

Type: Placer V

Model: _____

Serial Number _____

Operations and Procedures Manual
Strong Manufacturing Co., Inc.
Placer

Strong Manufacturing Company, Inc.
Specializing on Lightweight Cementitious Mixing and Pumping Equipment
2301 University Drive, PO Box 8068, Pine Bluff, AR 71611
(870) 535-4753 -- 800-238-5042 -- Fax (870) 535-4843

Table of Contents

I.	Preface	4
II.	General Safety Information	5-9
III.	Components	10-21
	1. Engine	10
	2. Mixer	11
	3. Material Pump	12-13
	A. Rotor and Stator	12
	B. Suction Housing	12-13
	C. Drive Assembly	13
	4. Loading System	14
	5. Hydraulics	15-18
	A. Maintenance	16-17
	B. Trouble Shooting	18
	6. Grout Machine Trailer	19-21
	A. Troubleshooting	21
IV.	Operations	22-27
	1. Setting Up	22-25
	2. Mixing and Pumping	25
	3. Clean-Up	25-27
V.	Manual Drawing List	28
VI.	Master Parts List	29

Preface

The Strong Model GR5 Grout Machine is specifically designed to convey, mix and pump cementitious slurries with a high concentration of sand aggregate. To best facilitate the handling of sand, a hydraulically powered skip bucket is used to transfer both the cement and sand from ground level up to the mixer and then be dumped.

We are confident that your new Grout Mixer-Placer will increase profits, but the life and service received from it will depend to a great extent on the care and attention you give it during daily and routine use. This OPERATION & MAINTENANCE MANUAL has been provided to assist you in obtaining the utmost from your machine and to instruct you and your operating personnel in its SAFE and efficient use. This Manual should be carefully read, and its instructions adhered to by those who will be responsible for the operation, maintenance, transportation, and uses of the machine. You should remember that the nature of your business – that is, the mixing and pumping of Gypsum or cement and sand aggregates, water, and admixtures – creates the most severe conditions under which machinery can operate. It was with these conditions in mind that the selection and design of the various components were made.

A separate section immediately following this Preface contains specific safety information. No one should be permitted to perform any function on the machine unless he or she has read the safety section of this Manual. The safety section is also available free of charge to owners of the Model GR5 Grout Machine as a separate pamphlet by writing the Strong Manufacturing Company, PO Box 8068, Pine Bluff, Arkansas 71611.

Following the safety section are descriptions of the function of the machine, its operation, various systems, maintenance information, and so on. In order to help you properly service and care for the machine, the operation and maintenance manuals from the various suppliers of components are included. These should be carefully read and followed by those who will be responsible for maintenance of the machine. The information given will help you produce a better and more profitable product.

Notice

The specific Safety Rules are important and should be read, understood, and followed by anyone who will operate, use, or work around the Grout machine. They will alert you to changes and procedures of which you may not be aware. In addition, it would be best to read the entire Operations Manual before using or working on the machine. If you observe anyone operating in non-conformance with these rules and procedures, inform them and the person in charge. Safety is your responsibility. Copies of this Safety Section are available free on request, at any time, by writing to: Strong Manufacturing Company, Inc., PO Box 8068, Pine Bluff, Arkansas 71611. Please include the serial number(s) of your machine(s) with your request. Additional copies of the entire Operation and Maintenance Manual can be obtained at the above address for the charge of \$30.00 each.

Important

General Safety Information

The Strong Manufacturing GR-5 Grout Machine is primarily used for the mixing and pumping of Gypsum or cement, sand and water slurry. In addition to the usual hazards of machinery, several special hazards are involved in these operations.

1. Do not reach into the mixer without first shutting off the engine and removing the key from the control panel. Also, place all hydraulic valves in the center or neutral position.
2. Make certain the Skip Bucket is in the full upright position for travel and the safety pin is installed. Failure to do this could allow the bucket to shake down during travel and become over-width. This would create a dangerous situation possibly resulting in property damage, personal injury or even death.
3. Do not disconnect material hose with hoses under pressure. Always run pump in reverse until pressure gauge reads "0" PSI, or hoses become soft. Failure to do so could result in material blowing out under pressure and striking someone causing bruises, cuts, breaking of limb or possible loss of sight if material enters eye.
4. Because of wear and weathering that occurs on material hose, the following test should be conducted at the beginning of each day to determine the conditions of the hose.

The field test consists of the following:

- a. Attach all of the sections of hose which will be used in the day's operation together just as they will be used.
- b. Pump water into the hose until it begins to discharge.
- c. Cap the discharge end securely with Test Cap.
- d. After advising all personnel to stand clear of the hose, operate the pump in 1st gear (slow with hydrostat) until the pressure indicated on the pressure gauge registers the maximum pressure the pump will produce and hold this pressure for 30 seconds.
- e. Reverse the pump until "0" PSI pressure indicates on the gauge and the discharge hose becomes soft. (See also Rule No. 4)

- f. Remove the cap. Operate the pump until the water has been discharged and then proceed with the pumping of the slurry.

This field test should be repeated if any damage or accident befalls a section of the hose or if, for any reason, a section is suspect.

All replacement material hose should not be less than 800 PSI tested. Such hoses can be obtained from Strong Mfg. Co. Do not use other hoses unless specifically advised by the Strong Manufacturing Company that they are adequate.

Caution: You should operate the machine with a properly functioning pressure gauge, which can be purchased from Strong Mfg, for use at the discharge end of the pump. This gauge allows the operator to prevent excessive pressures which could cause the hose to burst.

Caution: Never use weathered, rotten, or damaged hoses with damaged fittings in conjunction with pumping operations. They represent a hazard to operators, bystanders, and persons handling the hoses. If a hose should burst or a fitting let go under pressure, persons could be injured.

Caution: When removing a section of hose, pressure must be relieved before undoing a fitting. This can be done by putting the pump in reverse and running it slowly until the discharge hose at the pump becomes soft*. Failure to do this will result in the hose being under pressure when the fitting is undone, and material being blown out when disconnected striking the face & eyes with the danger of injury by striking.

**When pumping in reverse, be sure that materials are coming back into the hopper as evidenced by the materials level in the hopper rising. Watch the discharge hose to avoid collapsing it and causing the pump to run dry.*

5. Never run the materials pump dry because just a few minutes of running dry will ruin the pump stator. Always have water or slurry in hopper when running pump.
6. If plug-up occurs, or a section of hose is to be removed, the hose pressure must be relieved before uncoupling a fitting. This is done by running the materials pump in reverse slowly, until the pressure gauge on the pressure assembly reads "0" PSI. Failure to do so will result in material under pressure "blowing out" when uncoupled, resulting in possible bruises, lacerations, and most dreadfully, the potential of material blowing out into the eye causing injury or even loss of sight.
7. It is possible for excessive hydraulic pressure to develop if hydraulic line is blocked. Extreme care should be exercised while working on this hydraulic system – damage to equipment and/or injury may result from misuse or careless operation of these components. Never loosely block off a hydraulic line. If a pipe plug or cap is used when testing hydraulic components, be sure it is tight – it can become a deadly projectile.

8. Each hydraulic system is provided with a pre-set relief valve. This valve is pre-set at pressure lower than the maximum the various hydraulic components are rated. ONLY Strong Manufacturing personnel or persons with experience in hydraulics should adjust the relief valve. If the relief valve is adjusted to pressures exceeding the rating of the components used, the components can rupture or explode in a high-pressure situation. A motor, or hose exposed to greater pressures than it is rated for, can become a deadly projectile, resulting in broken bones, lacerations and even death.
9. Properly operating hydraulic pressure gauges should be on the machine at all times. These gauges provide an instantaneous read-out of hydraulic pressures required to power the system. Relief valves can malfunction. If hydraulic pressures ever exceed factory settings – the machine should be stopped immediately. Get relief valves replaced or properly adjusted only by Strong Manufacturing personnel or by people experienced in hydraulics. Without proper operating pressure gauges, malfunctioning relief valves cannot be determined; therefore, exposing personnel to potential injury caused by a component rupturing or exploding.
10. Be sure all machinery guards are in place. The guards provided with this machine consist of the following:
 - Mixer inlet guard
 - Mixer drive motor guard
 - Mixer splash guard
 - Wet materials hopper guard
 - Engine side panels

As a general rule, the machine should be kept as clean as possible. Material should not be allowed to build up on warning signs, instructions, gauges, etc. It is also possible that material buildup could interfere with control operation thus presenting hazards of a general nature.

Caution: Do not stand under or near the skip bucket at any time. Possible injuries such as cuts, bruises, broken limbs, or death could occur, if struck by the skip bucket while it is being raised and lowered.

WARNING

**Failure to follow these instructions may result in wheel loss which can cause injury or death!
Torque wheel nuts to 90-120 lb-ft before first road use. Retorque to 90-120 lb-ft after 10, 25, and 50
miles. Check periodically thereafter.**

SAFETY

Cleaning, Repairing, Servicing and Adjusting Prime Movers, Machinery & 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, service 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 (e.g. extended swabs, brushes, scrapers) 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 thorough training.

Engine

The power unit is a industrial diesel engine. These water-cooled engines are designed for industrial application and are the best engines for the job. The engine is also the most costly, single piece of equipment on the machine. When referring to the manual for service recommendation, use those given for the most severe conditions.

The engine speed is pre-set for optimal performance. Never slow the engine RPM down when pumping under full load, as this will cause the engine to “lug”, setting up high cylinder head temperature and causing engine damage.

The engine is equipped with a full range variable speed governor. This means that at a given throttle setting, the engine will maintain a given PRM unless overloaded. When the engine RPM falls off, it is caused either by load being greater than the engine can carry or the engine is not developing its required horsepower. When this occurs, check to see that the pumping pressure is not too great as caused by a restriction in the lines or a mix too dry. The other possibility is the engine not getting fuel properly, or the air intake could be restricted.

The engine has been serviced with a break-in oil which should be changed after 40 hours of service and replaced with a good grade of engine oil. (e.g. Rotella). (See engine owner’s manual for recommendations for your engine and operating conditions).

Strong-Mate Mixer

(Dwg. #86000190 & #86000663)

The Strong-Mate Mixer is a completely new idea in mixers...designed for mixing most varieties of cementitious materials. The Mixer is designed to give a MAXIMUM amount of agitation, complete disbursement of the cement sand, and admixtures in as short mixing cycle as is possible.

To accomplish this, we use two inter-connected fixed drums with 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 no “beat” the mix as is the case with the conventional types paddle mixers. The amount of mixing time to bring the mixture into a completely homogeneous mix under normal conditions is 15 to 20 seconds.

When it is necessary to stop the machine or to delay dumping a mix, the Mixer should be stopped from rotating. Mixer should be thoroughly cleaned after each day’s use to prevent a buildup of cement on blades and walls of Mixers.

The Mixer has a set of packing chambers with 5 rings of packing, at either end of 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. 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 housing inside of Mixer after the washing up operation. This insures that any materials that have worked past the seals is discharged out and cannot harden inside and prevent the sealing action.

Grease the fittings on the sides of the bearing housing every six months. These fittings are provided for greasing the race of the bearings and are pre-packed 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 in any way without stopping the engine and removing the ignition switch key. Always put mixer hydraulic control valve in neutral prior to stopping engine and checking to see if it is in neutral prior to starting engine. When cleaning mixer at end of day’s operation, it is necessary to wash out loose materials removed during clean-up. REPLACE the mixer guard before starting engine. Failure to do so could result in severe bodily injury.

Strong-Master Pump

Dwg. #04610242

The Strong-Master pump consists of three principle parts, i.e., 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 grout machine consists of a 2R10-0 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-up” in the hose occurs. When pressure of this amount occurs, stop the pump, put in reverse and relieve pressure. Find the “plug” in hose. Remove and clean the plugged section of hose. As the pump is operated, the rotor and stator will wear, causing the pressure to drop and discharge to fall off. Should either rotor or stator have excess wear it will shorten the life of the other part considerably. Worn parts cause “slippage” within the pumping elements which accelerates the wear. Generally, the stator wears first. With some grades of sand, the life of the stator could be as little as 300 yards, or about 600 batches. To prolong the stator life, change ends after about 250 yards, or 500 batches. Generally, two stators can be used with each rotor. Check rotor for wear with stator removed to see that it has uniform wear. If wear is excessive, the chrome will be worn off the lobes of rotor, usually at discharge end. When this occurs, replace rotor. Worn rotors 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 hose will decrease and become intermittent. When flow breaks, a small puff of vapor comes out. 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 break the joint with a pipe wrench. The stator can then be screwed out of threads by rotating the rotor slowly. After the stator is out of the threads, replace the pipe wrench and hold the stator from turning; and again, turn the rotor. The stator will “worm-off” the rotor. To replace the stator, reverse this procedure and use the machine power to turn the rotor.

Caution: When using a pipe wrench to hold the stator be sure the pump is turning at the lowest speed possible. Stay clear of the pipe wrench.

The suction housing has the material hopper bolted to it. A connecting rod connects the rotor to the drive shaft at the hub inside the suction housing. The connecting rod has a section of auger flighting bolted to it to keep materials agitated during operation. These parts operating in a sand-gypsum, or cement slurry, are subject to severe wear. The connecting rod should be inspected for excess wear at the pinholes every

400 hours of operation or more often after wear begins. It is easily done when the rotor is removed, at one end it's usually greatest so that it is not necessary to remove other end unless pinholes show wear. Inspect and replace worn pins and boot seals whenever rotor and/or connecting rod is inspected. Also, inspect the holes in both the rotor and drive shaft hub for wear. There are two sets of holes in each, so that an alternate pair of holes can be used when wear is excessive on one set of holes. When both sets of holes are worn, the drive shaft hub should be replaced.

Connected to the suction housing is the drive assembly that houses the packing chamber and chrome sleeve, drift shaft and bearings. The bearings should be greased every 40 hours of operation only. The packing chamber should be greased twice daily and always at the completion of the day.

Dismantling and Installing Pump Drive

Remove hydraulic motor from drive assembly adaptor or gear box from shaft depending on hydrostatic or mechanical drive. Remove square head from drive collar. Loosen boot clamps, and slip off end boot. Roll boot drive from collar. Remove four ½-inch bolts holding bearing housing to suction hopper. Remove bottom half of frame cradle. Loosen set screws and fastening bolts on top half of frame cradle. Entire unit will now lift clear of the suction hopper. There is approximately 1/16th-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 the housing. To install new unit, reverse the above procedures, following the steps below. It is important to set frame cradle to bearing housing last in order, not to place strain on it. Pack drive collar and 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. Pull the four housing bolts up alternately, so that housing faces contact all around. After drive unit is secured in place, tighten frame cradle set screws until cradle is firm against bearing housing. Tighten lock nuts and mounting bolts. Complete balance of assembly in reverse order of dismantling.

Loading System

Dwg. #86000234

A hydraulically powered bucket is used to transfer the cement and the aggregate from the ground, and dumped into the mixer.

The bucket is secured in the travel position by a pin through the bucket arm.

