Gravac Gravity / Pneumatic Discharge Gate

Gravac Manual

Revision A

2/25/2020

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Section 2
General Information

This manual consists of information which will be useful in operating and maintaining your Gravac Discharge Gate equipped cars. It includes operating and maintenance procedures, along with illustrations to assist in identifying various components by name and part number.

It is extremely important, before proceeding with operation or maintenance of your cars, that you carefully read and understand the SAFETY PRECAUTIONS SECTION 3 of this manual.

These instructions are issued to supply acceptable methods for the operation, maintenance and troubleshooting of the Gravac Discharge Gate, and to supply safety information to the user, which is in addition to safety, precautions prescribed by the AAR, FRA and individual handling railroads.

It is expressly understood that issuance of these Miner instructions which were prepared in good faith and are believed to be complete and accurate, shall not be construed to mean that Miner Enterprises, Inc. assumes any liability on account of accidents to persons or property involving the Gravac Discharge Gate.

Miner Enterprises is not responsible for car construction or design, including modifications for gate application.

Section 3
Safety Precautions

In addition to safety precautions prescribed by the car owner, loading site, unloading site, repair shop and handling railroad, the following safety precautions must be observed whenever a Gravac Discharge Gate is operated and whenever any maintenance is performed on it.

1) All maintenance, repair, or adjustment must be made on a shop or repair track where the car will not be moved.

2) Protective eye and ear wear should be used when gate is operated.

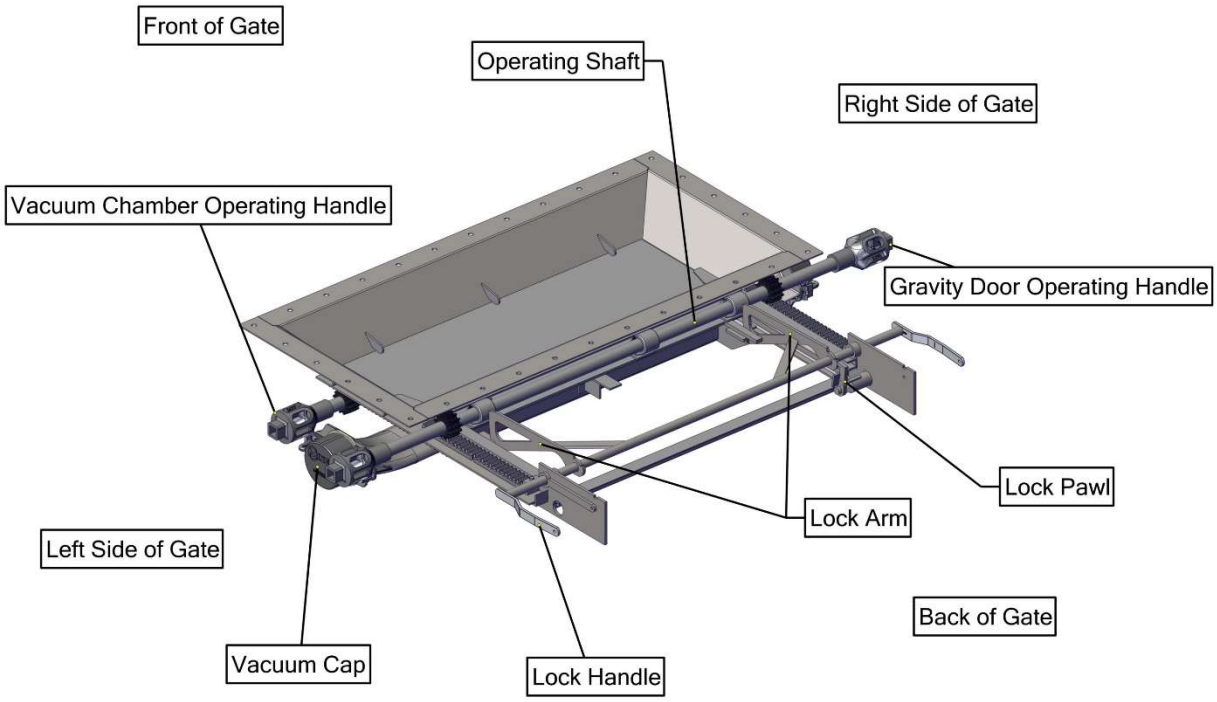
3) Read and follow Caution Notes found on the side of the car.

