

MI SWACO

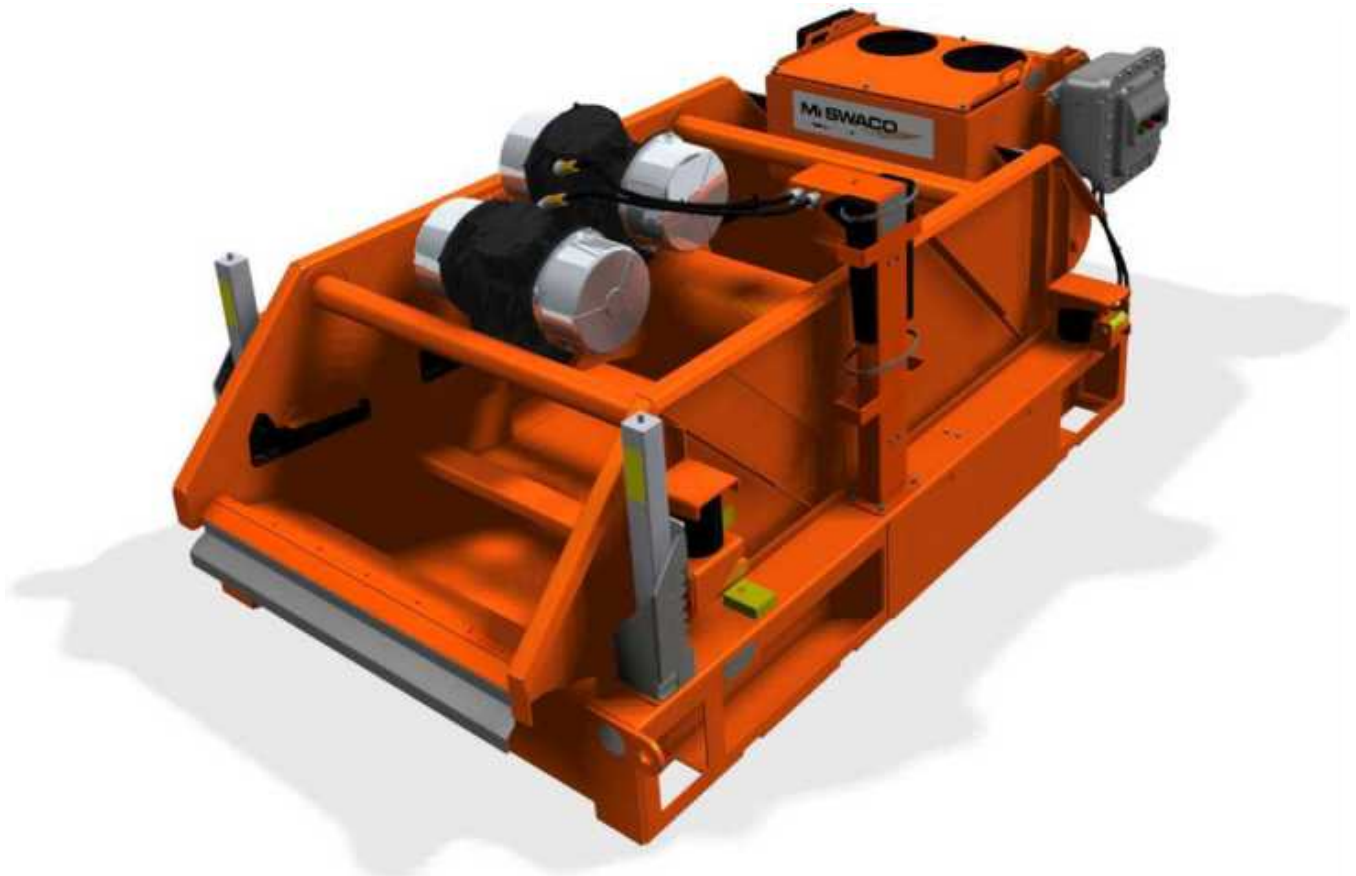
A Schlumberger Company

MONGOOSE PRO

Shale Shaker

Field Installation and Operation Manual

For Assemblies: 9675300-XXAD, 9675320-XXAD, 9675360-XXAD, 9675365-XXAD, 9675370-XXAD, 9675375-XXAD, 9675385-XXAD, 9675400-XXAD, 9675410-XXAD, 9675450-XXAD, 9675460-XXAD, 9675480-XXAD, 9675500-XXAD, 9675510-XXAD, 9675520-XXAD, 9675530-XXAD, 9675680-XXAD, 9675770-XXAD, 9675980-XXAD, 9675990-XXAD



For Configurations Certified to UL, ATEX, or IECEx Specifications

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ABOUT THIS MANUAL

As equipment is updated over time, changes to supporting documents may occur in the form of simple revisions or development of completely new documents.

Document version information is indicated on the front cover in parenthesis with the document part number. This part number and revision is duplicated on all printed pages. The initial release of a document is represented by double dashes (--) while subsequent revisions will be represented by sequential letters (A) (B) (C) etc.

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HOW TO USE THIS MANUAL

This manual is to be used by anyone installing, operating, repairing, or maintaining the MONGOOSE PRO Shale Shaker manufactured by M-I SWACO.

This manual is organized in paragraphs of technical information. To easily find specific information refer to the table of contents found at the front of this manual or the index found at the back of this manual.

This manual covers a variety of equipment configurations, therefore the illustrations used may not exactly match the configuration you have.

Illustrated parts breakdowns, diagrams, and schematics applicable to the equipment and tasks can be found at the back of this manual.

While every effort has been made to present accurate information in this manual, M-I SWACO will not be held liable for any errors or consequences resulting from the use of this information.

1. INTRODUCTION

The MONGOOSE PRO Shale Shaker is designed to provide primary solids removal from both oil-based mud (OBM) and water-based mud (WBM) during drilling operations. The MONGOOSE PRO basket holds four pretensioned composite wire mesh screens. The MONGOOSE PRO deck adjustment system allows flexible control of fluid pool depth and beach length in a variety of drilling conditions.

The MONGOOSE PRO is equipped with two explosion-proof vibratory motors that produce a dual motion system. The Normal (Efficiency) mode is a progressive elliptical motion used during normal drilling conditions to maximize both screen life and cuttings retention time. The motor output for this mode is 6.5Gs. The Capacity mode is a balanced elliptical motion used during fluid surges and heavy solids loading. The motor output is 7.5Gs when operating in Capacity mode.

2. HEALTH SAFETY AND ENVIRONMENT (HSE)

2.1 Summary

Equipment manufactured by M-I SWACO is typically installed and operated where hazardous conditions are likely to be present. Be sure to read and understand all HSE information contained in this manual before installing, operating or maintaining the MONGOOSE PRO.

Be sure to review any additional HSE information from local or national codes for the location where the equipment is being used as well as any job site specific regulations that must be followed.

The following explains the different type of advisories that may be found in this manual.



THIS ADVISORY DRAWS ATTENTION TO ACTIONS THAT COULD RESULT IN PERSONAL INJURY.



THIS ADVISORY DRAWS ATTENTION TO ACTIONS THAT COULD RESULT IN EQUIPMENT DAMAGE.



THIS ADVISORY GENERALLY PROVIDES RELEVANT INFORMATION TO HELP THE READER UNDERSTAND THE HIGHER LEVEL CONTEXT OF A SPECIFIC TASK.



THIS ADVISORY OFFERS A SUGGESTION OR RECOMMENDATION THAT COULD MAKE A TASK EASIER OR MORE CONVENIENT.

2.2 Personnel Health And Safety

All personnel working on, or around, any M-I SWACO equipment must be familiar with, and wear, the required Personal Protective Equipment (PPE) appropriate for the task they are performing.

The PPE items listed below are required for any task, be sure to check local and national codes as well as any job site or task specific regulations that may require you to use additional PPE.

- Approved hard hat.
- Approved safety footwear.
- Approved safety glasses with side shields and / or approved full face shield if appropriate.
- Approved gloves appropriate for the task being performed.
- Approved outer garments appropriate for the task being performed.

2.3 Equipment Safety

Before installing or maintaining any equipment, be sure to lock out and tag all sources of electrical, pneumatic or hydraulic power connected to it.

Lock out and tag any feed pumps or accessory equipment connected to the Shale Shaker. Be sure to isolate and tag any inlet piping that could deliver mud or other materials into the equipment during installation or maintenance.

3. PERSONNEL REQUIREMENTS

Shale Shaker operators must read and understand everything covered in this documentation prior to operating equipment. All personnel performing installation or operation procedures on this equipment should be trained on rig safety, operations, and maintenance for this equipment. Consult rig site management prior to operating the Shale Shaker, as individual locations may have specific training requirements for operators.



READ THE FOLLOWING PROCEDURES BEFORE INSTALLING OR PERFORMING MAINTENANCE ON MONGOOSE PRO SHALE SHAKER EQUIPMENT TO AVOID INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

4. EQUIPMENT USE

The MONGOOSE PRO Shale Shaker is designed to provide primary solids removal from both oil-based mud (OBM) and water-based mud (WBM) during drilling operations. Fluid from the wellbore is pumped up for processing. Depending on rig site conditions, this fluid can be processed before it reaches the Shale Shaker or stored in a tank. From the holding tank, fluid is pumped into a number of Shale Shakers to separate waste solids from viable drilling solution. Dried solids are collected and hauled away as waste, and the processed liquid is either routed to another storage tank for evaluation or pumped directly back into the wellbore.

4.1 Restrictions Of Use

4.1.1 Warranty

Refer to your purchase/sales agreement for warranty information specific to your unit.

In general, the warranty will be void if the unit is damaged due to intentional or accidental mishandling, improper preservation and storage, failure to follow recommended installation, operation and maintenance instructions or using the unit in a manner that deviates from the designed and intended purpose.

5. EQUIPMENT FUNCTION

The MONGOOSE PRO Shale Shaker has a screen deck made of four pretensioned composite wire mesh screens. Each Shale Shaker screen is secured to the basket with two screen wedges. An optional stainless steel vibratory vent hood upgrade is available for jobs that require fume extraction. The Shale Shaker deck adjustment system allows flexible control of fluid pool depth and beach length in a variety of drilling conditions.

The Shale Shaker is equipped with two explosion-proof vibratory motors that produce a dual motion system. The normal mode is a progressive elliptical motion used during normal drilling conditions to maximize both cuttings retention time and screen life. The motor output for this mode is 6.5Gs. The capacity mode is used during fluid surges and heavy solids loading. The motor output is 7.5Gs when operating in capacity mode.

5.1 Identification of Main Components

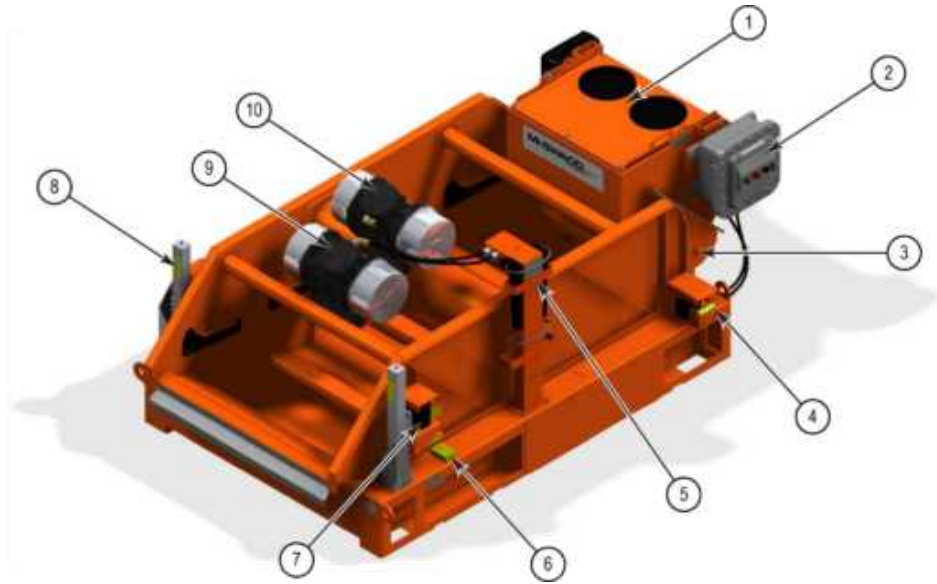


Figure 1. Main Components, MONGOOSE PRO Shale Shaker [Typical]

FIGURE 1 LEGEND		
ITEM	NAME	DESCRIPTION
1	HEADER BOX	ROUTES FLUID TO SHAKER SCREENS
2	CONTROL PANEL	HOUSES CONTROLS FOR THE ELECTRICAL COMPONENTS
3	BASKET	HOLDS THE MOTORS AND WIRE MESH SCREENS
4	FEED END SHIPPING BRACKET	SECURES THE FEED END OF THE SHAKER DURING TRANSPORTATION
5	CABLE TOWER	ROUTES MOTOR CABLES AND HOLDS SCREEN WEDGES
6	DISCHARGE END SHIPPING BRACKET	SECURES THE DISCHARGE END OF THE SHAKER DURING TRANSPORTATION
7	BASKET SPRING	ISOLATES VIBRATORY MOTION ON THE BASKET FROM THE SKID
8	DECK ADJUSTMENT ELEVATOR JACK	RAISES OR LOWERS THE DECK ANGLE TO OPTIMIZE FLUID AND SOLIDS FLOW DURING OPERATION
9	SWING WEIGHT MOTOR	PROVIDES ADJUSTABLE VIBRATORY MOTION TO EQUIPMENT
10	FIXED WEIGHT MOTOR	PROVIDES VIBRATORY MOTION TO EQUIPMENT

5.2 Variations Among MONGOOSE PRO Configurations

M-I SWACO offers a variety of MONGOOSE PRO configurations; this content will help operators become familiar with the particular model they will be using. Below is a configuration overview.

- Shaker with Header Box
 - The fluid distribution system is at the rear of the shaker basket and is mounted above the screen deck (Refer to Figure 2).
 - Fluid is redirected from the inlet line through the header box into a half pipe at the rear of the basket. Since fluid distribution is mounted above the screen deck, no trap exists to collect solids. As fluid passes through the diverter box, it sweeps the box clean.



Figure 2. MONGOOSE PRO with Carbon Steel Header Box

- Shaker with Possum Belly with Butterfly Valve Bypass
 - The manually-adjustable butterfly valve is located below the main inlet on the possum belly (Refer to Figure 3).
 - When the valve is closed, fluid flow is directed through the possum belly to the shaker bed.
 - The butterfly valve bypass is opened by rotating the valve 90°. When butterfly valve is opened, fluid is redirected into the skid, bypassing the screens.

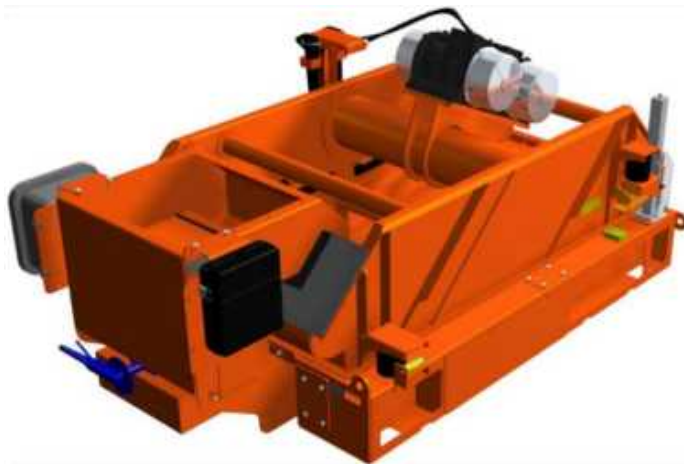


Figure 3. MONGOOSE PRO with Butterfly Valve Possum Belly

M-I SWACO MONGOOSE PRO Shale Shaker

- Shaker with Vent Hood
 - The optional stainless steel vent hood (Refer to Figure 4) covers the exposed basket area of the shaker and offers a 10", 150LB fume extraction port used to divert fumes safely away from the shaker.
 - Access panels line the sides of the hood to allow operators to install or remove screen wedges and screens.
 - This option is critical on rigs that house shale shakers indoors.

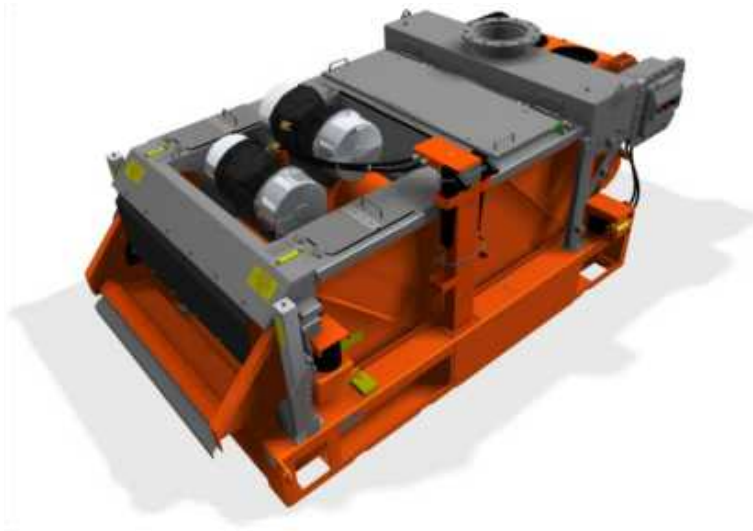


Figure 4. MONGOOSE PRO with Vent Hood

- Dual & Triple Shakers with Common Possum Belly and Knife Gate Bypass
 - The knife gate is controlled by a single rotating hand wheel (Refer to Figure 5 & Figure 6).
 - When the knife gate is opened, fluid is redirected into the skid bypassing the screens.
 - The manually operated header box slide gates are used to control the flow rate to each shaker.

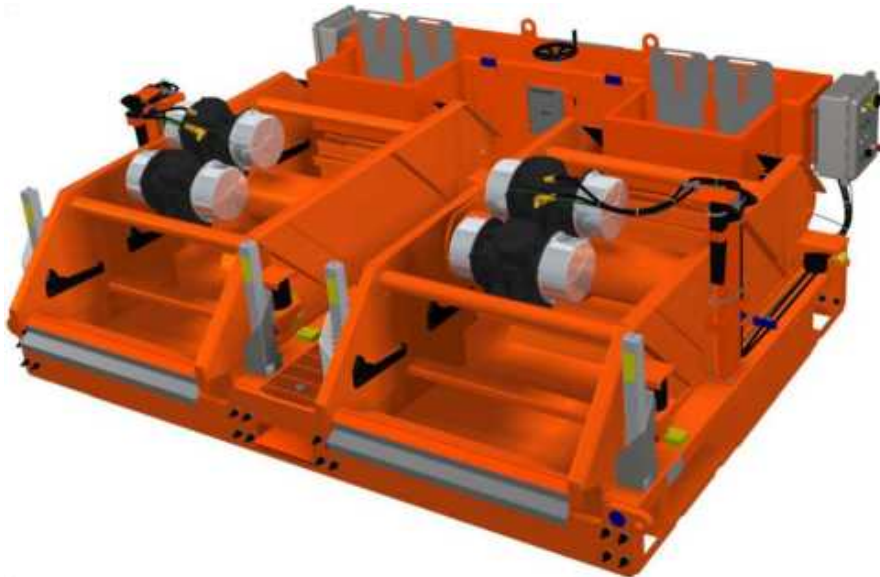


Figure 5. MONGOOSE PRO Dual Shaker with Common Possum Belly and Knife Gate

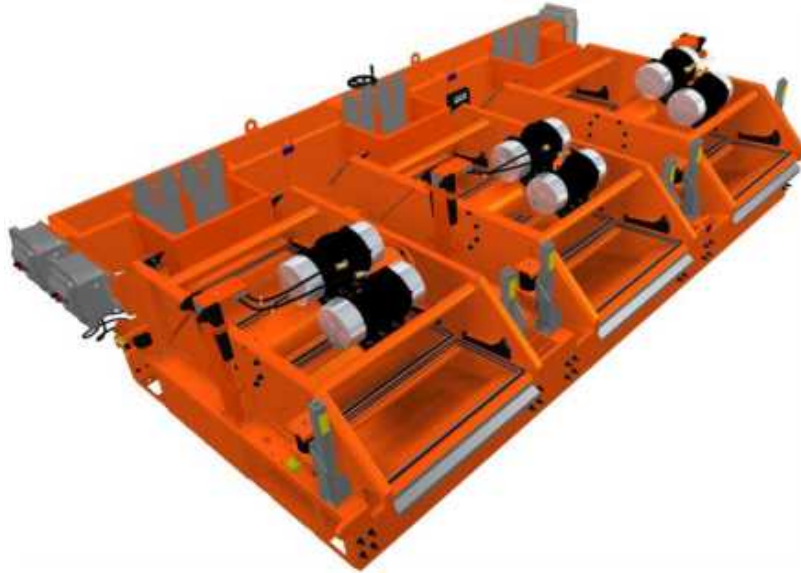


Figure 6. MONGOOSE PRO Triple Shaker with Common Possum Belly and Knife Gate

- Quad Shakers with Feed Manifold Assembly, Header Boxes & Butterfly Valve Bypasses
 - Mud feeds into the back of the feed manifold assembly with the flow evenly distributed to each of the header boxes (Refer to Figure 7).
 - Butterfly valves located at each header box are used to open or close flow to a particular shaker.
 - Butterfly valves located at the top of the feed manifold are used to close off flow to shakers enabling the use of a cement bypass.



Figure 7. MONGOOSE PRO Quad Shakers

M-I SWACO MONGOOSE PRO Shale Shaker

- Mud Cleaner Configurations
 - Mud Cleaners are equipped with D-SANDER and/or D-SILTER hydrocyclones.
 - Hydrocyclones provide finer filtration than the Shale Shaker basket wire mesh screens.
 - Variations in each configuration allow the equipment to operate at specific flow rates.
 - Figure 8 is an example of a MONGOOSE PRO Mud Cleaner equipped with a 3-12 D-SANDER and 10T4 D-SILTER.

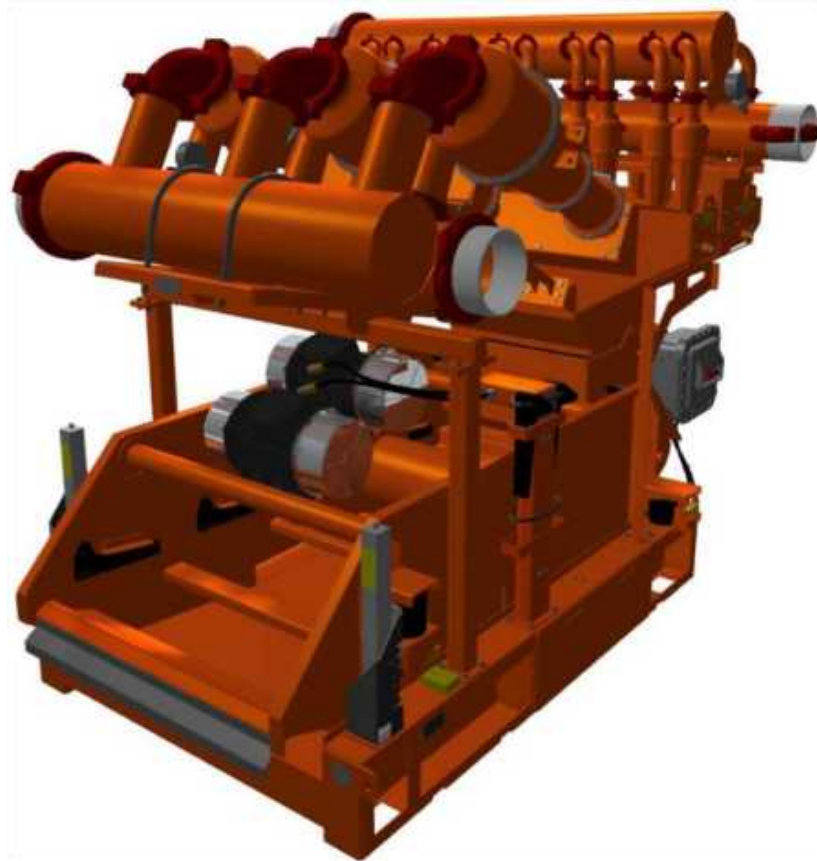


Figure 8. MONGOOSE PRO Mud Cleaner

6. SPECIFICATIONS

6.1 General Specifications

Equipment type----- MONGOOSE PRO Shale Shaker
Applications-----Drilling fluid and cuttings separation, filtration
Equipment Voltages/Frequencies-----Varies with each configuration; see below:
220-240V -----60Hz
380-415V -----50Hz
440-480V -----60Hz
575-600V -----60Hz
Temperature rating----- degF [degC]
ATEX/IECEX----- -4-131°F [-20-55°C]
UL -----4-104°F [-20-40°C]
Approvals-----UL [Class I Div I, T2C] OR [ATEX/IECEX EExd IIB 160C]

6.1.1 Unit Weights

Single Unit -----3,460lbs. [1,573kg.]
Dual Unit -----8,650lbs. [3,924kg.]
Triple Unit-----13,500lbs. [6,124kg.]
Quad Unit-----20,400lbs. [9,253kg.]

6.1.2 Unit Dimensions

Single MONGOOSE PRO
Length----- 119.8” [3,042mm]
Width-----68.9” [1,749mm]
Height-----52.3” [1,328mm]
Dual MONGOOSE PRO
Length----- 124” [3,149mm]
Width-----145.2” [3,699mm]
Height-----52.3” [1,328mm]
Triple MONGOOSE PRO
Length----- 124” [3,149mm]
Width-----229.6” [5,833mm]
Height-----56.4” [1,432mm]
Quad MONGOOSE PRO
Length----- 149.1” [3,787mm]
Width-----279.1” [7,090mm]
Height-----70” [1,777mm]

6.2 Performance

Rated Motor Output----- 2.49hp [1.86kW]
 Output Force----- 6.5 Gs (Normal Mode) & 7.5Gs (Capacity Mode)
 Filtering Area----- 30ft² [2.73m²] per shaker
 Operating Temperature----- 86°F [30°C]

6.2.1 Noise Data

Normal Operating Mode ----- 74.3 dBA
 Capacity Operating Mode----- 75.2 dBA

6.3 Consumption Requirements

Table 1. Electrical Consumption Data

DESCRIPTION	VOLTAGE	INPUT POWER	OUTPUT POWER	FREQUENCY
SHALE SHAKER 2-MOTOR DRIVE	220-240V	2.25KW	2.5HP [1.86KW]	60HZ
	380-415V	2.25KW	2.5HP [1.86KW]	50HZ
	440-480V	2.25KW	2.5HP [1.86KW]	60HZ
	575-600V	2.25KW	2.5HP [1.86KW]	60HZ

7. HANDLING AND TRANSPORTING

The MONGOOSE PRO Shale Shaker should always be transported to rig locations on a flatbed truck. Make sure the unit is properly secured prior to departure and the shipping brackets are installed.



NEVER ATTEMPT TO MOVE OR LIFT THE MONGOOSE PRO SHALE SHAKER WITHOUT THE SHIPPING BRACKETS SECURED TO THE EQUIPMENT! REFER TO PARAGRAPH 10.2 FOR INFORMATION CONCERNING SHALE SHAKER SHIPPING BRACKETS.



FAILURE TO SECURELY TIE DOWN EQUIPMENT TO TRUCK COULD CAUSE THE UNIT TO MOVE OR FALL DURING TRANSPORT, RESULTING IN PERSONAL INJURY.



USING ANY LIFTING OR HOISTING DEVICE AND ACCESSORY ITEM THAT IS NOT RATED TO SUPPORT THE UNIT WEIGHT CAN CAUSE PERSONAL INJURY OR DEATH FROM THE UNIT FALLING OR BEING UN-CONTROLLED WHEN HANDLING.

7.1 Lifting & Handling



PERFORM STRUCTURAL CHECKS ON THE DECK BEAMS TO ENSURE THEY CAN SUPPORT APPLIED LOADS (TWICE THE WEIGHT OF THE SHALE SHAKER) OF EQUIPMENT.

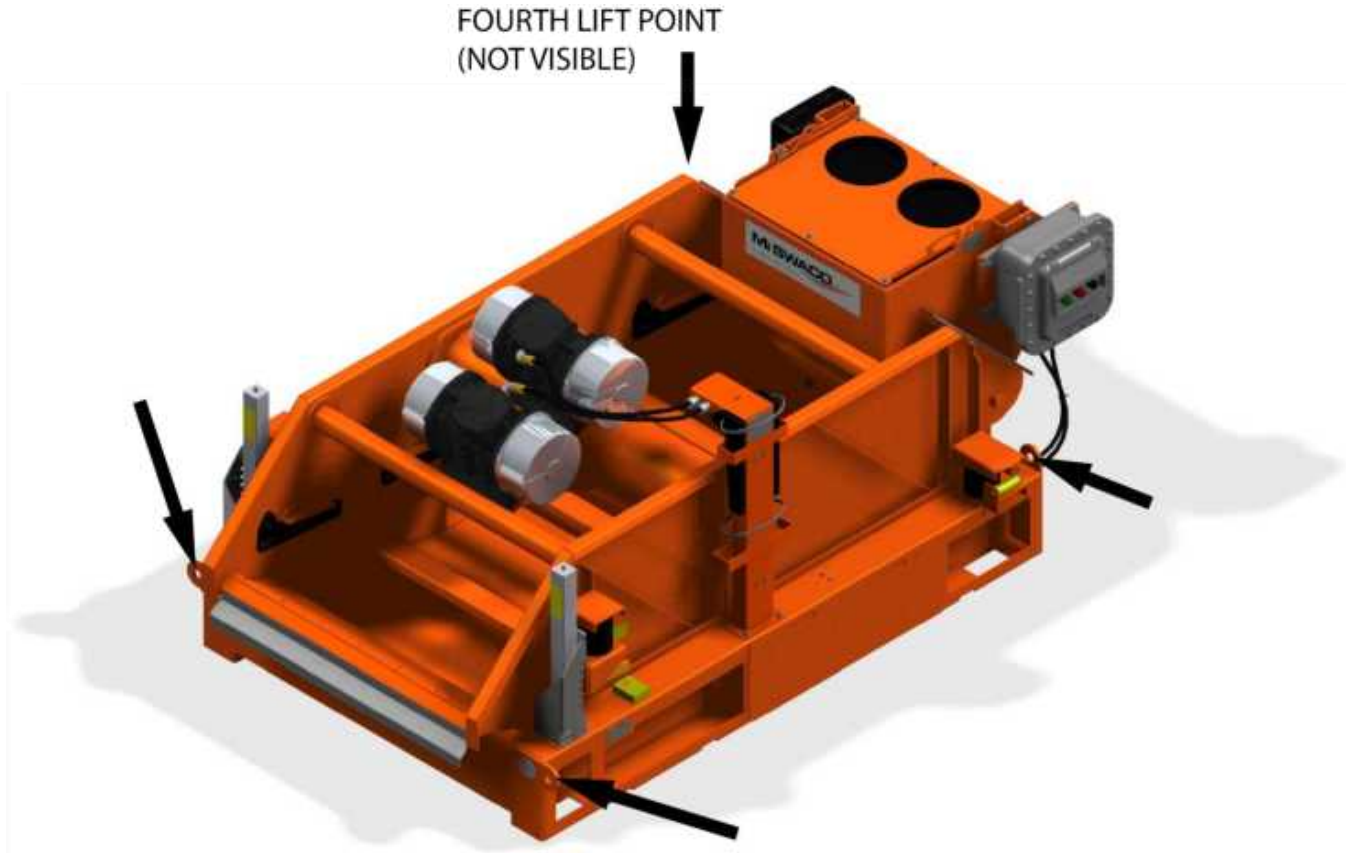


Figure 9. Lifting Points on the MONGOOSE PRO



Figure 10. Lifting Lug Label

M-I SWACO MONGOOSE PRO Shale Shaker

Table 2. MONGOOSE PRO Component Lifting Points

COMPONENT	LIFTING METHOD
UNIT ASSEMBLY	USE APPROPRIATE LIFTING DEVICE AT THE FOUR LIFTING LUGS, ONE AT EACH CORNER. WEIGHT: 3,460LBS. [1,569KG.]
BASKET ASSEMBLY	USE SOFT SLINGS AROUND BASKET OR SPRING MOUNTS. WEIGHT (INCLUDING MOTORS): 1,927LBS. [874KG.]
SKID	USE APPROPRIATE LIFTING DEVICE AT THE FOUR LIFTING LUGS, ONE AT EACH CORNER. WEIGHT: 1,296LBS. [588KG.]
MOTORS	IF MOTORS ARE REMOVED FROM BASKET ASSEMBLY, USE CERTIFIED LIFTING EYE STRAPS. WEIGHT: 282LBS. [127KG.]
HEADER BOX	USE APPROPRIATE LIFTING DEVICE AT THE FOUR LIFTING LUGS, ONE AT EACH CORNER. WEIGHT: 240LBS. [108KG.]

Single MONGOOSE PRO

- Basket Assembly (without motors) - 1,360lbs. [618kg.]
- Motors ----- 282lbs. [128kg.]
- Possum Belly----- 425lbs. [193kg.]
- Carbon Steel Header Box ----- 240lbs. [108kg.]

Dual MONGOOSE PRO

- Basket Assembly (without motors) - 1,360lbs. [618kg.]
- Motors ----- 282lbs. [128kg.]
- Possum Belly----- 1,918lbs. [870kg.]

Triple MONGOOSE PRO

- Basket Assembly (without motors) - 1,360lbs. [618kg.]
- Motors ----- 282lbs. [128kg.]
- Possum Belly----- 2,833lbs. [1,285kg.]

Quad MONGOOSE PRO

- Basket Assembly (without motors) - 1,360lbs. [618kg.]
- Motors ----- 282lbs. [128kg.]
- Possum Belly----- N/A
- Carbon Steel Header Box ----- 240lbs. [108kg.]

8. PREPARING RIG SITE

The MONGOOSE PRO Shale Shaker assemblies are mounted to a sturdy integral skid that secures the equipment to the rig site directly onto the deck or above sand traps/mud pits and directs fluid flow from the unit. Potential locations for the Shale Shaker must comply with the following:

- A proper rig location for a single MONGOOSE PRO Shale Shaker must have a minimum mounting space of 103.5 X 76in [2623 X 1923mm].
- The discharge end of the unit MUST have at least 25in [635mm] of free space in front of it to allow operators to remove and replace screens.
- Make sure the location has adequate space to manage solids discharge and effluent material.
- Make sure the chosen location for the equipment has access to adequate power and rig air requirements. Refer to paragraph 6.3 for consumption data.
- MONGOOSE PRO installers must be able to route drilling fluid to the Shale Shaker feeder box. Make sure there is a clear path from drilling fluid source to the feeder box.



PERFORM STRUCTURAL ANALYSIS ON THE DECK BEAMS TO MAKE SURE THEY CAN SUPPORT APPLIED LOADS (TWICE THE DRY WEIGHT OF A MONGOOSE PRO SHALE SHAKER) OF EQUIPMENT.

9. UNPACKING AND INSPECTING

9.1 Unloading



NEVER ATTEMPT TO LIFT THE ENTIRE UNIT BY THE BASKET OR MOTOR LIFTING POINTS! THEY ARE NOT DESIGNED TO HOLD THE WEIGHT OF THE ENTIRE UNIT. FAILURE TO COMPLY WILL DAMAGE THE UNIT AND COULD CAUSE EXTREME PERSONAL INJURY WHEN THE LIFTING POINTS FAIL.

ALWAYS LIFT THE UNIT BY THE MARKED LIFTING POINTS ON THE SKID!



FOLLOW ALL LIFTING SAFETY PROCEDURES OUTLINED IN PARAGRAPH 7.1. FAILURE TO COMPLY CAN RESULT IN EQUIPMENT DAMAGE.

9.1.1 Preferred Unloading Method

The preferred method used to remove the MONGOOSE PRO Shale Shaker from the trailer is using a crane to hoist it off. Refer to paragraph 7.1 for more information concerning proper techniques to use when unloading the Shale Shaker.

1. Remove any chains or straps securing the Shale Shaker to the trailer.
2. Attach the lifting device to the lifting points on the equipment, using suitable slings, cables, or chains.
3. Slowly and carefully lift the unit from the trailer and move to the desired operating position.
4. Disconnect the lifting device from the equipment lift points.

9.1.2 Alternate Unloading Procedure

It is possible to unload the unit using a forklift.

1. Remove any chains or straps securing the Shale Shaker to the trailer.
2. Using a forklift rated to handle the required load, slide the forklift tines underneath the skid.
3. Slowly and carefully move the unit to the desired operating position and set in place.

9.2 Placing Equipment For Operation

The operating location of the Shale Shaker should comply with the operating conditions established in paragraph 8. Examine the Shale Shaker mud flow diagrams in paragraph 21.3. Discharge and effluent flows must have clear paths leaving the unit. Bolt-on plates located at the sides and rear of the Shale Shaker can be removed to direct effluent flow.

1. Place the Shale Shaker in its intended position, using the lifting techniques outlined in paragraph 7.1
2. Identify which side(s) the effluent will run off from equipment.
3. Remove the appropriate bolt-on skid discharge plates from the side(s) of the unit to allow desired fluid flow.
 - a. Plates are secured with 9 bolts.
 - b. Place removed bolt-on plates and their corresponding bolts in a safe location so they are not lost.

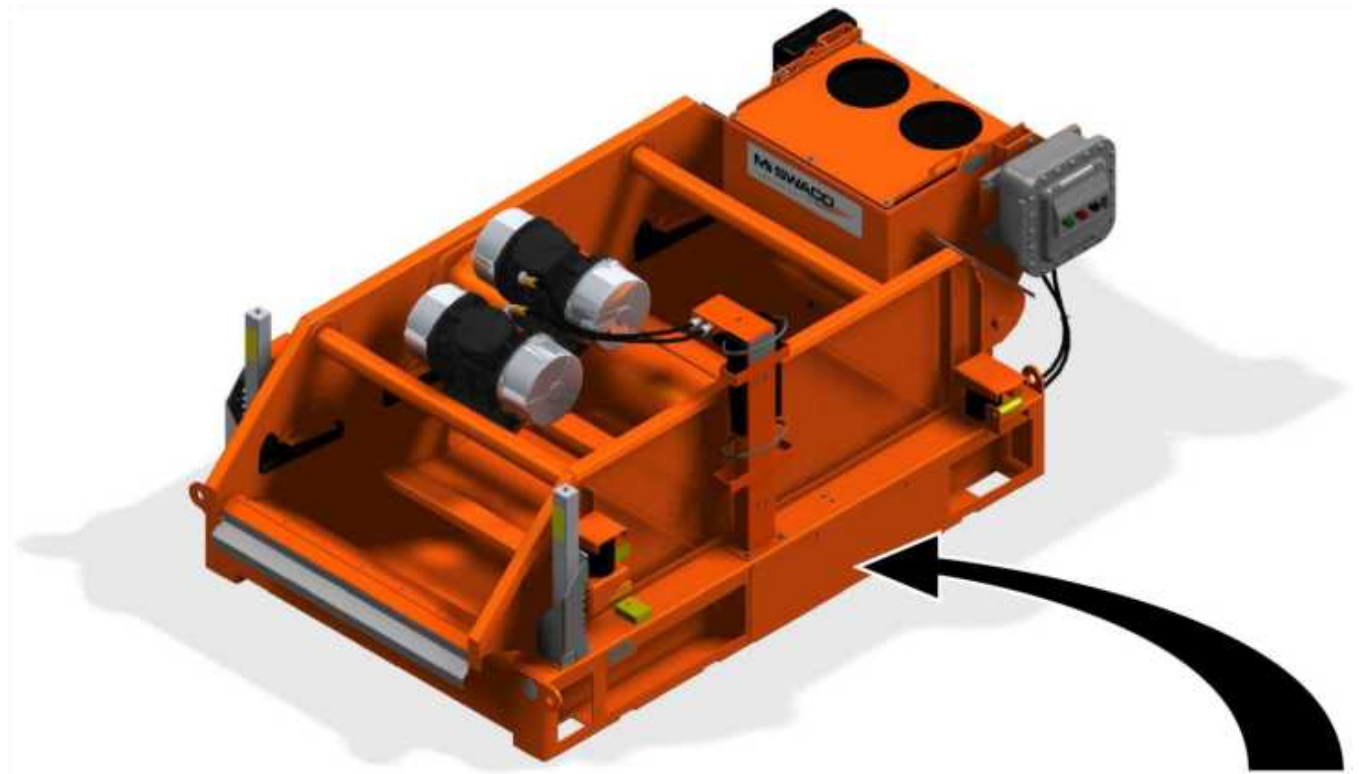


Figure 11. Skid Discharge Cover (Arrowed)

9.3 Removing Packaging Material

The MONGOOSE PRO is always secured for transportation with integrated shipping brackets. On occasion, the entire unit is crated for overseas or special shipping conditions. If the unit arrives in a crate, take care when opening the crate and use all recommended PPE.



FAILURE TO USE PROPER EYE PROTECTION OR PERSONAL PROTECTION EQUIPMENT WHILE OPENING CRATE CAN RESULT IN PERSONAL INJURY.

9.4 Inspecting Equipment

Inspect all goods as received from shipping company BEFORE setting up and operating the shale shaker. Report a claim for damage or loss immediately to both the carrier and M-I SWACO. Also check bill of lading for any separately shipped items, including manuals and CDs. Once an order is confirmed as received completed in an undamaged condition, installation can begin.

10. INSTALLING / RIG-UP

From delivery, the MONGOOSE PRO requires only minor preparation to install and commission the equipment for operation.

10.1 Connecting Equipment

The following steps will explain electric and piping connections.

10.1.1 Connecting Vent Hood

The vent hood uses a 10", 150LB flange connection. Installers should confirm the flange is connected to an air system capable of pulling 2,000cfm.

10.1.2 Completing Fluid Piping Connections

The carbon steel feeder assembly has an installation guide painted on the rear of the feeder for mounting the inlet pipe which can accommodate 6", 8" and 10" inlet pipe sizes (Refer to Figure 12).

1. Attach the inlet piping to the back of the feeder box. Refer to paragraph 21.4.1 for an overview of the unit's piping and instrumentation.

- a. Measure the size of the pipe that will be used to bring drilling fluid to the Shale Shaker.
- b. Cut out the appropriately-sized stencil for the inlet pipe if an opening has not already been made.
- c. Connect the pipe to the header box.

2. Confirm piping connection is free of leaks.



Figure 12. Piping Installation Guide Stenciling (Arrowed)

10.1.3 Connecting Rig Power



ELECTRICAL CONNECTIONS MUST BE COMPLETED BY A CERTIFIED ELECTRICIAN. UNTRAINED PERSONNEL ATTEMPTING TO COMPLETE THE FOLLOWING STEPS ARE AT RISK FOR SEVERE ELECTRICAL SHOCK, WHICH MAY RESULT IN INJURY OR DEATH.

Powering a MONGOOSE PRO Shale Shaker requires a client-supplied power source to be connected to the control panel.

1. Confirm motor connections to the control panel comply with the Cable Block Diagram in paragraph 21.1.1.
2. Connect the control panel to the equipment junction box.
3. Connect to the rig power.

10.1.3.1 Connecting UL Panel

Depending on the configuration, the MONGOOSE PRO is UL or ATEX/IECEX rated. The wiring and control panels for the UL and ATEX/IECEX rated assemblies are slightly different from one another. Refer to the appropriate control panel diagram for the unit.



IT IS NOT NECESSARY TO SHUTDOWN THE EQUIPMENT WHEN SWITCHING BETWEEN THE BALANCED ELLIPTICAL AND PROGRESSIVE ELLIPTICAL MOTIONS.

The UL rated panel (Refer to Figure 13) is a simple three-button layout.



REFER TO WIRING SCHEMATICS IN PARAGRAPH 21.1.

1. Open control panel door.
 - a. Inlet port is located on side of control box (Refer to Figure 14).



ALTERNATE INLETS ARE LOCATED ON THE BOTTOM OF THE CONTROL BOX. THESE INLETS ARE EASIER TO USE WITH CERTAIN CONFIGURATIONS.

2. Remove inlet port plug on control panel box (item b, Figure 15)
3. Insert cable gland and wires through connection port.



THE GREEN WIRE IS THE GROUNDING LEAD. THE BROWN, WHITE/GREY, AND BLACK WIRES ARE ALL LIVE POWER LEADS.

4. Attach (crimp) a terminal ring connector to the wire ends of the grounding cable.
5. Loosen wire clamp screws on power distribution box (item a, Figure 15).
6. Insert bare wire endings of the power leads into power distribution box.
7. Retighten screws on power distribution box once wires are in place.
8. Inspect o-ring seal on door surface. Replace if damaged.
9. Install ALL exterior door bolts to completely close and seal the enclosure.

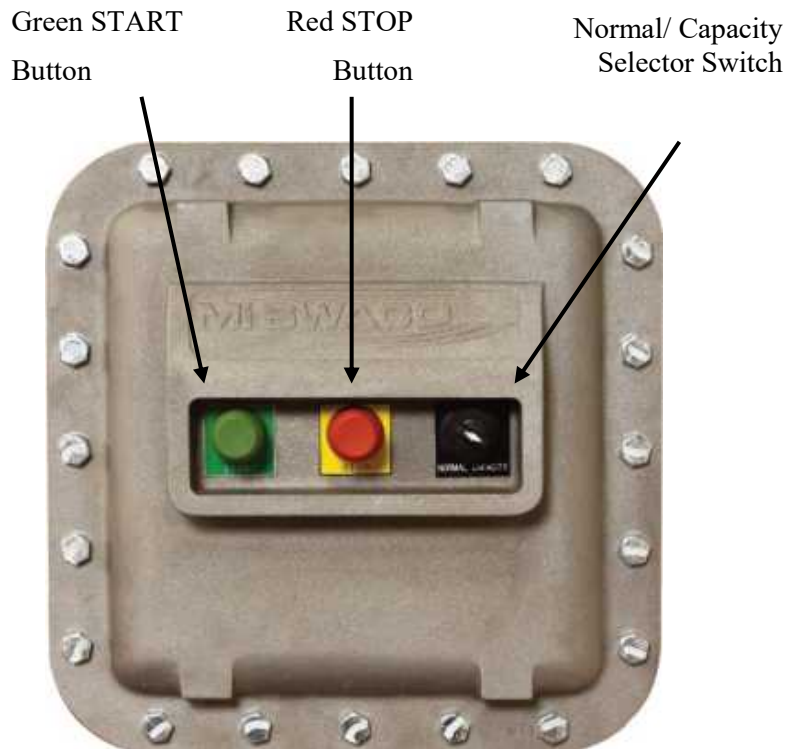


Figure 13. UL Motor Control Panel



Figure 14. Side Inlet Port

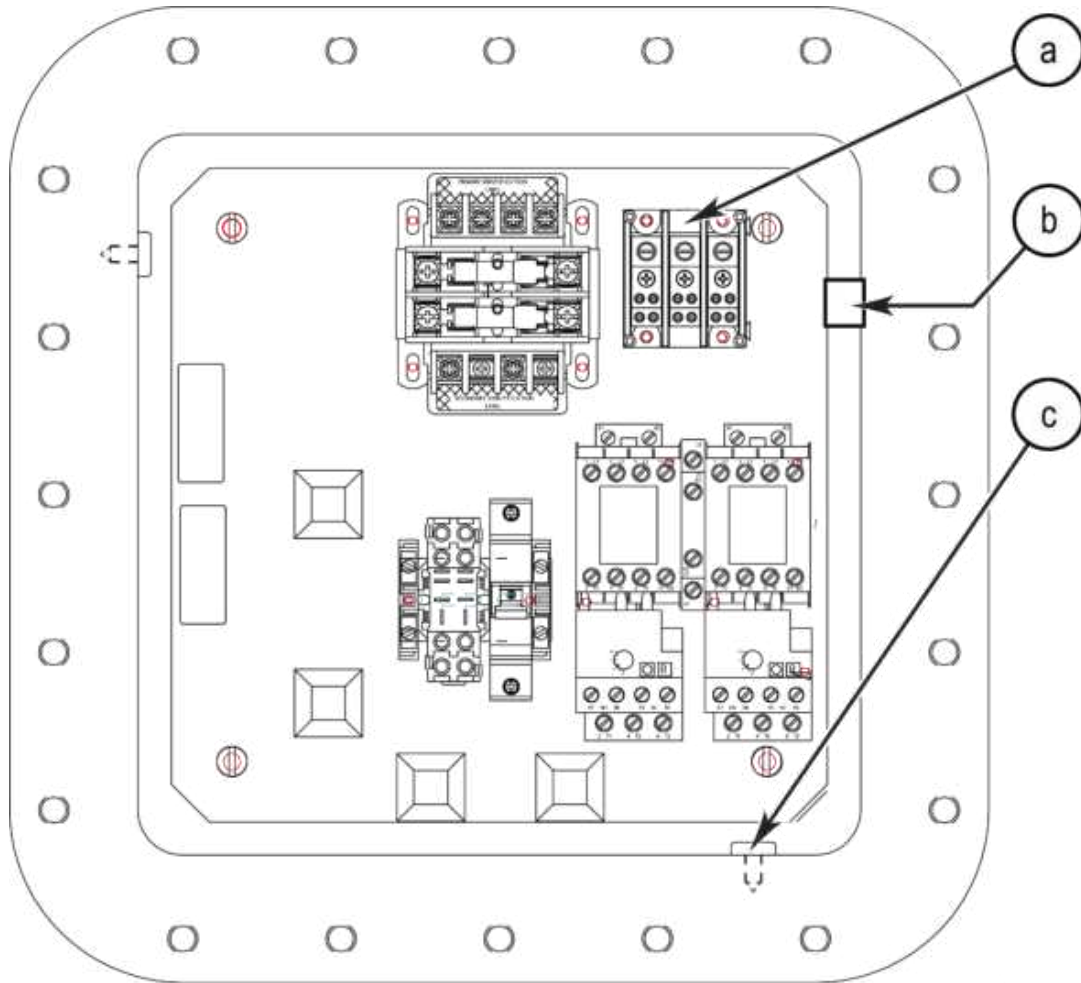


Figure 15. Interior View of Control Box

- a. Three power source cables (Power Leads) inserted into Power Distribution Box
- b. Inlet port plug (Cable gland connection port)
- c. Ground location

10.1.3.2 Connecting ATEX/IECEX Panel

The ATEX/IECEX rated panel (Refer to Figure 16) is configured as specified below:

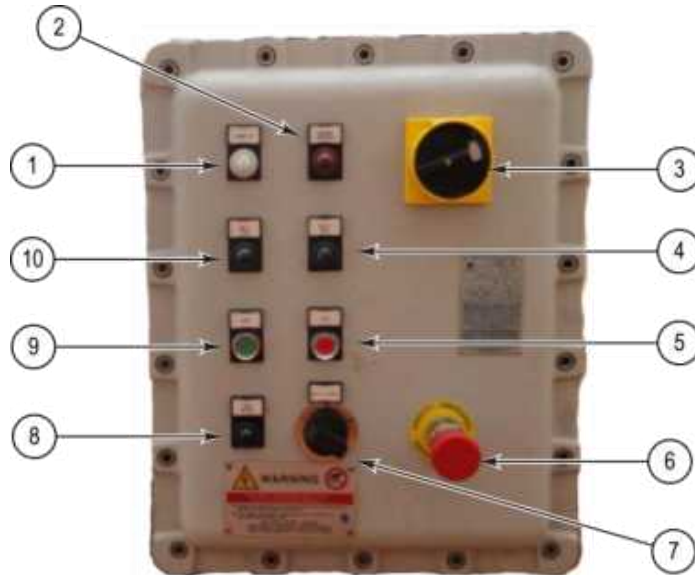


Figure 16. ATEX/IECEX Motor Control Panel

1. Power Indicator Light
2. Thermal Overload Indicator Light
3. I/O Power
4. Capacity Operation Indicator Light
5. Red STOP Button
6. Emergency Stop button
7. Normal / Capacity Selector Switch
8. Start Motors Indicator Light
9. Green START Button
10. Normal Operation Indicator Light

The ATEX/IECEX rated control panel is equipped with a white power indicator light. When illuminated, the unit is powered on. It is also equipped with operation mode indicator lights. When the “Normal” light is illuminated, the unit is operating in “Progressive Elliptical” mode. When the “Capacity” light is illuminated, the unit is operating in “Balanced Elliptical” mode.

The ATEX/IECEX rated control panel is equipped with a yellow thermal overload indicator light. It illuminates when the motor temperature exceeds safe operating levels.

ATEX/IECEX rated control panels have a large I/O power lockout switch on the front of the panel. The unit is powered when the switch is in the “I” position. Power to the unit is shut off when the switch is in the “O” position.



REFER TO THE WIRING SCHEMATICS IN PARAGRAPH 21.1 OF THIS DOCUMENT.

1. Remove the bolts securing the control panel enclosure.
2. Open control panel door.
3. Confirm grounding cables are secured to ground bolt within the panel.
4. Confirm power supply and motor connections are properly secured. External power supply and motor wire inlet ports are labeled in Figure 17.
5. Inspect o-ring seal on door surface. Replace if damaged.
6. Install ALL exterior door bolts to completely close and seal the enclosure.

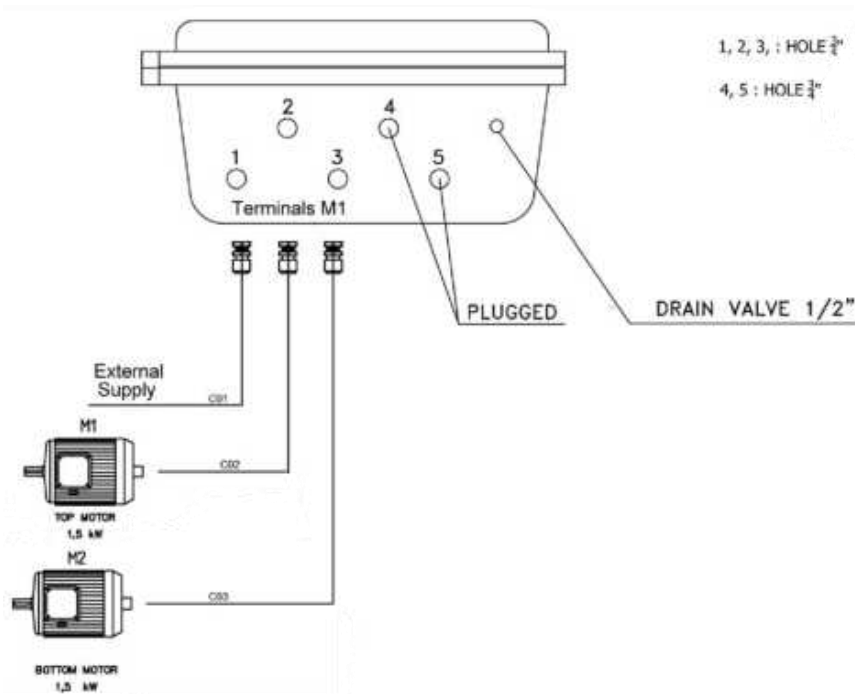


Figure 17. ATEX/IECEX Control Panel View

10.2 Removing Shipping Brackets



THE SHIPPING BRACKETS RETAIN THE BASKET ONTO THE SKID DURING ITS TRANSPORTATION. THEY ARE TO REMAIN SECURED TO THE UNIT UNTIL IT IS PLACED IN ITS FINAL LOCATION. KEEP THESE BRACKETS SAFE FOR TRANSFERS OR LONG-TERM STORAGE OF THE SHALE SHAKER.

The MONGOOSE PRO is equipped with special shipping brackets for the feed and discharge ends of the assembly. After the equipment is confirmed to be intact, the shipping brackets may be removed.

1. Locate the shipping brackets on the MONGOOSE PRO. Units arrive with shipping brackets locking the basket to the skid (Refer to Figure 18, Figure 19).
2. Using a 30mm socket wrench, loosen the bolt on the discharge end shipping brackets (Refer to Figure 18).

3. Using a 30mm socket wrench, loosen the bolt on the feed end shipping brackets (Refer to Figure 19)
4. Store brackets on the unit, using integrated bolt holes on the skid to hold the brackets in place (Refer to Figure 18 & Figure 19).



Figure 18. Discharge End Shipping Bracket Engaged (Left) and Stored (Right)



Figure 19. Feed End Shipping Bracket Engaged (Left) and Stored (Right)

11. PREPARING UNIT FOR OPERATIONS

11.1 Confirming Motor Weight Rotation



PERFORM A LOCKOUT / TAG OUT PROCEDURE TO ISOLATE THE UNIT FROM THE RIG POWER SUPPLY.
KEEP ALL GUARDS IN PLACE AT ALL TIMES TO AVOID EXPOSURE TO PARTS ROTATING AT HIGH SPEEDS.
WHEN POWER IS ON, SEVERE INJURY CAN OCCUR IF HANDS OR FEET REACH INSIDE THE EQUIPMENT.

1. Remove vibrator covers.
2. Confirm counter-weights match the specified operating frequency (Refer to Figure 20 & Figure 21). Note the recessed face on the 50Hz Swing Weight Motor.



THE TOP MOTOR ON THE SHAKER BASKET IS THE FIXED WEIGHT MOTOR; THE BOTTOM MOTOR IS THE SWING WEIGHT MOTOR.

3. Reassemble one cover to each vibrator; leaving one cover off of each vibrator.
 4. Bump start motors.
-



DURING THE BUMP START PROCEDURE IT IS IMPERATIVE THAT OPERATORS KEEP ALL LIMBS AWAY FROM THE MOTORS. MOTOR WEIGHTS WILL BE ROTATING AT HIGH SPEED AND CAN CAUSE SEVERE INJURIES.



ALL COMPONENTS INSIDE THE CONTROL BOX ARE LIVE AND PRESENT A SHOCK HAZARD. USE OF PPE IS MANDATORY AT THIS TIME TO PREVENT INJURY.

- a. To bump start motors, push the START button on the control panel; push the STOP button immediately after.
5. Check direction of top counter-weights to confirm their rotation matches the motor rotation diagram (Refer to Figure 22).
6. If the rotation matches Figure 22, reinstall all motor covers.
7. Start unit following procedures from paragraph 12 and run for approximately one hour. This will allow enough time for motor bearings to reach normal operating temperature.
8. Using an amp meter, verify the current drawn by the vibrators from the control panel matches the specifications on the vibrator nameplate (a clamp-on current meter is recommended).
9. Clamp around each motor cable lead to get current readings (Refer to Figure 23).
10. Reinstall control panel bolts to close and secure the control panel cover.



Figure 20. 50Hz Fixed Weight (Left) & Swing Weight (Right)



Figure 21. 60Hz Fixed Weight (Left) & Swing Weight (Right)

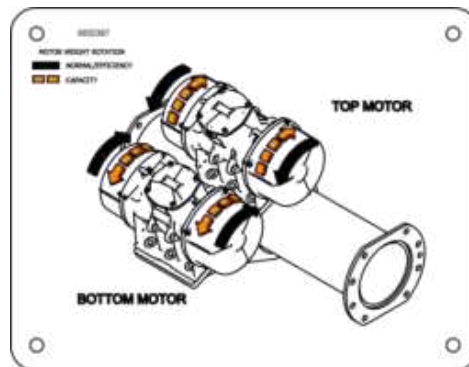


Figure 22. Motor Rotation Diagram



Figure 23. Amp Meter

12. STARTING EQUIPMENT

The list below explains checks necessary to startup the equipment:



REMOVE SHIPPING BRACKETS BEFORE TURNING ON POWER TO THE SHALE SHAKER. FAILURE TO COMPLY WILL RESULT IN DAMAGE TO EQUIPMENT AND CAN CAUSE SERIOUS INJURY FROM FLYING OBJECTS. KEEP ALL GUARDS IN PLACE AT ALL TIMES TO AVOID EXPOSURE TO ROTATING PARTS. WHILE POWER IS ON, SEVERE INJURY CAN OCCUR IF HANDS OR FEET REACH INSIDE THE EQUIPMENT.



MAKE SURE ALL OBJECTS, SUCH AS TOOLS AND COMPONENT PARTS, ARE CLEAR FROM THE EQUIPMENT BEFORE STARTING THE UNIT.



READ ALL OF THE INSTRUCTIONS IN THIS PARAGRAPH PRIOR TO OPERATION OF THE EQUIPMENT. IMPROPER INSTALLATION, MAINTENANCE, OR OPERATIONS MAY CAUSE PERSONAL INJURY OR MACHINE FAILURE.

12.1 Pre-Start Checklist



THE FOLLOWING STEP REQUIRES INTERACTING WITH EQUIPMENT THAT PRESENTS POTENTIAL PINCH POINTS FOR OPERATORS. KEEP ALL LIMBS FREE OF SCREENS AND USE VALVE LOCKOUTS.

- Make sure the shaker decks have screens loaded and secured to the basket (Refer to Figure 24). Consult paragraph 15.3.2 for screen installation steps.
- Make sure the Shale Shaker has power to the control panel and motors.
- Make sure the fluid connections to the feeder are secure.
- Make sure the discharge locations are appropriately routed.

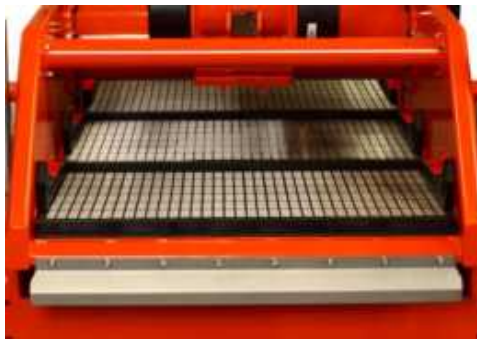


Figure 24. Screens & Wedges Firmly Engaged

12.2 Starting Sequence

1. Complete the clamping process to secure screens.
2. Wet the shaker screens with a substance compatible with the drilling fluid.
3. Select Normal or Capacity mode on the control panel, depending on the drilling parameters and conditions.
 - a. The “Capacity” or Balanced Elliptical mode effectively processes high-volume solids. The “Normal” or Progressive Elliptical mode produces drier cuttings and maximizes drilling fluid recovery.
4. Press the START button on the control panel.
5. Open fluid valve to the header box/feeder. Allow fluid to flow over the shaker screens.



APPLY FLOW OF FLUID SLOWLY AND GRADUALLY AT FIRST TO AVOID FLOODING THE SCREENS. ADJUST FLUID FLOW TO MAINTAIN OPTIMAL POOLING LEVELS.



KEEP FLUID END POINT AT 75% COVERAGE OF TOTAL SCREEN SURFACE FOR OPTIMAL PERFORMANCE. THIS ALLOWS OPERATORS TO USE THE FINAL SCREEN TO DRY THE CUTTINGS MORE EFFECTIVELY.

13. OPERATING EQUIPMENT

13.1 Adjustable Parameters During Normal Operating Conditions

13.1.1 Screen Selection

Optimal screen mesh selection depends on a number of factors:

- Flow rate
- Fluid condition
- Formation
- Rate of Penetration (ROP)
- Fluid type
- Quantity of shakers



OPERATORS SHOULD USE THE FINEST SCREEN MESH POSSIBLE TO ENSURE OPTIMUM PERFORMANCE TO THE RELATIVE SCREEN LIFE.

13.1.2 Adjusting Flow Rate

Flow rate is controlled external to the equipment, typically with a butterfly valve installed immediately prior to the fluid inlet. The optimal fluid end point is 35-45cm (14-18”) from the discharge end of the scalping deck screen (approximately 75% screen deck coverage). The flow rate should be adjusted to maintain a constant pool level at that optimal deck coverage.

13.1.3 Adjusting Basket (Deck) Angle

The basket deck angle is manually adjustable between -3° to $+3^{\circ}$ degrees (Refer to Figure 25). Lower deck angle settings result in longer screen life and wetter cuttings. Higher angle settings result in drier cuttings and increase fluid capacity. The fluid end point is affected by adjusting the basket angle or selecting a different screen mesh size.



DO NOT USE AIR/PNEUMATIC RATCHET OR WRENCH TO ADJUST THE DECK ANGLE JACK.

DO NOT ADJUST MORE THAN 2° PER SIDE WHEN ADJUSTING THE DECK ANGLE. FAILURE TO COMPLY WILL RESULT IN EQUIPMENT DAMAGE.

1. Locate manual jacks on discharge end of shaker
2. Using a manual ratchet, wrench or screen clamping wedge, adjust the 1- $\frac{1}{4}$ " nut located on top of jack to raise or lower the basket.
3. Adjust each side to desired position. Always set each side to the SAME angle.
4. Set basket at any angle between -3° and $+3^{\circ}$.
5. Change fluid end point by adjusting basket angle or by careful selection of mesh size.



ALWAYS OPERATE THE SHAKER WITH THE LOWEST POSSIBLE BASKET ANGLE THAT MEETS CAPACITY REQUIREMENTS. A STEEP INCLINE WILL RESULT IN OVERLOADING THE SCREEN AND DECREASED SCREEN LIFE.



OPERATORS CAN ADJUST THE DECK ANGLE WHILE THE SHALE SHAKER IS OPERATING WITHOUT DAMAGING THE EQUIPMENT. UNIT SHUT DOWN IS NOT REQUIRED.



Figure 25. Basket (Deck) Elevator Jack

13.1.4 Adjusting Shaker Speed

The shaker is designed to operate at 1,500 rpm (with 50Hz motor) or 1,800 rpm (with 60Hz motor) in either water or oil-based mud. Motor control panels have a selector switch for Normal (Progressive Elliptical) and Capacity (Balanced Elliptical) modes of operation. Switching between these modes affects the motion of the shaker.



NOTE

THE MOTORS GENERATE A LOUD METALLIC NOISE WHEN OPERATORS SWITCH BETWEEN DIFFERENT MODES OF OPERATION. THIS NOISE IS NORMAL AND DOES NOT INDICATE MOTOR FAILURE.



TIP

IT IS NOT NECESSARY TO SHUTDOWN THE EQUIPMENT WHEN SWITCHING BETWEEN THE BALANCED ELLIPTICAL AND PROGRESSIVE ELLIPTICAL MOTIONS.

13.2 Operating Hazards

Every action has been taken to ensure the Shale Shaker will function in a manner that is safe to the environment and the operator. However, there are certain inherent operating hazards operators need to understand:



OPERATORS MUST ALWAYS WEAR PPE LISTED IN PARAGRAPH 2 WHEN USING EQUIPMENT. FAILURE TO COMPLY CAN RESULT IN PERSONNEL INJURIES.

- During operation, the Shale Shaker generates a high level of vibrations on its basket to convey solids materials across the basket screens. NEVER reach into the basket while the unit is in operation.
- When adjusting the basket height with a socket wrench or a screen wedge, operators must keep each side of the basket within 2° of one another to prevent pinch points or equipment damage.



DO NOT USE AIR/PNEUMATIC RATCHET OR WRENCH TO ADJUST THE DECK ANGLE JACK. DO NOT ADJUST MORE THAN 2° PER SIDE WHEN ADJUSTING THE DECK ANGLE. FAILURE TO COMPLY WILL RESULT IN EQUIPMENT DAMAGE.

13.2.1 Acting in Emergency Situations

In the event of an emergency situation during operations, the Shale Shaker should be immediately shut down until the emergency has been addressed. In addition to any rig site emergency situation caused by other rig equipment, operators should consider the following emergency situations as well:

- Abnormal noise generated by motors
 - Shut down operation and diagnose motors



THE MOTORS GENERATE A LOUD METALLIC NOISE WHEN OPERATORS SWITCH BETWEEN DIFFERENT MODES OF OPERATION. THIS NOISE IS NORMAL AND DOES NOT INDICATE MOTOR FAILURE.

- Abnormal shaker basket motion / uneven motion
 - Shut down operation and diagnose motors and basket springs
- Feeder surge
 - Attempt to control inlet flow from source, shutting down operations if necessary
- Blinded screens
 - Shut down operation and spray down screens to loosen material
- Loose screens or missing screens
 - Shut down operation and secure screens
- Clamping pressure malfunction
 - Shut down operation and restore optimal clamping pressure before resuming

- System pressure malfunction
 - Shut down operation and examine air/hydraulic lines for leaks or damage.
- Deck adjustment elevator failure
 - Shut down operation and diagnose deck adjustment system, repairing or replacing as necessary

14. STOPPING / SHUTDOWN

The following procedures explain how to shut down the MONGOOSE PRO.

14.1 Controlled Shutdown of the Equipment for Routine Maintenance

1. Stop flow of drilling fluid to shaker.
2. While shaker is running, wash down screens, thoroughly cleaning all cuttings and solids build up around inside of deck and wedges, using an appropriate base fluid.
3. Push STOP button on the Start/Stop station to shut down shaker.



CAUTION

FOLLOW ALL SAFETY INSTRUCTIONS. USE PROPER PPE WHEN USING STEAM OR PRESSURE EQUIPMENT.



TIP

DO NOT USE A SQUEEGEE OR ANY OTHER FOREIGN OBJECT TO CLEAN SCREENS.



NOTE

IF UNIT IS OUT OF SERVICE FOR AN EXTENDED PERIOD, THOROUGHLY CLEAN AND DRY SHAKER SCREENS. REPLACE IN THEIR BOXES OR STORE ALL SCREENS IN A SAFE, DRY AREA.

15. MAINTAINING EQUIPMENT

15.1 Safety Related Maintenance Procedures

The following procedures explain basic tasks that will help extend the service life of the MONGOOSE PRO Shale Shaker. M-I SWACO recommends operators comply with these procedures to ensure the unit operates at its peak efficiency and in a safe manner.



INITIATE A CONTROLLED SHUTDOWN BEFORE STARTING ANY PARTS REPLACEMENT PROCEDURE. LOCKOUT / TAG OUT THE UNIT. HAVE A CERTIFIED ELECTRICIAN VERIFY THAT THE POWER SUPPLIES ARE ISOLATED BEFORE PERFORMING ANY MAINTENANCE PROCEDURE ON THE SHALE SHAKER.

Below are some basic safety-related procedures that must be followed when performing maintenance:

- Clean all parts and work area.
- Block up and secure heavy parts before working beneath an assembly or a component of an assembly.
- Always seek assistance when heavy lifting is required.
- Remove all screens BEFORE any work is performed on the shaker.
- Make sure all tools and old parts, such as nuts and bolts or washers, are removed BEFORE restarting the Shale Shaker.
- Do NOT weld on any part of the basket assembly for any reason.
- All maintenance is to be carried out by qualified personnel.

15.2 Preventive Maintenance Schedule

Consult the following preventive maintenance schedule for daily, weekly, and monthly maintenance tasks:

Table 3. Recommended Preventive Maintenance Schedule

ITEM	TASK	INTERVAL
MOTORS	GREASE MOTORS OPERATING AT NORMAL TEMPERATURE APPLY 1.41 OUNCES (40 G)	2000 HOURS RUN TIME
	GREASE MOTORS OPERATING ABOVE 70 C (158 F) APPLY 0.7 OUNCES (20 G)	1500 HOURS OF RUN TIME
ELECTRICAL CABLES	CHECK FOR WEAR AND DAMAGE	WEEKLY
SCREEN GASKETS	CHECK FOR CRACKS	MONTHLY
DECK ADJUSTMENT SYSTEM	CHECK FOR FULL UP AND DOWN TRAVEL	MONTHLY
SUPPORT SPRINGS	CHECK FOR UNEVEN COMPRESSION	MONTHLY
SCREEN HOLD DOWN BAR	CHECK SCREWS FOR TIGHTNESS	MONTHLY
GASKET GROMMETS	CHECK FOR HOLDING	MONTHLY
NUTS AND BOLTS	CHECK FOR TIGHTNESS	MONTHLY
MOTOR BOLTS	VERIFY PROPER TORQUE	MONTHLY
DECK ADJUSTMENT SYSTEM	GREASE JACK FITTING	MONTHLY



NOTE

TIME INTERVALS ABOVE ASSUME CONTINUOUS SHAKER OPERATION.

15.3 Handling Screens

MONGOOSE PRO units have four pretensioned screens and ten wedges per shaker basket (two are spares on the cable tower). Once screens are placed on the screen bed, wedges are driven between each screen edge and support bars on shaker sidewalls. The screen bed is slightly crowned at the center causing screen frames to bow when wedges are forced in place. This prevents screens from “whipping” up and down during shaker operation.

15.3.1 Removing Screens

1. Initiate a controlled shutdown of the equipment.



PERFORM LOCKOUT / TAG OUT PROCEDURES TO ISOLATE THE UNIT FROM RIG POWER SUPPLY.



WASH DOWN THE SCREEN AREA PRIOR TO INSTALLING NEW SHAKER SCREENS.



USE A RUBBER Mallet TO AVOID DAMAGING THE SCREEN WEDGES.

2. Each screen is secured in place by two wedges, one per side.
3. Strike top handle section of wedges to loosen them.
 - a. Always remove wedges with a dead blow hammer (Refer to Figure 26 for an alternative technique).
4. Remove screen panel. Screen panels are removed and installed one at a time.
 - a. Place the screen wedges in the wedge holders, located on the cable tower, to prevent losing them during screen changes (Refer to Figure 27).
5. Examine screen deck gaskets for aggressive wear.



REPLACE ANY DECK GASKETS THAT ARE WORN, CRACKED, OR HARDENED.



Figure 26. Use Extra Wedges with a Mallet to Loosen Screen Wedges



Figure 27. MONGOOSE PRO Cable Tower with Wedge Holders

15.3.2 Replacing Screens



TIP

ALWAYS WASH DOWN SCREEN BED AND SCREEN GASKETS PRIOR TO INSTALLING NEW SCREENS.



NOTE

DO NOT HAMMER WEDGES TOO TIGHTLY OR THEY WILL BE EXTREMELY DIFFICULT TO REMOVE.



TIP

BOTH WEDGES MUST BE IN POSITION PRIOR TO SECURING THEM. FAILURE TO DO SO COULD PREVENT OPERATORS FROM SECURING THE SCREEN'S OTHER WEDGE.



WEDGES FOR THE SECOND SCREEN FROM THE FEED END ARE REVERSED FOR EASIER INSTALLATION.

1. Lay new screen into shaker deck.
2. Position one screen wedge between the screen edge and the support bar on the shaker basket interior sidewall (Refer to Figure 28).
3. Position another wedge on the other side of the screen in the same manner.
4. Hammer each wedge securely into position.
5. Condition the screen mesh by wetting down new screen mesh with a compatible base fluid PRIOR to operations.



Figure 28. Screen Wedge Secured to Unit

15.3.3 Washing Screens



FOLLOW ALL SAFETY INSTRUCTIONS. USE PROPER PPE WHEN USING STEAM OR PRESSURE EQUIPMENT.



ALWAYS WASH SCREENS PRIOR TO STORING THEM TO AVOID MECHANICAL DAMAGE. WASH THE SCREENS WITH AN APPROPRIATE MEDIUM BEFORE SHUTTING DOWN EQUIPMENT. THIS WILL AVOID PLUGGING OR BLINDING THE SCREEN MESHES WITH DRIED SOLIDS. NEVER USE A WIRE OR STIFF FIBER BRUSH TO CLEAN THE SCREENS.

15.3.3.1 Washing Screens Plugged With Solids

1. Remove screens from the shaker, using procedures from paragraph 15.3.1.
2. Wash screens from the underside using a compatible base fluid.
3. Change screens to a finer screen mesh.

15.3.4 Storing Screens

- Store screens in original cardboard packaging to protect screen mesh.
- Horizontal or vertical stacking is permissible.

15.4 Maintaining Motors



INSTALLATION OF VIBRATORY MOTOR SHOULD BE COMPLETED BY A CERTIFIED ELECTRICIAN.

15.4.1 Lubricating Motor Bearings

Operators must lubricate Motor Bearings every 2000 Operational Hours to maintain optimum performance and reliability.



ONLY USE KLUBER ISOFLEX TOPAS NB52 LUBRICANT TO OIL THE BEARINGS. FAILURE TO DO SO WILL VOID THE MOTOR MANUFACTURER WARRANTY.

4. Remove plugs, one for each bearing (Refer to Figure 29).
 5. Insert a 1/8" NPT Zerk grease fitting.
 6. Pump 1.41 ounces (40 g) of lubricant into each bearing for normal bearing surface temperatures below 195°F (91°C).
-



DO NOT OVERFILL GREASE FITTINGS. ADDING TOO MUCH GREASE WILL CAUSE OVERHEATING AND DESTROY THE MOTOR.



Figure 29. Grease Fittings (Circled)

15.4.2 Applying Torque to Motor Bolts



NEVER REUSE THE MOTOR INSTALLATION HARDWARE (BOLTS, WASHERS, AND NUTS). ALWAYS USE NEW HARDWARE. CONFIRM TORQUE FOR ALL NEW MOTOR BOLTS AFTER THE FIRST FOUR HOURS OF OPERATING TIME.

Operators will prolong the life of Shale Shaker motor bolts if torque is properly applied at the appropriate intervals.

1. Using a 30mm socket (3/4" drive) with a 200mm (8") extension, apply an initial torque of 160ft-lbs. (217Nm) to all newly installed motor bolts.
 - a. Apply torque to each bolt in the order illustrated in Figure 30.
2. Apply a final torque of 300ft-lbs. (447.5Nm) to the motor bolts, once more following the torque order from Figure 30.
3. After four hours of operating time, confirm all motor bolts still have 300ft-lbs. (447.5Nm) of torque applied.



THERE ARE A TOTAL OF SIX MOTOR BOLTS ON EACH MOTOR. ALL BOLTS RECEIVE PROPER TORQUE FROM THE FACTORY.

4. Verify and document motor bolt torque every 672 hours or once per month of operation.



Figure 30. Motor Bolt Torque Pattern

15.4.3 Electrical Connections (Isolators)

Make sure black neoprene vibration isolators are installed properly prior to operating equipment any time motor leads are changed or cable is replaced.



WHILE THE ISOLATORS ARE REMOVABLE, THEY SHOULD ALWAYS BE IN PLACE WHEN THE UNIT IS IN USE TO PROTECT ELECTRICAL CONNECTIONS IN THE MOTOR. FAILURE TO DO SO CAUSES PREMATURE FAILURE OF THE WIRING AND COULD ALSO CAUSE THE MOUNTING POSTS TO BREAK.

1. Remove the four bolts securing the motor lead electrical cover.
2. Install the thin isolator first (Refer to Figure 31).

3. Connect motor leads to the correct terminals.
4. Place the thick isolator on top of motor leads (Refer to Figure 31).
5. Replace cover.
6. Replace cover bolts, tightening them to secure the motor.



Figure 31. Thin Lower Isolator; Leads Showing (Left) and Thick Top Isolator; Leads Not Showing (Right)

15.5 Maintaining Isolation Springs

Isolation springs isolate the skid and immediate surroundings from the vibratory motion of the motors and shaker basket. Their condition is vital to the performance of the Shale Shaker.



Figure 32. Spring Enclosed in Nitrile Boot

15.5.1 Inspecting Springs

Examine each spring for signs of fatigue or fracture every 3 months. Perform additional examinations if the shaker basket is tilting side-to-side or cuttings are running to one side of the basket.



SPRINGS ARE COVERED WITH A PROTECTIVE BLACK NITRILE BOOT THAT PROVIDES A SAFETY PRECAUTION AGAINST BARE SPRINGS, WHICH ARE A POTENTIAL PINCH POINT (REFER TO FIGURE 32).

- Check for spring fatigue by leveling the basket and measuring the height of each spring.

- The front two springs should be same height, and the back two springs should be same height.



HEIGHT OF BACK SPRINGS MAY DIFFER FROM HEIGHT OF FRONT SPRINGS.

15.6 Maintaining Deck Adjustment Jack

15.6.1 Greasing Deck Adjustment Jack

The deck angle adjustment jacks have a grease fitting located on the discharge side of the jack (Refer to Figure 33).

1. Once a month, apply 10 shots of multi-purpose grease into grease fitting.
2. Run deck angle adjustment up and down twice to allow grease penetration to jack inner screw.



Figure 33. Grease Port on the Elevator Jack (Arrowed)

15.7 Maintaining Screen Gaskets

15.7.1 Removing Screen Gaskets



INITIATE A CONTROLLED SHUTDOWN. DISCONNECT AND LOCKOUT / TAG OUT THE POWER SUPPLY TO THE CONTROL PANEL PRIOR TO ATTEMPTING ANY PARTS REPLACEMENT OR MAINTENANCE PROCEDURE.



FAILURE TO REPLACE WORN OR HARDENED SCREEN GASKETS CAN RESULT IN DAMAGE TO THE SCREEN BED. REPLACE THEM IN A TIMELY FASHION.

1. Wash and remove all screens from shaker.



PERIODIC CLEANING OF SHALE SHAKER SCREENS KEEPS THE UNIT EFFICIENTLY OPERATING. WASH SCREENS EACH TIME IT IS SHUT DOWN.

2. Wash deck area thoroughly. Ensure screen bed is clean.
3. Remove hardware and then remove rubber screen gaskets with bars.



REPLACE SCREEN DECK RUBBER SCREEN GASKETS WHEN SIGNS OF CRACKING OR HARDENING ARE PRESENT.

15.7.2 Replacing Grommets

Replace plastic grommets when rubber screen gasket is replaced (Refer to Figure 34).

1. Pry off old screen grommets.
2. Place new grommets in the rectangular slot and push them down to lock into position.



Figure 34. Plastic Grommet

15.7.3 Replacing Screen Gaskets

1. Thoroughly clean screen deck to ensure new gasket properly fits.
2. Lay new screen gasket into place and install screen bar on top of grommets.



IF NECESSARY, ALIGN GROMMETS WITH SCREW HOLES IN THE SCREEN BAR, USING A SMALL SCREWDRIVER.

3. Tighten all screws with a No. 2 square bit screwdriver. Ensure the lip of the gasket is tight to screen bar.



DO NOT OVER TIGHTEN SCREWS. THE GROMMETS MAY PULL OUT OF THE SCREEN DECK IF THEY ARE SUBJECTED TO EXCESS TORQUE.

16. SHAKER WASH DOWN PROCEDURES



CAUTION

FOLLOW ALL SAFETY INSTRUCTIONS. USE OF PPE IS REQUIRED DURING SHAKER WASH DOWN PROCEDURES.

16.1 Washing During Normal Conditions

1. Use base fluid and thoroughly hose down entire unit with screens in place and shaker running to completely remove all solids from screen surface.
 2. When unit is clean, shut off power and remove all screens and set them aside. Continue washing shaker.
 3. Clean screen bed area extremely well ensuring seal area is free of drilling fluid that can cause bypass around screen frame later.
 4. Wash screens to remove sticky solids.
-



NOTE

WHEN CLEANING WITH A PRESSURE WASHER, KEEP NOZZLE AT LEAST 16" AWAY FROM THE SCREENS TO PREVENT TEARING THE MESH.

16.2 Washing After Circulation of Completion Fluids



WARNING

COMPLETION FLUIDS CONTAIN A HIGHER AMOUNT OF CHLORIDES WHICH ARE HIGHLY CORROSIVE. USE APPROPRIATE PPE AND SAFETY EQUIPMENT WHEN CLEANING COMPLETION FLUIDS FROM SHAKER SCREENS. FAILURE TO COMPLY MAY RESULT IN INJURIES, INCLUDING EYE SWELLING OR BLINDNESS.

1. Follow the "Normal Operation" washing instructions from paragraph 16.1.
-



NOTE

AT THIS POINT, THERE SHOULD NOT BE ANY SCREENS LOADED IN THE SHAKER BASKET.

2. Raise shaker basket to its highest positive angle and thoroughly wash the basket interior.
3. Wash the screens separately from the Shale Shaker, following procedures from paragraph 15.3.3.

17. TROUBLESHOOTING

The following is a list of potential problems that could occur when operating the MONGOOSE PRO Shale Shaker. Each potential problem is followed by a possible cause and the suggested remedial action(s) to take. If you are not able to resolve a problem using this list please contact your M-I SWACO representative for assistance.



IF USERS ARE TROUBLESHOOTING HYDROCYCLONE COMPONENTS OF A MONGOOSE PRO MUD CLEANER UNIT, CONSULT THE TROUBLESHOOTING INFORMATION IN THE HYDROCYCLONE DOCUMENTATION.

17.1 Troubleshooting Table



FOLLOW ALL PROPER LIFTING PROCEDURES DISCUSSED IN PARAGRAPH 7.1. OBSERVE ALL SAFETY PRECAUTIONS IN EACH CORRECTIVE ACTION'S PROCEDURE(S). WEAR ALL REQUIRED PPE TO AVOID PERSONAL INJURIES.

Problem: Screen Wedge(s) Come Loose

Possible Cause: Screen wedge was not properly installed

Remedy: Remove screen wedge and reseal, making sure the wedge is fully engaged.

Possible Cause: Solids buildup under screen or screen wedge

Remedy: Remove wedge and screen, inspecting for solids or debris. Replace screen and wedges, making sure the wedges are fully engaged

Problem: Shaker Operating with Unusual Vibratory Motion

Possible Cause: Vibratory motors are rotating in the same direction.

Remedy: Perform a motor rotation check procedure from paragraph 11.1, correcting motor orientation as necessary. Make sure equipment operates properly in both Normal and Capacity operating modes.

Problem: Solids Not Conveying (Moving) Across Screens

Possible Cause: Loose screen cloth.

Remedy: Replace screen(s), per instructions from paragraph 15.3.2.

Possible Cause: Motor not phasing.

Remedy: Perform a motor rotation check procedure in paragraph 11.1, correcting motor orientation as necessary. Make sure equipment operates properly in both Normal and Capacity operating modes.

Problem: Short Screen Life

Possible Cause: Angle of basket too high.

Remedy: Lower the basket angle per instructions in paragraph 13.1.3.

Possible Cause: Solids loading too heavy.

Remedy: Use coarser screen mesh.

Problem: Excessive Noise From Shaker

Possible Cause: Loose bolts.

Remedy: Check and tighten all hardware. Follow motor bolt torque procedures in paragraph 15.4.2 when checking the torque on motor mounting hardware.

Possible Cause: Clamping system failure.

Remedy: Check and repair the screen clamping actuators and connections, replacing them as necessary.

Possible Cause: Vibratory motor bearing failure.

Remedy: Schedule shop to remove and replace broken vibratory motor / Ship broken motor to be rebuilt.

Possible Cause: Spring failure.

Remedy: Schedule shop to replace broken springs.

Problem: System Pressure Loss

Possible Cause: System not pressurized

Remedy: Pressurize the system per instructions in paragraph

Possible Cause: Leaks present in system.

Remedy: Shut off system and check pneumatic lines and fittings for leaks.

Problem: Solids Are Migrating To One Side of the Basket, Or Not Properly Discharging

Possible Cause: Unit is not level.

Remedy: Make sure the skid was mounted to a level surface and level equipment as necessary.

Possible Cause: Spring failure.

Remedy: Check for excessively worn or broken springs. Schedule shop to replace broken springs.

Problem: Mud Builds Up On Shaker Screens OR Too Much Mud Spills Over Discharge

Possible Cause: Incorrect deck angle.

Remedy: Adjust deck angle per instructions in paragraph 13.1.3.

Possible Cause: Screen mesh is too fine (not permitting solids to pass through).

Remedy: Use coarser screen mesh. Contact your local M-I SWACO representative for more information.

Problem: Mud Builds Up At The Back Edge Of Screen(s)

Possible Cause: Screen cloth tension is failing on the screen panel.

Remedy: Replace the screen panel that has failed per paragraph 15.3.2.

Problem: Vibratory Motors Overheating (70°F Over Ambient Temperature)

Possible Cause: Motor bearings out of grease.

Remedy: Service the motor bearings.

Possible Cause: Bearing has worn out.

Remedy: Schedule the motor for replacement.

17.2 Electrical Troubleshooting Table



ELECTRICAL TROUBLESHOOTING EXAMINATIONS MUST BE CONDUCTED BY A CERTIFIED ELECTRICIAN. FAILURE TO COMPLY COULD RESULT IN ELECTRICAL SHOCK OR DAMAGE TO EQUIPMENT.

Problem: Both Vibratory Motors Fail to Rotate

Possible Cause: Main power supply shut down.

Remedy: Check supply to control box.

Remedy: Make sure the electrical isolator is on.

Remedy: Check control panel circuit breakers for blown/missing fuses.

Problem: One Vibratory Motor Fails to Rotate

Possible Cause: Damaged wiring.

Remedy: Check wiring for damage, repairing and replacing as necessary.

Possible Cause: Damaged vibratory motor.

Remedy: Have motor components analyzed for wear or damage by a certified electrician.

Possible Cause: Damaged overload contact.

Remedy: Check control panel circuit breakers. Make sure outlet is active.

Remedy: Check the overload in the control panel

Problem: Shaker Operation Stops

Possible Cause: Control circuit tripped.

Remedy: Check circuit breakers and thermal overloads in the control panel, resetting and replacing as necessary.

18. PRESERVATION AND STORAGE

18.1 Storage of Non-Commissioned Equipment

Equipment can be stored (upon arrival) in the shipping crate for a 12 to 24 month preservation period. Do NOT expose equipment to dust, vibration or extreme weather conditions (such as heavy rain). If unit has been removed from original crate, cover with a tarpaulin during any preservation period.

Every 1-3 months, examine the motors. Remove their weight covers and rotate the counterweight to preserve the bearings.

18.2 Storage of Commissioned Equipment

When preparing a commissioned piece of equipment for storage, take the following steps to make sure it is protected:

1. Reinstall original shipping brackets to protect equipment.
2. When disconnecting power connections to control station and motors, plug all inlets with an appropriate fitting to keep water/moisture from entering. Do NOT leave any electrical connections open and exposed.
3. Add anti-condensation packs to motor junction boxes and control station.
4. Install and seal all control station doors and junction box covers.



USE HERCULES REAL TUFF THREAD SEALANT WITH TEFLON (MSDS NS 5820 A.5.4) ON PLUG THREADS TO HELP PREVENT LEAKAGE (REFER TO FIGURE 35).

5. Wash unit to remove any media from shaker basket, feeder and skid.
6. Remove screens.
7. Disconnect flow line from the feeder.
8. Disconnect main power line from isolator.
9. Attach shipping brackets to basket and skid.
10. Open air valves to relieve air pressure.
11. Disconnect air supply.
12. Move or transport shaker via lifting points indicated on skid.
13. Cover air line connections to prevent contaminants from entering the system.



Figure 35. Sealant Applied on a Plug Thread

19. RIG-DOWN / PREPARING EQUIPMENT FOR RELOCATION

To prepare a unit for rig down or relocation, ensure the following have occurred:

- Unit has been properly shut down (Refer to paragraph 14).
- Unit has been properly cleaned (Refer to paragraph 16).
- Screens have been removed (Refer to paragraph 15.3.1).
- Unit has been disconnected from fluid piping.
- Shipping brackets have been reinstalled (Refer to paragraph 10.2).

Once these steps are completed, the equipment is ready for transportation.

20. PARTS DRAWINGS AND LISTS

20.1 Assemblies, Sub-Assemblies, Spare Parts Lists, Additional Hardware

20.1.1 Rig Critical Spares (1 Year)



READ THIS ENTIRE SECTION BEFORE PLACING ANY MOTOR ORDERS.

REFER TO HYDROCYCLONE DOCUMENTATION FOR SPARE PARTS INFORMATION SATISFYING THE HYDROCYCLONE COMPONENTS OF A MONGOOSE PRO MUD CLEANER.

The following pages in this section contain Rig Critical Spare Parts Lists for the following general configurations:

- MONGOOSE PRO Shale Shakers
- Dual MONGOOSE PRO Shale Shakers
- Triple MONGOOSE PRO Shale Shakers
- Quad MONGOOSE PRO Shale Shakers

For quick reference, Table 4 provides an overall Rig Critical Spares (1 Year) List. It contains the part number for every MONGOOSE PRO Rig Critical Spares (1 Year) Kit. Ordering one of these kits will provide rigs with all parts necessary to operate and maintain a unit for one year. Spare parts kits are grouped by the quantity of baskets and configuration motor voltage.

The MONGOOSE PRO Rig Critical Spare Parts List (Refer to Table 5) and exploded view (Refer to Figure 36) identifies the spare parts required to keep the unit operating in the field. The basket assemblies and skids in the Dual, Triple and Quad MONGOOSE PRO Shale Shaker exploded views have been removed to call attention to the additional spare parts for each unique configuration.

Dual MONGOOSE PRO Shale Shaker assemblies require the same spare parts (in addition to the unique spare parts required to maintain Dual Shale Shaker assemblies) as a single MONGOOSE PRO Shale Shaker. Therefore, line item one in the Dual MONGOOSE PRO Shale Shaker Spare Parts List (Refer to Table 6) refers to the entire MONGOOSE PRO Shale Shaker Spare Parts List, with a quantity of one.

Triple and Quad MONGOOSE PRO Shale Shaker assemblies require twice the quantity of spare parts (in addition to their own unique spare parts) as a single MONGOOSE PRO Shale Shaker. Therefore, line item one in both the Triple MONGOOSE PRO Shale Shaker Spare Parts List (Refer to Table 7) and the Quad MONGOOSE PRO Shale Shaker Spare Parts List (Refer to Table 8) both refer to the entire MONGOOSE PRO Shale Shaker Spare Parts List, with a quantity of two.

Additionally, this section also contains a breakdown of MONGOOSE PRO motor kits for both the fixed (Refer to Table 9) and swing (Refer to Table 10) weight motors.

In the event of a swing weight motor failure, a fixed weight motor can be substituted in its place. While any Shale Shaker unit will retain basic functionality with two fixed weight motors, this setup will severely limit the unit's performance; Dual-motion functionality is not possible for units operating with two fixed weight motors.

To avoid any significant operation downtime, M-I SWACO recommends ordering a replacement Swing Weight Motor Kit from Table 10 as soon as possible after swing weight motor failure.

M-I SWACO MONGOOSE PRO Shale Shaker

Table 4. Rig Critical Spares (1 Year) Kit List For MONGOOSE PRO Shale Shaker

PART NO.	DESCRIPTION
9350051	KIT, RIG CRITICAL SPARES (1-YR) MONGOOSE PRO 440-480V 60HZ UL
9350052	KIT, RIG CRITICAL SPARES (1-YR) MONGOOSE PRO 440-480V 60HZ ATEX/IECEX
9350053	KIT, RIG CRITICAL SPARES (1-YR) MONGOOSE PRO 380-415V 50HZ UL
9350054	KIT, RIG CRITICAL SPARES (1-YR) MONGOOSE PRO 380-415V 50HZ ATEX/IECEX
9350055	KIT, RIG CRITICAL SPARES (1-YR) MONGOOSE PRO 575-600V 60HZ UL
9350056	KIT, RIG CRITICAL SPARES (1-YR) MONGOOSE PRO 575-600V 60HZ ATEX/IECEX
9350057	KIT, RIG CRITICAL SPARES (1-YR) DUAL MONGOOSE PRO 440-480V 60HZ UL
9350058	KIT, RIG CRITICAL SPARES (1-YR) DUAL MONGOOSE PRO 440-480V 60HZ ATEX/IECEX
9350059	KIT, RIG CRITICAL SPARES (1-YR) DUAL MONGOOSE PRO 380-415V 50HZ UL
9350060	KIT, RIG CRITICAL SPARES (1-YR) DUAL MONGOOSE PRO 380-415V 50HZ ATEX/IECEX
9350061	KIT, RIG CRITICAL SPARES (1-YR) DUAL MONGOOSE PRO 575-600V 60HZ UL
9350062	KIT, RIG CRITICAL SPARES (1-YR) DUAL MONGOOSE PRO 575-600V 60HZ ATEX/IECEX
9350063	KIT, RIG CRITICAL SPARES (1-YR) TRIPLE MONGOOSE PRO 440-480V 60HZ UL
9350064	KIT, RIG CRITICAL SPARES (1-YR) TRIPLE MONGOOSE PRO 440-480V 60HZ ATEX/IECEX
9350065	KIT, RIG CRITICAL SPARES (1-YR) TRIPLE MONGOOSE PRO 380-415V 50HZ UL
9350066	KIT, RIG CRITICAL SPARES (1-YR) TRIPLE MONGOOSE PRO 380-415V 50HZ ATEX/IECEX
9350067	KIT, RIG CRITICAL SPARES (1-YR) TRIPLE MONGOOSE PRO 575-600V 60HZ UL
9350068	KIT, RIG CRITICAL SPARES (1-YR) TRIPLE MONGOOSE PRO 575-600V 60HZ ATEX/IECEX
9350069	KIT, RIG CRITICAL SPARES (1-YR) QUAD MONGOOSE PRO 440-480V 60HZ UL
9350070	KIT, RIG CRITICAL SPARES (1-YR) QUAD MONGOOSE PRO 440-480V 60HZ ATEX/IECEX
9350071	KIT, RIG CRITICAL SPARES (1-YR) QUAD MONGOOSE PRO 380-415V 50HZ UL
9350072	KIT, RIG CRITICAL SPARES (1-YR) QUAD MONGOOSE PRO 380-415V 50HZ ATEX/IECEX
9350073	KIT, RIG CRITICAL SPARES (1-YR) QUAD MONGOOSE PRO 575-600V 60HZ UL
9350074	KIT, RIG CRITICAL SPARES (1-YR) QUAD MONGOOSE PRO 575-600V 60HZ ATEX/IECEX

M-I SWACO MONGOOSE PRO Shale Shaker

20.1.1.1 MONGOOSE PRO Rig Critical Spares

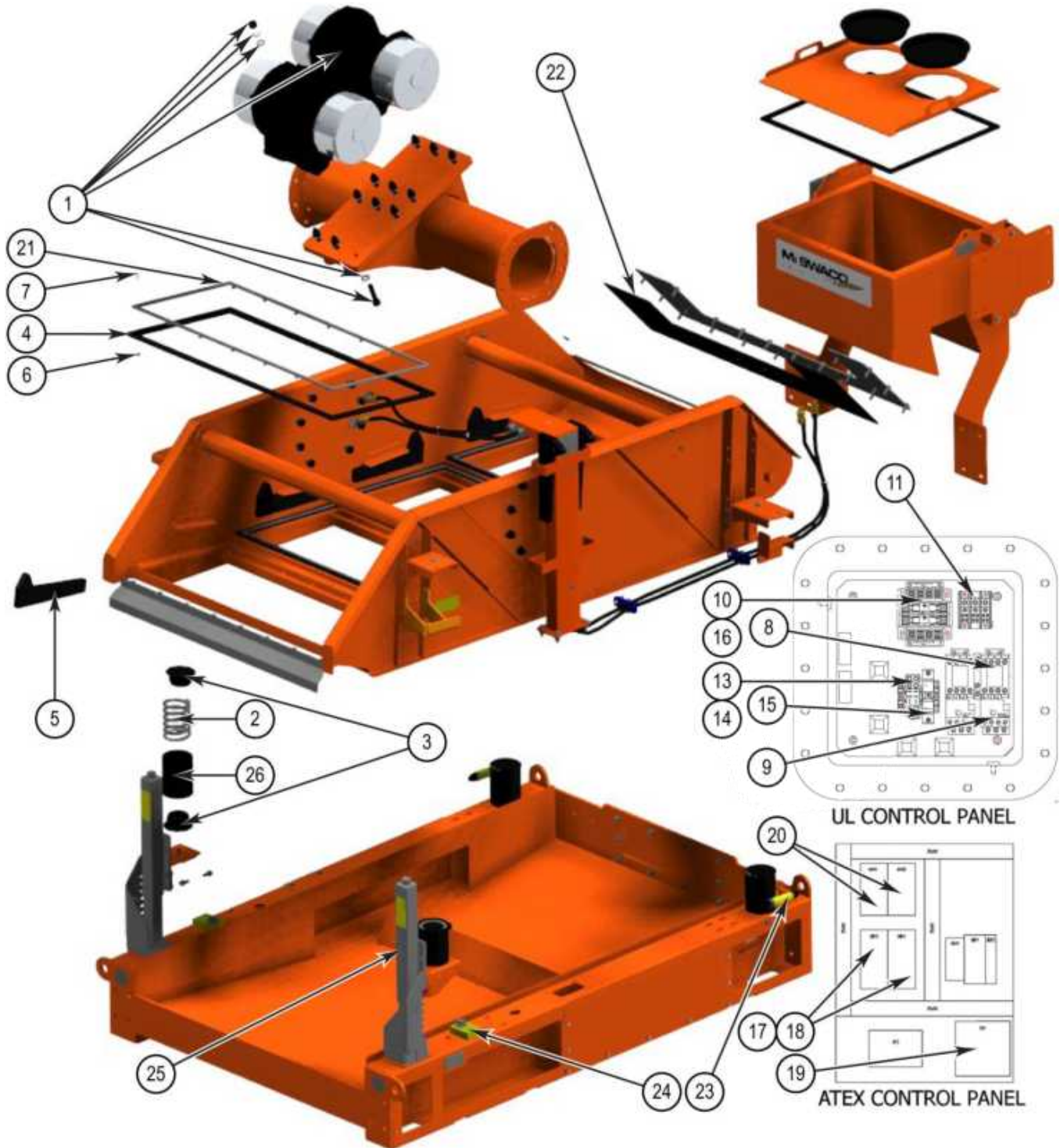


Figure 36. MONGOOSE PRO Shale Shaker Components Exploded View

M-I SWACO MONGOOSE PRO Shale Shaker

Table 5. Rig Critical Spare Parts List For MONGOOSE PRO Shale Shaker

ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY
1*	9870525	KIT, MOTOR 2.5 HP, FIXED WT (220-240/440-480V 70 FRAME)	1
	9870526	KIT, MOTOR 2.5 HP, FIXED WT (220-240/380-415V 70 FRAME)	
	9870527	KIT, MOTOR 2.5 HP, FIXED WT (575-600V 70 FRAME)	
2	9360007	SPRING COIL 7"	4
3	BM6K80290	SPRING SPOOL	8
4	5837001	GASKET, MONGOOSE FLAT PANEL SCREEN	8
5	5895001	WEDGE, MONGOOSE SCREEN CLAMPING	8
6	07-443	GROMMET RECT NYLON WHITE	100
7	1441471	#8 FLATHEAD SHEETMETAL SCREW W/SQUARE DRIVE	100
8	7150018	CONTACTOR, REVERSING	1
9	7152032	RELAY, THERMAL OVERLOAD (5.5-7.5A) 380V	2
	7152011	RELAY, THERMAL OVERLOAD (4.5-6.3A) 460V	
	7152033	RELAY, THERMAL OVERLOAD (3.5-4.8A) 575V	
	7152034	RELAY, THERMAL OVERLOAD (9.0-12.5A) 240V	
10	7790017	TRANSFORMER (460V)	1
	7790019	TRANSFORMER (575V)	
	7790018	TRANSFORMER (380V)	
11	7150014	POWER DISTRIBUTION BLOCK	1
12	8265105	EMITTER PLASTIC VCI-105 (NOT SHOWN IN DRAWING)	1
13	7150016	RELAY BASE	1
14	7150015	RELAY, DPDT 10A 120VAC	1
15	7510037	CIRCUIT BREAKER, 2 POLE, 1A	1
16	7518020	FUSE GOULD SHAWNUT ATMR1	1
17	102978481	380V CIRCUIT BREAKER SIZE 5.5-8A (ATEX/IECEX ONLY)	1
	102978486	460V CIRCUIT BREAKER SIZE 4.5-6.3A (ATEX/IECEX ONLY)	
	102978493	575V CIRCUIT BREAKER SIZE 3.5-.5A (ATEX/IECEX ONLY)	
18	102978470	AUX CONTACT BLOCK 1NO+1NC (ATEX/IECEX ONLY)	1
19	102978458	TRANSFORMER I 0-230-400-460-600-690/0-110V (ATEX/IECEX ONLY)	1
20	102978434	CONTACTOR 5.5KW 110 VAC (ATEX/IECEX ONLY)	1
21	9671640	SCREEN FRAME WELDMENT	4
22	5873004	FEED END SKIRT	1
23	9674128	TUBE, SHIPPING BRACKET	2
24	9675333	BLOCK, SHIPPING BRACKET HOLD DOWN	2
25	9675294	JACK LIFTING DECK	1
26	5804004	SPRING COVER / BOOT	1

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ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY
NOT SHOWN	103057238	BOLT M20 X 90MM FOR SHIPPING BLOCK	2
NOT SHOWN	04-1839	BOLT M20 X 160MM FOR SHIPPING TUBE	2
NOT SHOWN	04-1131	BOLT M8 X 30MM	9
NOT SHOWN	03-232	NUT M8	4
NOT SHOWN	05-276	FLATWASHER M8	18
NOT SHOWN	05-432	SCHNORR WASHER M8	9
NOT SHOWN	04-1105	BOLT M12 X 35MM	40
NOT SHOWN	04-1270	BOLT M12 X 45MM	10
NOT SHOWN	03-415	NUT M12	40
NOT SHOWN	05-305	FLATWASHER M12	80
NOT SHOWN	05-371	SCHNORR LOCKWASHER M12	40
NOT SHOWN	BM6Y10137-01	WASHER 0.48" ID X 1.25" OD X 0.135" THICK	4

*Motor kits MUST be ordered when replacing a motor. For a parts breakdown of each Motor Kit, refer to Table 9.

M-I SWACO MONGOOSE PRO Shale Shaker

20.1.1.2 Dual MONGOOSE PRO Rig Critical Spares

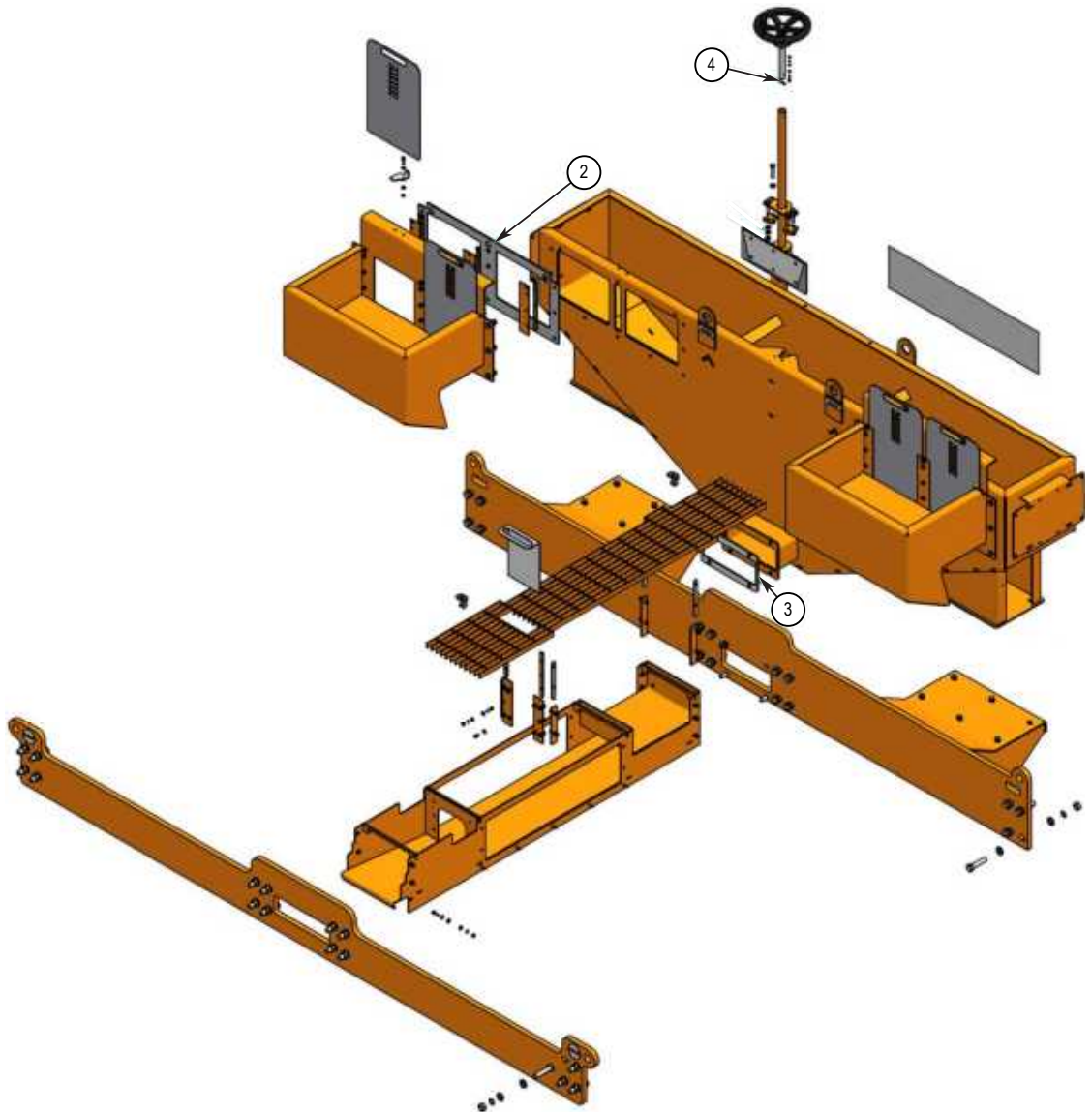


Figure 37. Dual MONGOOSE PRO Shale Shaker Components Exploded View

Table 6. Rig Critical Spare Parts List For Dual MONGOOSE PRO Shale Shakers

ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY
NOT SHOWN IN FIGURE	REFER TO TABLE 5	RIG CRITICAL SPARE PARTS LIST FOR MONGOOSE PRO	1
2	3914037	GASKET, FEEDER BOX COMMON POSSUM BELLY	2
3	3914036	GASKET, POSSUM BELLY TRANSITION DUAL SHAKER	1
4	06-247	ROLL PIN ¼ DIAMETER X 1.50 LG	1

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20.1.1.3 Triple MONGOOSE PRO Rig Critical Spares

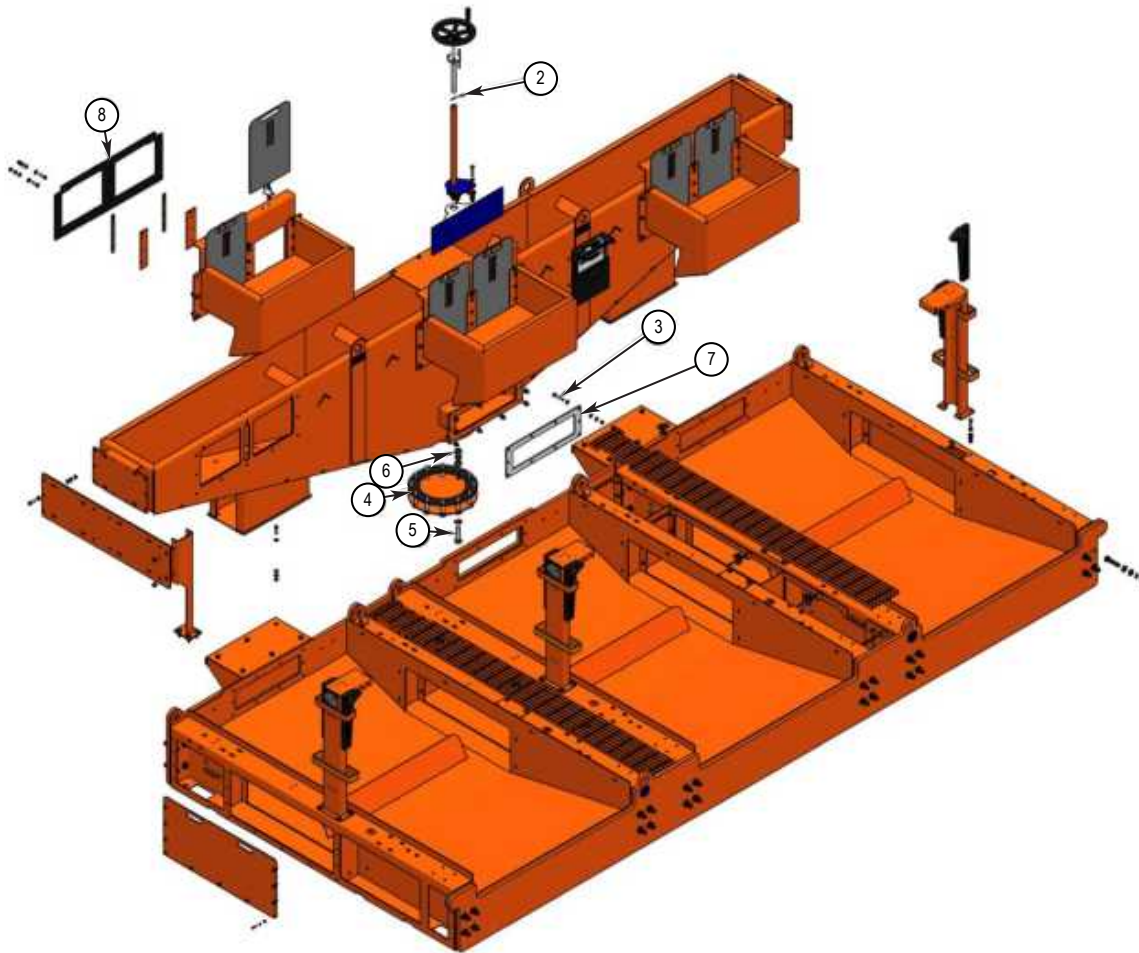


Figure 38. Triple MONGOOSE PRO Shale Shaker Components Exploded View

Table 7. Rig Critical Spare Parts List For Triple MONGOOSE PRO Shale Shakers

ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY
NOT SHOWN IN FIGURE	REFER TO TABLE 5	RIG CRITICAL SPARE PARTS LIST FOR MONGOOSE PRO	2
2	06-247	ROLL PIN ¼ DIAMETER X 1.50 LG	1
3	04-1509	HHCS M12 X 70 MM LG WITH FULL THREADS	10
4	3916067	GASKET, FULL FACE ANSI FLANGE, 150 LBS., 10"	1
5	103057244	HHCS M24-3.0 X 90 MM, XYLAN PLATED	12
6	03-412	HEX NUT M24	12
7	3914035	GASKET, TRANSITION BYPASS POSSUM BELLY	1
8	3914037	GASKET, FEEDER BOX COMMON POSSUM BELLY	3

M-I SWACO MONGOOSE PRO Shale Shaker

20.1.1.4 Quad MONGOOSE PRO Rig Critical Spares

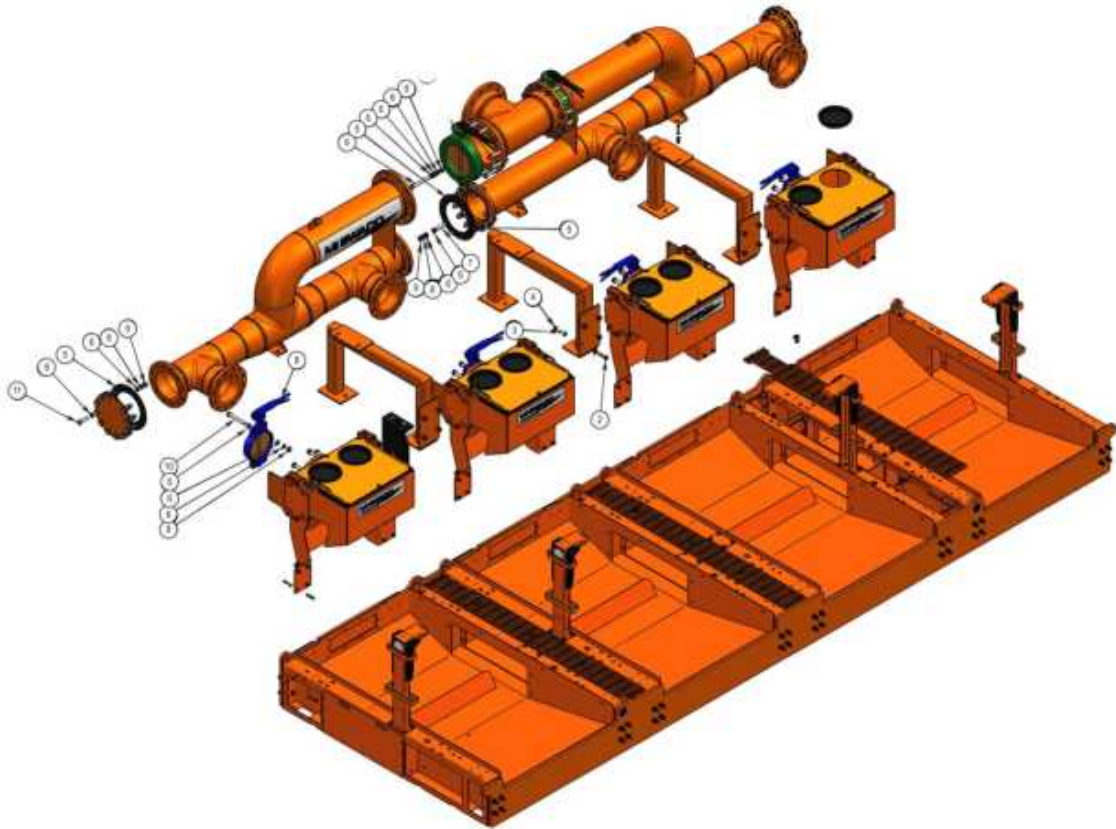


Figure 39. Quad MONGOOSE PRO Shale Shaker Components Exploded View

Table 8. Rig Critical Spare Parts List For Quad MONGOOSE PRO Shale Shakers

ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY
NOT SHOWN IN FIGURE	SEE TABLE 5	RIG CRITICAL SPARE PARTS LIST FOR MONGOOSE PRO	2
2	103057238	HHCS M20-2.5 X 90 MM LG, GRADE 10.9, XYLAN PLATED	16
3	05-244	LOCK WASHER SCHNORR M20 MARTIN	16
4	103058511	HEX NUT M20 MS GR 8.8 XYLAN 1424 D6586 BLACK COATING, OVERTAP	16
5	3916067	GASKET, FULL FACE ANSI FLANGE 150 LBS., 10"	3
6	05-308	FLAT WASHER M24 REGULAR	96
7	1493001	HHCS M24-3 X 110MM LG, GRADE 8.8, XYLAN PLATED	12
8	05-373	LOCKWASHER SCHNORR M24	48
9	03-412	HEX NUT M24	48
10	1493002	HHCS M24-3.0 X 180 MM, GRADE 8.8, XYLAN PLATED	24
11	103057244	HHCS M24-3.0 X 90 MM, XYLAN PLATED	12

20.1.2 MONGOOSE PRO Motor Kits

20.1.2.1 Fixed Weights



ALWAYS ORDER A COMPLETE MOTOR KIT WHEN BUYING A REPLACEMENT MOTOR. ORDER THE MOTOR KIT THAT CORRESPONDS TO THE APPROPRIATE VOLTAGE OF THE MOTOR IT IS REPLACING. REFER TO TABLE 9 FOR A COMPLETE PARTS BREAKDOWN OF THE MONGOOSE PRO FIXED WEIGHT MOTOR KITS.

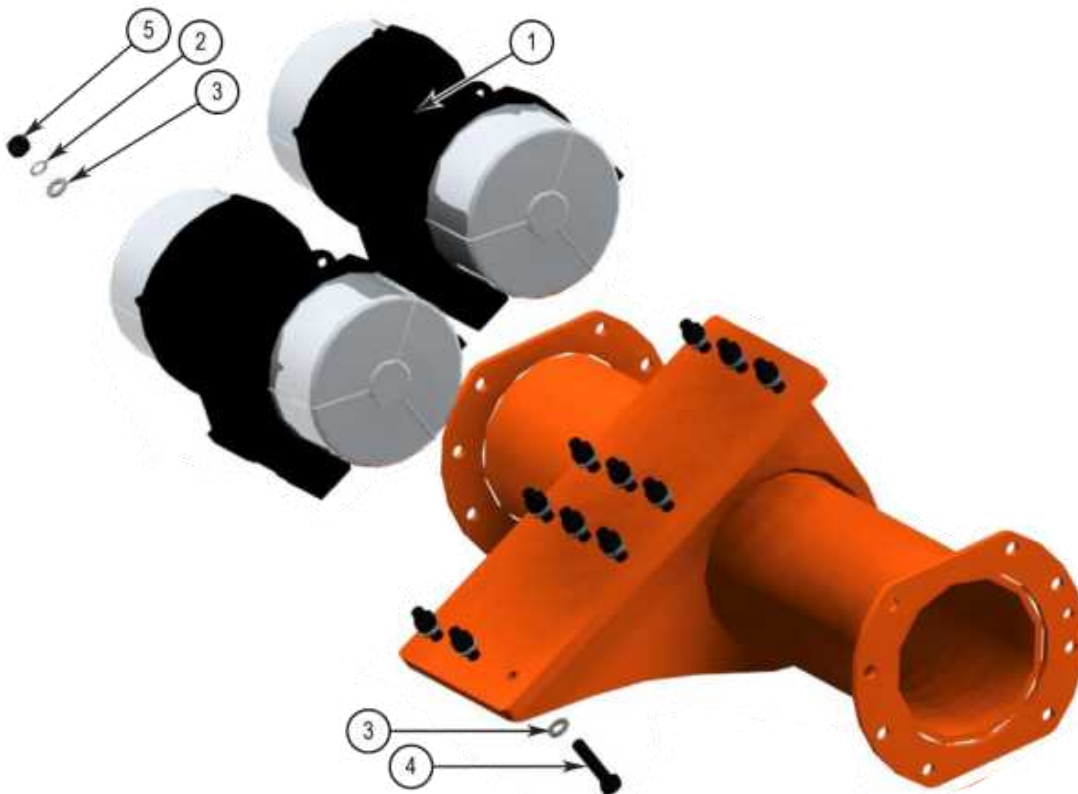


Figure 40. MONGOOSE PRO Motor Kit, Fixed Weight

Table 9. Fixed Weight Motor Kit Parts List*

ITEM NUMBER	PART NUMBER	USED IN MOTOR KIT NUMBER	DESCRIPTION	QTY.
1		9870525	MOTOR 2.5 HP 220-240/440-480V, FIXED WEIGHT	1
		9870526	MOTOR 2.5 HP 220-240/380-415V, FIXED WEIGHT	
		9870527	MOTOR 2.5 HP 575-600V, FIXED WEIGHT	
2		ALL	LOCKWASHER NO LONGER USED	0
3	1345015	ALL	WASHER FLAT BLACKENED F436 3/4" X 1-15/32" OD HARDENED	12
4	103057232	ALL	HHCS M20-1.5 X 90 LG METRIC GR 10.9 XYLAN COATING	6
5	103057261	ALL	NUT HEX PLT M20-1.5 GRADE 10.9 XYLAN COATING, OVERTAP	6

*When replacing a motor, a motor kit MUST be selected

20.1.2.2 Swing Weights



ALWAYS ORDER A COMPLETE MOTOR KIT WHEN BUYING A REPLACEMENT MOTOR. ORDER THE MOTOR KIT THAT CORRESPONDS TO THE APPROPRIATE VOLTAGE OF THE MOTOR IT IS REPLACING. REFER TO TABLE 10 FOR A COMPLETE PARTS BREAKDOWN OF THE MONGOOSE PRO SWING WEIGHT MOTOR KITS.

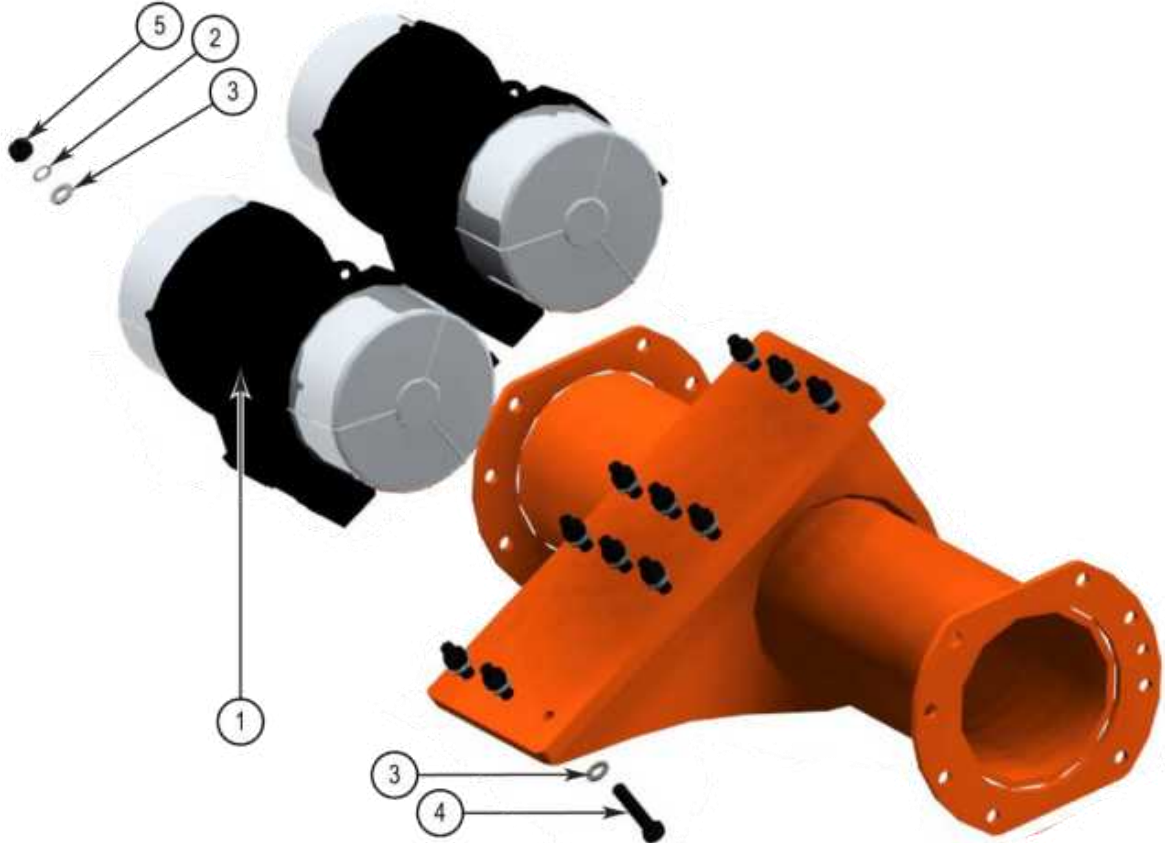


Figure 41. MONGOOSE PRO Motor Kit, Swing Weight

Table 10. Swing Weight Motor Kit Parts List*

ITEM NUMBER	PART NUMBER	USED IN MOTOR KIT NUMBER	DESCRIPTION	QTY.
1		9870528	MOTOR 2.5 HP 220-240/440-480V, SWING WEIGHT	1
		9870529	MOTOR 2.5 HP 220-240/380-415V, SWING WEIGHT	
		9870530	MOTOR 2.5 HP 575-600V, SWING WEIGHT	
2			LOCKWASHER NO LONGER USED	0
3	1345015	ALL	WASHER FLAT BLACKENED F436 3/4" X 1-15/32" OD HARDENED	12
4	103057232	ALL	HHCS M20-1.5 X 90 LG METRIC GR 10.9 XYLAN COATING	6
5	103057261	ALL	NUT HEX PLT M20-1.5 GRADE 10.9 XYLAN COATING, OVERTAP	6

*When replacing a motor, a motor kit MUST be selected

21. DIAGRAMS AND SCHEMATICS

21.1 Wiring Diagram, Electrical Schematics

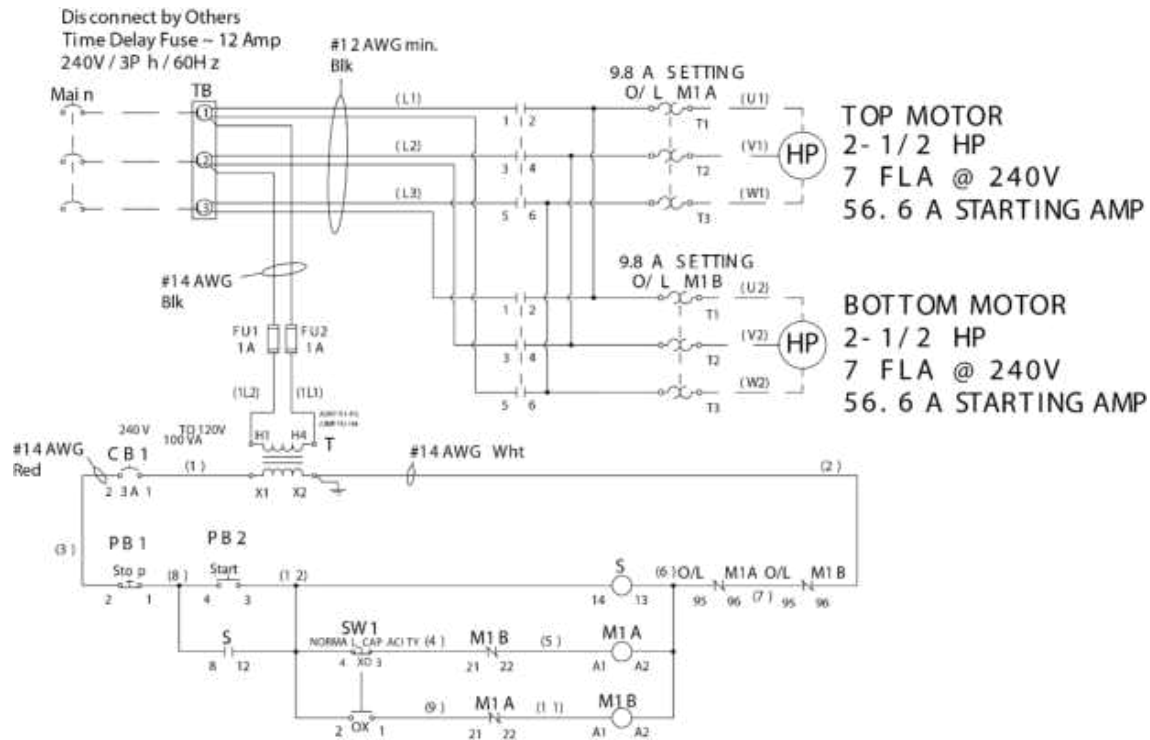


Figure 42. UL Rated MONGOOSE PRO 240V Diagram

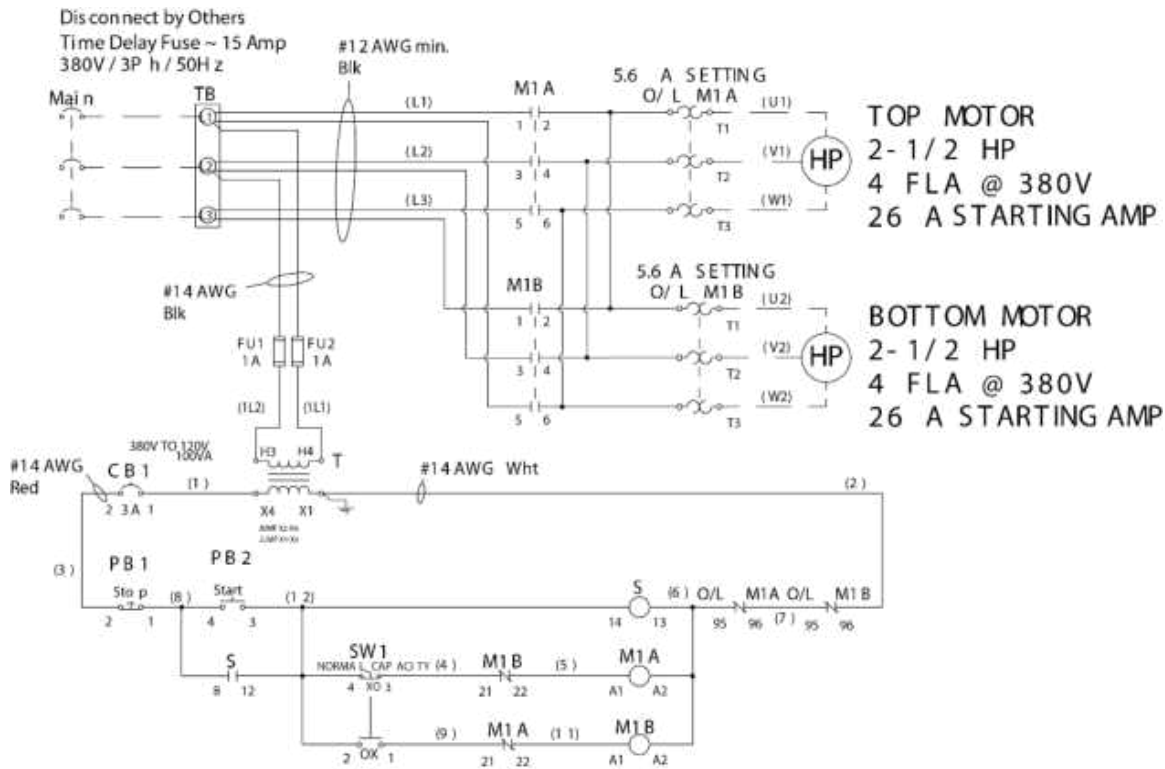


Figure 43. UL Rated MONGOOSE PRO 380V Diagram

M-I SWACO MONGOOSE PRO Shale Shaker

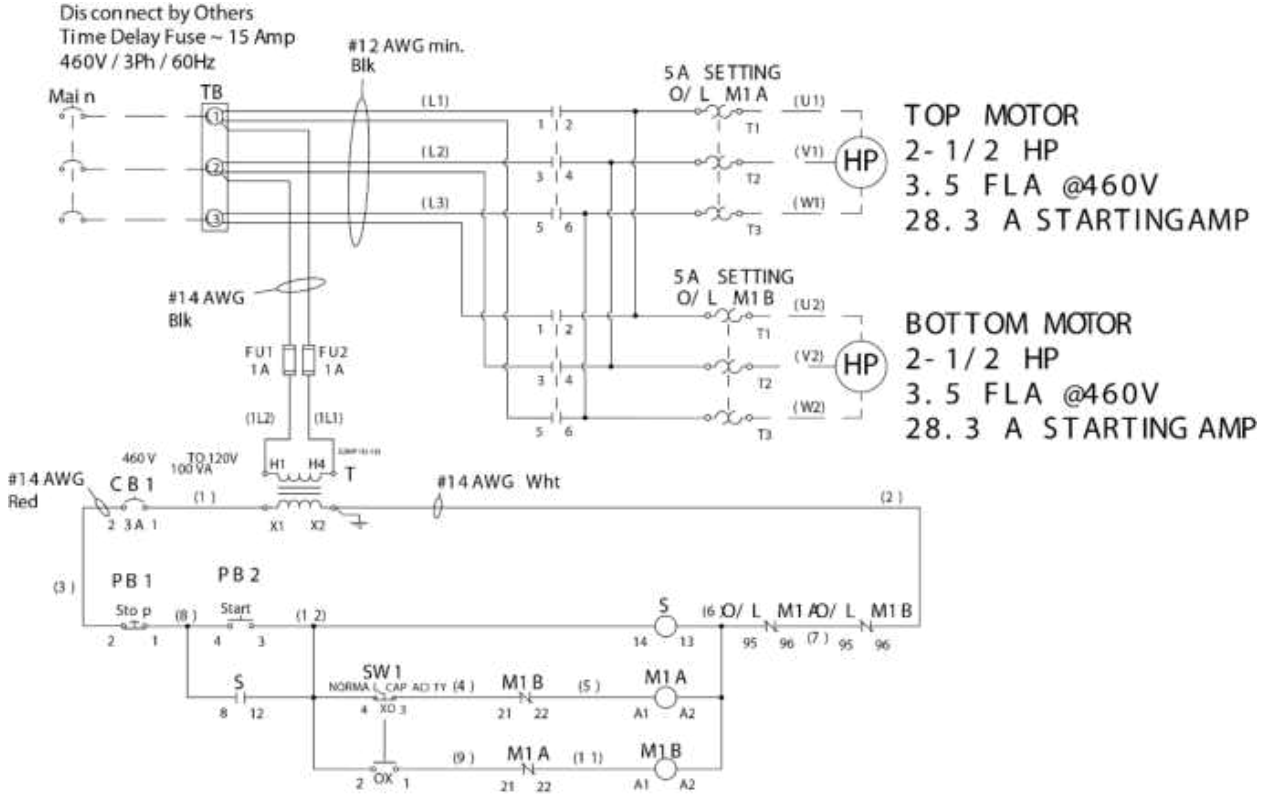


Figure 44. UL Rated MONGOOSE PRO 460V Diagram

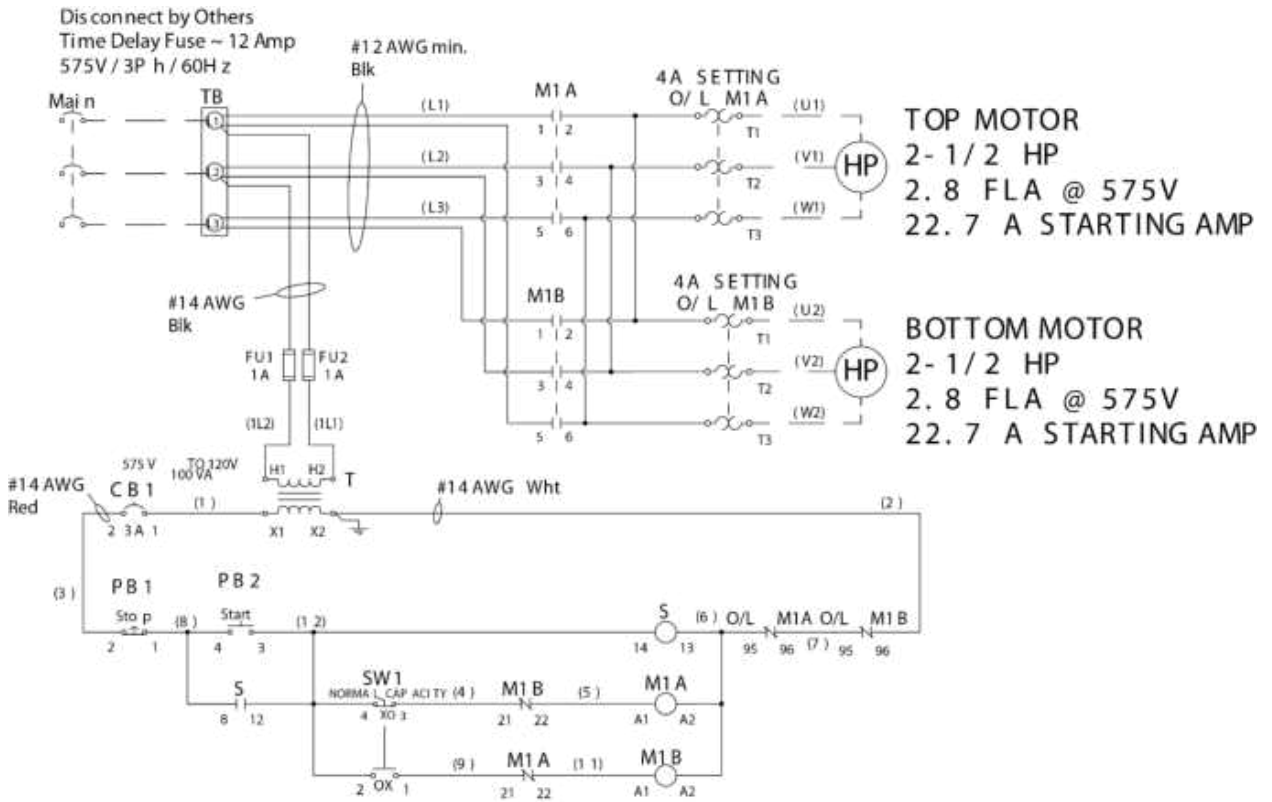


Figure 45. UL Rated MONGOOSE PRO 575V Diagram

M-I SWACO MONGOOSE PRO Shale Shaker

21.1.1 Cable Block Diagram

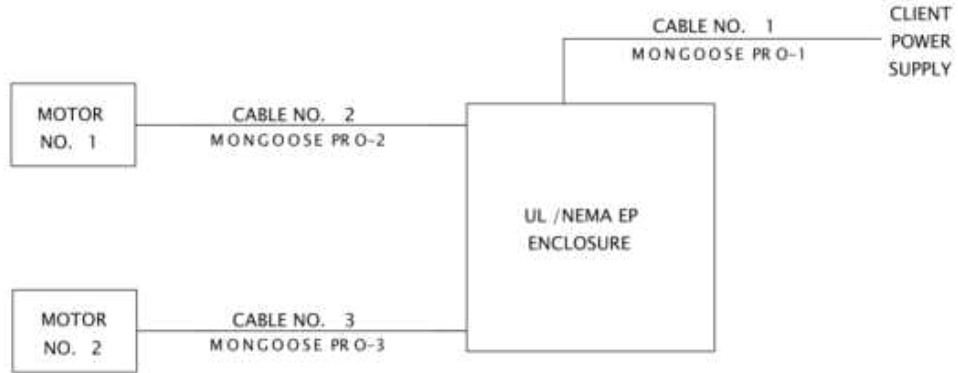


Figure 47. Cable Block Diagram

Table 11. Cable Block Diagram Details

CABLE	CABLE SIZE	TYPE	CABLE START	GLAND	CABLE FINISH	GLAND
1	N/A	N/A	CLIENT SUPPLY	N/A	UL/NEMA EP ENCLOSURE	CMP 20PX2KX
2	4CX14AWG (2.1MM ²)	IEEE-45/IEEE 1580 TYPE P	EP MOTOR JUNCTION BOX	CMP 20PX2KX	Motor #1	CMP 20PX2KX
3	4CX14AWG (2.1MM ²)	IEEE-45/IEEE 1580 TYPE P	EP MOTOR JUNCTION BOX	CMP 25PX2KX	Motor #2	CMP 25PX2KX

21.2 General Assembly Drawing

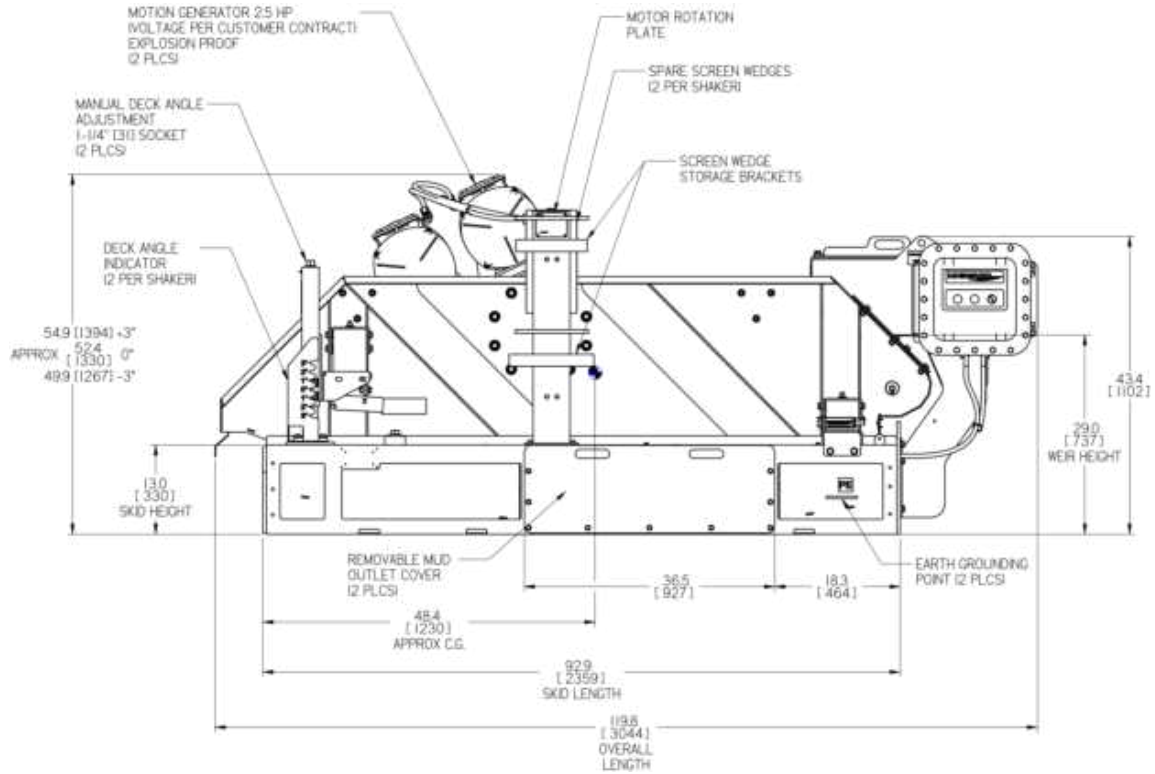


Figure 48. General Assembly: Side View

M-I SWACO MONGOOSE PRO Shale Shaker

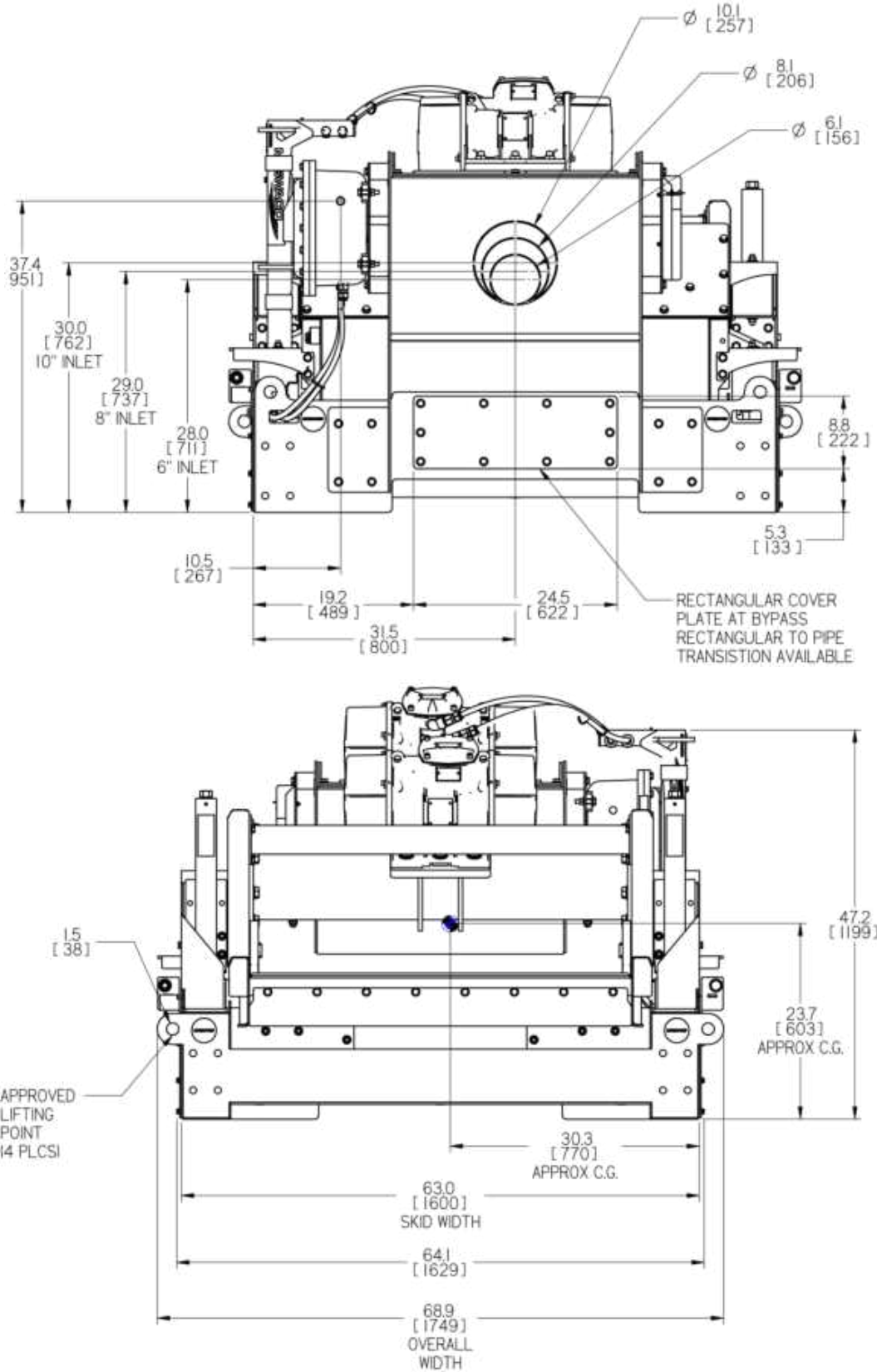


Figure 49. General Assembly: Feed (Top), Discharge (Bottom) Views

21.3 Mud Flow Diagram

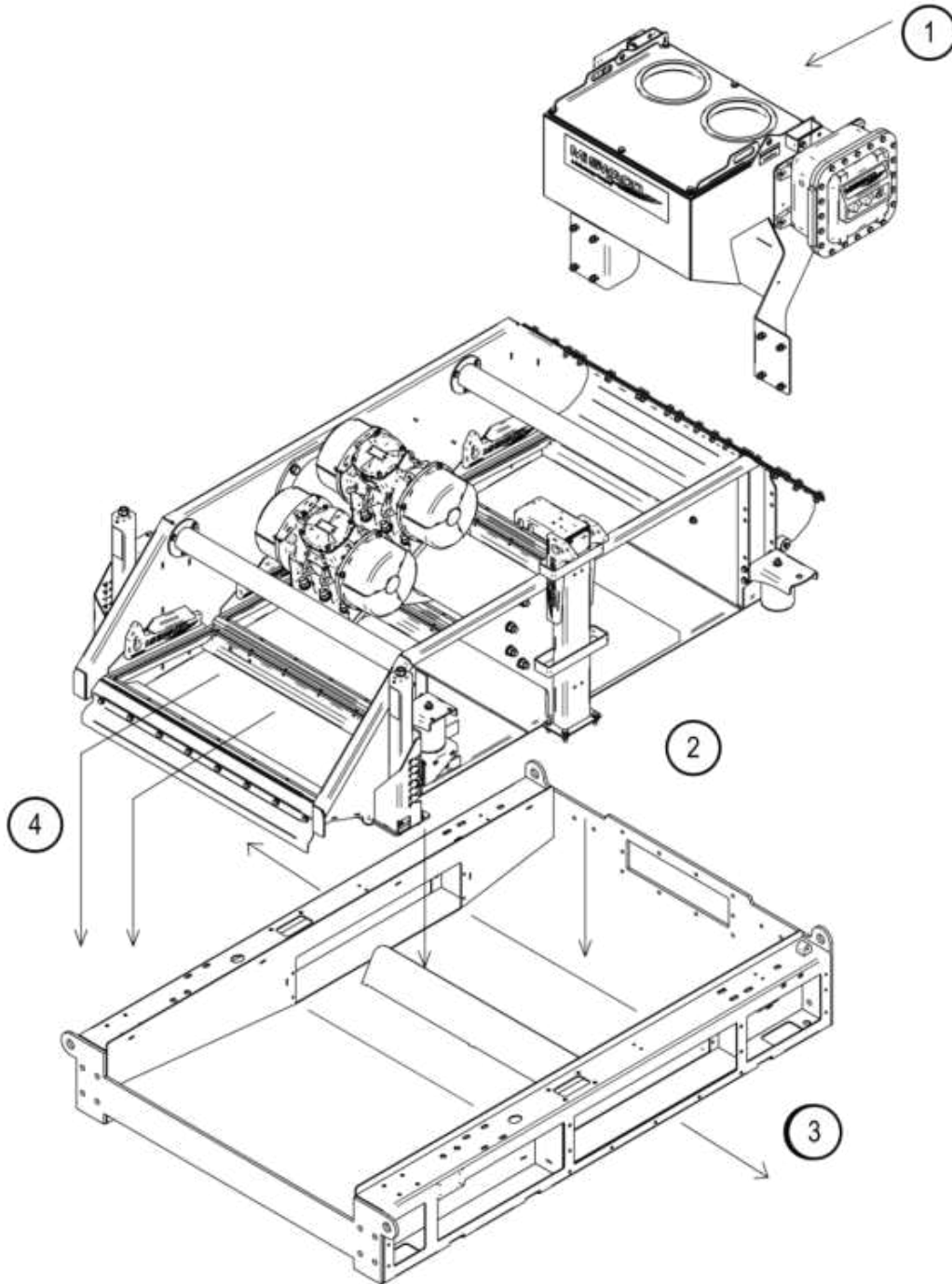


Figure 50. Mud Flow Diagram

- 1. Mud Inlet
- 2. Exit from Screen Decks Into Shaker Skid
- 3. Exit From Discharge Gates (Both Sides of Shaker)
- 4. Exit From Screen Deck

21.4 Mechanical Diagrams

21.4.1 Piping and Instrumentation Diagram

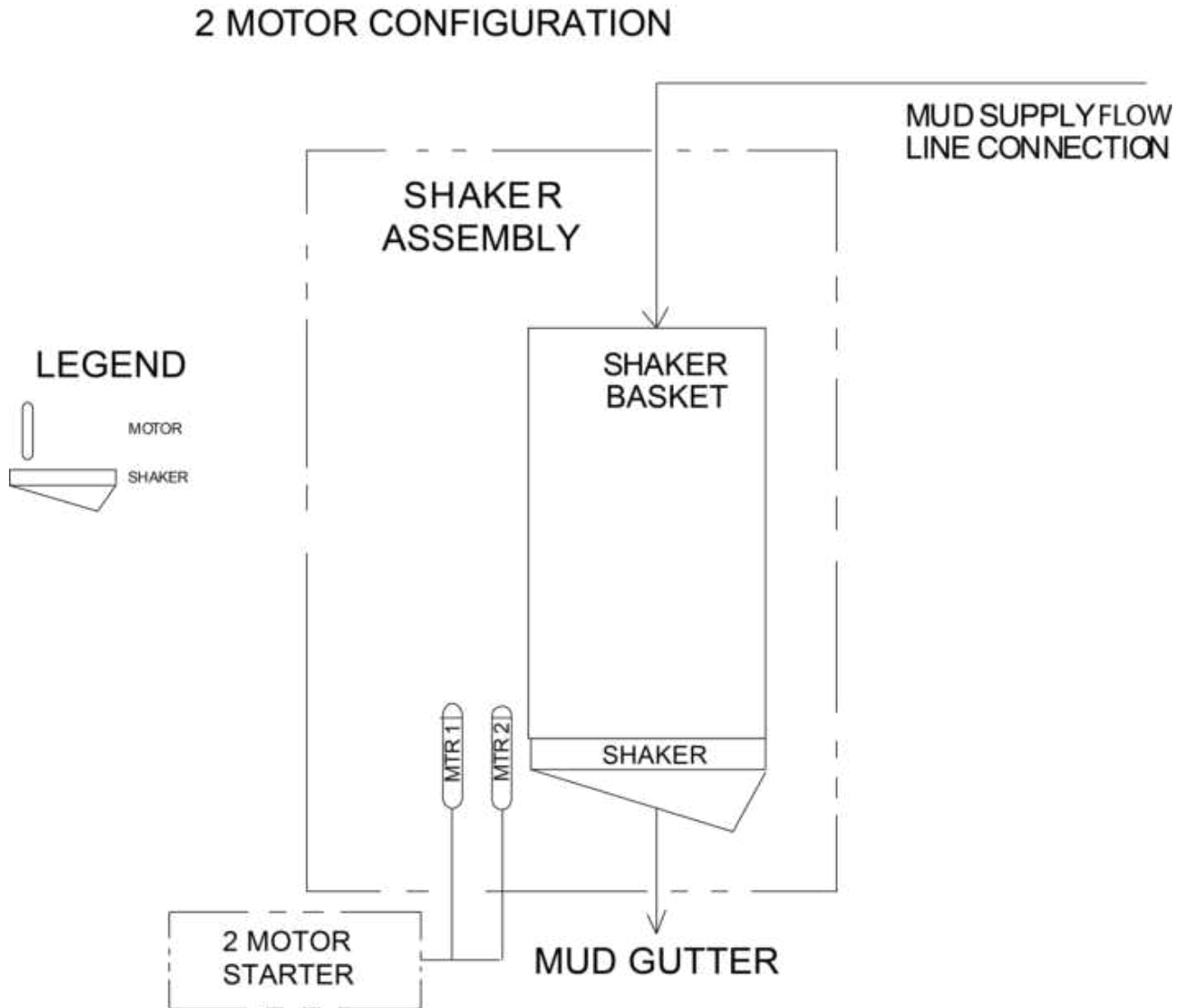


Figure 51. Piping and Instrumentation Diagram

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P.O. Box 42842
Houston, Texas 77242-2842
www.miswaco.slb.com
Email: questions@miswaco.slb.com

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