HOLLROCK ENGINEERING, INC.

Commercial Ball Washer

(28K, 28KV, 38K, 56K)

Patent #4, 181, 996

Figure 1: Commercial Ball Washer

Parts List

Your ball washer comes with the following parts:

Part Number	Description	Quantity
K-10	Wire Hopper	1
K-11	Rubber Mount	4
K-12	Vibrator Motor	1
K-13	Track Entrance Divider	1
K-05	Drain Elbow w/Plug	1

Tools

You will need the following tools:

Tool	Quantity	Purpose
7/16" Wrench 7/16" Socket and Ratchet	2	Attaching vibrator and entrance divider. Installing rubber mounts and wire hopper.
½" Wrench	1	Some rubber mounts require this to install.

Assembly

1. Assembly Instructions: See-attached sheet.

   A. Install the four rubber mounts on the two black top brackets. No washers are required on the lower threaded bolts, just nuts. Place one washer on each of the top threaded bolts from each rubber mount.

THE FOLLOWING IS CRITICAL TO ENSURE PROPER BALL FEEDING!!!!!

- Place hopper basket on top of the four rubber mounts exactly (7) seven openings (spaces) from the bottom of the hopper as per diagram.
- Make sure that the 4-1/2" x 7" rectangular hole in the bottom of the wire hopper basket aligns with the hole in the top of the washer top.
- Put second washer on threaded bolts over the hopper then secure with nuts. Just snug all nuts.

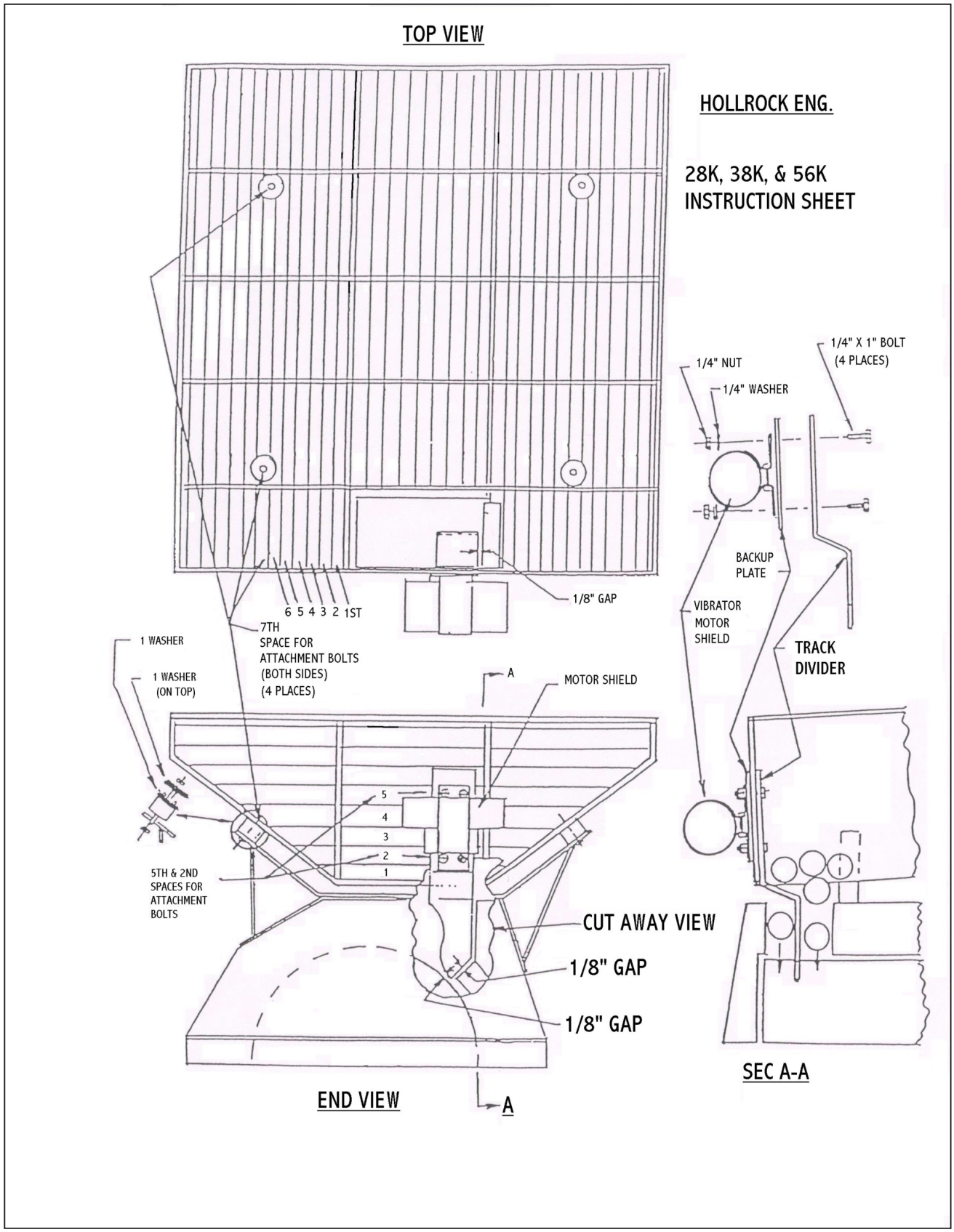
B. To double check the above procedure:
Looking into the top of the hopper you should observe the following:
1. Nut 2. Washer 3. Hopper Basket 4.Washer
5. Rubber Mount 6. Black Top Bracket 7. Nut