4) After unloading, confirm that the gate is completely closed and locked.

5) Always report an inoperable or damaged gate to a foreman or supervisor so that it may be properly repaired or replaced.

6) An input torque of 1,800 ft-lbs is not to be exceeded. Doing so may result in damage to the gate as well as personal injury.

Section 4
Gate Description and Operation



The Miner Gravac™ is a gravity/pneumatic gate. It comes in both 13x47 and 24x30 sizes. The 13x47 will be shown throughout this manual. The Gravac™ can unload commodity pneumatically from the vacuum chamber (plenum chamber) located on the bottom of the gate. The Gravac™ can also gravity unload commodity with the plenum chamber in the open position. Each portion of the gate has its own set of operating handles and pinion gears, which engage stationary rack sections. The gate has a single lock that engages and locks both portions of the gate. Both doors must be completely closed for the lock to engage normally. Both portions of the gate must be closed and locked before the car is moved. The gate must be manually unlocked before attempting to open the gate.

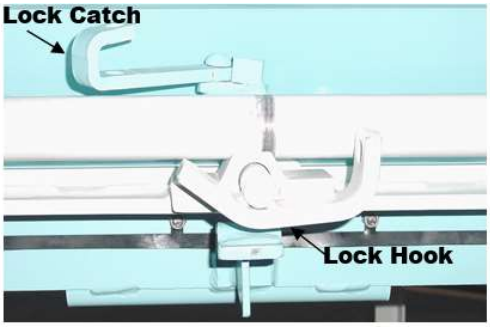
The Gravac™ was designed for use in barley / malt service. It is not designed for sanitary service as it is not sufficiently sealed for FDA food handling service. All Gravac™ gates have a rain and dirt shield strip on the back of the plenum, however this is not an FDA type sanitary load seal.

Lock Function

There are multiple lock designs for the Gravac™ discharge gate. All Gravacs have only one lock for both the gravity and vacuum portions of the gate. Older gates typically have a lock in the center of the gate as shown below.

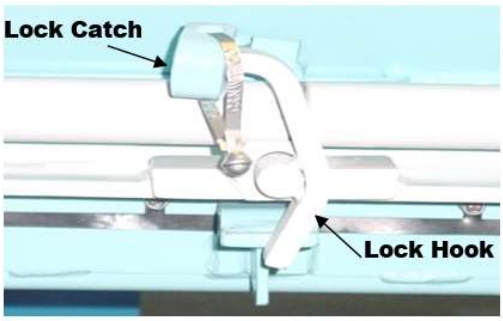
To Unlock: Remove the load seal. Rotate the Lock Catch away from the Lock Hook, then rotate the Lock Hook downward to horizontal.

To Lock: Fully close both door portions. Rotate the Lock Hook upwards to vertical. Engage Lock Hook in Lock Catch. Add the load seal.



Pivot Lock Catch, Rotate Lock Hook Down

Unlocked

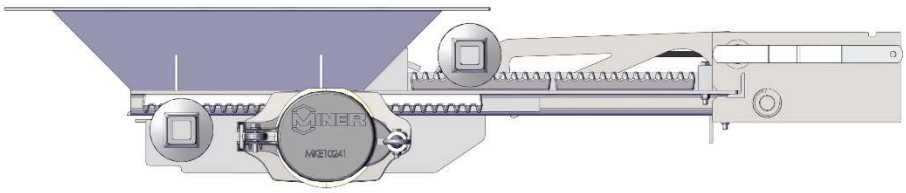


Engage Lock Hook in Lock Catch, Add Seal

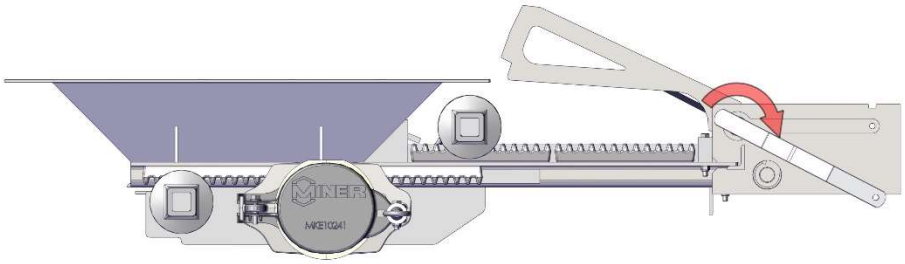
Locked and Sealed

Newer Gravac models have a side operated lock that is shown throughout this manual.

