear	4 <sup>th</sup> gear
V99S	→	→		
VH-12	→	→		

**Table 2**



### V99S VEGETABLE PREPARATION ATTACHMENT

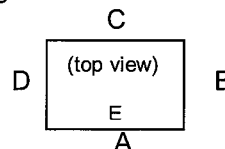
With a range of 8 plates to slice, grate or shred all types of vegetables and fruits from nuts and cabbage to carrots and cheese

### VH-12 MEAT MINCER

A No. 12 Mincing Attachment which works wonders with meat, fish and vegetables alike

## NOISE TEST REPORT

- 1) METCALFE SP80HI Mixer
- 2) Background noise:  
Add flour: background noise level is 59.8 dB(A)  
Dry running: background noise level is 52.6 dB(A)
- 3) Distance: 1m from the surface
- 4) Height: 1.6m from the floor



Unit: dB(A)

	A	B	C	D	E
Add Flour	69.6	70.1	69.9	70.6	69.1
Dry running	59.1	60.9	60.8	61.0	60.5

## CARE OF YOUR MIXER

The mixer is designed for simple maintenance carried out by operators. It may be necessary from time to time to apply a little Vaseline and oil to the rods on which the bowl cradle sides. It so, use a little food quality lubricant, ensuring that there is no excess oil that could contaminate the food mix.

**Water jet cleaning is not allowed.** Clean the mixer thoroughly after use. The body should be wiped down with a damp cloth after first isolating the machine from the electricity supply. Do not spray the machine with or immerse it in water. Do not forget to clean the rear of the machine and do not allow the rear vents to become blocked as this may result in overheating. Pay particular attention to the bowl pins and any surrounding areas of the cradle to prevent the accumulation of mix, as this could prevent correct location of the bowl. For the same reason ensure that the beater shaft and each of the sockets on the tools are cleaned thoroughly. The bowl and tools should be washed in hot soapy water, rinsed and dried before being put into storage. Do not wash the tools in a dishwasher, as the polished finish will be adversely affected by the dishwashing chemicals.

Steady state voltage: 0.9~1.1 of nominal voltage  
Frequency: 0.99~1.01 of nominal frequency continuously

Avoid exposing to vibration environment

Avoid exposing to direct sunlight or heat rays

The over-current protection device should be rated 30A.



## CAPACITY

Table 3 lists the recommended capacities of finished weights of regular mixes. Although the machine may be capable of mixing larger quantities, it will lead to excessive and premature wear and possible failure. Overloading also results in lengthy processes and unsatisfactory results.

PRODUCT	Maximum Regular Mix (Kg.)	Whisk	Beater	Dough Hook
Mashed potatoes	40 lbs. (18.2 Kg.)	●	●	
Fruit Cake	80 lbs.	●	●	
Sponge Cake	54 lbs.	●		
Honey Cake	80 lbs.		●	
Angel Cake	60 lbs.	●		
Cookies	30 lbs.	●		
Brioche	115 dz.		●	
Whipping Cream	16 qts.	●		
Mayonnaise	22 qts.	●		
Butter	32 qts.	●	●	
Egg White	2 qts. (2.1 litres)		●	
Muffin	90 dz.		●	
Pie	60 lbs.		●	
Light Bread Dough (65% moisture content)	86 lbs. – 2 <sup>nd</sup> speed			●
Heavy Bread Dough (60% moisture content)	73 lbs. – 2 <sup>nd</sup> speed			●
Pizza Dough (50% moisture content)	70 lbs. – 1 <sup>st</sup> speed			●
Pizza Dough (45% moisture content)	63 lbs. – 1 <sup>st</sup> speed			●

1. Recommended weight for a finished mix unless otherwise stated
2. Water content, i.e. 25% flour/12.5% water = 50% moisture
3. For pizza dough with lower moisture content, please consult METCALFE
4. For higher gluten flour reduce dough batch by 25%

## MAINTENANCE

Regular maintenance is necessary on all machines if they are to remain in good working condition. It is strongly recommended that all maintenance must be carried out by a trained technician from a METCALFE appointed distributor.

### ON A REGULAR BASIS

Clean the machine thoroughly after use and lubricate the rods. on which the bowl cradle slides, with Vaseline or lubrication oil. Wipe the beater shaft and slightly lubricate it with Vaseline to prevent rusting. (see CARE OF YOUR MIXER).

### ON AN ANNUAL BASIS

Check that all bolts are tight and bowl guard are secure. Please check the gear arm, bowl handle wheel and replace these parts if it is necessary.

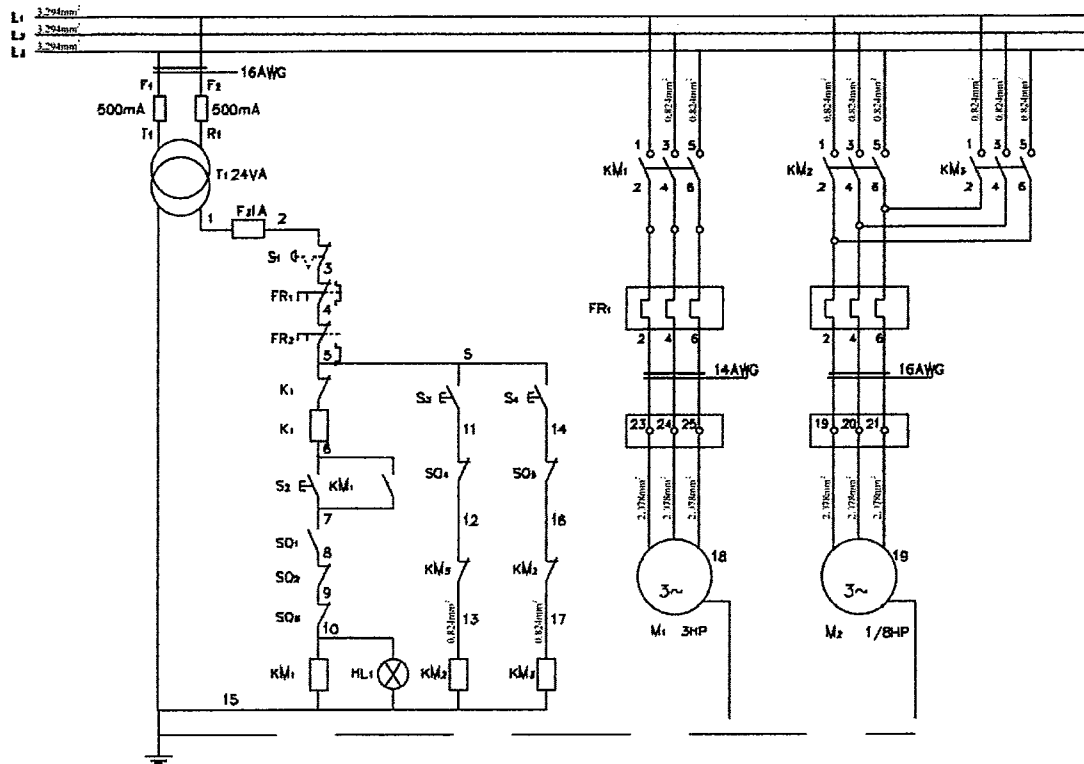
FAULT FINDING		
No power to Mixer	Check plug socket Check wiring in plug Check fuse in plug Check or change cable Check micro switch Check circuit breaker overload or short	Mixer not plugged into a live socket or not switched on Plug incorrectly wired – rewire correctly Possible faulty fuse – replace fuse Cable damaged or split – replace cable Limit switch damaged or faulty – replace switch Circuit breaker shut off or constantly short – reset or replace the circuit breaker (automatically reset).
Mixer becomes noisy	Check bowl and tools Check work surface Check the wear of bearing	Ensure that bowl and tool are correctly seated Uneven surfaces create excessive resonance Worn bearings – replace bearings
Mixer loses power	Check capacity Check power	Overloading of bowl – reduce load Power failure – please restore the power
Motor overheating	Check supply voltage	Voltage should correspond to rating plate
Oil on planetary shaft	Check oil seal	Worn oil seal – change oil seal
Mixing tools stuck on planetary shaft	Check planetary shaft bent, unclean or rusted	Planetary shaft twisted or bent – replace change planetary shaft Planetary shaft rusted – please use descaler for derusting Turn planetary shaft anti-clockwise to meet square groove, gently knock down mixing tools

- It is recommended that any servicing or maintenance work must be carried out by a trained technician or electrician.
- Isolate the mixer from the electricity supply by removing the plug from the socket before cleaning or servicing.
- Isolate the mixer from the electricity supply by removing the plug from the socket when not in use.

## **WARNING**

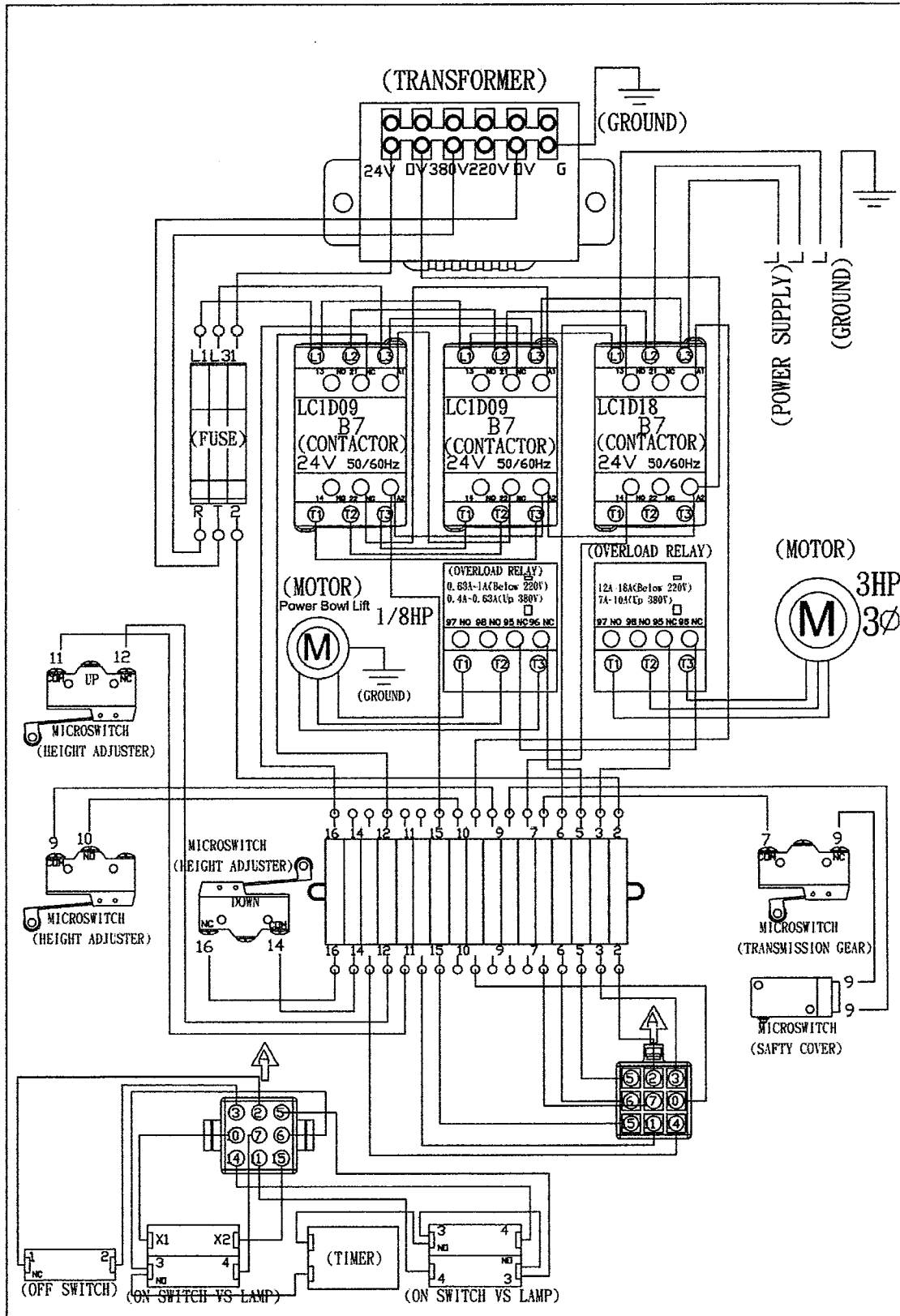
- ✖ We recommend that you do not lean the mixer over 35° during the transportation to avoid the oil leaking from the gear oil container.
- ✖ After replacing the parts by the technicians, please tighten the anti-draining cover to avoid the gear oil leaking.
- ✖ We recommend that all maintenance must be carried out by a trained technician.
- ✖ Carry out service on a more frequent basis of machine is arduously used.
- ✖ Do not allow children to operate the machine.
- ✖ Do not use the mixer before reading these instructions.
- ✖ Do not allow the cable to touch any heat source, any rough objects, trap or pull the cable.
- ✖ Do not insert any object into the air vent or into the bowl.
- ✖ Please unplug the machine when not in use.