Caution: Failure to install SAFETY PIN prior to travel could result in the bucket falling causing extensive damage to the machine and possible personnel injury.

The bucket is hydraulically operated. A directional control valve is used to divert oil flow to a cylinder. The operator engages the control valve handle to determine direction of bucket travel. NOTE: See hydraulic section for more detail.

The bucket is raised to the upper limit of travel and the valve released. The dump valve is then engaged, and the bucket dumps the material into the mixer. The procedure is then reversed for lowering the bucket to ground level.

Always raise the arms to their upright position before tilting the bucket. When lowering the buckets return the bucket to the upright position before beginning the decent of the arms.

Hydraulic System

The hydraulic system consists of the following components:

Refer to drawing #01354402.

WARNING:

The hydraulic pump is driven from the crankshaft of engine and is operating at all times the engine is running. Whenever the machine is not in use, or when working on any part, stop the engine and remove the ignition key to eliminate any danger of mixer being started, or skip bucket being lifted. Prior to starting engine, check to see that all control valves are in a neutral or off position. Failure to do so could cause someone working on, or around machine, to be trapped by a moving part and injured seriously.

Located on the operator's platform/panel, are the control valves. The operator should become familiar with these valves prior to starting the operation so he can start and stop without hesitation.

The skip bucket is actuated by two control valves on the operator's panel. One valve raises and lowers the bucket, and one controls the tilt of the bucket to dump material into the mixer. These two valves control the flow of oil into and out of hydraulic cylinders.

Optionally, on the rear of the machine on the operator's side is a control valve to direct the flow of oil to a hydraulic motor which can start, stop and reverse the hose reels. To unreel the hose the valve is lifted "up", to reel hoses in, the valve is depressed "down".

Also in the system are pressure relief valves. These control the hydraulic pressure that can be exerted to the various components and thus the force. These have been reset at the factory and should not be adjusted without consulting Strong Mfg. Co., or a qualified hydraulic mechanic. Further discussion of the hydraulic system and components to follow.

Hydraulic System

(Maintenance)

The hydraulic system must be kept free of dirt. Inside the tank is a strainer mounted on the pump suction line. If it becomes clogged, the pump will malfunction due to starvation. Also, damage to the pump will occur if starvation continues. Any increase in the noise of the system, while no load applied, may indicate this condition. This strainer should be checked after the first 100 hours and thereafter every six-(6) months or anytime a hydraulic component is replaced. To service the strainer, unbolt and gently lift the cover plate from the tank. This cover is directly over the strainer in the bottom of the tank. The strainer is connected to the suction line with pipe threads, turn it counterclockwise several turns and it will come out. Rinse the strainer in a nonflammable cleaning fluid using a paint brush to loosen sludge on the screen. If the screen shows any breaks, replace.

Suction line threaded connections must be maintained airtight. Use semi-head Permatex, or other oil proof compounds. Keep compounds out of line.

Approximately 30-60 gallons of hydraulic oil should be maintained in the reservoir. The recommended oil is Mobil DTE 10 Excel 68. (Tank size determined by final drive configuration.) The tank is equipped with an oil level indicator. Never allow the oil level to be less than the "low" mark of the sight gauge mounted at the end or side of the hydraulic tank.

Overheating of oil will occur if storage level drops too low. Condition and color of oil should be checked. Change oil when it becomes considerably darker than new oil. Also, check oil temperature occasionally. It should not be more than 150 degrees Fahrenheit during last half of workday. A thermometer is part of the hydraulic sight gauge. One hundred thirty (130) degrees is uncomfortable to touch. Use caution when touching hot surfaces.

All hoses should be checked periodically for signs of failure. It is very important to keep close check on the pump suction hose. Check for soft spots or breaks. The oil used in the system is Mobile DTE Excel 10.

The hydraulic system is composed of either one or three independent circuits. (A circuit diagram is enclosed). One circuit provides oil for the mixer motor drive and bucket lift drive. Another circuit provides oil for the bucket tilt, door, blender, and material hose reel drive. The third circuit powers the material pump (on hydrostatic units). The flow of oil is controlled by a series of hydraulic valves.

When trouble in the hydraulic system exists, it is usually accompanied by excessive heat. The major sources of trouble are worn parts in the pump and/or motor causing excessive slippage and heat, oil too thin and breaking down causing excessive slippage, and worn valves parts or broken "O" Rings causing a by-pass. To find where trouble exists in a system, see the Trouble Shooting section that follows.

Trouble Shooting

(Hydraulics)

Problem: Excessive Heat

Problem	How to Determine	Solution
Worn parts in hydraulic pump and/or hydraulic motors.	Measure oil temperature should not exceed 150F. If thermometer is not available place hand on storage tank – 130F is uncomfortable.	Determine pressure by following procedure.
Oil too thin and breaking down, causing excessive slippage.	Heat builds quicker than normal. Color of oil is darker. Less work is able to be done.	Drain old oil. Check strainers and filters (replace if needed). Add new oil.
Worn valve & parts or broken “O” rings causing a by-pass.	Loss of speed in components (shows loss of flow). Excessive heat building.	Replace worn parts or broken “O” rings.
Oil level too low.	Check sight gauge.	Add oil.
Operating pressure too high.	Check pressure gauge.	Eliminate some of load.

Trouble Shooting Procedure

- Break and plug a line at the control valve between the hydraulic pump and control valve, but downstream from pressure relief valve.
- Insert 0-3000 PSI pressure gauge in line.
- Start engine and run at idle speed and clutch disengaged.
- If pressure does not put up 2000 PSI of pressure, pump is worn, or relief valve is set too low.
- To check relief valve, remove acorn nut and screw in on the slot headed screw. Do so until pressure gauge reads 2000 PSI.
- If at this time pressure does not rise to 2000 PSI, hydraulic pump is worn and should be replaced.
- If pump produces sufficient pressure, insert pressure gauge between control valve and motor.
- Disconnect hydraulic line nearest valve foot pedal and insert pressure gauge. Plug line at motor.
- Push control valve forward and read hydraulic pressure.
- If pressure does not come up to 2000 PSI, control valve should be replaced.
- If relief valve and pump have checked out, the problem is the motor and should be replaced.

Grout Machine Trailer

The trailer is equipped with 7000-pound capacity axles with brakes on both axles, electric brakes are standard. The standard hitch is a Lunette eye Pintle with option for 2-5/16" diameter ball. Tires are 225/70 R19.5 L.R.G. radials. Trailer weight with equipment is approximately 10,500 pounds.

The trailer is equipped with a breakaway safety switch with electric brakes. The safety switch has a small cable to connect to tow truck that will pull a plug in electrical switch located at front end of trailer. Before moving trailer onto road or highway, the system should be checked to see if operating properly. To do this, pull the safety cable that attached to towing truck. This should cause the wheels on the trailer to lock and prevent wheels from turning when towing truck pulls on trailer. If brakes fail to lock, check system for cause.

When trouble exists in the electrical brake system it is generally caused by bad electrical connections. Check the electrical plug on the rear of the towing vehicle with a test light or preferably with a voltmeter. When moving the hand lever on the actuator in the cab of the tow truck a current should be produced. The current should increase when moving the hand lever. If no current is indicated, trouble is in tow vehicle. If a current is at the connection from the truck to the trailer and no brakes, check prongs on the electrical connector and spread open with the blade of a pocket knife to cause firm contact in plug.

Check to see if the ground wires as well as other wires are in contact. If all wiring checks out all right, remove the wheel and drum and see if the wiring inside of tire wheel is intact. Check the magnetic actuator for excessive wear. By using a steel object, check the magnet when applying the hand lever in the tow vehicle to see that a strong magnet exists. If not, replace magnet actuator. Adjust brake shoes every 10,000 miles or six months as described above.

The wheel bearings should be inspected and repacked with a good grade of wheel bearing grease every six months. Inspect all wiring and lights and replace when showing wear or damage.

Caution: After hooking the trailer to the towing vehicle and before driving away, check closely the following:

1. Trailer hitch to see that latch is closed and the safety pin is in position. Check to see that the trailer will not come off ball by lifting trailer with trailer jack. Balls and hitches wear and should be replaced when slack shows.
2. Electrical connectors: "pig-tail" is connected to tow vehicle.
3. All lights are working properly.
4. Brakes are working properly. Move trailer slowly and depress tow vehicle foot pedal to see that trailer brakes lock.
5. Inspect tires for wear. Check tire pressure. Inflate tire to 110 PSI Cold. Under inflated tires run hot and may blowout.

Trouble Shooting

Brakes

Problem: Electric brakes on trailer do not work.

Probable Cause	How to Determine	Solution
Bad electrical connections.	Check voltage at electrical plug on rear of truck with test light or volt meter while moving brake actuator lever on truck, also determine if current is present.	Find and repair bad connections insuring connections are tight.

Problem: Prongs are not making contact.

Solution: Spread prongs with small screwdriver to clean.

Problem: Wires are not making contact.

Solution: Tighten screws that contact wire.

Probable Cause	How to Determine	Solution
Loose wires.	Remove wheel & drum to check to see if wires are in contact.	Replace wires.
Brake magnetic actuator is not working.	Energize brakes and check with metal object to see if it is magnetized.	Replace bad magnetic actuator.
Current is not present at electrical connection at rear of truck.	Use volt meter or test light.	Check out electrical circuit on towing vehicle.

Operation Procedure

1. Setting Up

The following standard checks should be made prior to starting your machine:

- Check your fuel supply, the fuel tank holds 30 gallons, a full tank should last all day.
- Check engine oil level. If oil is needed, add a good grade of H.D. oil. See engine manual for grade based on operating conditions.
- Check water level in engine radiator. Add as necessary. If in cold climates, a periodic check should be made on anti-freeze effectiveness.
- There are four alemites on the mixer, two on each end. These should be greased as described in “The Strong-Mate Mixer” section, and at the end of each day’s operation.
- Check inside the mixer and hopper for foreign items.
- Lower leg stand on the machine. Set-up machine with the rear of the machine slightly lower than the front. The legs should be set on 2” x 6” lumber to prevent the legs from sinking into the ground. The machine weight should be distributed evenly on all four legs.
- Stretch out water hose and attach to water supply. Before starting engine, make sure that transmission is in neutral. In order to start the engine, use the following procedure:
 - Ensure all valves are in the off position.
 - Turn ignition key to ON position...indicated by generator light coming on.
 - After display comes on and if no codes are present start the machine.
 - Allow engine to warm at idle speed – 900-1200 RPM.

Optional:

The hose reel is hydraulically powered. In order to remove the hose from the reel, the directional control valve lever must be in the “UP” position. This valve is located at the rear of the trailer, facing the rear of the machine, the valve is located behind the right fender.

Remove only enough hose as needed for the day’s operation. The best place to protect hose not being used is to leave it on the reel.

Prior to attaching the hose to the pump, the bell reducer must be in place on the pump. The bell reducer serves two functions. It provides a transition of flow from the materials pump to the size of hose being used.

The most important function of the bell reducer is that it contains the pressure gauge that gives a direct reading of the amount of pressure required to move materials through the hose.

The amount of pumping pressure required to move materials through a hose is a function of several things.

- The type of slurry being pumped.
- Water content.
- The use of admixtures.
- Length of hoses being used.
- Height material is being pumped.

The pressure gauge is a quick indicator of a plug-up. If pressure rises fast, a plug has occurred. If a plug occurs, the pump should be run in reverse until the pressure gauge read “0” PSI.

Caution: DO NOT disconnect material hose with hoses under pressure. Always run pump in reverse until pressure gauge read “0” PSI, or hoses become soft. Failure to do so could result in blockage or material blowing out under pressure and striking someone causing bruises, cuts, breaking of limb or possible loss of sight if material enters eye.

Attach water hose to water inlet at rear of machine. Attach wash down hose to valve near water tank. The float switch must now be raised and set at the approximate water level by tightening the set screw on the set collar. When the water level raises the float inside the tank, a switch inside the float will disengage the water inlet valve.

After the tank has been filled for the first time that day, the water should be drained into the mixer. Start the mixer.

2. **Mixing and Pumping**

With mixer door open and mixer running, allow this batch of water to discharge into holding hopper over pump. Start pump and pump the water through discharge hoses, observing pressure gauge to see that hoses are clear of obstructions. Any show of pressure indicates something in hoses causing a plug. If plug exists, reverse pump to relieve pressure and remove plugged hose and clean. This can generally be done by inserting a garden hose in the plugged hose and washing out foreign materials. With hoses cleaned, mixing of materials can now begin.

Use the following procedure for mixing and pumping.

- Once required water is in tank, open water tank discharge valve. Be sure that mixer door is closed before opening tank discharge valve.
- Engage mixer control valve. This starts mixer paddles turning.
- Check to make sure mixer discharge door is closed.
- Close discharge valve when the proper amount of water has been added to mixer.
- Lower bucket to ground.

(Note: Be sure that safety pins have been removed prior to operating bucket.)

- Load a predetermined amount of sand into bucket and follow with bags of gypsum.
- With mixer running and predetermined amount of water in mixer, raise the bucket to full extent of lift. Then tilt bucket slowly allowing materials to discharge into mixer over a period of 10 to 15 seconds, (AVOID OVERLOADING MIXER). Return bucket to ground position for reloading. After mix has mixed thoroughly, open mixer door and dump into hopper. Close mixer door. Engage pump and start pumping.

Caution: There is more danger of a plug-up when first starting the material through hose. Keep a close watch on pressure gauge and stop pump immediately if pressure suddenly rises. Remove pressure and locate plug and clean as described before. After materials have discharged from hoses, continue mixing and pumping. Never run the pump “dry” or this will cause severe wear on rotor & stator. After 3 or 4 hours of operation, grease the mixer bearing fittings and the packing chamber on the pump drive assembly. Also, grease at end of each day’s operation, regardless of the length of time used.

Caution: Pump most all of materials from holding hopper each batch, Prior to dumping a new batch, as gypsum will start setting in a few minutes and can cause a “plug-up”. Build up inside the material hopper around the drive components will cause severe wear and restrict the rotation of the pump.

3. Clean Up

During design, emphasis was placed on making the machine simple to clean at the end of the day.

The following is recommended procedure for clean-up practiced by Strong Manufacturing which has proven to be a time saver.

- Throughout the day wash material spillage away.
- While the last batch is in the hopper, being pumped, take the wash down hose and wash inside of mixer, thoroughly.
- When all material is out of hopper, discharge dirty water from mixer into hopper.

- Let pump continue to run, allowing material in the hose to be pumped until water is at end of hose. During this time, mixer man should again be cleaning mixer inside and out. Take special care to clean area around mixer door.

CAUTION: Do not remove mixer cover with engine running.

- Dump water into the hopper and let water drain onto ground.
- Wash hopper thoroughly.
- Dump clean water through mixer into hopper.
- Remove material hose and insert rag or sponge into pressure gauge.
- Recouple hose.
- Engage pump and allow pump to run until rag or sponge has pumped through hose to remove sand.
- Run rag or sponge through hose as many times as necessary & until all sand has been discharged.
- Spray machine down with clean water.
- Remove drain plugs from bucket and wash clean. If machine is not to be used for some time and the unit is stored outside, remove all drain plugs and leave the mixer door open.
- Uncouple material hose from pump and store on hose reel.
- Putting hose back on reel allows excess water to be drained from hose and also allows hose to be washed.
- Put all control valves into neutral position.
- Push throttle control Down.
- Return engine to idle and run for a few minutes before shutting down the machine.

