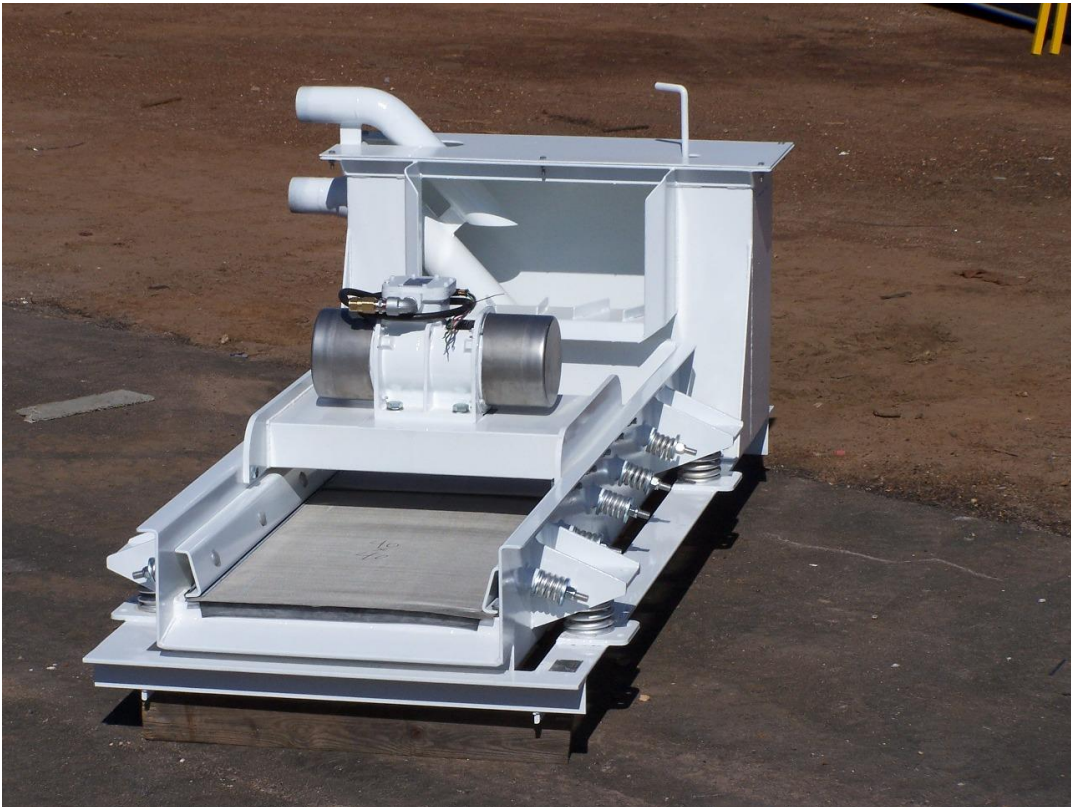




SERVICE & OPERATING MANUAL

126E SHALE SHAKER





TRI-FLO 126 HIGH SPEED SHALE SHAKER

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1.0 SAFETY

TURN OFF, LOCK OUT, & TAG OUT THE ELECTRICAL POWER TO ANY ELECTRICAL MOTOR OR OTHER EQUIPMENT BEFORE WORKING ON IT.

A MAIN POWER BREAKER SHOULD BE PLACED WITHIN SIGHT OF THE TRAILER(S).

ONLY TRAINED PERSONNEL SHOULD OPERATE OR REPAIR THE EQUIPMENT.

MOTORS SHOULD BE INSTALLED AND GROUNDED IN ACCORDANCE WITH LOCAL AND NATIONAL CODES.

NO PERSON SHOULD STAND, HOLD OR LEAN AGAINST ANY EQUIPMENT WHILE THE EQUIPMENT IS RUNNING. VIBRATIONS TRANSMITTED TO THE HUMAN BODY CAN BE HARMFUL.

The successful and safe operation of the equipment on this system depends on proper handling, installation, operation and maintenance.

WHEN USING SLINGS TO LIFT ANY EQUIPMENT BE SURE THE SLINGS ARE IN GOOD CONDITION AND ARE RATED FOR THE WEIGHT TO BE HANDLED.