## Electrical Diagram for SP-A80HI/ SP-A80I THREE PHASE TYPE 230V/400V

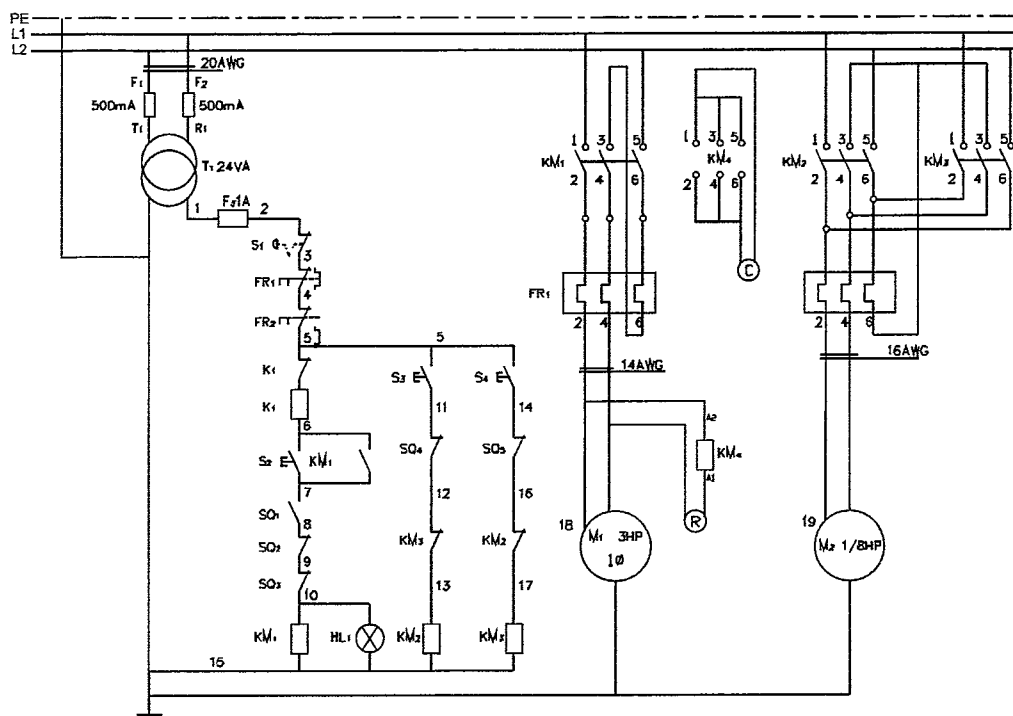


Seq.	Item	Description	Manufacturer	Specification	Compliance
1	F1	FUSES	POSSING	250V/500mA 5mm x 20mm	
2	F2	FUSES	POSSING	250V/500mA 5mm x 20mm	
3		FUSES	POSSING	250V/1A 5mm x 20mm	
4	S1	EMERGENCY STOP BUTTON	TELEMECCAQUE	600V/1.2A XB4BS542	IEC/EN 60947-5-1
5	S2	START BUTTON	TELEMECCAQUE	600V/1.2A XB4BW53361	IEC/EN 60947-5-1
6	S3	START BUTTON	TELEMECCAQUE	600V/1.2A XB45AA61	IEC/EN 60947-5-1
7	S4	START BUTTON	TELEMECCAQUE	600V/1.2A XB45AA61	IEC/EN 60947-5-1
8	KM1	CONTACTOR	TELEMECCAQUE	690V/18A LCID096B7	EN 60947-4-1
9	KM2	CONTACTOR	TELEMECCAQUE	600V/9A LCID096B7	EN 60947-4-1
10	KM3	CONTACTOR	TELEMECCAQUE	690V/9A LCID096B7	EN 60947-4-1
11	FR1	OVERLOAD RELAY	TELEMECCAQUE	690V/10A LCID096B7	EN 60947-4-1
12	FR2	OVERLOAD RELAY	TELEMECCAQUE	690V/10A LCID096B7	EN 60947-4-1
13	SQ1	MICROSWITCHES	OMRON	Z-15GW22-B	CE
14	SQ2	MICROSWITCHES	G.G.T	MFIMFR	CE
15	SQ3	MICROSWITCHES	VERMER	ER200390 M3-05 WOTNC	CE
16	SQ4	MICROSWITCHES	OMRON	Z-15GW22-B	CE
17	SQ5	MICROSWITCHES	OMRON	Z-15GW22-B	CE
18	M1	MOTOR	SHIUH JLANN	3HP 220V/380V 24A	CE
19	M2	MOTOR	MIN CHUEN	1/8HP 220V/380V 0.38A	CE

