

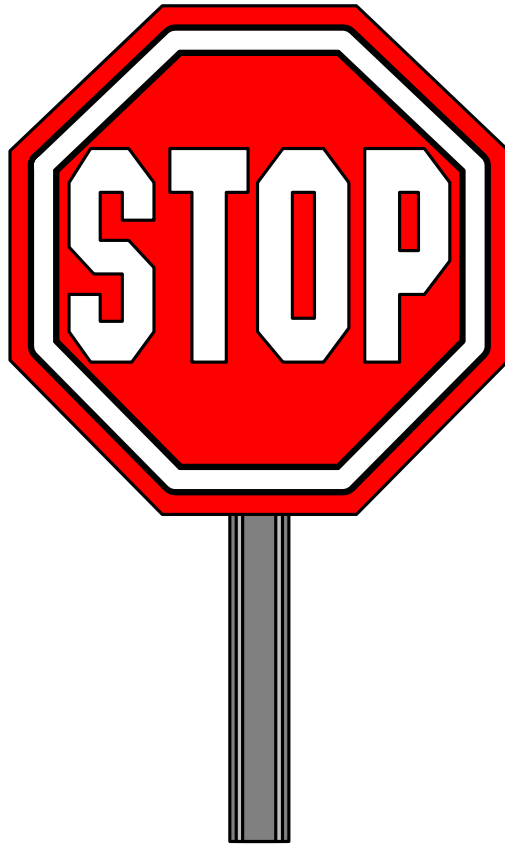


SMICO SHALE SHAKER

MANUAL



IMPORTANT!



SCREENER STORAGE

**Long Term Storage greater than
60 days may cause damage to
vibrator drive components.**

**Please consult
SMICO Manufacturing
for storage instructions.**

SMICO Manufacturing Co., Inc.
Oklahoma City, Okla. 73127
405-946-1461



INSTRUCTIONS AND PARTS FOR SMICO SHALE SHAKER

OPERATION

The primary function of the Shake Shaker is to remove the drilled solids from the weighted mud.

DESCRIPTION

The SMICO Shale Shaker is a solids removal linear separator. The Shale Shaker is mounted onto a steel skid and consists of essentially four elements:

1. Weir Tank (possum belly w/wedge-type by pass)
2. Shaker Screen Basket
3. Skid with tank
4. Electrical (including motors and starters)

The SMICO Shaker is normally capable of screening 12 to 15 barrels of mud per minute. This figure will vary depending on the amount of solids in the mud, the type of mud and the temperature of the mud.

INSTALLATION AND START-UP PROCEDURES

1. LOCATION

There are several possible locations for the SMICO Shaker on a rig.

- A. It may be set on the mud pit along side the rig shaker with a "y" connection installed from the rig flow line to the shaker, still leaving the rig shaker connected. When this is done, it is recommended that valves or other means of shutting off one or the other branch of the flow line be installed so that either the rig shaker, the SMICO Shaker, or both shakers may be operated as desired.
- B. The Shaker may replace the rig shaker. In this case the SMICO Shaker would be installed in place of the rig shaker.
- C. The SMICO Shaker may be set on the intermediate or suction pit and connections to it provided using the rig mud mixing system

The Shale Shaker should be located so that the outlet gates on one side or the other will deliver the screened mud into the pit or mud tank. When ever possible, the Shaker position would be such that these gates can be closed off and the gates on the opposite side opened. This allows flow from the shaker discharge pan over the side of the mud pit into the shale pit.

2. CONNECTION

The SMICO Shale Shaker is designed for a 10" inlet pipe in the surge tank. If the flowline or other inlet connection is a different size, it is intended that a suitable opening be cut out and a stub be welded to the surge tank. Connection can be made either by welding the assembly to the flow line or by using a dresser coupling.

3. LEVELING THE SHAKER

The shaking assembly should be adjusted level from side to side and from level to a slightly downward tilt or approximately 1/2" to 1" with the discharge end being lower.

