Type: Fillermate

Model Number:

Serial Number:

Strong Manufacturing Company, Inc.
P.O. Box 8068
2301 University Drive
Pine Bluff, Arkansas 71611-8068
Phone: 870-535-4753
Fax: 870-535-4843

Owner's Manual

For The

Strong Manufacturing Company, Inc.

FillerMate

Strong Manufacturing Company, Inc.
P.O. Box 8068
2301 University Drive
Pine Bluff, Arkansas 71611-8068
Phone: 870-535-4753
Fax: 870-535-4843

Table of Contents

Preface

The Strong Fillermate Tank Filling System (see Drawing #86000614) is specially designed for mixing and pumping Strong's specifically formulated materials for use in the steel fuel tank industry. Strong's premixed material is the optimum mix for filling the annulus between concentric steel walled tanks because:

1. The perlite rich premix is extremely effective in producing an insulating barrier that is more than adequate to pass a standard two-hour fire rating test.

2. Mechanized blending at Strong insures precisely measured ingredients, thereby allowing the customer to produce consistent mixes from pallet to pallet.

3. After setting, this special material is porous, which allows the absorption of leaked fuel, should any escape the inner tank.

4. Excess water in a mix can seep from the mix and rust the tank walls. Special additive in the Strong premix eliminate bleeding of water, reduce the amount of original water needed for mixing, and at the same time, increase pumpability of the material slurry.

5. Should any questions arise regarding materials of machine operation, Strong Manufacturing Company's technical or engineering department can answer questions in a timely manner.

With its patented double drum mixer, the Strong Fillermate mixes materials quickly and thoroughly with minimum degradation of lightweight aggregates. The special mixer also promotes air entrainment within the mix to maximize material yields.

The Strong Fillermate utilizes a progressive cavity pump that also prevents damage of fragile mix ingredients. The pump is capable of pumping in forward and reverse directions. Pumping in reverse is handy when the operator need to relieve hose pressure. Reverse can also be used to pull material back out of the annulus should an air pocket at the top of the tank be desirable.

Power is supplied to the mixer and pump via electrical gear motors. Standard units operate at 230 VAC. However, for particular applications some units are designed to operate at 460 VAC. The intent of this manual is to promote the best use of the Strong Fillermate by providing component description, operation and maintenance procedures, a troubleshooting guide and most importantly, safety instructions.

This operator's manual has been prepared assuming it will be mixing and pumping premixed materials. Due to the many other materials, it is capable of mixing and pumping Strong MFG. is unable to provide instructions for all products.

The manual should be read thoroughly and understood by everyone responsible for the operation and maintenance of the machine. With proper care and maintenance, the Strong Fillermate will provide its operators long and dependable service.

Extra copies of this manual and other literature are available from Strong Manufacturing for a nominal fee of $30. **However, the safety section of this manual can be obtained free of charge.**

To obtain additional manuals or if questions arise concerning the Fillermate System, please call or write:

Strong Manufacturing Company, Inc.
P.O. Box 8068
2301 University Drive
Pine Bluff, Arkansas 71611-8068
Phone: 870-535-4753
Fax: 870-535-4843

Important General Safety Information

The Strong Fillermate machine was specifically designed to mix and pump special pre-blended material slurries. It is also capable of mixing and pumping other materials blended on site. In addition to the usual hazards of machinery, several special hazards are involved in these operations. Please read and pay close attention to the following **SAFETY INFORMATION.**

A. Electrical

1. Read all instructions and safety literature for electrical components prior to connecting power.

2. Only a qualified electrician should be allowed to perform and service the electrical system on this machine.

3. Never remove any covers from the electrical components without first isolating and locking-out the source electricity to the machine.

4. While the machine is not in use and/or at the end of each day, the machine's red disconnect knob should be turned to the off position and locked.

5. Before unlocking the red disconnect knob or reconnecting power to the machine, always check to make sure that the pump and the mixer control switches are in off position and all guards are in place.

6. Use only the correct voltage that your particular machine is equipped for. Standard machine is 230 volts, Three Phase AC. Some special machines are designed to operate on 460 VAC.

7. A charged fire extinguisher designed for 230 VAC use on electrical fires should be kept near the machine at all times. (Class BC, Dry Chemical)

8. Throw electrical disconnect and lockout before final wash-down of exterior or main electrical cabinet.

9. Always keep main electrical cabinet closed and tightly sealed.

B. Machinery and Guards

1. Read all "WARNING" and "CAUTION" signs before starting machine.

2. Never operate machine with worn or loose parts, or with parts needing replacement

3. **Warning**: Do not remove mixer guard or grate or put hands or tools in mixer at any time without shutting down the power supply and locking it in the off position. When cleaning mixer at end of day's operation and washing out loose materials removed during cleanup, replace the mixer inlet grate before reconnecting or restarting the power supply. Failure to observe this warning may result in severe bodily injury including eye injury, loss of sight, loss of limbs, cuts, bruises or possibly death.