# **SP-A80HI/ SP-A80I SCHMATIC CIRCUIT DIAGRAM THREE PHASE TYPE**

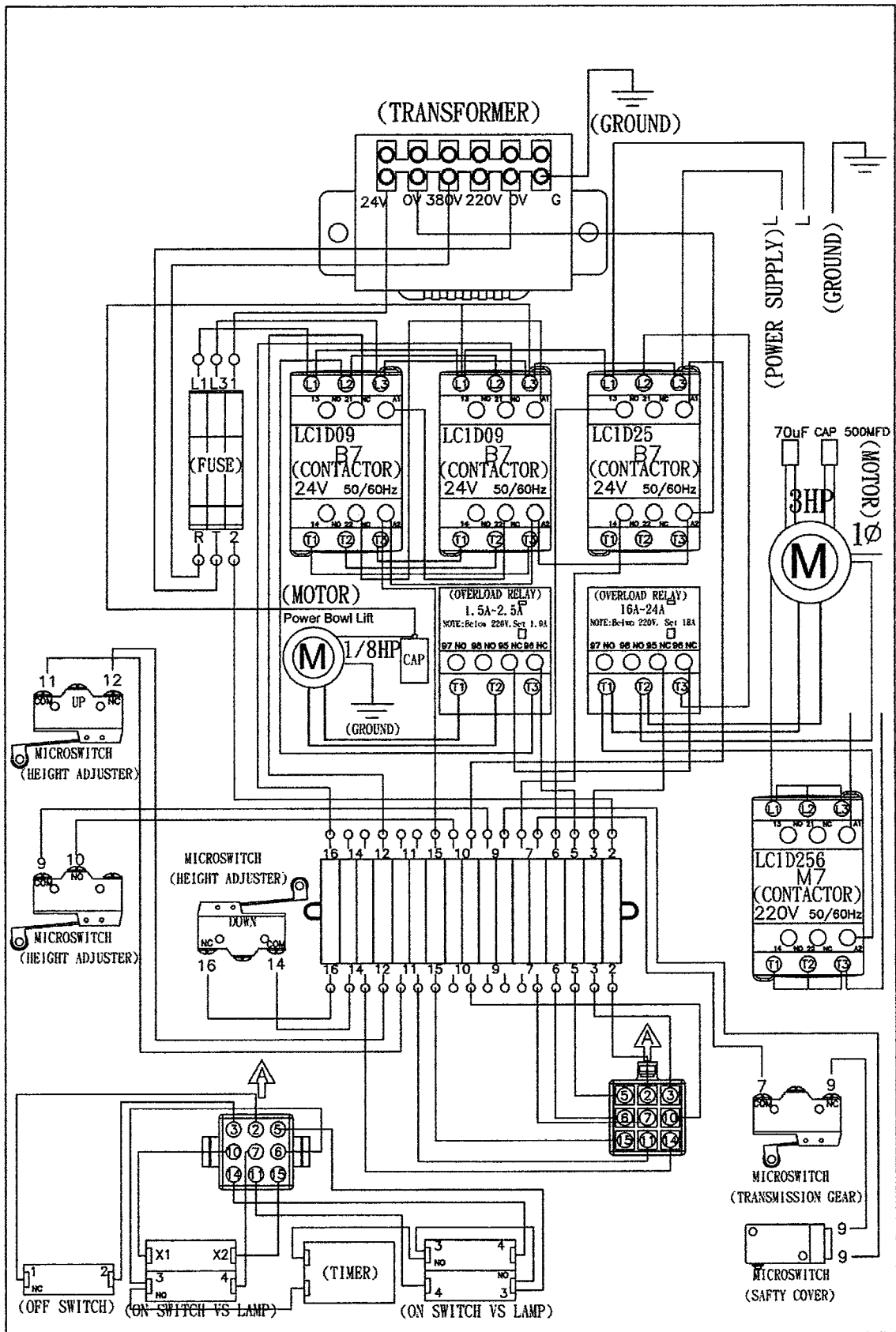


## Electrical Diagram for SP-A80HI/ SP-A80I THREE PHASE TYPE 230V/400V

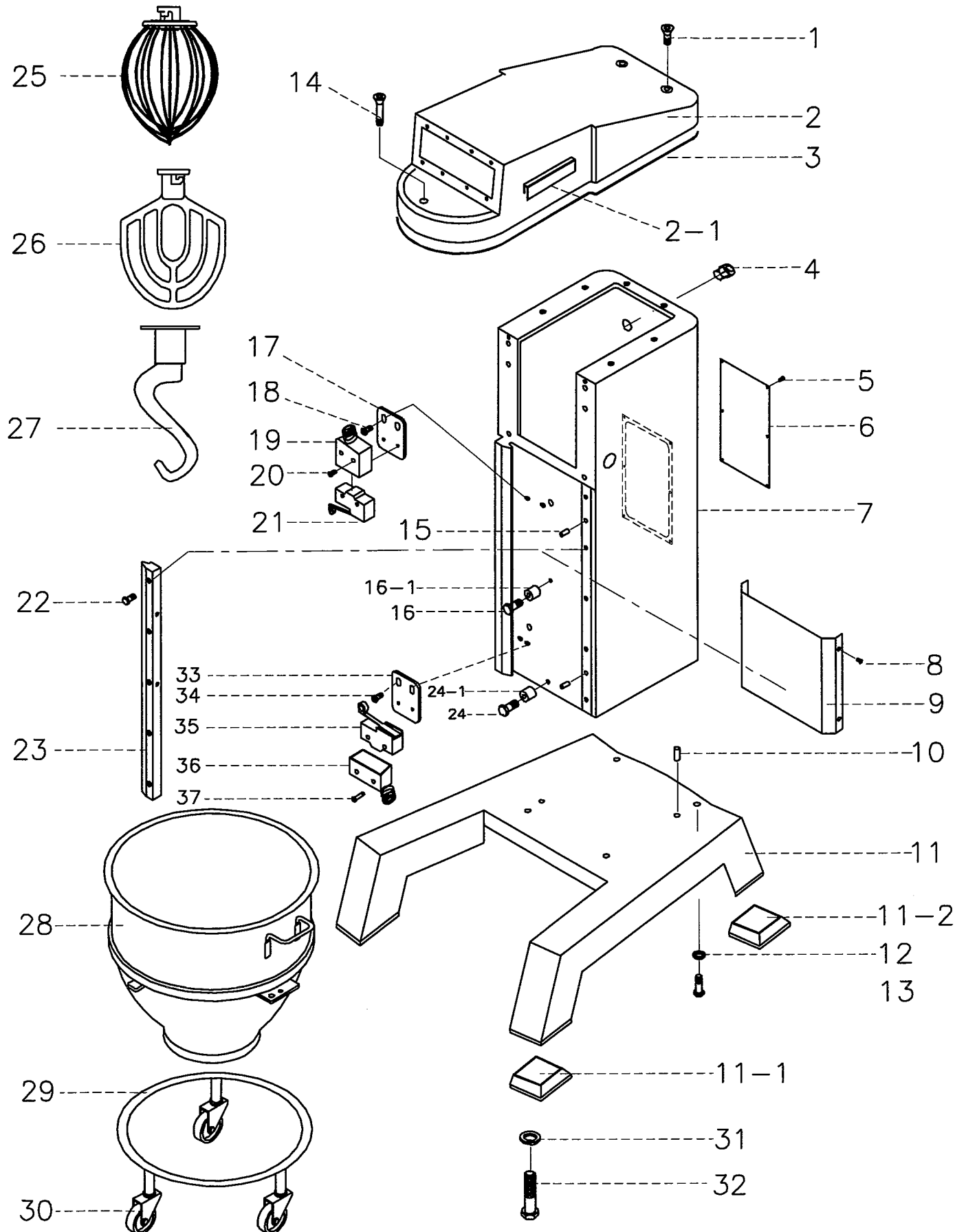


Seq.	Item	Description	Manufacturer	Specification	Compliance
1	F1	FUSES	POS GMA	F500 mAH, 250V	
2	F2	FUSES	POS GMA	F500 mAH, 250V	
3	F3	FUSES	POS GMA	1A, 250V	
4	S1	EMERGENCY STOP BUTTON	TELEMECCAQUE	600V/1.2A XB4BS542	IEC/EN 60947-5-1
5	S2	START BUTTON	TELEMECCAQUE	600V/1.2A XB4BW53361	IEC/EN 60947-5-1
6	S3	START BUTTON	TELEMECCAQUE	600V/1.2A XB45AA61	IEC/EN 60947-5-1
7	S4	START BUTTON	TELEMECCAQUE	600V/1.2A XB45AA61	IEC/EN 60947-5-1
8	KM1	CONTACTOR	TELEMECCAQUE	690V/40A LCID25 B7	EN 60947-4-1
9	KM2	CONTACTOR	TELEMECCAQUE	600V/25A LCID09 B7	EN 60947-4-1
10	KM3	CONTACTOR	TELEMECCAQUE	690V/25A LCID09 B7	EN 60947-4-1
11	FR1	OVERLOAD RELAY	TELEMECCAQUE	16~24A LR3D 22	EN 60947-4-1
12	FR2	OVERLOAD RELAY	TELEMECCAQUE	0.4~0.63A LR3D 04	EN 60947-4-1
13	SQ1	MICROSWITCHES	OMRON	Z-15GW22-B	CE
14	SQ2	MICROSWITCHES	OMRON	14Y7RN, D2WW-5-1M, 5A 125/250V AC	CE
15	SQ3	MICROSWITCHES	OMRON	Z-15GW22-B	CE
16	SQ4	MICROSWITCHES	OMRON	Z-15GW22-B	CE
17	SQ5	MICROSWITCHES	OMRON	Z-15GW22-B	CE
18	M1	MOTOR	SHIUH JLANN	3HP 220V/380V 24A	CE
19	M2	MOTOR	MIN CHUEN	1/8HP 220V/380V 0.38A	CE
20	R	RUN CAPACITOR	DJE	CAP/70Uf, W.V. 300V AC	CE
21	C	START CAPACITOR	SSEC	CAP. 500MFD	CE
22	K1	TIMER	ANN YIH	AT-615	CE

**SP-A80HI/ SP-A80I SCHMATIC CIRCUIT DIAGRAM SINGLE PHASE TYPE**



# Base Unit - A





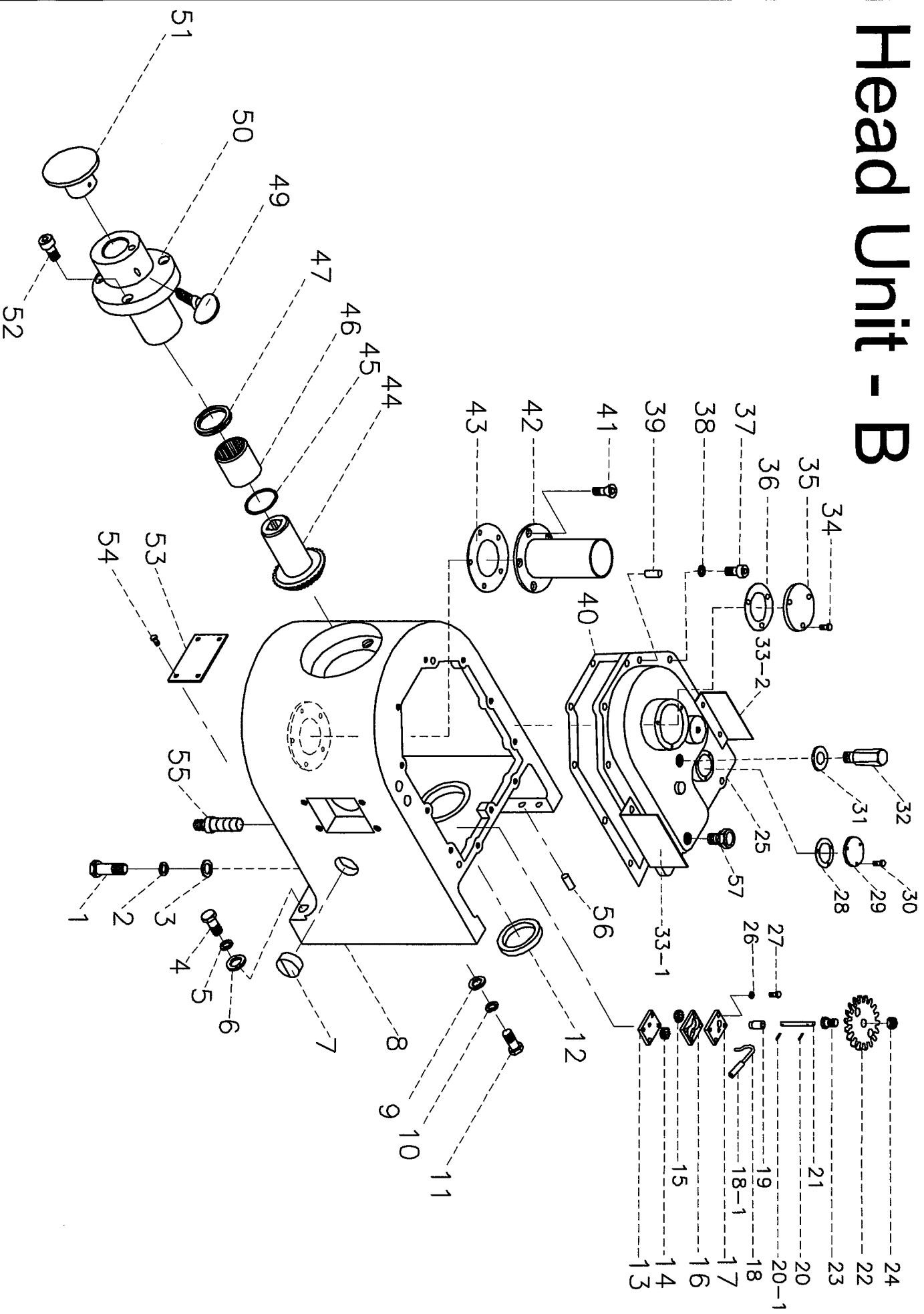
**Parts Table A for Base Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	A-8001	Screw: M8x1.25	2	
2	A-8002	Transmission case cover	1	
2_1	A-8002-1	Strain Reliever	1	
3	A-8003	Rubber cover seat	1	
4	A-8004	Strain relief	1	
5	A-8005	Screw: M5x0.8	6	
6	A-8006	Column rear plate	1	
7	A-8007	Mixer column	1	
8	A-8008	Screw: M5x0.8	4	
9	A-8009	Column front plate	1	
10	A-8010	Ø 10 mounting pin	2	
11	A-8011	Base	1	
11_1	A-8011-1	Rubber mates (front)	2	
11_2	A-8011-2	Rubber mates (rear)	2	
12	A-8012	Spring washer: M14	4	
13	A-8013	Screw: M14x2.0	4	
14	A-8014	Screw: M8x1.25	1	
15	A-8015	Pin: Ø 10	3	
16	A-8016	Screw	1	
16_1	A-8016_1	Sleeve	1	
17	A-8017	Mounting plate	1	
18	A-8018	Screw: M5x0.8	2	
19	A-8019	Micro switch housing	1	
20	A-8020	Screw: M4x0.7	2	
21	A-8021	Micro switch	1	
22	A-8022	Screw: M12x1.75	10	
23	A-8023	Front bowl slide	1	
24	A-8024	Pin: M12x1.75	1	
24_1	A-8024-1	Sleeve	1	
25	A-8025	Wire whip	1	
26	A-8026	Flat beater	1	Standard Accessory
	A-8026-1	S/S Flat beater	1	Optional Accessory
27	A-8027	Spiral Dough Hook (Round Type)	1	Optional Accessory
	A-8027-1	J Type Dough Hook	1	Optional Accessory
	A-8027-2	Spiral Dough Hook (Square	1	Standard Accessory
28	A-8028	S/S Bowl	1	