C. Attach the stainless steel track divider to the wire hopper, with the back-up plate fitting between the vibrator motor and the wire hopper connecting to the stainless steel track divider as shown in the attached sheet, SEC A-A. Tighten all nuts securely, being careful not to over tighten them.

Make sure that the bottom two bolts are positioned in the (2^{nd}) second slots of the wire hopper and the top two bolts are positioned in the (5^{th}) fifth slots of the wire hopper as shown in the attached sheet.

The stainless steel track divider should be !!CAREFULLY!! positioned 1/8" to 3/16" above the washer's brush and 1/8" away from the inner wall, again as shown in the attached sheet. Be sure there is ample space on both sides of the track for the golf balls to enter each track. IMPORTANT: Track divider should never touch the washer's brush.

!!!!TO AVOID PERSONAL INJURY!!!!
DO NOT INSERT HANDS IN TOP OF THE BALL WASHER'S TRACK DIVIDER OPENING WHILE IN OPERATION



Operation

1. Operating Instructions

A. It is recommended to place the professional ball washer under complete cover or indoors whenever possible. Also try to locate the washer on level ground. It is also recommended to rinse the washer with clean water to remove any debris that may be left from manufacturing.

B. Fill the lower washer tank with water approximately 2" from the top.

C. If desired, add a small amount of Ball Bright to the water.

D. To help minimize corrosion, empty the water from the tank and rinse thoroughly when not in use. This will also promote a longer brush life.

E. No nuts are needed to hold the brush in place. It is designed so the bearings just sit on the threaded bolts. Should harmful debris enter the machine, the brush will be able to move freely preventing damage to it or the washer motor.

F. Keep the motor and all wires as dry as possible. Avoid prolonged storage in direct sunlight. Protect the washer tank from high impact, i.e.; golf balls.

G. Drain water in freezing temperatures.

H. Use a 20 amp 115 volt 60 Hz power supply. A three-prong power receptacle with an electrical ground is required.

I. As always, exercise caution when operating any machinery.

Troubleshooting

The following troubleshooting guide is to help diagnose any problems you may have with your Hollrock Ball Washer. Your washer will give you many years of service if maintained properly. Remember, keep machine clean and replace any worn parts immediately.

At no time should you try to push balls into machine with a broom handle, golf club shaft or any other object. If balls are backing up, find the problem and repair.

If you have a problem with the motor, you will need the motor's model number. This can be found by removing two (2) rivets or screws on back of motor shield to read the tag on the side of the motor.