4. Before unlocking electrical disconnect knob make sure that all guards and covers are back in place. The guards provided with this machine consist of the following:

    - Mixer Chain Guard – Covers chain and sprockets that drive the mixer.

    - Mixer Inlet Grate – Covers top of mixer inlet

    - Hopper Grate (Or Sub-Grate) – Fits in bottom of wet material hopper to cover flighting on pump drive shaft

    - Coupling Guard – Horseshoe shaped guard that covers the coupling between the pump drive assembly and gearbox.

5. Never Operate the mixer or pump under any excessive load causing the electrical system to overload.

6. Never wear long hair or loose clothes around rotating machinery.

7. Never place hands, arms, tools, etc. through grates or guards.

8. The machine should be kept as clean as possible. Material should not be allowed to build up on warning signs, instructions, gauges, etc.

9. Guards are designed for specific purposes and should never be altered in any way.

10. Machines set on casters should always be blocked in place to prevent machine from movement during operation.

Caution: Failure to observe the preceding warnings can result in severe bodily harm, including eye injury, loss of sight, loss of limbs, cuts, bruises, electrical shock or possibly death.

C. **Material Pump and Hose**

1. Do not disconnect material hose with hoses under pressure. Always run pump in reverse until hose becomes soft before disconnecting it. Failure to do so could result in material blowing out under pressure and striking someone causing bruises, cuts, breaking of limbs or possible loss of sight if material enters eye.

   Note: When pumping in reverse, be sure that material is flowing back into the hopper as evidenced by the materials level in the hopper rising. Watch the discharge hose to avoid collapsing in and causing the pump to run dry. Running the pump dry can damage the stator in just a few seconds.

2. Examine material hose at the beginning of each shift. If cuts, bubbles, or any other weak spot is noticed the hose should be replaced. Check all couplings to be sure they are tight and properly latched.

3. Never stick hands, arms, tools, etc. through the pump hopper grate.

4. Never remove pump hopper grate with power disconnect in the “ON” position. Turn the disconnect switch to the “OFF” position and lock it out.

D. Mixer

1. Never stick hands, arms, tools, etc. through the mixer inlet grate or discharge door.

2. Always lock and tag electrical power disconnect off before removing mixer grate. Replace the grate before reconnecting power.

3. Warning: The mixer safety kill switch is connected to the mixer and detects the presence of the mixer grate. This switch should never be removed, dismantled, or hindered in any way. The switch should be checked regularly to assure proper operation. This switch is designed to stop mixer rotation in the event the mixer grate becomes accidently dislodged.

4. Lock the electrical power disconnect **OFF** before doing any work on the mixer.

Caution: Failure to observe the preceding warnings can result in severe bodily harm, including eye injury, loss of sight, loss of limbs, cuts, bruises, electrical shock or possibly death.

5. Always wear safety glasses or other eye protection when operating the machine, dust particles become airborne and could get into the eyes causing severe irritation or even permanent loss of sight.

6. Never wear long hair or loose clothes around the mixer as they may be caught between paddle blades. The winding motion of the paddle can pull a person into the mixer.

E. Water

1. Never connect water to machine, if incoming water line pressure is over 150 PSI.

2. Always flush water lines prior to connecting to machine. Debris in the line may cause damage to the water meter. Excess air in the line may also damage the water meter.

3. Use only water that is suitable for drinking.

4. Disconnect water from machine at end of shift; drain water meter and water lines, if a possibility of freezing exists.

Cleaning, Repairing, Servicing And Adjusting Prime Movers, Machinery And Equipment Section 3314 – General Industry Safety Orders

Machinery or equipment capable of movement shall be stopped and the power source de-energized or disengaged, and, if necessary, the moveable parts shall be mechanically blocked or locked to prevent inadvertent movement during cleaning, servicing or adjusting operations unless the machinery or equipment must be capable of movement during this period in order to perform the specific task. If so, the employer shall minimize the hazard of movement by providing and requiring the use of extension tools (EG extended swabs, brushes, scrappers) or other methods or means to protect employees from injury due to such movement. Employees shall be made familiar with the safe use and maintenance of such tools by through training.

Caution: Failure to observe the preceding warnings can result in severe bodily harm, including eye injury, loss of sight, loss of limbs, cuts, bruises, electrical shock or possibly death.

F. Catwalk

1. Never sit, stand or climb on handrail.

2. Never operate machine without either the optional pallet rack or standard handrail in place.

3. Never stand on catwalk without it being bolted securely to the floor. Without the legs being bolted down, the catwalk may tend to be unstable and tip backwards.