**Parts Table A for Base Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
29	A-8029	Trolley	1	
30	A-8030	(1/2 UNC) wheels	4	
31	A-8031	(1/2 UNC) washer	4	
32	A-8032	(1/2 UNC) screw	4	
33	A-8033	Steady (for Microswitch)	1	
34	A-8034	Screw: M6 x 1.0	2	
35	A-8035	Micro switch	1	
36	A-8036	Housing (for Microswitch)	1	
37	A-8037	Screw: M4x0.7	2	

# Head Unit - B



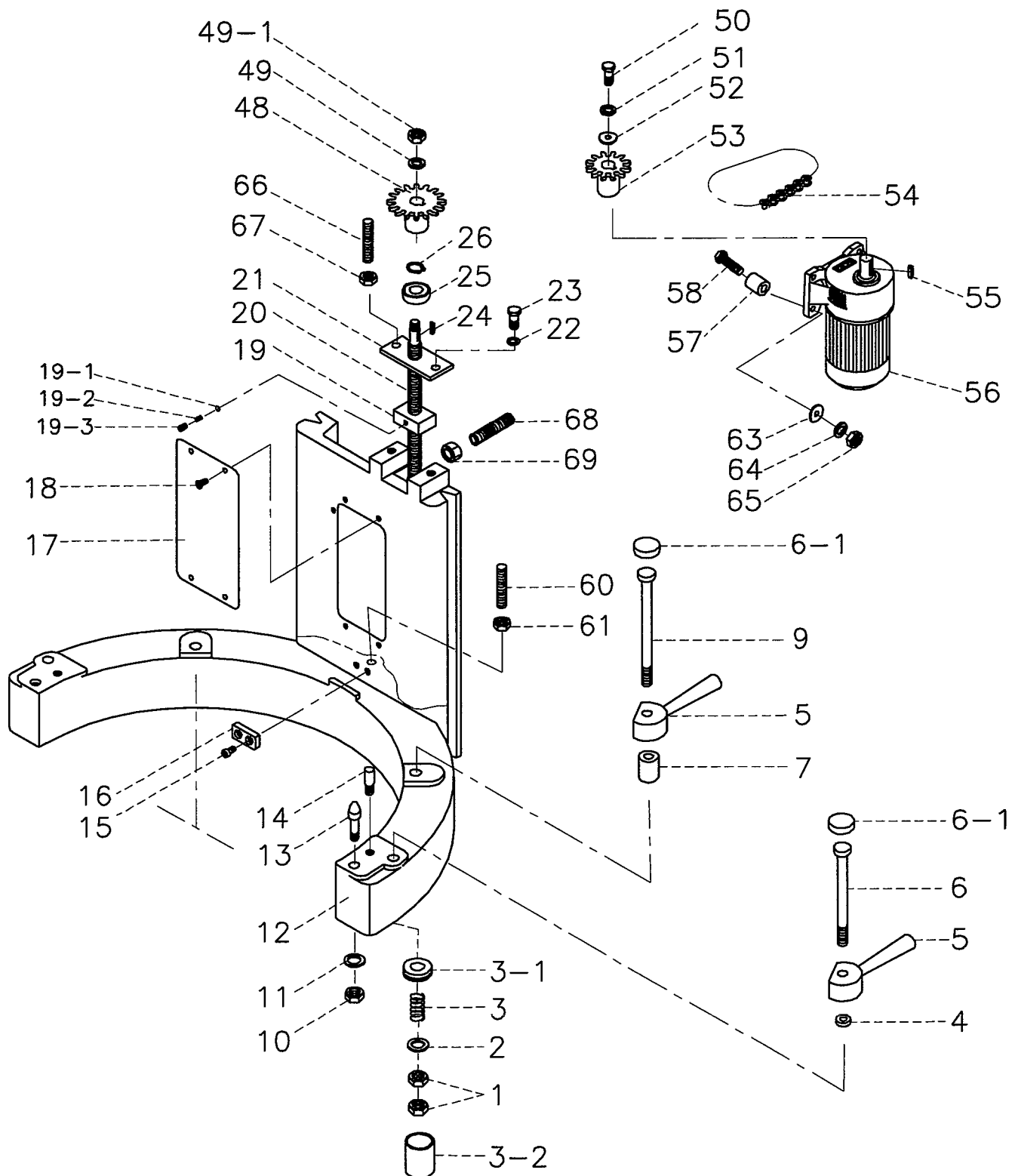
**Parts Table B for Head Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	B-8001	Screw: M10x1.5	1	
2	B-8002	Spring washer: M10	1	
3	B-8003	Washer: M10	1	
4	B-8004	Mach screw: M12x1.75	2	
5	B-8005	Spring washer: M12	2	
6	B-8006	Washer: M12	2	
7	B-8007	Gauge oil level	1	
8	B-8008	Case transmission	1	
9	B-8009	Washer: M12x1.75	6	
10	B-8010	Spring washer: M12	6	
11	B-8011	Mach screw: M12	6	
12	B-8012	Seal oil: TC50x80x10	1	
13	B-8013	Plate oil pump bottom	1	
14	B-8014	Gear oil pump right: 15T	1	
15	B-8015	Gear oil pump left: 15T	1	
16	B-8016	Gear set pump	1	
17	B-8017	Housing & tube assy	1	
18	B-8018	Pump outlet bronze pipe	1	Pump Assy.
18_1	B-8018-1	Plastic tube	1	
18_2	***	***	***	***
18_3	***	***	***	***
19	B-8019	Pump shaft bushing	1	
20	B-8020	Rollpin: Ø2x18	1	
20_1	B8020-1	Rollpin:Ø2x10	1	
21	B-8021	Shaft oil pump	1	
22	B-8022	Gear: 29T	1	
23	B-8023	Conveying gear pipe	1	
24	B-8024	Nut	1	
25	B-8025	Cover transmission case	1	
26	B-8026	Spring washer: M5	1	
27	B-8027	Screw: M5x0.8	2	
28	B-8028	Lead-in oil pad	1	
29	B-8029	Transmission shaft Bearing	1	
30	B-8030	Screw: 5x0.8	3	
31	B-8031	Spring washer: M20	1	
32	B-8032	Bolt: M20x2.0	1	

**Parts Table B for Head Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
33	***	***	***	***
33_1	B-8033-1	Top cover assy (right)	1	
33_2	B-8033-2	Top cover assy (left)	1	
34	B-8034	Screw: M5x0.8	3	
35	B-8035	Retainer-drive shaft bearing	1	
36	B-8036	Lead-in oil pad	1	
37	B-8037	Cap screw M8x1.25	11	
38	B-8038	Washer: M8	11	
39	B-8039	Pin: Ø8	2	
40	B-8040	Lead-in oil pad gasket	1	
41	B-8041	Mach screw: M5x0.8	5	
42	B-8042	Lead-in oil bushing	1	
43	B-8043	Lead-in oil bush pad	1	
44	B-8044	Level drive gear: 16T	1	For SP-A80HI and SP-A80H Use Only
45	B-8045	Washer-thrust: Ø45	1	For SP-A80HI and SP-A80H Use Only
46	B-8046	Sleeve square drive TA-35x30	2	For SP-A80HI and SP-A80H Use Only
47	B-8047	Seal-oil: TC 35x45x8	1	For SP-A80HI and SP-A80H Use Only
48	***	***	***	***
49	B-8049	(1/2 UNC) thumb screw	1	For SP-A80HI and SP-A80H Use Only
50	B-8050	Hub-attachment	1	For SP-A80HI and SP-A80H Use Only
51	B-8051	Plug-attachment hole	1	For SP-A80HI and SP-A80H Use Only
52	B-8052	Mach screw: M6x1.0	3	For SP-A80HI and SP-A80H Use Only
53	B-8053	transmission front guard	1	
54	B-8054	Screw: M5x0.8	4	
55	B-8055	Dowel	1	
56	B-8056	Mach dowel: Ø10	2	
57	B-8057	Oil tube fixture	1	

# Power Bowl Lift Unit - C & H



**Parts Table C & H for Power Bowl Lift Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	C-8001	Nut: M12 x 1.75	8	
2	C-8002	Spring washer: M12	4	
3	C-8003	Spring	4	
3_1	C-8003-1	Spacer	4	
3_2	C-8003-2	Sleeve	4	
4	C-8004	Bronze bushing (front)	2	
5	C-8005	Bowl clamps	4	
6	C-8006	Screw (front): M12	2	
6_1	C-8006-1	Screw cover	4	
7	C-8007	Bronze bushing (rear)	2	
8	***	***	***	
9	C-8009	Screw (rear): M12	2	
10	C-8010	Nut: M12	2	
11	C-8011	Spring washer: M10	2	
12	C-8012	Bowl raise cradle	2	
13	C-8013	Screw: M10	2	
14	C-8014	Screw: M8	2	
15	C-8015	Screw: M8 x 1.25	2	
16	C-8016	Lokcing bracket	1	
17	C-8017	Bowl cradle front cover	1	
18	C-8018	Screw: M5 x 0.8	4	
19	C-8019	Nut	1	Bowl Raise Screw Assy.
19_1	C-8019-1	Ring	1	
19_2	C-8019-2	Spring	1	
19_3	C-8019-3	Screw: M6 x 1.0	1	
20	C-8020	Bowl raise screw	1	
21	C-8021	Nut mounting plate	1	
22	C-8022	Spring washer: M10	2	
23	C-8023	Screw: M10 x 1.5	2	
24	C-8024	Key-way: 6 x 6	1	
25	C-8025	Ball bearing: 6203	1	
26	C-8026	C-ring: RTW-40	1	
48	H-8048	Chain gear: 16T	1	
49	H-8049	Washer: M16	1	
49_1	H-8049-1	Nut: M16 x 2.0	1	
50	H-8050	Screw: M6 x 1.0	1	

