TFI-1200
Operating Manual

TFI-1200

Site
Equipment Rig Up

A. Position & level System

B. Untie shakers (Save tie down bolts)

C. Untie & remove pit pump

D. Place Pit Pump in pit as close to vertical as possible. (Ensure that the motor, coupling, and upper bearing remain out of the mud)

E. Connect return hose between Pit Pump & System. (Ensure the rubber gaskets are in place)

F. Connect the power cord from the Pit Pump remote to the Pit Pump. (Ensure the connection is not submerged)

G. Connect the charge pump discharge to your drill machines on board pump suction or a TFI Stand Alone High Pressure Pump System

H. Ensure that all dump gates are closed securely

I. Replace any drain plugs that have been removed (from antifreezing process)

J. Ensure that the gate is in place dividing the two tanks

K. Open all suction valves. (Ensure that the valve on the throat opening of the Hopper is closed)

L. The System is now ready to receive water. (If you are introducing premixed fluid it should be done so through the Possum Belly and over the primary shaker)

Start Up

A. Generator

1. Check Oil, Fuel, Water.
2. Ensure Breaker is off.
3. Switch Run/Off switch to run.
4. After sufficient warm up time, bring Gen up to speed (60 hz) ** 60 hz must be maintained throughout the day **
5. Turn 480 breaker on.
6. Unit is currently fully powered up.

B. Plugs

1. Replace drain plugs (if removed for antifreezing)

C. Valves

1. Insure that the throat valve on the hopper is closed
2. Open all suction valves

D. Shakers

1. Start shakers
2. Wet screens

E. Mud Cleaner

1. Open Mud Cleaner pressure valve 4 notches
2. Start Mud Cleaner pump
3. Ensure that the pressure builds to max 25 psi
   ** No more that 25 psi should be maintained **
4. These pumps are mechanically sealed and should only start leaking when seal damage has occurred.

**** Do not run these pumps dry!! Seal damage will occur ****

F. Mud Hopper

1. Ensure that one of the two flow valves is open
   ** Flow Valves – Mud Hopper or Mud Gun **
2. Ensure that fluid is moving.
3. These pumps are mechanically sealed and should only start leaking when seal damage has occurred.

**** Do Not run these pumps dry!! Seal damage will occur ****

G. Charge Pump

1. Start / Stop charge pump as necessary
2. These pumps are mechanically sealed and should only start leaking when seal damage has occurred.

**** Do Not run these pumps dry!! Seal damage will occur ****

H. Pit Pump

1. Ensure return hose is connected.
2. Ensure power cord is connected.
3. Start / Stop pit pump as necessary.
4. Remove NPT plugs in lower bearing cartridge and purge with a good quality grease (EP #2) in both chambers. Check after first 8 hours run and then every 30-40 hours.

Training / Theory Discussion

A. Possum-Belly
1. Inlets
2. Drain

B. Shakers
1. Screens/Installation
2. Starters
3. Motor

C. First Tank / Compartment
1. Man hole entry
2. Dump gate
3. Suction
4. Mud Gun

D. Mud Cleaner Pump
1. Grease & Pack Bearings
2. Grease & Adjust Packing
3. Drain Plug
4. Consumable items
5. Valving

E. Mud Cleaner Hose
1. Cam locks / Gaskets

F. Mud Cleaner
1. Valve / Pressure
2. Valves on Manifold
3. Cone Changes
4. Cone Operation
5. Siphon Tube / Cane Operation
6. Solids / Liquid Flow

G. Mud Cleaner Shaker
1. Screen / Install
2. Starter
3. Motor

H. Second Tank / Compartment

1. Dump gate
2. Mud-Gun
3. Suctions
4. Manhole entry
5. Hopper discharge

I. Hopper / Mud Gun Pump

1. Drain plug
2. Consumable Items
3. Valving

J. Hopper Operation

1. Flow
2. Feeding
3. Drain Plug
4. Consumable Items
5. Valving

K. Charge Pump

1. Drain plug
2. Consumable Items
3. Valving

L. Pit Pump

1. Consumable Items
2. Lifting / Installation

M. Generator

1. Oil / Fuel / Water
   A. Primer Pump / Gauge
2. Starting
3. Panel Requirements
4. Breaker
5. Transformer
6. 110 On / Off Outlets
7. Stopping
8. Warranty

N. Operate Unit

SERVICE & OPERATING MANUAL
123E SHALE SHAKER

TRI-FLO 123E SHALE SHAKER

INTRODUCTION

GENERAL INFORMATION

The TRI-FLO 123E SHALE SHAKER is a compact and reliable solids removal method. Most shakers are similar in design and application. TRI-FLO asserts that their high-speed shale shaker is that necessary first line of defense against large drilled solids reentering an active mud system. The TRI-FLO 123E SHALE SHAKER easily removes 74 micron, or larger size, particles for proper mud weight maintenance and efficient solids control. Balanced mud rheology leads to longer pump life, less daily fluid maintenance expense, improved desander and desilter efficiency, and better penetration rates.

Vibrator amplitude may be changed from 0-100%, factory settings 85%. The adjustment is made by changing the position of the unbalanced weights. IT IS IMPORTANT THAT BOTH WEIGHTS BE ON THE SAME SETTING. The vibrator assembly can be changed in the field quickly and simply.

The possum belly with the mud inlet at the bottom and the mud flume at the top is connected to the pit pump.

Replacement screens are available from coarse 10-mesh variety to a 400 mesh fine screen and they are easily changed in the field.

POWER REQUIREMENTS

Connect the green insulated wire to ground.

The TRI-FLO 123E SHALE SHAKER is normally wired at the factory for 460 V.A.C 60 HZ, 3 PHASE.

If 230 V.A.C. 60 HZ, 3 PHASE is needed it is necessary to:

1. Rewire the motor.

2. The motor junction box must be packed with foam rubber to prevent the wires from rubbing together when the shaker is vibrating. This is necessary after the rewiring is completed.

Turn the starter switch on and check the motor rotation. The top of the counterweights should travel in the same direction as the flow of the mud.

If the rotation is incorrect, change any two of the red, black or white wires at the motor control panel. The green wire should always be ground and would not effect the rotation of the motor.

NOTE: Refer to Section 5 of the Vimarc Motor manual (Electrical connection).

SCREENS

The procedure to install or change the screens is as follows:

1. Remove the tension lock nuts, washers, tension springs, the tension bolts and the tension rail plates from the screen box, on the screen support bars.

2. Install decking rubber on the screen support bars.

3. Install the screen in position, leaving equal space on each side. When installing the screen be careful not to bend or crease these screens.

4. Put the tension plates in position with the bolts extending through their respective holes in the side plates of the screen box. The tension rail plates should only touch the hook strips and not the screen.

5. Install the springs, washers and lock nuts. Tighten the tension lock nuts to expose 1/8" of the threads, starting at the center tension lock nuts and working toward each end.

6. Check the screen for creases and ripples. If any appear, the hook strips are not even. Work out the wrinkles by hand by adjusting the position of the hook strips and by smoothing the screen cloth by hand.

7. Tighten the center tension lock nuts to expose 5/8" of threads, then tighten the other nuts the same amount, working from one side and the other.

8. Tighten the nuts just enough to fully compress the tension springs. Rap the tension plate and the tension bolt heads lightly with a hammer to insure that the bottom of the tension plate is parallel to the support bar. After fully compressing the springs they will maintain tension on the screens. It is recommended that after 3 hours the tension nuts should be retightened.

9. Wet the screen with water (or diesel when using oil mud) before diverting mudflow over the screen.

LUBRICATION

Refer to Section 7 of the Vimarc Motor manual (Relubrication).

ADJUSTMENTS

Refer to Section 6 of the Vimarc Motor manual (Adjustment of Centrifugal Force Output).

The intensity of vibrations may be varied to suit conditions by changing the position of the adjustable counterweights. Position of 100% gives the maximum, and each successive notch or setting reduces the motion. Position of 0% gives the minimum intensity of vibrations. IT IS IMPORTANT THAT BOTH COUNTERWEIGHTS HAVE THE SAME SETTING. This is easily checked by a scale located on both inner counterweights.

VIBRATOR ROTATION

The direction of rotation is normally with the flow of the material. Top of the counterweight toward the end of the shaker.

MAINTENANCE

INSPECTION

Since the TRI-FLO SHALE SHAKER is a vibratory machine, it is important to correct all minor troubles before serious damage develops. Replace faulty support springs and any missing bolts at once. Cracks forming in the structure (usually at or near the joints) and unusual noises and motion are signs of developing failure. Drill 1/4" holes through the ends of such cracks and consult TRI-FLO at once in the event of such failures. **WARNING IF WELDING IS DONE TO NO GROUND WELDER THRU VIBRATING SCREEN.**

Refer to Section 8 of the Vimarc Motor manual (Replacement of Bearings).

CHANGING THE SPRING COILS ON VIBRATING DECK

The Spring Coils on the vibrating deck should be checked every 6 months. When the spring shrinks or collapses to less than 4 inches they should be replaced. A new spring measures 4-1/2 inches. This is done by lifting the shaker box, removing the old springs, and installing the new ones.

VIBRATORY MOTOR

1. Check for loose bearings.
2. Check the mounting bolts.
3. Inspect the power cable for wear between the switch and the motor.

TROUBLESHOOTING

VIBRATOR MECHANISM

Over heating of Vibrator

1. CAUSE: Low voltage or hertz.
   SOLUTION: Adjust to recommended 460V 60Hz.
2. CAUSE: Loss of phase.
   SOLUTION: Check connection inside motor junction box and at bottom of starter overload.
3. CAUSE: High ambient temperature caused by handling hot material or by surrounding condition.
   SOLUTION: Ventilate area or use high temperature lubricant.

Noisy Bearings

1. CAUSE: Bearing failure caused by mentioned reasons.
   SOLUTION: Replace bearings: take necessary precautionary steps to avoid reoccurring failure.

2. CAUSE: Normal fatigue failure associated with the vibrator service-identified by spalling or roller and inner race at the high load zone.
   SOLUTION: Replace the bearings; see assembly instructions.

Erratic Vibration or Performance

1. CAUSE: Shaker not up to speed.
   SOLUTION: Check connection.

SHORT SCREEN LIFE

1. Careless handling and installation.
2. Failure to clean all support surfaces prior to screen installation.
3. Improper tension during installation.
4. Tension plates are not seated properly.
5. Cuttings build up under the edge of the screen.
6. Worn or dirty deck rubber.

SPARE PARTS

Refer to Section of the Vimarc Motor manual (Repairs and Spare parts).

Always order spare parts from TRI-FLO INTERNATIONAL. This is particularly true of bearings, which may not be available from the local bearing sources because of special internal clearance requirements.

4.D SAFETY

NO PERSON SHOULD STAND, HOLD OR LEAN AGAINST THE VIBRATING FRAMES. VIBRATIONS TRANSMITTED TO THE HUMAN BODY CAN BE HARMFUL. THESE SCREENS ARE NOT THERAPEUTIC DEVICES.

BECAUSE OF THE MOTION OF THE VIBRATING SCREEN IT IS IMPOSSIBLE TO SERVICE THE SHAKER WHILE IN MOTION. NEVER LAY TOOLS OR SPARE PARTS ON THE SCREENS.

ONLY TRAINED PERSONNEL SHOULD OPERATE OR REPAIR THIS SHAKER.

TIGHTENING TORQUES FOR HIGH-STRENGTH BOLTS.

Cap screw or bolt diameter, inches	Torque foot•pounds	
	Bolts	Cap screws
3/8”	41	47
1/2”	105	120
5/8”	210	210

4.G RECOMMENDED LUBRICANTS

Shell Oil Co.	Alvania No. P-3 (for Vimarc motor only**)
Texaco Inc.	Multifax No. E P-2
Gulf Oil Co.	Crown No. 2
Chevron Oil Co.	Duralith No. E P-2
Mobil Oil Corp.	Mobilux E P-0, 1,2
Universal	Mollux No. 3400
Citgo	Mystik SX-6 Extreme Temp. –65 to 350 degrees
Citgo	Mystik JT-6 HighTemp.

Refer to Section 7 of the Vimarc Motor manual (Relubrication).

TRI-FLO 2’ X 3’ STANDARD SCREEN

	TRI-FLO PART NO.
20 Mesh Screen	03-00-030
30 Mesh Screen	03-00-031
40 Mesh Screen	03-00-032
50 Mesh Screen	03-00-033
60 Mesh Screen W/BU2PB	03-00-034
80 Mesh Screen w/BU2PB	05-00-483
100 Mesh Screen w/BU2PB	05-00-484
120 Mesh Screen w/BU2PB	05-00-468
150 Mesh Screen w/BU2PB	05-00-473
160 Mesh Screen w/BU2PB	05-00-486
180 Mesh Screen w/BU2PB	05-00-474
200 Mesh Screen w/BU2PB	05-00-476
250 Mesh Screen w/BU2PB	05-00-490
325 Mesh Screen w/BU2PB	05-00-491