INSPECT ALL WIRING ON A ROUTINE BASIS (DAILY) FOR DETERIORATION, FRAYING, CUTS, AND LOOSE CONNECTIONS



2.0 INTRODUCTION

GENERAL INFORMATION

The TRI-FLO 126 High Speed 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 126 High Speed SHALE SHAKER easily removes 74 micron, or larger size, particles for proper mud weight maintenance and efficient solids control. Balanced mud leads to longer pump life, less daily fluid maintenance expense improved desander and desilter efficiency, and better penetration rates.

TRI-FLO 126 High Speed SHALE SHAKER is mounted on a heavy-duty frame for added strength and stability. The screen box and deck are made of low alloy steel.

Vibrator amplitude may be changed from 0% - 100%. The adjustment is made by changing the position of the unbalanced weights. IT IS IMPORTANT THAT BOTH WEIGHTS BE ON THE SAME SETTING, AND IS CHANGED ONLY UNDER ADVISEMENT OF TRI-FLO. The vibrator assembly can be changed in the field quickly and simply.

TRI-FLO's deck construction employs two screens mounted flat. The lower frame contains the possum belly with the mud inlet at the side and the mud flume at the front.

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

TFI-126 Shale Shaker w/Possum Belly Shaker includes 3 HP, 230/460 VAC, 3 PH, 60 HZ, 1800 RPM or 190/360 50 HZ, U.L./C.S.A. (other voltages available) approved explosion proof motor with starter switch.

Equipped with (2) 2' x 3' screens (standard 30 mesh) or as specified by customer.

DIMENSIONS:

Length: 95"
Width: 3' x 8"
Height: 41.5"
Weight: 1,450 Lbs.
Volume: 300 GPM



3.0 MAINTANENANCE

ADJUSTMENT OF CENTRIFUGAL FORCE OUTPUT

Vibrator motors leave the factory with the adjustable centrifugal weights positioned at 0% to minimize the possibility of damaging the bearings while in transport. The procedure to adjust the centrifugal force output is the same for explosion proof and standard models. The centrifugal weights of the vibrator motor can be reset to any percentage in order to obtain the working moment and centrifugal force to produce the required amplitude or stroke of the machine by the following procedure:

- 1) Detach and remove both weight covers.
- 2) Loosen both camping bolts to release the inner centrifugal weights and rotate each inner weight equally, relative to outer weights, in the same direction (see warning). Outer weights are keyed on the shaft and thus fixed. These outer weights are provided with a marking line and the inner weights have a scale. If a marking line is not visible, utilize the edge of the outer weight. The scale on the inner weights represents a percentage value of the total maximum centrifugal force available.
- 3) Retighten the clamping bolts. Retighten the clamping bolts to the proper torque values as shown in Section 4 of the Vibrator motor manual.
- 4) Refit and secure both weight covers. Make sure that the o-ring seal of the weight covers are in a "like new" condition.

WARNING! EXCEPT FOR SPECIAL APPLICATIONS, IT IS ESSENTIAL THAT THE WEIGHTS AT BOTH ENDS OF THE MOTOR SHAFT ARE SET AT PRECISELY THE SAME PERCENTAGE VALUE. ANY UNEQUAL SETTING OF THESE WEIGHTS WILL GENERATE TREMENDOUS TRANSVERSE FORCES WHICH MAY RESULT IN INJURY OR DESTRUCTION OF YOUR VIBRATING EQUIPMENT.

RELUBRICATION

Of the standard (non-hazardous locations) Vibratory motors, only two pole models, series C up to and including F, and also all G, H, and K motors are delivered with grease fittings. Any model not fitted by the manufacturer with grease fittings does not require regreasing for the B-10 life of its bearing. However, grease fittings may be ordered even for such models and then the procedure for regreasing should be followed.

Note: None of the explosion proof (hazardous locations) motors are fitted with grease fittings, except for the "G" series.



Relubricate using a lithium hydroxystearate grease, such as Shell Alvaniz R3 or equal, after the first 500 operating hours, and every 1000 operating hours thereafter in the following quantities:

Model	Grams per Grease Fitting
A and B	3
C and D	5 – 10
E and F	10 – 15
G	15 – 20
K	20 – 30
H	20 – 30 (IF equipped w/NJ 2319 bearings)*
H	30 – 40 (IF equipped w/NJ 2322 bearings)*

*see motor rating plate

Lubrication above the recommended quantities can be harmful to the bearing life of the motor.

VIBRATOR ROTATION

The direction of rotation is normally with the flow of the material. In some situations, for a different retention time, the rotation can be opposite the flow of the material (counterflow). Changing from one to the other is done by reversing the electrical leads to the motor.