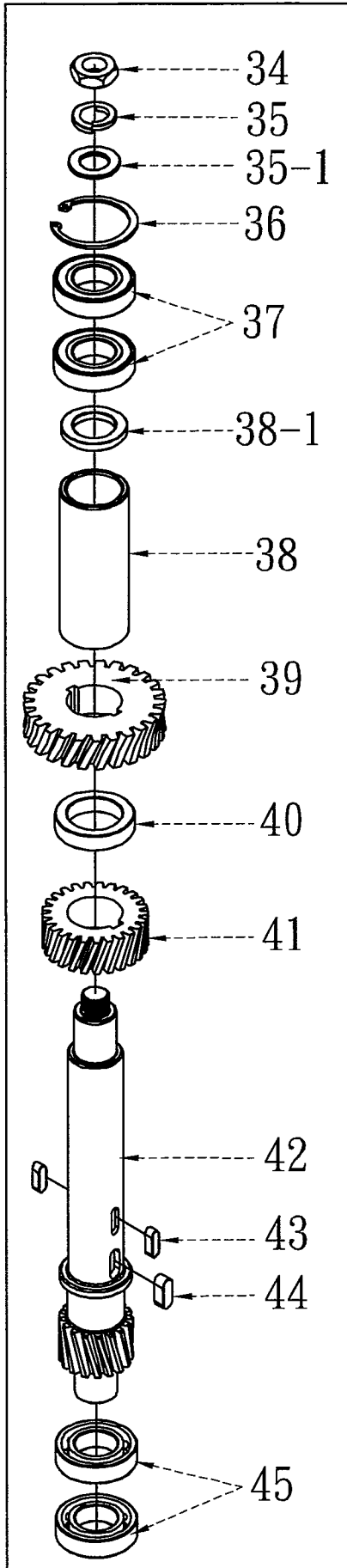
**Parts Table C & H for Power Bowl Lift Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
51	H-8051	Spring washer: M6	1	
52	H-8052	Washer: M6	1	
53	H-8053	Chain gear: 12T	1	
54	H-8054	Chain: 3/8	1	
55	H-8055	Key way: 6 x 6	1	
56	H-8056	Motor: 1/8HP	1	Please indicate the voltage when ordering
57	H-8057	Sleeve	4	
58	H-8058	Screw: M8 x 1.25	4	
59	***	***	***	
60	H-8060	Nut: M10	1	
61	H-8061	Screw: M6	1	
62	***	***	***	
63	H-8063	Washer: M8	4	
64	H-8064	Spring washer: M8	4	
65	H-8065	Nut: M8	4	
66	H-8066	Screw: M10	1	
67	H-8067	Nut: M10	1	
68	H-8068	Screw: M6	1	
69	H-8069	Nut: M6	1	

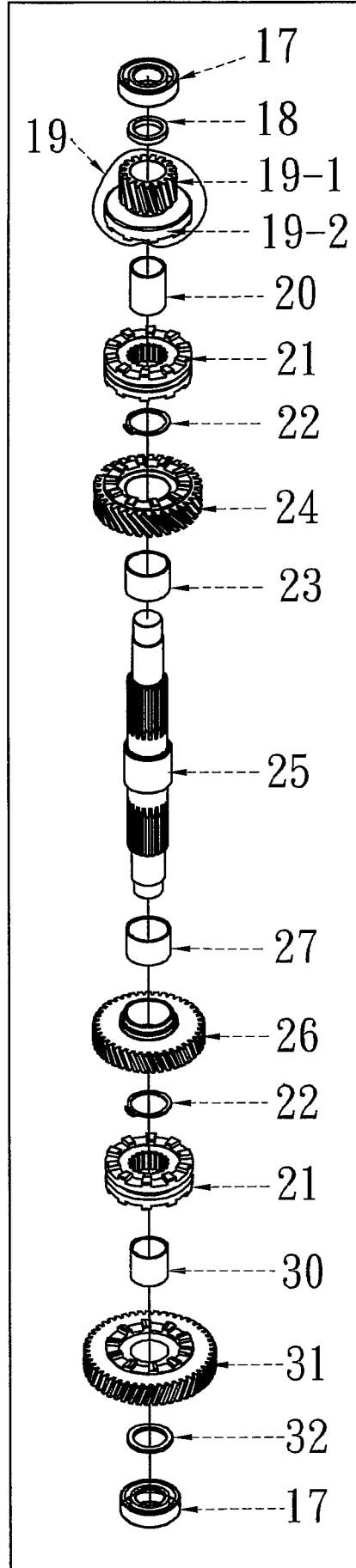


# Gear Box Unit-D

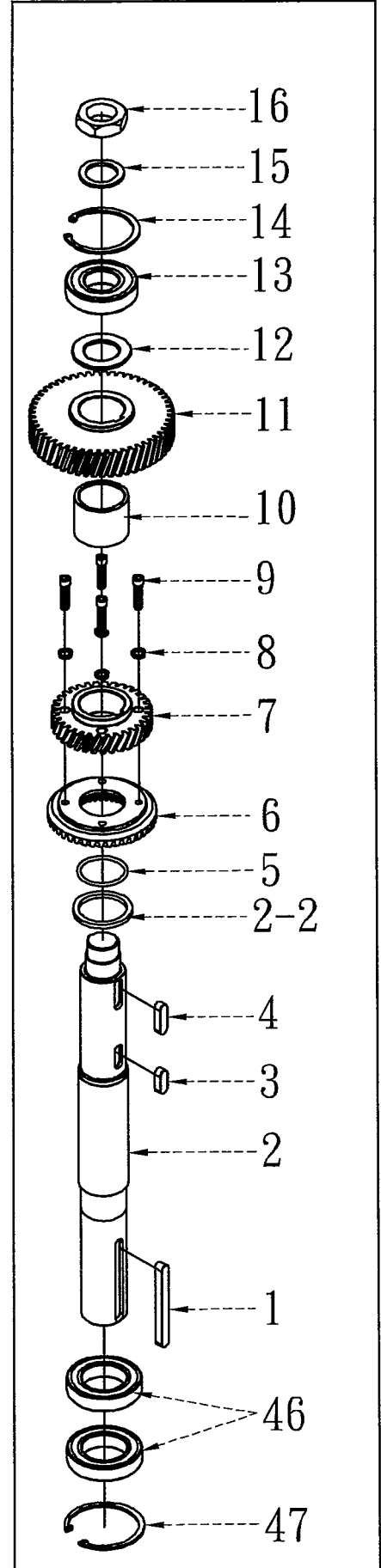
TRANSMISSION SHAFT ASSY.



MASTER SHAFT ASSY.



DRIVE SHAFT ASSY.



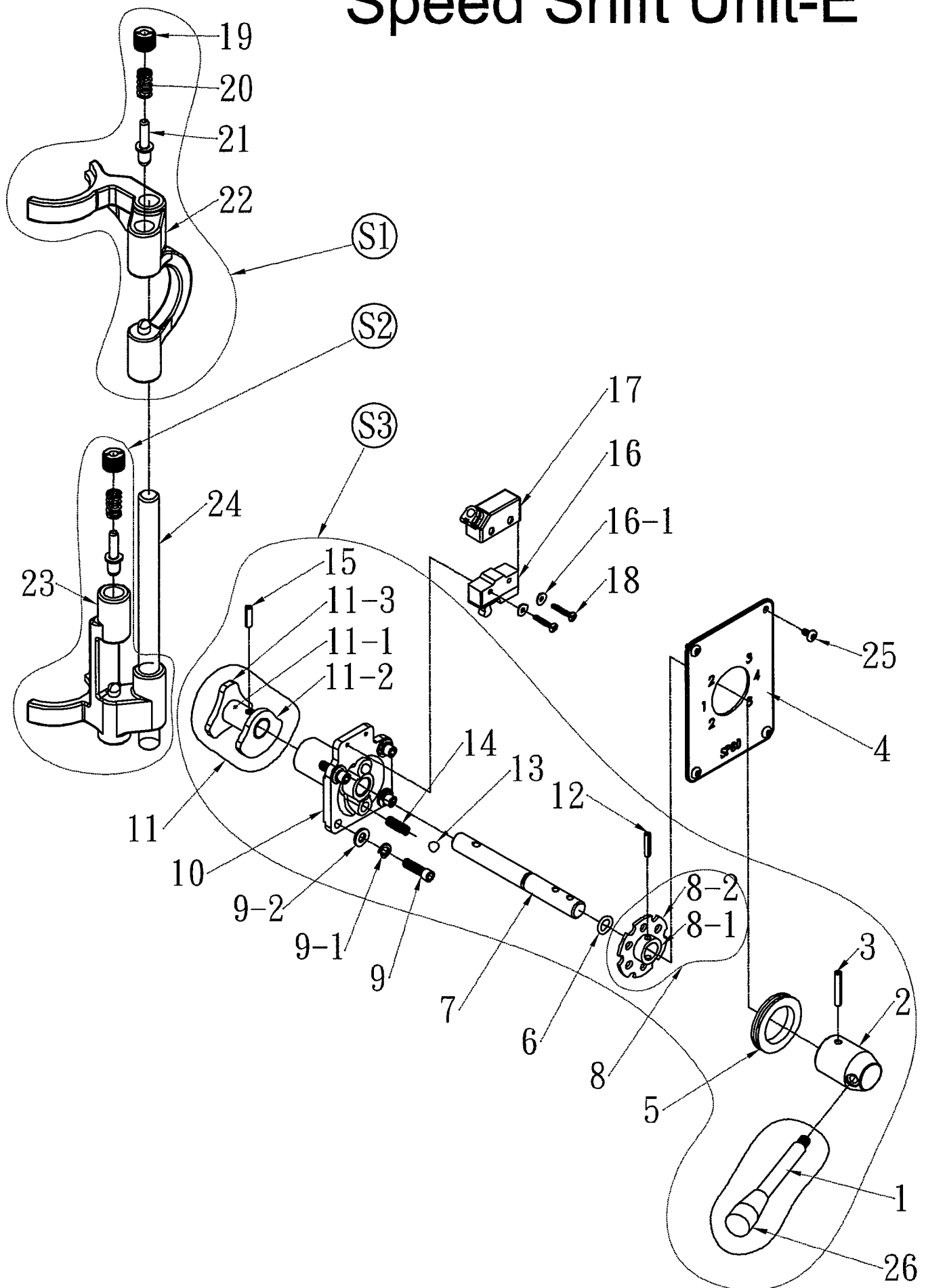
**Parts Table D for Gear Box Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	D-8001	Key-way: 10 x 10	1	
2	D-8002	Drive shaft	1	
2_2	D-8002-2	Pad	1	
3	D-8003	Key-way: 10 x 10	1	
4	D-8004	Key-way: 10 x 10	1	
5	D-8005	O-ring	1	
6	D-8006	Gear: 41T	1	
7	D-8007	Main shaft gear: 3T	1	
8	D-8008	Spring washer: M8	4	
9	D-8009	Screw: M8 x 1.25	4	
10	D-8010	Drive shaft bronze bushing	1	
11	D-8011	Drive shaft gear: 53T	1	
12	D-8012	Drive shaft pad	1	
13	D-8013	Ball bearing: 6207LLU	1	
14	D-8014	C-ring: RTW-72	1	
15	D-8015	Spring washer: M32	1	
16	D-8016	Nut: M32 x 1.5	1	
17	D-8017	Ball bearing: 6205z	2	
18	D-8018	Master shaft pad	1	
19	D-8019	Master shaft gear: 17T	1	Master shaft gear assy. (include Item 19-1 & 19-2)
20	D-8020	Bronze bushing	1	
21	D-8021	Clutch sleeve	1	
22	D-8022	C-ring: STW-35	1	
23	D-8023	Bronze bushing	1	
24	D-8024	Master shaft gear: 33T	1	
25	D-8025	Master shaft	1	
26	D-8026	Master shaft gear: 41T	1	
27	D-8027	Bronze bushing	1	
28	***	***	***	Same as Part No. D-8022
29	***	***	***	Same as Part No. D-8021
30	D-8030	Bronze bushing	1	
31	D-8031	Master shaft gear: 49T	1	
32	D-8032	C-ring	1	
33	***	***	***	Same as Part No. D-8017
34	D-8034	Nut: M16 x 1.5	1	