4. Never let empty bags, hoses, etc., pile up on catwalk as these may become tripping hazards.

Strong-Mate Mixer

Drawing #386000620

The Strong-Mate Mixer is a completely innovative idea in mixers, designed for mixing most varieties of cementitious materials. The mixer is designed to give a maximum amount of agitation, and complete dispersement of the particulate ingredients and admixtures in as short a mixing cycle as is possible.

To accomplish this, two inter-connected fixed drums are attached and include two self-wiping, ribbon paddles that counter-rotate. The mix is brought to the center where it gets an EXTRA ORDINARY and VIOLENT mixing action – but does not "beat" the mix as is the case with the conventional type paddle mixers. The amount of mixing time to bring the mixture into a completely homogenous mix under normal conditions is about 30 seconds. With longer mixing times the yield of a mix can actually be increased over 100%.

The mixer should be thoroughly cleaned after each day's use to prevent a buildup of materials on blades and walls of the mixer. Power is supplied to the mixing paddles by a 5 horsepower, 3 phase, A.C. electric motor.

The mixer has a set of packing chambers with rings of packing at either end of the paddle blade shafts to prevent water and the mix from getting into the flange bearings. One fitting, on each of the flange bearings, is for greasing the seals inside. **THESE FITTINGS ARE LOCATED ON TOP OF THE BEARING HOUSING AND MARKED "GREASE TWICE DAILY".** These should be greased every four hours of operation and at the end of each day's operation. Enough grease is injected to show at the end of the packing house inside the mixer after the cleanup operation. This ensures that any materials that have worked past the seals is discharged out and cannot harden inside and prevent the sealing action necessary to protect the shaft bearing.

Grease the fittings on the sides of the bearing housing every 150 hours of operation. These fittings are provided for greasing the race of the bearings which are prepacked at the factory. Too much grease here can shorten the life of the bearing more than not greasing it at all.

Caution: Do not remove mixer guard or put hand in mixer at any time without disconnecting electrical power and locking it in the off position. When cleaning mixer at end of day's operation and washing out loose materials removed during cleanup. Replace the mixer inlet grate before reconnecting power. Failure to do so could result in severe bodily injury.

Strong-Master Pump

Drawing #86000616

The Strong-Master pump consists of three principle parts, the pumping elements, the suction housing for material storage and the drive assembly to transfer power to the pumping elements.

The pumping elements for the Fillermate consist of a #80 rotor and stator connected to the suction housing. This rotor-stator combination is capable of producing 400 PSI pressure when new. Pressure of this amount will not be encountered during normal operations, UNLESS a "plug" in hose occurs. If a plug does occur, stop the pump immediately. Run the pump in reverse to relieve the hose pressure. Find the "plug" in hose. Remove and clean the plugged section of hose.

As the pump is operated, the rotor will wear, causing the pressure to drop and discharge rate to reduce. Should either rotor or stator has excessive wear, it will shorten the life of the other component considerably. Worn parts cause "slippage" within the pumping elements which accelerates the wear. Generally, the stator wears first.

It is not critical which end of the stator is screwed into the pump hopper. To prolong the stator life, reverse ends when stator wear in noticed. This is indicated by a substantial reduction of flow out of the end of the material hose. Eventually, the rotor will wear also. Rotor wear consists of chrome missing from the lobes of the rotor. When this occurs, replace the rotor. Worn rotor will result in reduction of stator life by one-half or more. Never use a new stator with worn-out rotor. When wear is excessive, the material flow from the hose will decrease and become intermittent. When flow breaks, a small puff of vapor may be released. At this point, the rotor and stator should be examined and one, or both, replaced if wear is observed.

To remove the stator, loosen the "U" bolt clamp and unscrew the stator with a pipe wrench. The stator can then be screwed out of threads by rotating the stator slowly while holding backward pressure on the pipe wrench. To replace a stator, lubricate the inside of the stator and outside of the rotor with glycerin or soap. Using a pipe wrench hold forward pressure against the stator and screw it on to the rotor and into the pump housing. Holding pressure against the discharge end of the stator may be required. Do not use the machine to thread stator into housing. This must be done by hand. Damage to threads could occur if attempt is made to thread stator into housing by use of the machine.

The suction housing (See Drawings #86000370 and #86000617) has the materials holding hopper welded to it. A connecting rod connects the rotor to the drive shaft at hub inside the suction housing.

The connecting rod has auger flighting welded to it to keep materials agitated and fed to the pump during operation. These parts which operate in the cement slurry environment, are subject to severe wear. The connecting rod should be inspected for excess wear at pin holes every 40 hours of operation. It is easily done when rotor is removed as one end of connecting rod is exposed. The wear at the rotor end is usually greatest so that it is not necessary to remove other end unless pin holes can be used when wear is excessive on one set. When both sets of holes are worn, the drive shaft hub should be replaced.