Caution: **DO NOT** perform any cleanup or maintenance that may expose any part of the body to moving or rotating parts with the engine running. Doing so exposes one to severe safety hazards that could result in cuts, bruises, loss of limb or even death.

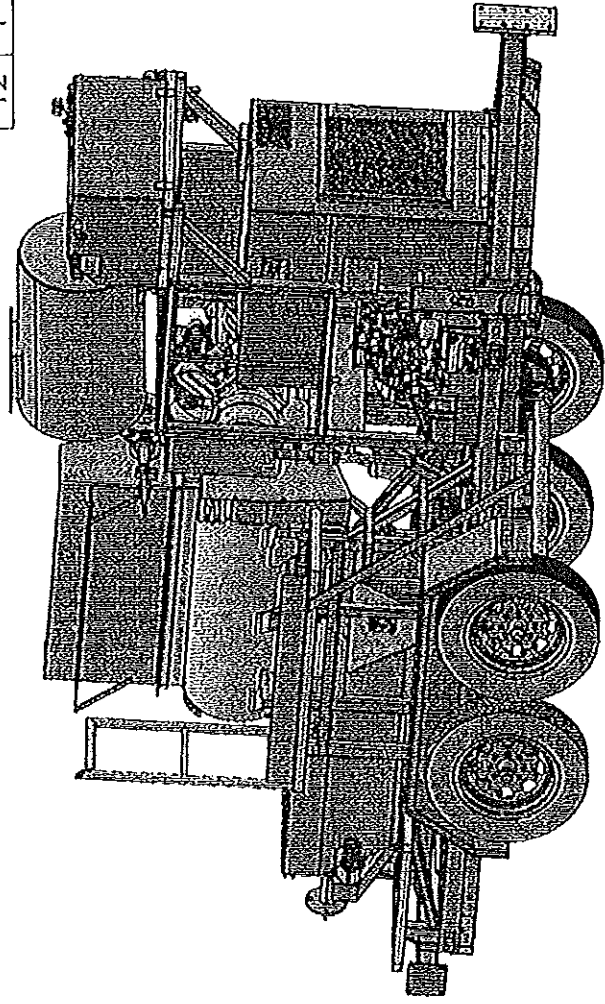
Use of a debonding agent such as steel guard sprayed onto the machine at the end of day's operation, prior to starting up, will make the machine much easier to keep clean.

Manual Drawing List

Placer

Drawing Name	Number
JD T4 Final Assy-Part	
Placer Skip Bucket Volume	11144302 volume sheet
60 Gallon Round Hydraulic Tank Assembly	88003936
60 Gallon Water Tank Plumbing	02060302
Hydraulic System Placer Hydrostat	01354402
#10 Open Throat Pump Assembly	04610242
#10 Open Throat Drive Assembly Hydrostat	04610262
420 Mixer Parts with #60 Chain	86000190
Mixer -- 420 Direct Drive	86000663
Hydraulic Powered Skip Loader System	86000234
Trailer Wiring Assembly	15008272
Hydraulic Cooler Fan Circuit	Hydraulic oil cooler circuit
Power Train Placer (John Deere Tier4)	88003908
Manual Water Hose Reel	86000665
Material Hose Reel (Hydraulic)	86000664
Safety Chain Attachment	86000014

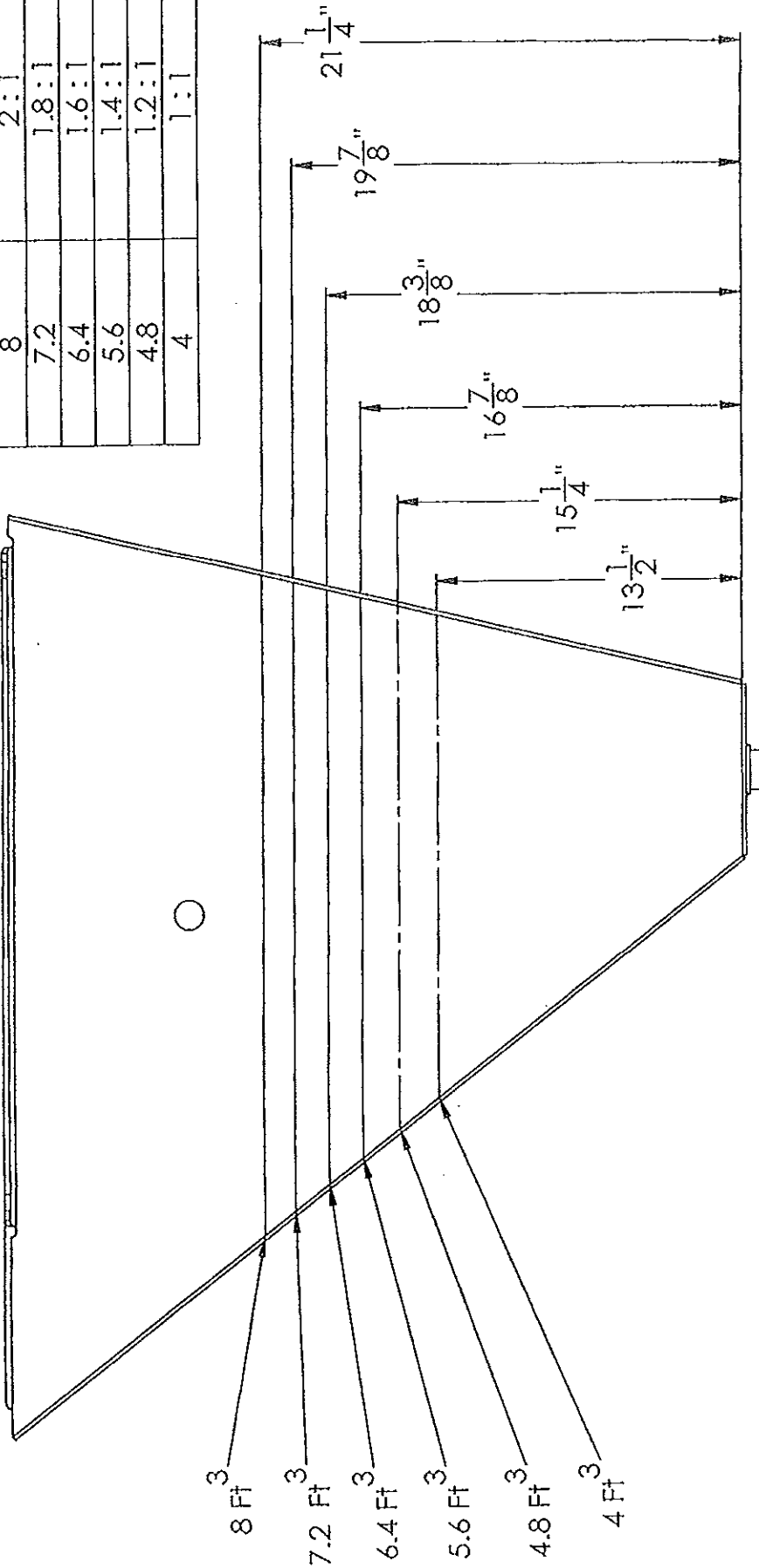
Item Qty	Description	Ref. No.
1	Trailer Assembly	05140321
2	Power Train	88003908
3	Hydraulic System	01354402
4	420 Mixer w/ chain	86000190
6	#10 Pump Assembly	04610242
7	(Optional) Hose Reel Material	21002001
8	(Optional) Hose Reel Water	21001001
9	Skip System	86000234
10	Wet Material Hopper	09141002
11	(Optional) Tivar Kit-Bucket	88001692
12	(Optional) Tivar Kit-Hopper	88001691



<p>P O BOX 3065 PRIME BLDG, AR 71633 P: 870-535-4753/7050-535-5042 F: 870-535-4820 Web: strongmanufacturing.com</p>		<p>Strong MANUFACTURING</p>	
<p>UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± BEND ± ANGULAR: MACH ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±</p>		<p>NAME</p>	<p>DATE</p>
<p>INTERPRET GEOMETRIC TOLERANCING PER: FINISH</p>		<p>ENG APPR.</p>	<p>MFG APPR.</p>
<p>DO NOT SCALE DRAWING</p>		<p>Q.A.</p>	<p>MATERIAL:</p>
<p>LTR. ECN. DESCRIPTION</p>		<p>MATERIAL #</p>	<p>COMMENTS:</p>
<p>Revisions</p>		<p>SCALE: A</p>	<p>WEIGHT:</p>
<p>BY DATE</p>		<p>SIZE DWG. NO.</p>	<p>REV</p>
<p>5</p>		<p>TITLE: JD T4 Final Assy-PART</p>	<p>SHEET 1 OF 1</p>

PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS
 DRAWING IS THE SOLE PROPERTY OF
 Strong Manufacturing Inc. ANY
 REPRODUCTION IN PART OR AS A WHOLE
 WITHOUT THE WRITTEN PERMISSION OF
 Strong Manufacturing Inc. IS
 PROHIBITED.

Volume (ft ³)	Ratio(sand to bag)
8	2:1
7.2	1.8:1
6.4	1.6:1
5.6	1.4:1
4.8	1.2:1
4	1:1



Strong
MANUFACTURING

P O BOX 2068
PINE BLUFF, AR 71611
P: 870-535-4753/800-238-5042
F: 870-535-4023
Web: strongmanufacturing.com

TITLE: Placer Skip Bucket Volume

SIZE: A DWG. NO.: 11144302 volume sheet REV: REV

SCALE: 1:7 WEIGHT: SHEET 1 OF 1

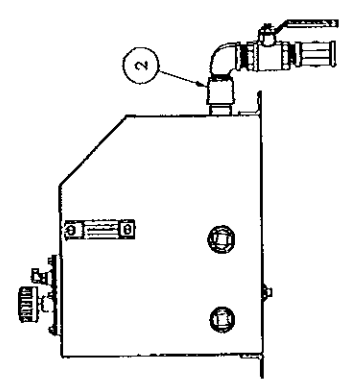
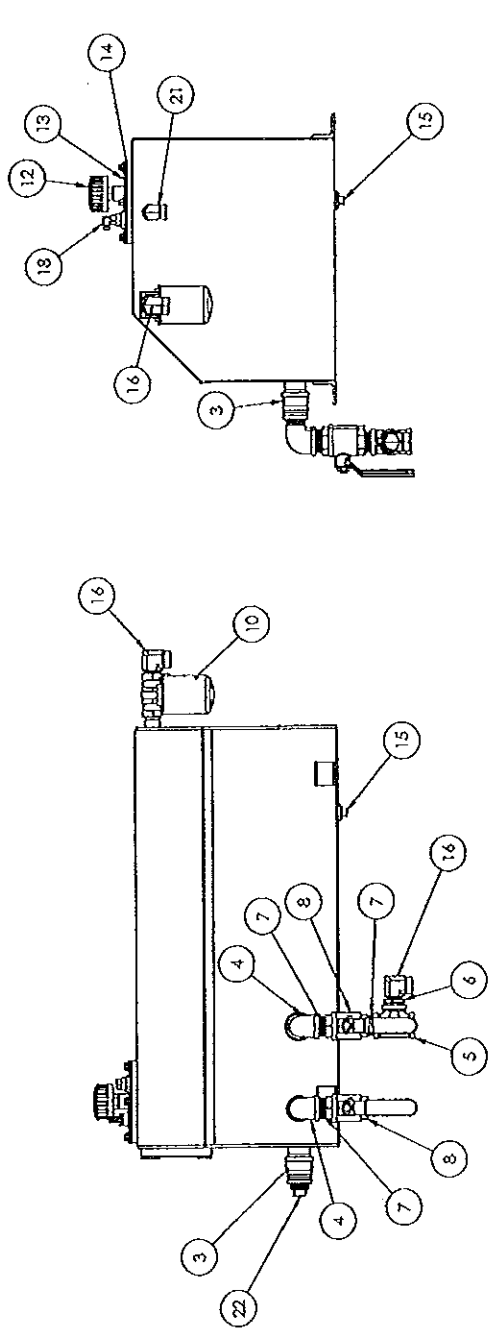
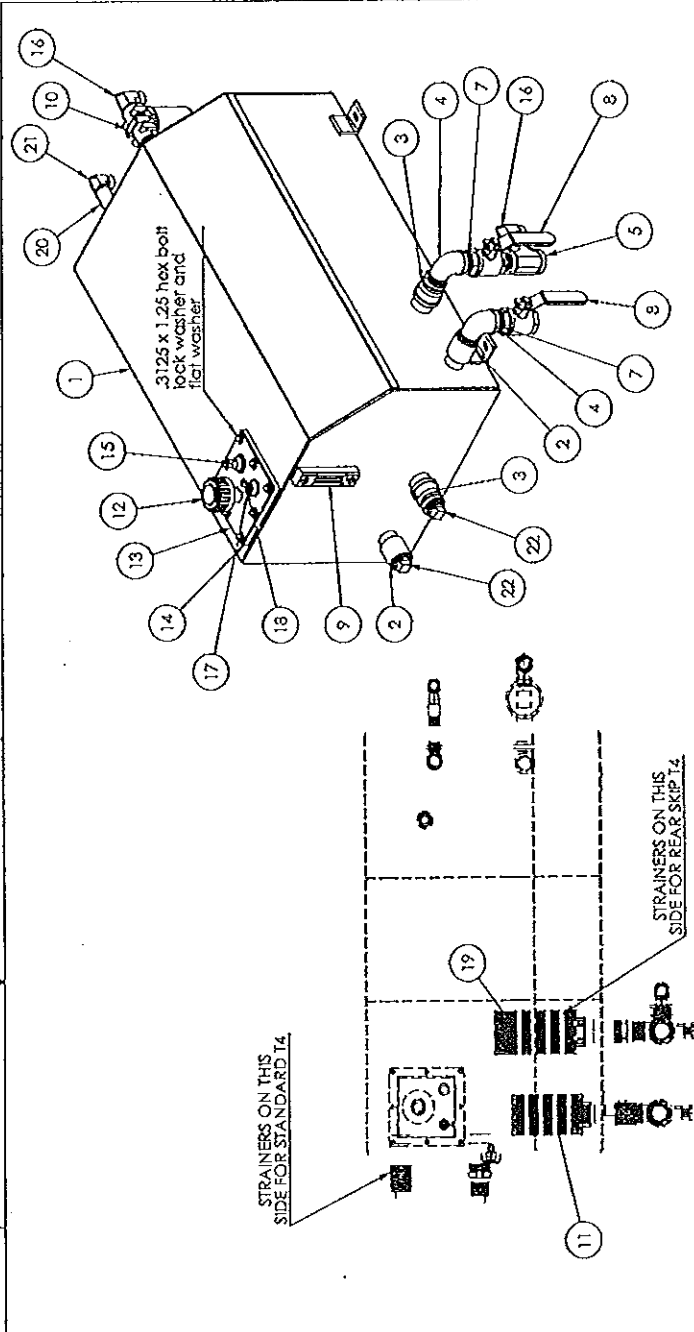
UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES	DG	
TOLERANCES:		
FRACTIONAL: ±		
ANGULAR: MACH: ± BEND: ±		
TWO PLACE DECIMAL: ±		
THREE PLACE DECIMAL: ±		
INTERPRET GEOMETRIC TOLERANCING PER:		
FINISH:		
MATERIAL #		
COMMENTS:		
DO NOT SCALE DRAWING		

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF Strong Manufacturing Inc. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF Strong Manufacturing Inc. IS PROHIBITED.