**Parts Table D for Gear Box Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
35	D-8035	Spring washer: M16	1	
35_1	D-8035-1	Washer: M16	1	
36	D-8036	C-ring: RTW-47	1	
37	D-8037	Ball bearing: 6005LLU	2	
38	D-8038	Bronze bushing (top)	1	
38_1	D-8038-1	Bronze bushing (down)	1	
39	D-8039	Worm gear: 26T (50HZ)	1	Parts might be different subject to mixer's frequency.
	D-8039-1	Worm gear: 25T (60HZ)	1	
40	D-8040	Bronze bushing	1	
41	D-8041	Transmission gear: 25T	1	
42	D-8042	Transmission gear: 25T	1	
43	D-8043	Key-way: 6 x 6	1	
44	D-8044	Key-way: 8 x 8	2	
45	D-8045	Ball bearing: 6005	2	
46	D-8046	Ball bearing: 6009	2	
47	D-8047	C-ring: RTW-75	1	

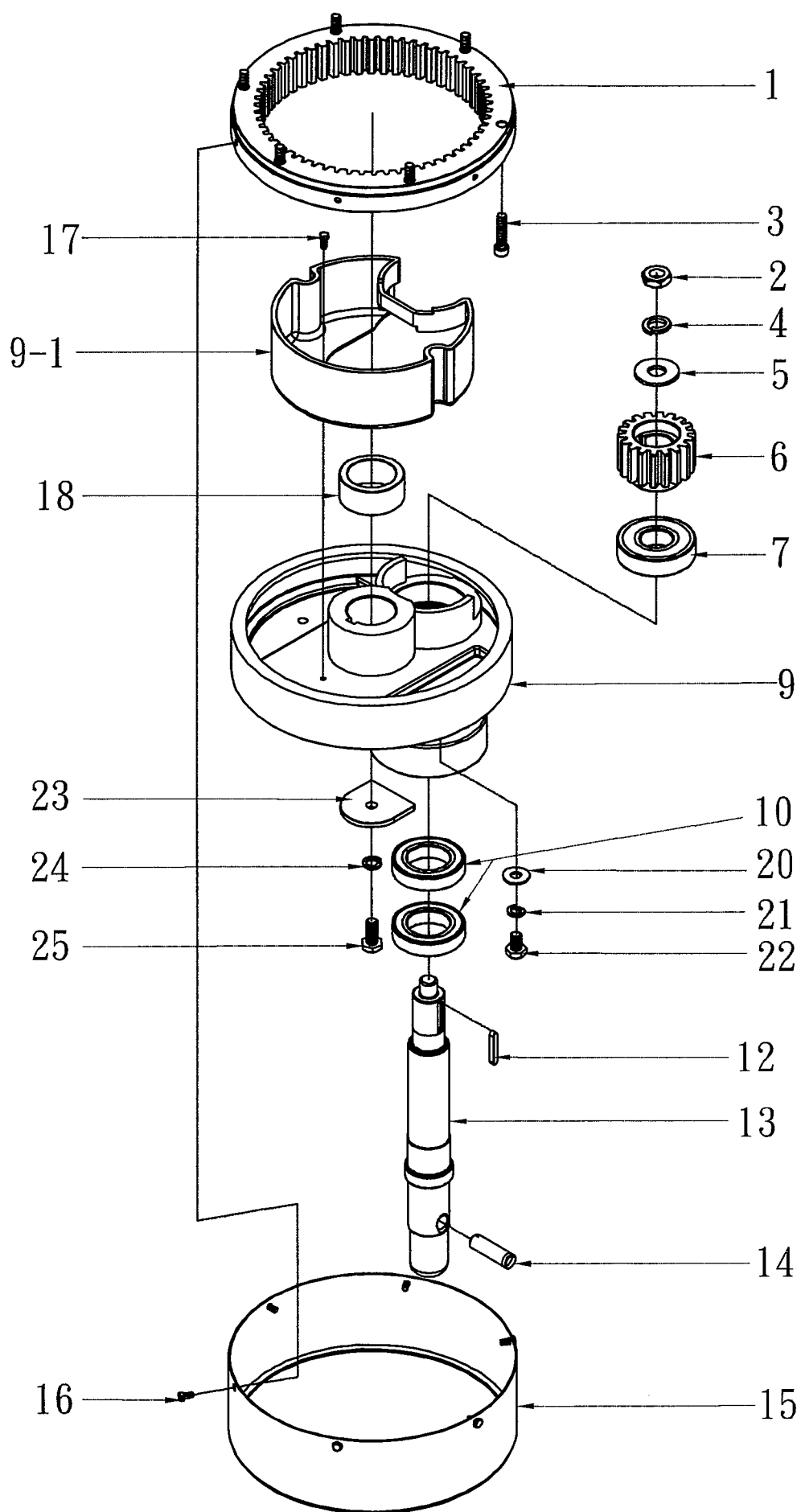
# Speed Shift Unit-E



**Parts Table E for Speed Shift Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	E-8001	Gear shift arm	1	
2	E-8002	Gear shift arm hub	1	
3	E-8003	Pin: 6x38	1	
4	E-8004	1-4 speed indication plate	1	
5	E-8005	Oil seal	1	
6	E-8006	O-ring	1	
7	E-8007	Shifter guide rod	1	
8	E-8008	Hub and cam assembly	1	Hub and Cam Assy.
8_1	E-8008-1	Sleeve	1	
8_2	E-8008-2	Plate	1	
9	E-8009	Screw: M8x1.25	4	
9_1	E-8009-1	Spring washer: M8	4	
10	E-8010	Shaft cover	1	
11	E-8011	Gear shift cam assembly	1	Gear Shift Cam Assy.
11_1	E-8011-1	Sleeve	1	
11_2	E-8011-2	Plate (front)	1	
11_3	E-8011-3	Plate (back)	1	
12	E-8012	Pin: M5	1	
13	E-8013	Steel ball: M9	2	
14	E-8014	Spring : M8	2	
15	E-8015	Pin: M6	1	
16	E-8016	Micro switch	1	
16_1	E-8016-1	Washer	2	
17	E-8017	Micro switch cover	1	
18	E-8018	Screw: M4x0.7	2	
19	E-8019	Nut: M20x2.0	4	
20	E-8020	Spring: M9	4	
21	E-8021	Touch shaft	4	
22	E-8022	Speed shifter yoke (top)	1	
23	E-8023	Speed shifter yoke (rear)	1	
24	E-8024	Shifter guide rod	1	
25	E-8025	Screw: M5x0.8	4	
26	E-8026	Hand knob	1	
S1	E-80S1	Speed Shifter Yoke (TOP) Assy.	1	Include Item 19~22
S2	E-80S2	Speed Shifter Yoke (REAR) Assy.	1	Include Item 23~24 and Item 19~21
S3	E-80S3	Gear Shift Assy.	1	Include Item 1~18, Item 25 and Item 26