Connected to the suction housing is the drive assembly (see Drawing #86000615) which houses the packing chamber/chrome sleeve, and drive shaft bearings. The bearing housing is pregreased at the factory and should not require additional lubrication more than once a year.

The standard power supply for the standard Fillermate pump is a 7 ½ horsepower, 230-460 VAC, 3 phase, A.C. electric gear motor.

A. <u>Packing Chamber</u>

The Strong-Master #80 pump features a packing chamber (see Drawing #86000615) specially designed to handle cementitious slurries.

The packing chamber consists of a set of specially prepared packing and one lantern ring. These stationary rings seal against the rotating drive shaft that has been hard chrome plated to resist wear. To maintain the sealing pressure required, a grease fitting and a conventional packing gland are utilized.

The packing chamber must be kept well-greased. This should be done every four hours of operation and at the end of each operational day. This will prevent water and mix from entering the chamber and setting up.

The packing gland is used to maintain a uniform packing pressure as the rings wear. There is enough adjustment for one full ring of packing. When the gland has bottomed out against the chamber, an additional ring should be added.

When the packing chamber continues to leak after greasing and gland adjustment, the original rings are too badly worn or dried out and will not seal. Remove the gland and all of the rings. Replace with compete new set as shown on the pump drawing. The lantern ring and chrome plated drive shaft usually will not need replacing, but they should be inspected and cleaned. If the holes in the lantern ring are stopped up with dry material, they should be cleaned as grease

will not reach the packing and rapid wear of the packing will occur. The chrome on the drive shaft should be inspected for wear and cleaned or replaced. Excessive grooving or lack of chrome indicates a need to replace the drive shaft.

B. Dismantling and Installing Pump Drive

Disconnect and lock0out electrical power source. Disconnect wires at electric motor (make a note regarding where the wires were attached). Remove connecting rod pin in drive hub. Remove four 3/8 inch bolts holding bearing housing to suction hopper. Entire unit will now lift clear of suction hopper. There is approximately 1/16 inch clearance all around between the drive collar and the center hole into the suction hopper and plate. Set-up concrete may block passage of drive collar through housing.

To install a new unit, reverse the above procedures, paying particular attention to the following:

Pack drive collar with Esso Nebula EP2 or equivalent grease. On the bearing housing is a raised boss which fits into a counter bore in the suction hopper bolting face. Examine both of these sections for burrs. Remove with flat mill file. Make sure all foreign matter is removed from all mating surfaces. Wipe with grease after cleaning. Tighten the four housing bolts up alternately, so that housing faces contact securely all the way around. Reconnect connecting rod pin and reconnect wires to the motor according to the notes you took above.

Machine Installation

A. Locating Machine

1. Care should be taken to locate machine on level ground.

2. Caster on bottom of skid should be blocked to prevent rolling during machine operation.

3. Machine should be located near a charged fire extinguisher.

4. Machine should be located where excess water from wash-down and normal operation will run off and not leave a hazardous walking surface.

B. Connecting Electrical Power (see Drawing #86000621)

The electrical power required for the 430 Fillermate machine is 230 volts, three phase, A.C. Special machines are supplied with a 460-230 control voltage transformer and must operate on 460 volts.

Warning: Only a certified electrician should be allowed to perform electrical work on this installation.

1. The plant's main electrical disconnect should be thrown to the OFF position and locked before beginning any work on the machine.

2. Before connecting hot leads to machine, make sure that all guards are installed properly on the machine and that all switches are in the OFF position.

3. Connect the machine's main power supply cord to an existing electrical power supply. The three power leads should be connected as shown in Drawing #86000621.

4. Route wires to the machine so they are not a hazard to workers operating around the machine.

5. Make sure that wires are connected to the terminals securely and that all wire fittings on cabinet are tightly sealed.

Warning: Improperly sealed wires can allow water to enter the cabinet causing the possibility of electrical shock.

Danger: This machine should never be operated or sprayed with water without sealing the electrical disconnect box. The metal key supplied with the machine should always be used to lock and seal the machine's electrical disconnect box before clean up begins. Rotating the lock counter clock-wise, by use of this key will seal the box and prevent water from contacting electrical components inside the box.

DO NOT TURN THE MIXER OR PUMP ON YET

C. Connecting Water

Note: The following procedures should be adhered to before attempting to start the mixer or pump.

1. In order to flush air and debris from the incoming water line, turn the water on before connecting it to the Fillermate water system.