4. TRANSIT BRACKETS

Remove the upper bolt on the transit bracket located on each of the four springs. Loosen the lower bolt and swing the transit bracket away from the spring, then re-tighten the lower bolt. Do not discard the transit brackets. They are required to stabilize the vibrator unit each time the mud cleaner is moved.

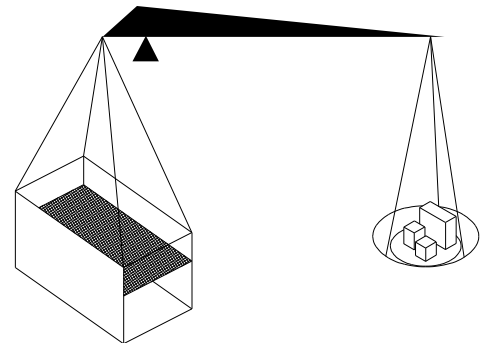


CONTROL YOUR PRODUCT

Your LINEAR series screener is fully adjustable to your product; Take full advantage of these exclusive features so you may obtain the most efficient results possible. Be sure the stroke, speed, and the angle of the machine are correct for your product. Do not guess! Check it!

BALANCE

SMICO LINEAR series of screeners are dynamically balanced. Dynamically balanced means the weight of the machine is counter balanced by the rotating counter weights, on the shafts, to produce the vibrating effects that are uniform across the entire screen area. This motion is effected by the loading of the machine and dramatic surge loading of the machine could produce undesired effects.



The weight of the machine is accurately counterbalanced. These counter weights are attached to the shafts, and are not to be changed unless additional weight is added to or removed from the machine. If weight is added or removed from the machine contact the factory for assistance in adding or subtracting counterweight. **NOTE: DO NOT** add skirt boards, wearing plates, chutes, feeders, or any other material to the live part of the machine. These structures will be subject to extreme dynamic forces and fatigue; In addition, they will change the balance of the screen. Such unbalance could cause serious problems such as premature bearing failure, destroying the motor, and transmitting excessive vibration to the structure, and other similar undesired effects.

ANGLE

The inclination at which the screening surface is operated plays an important part in the screening efficiency. If the angle is too great the material will pass over too rapidly, and will not be properly separated. If the angle is too slight, efficient separation may not be maintained, the capacity of the screen will be reduced, and material will tend to accumulate at the feed end of the machine, causing undue wear and breakage of the screen cloth. Proper inclination of the screen provides efficient separation and capacity.

The deck construction or screen body is held in position by springs at each of the four corners of the machine. These springs should be vertical during operation. Consult the factory for more than minor changes in the inclination.

AWD (Adjustable while drilling) ANGLE CONTROL



The deck angle can be adjusted from -1 degree to +5 degree with the manual operated jack or electric operated jack (optional equipment).

To adjust the deck angle, loosen the 6 bolts on each of the two front spring mounts. The spring mounts can be raised or lowered by using either jack by turning the hand crank clockwise or counter clockwise.

The two jacks are internally connected so both spring mounts adjust uniformly from either jack.

After angle adjustments are made, retighten the 6 bolts on each spring mount

STROKE

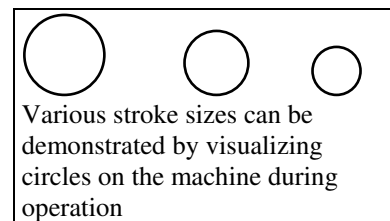
The SMICO LINEAR Shale Shaker uses a rugged vibrator drive to impact a Linear vibration pattern. The Linear drive has been designed to produce a 3/16 stroke for optimum solids conveyance.

The stroke can be measured in one of two ways.

First, a dot can be placed on the side of the machine and the length of the line the dot makes when the machine is in operation is the stroke.

Second, a stroke gauge can be used to determine the stroke.

A small stroke gauge is made up of a number of circles with specific diameters. One of those diameters must correspond to the stroke of the machine. The diameter of the circles corresponds to the number below the circle. When this gauge is placed on the side of a machine the circles will blur. There will be one blurred circle where the two extreme circles come together in the middle at one point. The diameter of that circle will be the stroke.