To remove the brush from your washer for cleaning and maintenance, hold each end of the brush and lift straight up. To reinstall the brush, line slots up on coupler and place brush back in machine, lining bolts up with holes in bearings.

If balls are not feeding properly, understand the following procedure to diagnose where the problem exists, then refer to the trouble shooting chart. To determine where the problem is, stop the feeding of balls and allow the balls to clear the washer. Turn off the washer and clear any loose balls at the entrance. Slowly lift the cover and check for backed up balls. Take note of where the lead ball is stopped. Proceed to the proper step from following list:

- 1 – Ball entrance
- 2 – Bottom of washer under brush
- 3 – Going from bottom tub to cover at back of machine
- 4 – Ball exit
- 5 – In hopper basket

Trouble Shooting Chart

Problem	Reason	Solution
Lead ball stopped at entrance to bottom tank	1. Entrance track divider may be too close to side of opening	1. Adjust divider by pushing on it so there is enough clearance on either side for balls to pass through freely. See figure A-A
	2. Beginning of rubber tracking may not be tapered	2. With small grinder or sharp knife, shave top edge of tracking. Make sure plastic is tight against tank
	3. Balls may be catching on white plastic track	3. White plastic may need to be trimmed. See figure 1
Lead ball stopped at bottom of washer under brush	1. Rubber tracking is misaligned	1. Tracking should be flat and butted against edge of next piece. A small gap is permissible
	2. White plastic is misaligned	2. Plastic track joint should be offset. See figure 2. If track is worn, replace it
Lead ball stopped at transition between top and bottom at back of washer	1. Rubber tracking is misaligned	1. Tracking should butt slightly and lay flat
	2. White plastic track misaligned	2. Make sure track pieces are offset. See figure 3. If track is worn, replace it
	3. The #2 white track is not lifted away from tub	3. Install plastic track lifter between track and tank
Lead ball stopped at ball exit	1. Aluminum exit chute bent	1. Fix or replace
	2. Exit chute too far away from brush	2. Chute should be approximately 3/16” from brush. Drill out rivets and reposition if necessary
	3. Exit divider (28K only) may be bent	3. By pushing on end of divider where it joins white plastic, adjust so balls fit through freely on each side

Balls won't feed from hopper	1. Foreign objects and debris 2. Entrance divider not adjusted 3. Vibrator motor not working	1. Clear ball path 2. Adjust as per instructions 3.check for power, replace vibrator motor
Water leaking where drain attaches	1. Threads not sealed 2. Fitting in bottom of washer cracked 3. Water leaking at drain plug	1. Wrap threads with plumbers tape 2. Contact company 3. Wrap threads with plumbers tape or replace gasket on plug
Motor runs but brush doesn't turn	1. Coupler may be loose on motor 2. Coupler on brush shaft may be loose 3. High speed gear in motor is broken 4. loose or broken wire	1. Check motor coupler. Coupler is held in place by a woodrif key and allen head set screw. Make sure key is present and set screw is tight 2. Replace bolt or split pin 3. Replace gear or motor 4. Tighten / replace wire
Motor won't run	1. No power 2. GFCI in switchbox is tripped 3. GFCI outlet is defective 4. Motor burned out	1. Check to see if washer is plugged in and power turned on 2. Push reset button 3. Replace outlet 4. Replace motor
Balls not getting cleaned	1. Brush worn 2. Rubber track worn 3. Wash water dirty 4. Not enough pressure between ball and brush	1. Reverse or replace brush 2. Replace rubber track 3. Drain water and refill with clean water 4. Put lifter under rubber track