2. Turn the water line off.

3. Connect the water line to the fitting on the bottom of the water system.

4. Open the wash-down faucet and water inlet valve to allow excess air to escape.

5. Turn incoming water back on until water flows through the two ports.

6. Open mixer door an allow water to flow into wet material hopper.

7. Open hopper trap door so that this water and any excess debris can be emptied.

8. Close the hopper trap door and place 10 more gallons of water in the hopper.

D. Test Electrical Controls

1. All guards should be in place before turning any component of machine on.

2. TEST THE PUMP FIRST. Make sure there is water in the hopper. When the pump control switch is set to FORWARD the water level does not drop and bubbles come from the back of the rotor/ stator, stop the pump IMMEDIATELY, the incoming electrical leads have been installed backwards.

3. Only, after the pump operates correctly in FORWARD and REVERSE should the mixer controls be tested. With controls in the ON position the mixer should turn approximately 50 RPM.

Machine Operation

The **General Safety Information** section of this manual should be studied carefully by everyone working around this machine before it is operated. This machine should never be operated or serviced without all safety guards in place and operating correctly.

Danger: Never stick hands, arms, tools, etc. into the mixing chamber either through the inlet grate or discharge door with electrical power connected to the machine.

A. Mixing and Pumping Batches

During the mixing operation, the wash down hose can be used to remove any material that adheres to the mixer grate or paddles. Do not remove the mixer grate. Adequate room for clean-up is provided through the mixer grate openings.

When using material that has not been pre-blended, add water to mixer, add admixture if required, spreading evenly over entire length of mixer, add cement, add aggregate. *All material should be added slowly and evenly to prevent excessive mix times and prevent lumpy material. Dumping ingredients without spreading evenly may affect mix consistency.

Mix 2 to 3 minutes or until proper density is achieved.

1. Reset water meter to zero.

2. Turn the mixer ON.

3. After making sure the mixer door is closed, open the water inlet valve to allow water to flow into the mixer. The amount of water required for a batch of material is specified by material vendor. Place all of the specified amount of water in the mixer except 1 or 2 gallons. These should by saved to do final adjustments on the mix after the material has been added.

4. Place dry premixed material in the mixer one bag at a time, adding the last bag slowly. Mix 2 to 3 minutes. Adjust water as necessary. Open door and dump, close door, wash down, add water. NEVER place dry material in the mixer before the majority of specified water has

entered the mixer or without the mixer paddles turning. Doing either of these two operations will cause extreme loading of the mixers electrical motor and power train.

5. After all bags have been emptied into the mixer, add the remainder of the after slowly until the correct material consistency is obtained.

6. When the mixer is thoroughly blended and air entrained (2-3 minutes after last bag of material is dumped), the mixer door should be opened to allow the mixed material to gump into the pump hopper.

7. The mixer should be left running continuously. The mixing action of the paddle blades will force remainder of mixed material out of the discharge door.

8. After all material is discharged to the holding hopper, close door, spray with wash down hose & nozzle, begin mixing a new batch (Step #1).

9. Turn the pump control switch to FORWARD. The material level in the hopper is designed to a specific volume that will allow continuous operation of the mixer. As one batch is mixed another is being pumped. However, before the pump hopper is completely empty, the batch in the mixer should be discharged to keep the pump from running dry. If for any reason the required mixing time is greater than the required pumping time, turn the pump controls to OFF before the pump runs completely out of material. Running the pump dry can cause damage to the stator in a matter of seconds.

10. The hose and hopper should be monitored periodically to make sure that the hose is not plugged. If the level in the hopper stops falling, the material hose becomes very firm and no material is flowing from the end of the hose, the hose is plugged. Turn the pump to REVERSE immediately until the hose becomes soft again.

    Caution: Only after the pump has been reversed and the hose is soft again should the hose be uncoupled and the plug removed.

11. If a void is desired at the top of the tank's annulus, this is easily accomplished. First, fill the tank completely using the standard procedure. Next, place the pump in reverse to suck material back from the tank. Make sure that material is continuously flowing back to the

holding hopper, or else the pump will run dry and cause damage.

12. With the application of a few of Strong's optional Tank Filling Valve Assemblies, operators can fill multiple tanks. This assembly connects to a threaded port at the base of the tank and allows the operator to quick connect the material hose to the tank bottom. After the tank is filled, the valve on the assembly is closed to prevent material leakage and the material hose is disconnected. The hose is ready for use on another tank and the valve assembly is left on the tank until the material sets. After the material takes its initial set, the valve assembly can be removed and reused on the other tanks.

Caution: Always wear safety glasses or other eye protection while operating machine.

Clean-Up

After operation has been completed for the day, the following procedure should be used to clean the machine and material hose.

Throughout the day, the machine operator should have sufficient time to keep the exterior and interior of the machine washed clear of any excessive build-up of material caused by spillage or ingredient addition during the mixing operation. A wash-down hose and spray nozzle are a part of the supplied water system. This hose should be used to keep the exterior and interior of the machine clean and for machine cleanup at the end of the day.

Danger: This machine should never be operated or sprayed with water without sealing the electrical disconnect box. The metal key supplied with the machine should always be used to lock and seal the machine's electrical disconnect box before clean up begins. Rotating the lock counter-clockwise, by use of this key will seal the box and prevent water from contacting electrical components inside the box.

A. Machine Clean-Up

In order to maximize the amount of material put in place, the machine operator should run water into the mixer and start cleanup immediately after last batch is mixed and discharged into the pump hopper. Continue pumping until wet material is being discharged at end of hose.

With mixer discharge door closed and paddles turning, fill the mixer about 1/3 full of water. At the same time, spray water through mixer grate onto any material buildup inside. DO NOT REMOVE MIXER GRATE WITH MACHINE RUNNING. Wash as much material buildup as possible from inside the mixer and paddles with water from wash-down hose. Let mixer run at least two minutes with water in mixer, or until material level in hopper is low enough to see agitator blade. Continue pumping and discharging water into hopper.

The hose operator should continue until materials become too wet to use. The machine operator should warn hose operator when water is being pumped. This alerts the hose operator to watch for wet materials.

The mixer operator should pump remaining water out of hopper through hose until approximately one inch of the agitator blade is visible. With hopper almost empty, place all controls in "OFF"

position. Pull the main disconnect and lockout in the OFF position. Remove mixer and hopper grate if necessary and wash thoroughly using a stiff scrub brush. Using a scrapper, remove any set material inside mixer, hopper and on machine that cannot be removed by washing. With components clean, replace all grates and energize power. Operate mixer and flush all material into hopper. Run five more gallons of water into mixer for final rinsing. Spray with wash-down hose as necessary.

Pump final clean-out water through hose, rinsing hopper with spray hose as water is being pumped. Stop pump when water level exposes approximately one inch of agitator blade.

B. Clean-Up of Material Hose

Before disconnecting the material hose from the pump, reverse the pump by putting the pump selector switch in the reverse position. Material hose should become soft or easy to depress. When all hose pressure is relieved it should be safe to disconnect the hose. Be sure to wear proper safety equipment such as eye and hand protection.

Disconnect the material hose from the end of the pump assembly. Saturate a sponge with water and insert it into the bell reducer. Recouple hose and discharge water into the end of hose. Repeat as many times as necessary until clear water comes out preceding the sponge.

After hoses are clean., drain water from the hose roll up and couple the ends of the hoses and line together. This protects fittings and also keeps foreign materials out of hose. Wash exterior of hose off with wash-down hose. During cold weather, drain all water from the hoses, meters, and pipes to prevent freeze damage.

Danger: Never remove any grates or guards without disconnecting the main power and locking it out. At no time should this machine be operated, cleaned, or serviced without all guards and grates in place.

Machine Maintenance

(See Drawing #86000614)

A. Mixer (see Drawing #86000620)

The greasing of the four alemites on the mixer that are marked "GREASE TWICE DAILY" require strict enforcement. Inject three shots of a good grade all-purpose grease into each fitting. These fittings are used to grease the packing mounted behind the mixer bearings. This grease prevents the slurry inside the mixer from penetrating and ruining the bearings.

Note: At no time should the mixer operate more than four hours without greasing.

All keys, taper lock bushings and Alan screws should be inspected at least once a week to determine condition of each.

The rubber wipers on the paddles will wear and need replacing. The rubber is attached to the paddles by screws and a metal backing plate. Remove the screws and backing plate. Insert screws through backing plate and new rubber and bolt in place.

The seals are located in the housing behind the bearings. They do wear and need replacing. An indication of wear is when cement appears in bearings. Remove motors and bearings. Pull housings off paddles. Remove old seals. Refer to manual for instructions on how to install new seals. The stainless-steel sleeve should be changed at the same time.

The grease fittings on bearings not marked "GREASE TWICE DAILY" are for greasing of the bearing races only and require one shot of grease every 150 hours of operation.

B. Pump (see Drawing #86000616)

A packing gland on the pump drive assembly requires greasing at least every two hours. This usually requires at least two-three shots of good grade all-purpose grease.

An adjustable packing gland is a part of the pump drive assembly. When leakage start appearing through the packing, add grease until leakage stops. If leakage cannot be stopped with the addition of grease tighten the packing evenly from both sides. Tighten until leakage stops. Do not overtighten as unit will run hot. When packing gland bottoms out, new packing is required. Refer to pump section of manual for instructions on how to change packing.