The stroke of the LINEAR series of screeners can be changed by adding or removing counter weight that is laminated on the shafts. It is imperative that the two shafts must have the same amount of counter weight. **NOTE:** Changes in the counter weight will cause changes in the stroke; this **stroke change requires a speed change**. Please refer to the section on speed for proper speed selection. **Consult the factory for any dramatic changes in the operation of the equipment.** Improper changes to the stroke and speed could result in severe damage to the machine.

SPEED

The SMICO Linear Shale Shaker has been designed to operate at 1324 RPM for optimum solids conveyance and higher fluid capacity

GENERAL INFORMATION

SMICO screens operate at speeds from 800 - 1500 RPM, and they normally operate with strokes from 1/8" - 1/4". The speed is inversely related to the stroke for energy limits. For example:

1/8" stroke	1300 - 1600 RPM
3/16" stroke	1200 - 1300 RPM
1/4" stroke	1000 - 1200 RPM
3/8" stroke	800 - 1000 RPM

These machines should not be operated outside these limits. If the speed is too slow the machine will not operate at maximum capacity; yet if the speed is too great the bearings will become overloaded, which results in premature bearing failure.

Generally a stroke of 3/16 and a speed of 1250 RPM is efficient in screening most materials. In other cases a slower speed with larger stroke works well for larger size material, and faster speed with smaller stroke works well for smaller material.

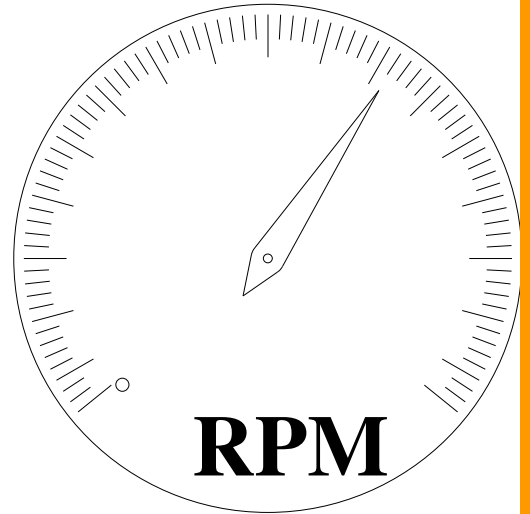
Speed on a SMICO screen may be controlled in either of two ways. First, the speed can be controlled by using a variable speed motor or motor controller. Second, the speed can be changed by sheave selection. Single speed v-type sheaves are standard on SMICO screens. These sheaves are sized to give the speed our tests and experience indicates most desirable for the job.

SCREEN CLOTH SELECTION

Screen cloth selection is very important in order to obtain proper results, to eliminate screening problems, and to avoid costly maintenance and replacement. Screen cloth should be selected by considering three aspects.

FIRST:

The first aspect is maximum open area. When the open area is maximized, the capacity and efficiency of the screen are at their peak; however, the screen life is greatly reduced, and frequent replacement will be required. The open area of a screen cloth can be increased by decreasing the wire size used in making the screen cloth.



SECOND:

The second aspect is maximum screen life. When screen life is at its maximum, the life of the screen is increased causing less frequent screen replacement, and fewer down times; however, when screen life is high the capacity of the screen is low. Increasing the wire size used in making the screen cloth can increase the life of a screen cloth.

THIRD:

The third aspect is corrosion resistance. With a high corrosion resistant screen the screen will hold up longer from chemical materials such as water or acid; Yet, a screen with a high corrosion resistance is costly, and may be hard to locate, and have a long delivery schedule.

The hooks on the outside edges of the screen cloth should vary depending upon the wire diameter of the screen cloth. For lighter than 16 GA cloth the hooks need to be double bent sheet metal shrouds, to prevent the screen cloth from pulling loose when the screen cloth is tightened. Screen cloths from 16 GA to 8 GA wires need only a single fold sheet metal shroud. Wires heavier than 8 GA are strong enough to allow tensioning without any shroud.

In addition to this, specialty screens can be furnished for your particular needs. Some of these types of screens are perforated plate, slotted screens, music wire screens, flat top screens, synthetic screens, and many others. If you need further information on screen cloth selection consult the factory.

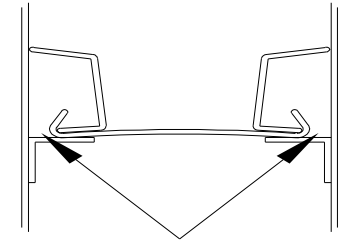
SCREEN CLOTH REMOVAL

1. Loosen the tension bolts on each side. These are the bolts holding the tension rail that stretches the screen cloth. The nuts should be backed off sufficiently to allow easy sliding of screen hooks along the tension rail or to allow the tee head bolt to disengage the tension rail. (Be sure that ALL tension bolts have been loosened.)
2. Stand at the end of the machine and slide the screen out, pulling it squarely toward you. Care should be exercised that when the screen is almost all the way out, that it is held level until it's completely out.

SCREEN CLOTH INSTALLATION

1. The inside of the screen body should be thoroughly washed or wiped clean. Be sure that all surfaces are free from debris and that there are no cuttings or other foreign material caught beneath the screen when it is installed.
2. Make sure tension rails are pulled out as far as the slack in the tension bolts will allow, or insert the tee head bolt and turn 90°

3. Now insert the new screen cloth. Start one side of the screen hook strips under the tensioning rail and slip it in slightly. Start the opposite side in the same manner and with the screen square; push it into the screener.
4. The screen is in place when the hook strips on the screen are flush with each end of the screener.
5. Hand tighten the four corner tensioning nuts so that there is an equal amount of space between the hook strips and the wall of the screener on all four corners.
6. Tighten the remaining nuts hand tight.
7. Starting with the nuts in the CENTER of the tension rail and working out to the ends, slightly tighten two bolts on one side; then move to corresponding two bolts on opposite side and tighten in equal proportions. Repeat process moving from the center to the ends until screen feels tight and even.
8. Check the cloth tightness by feeling of the cloth for loose spots. The screen cloth must be drum head tight. Life of the screen cloth and efficiency of separation depend on there being no loose areas in the cloth. Any loose spots must be removed by tightening the tension bolts in the vicinity of the loose spot. If this does not correct the problem consult the factory.
9. Run the screener for about 30-40 minutes. Then stop the machine and re-tighten the tension bolts. This is important since the weave of the screen will allow it to take a certain set during the first few minutes of operation and will allow slack to develop in the screen.
10. Again, re-tension after running 24 hours, as this will give greatly improved screen life.



These distances must be equal

BOLTS

All bolts on the screener are secured with lock washers or some other type of locking mechanism. After the machine has been in operation for two weeks it is wise to re-tighten the bolts to assure they are tight. Loose bolts break.

LUBRICATION

The LINEAR series of screeners is a grease-lubricated drive. The recommended grease is a lithium-based grease, penetration class 2, with high additives and corrosion inhibitors. This lithium based EP2 grease should not be blended with any other type of grease. The blending of greases of different saponification bases is likely to result in a marked deterioration of lubricity and possible premature bearing failure.

The bearings of vibrating screens need to be relubricated every 50 hours of operation for normal duty operations. For higher temperature applications more frequent greasing is required. If the screener is in a hostile environment, the bearings will require more frequent relubrication.

The amount of grease required at each relubrication differs for each drive.

Your drive is #22312, which needs 2oz.

The lubrication of a machine will directly affect the life of the bearing. Greasing too frequent will not harm the bearing; however, adding large quantities of grease at a time may have adverse effects.