Appendix for 28KV Vari-Speed Washers

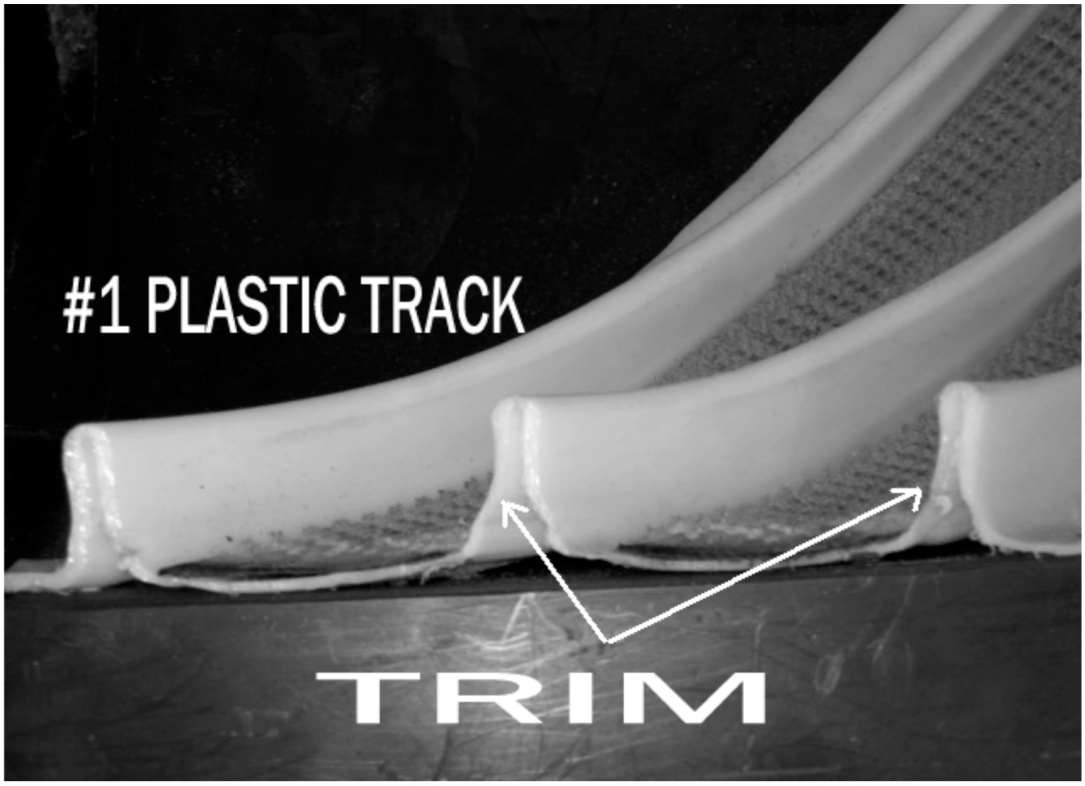
Trouble Shooting Speed Reducer

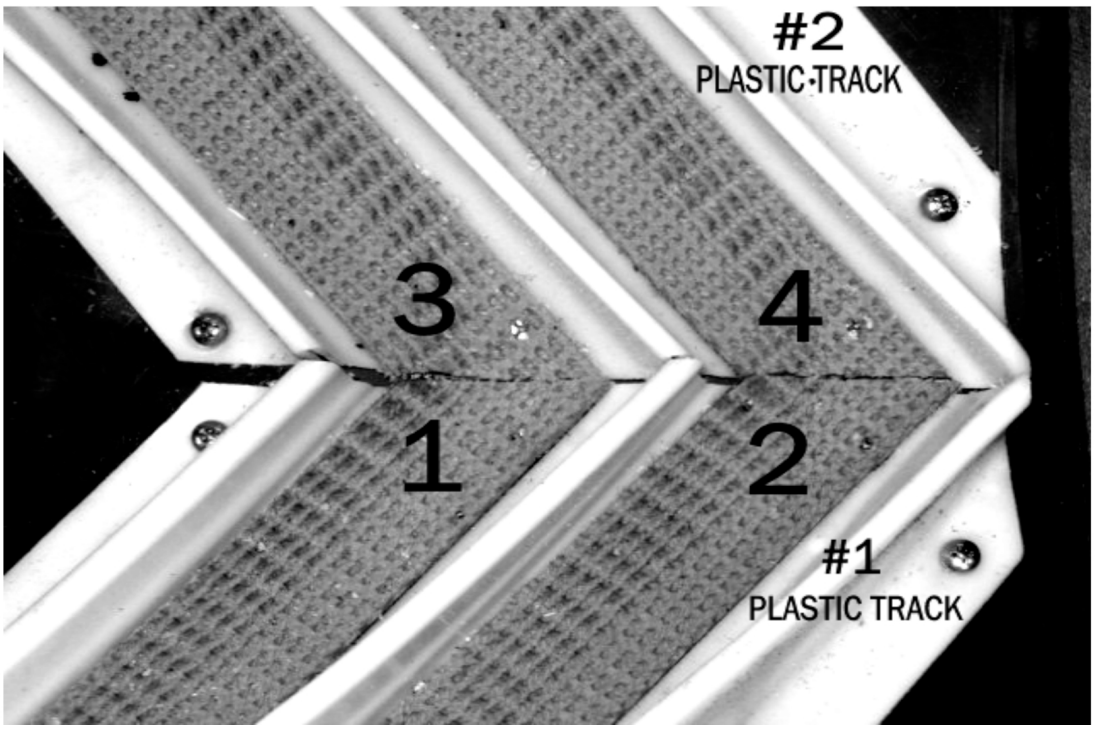
Problem	Reason	Solution
Unit fails to operate	1. Blown fuse or open circuit breaker 2. Defective motor	1. Replace fuse or reset breaker 2. Replace
Motor runs, brush won't turn	1. Failed gears	1. Replace gears
Brush turns intermittently	1. Poor electrical connection 2. Damaged gear assembly	1. Check connection 2. Replace gear assembly
Excessive noise	1. Bearing worn 2. Insufficient lubrication	1. Replace bearing 2. Check oil level. Should be level with plug on shaft side of unit. Use AGMA#4 gear oil
Unit leaks oil	1.Vent plug not installed 2. Gasket broken or not seated 3. Damaged or worn seal	1. Install vent plug on top of unit 2. Reseat or replace gasket 3. Replace seal