LTR.	ECN.	DESCRIPTION	BY	DATE
		Revisions		

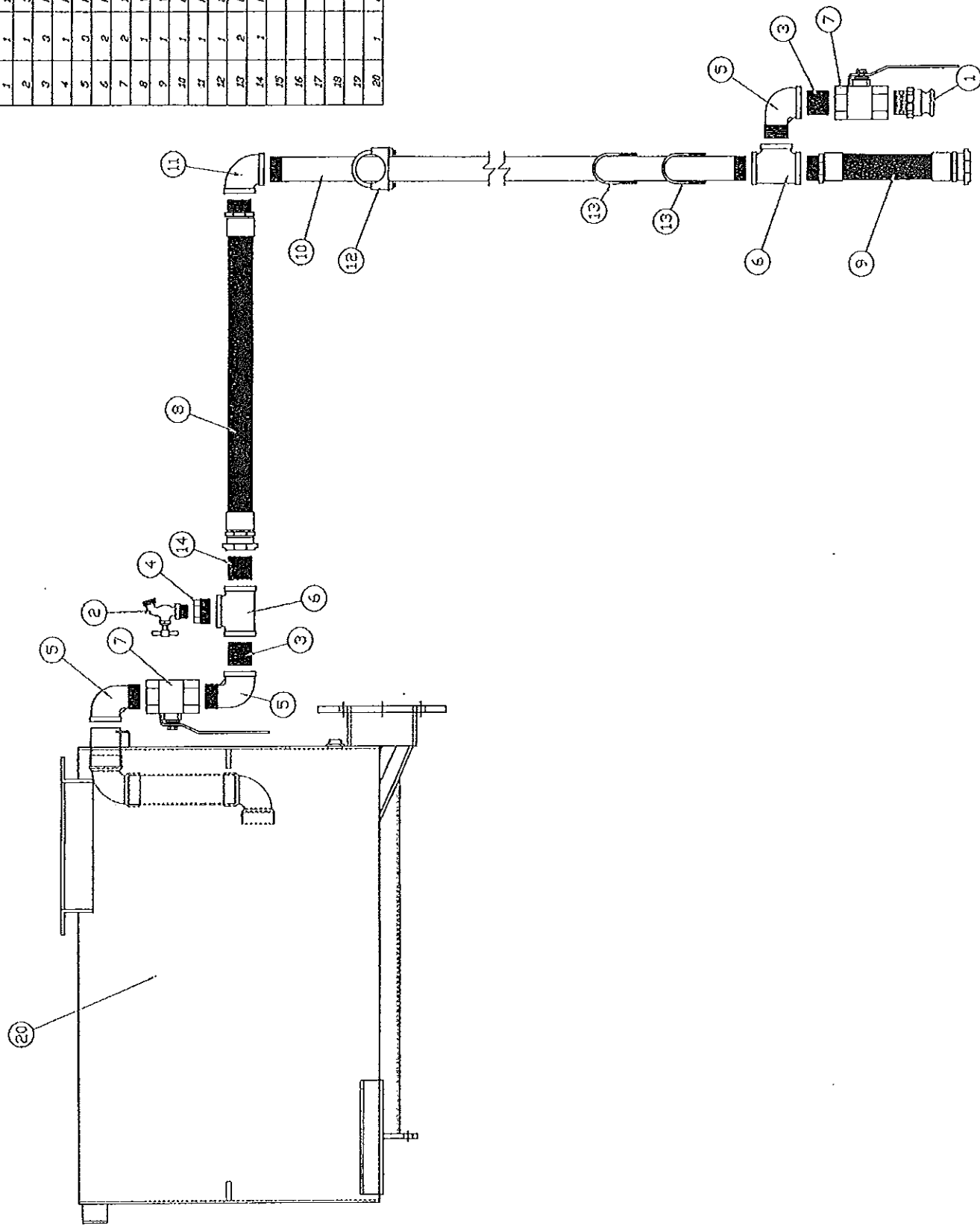
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	88003935	60 Gallon Hydraulic Tank	1
2	1601460	PF COUPLING LP 1.25	2
3	1600745	PF BELL LP 1.5 X 1.25	2
4	1603311	PF ST BELL LP 1.25 90	2
5	1609450	PF Tee LP 1.25in	1
6	1601080	PF BUSH LP 1.25 X 1	1
7	1600637	PF ALL-THREAD LP 1.25	3
8	2200147	VALVE BALL 1.25 FF	2
9	1921140	Silts Glass	1
10	0620330	Hydraulic Filter 1"	1
11	1922821	Strainer	1
12	0620201	Filter Cap	1
13	88003483	LID-ACCESS ASSY 60GL TANK HYDR	1
14	89000751	Gasket access hyd tank	1
15	1603140	3/4" Pipe Plug	2
16	1923105	FS2501-16-16-FG	2
17	1601030	PF BUSHING RED HP .500X .250	1
18	1922080	FS2501-04-04-FG	1
19	1922820	strainer hydraulic 1.5	1
20	1601450	pf coupling sid .75	1
21	1923100	FS2501-12-12-FG	1
22	1603150	PF PLUG 1.25" Std.	2



		DATE	BY	DATE	DESCRIPTION
DESIGNED	BY	DATE	BY	DATE	REVISIONS
CHECKED	BY	DATE	BY	DATE	
ENG. APPR.	BY	DATE	BY	DATE	
MFG. APPR.	BY	DATE	BY	DATE	
QA	BY	DATE	BY	DATE	
TITLE: TANK - HYD ASSY T4 60 GAL HYDRO					
SCALE: 7/8" = 1'-0"					
DRAWING NO: C 88003936					
REV:					
SHEET 1 OF 1					

PROVIDENT AND CHEMICAL
 11000 W. 110th Street, Omaha, NE 68148
 A MEMBER OF THE ARCO CHEMICAL COMPANY
 ALL RIGHTS RESERVED

Item	Qty.	Description	Part No.
1	1	1 1/2" Quick Coupling G-500F A	6002500
2	1	3/4" Faucet	6000700
3	3	PF 1 1/2" Galv. Allthread	1600616
4	1	PF 1 1/2" x 3/4" Reducer Bushing - Galv.	6000845
5	3	PF 1 1/2" St. Ell. 90° - Galv.	1602221
6	2	PF 1 1/2" Tee - Galv.	1602360
7	2	1 1/2" Ball Valve	2200145
8	1	Water Hose Assy. 1 1/2" x 70'	8800029
9	1	Water Hose Assy. 1 1/2" x 12'	8800020
10	1	60 Gal. Round Water Plumbing Pipe	8800042
11	1	PF 1 1/2" Elbow - Galv.	1601646
12	1	2" Muffler Clamp	0200900
13	2	U-Bolt 3/4" x 2" x 3 1/4"	2100021
14	1	Friction Hyd 5404-24-24	1923010
15			
16			
17			
18			
19			
20	1	60 Gallon Round Water Tank	-Ref-

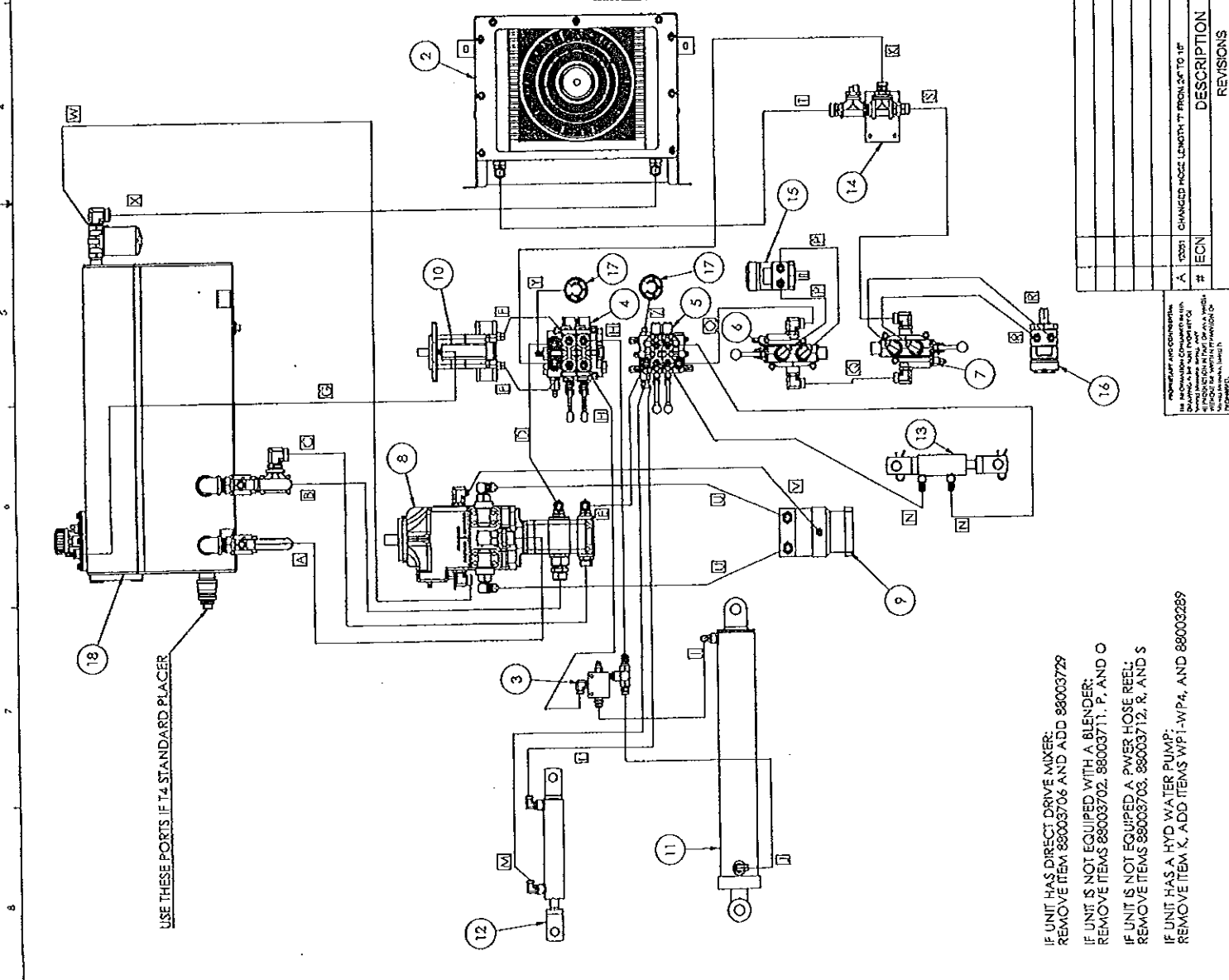


REVISIONS		DATE	BY	DESCRIPTION
1	Initial			Initial
2	Change			Change
3	Change			Change
4	Change			Change

60 GALLON WATER TANK PLUMBING
 Strong Manufacturing Company
 1500 N. 10th St., Minneapolis, Minn. 55412
 612-339-1000

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1520110	OIL HYD MOBIL DTE 10 EXCEL 68	70
2	89003450	COOLER OIL ASSY HYDROSTATIC	1
3	89003463	VALVE ASSY COUNTER-BALANCE SUPER 80	1
4	89003700	PLACER HYDRO VALVE ASSY MIXER LIFT	1
5	89003701	PLACER HYDRO VALVE ASSY TILT-DOOR	1
6	89003702	PLACER HYDRO VALVE ASSY BLENDER	1
7	89003703	PLACER HYDRO VALVE ASSY HOSE REEL	1
8	89003704	PLACER HYDRO HYD PUMP ASSY	1
9	REF (89003705)	PLACER HYDRO MATH PUMP MOTOR ASSY	1
10	89003706	MIXER MOTOR ASSY / DODGE GEAR BOX	1
11	89003707	PLACER LIFT CYLINDER ASSY	1
12	89003708	PLACER TILT CYLINDER ASSY	1
13	89003709	PLACER MIXER DOOR CYLINDER ASSY	1
14	89003710	PLACER HYDRO RETURN MANIFOLD	1
15	REF (89003711)	BLENDER MOTOR ASSY 16CU/FT	1
16	89003712	PLACER POWER HOSE REEL MOTOR ASSY	1
17	89003713	PLACER HYD GAUGE ASSY	2
18	89003986	TANK HYD ASSY T4 60 GAL HYDRO	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	LENGTH	HOSE	FITTING	REV
A	901285134	SECTION HYDROSTATIC PUMP	1	128"	128"	901285134	
B	901285135	SECTION LARGE GEAR PUMP	1	128"	128"	901285135	
C	901285136	SECTION SMALL GEAR PUMP	1	128"	128"	901285136	
D	901285137	SUPPLY MIXER/LIFT VALVE	1	128"	128"	901285137	
E	901285138	MIXER VALVE TO MIXER MOTOR	1	128"	128"	901285138	
F	901285139	MIXER MOTOR GEAR DRAIN TO TANK	1	128"	128"	901285139	
G	901285140	LIFT VALVE TO COUNTER BALANCE	1	128"	128"	901285140	
H	901285141	LIFT VALVE TO RETURN MANIFOLD	1	128"	128"	901285141	
I	901285142	LIFT VALVE TO UPPER PORT TILT CYLINDER	1	128"	128"	901285142	
J	901285143	TILT VALVE TO LOWER PORT TILT CYLINDER	1	128"	128"	901285143	
K	901285144	DOOR VALVE TO DOOR CYLINDER	1	128"	128"	901285144	
L	901285145	BLENDER VALVE TO BLENDER MOTOR	1	128"	128"	901285145	
M	901285146	BLENDER VALVE TO HOSE REEL VALVE	1	128"	128"	901285146	
N	901285147	HOSE REEL VALVE TO HOSE REEL MOTOR	1	128"	128"	901285147	
O	901285148	RETURN MANIFOLD TO OIL COOLER	1	128"	128"	901285148	
P	901285149	HYDROSTATIC PUMP TO MATH PUMP MOTOR	1	128"	128"	901285149	
Q	901285150	HYDROSTATIC PUMP TO SIDE OF TANK	1	128"	128"	901285150	
R	901285151	OIL COOLER TO FILTER ON SIDE OF TANK	1	128"	128"	901285151	
S	901285152	Gauge Line Mixer/Lift	1	128"	128"	901285152	
T	901285153	Water Pumps Valve Supply	1	128"	128"	901285153	
U	901285154	Water Pump Motor Supply	1	128"	128"	901285154	
V	901285155	Water Pump Motor Return	1	128"	128"	901285155	
W	901285156	Water Pump Return	1	128"	128"	901285156	



USE THESE PORTS IF T4 STANDARD PLACER

IF UNIT HAS DIRECT DRIVE MIXER:
REMOVE ITEM 89003706 AND ADD 89003729

IF UNIT IS NOT EQUIPPED WITH A BLENDER:
REMOVE ITEMS 89003702, 89003711, P, AND O

IF UNIT IS NOT EQUIPPED WITH A POWER HOSE REEL:
REMOVE ITEMS 89003703, 89003712, R, AND S

IF UNIT HAS A HYD WATER PUMP:
REMOVE ITEM K, ADD ITEMS WP1-WP4, AND 89003289

REVISIONS

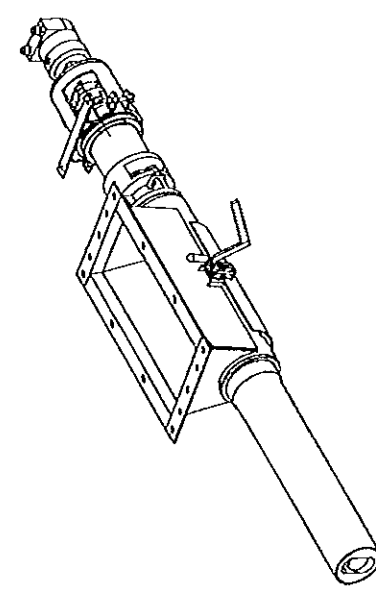
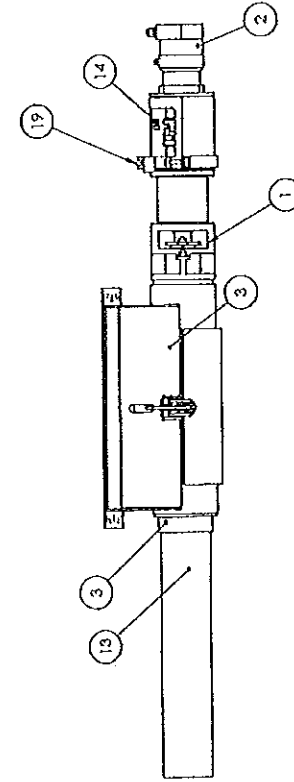
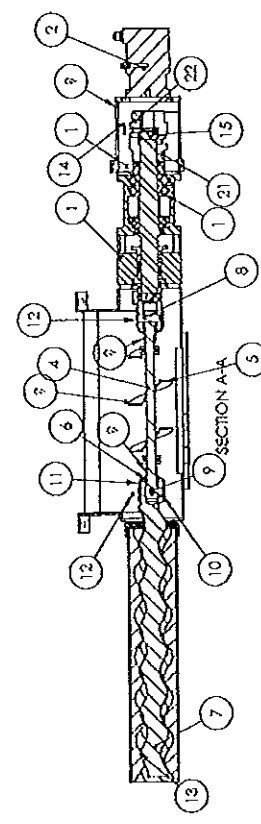
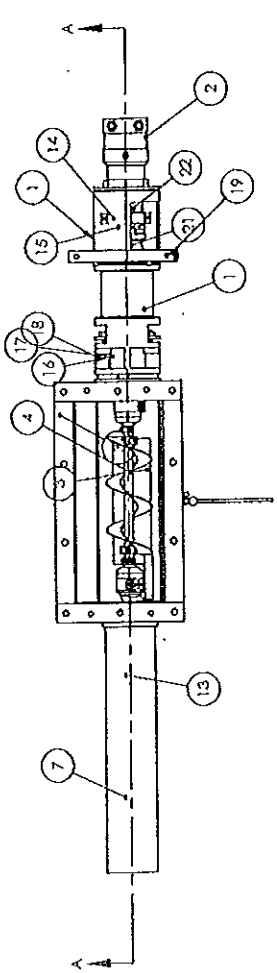
#	ECN	DESCRIPTION
1	A 13051	CHANGED HOSE LENGTH FROM 24" TO 18"

DATE: 06/14/78
BY: [Signature]

HYD SYSTEM PLACER T4
HYDROSTAT

REV NO. C 01354402
SCALE: 1:1
SHEET 1 OF 1

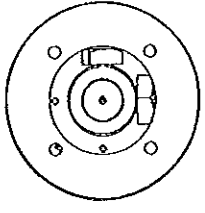
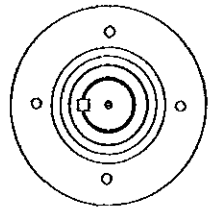
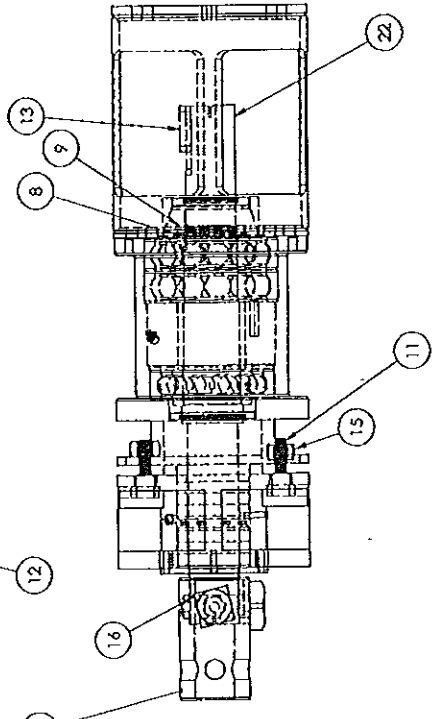
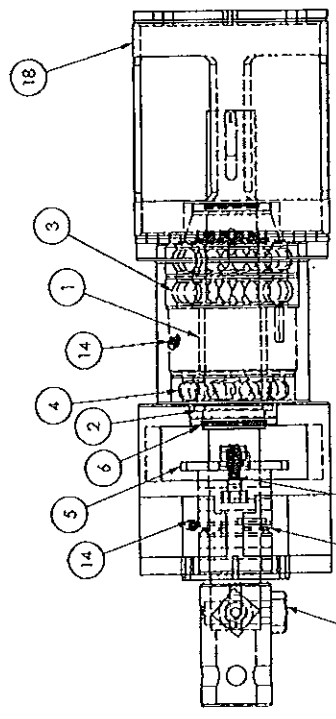
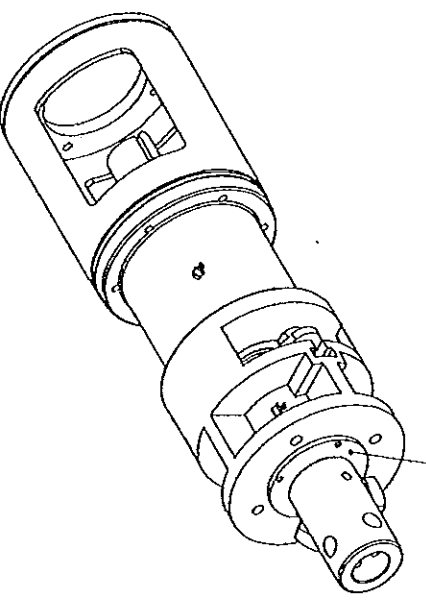
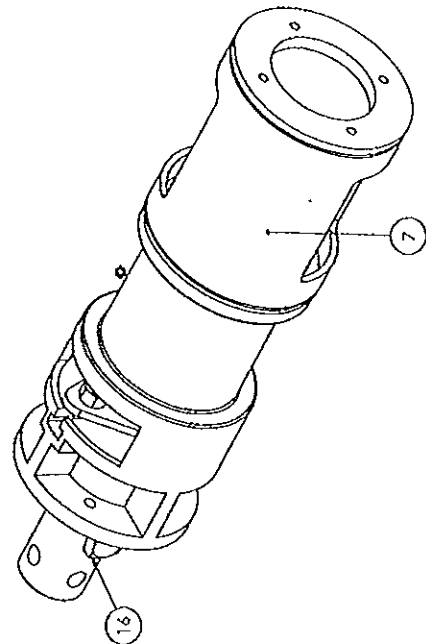
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	04610262	Drive Assy #100 O-T Hydrastat	1
2	88003705	PLACER HYDRO MATL PUMP MOTOR ASSY	1
3	0414312	TROUGH SLURRY #10 GROUT GATE BOTTOM	1
4	89001199	Connecting Rod #100	1
5	88000155	Agitator #10 RH	1
6	0710840	Grammet #10	2
7	88000254	Rotor 2R 10-0 STD w/o Chrome	1
8	1613741	Pin Conn. Rod #10 3"	1
9	1613740	Pin Conn. Rod #10 2-5/8"	1
10	89001194	#100 Pin Retainer Rotor End	1
11	0210870	Boot Sock #10 standard	2
12	0210760	Boot Clamp #10 3-7/16"	2
13	87000288	STATOR 2R10 DM	1
14	89011579	speed sensor mount	1
15	0801325	COUPLING INSERT L225 HYDREL	1
16	0100080	Adapter, Connector 3/16" 45° Flare Tube x 1/8" NPT 1"	2
17	0100100	Adapter Long Nut 3/16" Tube 45° SAE Flare 0.81" L	2
18	98000580	3/16" Diameter Copper Tubing	60
19	88000026	BRACKET-DR-ASY #10 BLT ON ASSY	1
20	03000880	Clamp Mini #16 0427611	2
21	87000297	Coupling, Loveloy, L225 - 2 3/16" x 1/2" x 1/4"	1
22	87000298	Coupling, Loveloy, L225 - 40mm x 1.5x3.3k	1



DATE	NAME	DATE
DESIGNED BY	DRAWN BY	CHECKED BY
APPROVED BY	ENG. APPR.	DATE
TITLE: PUMP #10 HYD POWERED		
SHEET NO. 04610242		
SCALE: AS SHOWN		
REV. REV.		
SHEET 1 OF 1		

PROPRIETARY AND CONFIDENTIAL
 This drawing is the property of
 and is not to be distributed
 outside the organization without
 written permission of the
 originating department.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	89002974	Bearing Spacer #10 Pump	1
2	89002975	Thrust Ring #10 Pump	1
3	0211655	BRG #10 6412 Koyo	2
4	0211640	BRG #10 Gyp 3132T	1
5	87000130	#10-C Packing Gland w/ Sleeve	1
6	1900450	Seal 41 5960	1
7	1900380	Seal 41 1376	1
8	2310140	lock washer w/12	1
9	1410130	lock nut m12	1
10	89003907	Packing retainer #10	1
11	0240690	Bolt toe .5 x 2.5 #100	2
12	89003906	Lamtem Ring #10 with sleeve	1
13	89004752	Drive Key #10 Casting	1
14	0602001	Rifling Grate 9262	2
15	hex nut		2
16	square bolt		2
17	1603120	PF PLUG STD .125	2
18	89003528	MOUNT MOTOR ASY #10 HYDRO DR	1
19	89000316	Hub - Drive #10 Pump	1
20	87000070	#10 Drive Housing - Casting type	1
21	1610105	Packing set #10	1
22	88003514	SHAFT-DR ASSY #10 SHORTW/CHROM	1



DATE	BY	CHKD	APP'D
2016	JAD		

TITLE: Drive Assy #100 O-T Hydrastat
 SCALE: 1:2
 SHEET: OF: 1

FEDERAL AND COMMERCIAL
 DRAWINGS TO BE MADE IN ACCORDANCE WITH THE
 STANDARDS OF THE AMERICAN SOCIETY OF MECHANICAL
 ENGINEERS (ASME) Y14.1-2003 AND Y14.2-2003
 UNLESS OTHERWISE SPECIFIED

MATERIALS AND DIMENSIONS
 SHALL BE AS SPECIFIED IN THE
 DRAWING UNLESS OTHERWISE
 SPECIFIED. THE USER SHALL
 BE RESPONSIBLE FOR THE
 PROPER USE OF THE DRAWING
 AND FOR THE PROTECTION OF
 THE RIGHTS OF THE DRAWING
 OWNER.

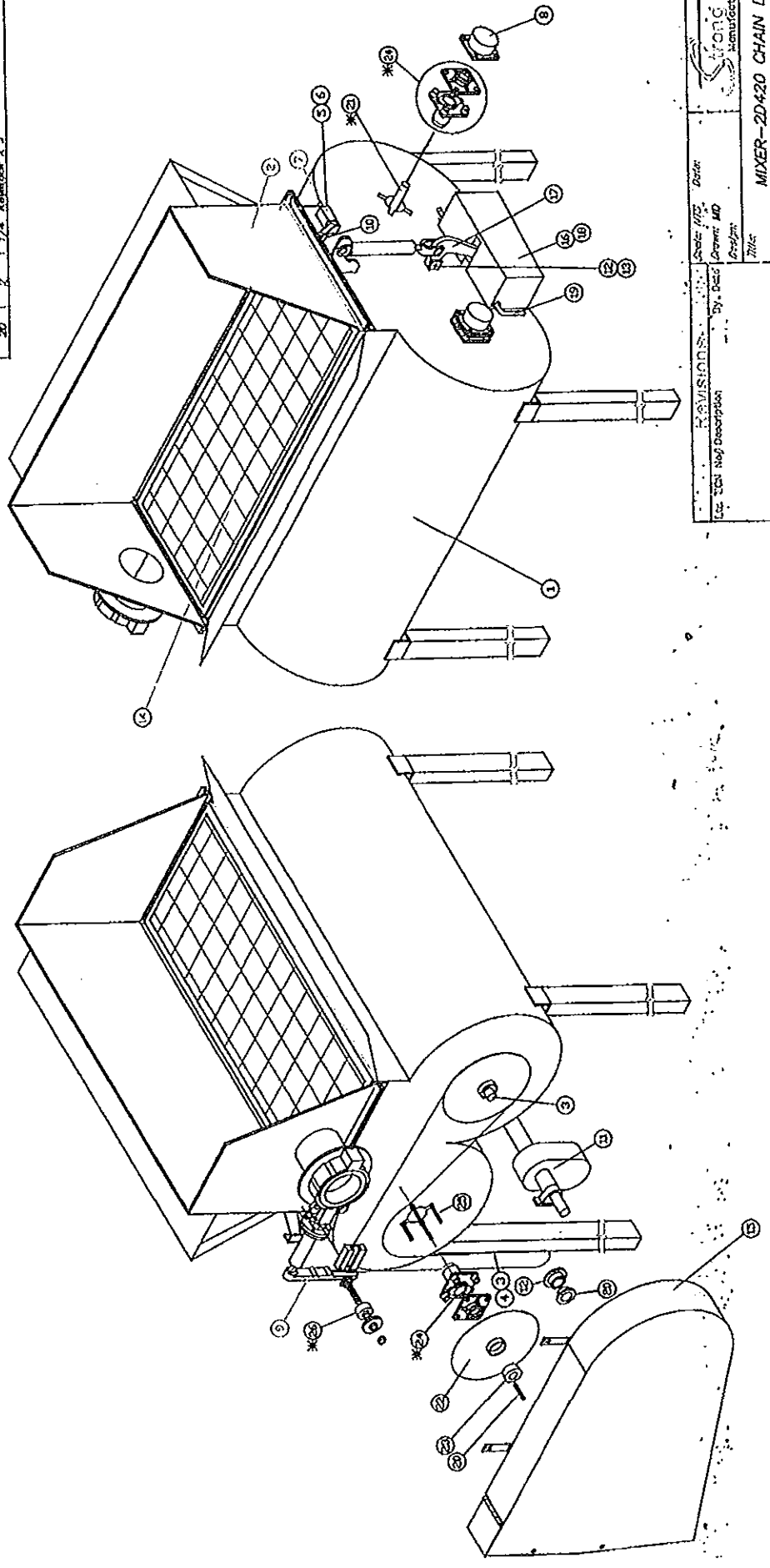
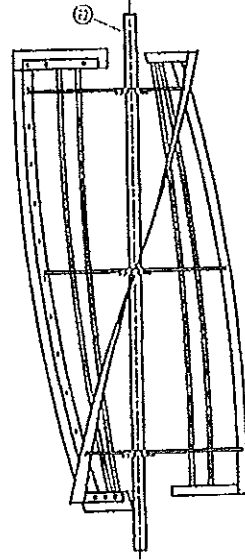
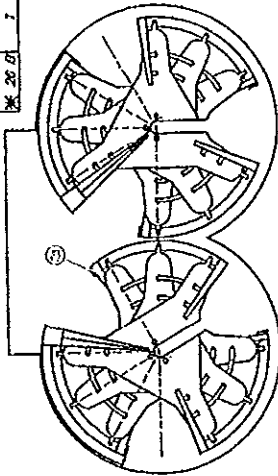
THE USER SHALL BE RESPONSIBLE FOR THE
 PROPER USE OF THE DRAWING
 AND FOR THE PROTECTION OF
 THE RIGHTS OF THE DRAWING
 OWNER.

THE USER SHALL BE RESPONSIBLE FOR THE
 PROPER USE OF THE DRAWING
 AND FOR THE PROTECTION OF
 THE RIGHTS OF THE DRAWING
 OWNER.

THE USER SHALL BE RESPONSIBLE FOR THE
 PROPER USE OF THE DRAWING
 AND FOR THE PROTECTION OF
 THE RIGHTS OF THE DRAWING
 OWNER.

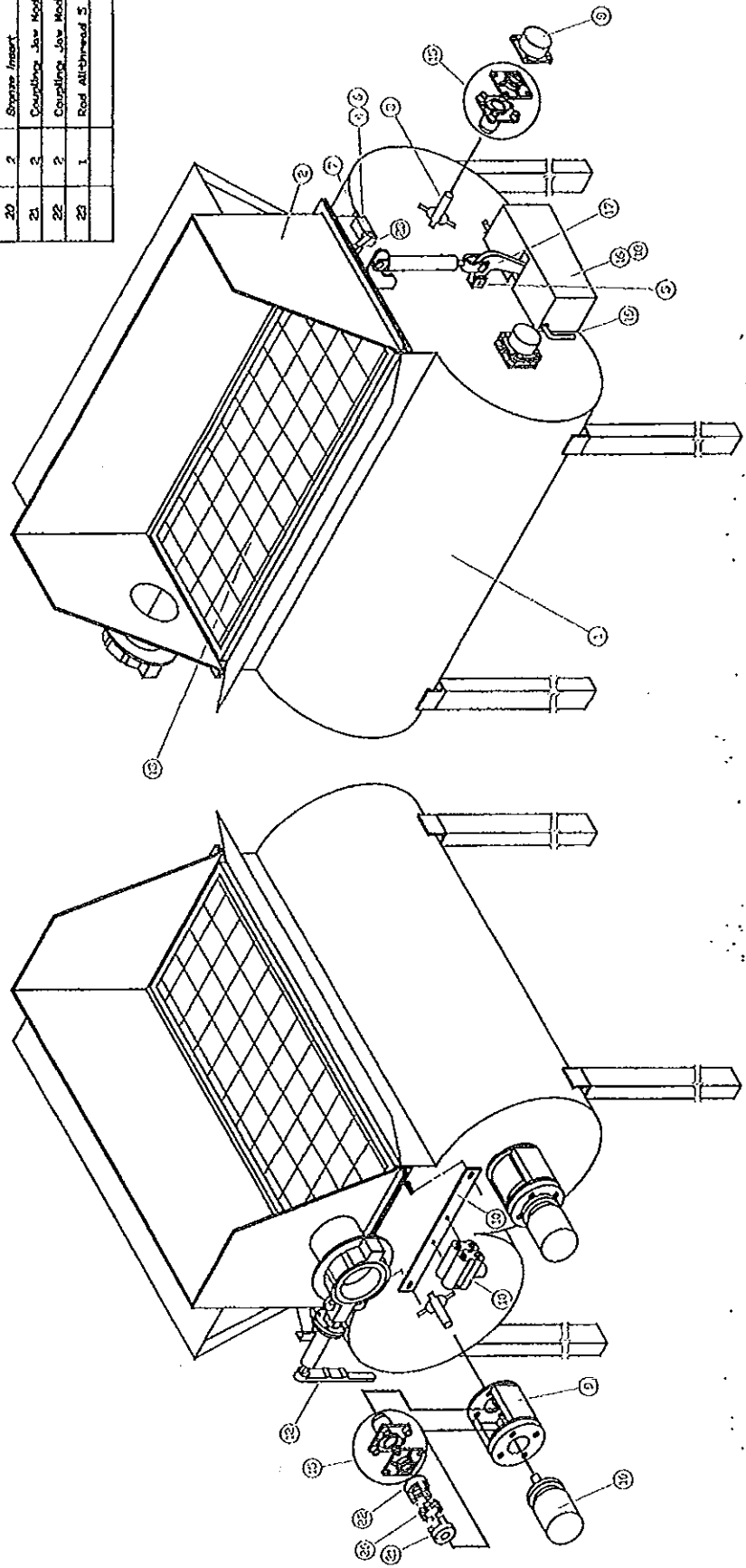
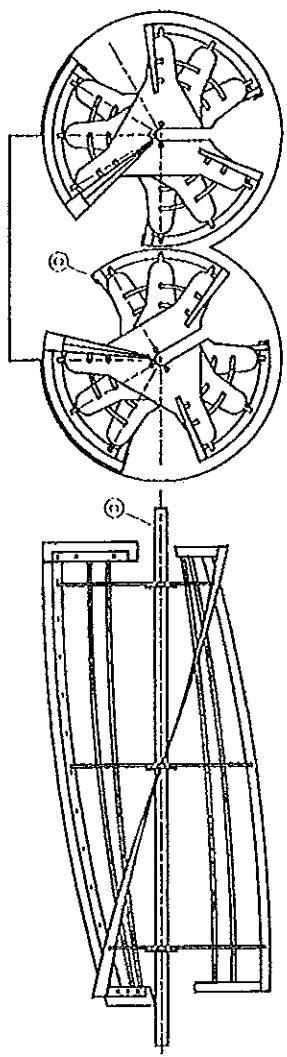
THE USER SHALL BE RESPONSIBLE FOR THE
 PROPER USE OF THE DRAWING
 AND FOR THE PROTECTION OF
 THE RIGHTS OF THE DRAWING
 OWNER.

Item	Qty	Description	Part No.	Item	Qty	Description	Part No.
* 21 A	2	420 Paddle - For Std	12220102	1	Body - 420 Mixer w/ Legs	08222002	
* 21 B	2	420 Paddle - For Adj	12400042	2	Wing Nut	08222002	
22	2	Bracket, TD-620	12018770	3	Chain, #60	0306680	
23	2	Bushing, TLR 2017	02122820	4	420 Mixer Link	1200317	
* 24 A	4	Bearing Assy - For Std	68003205	5	Connector, 1/2"	0309350	
* 24 B	4	Bearing Assy - For Adj	68003203	6	Limit Switch	1002045	
25	16	1/2" Carbide Bit	-Std-	7	Wing 15/16" Co. SJ	2200419	
* 26 A	1	Idle Assy - For Std	68000180	8	Cover - 1 1/4" Bearings	68000215	
* 26 B	1	Idle Assy - For Adj	68003301	9	Motor Valve 5"	14005302	
				10	Roll - Aluminum 5 1/2"	68000802	
				11	Mixer Drive (#80 Chain)	08220602	
				12	Chain Pin #7/16" x 1 1/4"	1603648	
				13	Outlet Pin	1603685	
				14	Mixer Drive	20221202	
				15	Chain Guard	20121502	
				16	20" Mixer Door w/ Rubber Backing	68000465	
				17	Pinch - Mixer Door	68000609	
				18	Splash Guard	68000042	
				19	Roll - 420 Mixer Splash Guard Hold	68001078	
				20	1/4" Keenlock X 3"	68011404	



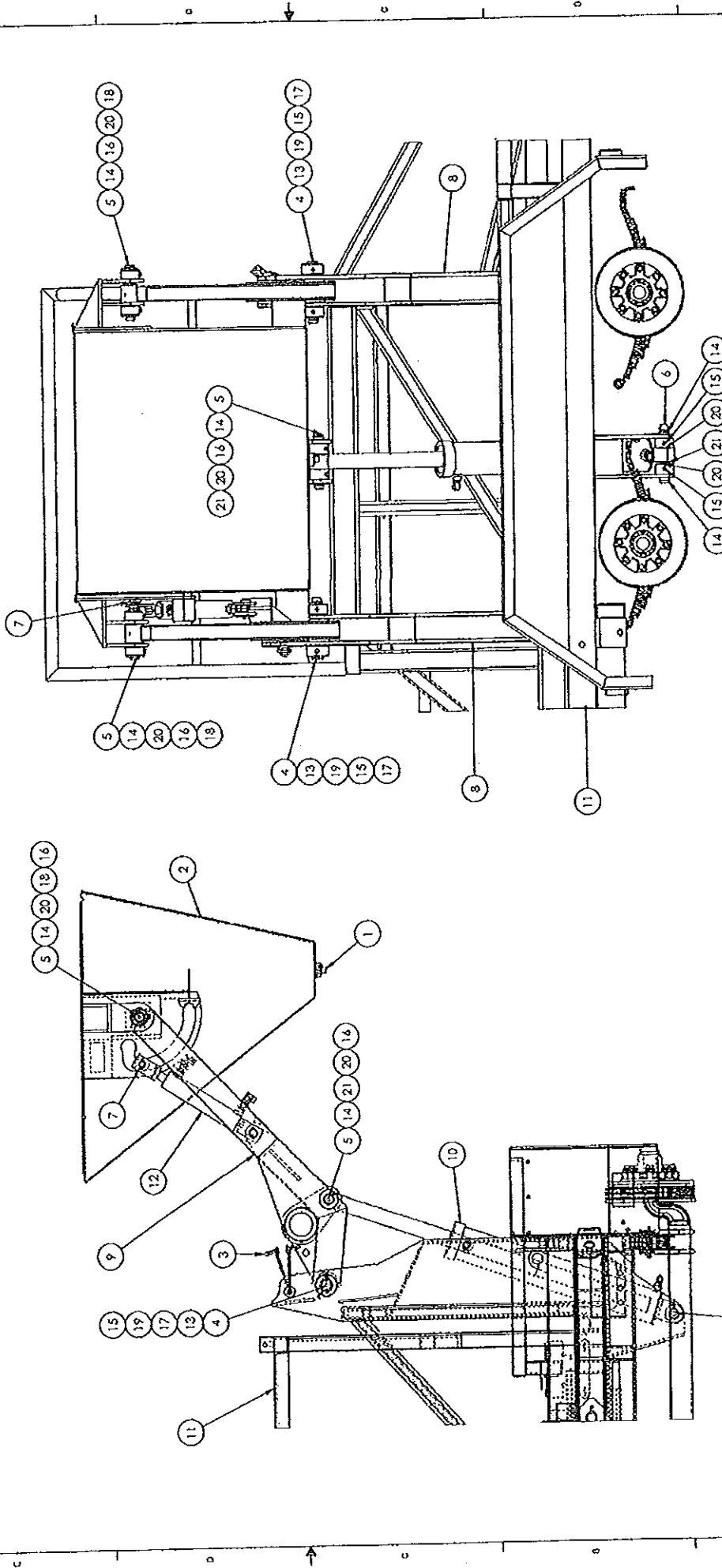
REVISIONS: _____ Date: _____
 Drawn By: _____
 Checked By: _____
 Title: _____
 For Material Description For Material Ref Drawing Ref
MIXER-2D420 CHAIN DRIVE
 08000890

Item	Qty	Description	Part No.
1	1	Body - 420 Mixer w/ Legs	0822202
2	1	420 Mixer Wing Wall	0822202
3	2	420 Riddle - For Asst.	22400042
4	1	Connector 1/2" K&L S&C 1022	0201350
5	2	Choke Pin 47/16" x 1 1/4"	1803648
6	1	Limit Switch	7902419
7	1	Wre 1 1/2 Ga. St	2300459
8	2	Cover - 1 1/4" Spacing	08002078
9	2	Adapter Mixer Drive Assembly	08003759
10	1	Flange Assembly Mixer Direct Drive	08003729
11			
12	1	Water Valve - 5"	7403532
13	1	Mixer Cord	20221202
14			
15	4	Spacing Assy. For Asst. Paddling	08003083
16	1	20" Mixer Door w/ Rubber Backing	08000463
17	1	Pinot - Mixer Door	08000009
18	1	Splash Guard	08001042
19	1	Red - 420 Mixer Splash Guard Hold	08001078
20	2	Spacer Insert	0301507
21	2	Counting Jaw Modified 6720 5/16" Key	07000194
22	2	Counting Jaw Modified 6720 1/4" Key	07000268
23	1	Red Airhead 5 1/2"	09005662



REVISED	By	Date
REV. ESN Mod Description		
 STRONG Manufacturing Company, Inc.		
MIXER - 420 DIRECT DRIVE		
<i>Rev. 10/19/82 Description Rev. 10/19/82 Drawing 10/82</i>		

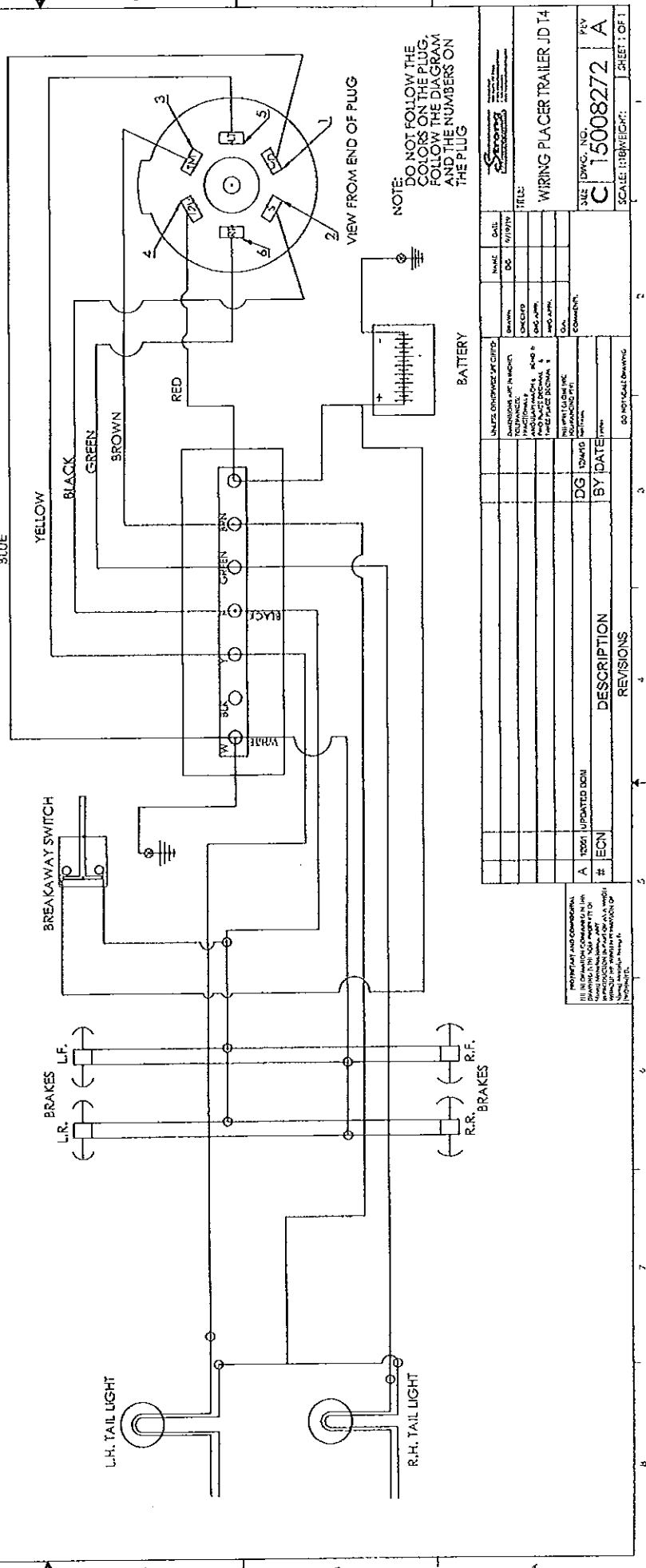
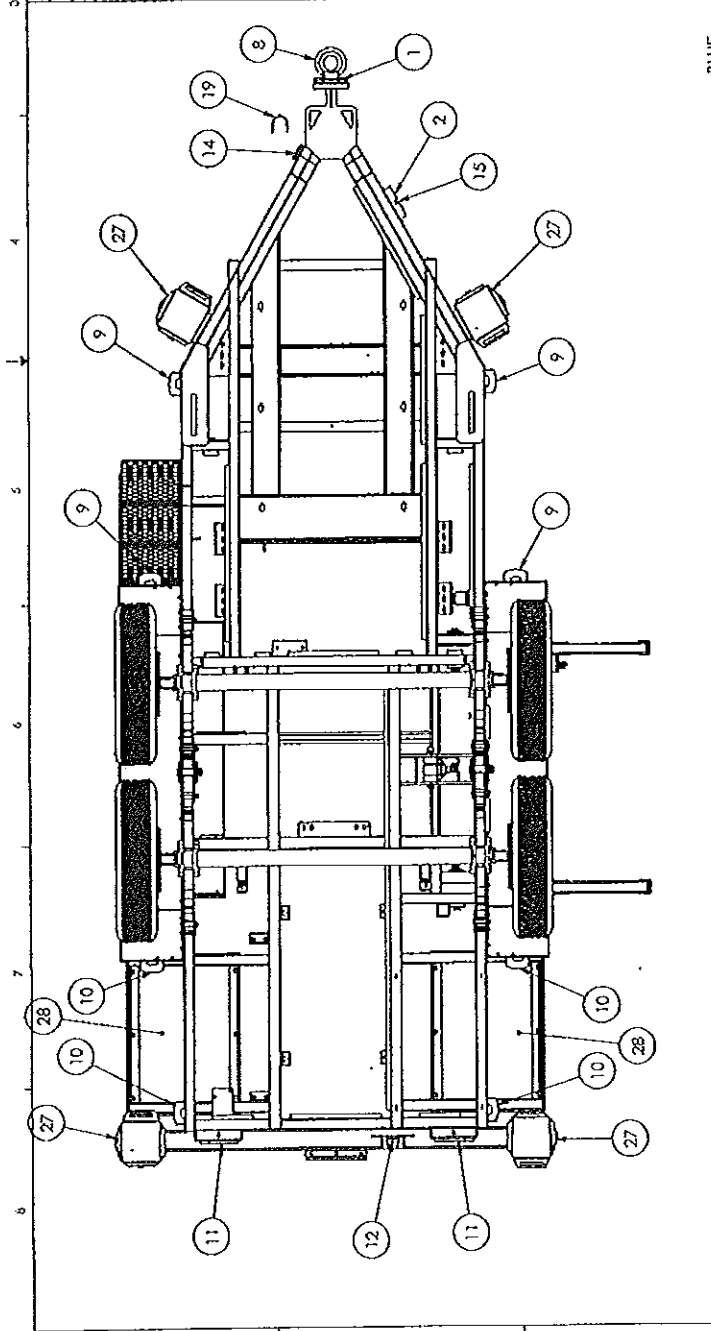
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1603145	PF PLUG STD 1.000	1	12	89000937	RT CYLINDER 2X6 PLACER	1
2	11144302	Skip Loader Bucket Assy.	1	13	1800413	RING SNAP SH-143ST PA	4
3	89001525	Lifting Arm Locking Shaft Assy	2	14	1800616	RING SNAP SH-125ST PA	8
4	89001462	Skip Loader Arm to Stand - Conn Shaft	2	15	1910440	SCREW SQST CP 3/8-1.6X1"	6
5	89001464	Skip Loader Arm to bucket Conn Shaft	3	16	1910435	SCREW SQST CP 3/8-1.6X3/4"	6
6	89009502	SHAFT-SK LD CYL TO FRAME CONNE	1	17	87000200	Bushing Skip Bucket	2
7	89001465	Shaft-SK BKT DUMP CYL BKT END	1	18	87000257	Bushing End	2
8	11144102	Skip Loader Arm Stand (Hyd Controlled) Standard Gwy. Crs	2	19	89011279	Skip Loader Arm Stand Shaft Holder-Sales	4
9	11144202	Skip Loader Bucket Lifting Arm	1	20	89001468	Skip Loader Lift Cyl. Lower Shaft Holder	8
10	89003707	PLACER LIFT CYLINDER ASSY	1	21	8202072	Cylinder Bushing	2
11	05140191	Frame Placer JD Sub - Assy #2 J	1				



		DATE	SCALE	1:1
Strong MANUFACTURING		REVISED	BY	DATE
TITLE Hydraulic Powered Skip Loader System		DESIGNED	BY	DATE
SIZE C 86000234 F		DRAWN	BY	DATE
SCALE: 1:1 (WEIGHT)		CHECKED	BY	DATE
SHEET 1 OF 1		APPROVED	BY	DATE
UNCHECKED AND BROUGHT INTO SOLIDWORKS		DATE	BY	DATE
DESCRIPTION REVISIONS		DATE	BY	DATE
# ECN		DATE	BY	DATE
DRAWN SCALE DRAWING		DATE	BY	DATE

PROPERTY AND CONFIDENTIAL
This drawing contains the design and construction information for the product shown. It is the property of Strong Manufacturing and is not to be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Strong Manufacturing.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D2000615	BOLT KIT HITCH 4 BOLT	1
2	D2009968	x	1
3	D3000940	CLAMPS WIRE LOOM 3/4	5
4	D301183	LOOM .25 783	180
5	D301185	LOOM .5 786	380
6	D301324	CONNECTOR 12-10 SOLDER	6
7	D301325	CONNECTOR 16/14 SOLDER	25
8	D4300343	PINLE HITCH 4 BOLT 3" EYE	1
9	12300110	Light Clearance - Amber	4
10	12300112	Light Clearance - Red	4
11	12300195	Light Tail 6" Oval	2
12	12300210	Light Clearance Bulker	1
13	16043979	PLUG ELEC 7 WAY RV MALE	1
14	19332420	Switch Breakaway	1
15	2000248	TERMINAL RING #10	13
16	2000250	Terminal Ring 1/4"	2
17	2000254	TERMINAL RING 5/16-1614	1
18	2000345	TIE STRAP 14-11/2"	3
19	2000350	Tie Strap 11"	15
20	2300418	WIRE 14/2	240
21	2300422	WIRE #14 WHITE	12
22	2300425	WIRE #14 RED	236
23	2300431	WIRE #14 BROWN	500
24	2300440	14/6 GA WIRE	46"
25	2300470	WIRE 16/3 TAIL LIGHT	288
26	05140391 REF	FRAME PLACER MASTER HYD JD74	1
27	38003714	JACK OUTRIGGER 20K	4
28	89012621	HOSE REEL COVER PLATE	2



NOTE:
DO NOT FOLLOW THE
COLORS ON THE PLUGS,
FOLLOW THE DIAGRAM
AND THE NUMBERS ON
THE PLUG

DATE	BY	DESCRIPTION
	DG EDWARDS	

SCALE	1/8" = 1'
TITLE	WIRING PLACER TRAILER JD 74
DATE	
BY	
CHKD	
APP'D	
CONTR	

UNITS	QUANTITY	DATE

REV	NO	DATE	DESCRIPTION
1	15008272		
2			
3			

REVISIONS

SCALE: 1/8" = 1'

TITLE: WIRING PLACER TRAILER JD 74

DATE: _____

BY: _____

CHKD: _____

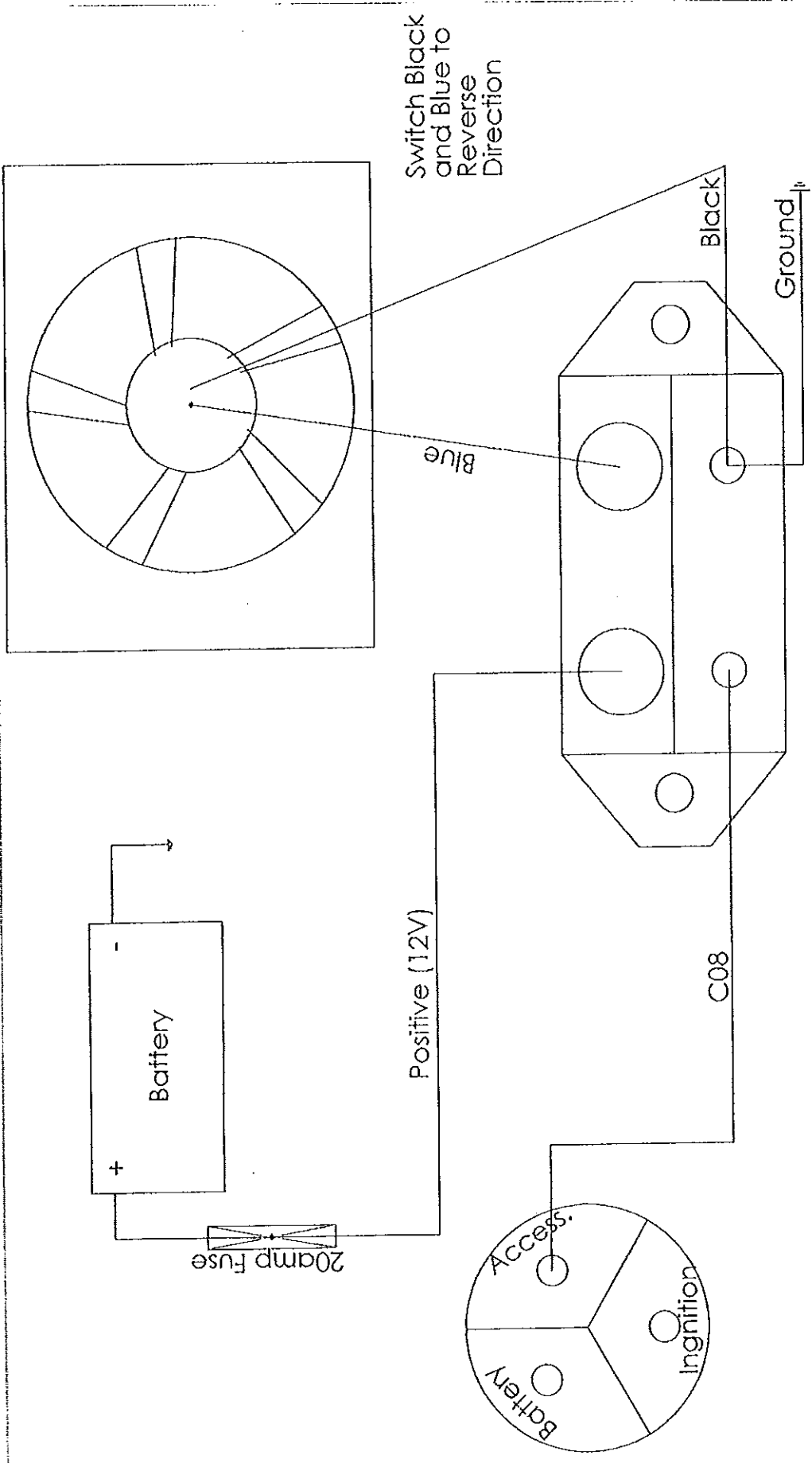
APP'D: _____

CONTR: _____

UNITS: _____

QUANTITY: _____

DATE: _____



UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		YG	6/28/17
TOLERANCES:			
FRACTIONAL:			
ANGULAR: MACH :			
TWO PLACE DECIMAL :			
THREE PLACE DECIMAL :			
INTERPRET GEOMETRIC TOLERANCING PER:			
FINISH			
LTR. ECN DESCRIPTION		BY	DATE
Revisions			
DO NOT SCALE DRAWING			
COMMENTS:			
MATERIAL #			
MATERIAL :			
G.A.			
MFG APPR.			
ENG APPR.			
REVISED			
DRAWN			

PO BOX 8068
 PINE BLUFF, AR 71601
 P: 870-535-4723/800-238-5042
 F: 870-535-4260
 Web: rrrongmanufacturing.com

Strong
 MANUFACTURING

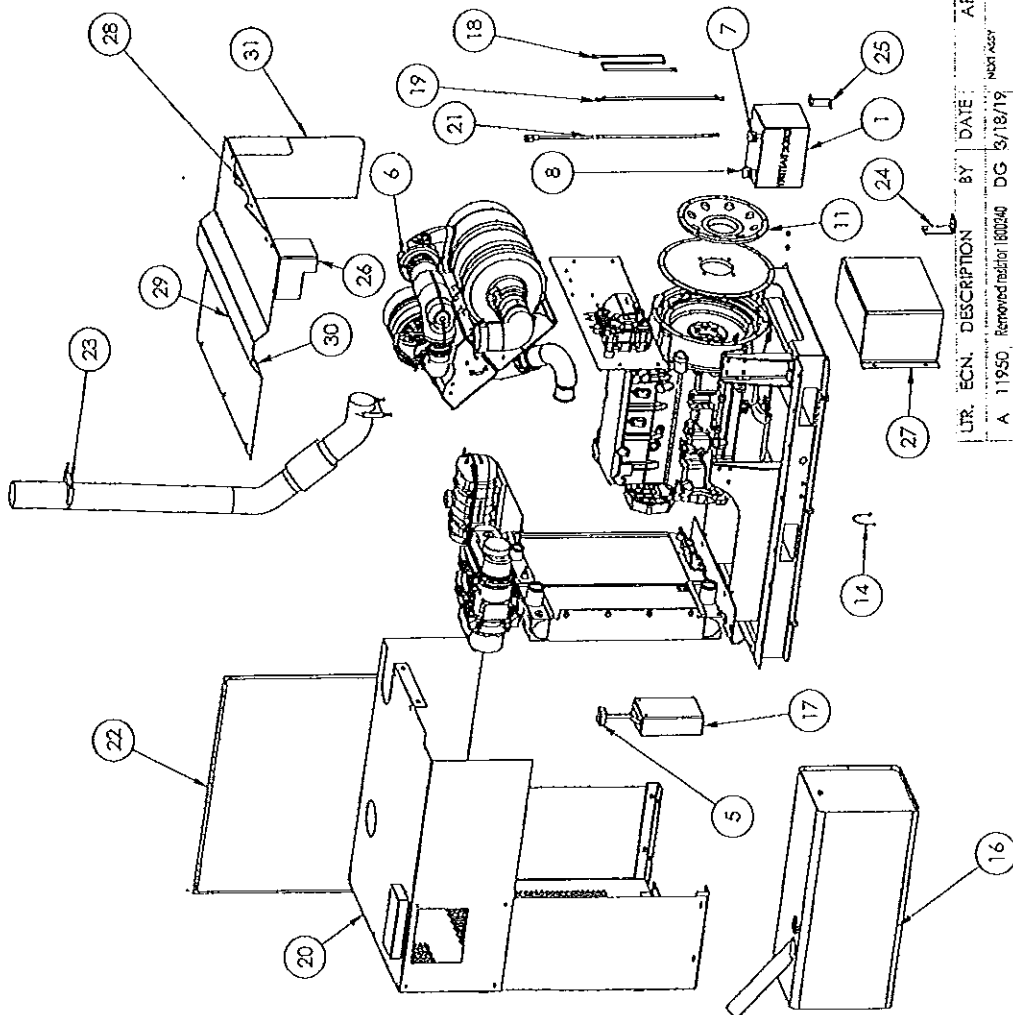
TITLE:
 Hydraulic Cooler Fan Circuit

SIZE DWG. NO.
 A Hydraulic oil cooler circuit

SCALE: 1:1 WEIGHT: SHEET 2 OF 2

PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF Strong Manufacturing Inc. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF Strong Manufacturing Inc. IS PROHIBITED.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	0200165	BATTERY 78DTCB	1
2	0200707	Bolt Hex HD 10mm X 1.5PT	2
3	0300105	CABLE CONTROL HYDROSTAT 120"	1
4	0300110	Cable Sensor Mod 14.4	1
5	0301250	Control Lever T-Handle Hydrostat	1
6	0504004	Engine Diesel JD Tier 4 Final	1
7	0940000	INSULATOR BATTERY TER 1/0 BLK	1
8	0940005	INSULATOR BATTERY TER 1/0 RED	1
9	1300020	Meter Totalizer	1
10	1410140	5/8 LOCK NUT	6
11	1624613	twin disc pump adaptor	1
12	1900550	Proximity Sensor	1
13	2000295	.3125-18 X 1 Hex bolts	2
14	2000350	Tie Strap 11"	20
15	2310150	Washer Lock 10M	2
16	22600114	FUEL SYSTEM PLACER	1
17	86003621	Hydrostat Control Box Assy	1
18	86003634	Battery Cable Assembly	1
19	86003848	Cable- Battery- Assy Ground Frame to Eng.	1
20	86003902	Tier 4 Cowlng Assembly	1
21	86003922	CABLE BATTERY GRD 28" #1 GA	1
22	86003928	GUARD EXHAUST OPERATOR SIDE - T4	1
23	86003929	EXHAUST ASSY JD T4 PLACER	1
24	89009190	SPARE TIRE RACK BRACE GYP CRETE	1
25	89012121	MOUNT-CABLE	1
26	89012581	UPPER MATERIAL GUARD-T4 JD	1
27	89012582	LOWER Material <not specified> GUARD - T4 JD	1
28	89012586	HEAT SHIELD SUPPORT	1
29	89012587	HEAT SHIELD	1
30	89012594	HEAT SHIELD - STICK ON	1
31	89012766	UPPER Material <not specified> GUARD-T4 JD	1



UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	DATE 11/20/14
DIMENSIONS ARE IN INCHES	DRAWN TO 1:1	
TOLERANCES FRACTIONAL DECIMALS	DRAWN TO 1:1	
FINISHES: 1. UNLESS OTHERWISE SPECIFIED: 2. UNLESS OTHERWISE SPECIFIED: 3. UNLESS OTHERWISE SPECIFIED: 4. UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	
THREADS: 1. UNLESS OTHERWISE SPECIFIED: 2. UNLESS OTHERWISE SPECIFIED: 3. UNLESS OTHERWISE SPECIFIED: 4. UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	
PLACEMENT OF DIMENSION LINES: 1. UNLESS OTHERWISE SPECIFIED: 2. UNLESS OTHERWISE SPECIFIED: 3. UNLESS OTHERWISE SPECIFIED: 4. UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	
PLACEMENT OF DIMENSION LINES: 1. UNLESS OTHERWISE SPECIFIED: 2. UNLESS OTHERWISE SPECIFIED: 3. UNLESS OTHERWISE SPECIFIED: 4. UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	
PLACEMENT OF DIMENSION LINES: 1. UNLESS OTHERWISE SPECIFIED: 2. UNLESS OTHERWISE SPECIFIED: 3. UNLESS OTHERWISE SPECIFIED: 4. UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	
PLACEMENT OF DIMENSION LINES: 1. UNLESS OTHERWISE SPECIFIED: 2. UNLESS OTHERWISE SPECIFIED: 3. UNLESS OTHERWISE SPECIFIED: 4. UNLESS OTHERWISE SPECIFIED:	DRAWN TO 1:1	

UTR. ECN.	DESCRIPTION	BY	DATE	APPLICATION
A	11950: Removed radiator (800240)	DG	8/18/19	USED ON
B	12000: ADDED EXHAUST ASSY AND FUEL SYSTEM AND GUARDS	DG	8/27/19	
C	12001: UPDATED BOM	DG	12/4/19	
D	12040: ADDED 86003902	DG	1/3/20	
E	12069: ADDED 86003621	DG	1/15/20	

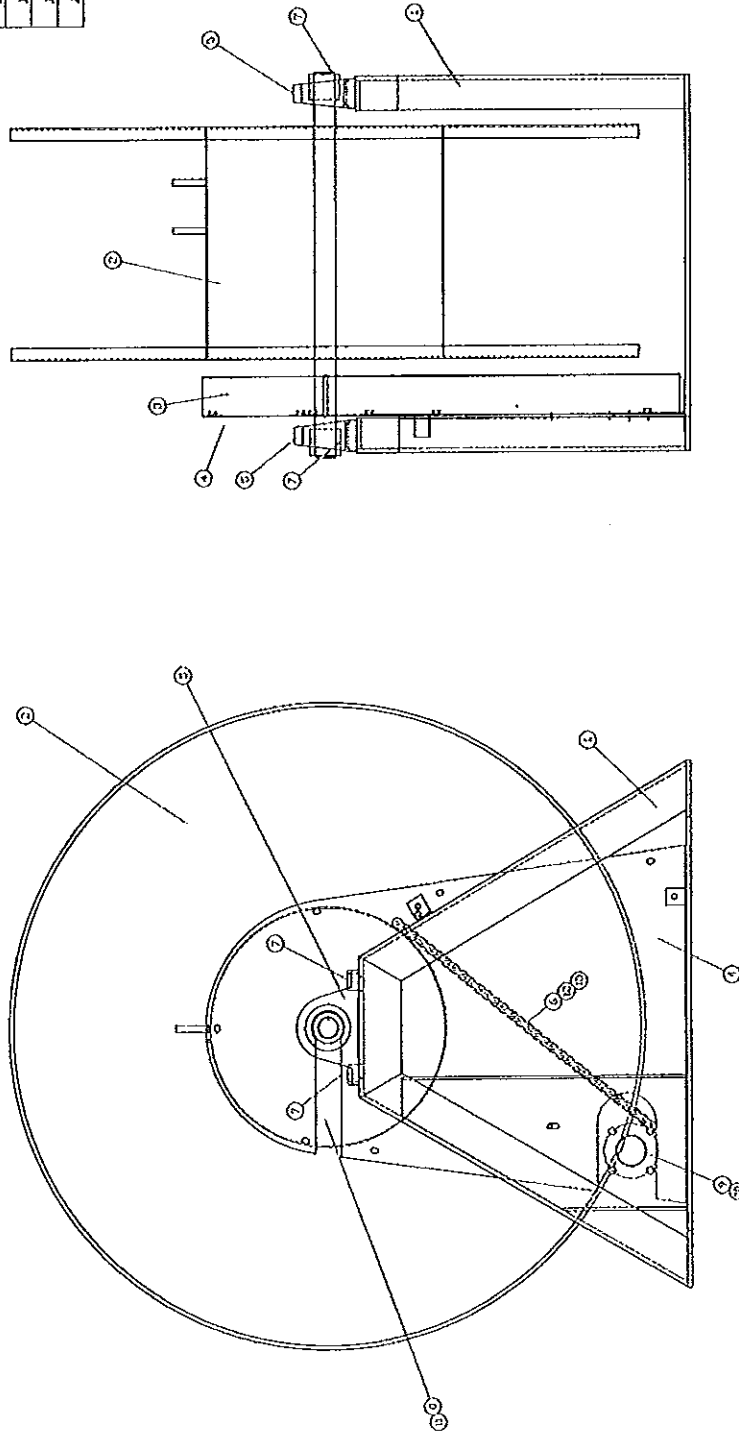
PROPRIETARY AND CONFIDENTIAL
THIS DRAWING IS THE PROPERTY OF STRONG MANUFACTURING INC. ANY REPRODUCTION OR TRANSMISSION OF THIS DRAWING OR INFORMATION CONTAINED HEREIN WITHOUT THE WRITTEN PERMISSION OF STRONG MANUFACTURING INC. IS PROHIBITED.

Strong MANUFACTURING

JD T4 Hydro Powertrain

SHEET 1 OF 1
REV E
DWG. NO. 88003908
SCALE: 1:18 WEIGHT:
COMMENTS: 1 2 3 4 5 6 7 8

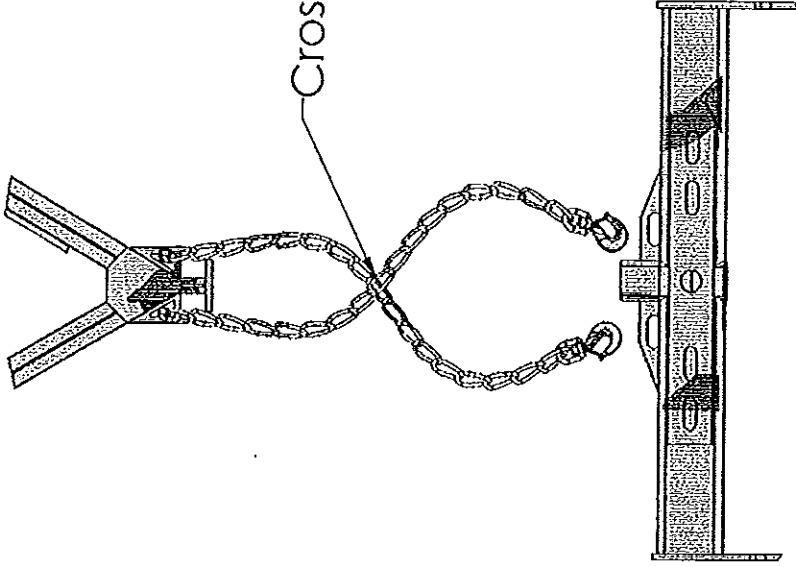
Item	Qty.	Description	Part No.
1	1	Material Hose Reel Stand	21003302
2	1	Material Hose Reel	21001202
3	1	Hose Reel Chain Guard Rear	82003234
4	1	Chain Guard Front	82001247
5	2	1/4" SS Pillow Block Bearing	02018607
6	62	#50 Chain w/ Master Link SS	02005270
7	4	BOLT CARTRIDGE 500-113 X 2.25	02040710
8	1	560 TLB Sprocket	1201630
9	1	515 TLB Sprocket	1201780
10	1	Bushing 1210 w/ 1" Bore	02002370
11	1	Bushing 2012 w/ 1 1/4" Bore	02002720
12	1	#50 Offset Link	12003000
13	1	LINK CONNECTING #50 CHAIN	12003216
14			
15			
16			
17			
18			
19			
20			



REVISIONS

Rev.	Description	By	Date
A	Delete 1200300	Barbara J. Stone	12/14/77
B	Added Item #12	Barbara J. Stone	12/14/77
C	Selected Item #7	JS	1/10/78
D	Updated to Current Part #15	JS	1/10/78
E	Added to Current Part #15	JS	1/10/78
F	Added to Part #15	JS	1/10/78

Scale: NTS 1:1
 Design: Barbara J. Stone
 Designer: Barbara J. Stone
 Date: 12/14/77
 Part No: 21003302
 Description: MATERIAL HOSE REEL (HYDRAULIC)
 Strong Manufacturing Company
 8020664



Cross Chains Between Vehicles

PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF Strong Manufacturing Inc. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF Strong Manufacturing Inc. IS PROHIBITED.		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±		DRAWN REVISED ENG APPR. MFG APPR.	NAME JG	DATE 1/28/20	P O BOX 8042 PINE BLUFF, AR 71603 P: 870-535-4752/800-338-0042 F: 870-535-4823 WEB: strongmanufacturing.com			
		INTERPRET GEOMETRIC TOLERANCING PER: FINISH		Q.A. MATERIAL:	Q.A. MATERIAL:	Q.A. MATERIAL:		Q.A. MATERIAL:		
LTR. ECN. DESCRIPTION BY DATE		DO NOT SCALE DRAWING		COMMENTS:		SCALE:	WEIGHT:	SHEET 1 OF 1		
Revisions		1	2	3	4	5	TITLE: Safety Chain Attachment	SIZE A	DWG. NO. 86000014	REV