Gate is Locked

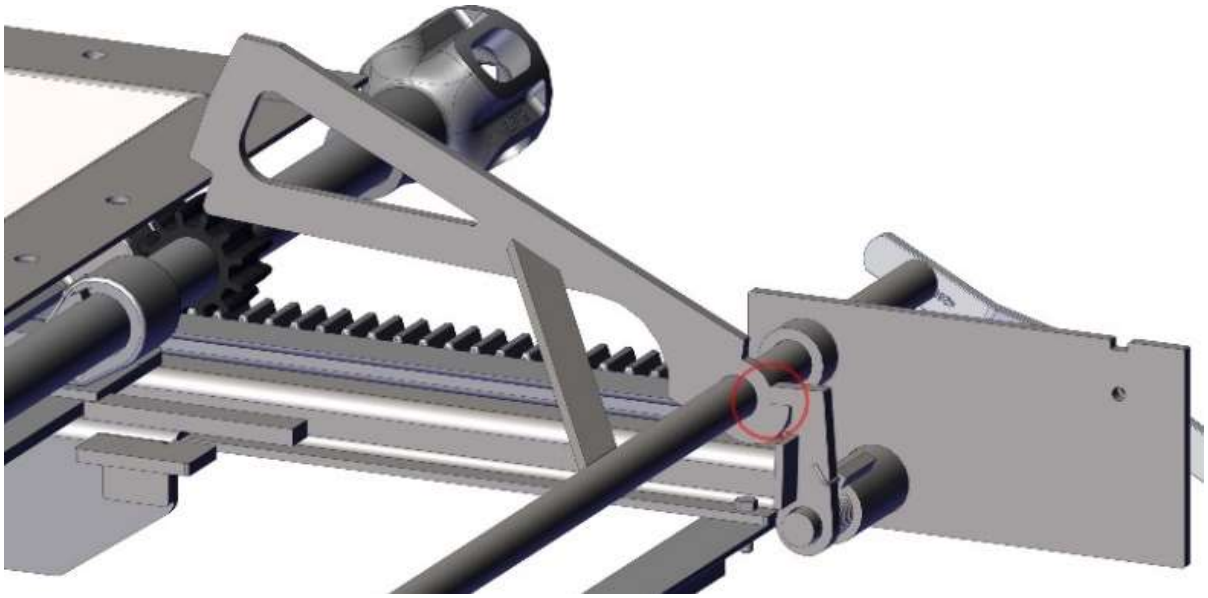


Gate is Unlocked

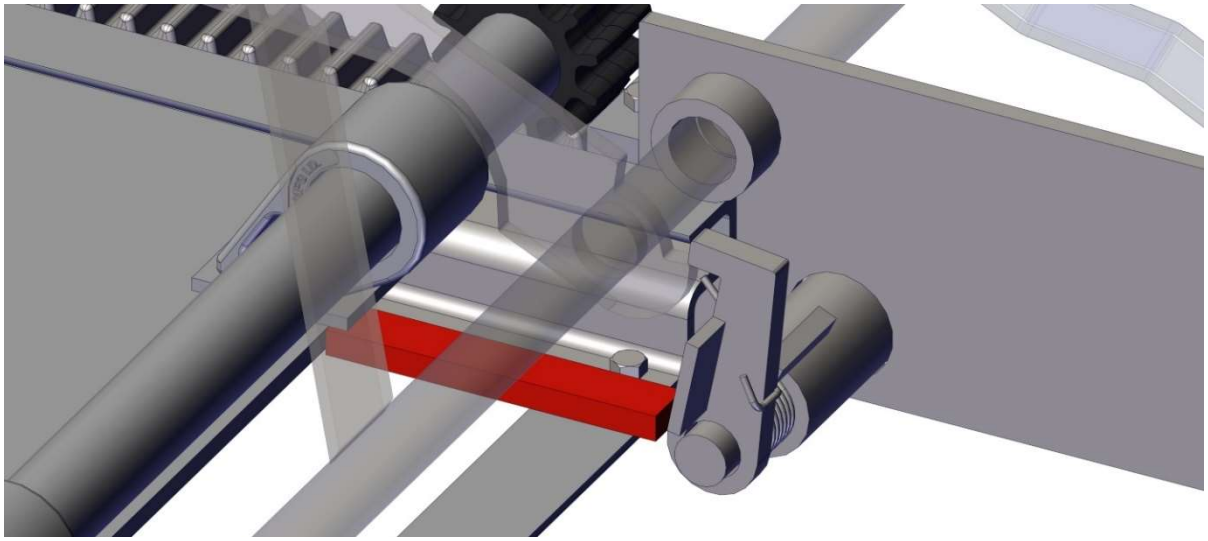


Gate Locking

Rotate the lock handle downwards until the lock pawl catches the lock arm as shown on the previous page. This will unlock both the door and the plenum.

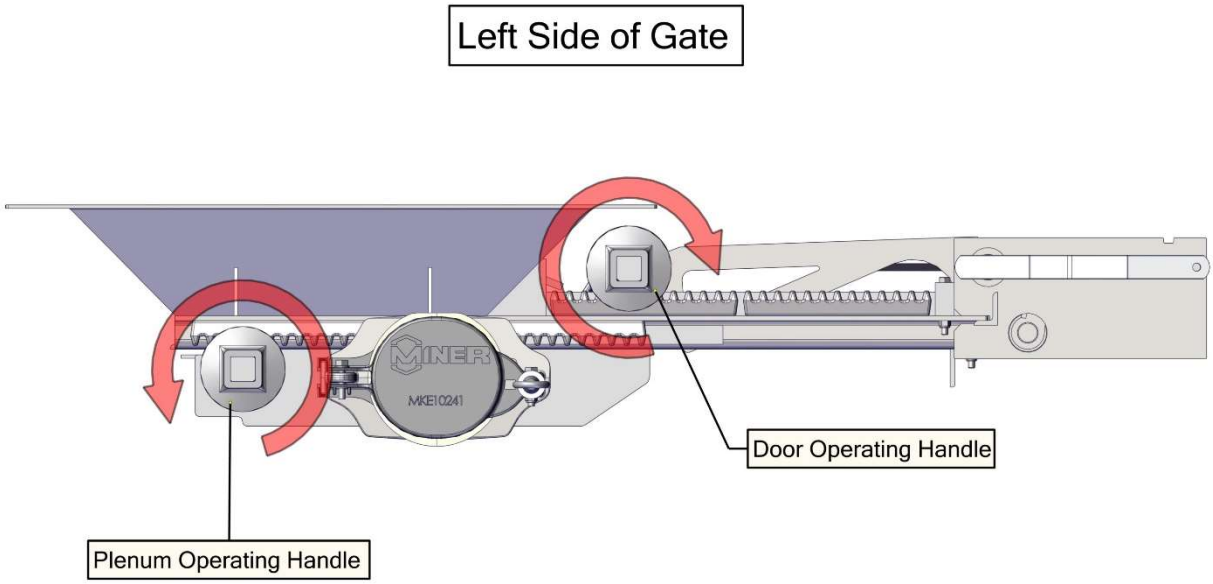


To relock the gate, open the door completely. The trip bar on the door shown in red below will release the lock catch and re-lock the gate. When closing the door, the lock arms will ride over the door and fall back into place ensureing the door and plenum remain locked.



Gate Operation

Each operating handle is connected to a welded gear pinion, which travels in a stationary rack. The upper handle opens and closes the gravity door of the gate. Seen from the left side of the gate, the handle rotates clockwise to open, and counterclockwise to close. The lower handle operates the vacuum portion of the gate. Seen from the left, this handle operates counterclockwise to open, and clockwise to close the vacuum portion.

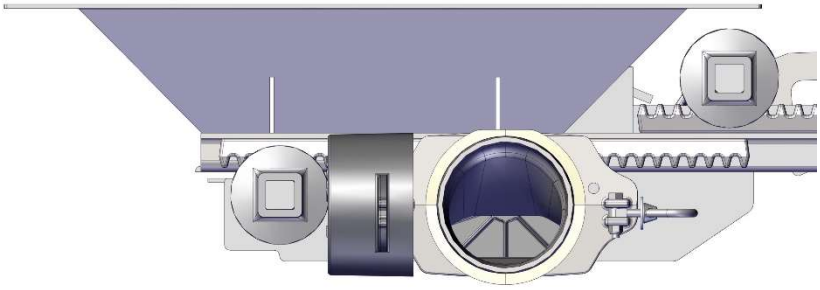


Both handles are mobile and travel along with their gate portion as they open and close, so a stationary power tool is not suitable for this gate. A power tool of reasonable size can be used but it must be able to move linearly with the operating handle as that portion of the gate opens and closes.

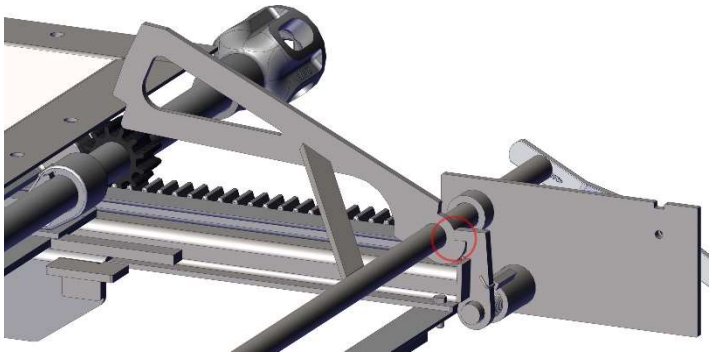
If a gate is very difficult to open with a manual tool it has probably been damaged and should be repaired. Contact Miner Customer Support for replacement parts.

Vacuum Unloading:

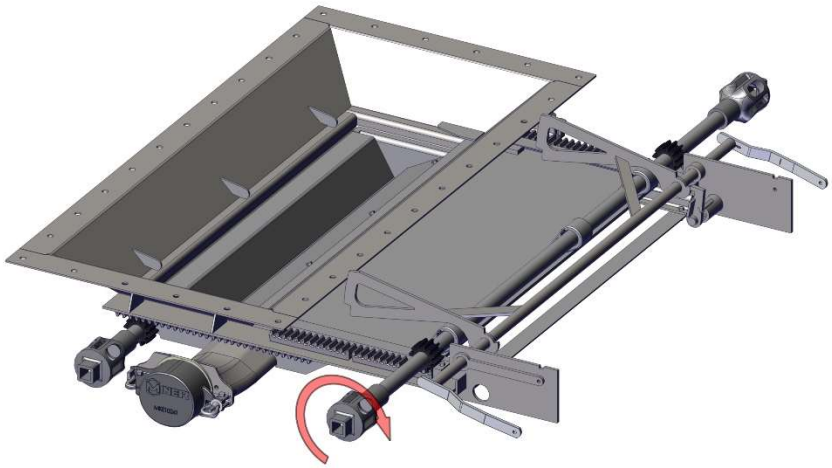
1. Turn the cap eye bolts on both sides of the gate counterclockwise until sufficiently loose. Pivot the bolts ninety degrees and open the caps.



2. Attach hose(s) and connections.
3. Rotate the lock handle downward to unlock the gate. Ensure that the lock catch engages as shown below.

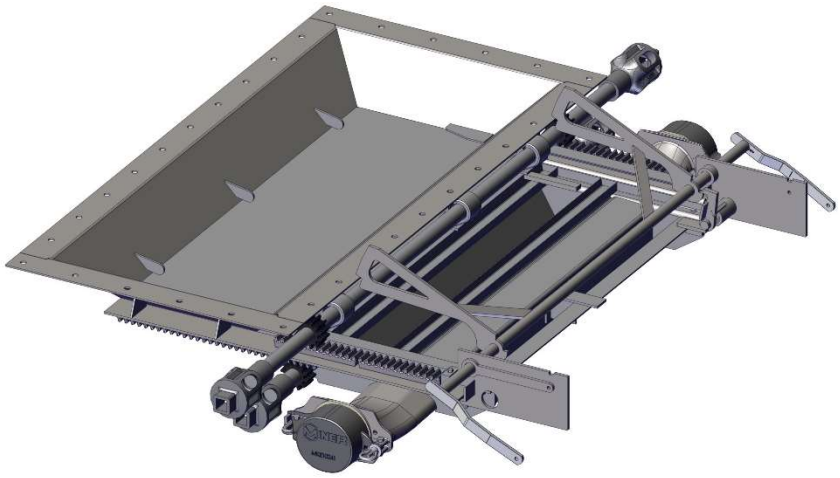


4. Facing the left side of the gate, rotate the door operating handle clockwise as shown below. Note that the operating handle will move with the door. Fully opening the door automatically relock the gate.

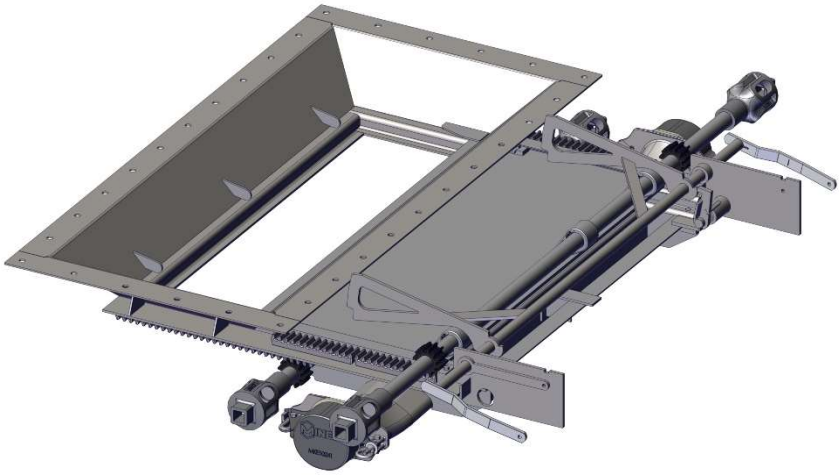


Gravity Unloading

1. Rotate the lock handle downward to unlock the gate. Ensue that the lock catch engages.
2. Facing the left side of the gate, rotate the plenum operating handle counterclockwise as shown below. Note that the operating handle will move with the plenum.



3. Fit unloading boot, sled, or bag if applicable.
4. Facing the left side of the gate, rotate the door operating handle clockwise as shown below. Note that the operating handle will move with the door. Fully opening the door will automatically relock the gate.



Section 5
Maintenance

Inspection

1. Periodic gate inspection will ensure that damaged or dirty gates are not used in service
2. Recommended interval is once per year or if unusual issues are reported.
3. The gates should only be cleaned on a safe track location and only with an empty car.
4. The gate should only be internally inspected on a safe track or shop location with an empty car.

Cleaning

Most Gravac™ operations difficulties be reduced or eliminated by maintaining cleanliness of a gate.

1. Both external and internal gate parts and running surfaces can be carefully cleaned mechanically, pneumatically, or with a water wash.
2. The vacuum chamber has an internal hood that can be unbolted and removed from the open chamber to facilitate cleaning. The hood should be reinstalled before the car is loaded.
3. Gates should only be cleaned on a safe track location and only with an empty car.

Section 6
Troubleshooting

A majority of problems with difficult operating Gravac™ gates can be traced back to a lack of proper cleanout at the unload point. This is especially true with products that are powdery or change state when exposed to moisture. Commodities such as flour and sugar are prone to packing and sticking to the running surfaces of the gate.

CAUTION

1. DO NOT strike or use heat on outlet gate or door to force open.
2. Use of powered gate opening units to force doors open may damage outlet gate.
3. Use of other mechanical devices (Car pullers, come-a-longs, hydraulic jacks) to open units may damage outlet gate.
4. Use recommended operating procedures specified in this manual.

NEED HELP?

For further assistance or information, contact Miner at 630-232-3000.
Please have your gate model number handy.