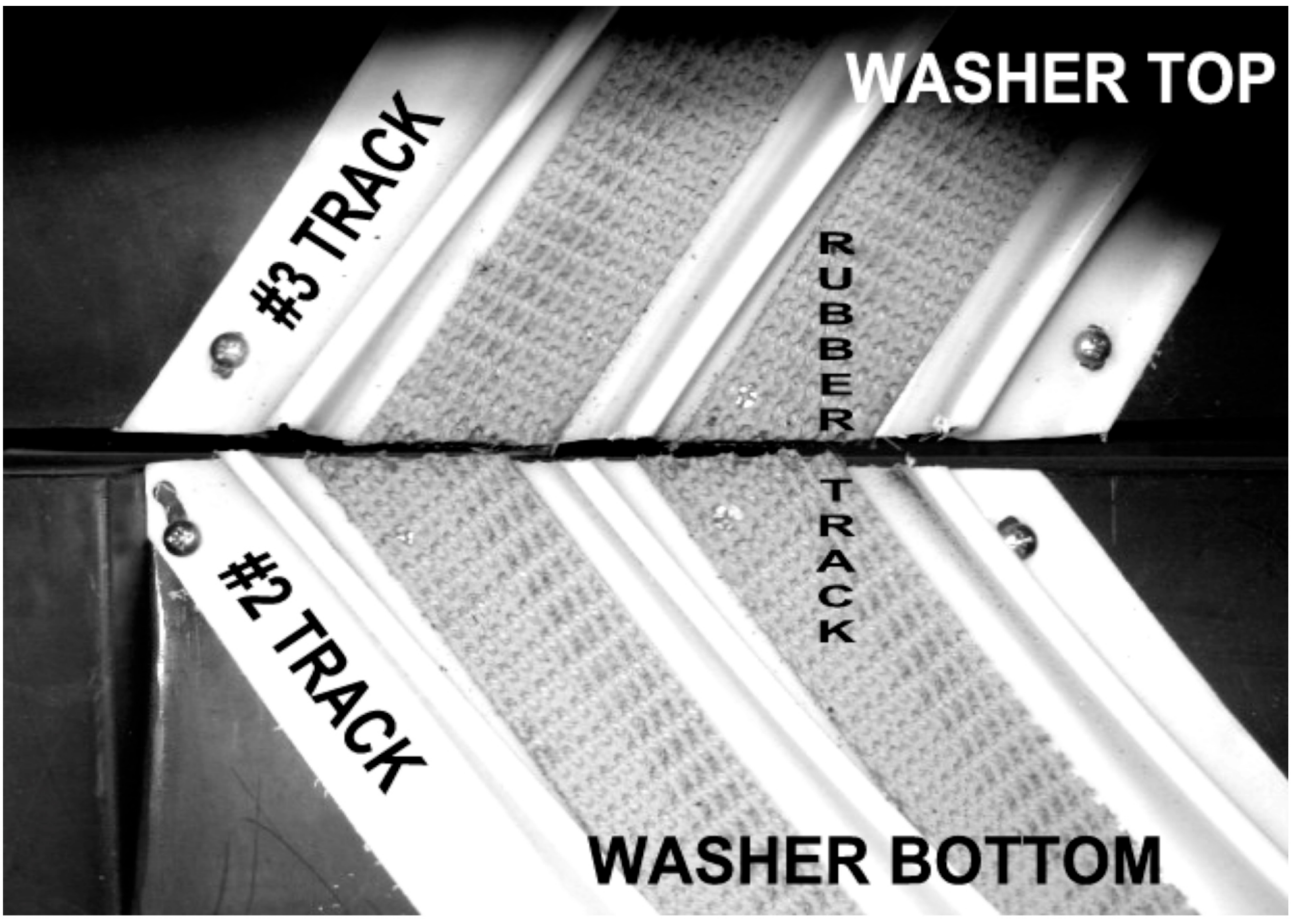
Troubleshooting 28KV Motor

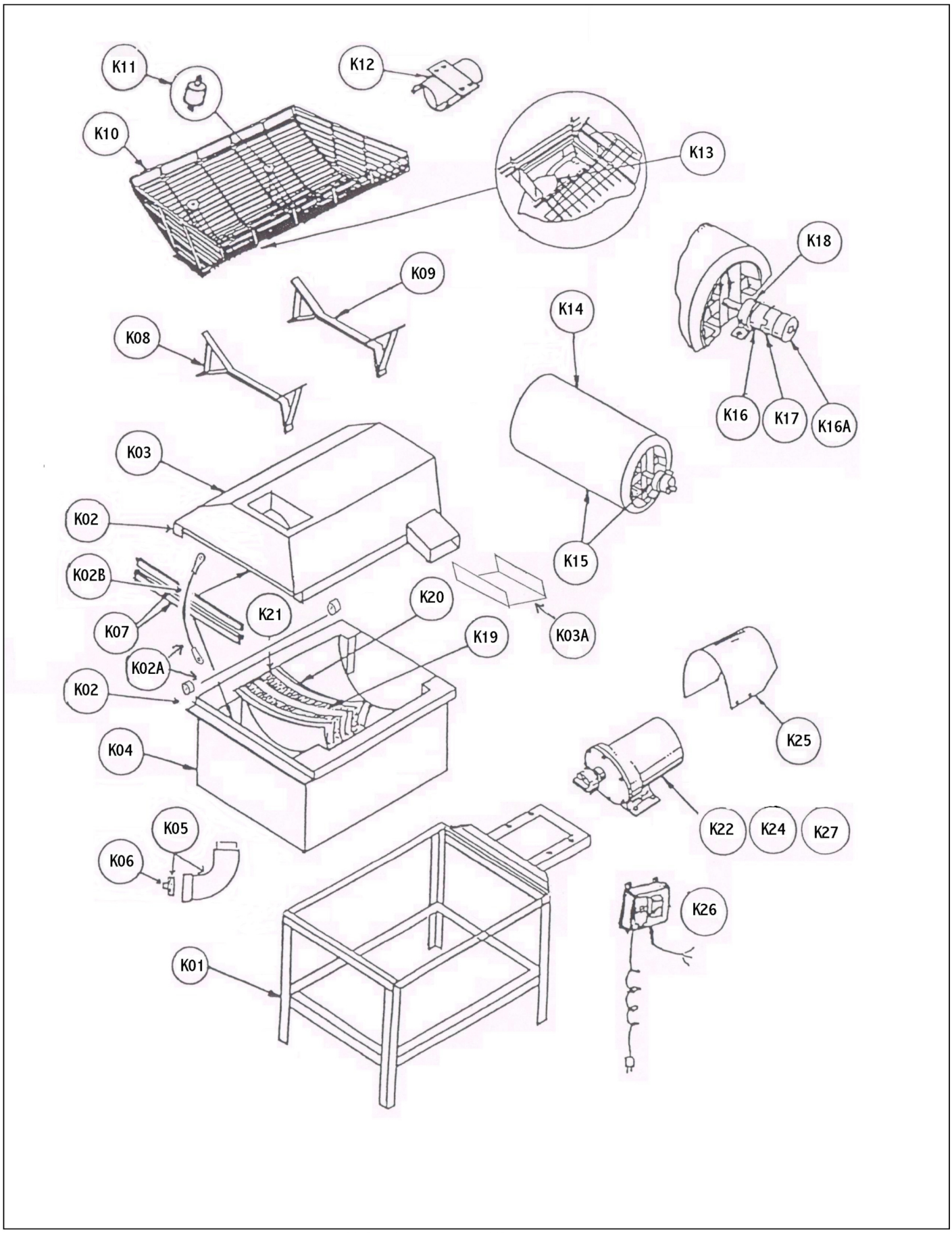
Symptom	Possible Causes	Corrective Action
Indicator light OFF; motor does not run	1. Power switch in OFF position 2. Blown fuse or open circuit breaker 3. Incorrect power source 4. Defective power switch	1. Move to Run CW/Run CCW position 2. Replace fuse or reset circuit breaker 3. 115 vac +/- 10% 60/50Hz full load amps: 4.2 4. Replace switch
Indication light ON; motor does not run	1. Speed control dial set to zero 2. Loose connections 3. Worn motor brushes 4. Faulty PC board	1. Turn knob CW to start motor 2. Make sure all connections are secure 3. Replace brushes 4. Replace PC board
Power ON indication light does not come on when power switch is in Run CW/Run CCS position, and line fuse blows	1. Defective suppressor 2. Defective motor 3. Short to ground 4. Faulty PC board	1. Check suppressor. Replace if defective 2. Check motor 3. Check for shorts to ground Correct as required 4. Replace PC board
Motor runs full speed regardless of speed control dial setting	1. Defective PC board 2. Defective speed control dial pot	1. Replace PC board 2. Replace speed control dial pot