Pins and connecting rod wear with use. An indication is slack in connecting rod. Follow procedure outlined in Pump Components Section for replacement procedure. The pump components wear and will need replacement. Output at the end of the hose will drop considerably when the stator and/or rotor wears.

Usually, stators wear much faster than rotors (3:1). A rotor needs replacing when wear marks begin to show on chrome plating. Refer to Pump Components for procedure to change rotor.

C. Material Hose

Hose and couplings require routine inspection, making sure hose gaskets are in good shape and in place.

Hose should be inspected for cuts, weathering and soft spots. Replace with hose of equal specifications.

Couplings should be thoroughly cleaned and oiled regularly.

D. Water System (see Drawing #86000618)

Inlet water to the Fillermate's water system should be at less than 150 PSI. Flow should be established at the end of the water supply hoe before connecting to the Fillermate. This does two things. First, it allows all contaminants that may harm the water meter to be flushed out. Second, it forces most of the air out of the supply line. This excess air, if left in the hose, could cause damage when pushed through the water meter.

The water meter should be drained daily to protect from freezing. This is done by opening the small drain on the bottom of the water meter housing, removing the inlet water line and open the main discharge valve.

The Y-strainer included in the Fillermate water system protects the water meter from harmful debris and should be cleaned periodically.

E. Electrical System (see Drawing #86000619)

The main power cord for this machine should be routed so that it cannot be damaged. It should be inspected daily for wear, weathering, or cuts. If bare wires are visible at any place on the cord

In the they should be replaced immediately or sealed with water tight heat shrink. The electrical limit switch on the mixer grate should be checked daily to make sure that it kills power to the mixer inlet grate is removed.

If fuses in the electrical system blow, replace with identical size fuses. The pump uses 40-amp fuses and the mixer uses 15-amp fuses.

1. Opening the Machines Main Electrical Cabinet

Danger: It is very important that the metal key supplied with this machine be used to seal the electrical disconnect cabinet box door any time power is supplied to the machine. The supervisor in charge of this key should store is elsewhere to prevent unauthorized opening of the box.

a. Make sure that the main power into the machine is disconnected.

b. Turn the red disconnect knob on the machine's electrical cabinet counter clock-wise to the OFF position.

c. Place the metal key into the lock on the cabinets front panel and turn clock-wise to unseal the cabinet.

d. Rotate and hold the thumb button to its most clock-wise position and open the door.

e. This procedure should be reversed when closing/sealing the cabinet.

2. Machines Designed to Operate on 460 VAC

Standard Fillermates operate at 230 VAC. However, some machines are constructed to operate at 460 VAC. See drawing #86000622. These machines should only be operated at 460 volts.

Caution: Even with the door closed, water may enter the cabinet if the key is not used to seal the door. Never operate or wash the machine without the door being sealed completely.

Extra keys are available from Strong Manufacturing Co., Inc.

Trip Preparation Checklist

There are a number of simple rules to follow in caring for your trailer axle assembly that can add to its life – and in the case of some of these rules, you may be protecting your own life as well. Using the following checklist before starting a trip with your trailer is highly recommended. Some of these items should be checked 2-3 weeks prior to planned trip to allow sufficient time to perform maintenance.

1. Check your maintenance schedule and be sure you are up-to-date.

2. Check hitch. Is it showing wear? Is it properly lubricated?

3. Fasten safety chains and breakaway switch actuating chain securely. Make certain the breakaway battery is fully charged.

4. Inspect towing hookup for secure attachment.

5. Load your trailer so that approximately 10% of the trailers total weight are on the hitch. For light trailers, this should be increased to 15 %.

6. *Do Not Overload.* Stay within your gross vehicle rated capacity. (Consult your trailers identification plate).

7. Inflate tires according to manufacturer's specifications; inspect tires for cuts, excessive wear, etc.

8. Check wheel mounting nuts/bolts with a torque wrench. Torque, in proper sequence, to the levels specified in this manual.

9. Make certain brakes are synchronized and functioning properly.

10. Check tightness of hanger bolt, shackle bolt, and U-bolts nuts per torque values specified in manual.

11. Check operation of all lights.

12. Check that your trailer is towing in a level position and adjust hitch height if required.

Trouble Shooting

Warning: Only a certified electrician should be allowed to troubleshoot the electrical system on this machine.

Danger: Power should be disconnected and locked out before doing any work on the electrical system of this machine.

Problem: Mixer will not turn.

Probable Cause	How to Determine	Solution
Control switch in OFF position.	Visually check to determine if switch is set to OFF.	Move switch to ON.
The limit switch is not in the "run" position.	Visually check to see if the mixer inlet grate is not in place or if the limit switch is not set.	Put the grate in place so that it holds the switch back.
Fuse(s) blown	Check for continuity with an Ohm meter.	Replace fuse(s) (15 amp)
Stripped keys	Remove guard, check keys.	Replace keys.
Wiring into or out of start is loose.	Physically check all connections.	Tighten all connections.
Starter may need to be reset.	Press red buttons on front of main electrical cabinet.	