Other factors such as screen incline and vibrator speed may be adjusted under some circumstances, under the guidance and direction of TRI-FLO INTERNATIONAL, INC.

INSPECTION

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 THRU VIBRATING SCREEN**

REPLACEMENT OF BEARINGS

The bearing type is specified on the rating plate of your Vibratory motor. It is usually a cylindrical roller bearing. The inner and the outer race of the bearing have raised collars, providing a lateral bearing surface for the rollers to take up the axial load on the bearing. As long as your Vibratory motor is properly installed and maintained as specified in the Manual, the bearing life will not be affected by normal thrust loads during operation.



WARNING! Vibratory explosion proof models conform to code FM 3615, that makes high demands upon the tolerances of the fittings between bearing housing and stator housing, and between the bearing housing and the spacers, which are shrunk on the shaft. When changing bearings on the explosion proof models, the above mentioned fittings must be checked to ensure they are still in accordance with the code to maintain the explosion proof certification.

Note: The following procedure for replacement of bearings is the same for explosion proof and standard models. (Reference the Vibratory Motor Manual)

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.

RECOMMENDED LUBRICANTS

Shell Oil Co.

Alvania R3 or equal



4.0 START UP

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. (See tension plate detail on Figure 3)
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 compress the tension springs to a card thickness between the coils. Rap the tension plate and tension bolt heads lightly with a hammer to insure that the bottom of the tension plate is parallel to the support bar. After compressing the springs they will maintain tension on the screens. It is recommended that after 3 hours the tension nuts be retighten.
9. Wet the screen with water (or diesel when using oil mud) before diverting over the screen.



5.0 OPERATION

The TRI-FLO 126 High Speed SHALE SHAKER is installed on the end of the mud tank and has a mud line attached to the possum belly from the pit pump. The drilling mudflows down the line into the possum belly, fills the belly, onto the mud flume, then onto the screens. After the mud passes through the screens it falls into the mud tank. The drill solids or cuttings are conveyed across the screen and then fall off the “Discharge End”.

The TRI-FLO 126 High Speed SHALE SHAKER should be mounted at the end of the mud tank. The TRI-FLO 126 High Speed SHALE SHAKER should be mounted with the inlet towards the flow line and the frame secured to the mud tank.

It is important that the TRI-FLO 126 High Speed SHALE SHAKER be mounted level. This will aid in an efficient operation.

After mounting remove the four shipping bolts. These bolts are located at each spring coil on the vibrating deck.

Connect a flow line between the pit pump and the mud inlet of the TRI-FLO 126 High Speed SHALE SHAKER.

If it is not desirable to permit the cuttings or solids to drop off the end of the screen, it will be necessary to mount the shale slide from the end of the TRI-FLO High Speed SHALE SHAKER to the shale pit. This slide should be as steep as possible. Water spray may be added to wash the cuttings into the shale pit.

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

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

Turn the starter switch on and check the motor rotation. The top of the centrifugal weight 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 junction box at the rig power supply. The green wire should always be ground and would not effect the rotation of the motor.



6.0 TROUBLESHOOTING

ELECTRIC MOTOR

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

VIBRATOR MECHANISM

Overheating of the Vibrator

1. CAUSE: Bearing fatigue failure.
SOLUTION: Replace bearings.
2. CAUSE: Loss of phase.
SOLUTION: Check voltage, phase to phase, and then phase to ground.
3. CAUSE: High ambient temperature caused by handling hot material or by surrounding condition.
SOLUTION: Ventilate area or use high temperature lubricant.

Lubricant Leakage

1. CAUSE: High temperature causes grease to become fluid and leak through the seals.
SOLUTION: Use high temperature grease.

Gritty Bearing

1. CAUSE: Entrance of grit while servicing or through the seals during operation.
SOLUTION: Flush bearing and cartridge and relubricate.



Noisy Bearing

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: Deck spring worn or broke.
SOLUTION: Replace.
2. CAUSE: Slow RPM.
SOLUTION: Check voltage.
3. CAUSE: Unit is not level
SOLUTION: Relevel the shaker with shims.

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.



7.0 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.