BEARING REMOVAL

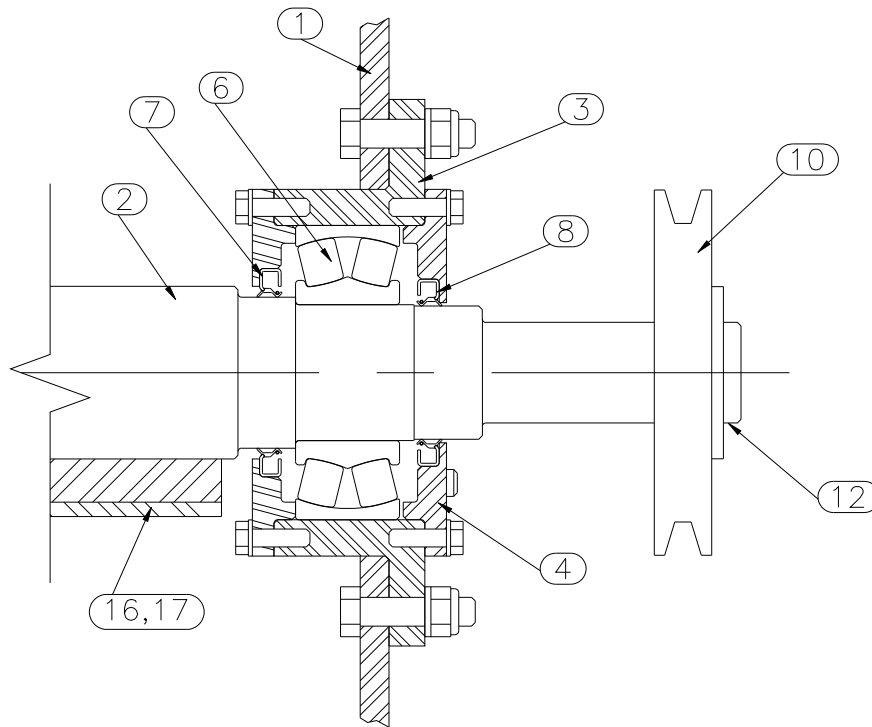
1. Disconnect the power to the motor. Tag out or lock out the motor while servicing.
2. Remove the belt guard on the side of the drive where the bearing to be replaced is located.
3. Remove the belt and all sheaves and bushings from the motor and the drive shaft
4. Remove belt guard mounting brackets.
5. Remove the drive housing cover door. This is the flat sheet metal that is bolted across the width of the drive
6. Block the shaft (2) securely into place.
7. Remove the inner seal housing from the bearing housing (3).
8. Remove outer seal housing cover plate (4) or blind cover whichever applies to the bearing in question.
9. Remove the housing bolt assemblies
10. Install three 1/2-13NC bolts into the tapped holes in the outer ring of the bearing housing (3).
11. Tighten these bolts evenly to remove the bearing housing (3) from the drive weldment (1).
12. Once the bearing housing (3) is free from the drive weldment (1), remove the bearing housing and the bearing (6) from the shaft.
13. Use a press to remove the old bearing from the bearing housing.

NOTE: Remove all old grease from any parts that are to be reused.

BEARING INSTALLATION

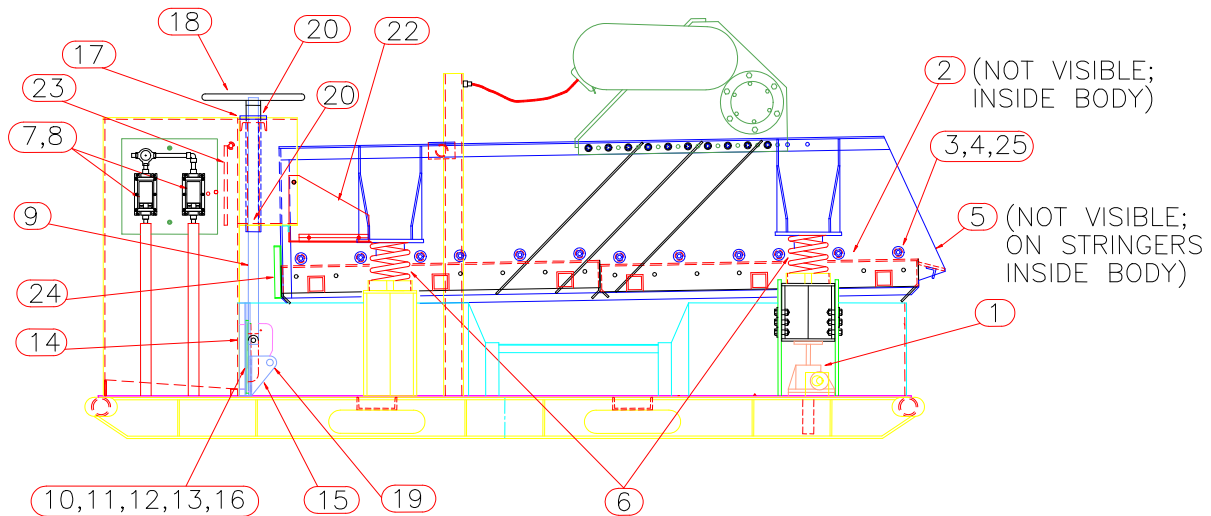
1. When purchasing a bearing please make sure the number of the bearing you are replacing matches the number of the bearing you purchased to replace it.
2. Bolt inner seal housing to inside of bearing housing.
3. Using a press, press bearing into housing until the bearing seats against the inner seal housing.
4. Reassemble the drive in the reverse order of the removal process.