Note: It none of the preceding solve the problem, contact Strong Manufacturing Co., Inc.

Trouble Shooting

Warning: Only a certified electrician should be allowed to troubleshoot the electrical system on this machine.

Danger: Power should be disconnected and locked out before doing any work on the electrical system of this machine.

Problem: Pump will not turn.

Probable Cause	How to Determine	Solution
Control switch in OFF position.	Visually check to determine if switch is set to OFF.	Move switch to FORWARD.
Coupling not secure.	Is motor shaft turning but drive assembly shaft or coupling are not.	Tighten set screws and/or replace key.
Fuse(s) blown.	Check continuity with an Ohm meter.	Replace fuse(s) (40 amp)
Wiring into or out of starter is loose.	Physically check all connections.	Tighten all connections.
Starter may need to be reset.	Physically check all connections.	Tighten all connections.

Note: It none of the preceding solve the problem, contact Strong Manufacturing Co., Inc.

Trouble Shooting

Warning: Only a certified electrician should be allowed to troubleshoot the electrical system on this machine.

Danger: Power should be disconnected and locked out before doing any work on the electrical system of this machine.

Problem: Both mixer and pump will not turn.

Probable Cause	How to Determine	Solution
Electric disconnect is thrown.	Visually check to see if the red disconnect knob on the main electrical cabinet is in the OFF position.	Switch it to ON.
The main disconnect is thrown.	Visually check to see if a disconnect is on OFF position.	Switch it to ON.
Power leads not secure.	Check 3 wire connections at the machine and at the 3 at the main disconnect box.	Secure wires.
Fuses blown for both.	Check with Ohm meter.	Replace fuses.

Note: It none of the preceding solve the problem, contact Strong Manufacturing Co., Inc.

Optional Equipment

For the Strong Fillermate – Tank Filling System

Dust Hood

The hood will capture and filter perlite fines that may prove inconvenient or uncomfortable for an operator in a confined or limited environment.

Pallet Rack

This support will attach directly to the standard operator's platform. The rack will support a standard pallet of material in a way that provides for efficient loading of dry material into the mixer.

Quick Disconnect/Globe Valve Assembly

This assembly allows connection of the material hose discharge to the standard 2-inch pipe fitting on the tank bottom. Use of this valve allows for disconnection of the material hose, while preventing material leakage from the tank. After material in the tank sets, the valve assembly can be reused on another tank. Several of those assemblies are necessary for filling multiple tanks.

Electronic Scales

These 12-volt scales are perfect for measuring quantities of material for weight per cubic foot calculations. Scales include an adaptor for operation using 110 VAC 9standard wall electrical power).

Test Cylinders

These standard 3" X 6" tall cups are useful in capturing known quantities of materials for testing.

Mix Quality Assurance Program

Strong will perform a series of tests on mix samples, sent in by customers. Customers will then be provided data on the dry density and compressive strength of their own finished product. Samples can be tested on every pallet of material that the customer receives from Strong-Lite Products.

Suggested Spare Parts List

For The Strong Fillermate – Tank Filling System

1 Each - #80 Spare Parts Kit (P/N: 88001872)

1 Each – Stator
1 Each – Connecting Rod
2 Each – Pins
2 Each – Grommet
1 Each Pin Retainer
1 Each Clamp
1 Each – Pumping Packing

1 Set – 420 Mixer Paddle Rubber Wipers (P/N: 12250302)

1 Each – 420 Mixer Packing Chamber Replacement Kit

4 Each – Mixer Packing
4 Each – Rear Packing Retainer
4 Each – Front Packing Retainer
4 Each – Wear Sleeves
4 Each – Bearings

1 Each – Coupling Insert (Pump Drive)

1 Each – 2 Position Electrical Switch

1 Each – 3 Position Electrical Switch

1 Each – Mixer Door Pad Replacement Kit

1 Each – Rubber Pad
1 Each – Adhesive
1 Each – Replacement Instructions

Manual Drawing List

Serial Number:_____

Unit Type:_____

Drawing #	**Description**
86000614	420 Fillermate Master Assembly
86000615	Drive Assembly
86000616	Pump Assembly
86000617	Hopper Assembly
86000618	Water System
86000619	Electrical System
86000620	Mixer Assembly
86000621	Electrical Installation
86000370	Slurry Trough Assembly
86000370A	Parts List for Slurry Trough Assembly
86000623	240 Volt Schematic Fillermate
86000624	480 Volt Schematic Fillermate