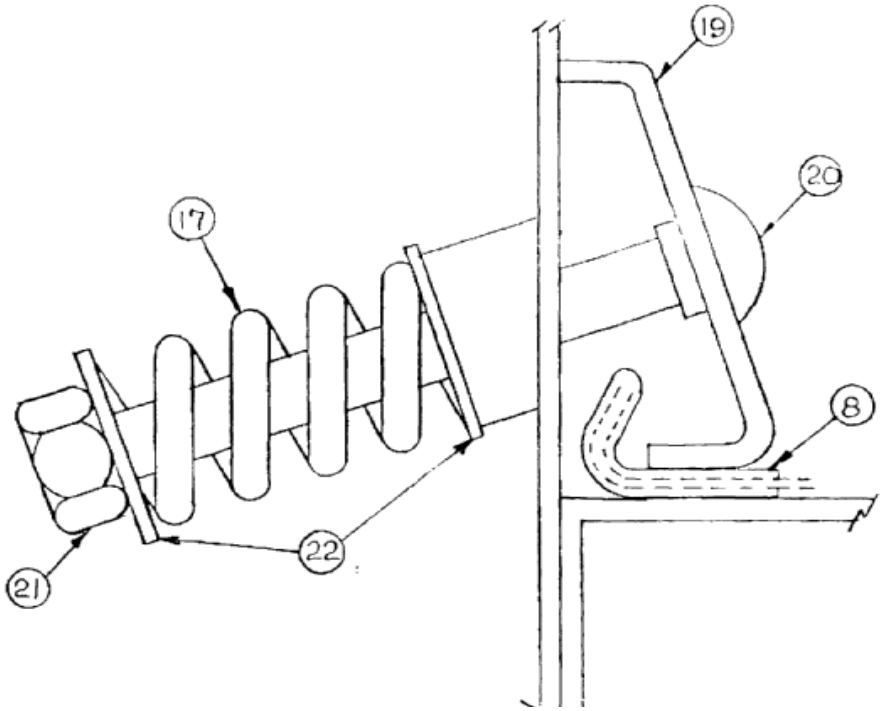
**BU2PB – With Laminated Backs
When ordering screens they should be ordered in pairs. Both screens should be replaced at the same time.

COMMON OILFIELD SHAKER SCREENS

MESH	WIRE DIAMETER	OPENING INCHES	OPENING MICRONS	% OPEN AREA
8 X 8	.028	.097	2464	60.2
10 X 10	.025	.075	1905	56.3
12 X 12	.023	.060	1524	51.8
14 X 14	.020	.051	1295	51.0
16 X 16	.018	.0445	1130	50.7
18 X 18	.018	.0376	995	45.8
20 X 20	.017	.033	838	43.6
8 x 20	.032/.020	.093/.030	2362/762	45.7
20 x 30	.015	.035/.0183	889/465	39.5
30 x 30	.012	.0213	541	40.8
30 x 40	.010	.0233/.015	592/381	42.5
40 x 36	.010	.015/.0178	381/452	40.5
40 x 40	.010	.015	381	36.0
50 x 40	.0085	.0115/.0165	292/419	38.3
50 x 50	.009	.011	279	30.3
60 x 40	.009	.0077/.016	200/406	31.1
60 X 60	.0075	.0092	234	30.5
70 X 30	.0075	.007/.026	178/660	40.3
80 X 80	.0055	.007	178	31.4
100 X 100	.0045	.0055	140	30.3
120 X 120	.0037	.0046	117	30.9
150 X 150	.0026	.0041	104	37.4
160 X 160	.0025	.0038	97	37.64
200 X 200	.0021	.0029	74	33.60

TENSION PLATE AND SCREEN ASSEMBLY

PART	TRI-FLO PART NO.
Tension Bolt Assembly (includes bolt, nut, spring, & 2 washers)	03-00-006
Tension Bolt (Item 20)	04-00-107
Tension Spring (Item 17)	05-00-350
Tension Lock Nut (Item 21)	04-00-150
Tension Washer (Item 22)	04-00-177
Tension Rail Plate	03-00-007
Screen Jay Hook (8)	



TRI-FLO PARTS PRICE LIST
TFI 123E SHALE SHAKER

Part No.	Description
03-00-004	Deck Rubber
03-00-006	Tension Bolt Assembly
04-00-014	Tie Down Assembly
03-00-007	Tension Rail
03-00-005	Deck Spring
04-00-107	Tension Bolt
04-00-150	Tension Bolt Nut
05-00-350	Tension Springs
04-00-177	Tension Bolt Washers
03-03-591	Vimarc Motor Mount
01-01-178	Vimarc Motor (60 Hertz)
01-01-143	Vimarc Motor (50 Hertz)

NOTES:

SERVICE & OPERATING MANUAL

4 – 4/123E Mud Cleaner

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INTRODUCTION

The TRI-FLO 4 Cone Fluid Separator (Mud Cleaner) is a combination of a TRI-FLO Sand/Silt Separator and a TRI-FLO 123E Shale Shaker.

The TRI-FLO Fluid Separator is designed to remove the sand and silt sized particles before they have a chance to break down even smaller. The TRI-FLO Fluid Separator operates efficiently on weighted mud as well as unweighted mud systems.

The TRI-FLO Fluid Separator is designed to save barite and remove low gravity solids larger than barite from weighted mud system. The Sand/Silt Separator Hydro-cyclones will separate the low solid liquid slurry from the barite and larger than medium silt range particles. The barite and larger silt size particles will be directed on the screen surface to save barite and drilling fluid while the large silt size particles will go off the end of the screen.

On the unweighted mud systems the TRI-FLO Fluid Separator will reduce the costs by reduced jetting, less chemical replacement and less replacement of water and/or oil. With the use of 400 mesh screens it is possible to remove solids to approximately 25-micron silt size particle.

The TRI-FLO Fluid Separator has several design characteristics that justify its ability to remove sand and silt sized solids from the drilling fluid. The feed manifold is designed to insure balanced feed pressure into the hydro cyclones. System balance is achieved by opening or closing individual control valves on each hydro cyclone, by lowering or raising the siphon tubes on each overflow tube, and/or increasing or decreasing the apex valve size. Any of these adjustments can alter the GPM rate and handle most volume requirements. These adjustments can make particle interference, mud viscosity, and rejection volume less critical and enable the system to work more efficiently. The TRI-FLO Fluid Separator can remove solids that are often found to be the cause of drill collar sticking and wear on mud pump expendables.

OPERATION

The feed slurry of solids and liquid is fed through the inlet at a high velocity obtained by steady pressure of twenty-five **(25) psi**. The high velocity transmitted to the feed section creates a spinning velocity and resulting centrifugal forces. The vortex finder causes the stream to spiral downward towards the underflow solids discharge. Centrifugal force and inertia causes solids to settle outward toward the hydro cyclone wall, in a downward spiraling stream.

The solids separate according to size and weight of the particles. In the density range of solid particles in drilling fluids, size is of far more influence than the variations in density so that basically the biggest particles settle first and fastest.

The cone section narrows, inner layers of the downward spinning liquid turn back toward the overflow because of the increasing centrifugal forces near the center.

In the TRI-FLO's hydro cyclone, as the last of the liquid moves to the center and back upward toward the overflow, the downward spiraling solids continue out the apex, not being able to turn back because of their greater inertia and high downward velocity. Therefore, the actual solids removal at the underflow is by inertia, not by settling. The underflow rate and density varies with the volume and size of solids being separated to the underflow.

The TRI-FLO 16-4" Fluid separator can handle up to 1040 GPM of drilling fluid.
The TRI-FLO 8-4" Fluid Separator can handle up to 520 GPM of drilling fluid.
The TRI-FLO 6-4" Fluid Separator can handle up to 390 GPM of drilling fluid.
The TRI-FLO 4-4" Fluid Separator can handle up to 260 GPM of drilling fluid.
The TRI-FLO 2-4" Fluid Separator can handle up to 130 GPM of drilling fluid.

The underflow from the fluids, even under extreme conditions, will be approximately 40 GPM and ordinarily under 30 GPM. This makes it possible to use fine mesh screen (150-200 mesh) to clean all of the mud returning from the bore hole. 200 mesh screens have openings of 74 microns and the 150 mesh screens have openings of 104 microns. Theoretically, particles smaller than these openings should remain with the mud and larger particles and would be carried off the end of the shaker.

ADJUSTMENTS

The TRI-FLO Fluid Separator is operated at **25 psi** of pressure. A six (6) inch butterfly valve should be placed in the discharge line between the centrifugal pump and the manifold inlet. This valve would be used for adjusting the manifold pressure to 25 psi.

Each hydro cyclone has a two (2) inch butterfly valve located before the feed inlet. This valve permits the operator to turn off each hydro cyclone individually for system balance and removal of the hydro cyclone, without shutting down the entire system. TRI-FLO does not recommend this valve to be used as a flow adjustment and should be either fully open or fully closed.

The siphon tubes, located on the top of the overflow tubes are an adjustment of the underflow. When the siphon tube is completely down, the air entering the apex bushing is increased and less drilling fluid is permitted to spray out the apex of the hydro cyclone.

When a more wet underflow with more fine solids is desired, the siphon tube should be raised. This adjustment will reduce the amount of air permitted through the apex and cause a wetter underflow to travel to the shaker screen. The distance the siphon tube should be raised will vary with the drilling conditions and no hard fast rule will apply.

The apex nut and apex bushing are designed for easy removal when plugging becomes a problem and are adjustable to permit the required amount of spray discharge desired. When a smaller opening is necessary tighten the apex nut to the desired setting. The tighter the adjustment the less air permitted to enter the bottom of the hydro cyclone. At times when plugging is a problem, the apex nut and the apex bushing can be removed. This may be necessary when drilling a surface hole or when large amounts of sand are present.

CAUTION:
Over tightening of the apex nut and apex bushing will cause the hydro cyclone to become plugged. When the hydro cyclone becomes plugged severe erosion will occur in the feed section of the hydro cyclone and may damage the interior of the hydro cyclone. The damage will first be noticed in the zone of maximum wear on Figure 1 and may make the hydro cyclone virtually useless.

The TRI-FLO hydro cyclone consists of a feed section, cone section, apex nut, apex bushing and a clamp.

LOCATION

The TRI-FLO Fluid Separator should be mounted level on the mud tank next to the Shale Shaker. The centrifugal pump supplying the TRI-FLO Fluid Separator should have the suction in the compartment of the Shale Shaker discharge if a degasser is not used. If a degasser is used, the TRI-FLO Fluid Separator suction line should be in the compartment of the degasser's discharge. The TRI-FLO Separator should have a six (6) inch supply line from a separate centrifugal pump to the manifold inlet. See page 22.

MAINTENANCE

The TRI-FLO Fluid Separator is a high performance piece of mud equipment and requires a regular maintenance program.

Hydro cyclone wear and performance is highly dependent of the feed pressure and the conditions of the hydro cyclones. The pressure should never exceed 25 psi, as more than 25 psi will cause excessive wear on the hydro cyclones.

Damaged or worn, hydro cyclones will not separate the fine drill solids from the drilling fluid and need to be checked periodically for wear.

TROUBLESHOOTING

PROBLEM: Pressure at the manifold too low:

CAUSE: Is the pump impeller large enough to deliver 25 psi?
Is the pump speed correct?
Is the supply line from the pump to the manifold six (6) in diameter?
Is the pump supplying any other piece of equipment?
Is the supply line to the manifold plugged?
Is the centrifugal pump suction plugged?

PROBLEM: No underflow or too little underflow:

CAUSE: Is the feed pressure at 25 psi?
Is the apex bushing plugged?
Is the apex bushing closed too tightly?
Are there fine-drilled solids in the mud?
Is the valve to the hydro cyclone open?
Is the pump running?

PROBLEM: Too much underflow:

CAUSE: Is the hydro cyclone feed suction or cone section damaged?
Is the apex bushing in the hydro cyclone?
Is the pressure too high?

INSTALLATION

POWER REQUIREMENTS

Connect the power cable from the motor starter switch to the rig power supply. Connect the green insulated wire to ground.

The TRI-FLO 123E Shale Shaker is wired at the factory for 460 V.A.C. 3 phase, 60 Hz or 380 V.A.C. 3 Phase, 50 Hz. depending on the application.

If 230 V.A.C. 3 phase 60 Hz. is needed it is necessary to:

1. Rewire the motor. (See page 26)
2. Replace overloads.

Turn the starter switch on and check the motor rotation. The top of the counterweights should travel in the same direction as the flow of the mud. This is from the “possum belly flume” of the shaker to the “solids discharge end.”

If the rotation is incorrect, change any two of the red, black or white wires at the motor control panel. The green wire should always be ground and would not effect the rotation of the motor.

Refer to Section 5 of the Vimarc Motor manual (Electrical Connection).

SCREENS

The procedure to installing or changing screens on the 123E Shale Shaker is as follows:

1. Remove the tension lock nuts, washers, tension springs, tension bolts and tension rail plates from the screen box. (See tension plate detail).

2. Install or check the decking rubber for wear and make sure the rubber is sitting on the screen support bars properly.

3. Install the screen in position, leaving equal space on each side. When installing the screen be careful not to bend or crease the screens.

4. Put the tension plates in position with the bolts extending through their respective holes in the side of the plates of the screen box. The tension rails should only touch the hood strips and not the screen.

5. Install the springs, washers and lock nuts. Tighten the tension lock nuts to expose 1/8" of the threads, starting at the center and working toward each end.

6. Check the screen for creases and ripples. If any appear, the hook strips are not even. Work out the wrinkles by hand by adjusting the position of the hook strips and by smoothing the screen cloth by hand.

7. Tighten the center tension lock nuts to expose 5/8" of threads, then tighten the other nuts the same amount, working from one side and then the other.

8. Tighten the nuts enough to fully compress the tension springs. Rap the tension plate and the tension bolt heads lightly with a hammer to insure that the bottom of the tension plate is parallel to the support bar. After fully compressing the springs they will maintain tension on the screens. It is recommended that after three (3) hours of running the tension nuts should be retightened.

9. Wet the screens with water (or diesel when using oil mud) before diverting mudflow over the screen.

LUBRICATION

Refer to Section 7 of the Vimarc Motor manual (Relubrication).

ADJUSTMENTS

Refer to Section 6 of the Vimarc Motor manual (Adjustment of Centrifugal Force Output).

The intensity of vibrations may be varied to suit conditions by changing the position of the adjustable counterweights. Position of 100% gives the maximum, and each successive notch or setting reduces the motion. Position of 0% gives the minimum intensity of vibrations. IT IS IMPORTANT THATBOTH COUNTERWEIGHTS HAVE THE SAME SETTING. This is easily checked by a scale located on both inner counterweights.

MAINTENANCE

INSPECTION

Since the TRI-FLO High Speed Shale Shaker is a vibratory machine, it is important to correct all minor troubles before serious damage develops. Replace faulty support springs and any missing bolts at once. Cracks forming in the structure (usually at or near the joints) and unusual noises and motion are signs of developing failure. Drill 1/4" holes through the ends of such cracks and consult TRI-FLO at once in the event of such failures. **Warning: if welding is done do not ground welder through vibrating screen.**

Refer to Section 8 of the Vimarc Motor manual (Replacement of Bearings).

CHANGING THE SPRING COILS ON VIBRATING DECK

The spring coils on the vibrating deck should be checked every 6 months. When the spring shrinks or collapses to less than 4 inches they should be replaced. A new spring measures 4 1/2 inches. This is done by lifting the shaker box, removing the old springs, and installing the new ones.

VIBRATORY MOTOR

1. Check for loose bearings.

2. Check the mounting bolts.

3. Inspect the power cable for wear between the switch and the motor.

TROUBLESHOOTING

VIBRATOR MECHANISM

OVERHEATING OF THE BEARING

1. CAUSE: Low voltage
   SOLUTION: Adjust to recommended 460V 60 hz.

2. CAUSE: Loss of phase.
   SOLUTION: Check connection inside of motor junction box and at bottom of starter overload.

3. CAUSE: High ambient temperature caused by handling hot material or by surrounding condition.
   SOLUTION: Ventilate area or use high temperature lubricant.

NOISY BEARING

1. CAUSE: Bearing Failure caused by mentioned reasons.
   SOLUTION: Replaced bearings: take necessary precautionary steps to avoid reoccurring failure.

2. CAUSE: Normal fatigue failure associated with the vibrator service identified by spalling or roller and inner race at the high load zone.
   SOLUTION: Replace bearings; see assembly instructions.

ERRATIC VIBRATION OR PERFORMANCE

1. CAUSE: Shaker not up to speed.
   SOLUTION: Check your connections.

SHORT SCREEN LIFE

1. Careless handling and installation.
2. Failure to clean all support surfaces prior to screen installation.
3. Improper tension during installation.
4. Tension plates not seated properly
5. Cuttings build up under the edge of the screen.
6. Worn deck rubber.

SAFETY

No person should stand, hold or lean against the vibrating frames. Vibrations transmitted to the human body can be harmful. These screens are not therapeutic devices.

Because of the motion of the vibrating screen it is impossible to service the shaker while in motion. Never lay tools or spare parts on the screens. **Only trained personnel should operate or repair this shaker.**

RECOMMENDED LUBRICANTS

Shell Oil Co.	Alvania No. R-3 (for Vimarc only**)
Texaco Inc.	Multifax No. E P-2
Gulf Oil Co.	Crown No. 2
Chevron Oil Co.	Duralith No. E P-2
Mobil Oil Corp.	Mobilux E P-0,1,2
Universal	Mollux No. 3400
Citgo	Mystik SX-6 Extreme Temp. -65 to 350 degrees
Citgo	Mystik JT-6 High Temp.

Refer to Section 7 of the Vimarc Motor manual (Relubrication).

SCREEN SIZES / PART NUMBERS

TRI-FLO 2’ X 3’ STANDARD SCREEN	TRI-FLO PART NO.
20 Mesh Screen	03-00-030
30 Mesh Screen	03-00-031
40 Mesh Screen	03-00-032
50 Mesh Screen	03-00-033
60 Mesh Screen	03-00-034
80 Mesh Screen w/BUVLB	05-00-483
100 Mesh Screen w/BUVLB	05-00-484
120 Mesh Screen w/BUVLB	05-00-468
150 Mesh Screen w/BUVLB	05-00-473
160 Mesh Screen w/BUVLB	05-00-486
180 Mesh Screen w/BUVLB	05-00-474
200 Mesh Screen w/BUVLB	05-00-476
250 Mesh Screen w/BUVLB	05-00-490
325 Mesh Screen w/BUVLB	05-00-491

**BUVLB – With Back Up Laminated Backs
When ordering screens they should be ordered in pairs. Both screens should be replaced at the same time.

TRI-FLO 2’ X 3’ Layered with 2” Plastic Perforated Backing

80 Mesh	05-00-450
100 Mesh	05-00-461
120 Mesh	05-00-453
180 Mesh	05-00-458
200 Mesh	05-00-452
250 Mesh	05-00-456

RECOMMENDED SPARE PARTS

Always order spare parts from **TRI-FLO INTERNATIONAL, INC**. This is particularly true of bearings, which may not be available from the local bearing sources because of the special internal clearance requirements.

It is advisable to stock the following spare parts so that breakdowns can be repaired promptly and costly delays eliminated.

123E Shale Shaker spare parts list.

Name of Part	Qty.	Tri-Flo Part No.
Deck Rubber	18	03-00-004
Deck Spring	2	03-00-005
Tension Bolt Assemblies	12	03-00-006
Tension Rail	4	03-00-007
Tension Bolt	6	04-00-107
Tension Bolt Nut	6	04-00-150
Tension Spring	6	05-00-350
Tension Bolt Washers	12	04-00-177
Motor Mount	1	03-03-591
Vimarc Motor	1	01-01-178

Recommended Spare Part for 4 Cone Fluid Separator or Sand/Silt Separator.

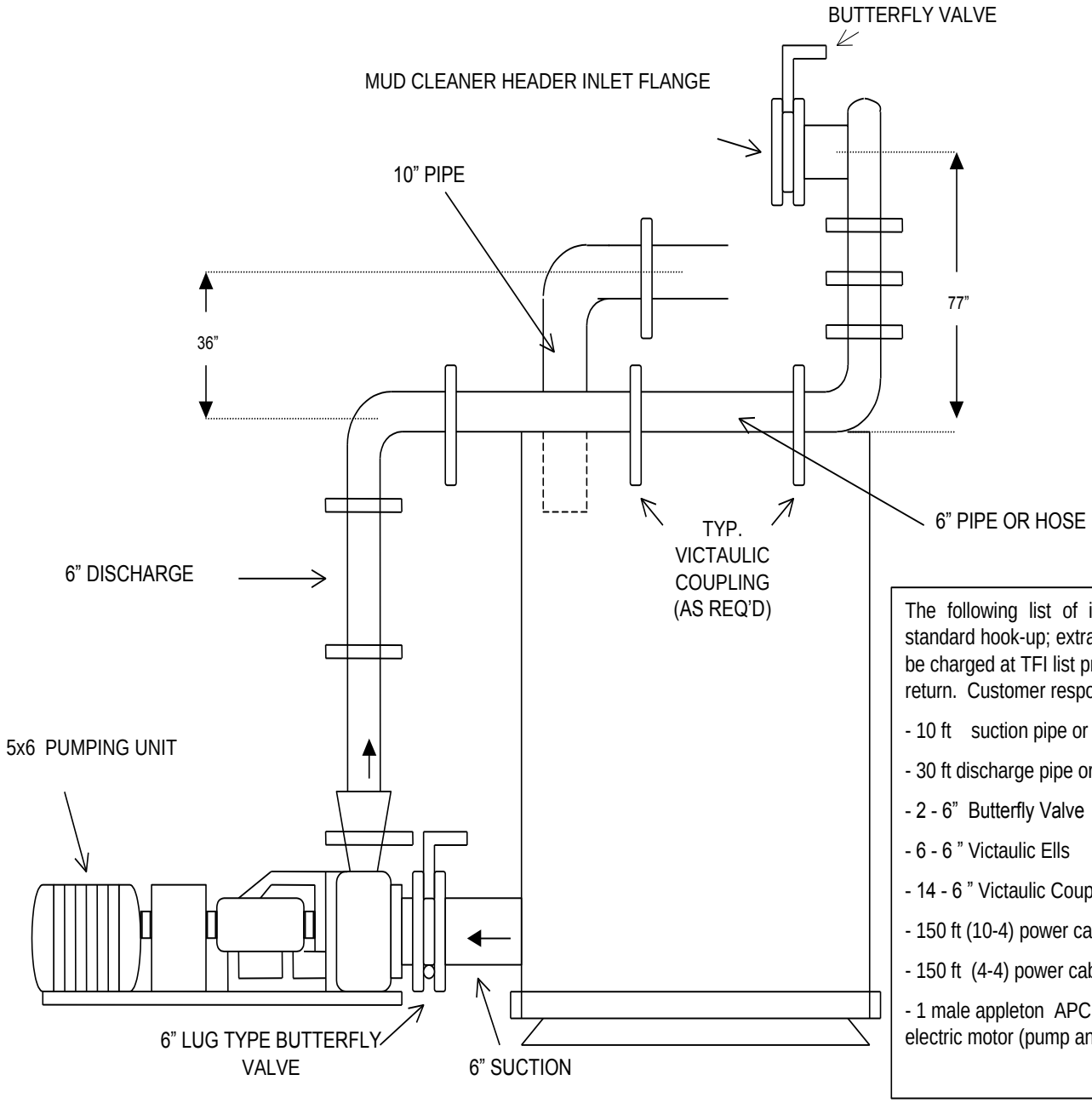
Name of Part	Qty.	Tri-Flo Part No.
Hydro cyclone Complete 4”	4	03-00-044
Victaulic Coupling 2”	12	00-00-047
Victaulic Gasket 2”	12	00-01-008
Siphon Rod Seals	4	01-00-011
Pressure Gauge	1	02-00-020
Apex Bushing	4	03-00-048
Apex Nut	4	03-00-047

TRI-FLO PARTS PRICE LIST

TFI 123E SHALE SHAKER

Part No.	Description
03-00-004	Deck Rubber
03-00-006	Tension Bolt Assembly
04-00-014	Tie Down Assembly
03-00-007	Tension Rail
03-00-005	Deck Spring
04-00-107	Tension Bolt
04-00-150	Tension Bolt Nut
05-00-350	Tension Springs
04-00-177	Tension Bolt Washers
03-03-591	Vimarc Motor Mount
01-01-178	Vimarc Motor (60 Hertz)
01-01-143	Vimarc Motor (50 Hertz)
03-00-004	Deck Rubber
03-00-006	Tension Bolt Assembly
04-00-014	Tie Down Assembly
03-00-007	Tension Rail
03-00-005	Deck Spring
04-00-107	Tension Bolt
04-00-150	Tension Bolt Nut
05-00-350	Tension Springs

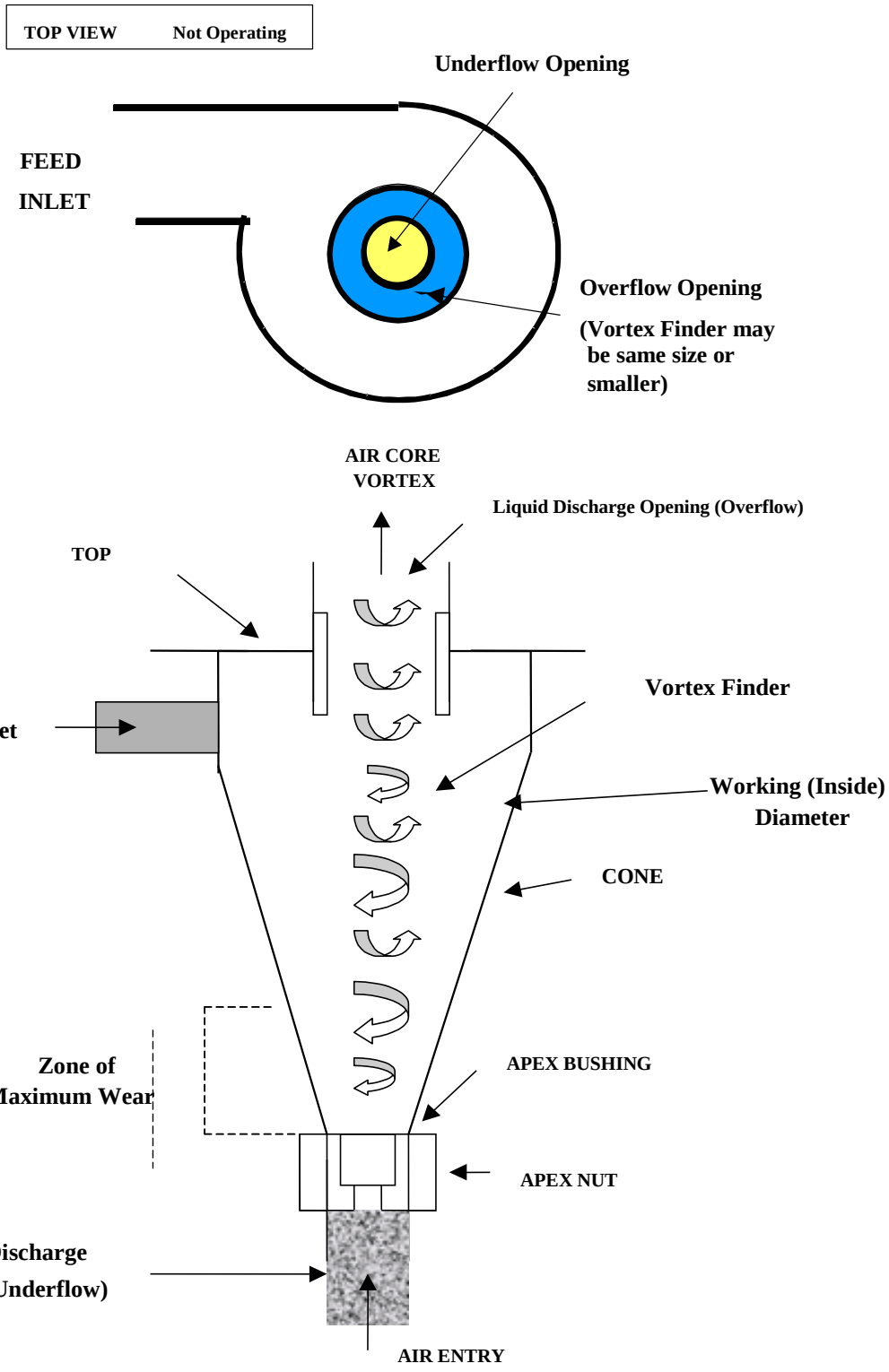
Drawing - General Hook-up for Mud Cleaner/Sand Silt Separator



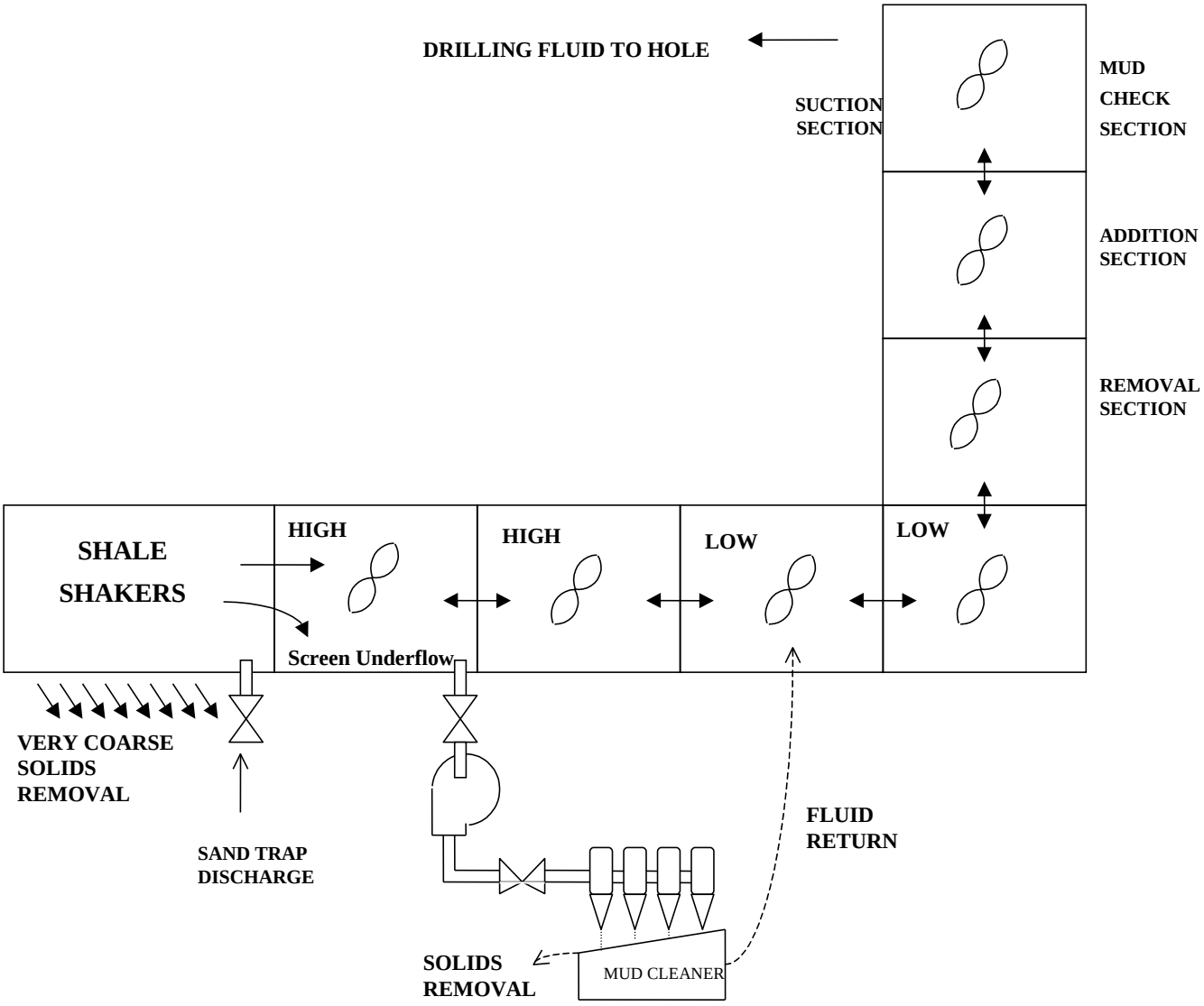
The following list of items are considered standard hook-up; extra material required will be charged at TFI list price and credited upon return. Customer responsible for welding:

- 10 ft suction pipe or hose
- 30 ft discharge pipe or hose
- 2 - 6" Butterfly Valve
- 6 - 6 " Victaulic Ells
- 14 - 6 " Victaulic Coupling
- 150 ft (10-4) power cable (shaker)
- 150 ft (4-4) power cable (pump)
- 1 male appleton APC 1034 plug per electric motor (pump and/ or shaker).

Drawing: Spray Discharge of Hydro cyclone



Drawing: Location Diagram



Drawing: Mechanical Solids Control of Weighted Drilling Mud

Centrifuge

Removes low gravity solids and Barite smaller than 15 microns.

Returns smaller solids to active mud system.

Operates on small fraction of total mud system.

Mud Cleaner

Removes drilled solids larger than 74-105 microns before they degrade onto ultra fine solids, which cause viscosity build-up. Small amounts of oversized Barite and some colloidal Barite may be removed with drilled solids.

Returns smaller solids including barite to active system.