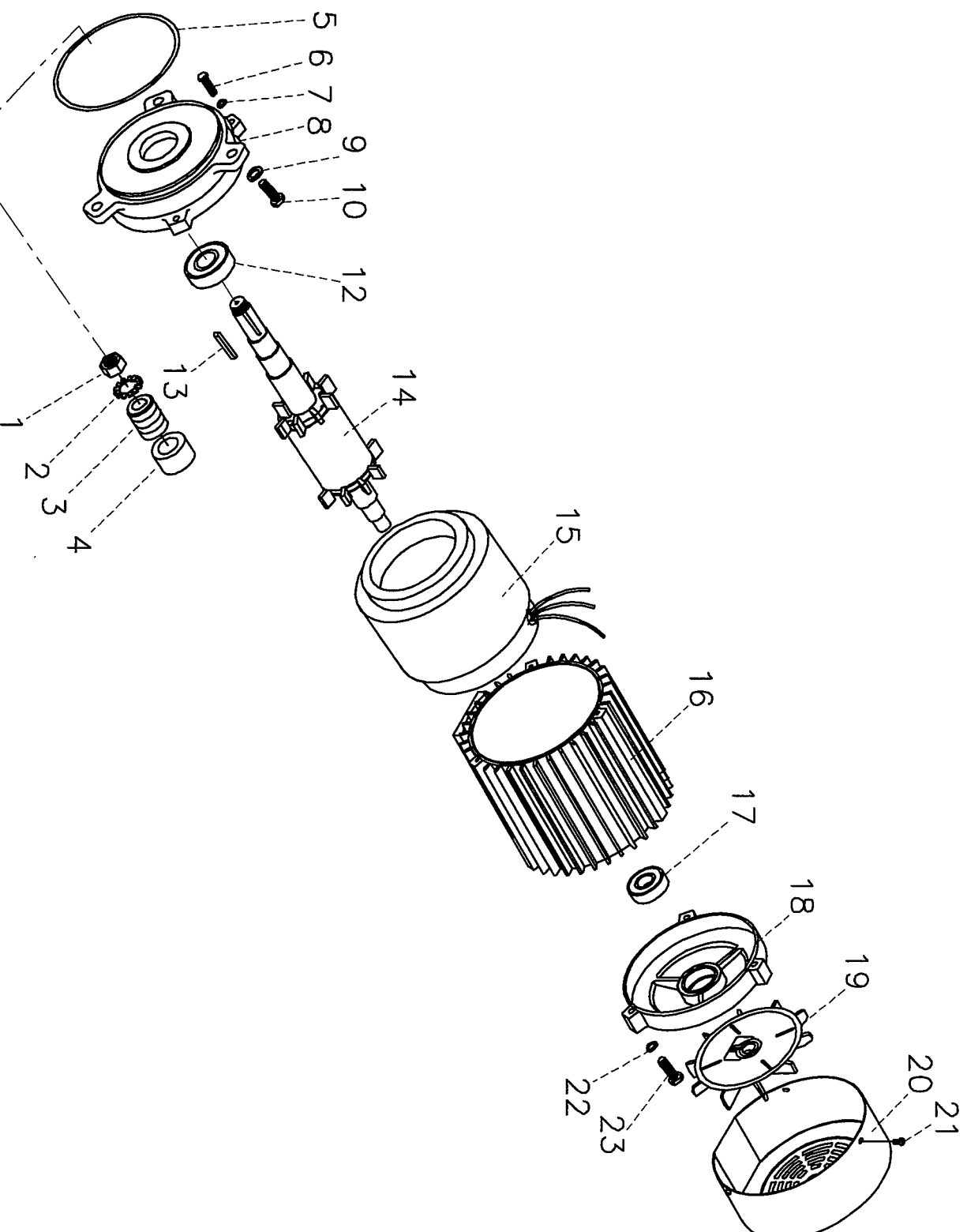
# Planetary Unit-F



**Parts Table F for Planetary Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	F-8001	Planetary gear: 59T	1	
2	F-8002	Nut: M16x1.5	1	
3	F-8003	Steel screw: M8x1.25	6	
4	F-8004	Spring washer: M16	1	
5	F-8005	Washer: M16	1	
6	F-8006	Pinion gear: 18T	1	
7	F-8007	Ball bearing: 6306zz	1	
8	***	***	***	
9	F-8009	Planetary holder	1	
9_1	F-8009-1	Oil cover for Planetary Holder	1	
10	F-8010	Ball bearing: 6008	2	
	F-8010-1	Ball bearing: 6207	1	For USA Market Use Only
11	F-8011	Oil seal: 40x72x12	1	For USA Market Use Only
12	F-8012	Key-way: 6x6	1	
13	F-8013	Planetary shaft	1	
14	F-8014	Planetary shaft pin: M14	1	
15	F-8015	Holder cover	1	For SP-A80H and SP-A80 Use Only
16	F-8016	S/S screw: M5x0.8	6	
17	F-8017	Screw	1	
18	F-8018	Guard oil busk	1	
19	***	***	***	***
20	F-8020	Washer: M10	2	
21	F-8021	Spring washer: M10	2	
22	F-8022	S/s screw: M10x1.5	2	
23	F-8023	Washer: M10	1	
24	F-8024	Spring washer: M10	1	
25	F-8025	S/S screw: M10x1.5	1	

# Motor Unit-G

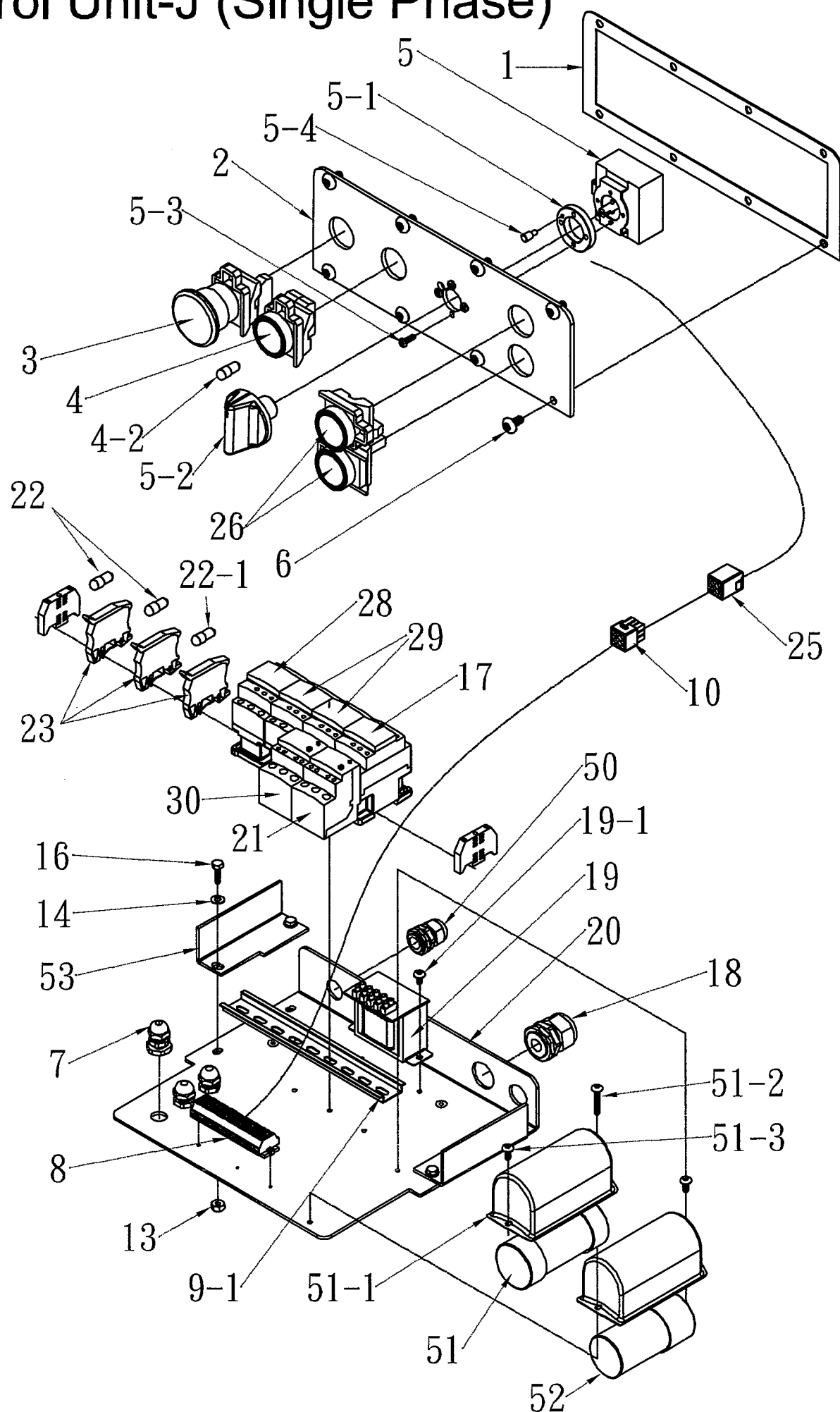




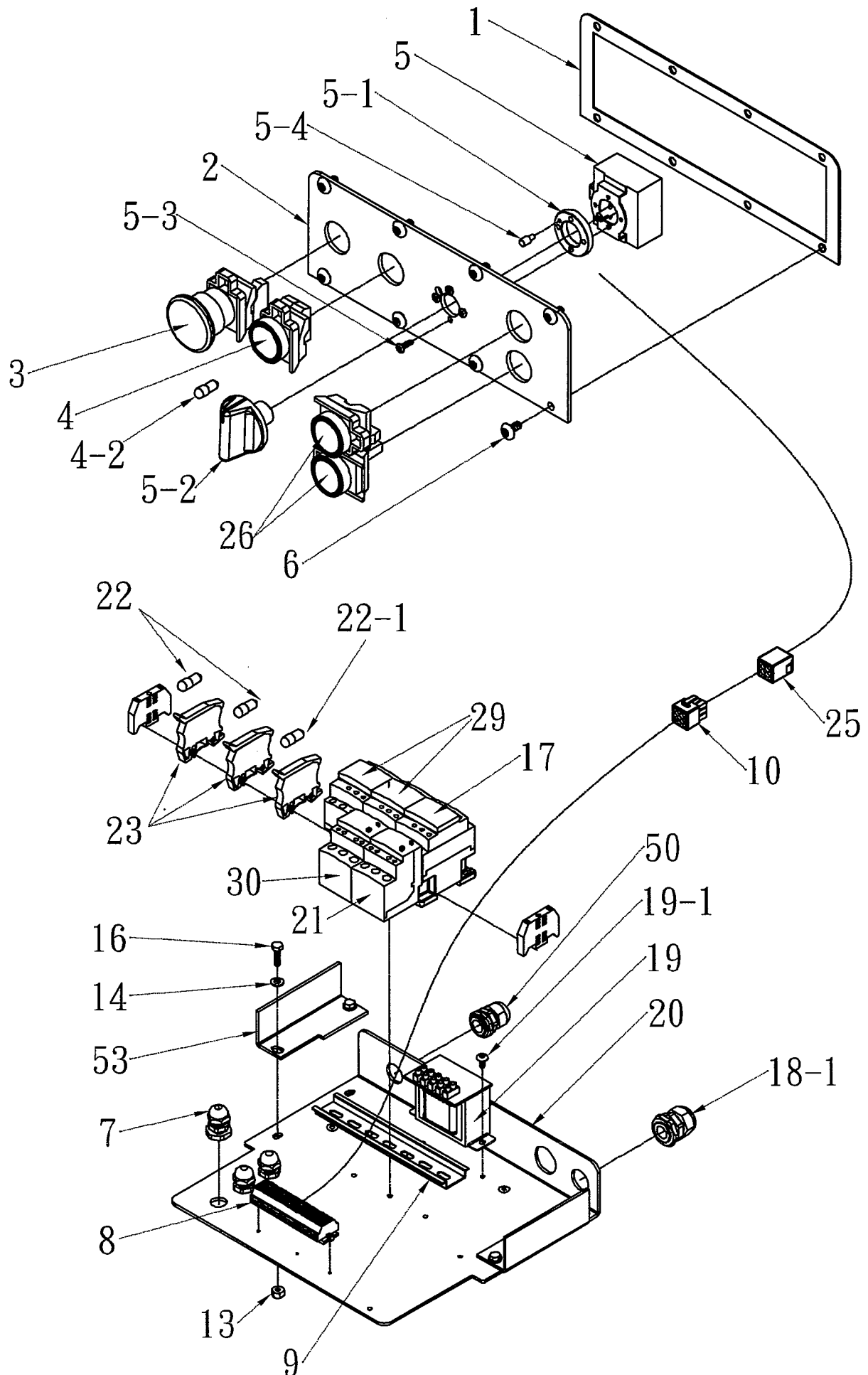
**Parts Table G for Motor Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	G-8001	Nut: M25x1.25	1	
2	G-8002	Washer: M25	1	
3	G-8003	Worm drive: 50Hz	1	Parts might be different subject to mixer's frequency.
	G-8003-1	Worm drive: 60Hz	1	
4	G-8004	Bronze bushing	1	
5	G-8005	O-ring: P73x3	1	
6	G-8006	Screw: M6x1.0	3	
7	G-8007	Spring washer: M6	3	
8	G-8008	Motor front cover	1	
9	G-8009	Spring washer: M12	3	
10	G-8010	Washer: M12x1.75	3	
12	G-8012	Ball bearing: 6307zz	1	
13	G-8013	Key-way: 6x45	1	
14	G-8014	Motor shaft	1	
15	G-8015	Motor coil: 3HP	1	
16	G-8016	Motor body	1	
17	G-8017	Ball bearing: 6204zz	1	
18	G-8018	Motor rear cover	1	
19	G-8019	Fan	1	
20	G-8020	Fan cover	1	
21	G-8021	Screw: M5x0.8	1	
22	G-8022	Spring washer: M6	3	
23	G-8023	Screw: M6x1.0	3	