LINEAR DRIVE



ITEM	QTY	PART NO	DWG NO	DESCRIPTION
1	1	430-302-400	21503-x	SMICO 48" weldment
2	2	430-301-400	24667	SMICO 48" shaft
3	4	430-303-002	19185	Bearing Housing
4	6	430-314-001	19182-1	Grease Seal Retainer
5	2	430-314-002	19182-2	Blind Seal Retainer (not shown)
6	4	304-080	n/a	Bearing 22312
7	4	314-160	n/a	Inner Seal
8	2	314-130	n/a	Outer Seal
9	2	360-056	n/a	Motor Sheave
10	2	360-074	n/a	Drive Sheave
11	2	341-113	n/a	Motor Bushing
12	2	341-175	n/a	Drive Bushing
13	1	371-046	n/a	Short Belt
14	1	371-062	n/a	Long Belt
15	2	730-203	n/a	3 HP Motor, 1750 RPM, X-Proof, 230/460, 3/60
16	4	*	19188-8	1/2" counter weights
17	2	*	19188-2	11 Ga. counter weights
18	2	*	19188-1	16 Ga. counter weights

*Contact Factory



PARTS LIST

ITEM	QTY	DESCRIPTION	DRAWING	PART NUMBER
1	2	JOYCE JACK SCREW w/ BOOTS	RWFT122-6-UP-T2	
2	4	TENSION RAIL, 304 SS	24679	
3	24	TENSION BOLTS, 304 SS	24678	220-510
4	24	TENSION BOLT SEAL	23744	220-500
5	16	¼" NITRILE SUPPORT RUBBER X 48"		251-150
6	4	GYRETTE SPRING		400-330B
7	2	MOTOR STARTER, MANUAL ON-OFF, X-PROOF, SIZE "0"		311-800-110
8	6	MOTOR HEATERS, 440V/4.1AMP		311-800-105
9	1	BY-PASS SCREW	18582	*
10	1	BY-PASS GATE	18565	*
11	2	BY-PASS GATE GASKET	21912	*
12	2	BY-PASS GATE DOOR RETAINER	21910	*
13	2	BY-PASS GATE SPACER	21909	*
14	1	BY-PASS GATE BASE PLATE	21908	*
15	1	BRACKET BY-PASS GATE	18386X	*
16	1	BY PASS GATE PARTS	24682	*
17	1	RETAINER PLATE	18580	*
18	1	HAND WHEEL	18561	311-790-103
19	1	WEDGE LOCK PIN	18578	*
20	2	OIL LITE BUSHING	EF 2428-24	311-304-001
22	1	SPLASH PAN	18339X/24680	311-600-003
23	1	MUD DIVERTER ASSY (MUD FLAP)	19297X	*
24	2	SPLASH GUARDS (NITRILE)	19907	*
25	24	TEFLON "O" RING		311-700-100