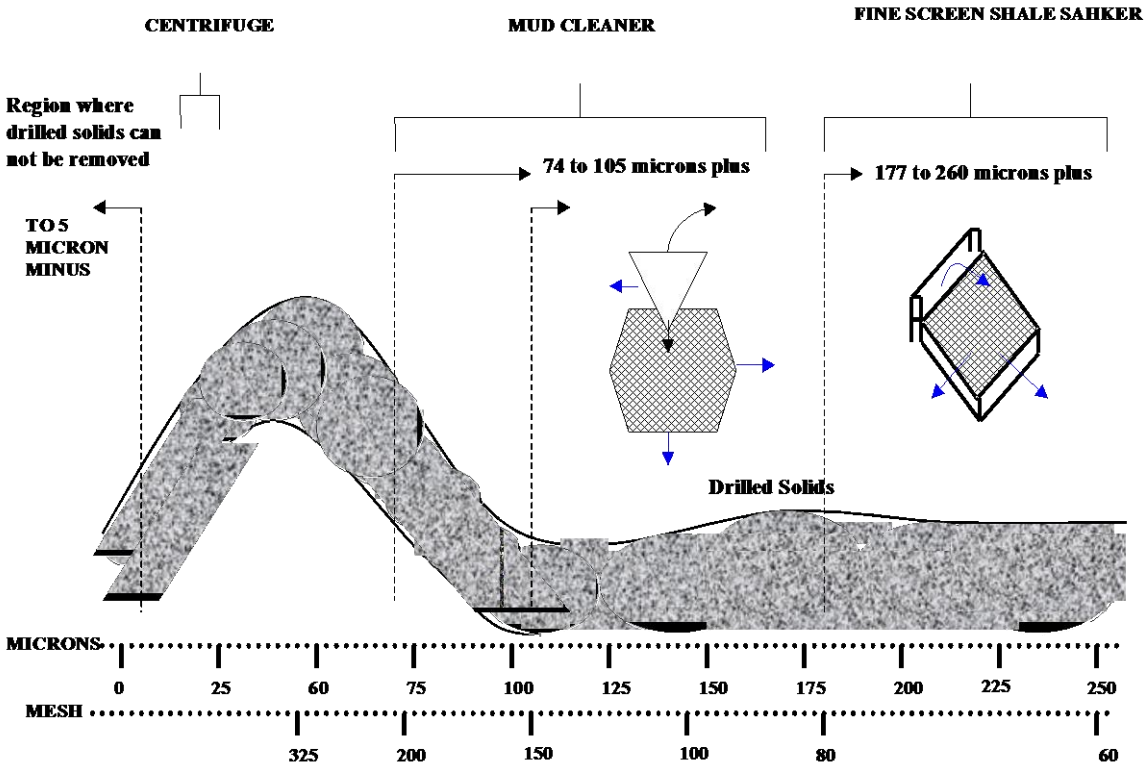
Operates on entire circulating volume.

Fine Screen Shale Shaker

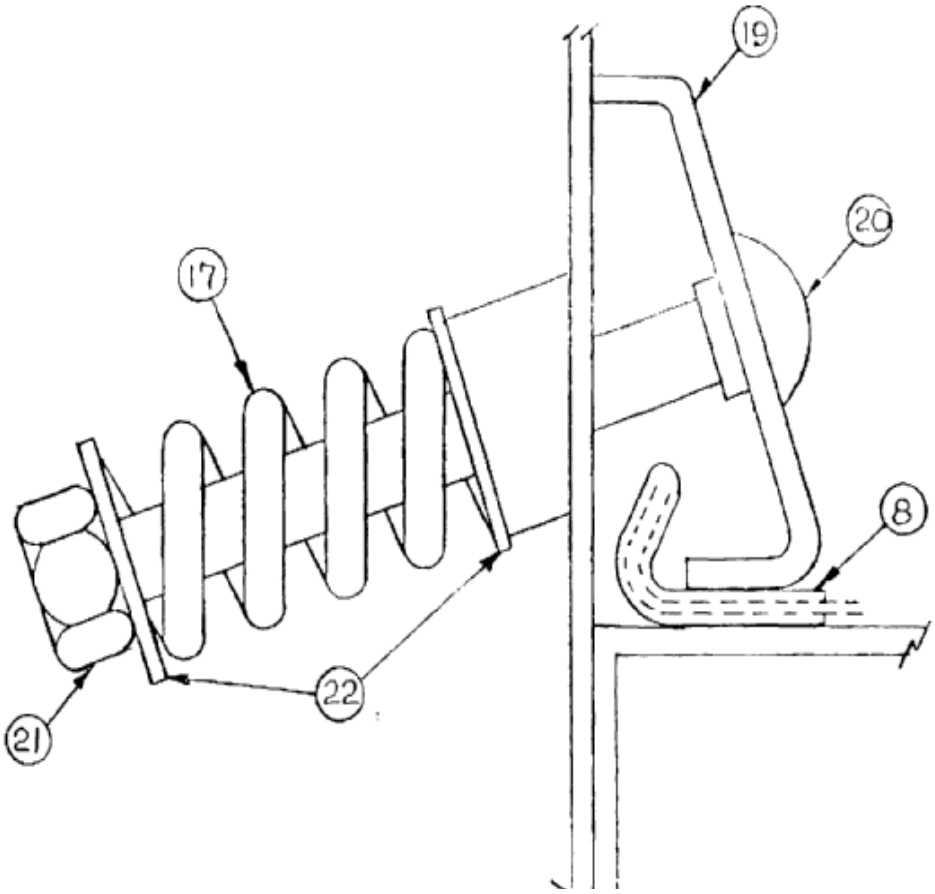
Removes drilled solids larger than 177-260 microns. Small amounts of colloidal barite may be removed with drilled solids.

Returns smaller solids to active mud system.

Operates on entire circulating volume.



TENSION PLATE AND SCREEN ASSEMBLY



Part	Tri-Flo Part No.
Tension Bolt Assembly (includes bolt, nut spring, & 2 washers)	03-00-006
Tension Bolt (Item 20)	04-00-107
Tension Spring (Item 17)	05-00-350
Tension Lock Nut (Item 21)	04-00-150
Tension Washer (Item 22)	04-00-177
Tension Rail Plate	03-00-007

COMMON OILFIELD SHAKER SCREENS

Mesh	Wire Diameter	Opening Inches	Opening Microns	Open Area
8x8	.028	.097	2464	60.2
10x10	.025	.075	1905	56.3
12x12	.023	.060	1524	51.8
14x14	.020	.051	1295	51.0
16x16	.018	.0445	1130	50.7
18x18	.018	.0376	955	45.8
20x20	.017	.033	838	43.6
8x20	.032/.020	.093/.030	2362/762	45.7
20x30	.015	.035/.0183	889/465	39.5
30x30	.012	.0213	541	40.8
30x40	.010	.0233/.015	592/381	42.5
40x36	.010	.015/.0178	381/452	40.5
40x40	.010	.015	381	36.0
50x40	.0085	.0115/.0165	292/419	38.3
50x50	.009	.011	279	30.3
60x40	.009	.0077/.016	200/406	31.1
60x60	.0075	.0092	234	30.5
70x30	.0075	.007/.026	178/660	40.3
80x80	.0055	.007	178	31.4
100x100	.0045	.0055	140	30.3
120x120	.0037	.0046	117	30.9
150x150	.0026	.0041	104	37.4
160x160	.0025	.0038	97	37.64
200x200	.0021	.0029	74	33.60

NOTES;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