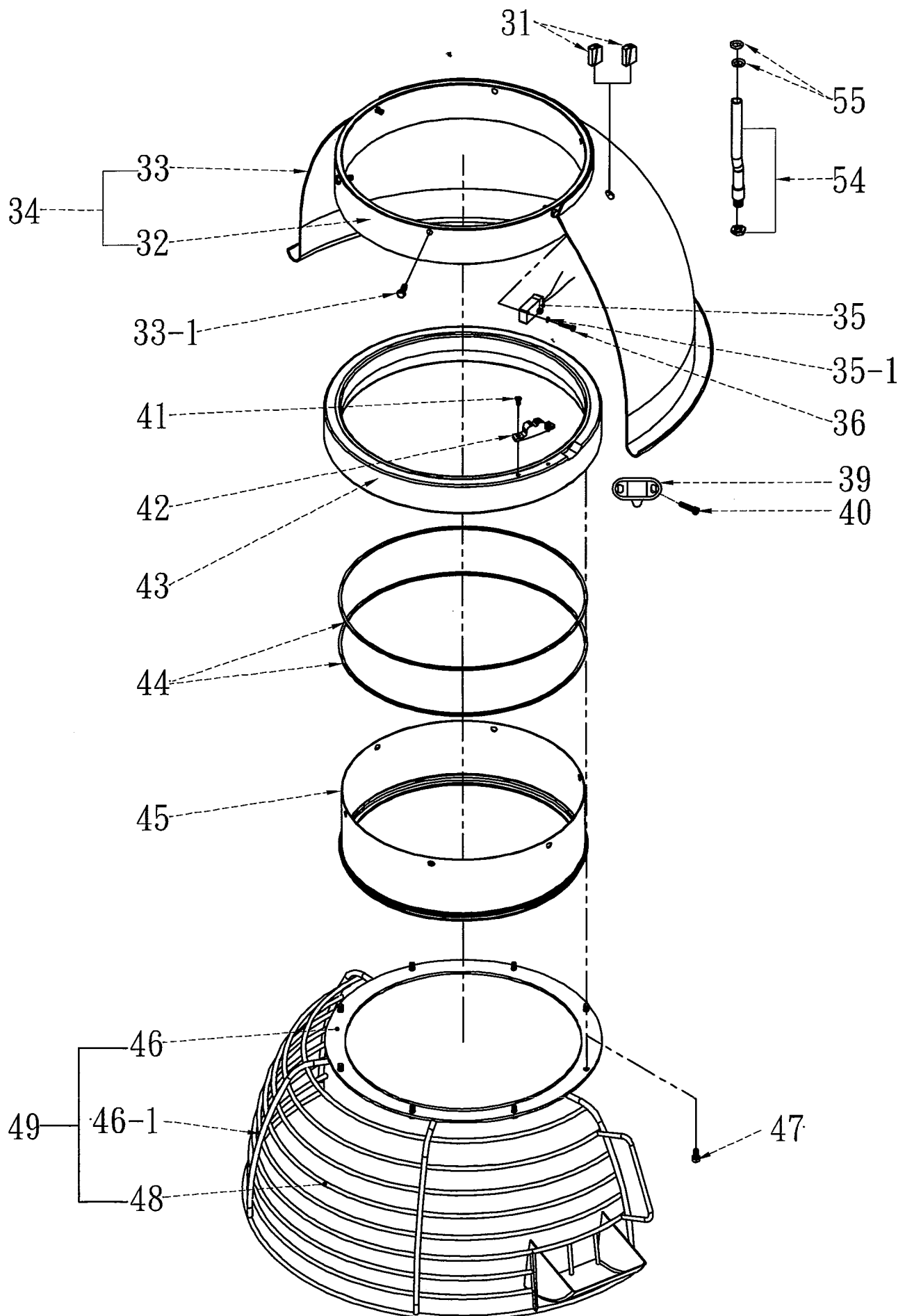
# Control Unit-J (Single Phase)



# Control Unit-J (Three Phase)



# Safety Guard Unit-J



**Parts Table J for Control Panel and Safety Guard Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
1	J-8001	Gasket	1	
2	J-8002	Operation plate	1	
3	J-8003	Off-stop button assy.	1	Include seat
4	J-8004	On-start button assy.	1	Include seat
4_2	J-8004-2	Light (for start button)	1	
5	J-8005	Timer	1	
5_1	J-8005-1	Washer	1	
5_2	J-8005-2	Hand knob	1	
5_3	J-8005-3	Screw: M3x0.6	2	
5_4	J-8005-4	Screw	1	
6	J-8006	S/s screw: M4x0.7	8	
7	J-8007	Fixture	3	
8	J-8008	Terminal block	1	
9	J-8009	Foundation (for Contactor)	1	Three Phase Mixer Use Only
9_1	J-8009-1	Foundation (for Contactor)	1	Single Phase Mixer Use Only
10	J-8010	Connecting block	1	
11	***	***	***	
12	***	***	***	
13	J-8013	Sleeve	4	
14	J-8014	Washer	4	
15	***	***	***	
16	J-8016	Screw: M6x1.0	4	
17	J-8017	Contactor: 24V	1	
18	J-8018	Support tube	1	Single Phase Mixer Use Only
18_1	J-8018-1	Support tube	1	Three Phase Mixer Use Only
19	J-8019	Transformer: 24V	1	
19_1	J-8019-1	Screw	2	
20	J-8020	Electronics mounting plate	1	
21	J-8021	Overload relay	1	
22	J-8022	Fuse	2	
22_1	J-8022-1	Fuse	1	
23	J-8023	Fuse fixture	3	
24	***	***	***	
25	J-8025	Connector	1	
26	J-8026	Bowl raise and lower button	2	Include seat

**Parts Table J for Control Panel and Safety Guard Unit**

Item	Parts No.	Name of Parts	Qty.	Remark
27	***	***	***	
28	J-8028	Contactor: 24V	1	Single Phase Mixer Use Only
29	J-8029	Bowl raise contactor: 24V	2	
30	J-8030	Overload relay (for bowl lift motor )	1	
31	J-8031	Connector	2	For Safety Guard Use Only
32	J-8032	Internal	1	For Safety Guard Use Only
33	J-8033	Rear guard-fixed	1	For Safety Guard Use Only
33_1	J-8033-1	Screw	6	For Safety Guard Use Only
34	J-8034	Rear Safety Guard Assy.	1	For Safety Guard Use Only (Include Part J-8032, J-8033)
35	J-8035	Microswitch	1	For Safety Guard Use Only
35_1	J-8035-1	Washer	2	For Safety Guard Use Only
36	J-8036	Screw: M3x0.5	2	For Safety Guard Use Only
37	***	***	***	***
38	***	***	***	***
39	J-8039	Safety guard spring lock	1	For Safety Guard Use Only
40	J-8040	Screw: M3x0.6	2	For Safety Guard Use Only
41	J-8041	Screw: M4x0.7	2	For Safety Guard Use Only
42	J-8042	Safety guard spring lock fixture	1	For Safety Guard Use Only
43	J-8043	Slide sheath	1	For Safety Guard Use Only
44	J-8044	Mat	2	For Safety Guard Use Only
45	J-8045	Planetary internal gear	1	For Safety Guard Use Only
46	J-8046	Fixed slice	1	For Safety Guard Use Only
46_1	J-8046-1	Fixture for safety guard	4	For Safety Guard Use Only
47	J-8047	S/s screw: M5x0.8	6	For Safety Guard Use Only
48	J-8048	Safety guard	1	For Safety Guard Use Only
49	J-8049	Safety Guard Assy	1	For Safety Guard Use Only (Include Item 46, 46-1 and 48)
50	J-8050	Support tube	1	
51	J-8051	Capacitor (start)	1	Single Phase Mixer Use Only
51_1	J-8051-1	Cover for Capacitor	2	
51_2	J-8051-2	Screw	2	
51_3	J-8051-3	Screw	2	
52	J-8052	Capacitor (low voltage)	1	Single Phase Mixer Use Only
53	J-8053	Foundation for Top Cover	2	
54	J-8054	Wire Piping	1	For Safety Guard Use Only
55	J-8055	O-Ring	2	For Safety Guard Use Only



Metcalfe Catering Equipment Ltd  
Haygarth Park, Blaenau Ffestiniog, Gwynedd,  
LL41 3PF, Great Britain  
t +44 (0)1766 830 456  
f +44 (0)1766 831 170  
e [enquiries@metcalfecatering.com](mailto:enquiries@metcalfecatering.com)  
w [www.metcalfecatering.com](http://www.metcalfecatering.com)

## **metcalfe** WARRANTY

All **METCALFE** products are guaranteed against defects in material and workmanship for a period of one year from date of Invoice, except where specially noted.

The Company's obligation under this warranty is limited to repairing or replacing, without charge, any part or parts found to be defective under normal use, in accordance to the specified operations manual and capacity ratings.

On all return to factory warranty items, it is the responsibility of the purchaser to return the entire unit to the factory, properly packed and labelled.

All repairs, alterations or replacement of materials or parts not authorised by **METCALFE** will automatically void all warranties in their entirety.

There is a limited **6-month warranty** on the following

- Mixer attachments (beater, whisk and dough hook)
- Parts purchased or supplied for the repair of **METCALFE** equipment

This warranty does not cover the following

- Failure due to neglect, abuse, careless handling or misuse of machine
- Failure caused due to improper maintenance
- Blender clutches
- Knives and gears on can openers
- Sharpening of slicer blades

**METCALFE** and its suppliers reserve the right to make changes in design and specification to any product without prior notification.



## Electrical PAT Certificate

Test Detail	Results
Item:	
Class:	Class 1 / Class 2
Date:	/ /
Appliance ID:	
User ID:	M.C.E.
Visual:	
Earth Current:	amps
<b>Class 1</b> Earth Result/RPE:	$\Omega$
RISO:	M $\Omega$
1 EA:	MA
<b>Class 2</b> RISO:	M $\Omega$
1 EA:	MA
Insulation (500V):	M $\Omega$
Load:	KVA
Leakage:	MA
Polarity (leads only):	

Test Detail	Results
Item:	
Class:	Class 1 / Class 2
Date:	/ /
Appliance ID:	
User ID:	M.C.E.
Visual:	
Earth Current:	amps
<b>Class 1</b> Earth Result/RPE:	$\Omega$
RISO:	M $\Omega$
1 EA:	MA
<b>Class 2</b> RISO:	M $\Omega$
1 EA:	MA
Insulation (500V):	M $\Omega$
Load:	KVA
Leakage:	MA
Polarity (leads only):	

## Electrical PAT Certificate

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1 EA:	MA
<b>Class 2</b> RISO:	M $\Omega$
1 EA:	MA
Insulation (500V):	M $\Omega$
Load:	KVA
Leakage:	MA
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Earth Current:	amps
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1 EA:	MA
<b>Class 2</b> RISO:	M $\Omega$
1 EA:	MA
Insulation (500V):	M $\Omega$
Load:	KVA
Leakage:	MA
Polarity (leads only):	