Motor stalls or runs at very low speed w/ speed control dial turned full CW	1. Low voltage 2. Overload condition 3. Worn motor brushes 4. Loose connections 5. Defective components on PC board 6. Defective motor bearings	1. Check input voltage. It should not be below 104 VAC. Increase voltage to 115 VAC 2. Reduce load 3. Replace brushes 4. Make sure all connections are secure 5. Replace PC board 6. Replace bearings
Motor is unstable.	1. Defective motor 2. Defective components on PC board	1. Replace motor 2. Replace PC board
Repeated fuse blowing	1. Low voltage 2. Overload condition 3. Loose connections 4. Worn motor brushes 5. Defective bearings 6. Defective components on PC board	1. Input voltage should not be below 104 VAC. Increase voltage to 115 VAC 2. Reduce load 3. Make sure connections are tight 4. Replace brushes 5. Replace bearings 6. Replace PC board
Direction switch inoperative in one or more of its functions	Defective switch	Replace switch
PC board problems; obvious damage to board component(s)	Defective PC board	Replace PC board
Motor will not maintain speed under load	1. Motor overloaded 2. Defective components on PC board	1. Reduce load 2. Replace PC board

View looking down at the ball track in the lower tank.






WASHER TOP
#3 TRACK
RUBBER TRACK
#2 TRACK
WASHER BOTTOM



Washer parts diagram