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

Name of Part	Quantity Each Part	TRI-FLO Part No.
Tension Bolt Assembly (includes bolts, nut, spring and 2 washers)	6	03-00-006
Spring, Coil (Vibrating Deck)	4	03-00-005

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/BU-2PB	03-00-035
100 Mesh Screen w/ BU-2PB	05-00-461
120 Mesh Screen w/BU-2PB	12-00-349
150 Mesh Screen w/ BU-2PB	05-00-457
180 Mesh Screen w/BU-2PB	03-00-037
200 Mesh Screen w/ BU-2PB	03-00-025
250 Mesh Screen w/ BU-2PB	05-00-386
325 Mesh Screen w/BU-2PB	05-00-496

When ordering screens they should be ordered in pairs. Both screens should be replaced at the same time.



**TRI-FLO PARTS LIST
TFI 126 SHALE SHAKER**

Part No.	Description
01-01-591	Motor Mount
01-01-178	Motor, .56hp 1750 RPM 60 HZ
01-01-140	Motor, .56hp 1475 RPM 50 HZ
03-00-004	Decking Rubber
03-00-005	Deck Spring
03-00-006	Tension Bolt Assembly
04-00-014	Tie Down Assembly
03-00-007	Tension Rail
04-00-107	Tension Bolt
04-00-150	Tension Bolt Nut
05-00-350	Tension Springs
04-00-177	Tension Bolt Washers
01-02-179	$\frac{3}{4}$ " Hawke Gland
00-00-130	$\frac{3}{4}$ " Street Elbow



8.0 MISCELLEANOUS INFORMATION

TIGHTENING TORQUES FOR HIGH-STRENGTH BOLTS.

Capscrew or bolt diameter, inches	Torque foot-pounds	
	Bolts	Capscrews
3/8"	41	47
1/2"	105	120
5/8"	210	210

FORCES

Forces generated by TRI-FLO's 126-vibration screen at various counterweight settings.

Settings	Unbalance (inch-lbs.)	Stroke (inches)	Forces (g's)
1	31.0	.101	4.4
2	29.8	.097	4.2
3	26.8	.087	3.8
4	21.9	.071	3.1
5	15.4	.050	2.2
6	8.0	.026	1.1



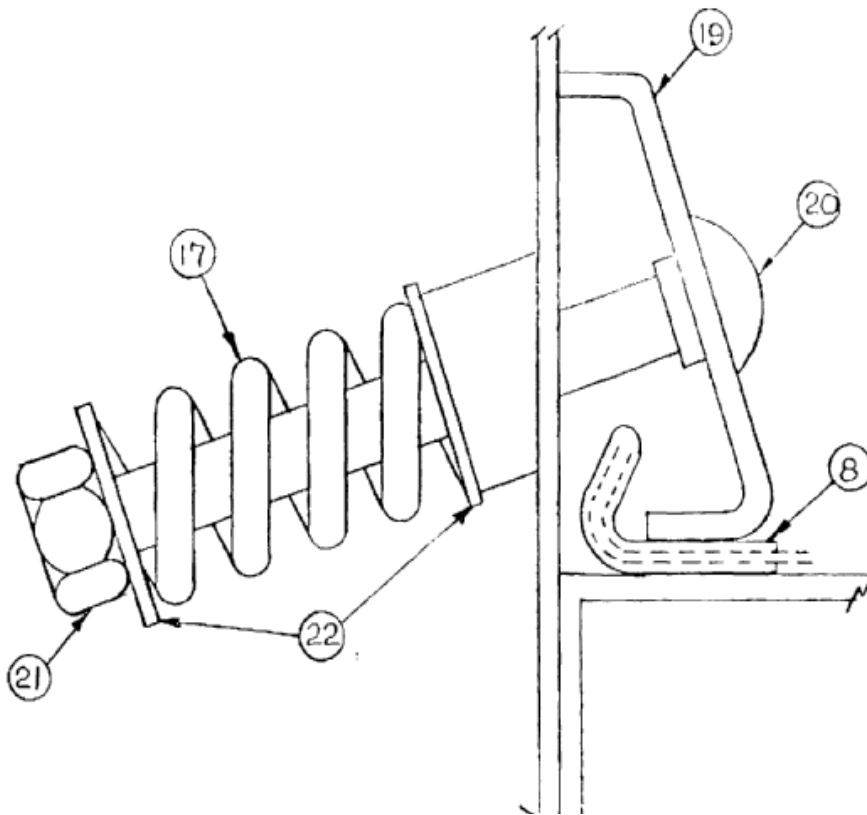
COMMON OILFIELD SHAKER SCREENS

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



Figure 3

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 & Hook Strip (8)



NOTES: