Publication: BI-IOM-008A

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

* MANUFACTURED BY BEELER INDUSTRIES UNDER LICENSED AGREEMENT

MODEL NO(S). SR-36 & SR-48 SHEAR ROLL

CR-30 & CR-42 CRACKER

30" & 42" FEEDER

BEELER INDUSTRIES

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IMPORTANT SAFETY INFORMATION

Before *installing, operating or maintaining this machine you must* ***read*** *and* ***understand*** *the contents of this manual. Failure to do so may result in equipment damage, injury or death.*

Antes *de la instalación, funcionamiento o mantenimiento de este equipo debe* ***leer*** *y* ***comprender*** *el contenido de este manual. El no hacerlo puede resultar en daño al equipo, lesiones o la muerte.*

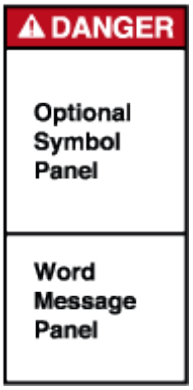
Safety Labels

Throughout this manual and on the machine, safety labels have been placed to bring attention to characteristics of this equipment that warrant particular awareness. There are potential hazards on any device and care should be exercised whenever installing, operating or maintaining any equipment.

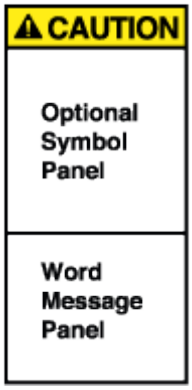
Ensure that all original labels are maintained in good condition. In the event that labels are rendered illegible contact Beeler Industries for replacement labels.

Lock Out / Tag Out

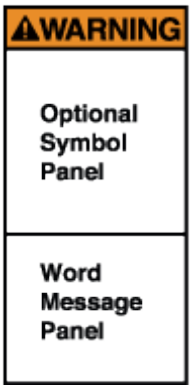
It is the user's responsibility to ensure that proper LOCK OUT / TAG OUT procedures are implemented throughout the facility. **Follow your facilities Lock Out/Tag Out procedures.** Prior to any maintenance, service or cleaning of any equipment it should be locked out and tagged out from all potential sources of energy (electrical, pneumatic, hydraulic, mechanical, etc.) Failure to do so will endanger the user and others and may lead to damage, severe injury or even death.



Danger: Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.



Caution: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



Warning: Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

Take the time to be safe!

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SECTION 1

GENERAL INFORMATION

1-1 Introduction

Thank you for purchasing an LMC Shear Roll/ Cracker. Your new shear roll/cracker is built to the highest industry standards. Great care has been taken to design and manufacture a high quality, low maintenance product that is economical to use and maintain.

This manual is intended to assist in the installation, operation and maintenance of your shear roll / cracker. The instructions in this manual are general in nature and apply to a variety of models. Each situation dictates the need for any special precautions, and it is the user's responsibility to ensure that adequate safety measures are employed in installation, operation and maintenance. As always, follow good safety practices around all equipment.

1-2 Contacting Beeler Industries

Beeler Industries, Incorporated

Mail: P.O. Box 380

Physical: 4664 Kiernan Court
Salida CA 95368

Main Office: (209) 545-0740

Sales: (209) 613-0407

Parts: (209) 545-0740

Service: (209) 613-0407

Fax: (209) 545-0768

email: customer@beelerindustries.com

Website: www.beelerindustries.com

1-3 Purpose and Scope

This manual provides installation, operation and maintenance procedures for standard shear roll / crackers. Due to variations in design and manufacture for unique customer needs, not all shear roll / crackers might be covered. For special assistance, please contact Beeler Industries Service for additional information.

1-4 Receipt of Product

All shipments should be immediately checked for proper product and quantity upon receipt and inspected for any visible defects or damage. Any discrepancies should immediately be reported to Beeler Industries and the freight provider. If installation is provided by Beeler Industries, this inspection may be performed by Beeler personnel.

1-5 Precautions of Use and Installation

1. Use only qualified personnel for installation and wiring of the shear roll / cracker. Personnel are required to be familiar with the general use of required tools for installation of this unit. Should you require assistance in the installation, Beeler Industries offers such a service. Please contact our Service Department for estimates and scheduling.
2. Lifting/moving/positioning: The shear roll / cracker assembly is top heavy however it may be lifted with a fork truck under the shear roll frame. Secure shear roll to forks to prevent tipping. Move slowly and descend grades in reverse. When moving cracker assembly as a separate unit use lifting straps and clevises on the three lift ears provided.
3. The standard motors specifications provided are listed in table 1.1 unless otherwise specified in the purchase contract. All wiring must be run in conduit and installed per local and state code by a qualified electrician. A manual electrical lock-out for maintenance must be provided by the owner prior to operation. Typical installations include a customer provide variable frequency drive for the rubber roll drive motor.

MODEL	HP	V/F/PH	QTY
SR-30	3	230/460/60/3	2
SR-48	3	230/460/60/3	2
CR-30	1	230/460/60/3	1
CR-42	1.5	230/460/60/3	1
30" FEEDER	0.24	460/60/3	1
42" FEEDER	0.42	460/60/3	1

TABLE 1.1 MOTOR SPECIFICATIONS

SECTION 2

OPERATION & MAINTENANCE

2-1 Operation and Adjustment

Shear Roll

The shear roll splits open the two halves of the nut shell by passing the nut between a rubber belt and a rubber roll with different linear speeds.

The pressure with which the belt and roll hold the shell as it passes between them is a function of the gap between the roll and belt. The belt support roll is spring mounted allowing a variety of sizes as well as foreign material to pass through without damaging the meat or the machine.

After shearing, the belt carries the product to the built-in aspirator. The shell is lifted by the air stream and the meats are dropped through to the discharge. The lifted material may be observed at the window above the discharge however the airstream should be sampled using an optionally available sample box.

It is important that the shear roll in-feed is metered through a feeder pan to evenly distribute as well as control input flow. If product is not distributed across the full width of the roll it will wear unevenly requiring truing or replacement.

Adjustment

1. Rotate the crank handle located on the rubber roll bearing adjuster to raise and lower the rubber roll. As the roll wears it will need to be lowered to make up for wear. As the roll wears the linear speed of the roll is reduced therefore the customer provided variable frequency drive should be adjusted to increase the speed.
2. The amount and density of product that will be lifted by the aspirator will depend on the air flow provide by the customer's air system. Initially the bleed on the aspirator should be closed via the thumbwheel then the air systems blast gate should be adjust to just lift all the discharge. At this point the bleed should be opened to a point that drops the good product to the discharge while still lifting the majority of the shell.

This adjustment is made through iteration and experience as well as customer preference. Cleaner discharge will be produced if some good product is allowed to be lifted with the shell. Likewise allowing some shell in with the good product will reduce loss of good product. By trial and error the system blast gate may be adjusted down to conserve system air still allowing enough adjustment to the bleed to allow for variations in product.

3. Shear belt adjustment is necessary when replacing belt or when tracking problems arise. The drive and tail pulley are designed with a slight taper at each end. This allows the belt to track with minimal tension and without the problems common to straight pulleys. To remove shear belt follow the steps below:

1.) Lock out and tag out per your facilities procedure.

2.) Remove belt guard and body panel on opposite side.

3.) Remove both drive v-belts.

4.) Loosen tail end bearing mount bolts and adjust bearing tension bolt counterclockwise until bearing bottoms out in adjustment slot.

5.) Starting with the tail bearing on the non-drive side insert shaft tool into shaft end recess. Support shaft tool and remove bearing mount bolts on non-drive side only. Lower shaft support tool until shear belt top clears the bottom of frame rail.

6) Repeat step 4 for remaining shafts.

7) Slide belt off of pulleys. Caution! The belt is heavy and will require a minimum of two persons to safely manipulate it.

8) Install new genuine LMC shear belt in reverse order of above steps.

9) Adjust tension evenly on both sides. Use a tape measure to check centers on tail and drive shaft. Ensure that they are the same. A slight variation of 3/16" is permissible due to manufacturing tolerances of the shear belt.

10) Belt tension should be set so that the belt sag is approximately halfway up the face of the white guide rollers on each side of the belt. Too much tension will shorten bearing life and too little will cause slippage under load.

11) Replace guards and panels. Run machine and observe tracking. Adjust as necessary.

Rubber roll replacement. Over time the rubber roll will wear and become too small to work properly. At this point it should be replaced with a new or reconditioned roll. To replace roll follow these steps.

1) Lock out and tag out per your facilities procedure.

2) Remove belt guard.

3) Loosen adjuster cross shaft coupling bolts and remove shaft.

4) Remove top cover panel exposing rubber roll.

5) Remove bearing adjuster assembly to frame mount bolts.

6) Using appropriate lift equipment as well as straps and clevis lift roll with adjusters up out of the body of the shear roll. The adjusters may swing down as the roll is lifted so they must be protected from damage or from causing damage.

7) Set roll down on work bench and secure in place.

8) Measure and record distance from end of shaft to edge of bearing.

9) Loosen bearing set screws and slide bearing assemblies off of shaft.

10) If replacing roll with new shaft mounted roll go to step 14

11) Measure and record distance from end of shaft to face of bushing.

12) Loosen bushing set screws and remove bushing mount bolts. On QD style bushings place bolts into threaded holes on bushing and alternately and incrementally tighten the bolts to extract the bushing. On taper-lock bushings place setscrews

in threaded holes on bushing and alternately and incrementally tighten until bushing is extracted. Remove shaft.

13) Install shaft into reconditioned rubber roll setting bushings at position recorded in step 11.

14) Install bearing adjuster assemblies at positions recorded in step 8.

15) Lift roll into place and re-install per steps 1-7 in reverse order.

Cracker

The cracker is used to break the shell of hard shell varieties by passing it between two hardened grooved rolls turning at different speeds. The gap between the rolls controls the pressure applied to the shell. The adjustable roll is also spring mounted allowing larger foreign material to pass through without stopping or damaging the rolls.

As with the shear roll the product entering the cracker should be both metered and evenly distributed. Better results are achieved with singulation of product at the in-feed.

Adjustment

1. Roll gap is adjusted by turning the large hand wheel on the front of the machine. Clockwise rotation closes the gap, counter-clockwise rotation opens the gap See item 5 on figure 3.2.

2. It is critical for consistent cracking that the rolls be parallel. Rolls should be checked periodically to ensure an even gap. Gap may become uneven over time as the chain connecting the two adjusters slackens. To re-establish proper gap turn machine off and follow lock out / tag out procedure. Remove the belt guard so the bearings and shafts are visible. Turn the roll adjustment handle clockwise until one bearing contacts the "C" shaped stop plate. See figure 2.1. Check the center distance between the fixed roll shaft and the movable roll shaft on both sides of the machine. It is easier to check shaft edge to shaft edge than to find centers. If there is a significant distance (> 1/16") then remove the chain and turn the handle to even out the measurements. Replace the chain and re-tension. Run the rolls out all the way and then back to recheck the gap. Repeat above steps until proper equal measurements are achieved. Replace all guards, etc. prior to restarting cracker.

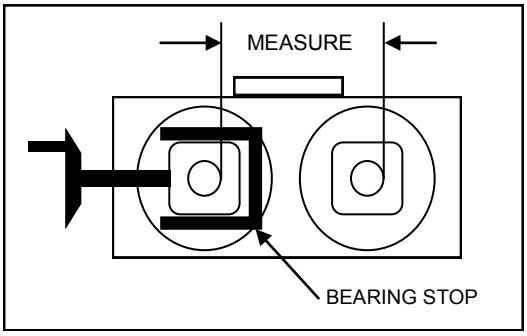


FIG. 2.1 CRACKER ROLL CHECK

3. Belt tensioning: Matched belts require inspection every one thousand eighty (1080) hours of operation. Check for worn or frayed belts and worn sheaves. Replace as necessary. Tension is determined by spring tensioner so no adjustment is necessary or available. Inspect spring for signs of fatigue. Replace spring if cracked or discolored.

Feeders

The vibratory feeders are used to meter and spread the flow of incoming product. The feeder is compression spring mounted and driven by an eccentric vibratory motor. The eccentrics are factory set for correct feeder performance.

Adjustment

1. The feeder pan may be adjusted to tip the discharge edge. Four 3/8 bolts hold the pan spring mounts to the mounting frame. Typically the pan is adjusted so the four bolts are in the center of the adjustment slots. If increased feed is desired the pan can be adjusted to tip the discharge edge slightly forward. Ensure the pan is free to move without rubbing or hitting any surrounding metal work.

2. The vibrator should be set to 50%. Any increase in force may lead to premature pan failure. Prior to service lock out / tag out. The vibrator is adjusted by removing the two end caps exposing the eccentric weights. The outer weights may be adjusted relative to the inner weights

using the percentage markings on the inner weight as a guide. See fig 2.2. It is of utmost importance that both sides of the vibrator are set identically. Any disparity in the weight settings will lead to motor failure.

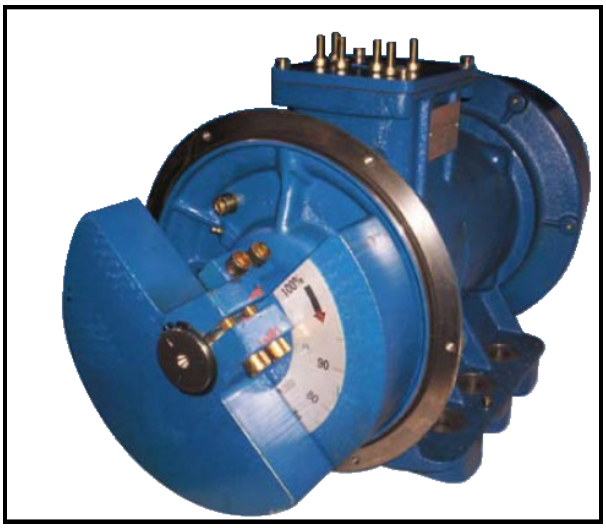


FIG. 2.2 Vibrator eccentric weights

2-2 Lubrication

1. Ball bearings equipped with grease (zerk) fittings should be manually lubricated with one half (½) pump of Food Grade NLGI 2 grease every one hundred twenty (120) hours of operation. Bearings without fittings should be replaced after five thousand (5000) hours of operation.
2. Chain drives require a manual application of FDA CFR-178.3570 food grade grease about the chain contact inner-teeth of both drive and driven sprockets every one hundred eighty (180) hours of operation.
3. The Shear roll is equipped with Dodge Quantis or SEW Eurodrive gear reducers and comes pre-lubricated from Beeler Industries. The oil level should be flush to the level plug located approximately one and one half inches (1-1/2") up from the base and checked prior to initial use and every one hundred eighty (180) hours of operation. Change the oil using Mobil SHC 630 every five thousand (5000) hours or every three years whichever is less.

2-3 Repair Parts

Necessary repair and maintenance parts can be obtained through Beeler Industries directly by contacting our Parts Department at (209) 545-0740 or through your Beeler Sales representative. When ordering, please supply the nameplate serial number information located on the Beeler red tag secured to the frame of the Shear roll/cracker.

Refer to section 3-2 for part identifying / locating and for common part listing and order identification number. Contact our service department for required parts not identified on those pages.

2-3 Model Variation

Standard shear roll / crackers are built with drive components on the left as viewed in the direction of product flow. Units may be ordered with right hand drive. Standard power requirements are listed in table 1.1. Units for export may be ordered with appropriate voltage and frequency.

Contact Beeler Industries Customer Service with any questions resulting from machine variations.

3-1 SERIAL NUMBER LOCATION

It is important to have the serial number information when contacting Beeler Industries regarding service information or parts ordering. The number is stamped on the identification plate located per the illustration below.

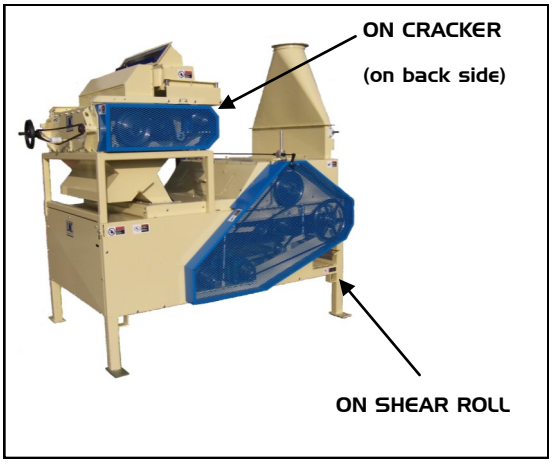
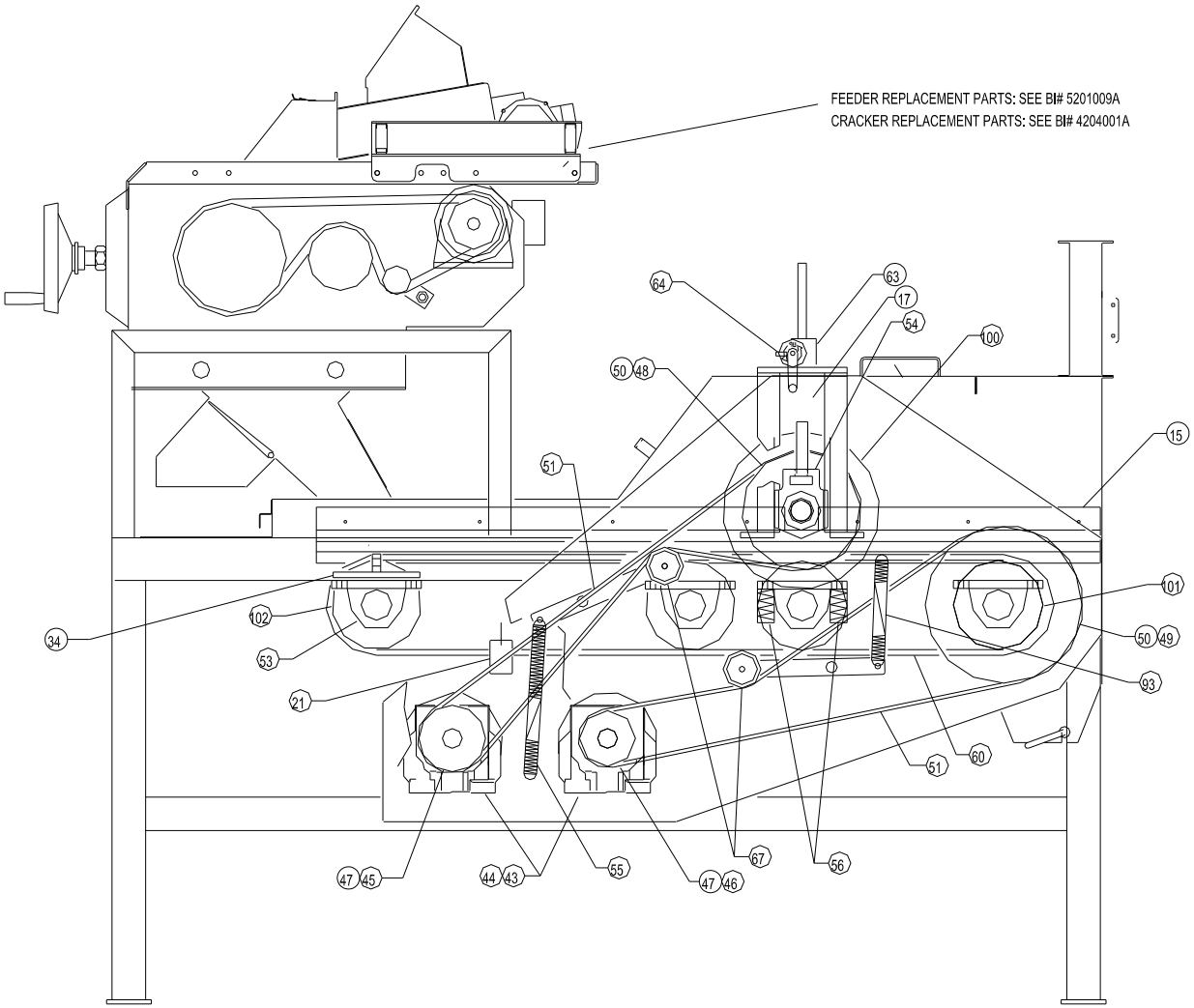


FIG. 3.1 SERIAL PLATE LOCATIONS

BILL OF MATERIALS

PART	NAME/DESC	ORDER NUMBER	QTY
15	BELT FLASHING	23A139	2
17	DUST SEAL	23A430	2
21	UHMW ROLLER	24A047	2
34	BEARING TAKE-UP	23A019	2
43	GEARBOX-DODGE OR SEW	11-072	2
44	MOTOR - BALDOR	10-035	2
45	SHEAVE-ROLL DRIVE	15-234	1
46	SHEAVE-BELT DRIVE	15-233	1
47	BUSHING-DRIVE	15-230	2
48	SHEAVE-ROLL DRIVEN	15-232	1
49	SHEAVE-BELT DRIVEN	15-160	1
50	BUSHING-DRIVEN	15-231	2
51	DRIVE BELT	15-235	2
53	DODGE PILLOW BLK BRG	20-005	8
54	DODGE TAKE-UP BRG	20-041	2
55	SPRING-BELT TAKE-UP	26-054	1
56	SPRING-PINCH ROLL	26-050	4
60	SHEAR ROLL BELT	36":37-009 48":37-010	1
63	SCREW JACK	22-023	2
64	BALL PLUNGER	36-022	1
67	AETNA IDLER	18-151	2
93	SPRING-BELT TAKE-UP	26-052	1
100	SHEAR PULLEY	BI#4201002A xWIDTH	1
101	BELT DRIVE PULLEY	BI#4201003A xWIDTH	1
102	BELT IDLER PULLEY	BI#4201004A xWIDTH	3



36"SHEAR ROLL: 23E658

48"SHEAR ROLL: 23E644

MIDSTATE / LMC SHEAR ROLL REPLACEMENT PARTS

PART# 4201001A

FIG. 3.2 SHEAR ROLL ASSEMBLY

ITEM	#REQ	DESCRIPTION	PART #	
2	2	THREADED ADJUSTER ASSEMBLY	23B200	
4	2	9 1/4" STEEL ROLL	23B191C xWIDTH	
5	1	10" PLASTIC HANDWHEEL	24A63	
8	1	IDLER BELT ROLLER	23A266	
14	2	SPROCKETS, #40	16-045	
16	2	BELT	15-229	
17	1	CHAIN #40	16-007	
18	1	SHEAVE 9.4"DIA.	15-227	
19	1	SHEAVE 5.4"DIA.	15-228	
20	1	SHEAVE 4.2"DIA.	15-014	
21	2	COMPRESSION SPRING, 1 1/2" OD	26-050	
22	1	TENSION SPRING	26-053	
23	4	2 7/16" 4 BOLT FLANGE BEARING	20-022	
24	1	GEAR BOX : SUMITOMO	11-071	
25	1	MOTOR 143TC 1800 RPM	30":10-049	42":10-024
31	2	THREADED SET COLLAR	26-048	

30"CRACKER: 23E193
42"CRACKER: 23E470

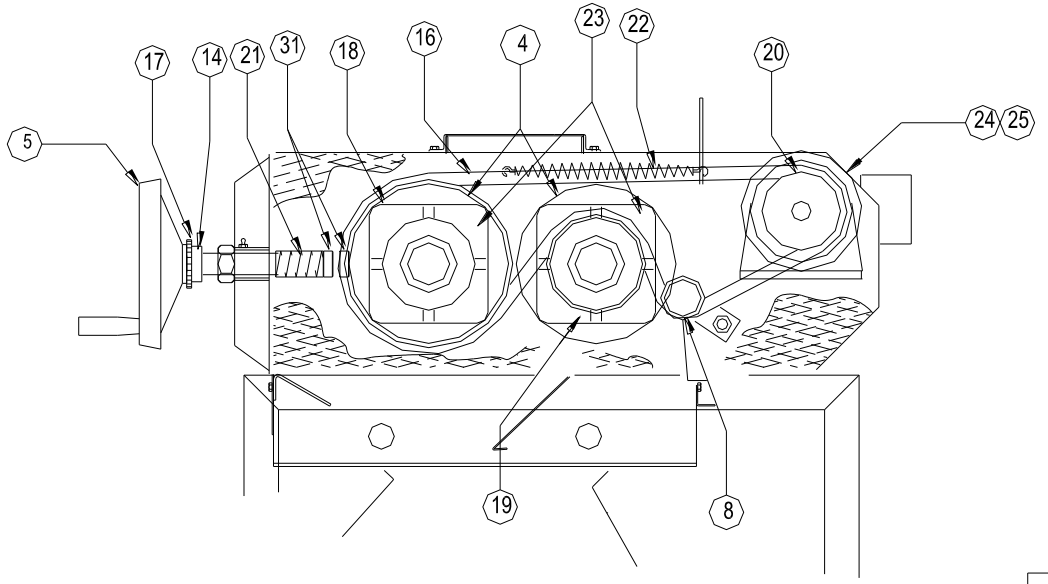
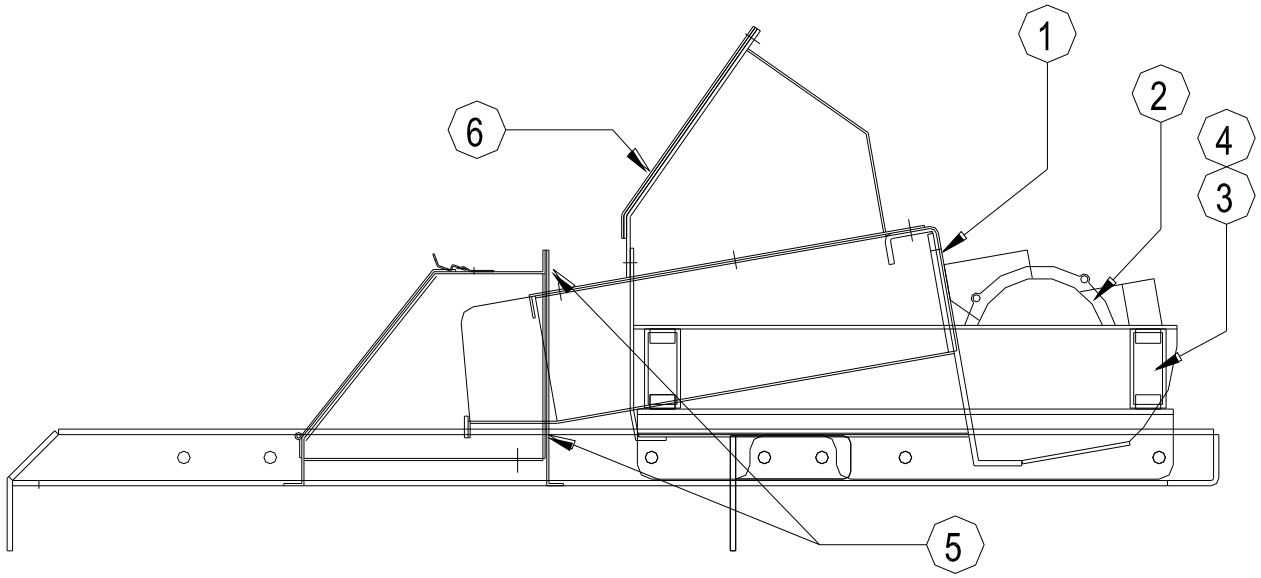


FIG. 3.3 CRACKER ASSEMBLY

LMC/MIDSTATE ROLL CRACKER REPLACEMENT PARTS

PART# 4204001A

ITEM	#REQ	DESCRIPTION	30"PART#	42"PART#
1	1	VIBRATORY FEEDER PAN ASSEMBLY	29E2540X	29E3100X
2	1	SHAKER - (SET WEIGHTS AT 50%)	11-069	11-070
3	4	SPRING, 1 1/4 OD X 3"LG.	26-050	26-050
4	8	SPRING, MOUNT 1/2 X 7/8	37-006	37-006
5	2	CI FLASHING - 1 1/2"	37-015	37-015
6	1	URETHANE INLET FLASHING	29E254	29E310



LMC/MIDSTATE FEEDER REPLACEMENT PARTS

PART# 5201009A

FIG. 3.4 FEEDER ASSEMBLY

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SECTION 3.3

NOTES

Non-Liability

The information contained in this manual has been compiled by Beeler Industries with high diligence to ensure correct information.

Beeler Industries does not assume liability for eventually wrong conclusions and results arising from this. The notes given in the manual describe the most common fault reasons. But often there are further reasons for existing faults, which cannot be listed here, or there are further sources of error, which are unknown yet. Beeler Industries does not assume liability for failed or unnecessary repair work. Beeler Industries does not assume liability for appliance of data and information, which either turn out as wrong, were incorrectly described or faults, which by mistake appeared during data compilation. Without restriction of the above mentioned facts, Beeler Industries does not assume liability for any loss regarding profits, company value or any other, also economic, loss arising from this.

No matter which legal justifications are present, Beeler Industries is liable for compensation only in case of intention, gross negligence and in warranty of assured quality. Warranties of assured qualities require the explicit written statement.

Liability according to product liability law shall remain unaffected. Beeler Industries reserves the right of user's contributory negligence argument. Beeler Industries is not liable to pay compensation for damages, which arise from misusage of the subject matter of the contract, even if Beeler Industries has been informed on the possibility of this damage. The liability of Beeler Industries is confined to the real price paid for the product. Beeler Industries takes no liability for damage or operating troubles arising from non-compliance of this user manual and the special safety precautions mentioned there. The burden of proof is on the user of the device, that he has paid attention to technical explanations, notes on operation, equipment care as well as maintenance and safety without exception. This non-liability does not hold, if any damage from injuries of body or health is based on deliberate or careless delinquency of Beeler Industries.